U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

NUREG-1437
Supplement 56
Volume 2

Generic Environmental Impact Statement for License Renewal of Nuclear Plants

Supplement 56

Regarding Fermi 2 Nuclear Power Plant

Draft Report for Comment

Appendices

Office of Nuclear Reactor Regulation

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Appendices

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Office of Nuclear Reactor Regulation

Proposed Action	Issuance of renewed operating license NPF-43 for Fermi 2 Nuclear Power Plant, in Frenchtown Township, Michigan
Type of Statement	Draft Supplemental Environmental Impact Statement
Agency Contact	Ms. Elaine Keegan U.S. Nuclear Regulatory Commission (NRC) Office of Nuclear Reactor Regulation Mail Stop O-11F1 Washington, DC 20555-0001 Phone: 301-415-8517 E-mail: elaine.keegan@nrc.gov
Comments	Any interested party may submit comments on this supplemental environmental impact statement. Please specify NUREG–1437, Supplement 56, draft, in your comments. Comments must be received by December 28, 2015. Comments received after the expiration of the comment period will be considered if it is practical to do so, but the NRC cannot give assurance of consideration of late comments. Comments may be submitted electronically by searching for docket ID NRC-2014-0109 at the Federal rulemaking Web site, http://www.regulations.gov. Comments also may be mailed to the following address: Chief, Rules, Announcements, and Directives Branch Division of Administrative Services Office of Administration Mail Stop: OWFN-12 H08 U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 Please be aware that any comments that you submit to the NRC will be considered a public record and entered into the Agencywide Documents Access and Management System. Do not provide information you would not want to be publicly available.

COVER SHEET

Responsible Agency: U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation. There are no cooperating agencies involved in the preparation of this document.

Title: *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 56, Regarding Fermi 2 Nuclear Power Plant, Draft Report for Comment* (NUREG–1437). Fermi 2 is located in Frenchtown Township, Michigan.

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ABSTRACT

This supplemental environmental impact statement (SEIS) has been prepared in response to an application submitted by DTE Electric Company (DTE), to renew the operating license for the Fermi 2 Nuclear Power Plant for an additional 20 years.

This SEIS includes the preliminary analysis that evaluates the environmental impacts of the proposed action and the alternatives to the proposed action. Alternatives considered include: (1) natural gas combined-cycle (NGCC), (2) coal-integrated gasification combined-cycle (IGCC), (3) new nuclear power generation, (4) a combination of NGCC, wind, and solar generation, and (5) the no-action alternative (i.e., no renewal of the license).

The U.S. Nuclear Regulatory Commission (NRC) staff's preliminary recommendation is that the adverse environmental impacts of license renewal for Fermi 2 are not so great that preserving the option of license renewal for energy-planning decisionmakers would be unreasonable. The NRC staff based its recommendation on the following factors:

- the analysis and findings in NUREG–1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants,* Volumes 1 and 2;
- the Environmental Report submitted by DTE;
- consultation with Federal, state, tribal, and local government agencies;
- the NRC staff's independent environmental review; and
- consideration of public comments received during the scoping process.

TABLE OF CONTENTS

FIGURES

TABLES

Tables

EXECUTIVE SUMMARY

BACKGROUND

By letter dated April 24, 2014, DTE Electric Company (DTE) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) to issue a renewed operating license for Fermi 2 Nuclear Power Plant (Fermi 2) for an additional 20-year period.

Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 51.20(b)(2), the renewal of a power reactor operating license requires preparation of an environmental impact statement (EIS) or a supplement to an existing EIS. In addition, 10 CFR 51.95(c) states that, in connection with the renewal of an operating license, the NRC shall prepare an EIS, which is a supplement to the Commission's NUREG-1437, *Generic Environmental Impact Statement (GEIS) for License Renewal of Nuclear Plants*.

Upon acceptance of DTE's application, the NRC staff began the environmental review process described in 10 CFR Part 51 by publishing a Notice of Intent to prepare a supplemental environmental impact statement (SEIS) and to conduct scoping. In preparation of this SEIS for Fermi 2, the NRC staff performed the following:

- conducted public scoping meetings on July 24, 2014, in Monroe, Michigan;
- conducted a site audit at Fermi 2 from September 8, 2014, to September 11, 2014;
- reviewed DTE's Environmental Report (ER) and compared it to the GEIS;
- consulted with Federal, state, tribal, and local agencies;
- conducted a review of the issues following the guidance set forth in *Standard Review Plans for Environmental Reviews for Nuclear Power Plants: Environmental Standard Review Plan for Operating License Renewal (NUREG-1555 Supplement 1, Revision 1, Final Report)*; and
- considered public comments received during the scoping process.

PROPOSED ACTION

DTE initiated the proposed Federal action (i.e., issuance of a renewed power reactor operating license) by submitting an application for license renewal of Fermi 2 for which the existing license (NPF-43) expires on March 20, 2025. The NRC's Federal action is to decide whether to renew the license for an additional 20 years. The regulation at 10 CFR 2.109 states that, if a licensee of a nuclear power plant files an application to renew an operating license at least 5 years before the expiration date of that license, the existing license will not be deemed to have expired until the safety and environmental reviews are completed and until the NRC has made a final decision on whether to deny the application or to issue a renewed license for the additional 20 years.

PURPOSE AND NEED FOR ACTION

The purpose and need for the proposed action (issuance of renewed license) is to provide an option that allows for power generation capability beyond the term of the current nuclear power plant operating license to meet future system generating needs. Such needs may be determined by other energy-planning decisionmakers, such as states, operators, and, where authorized, Federal agencies (other than the NRC). This definition of purpose and need reflects

the NRC's recognition that, unless there are findings in the safety review required by the Atomic Energy Act of 1954, as amended, or findings in the National Environmental Policy Act of 1969, as amended, environmental analysis that would lead the NRC to reject a license renewal application, the NRC does not have a role in the energy-planning decisions as to whether a particular nuclear power plant should continue to operate.

ENVIRONMENTAL IMPACTS OF LICENSE RENEWAL

The SEIS evaluates the potential environmental impacts of the proposed action. The environmental impacts from the proposed action are designated as SMALL, MODERATE, or LARGE. As established in the GEIS, Category 1 issues are those that meet all of the following criteria:

The environmental impacts associated with the issue are determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristics.

A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal.

Mitigation of adverse impacts associated with the issue is considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

SMALL: Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

MODERATE**:** Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE**:** Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

For Category 1 issues, no additional site-specific analysis is required in this SEIS unless new and significant information is identified. Chapter 4 of this SEIS presents the process for identifying new and significant information. Site-specific issues (Category 2) are those that do not meet one or more of the criteria for Category 1 issues; therefore, an additional site-specific review for these nongeneric issues is required, and the results are documented in the SEIS.

Neither DTE nor the NRC identified information that is both new and significant related to Category 1 issues that would call into question the conclusions in the GEIS. This conclusion is supported by the NRC staff's review of the applicant's ER and other documentation relevant to the applicant's activities, the public scoping process and substantive comments raised, and the findings from the environmental site audit conducted by the NRC staff. Therefore, the NRC staff relied upon the conclusions of the GEIS for all Category 1 issues applicable to Fermi 2.

Table ES-1 summarizes the Category 2 issues relevant to Fermi 2 and the NRC staff's findings related to those issues. If the NRC staff determined that there were no Category 2 issues applicable for a particular resource area, the findings of the GEIS, as documented in Appendix B to Subpart A of 10 CFR Part 51, are incorporated for that resource area.

Table ES–1. Summary of NRC Conclusions Relating to Site-Specific Impacts of License Renewal

Resource Area	Relevant Category 2 Issues	Impacts
Groundwater Resources	Radionuclides released to groundwater	SMALL
Terrestrial Resources	Effects on terrestrial resources (noncooling system impacts)	SMALL
Special Status Species and Habitats	Threatened, endangered, and species and essential fish habitat	No effect[(a)]
Historic and Cultural Resources	Historic and cultural resources	No adverse effect[(b)]
Human Health	Electric shock hazards	SMALL
Environmental Justice	Minority and low-income populations	See note below[(c)]
Cumulative Impacts	Air Quality and Noise	SMALL
	Geology and Soils	SMALL
	Water Resources	SMALL to MODERATE
	Terrestrial Ecology	MODERATE to LARGE
	Aquatic Resources	LARGE
	Historic and Cultural Resources	SMALL
	Socioeconomic	SMALL to LARGE
	Human Health	SMALL
	Environmental Justice	See note below[(c)]
	Waste Management	SMALL
	Global Climate Change	MODERATE

[(a)] For Federally protected species, the NRC reports the effects from continued operation of Fermi 2 during the license renewal period in terms of its Endangered Species Act of 1973, as amended, findings of "no effect," "may effect, but not likely to adversely effect," or "may affect, and is likely to adversely affect."

[(b)] The National Historic Preservation Act of 1966, as amended, requires Federal agencies to consider the effects of their undertakings on historic properties.

[(c)] There would be no disproportionately high and adverse impacts to minority and low-income populations and subsistence consumption from continued operation of Fermi 2 during the license renewal period and from cumulative impacts.

SEVERE ACCIDENT MITIGATION ALTERNATIVES

Since severe accident mitigation alternatives (SAMAs) have not been previously considered in an environmental impact statement or environmental assessment for Fermi 2, 10 CFR 51.53(c)(3)(ii)(L) requires DTE to submit, with the ER, a consideration of alternatives to mitigate severe accidents. SAMAs are potential ways to reduce the risk or potential impacts of uncommon, but potentially severe accidents. SAMAs may include changes to plant components, systems, procedures, and training.

The NRC staff reviewed DTE's ER evaluation of potential SAMAs and determined whether the identified potentially cost-beneficial SAMAs are subject to aging management. Because the potential cost-beneficial SAMAs are associated with procedure changes, new hardware to improve a manual action, and a new structure between switchgear rooms, the NRC staff determined that these SAMAs do not relate to managing the effects of aging during the period of

extended operation. Therefore, the potentially cost-beneficial SAMAs identified need not be implemented as part of the license renewal, pursuant to 10 CFR Part 54.

ALTERNATIVES

The NRC staff considered the environmental impacts associated with alternatives to license renewal. These alternatives include other methods of power generation, as well as not renewing the Fermi 2 operating license (the no-action alternative). The NRC staff considered the following feasible and commercially viable replacement power alternatives:

- natural gas combined-cycle (NGCC);
- coal-integrated gasification combined-cycle (IGCC);
- new nuclear power; and
- a combination of NGCC, wind, and solar power.

The NRC staff initially considered a number of additional alternatives for analysis as alternatives to the license renewal of Fermi 2. The NRC staff later dismissed these alternatives because of technical, resource availability, or commercial limitations that currently exist and that the NRC staff believes are likely to continue to exist when the current Fermi 2 licenses expire. The no-action alternative and the effects it would have were also considered by the NRC staff.

Where possible, the NRC staff evaluated potential environmental impacts for these alternatives located at both the Fermi 2 site and some other unspecified alternate location. The NRC staff considered the following alternatives, but dismissed them:

- energy conservation and energy efficiency,
- solar power,
- wind power,
- biomass power,
- hydroelectric power,
- wave and ocean energy,
- fuel cells,
- delayed retirement,
- geothermal power,
- municipal solid waste,
- petroleum-fired power,
- supercritical pulverized coal, and
- purchased power.

The NRC staff evaluated each alternative using the same resource areas that were used in evaluating impacts from license renewal.

PRELIMINARY RECOMMENDATION

The NRC staff's preliminary recommendation is that the adverse environmental impacts of license renewal for Fermi 2 are not so great that preserving the option of license renewal for energy-planning decisionmakers would be unreasonable. The NRC staff based its recommendation on the following:

- the analyses and findings in the GEIS;
- the ER submitted by DTE;
- the NRC staff's consultation with Federal, state, tribal, and local agencies;
- the NRC staff's independent environmental review; and
- the NRC staff's consideration of public comments received during the scoping process.

ABBREVIATIONS AND ACRONYMS

ac	acre(s)
AC	alternating current
ACHP	Advisory Council on Historic Preservation
ADAMS	Agencywide Documents Access and Management System
AEA	Atomic Energy Act of 1954 (as amended)
ALARA	as low as is reasonably achievable
ANS	American Nuclear Society
APE	averted public exposure
APE	area of potential effect
AQCR	Air Quality Control Region
ASLB	Atomic Safety and Licensing Board (NRC)
ASME	American Society of Mechanical Engineers
ATWS	anticipated transient(s) without scram
AWEA	American Wind Energy Association
BGEPA	Bald and Golden Eagle Protection Act of 1940, as amended
Black and Veatch	Black & Veatch Corporation
BLM	Bureau of Land Management
BLS	Bureau of Labor Statistics
BOEM	Bureau of Ocean Energy Management
BWR	boiling water reactor
°C	degrees Celsius
CAA	Clean Air Act
CAES	compressed air energy storage
CCS	carbon capture and storage
CDC	Centers for Disease Control and Prevention
CDF	core damage frequency
CEQ	Council on Environmental Quality
CET	containment event tree
CFR	*Code of Federal Regulations*
cfs	cubic foot (feet) per second
cm	centimeter
CNWR	Center for Nuclear Waste Regulatory Analysis
CO	carbon monoxide

CO_2	carbon dioxide
CO_2/MWh	carbon dioxide per megawatt hour
COL	combined license
Compact	2008 Great Lakes–St. Lawrence River Basin Water Resources Compact
CSPAR	Cross-State Air Pollution Rule
CWA	Clean Water Act
CWR	circulating water reservoir
CWS	circulating water system
CZMA	Coast Zone Management Act of 1972
dB	decibels
dBA	decibel(s) on the A-weighted scale
DBA	design-basis accident
DECo	Detroit Edison Company
DBH	diameter at breast height
DOE	U.S. Department of Energy
DRIWR	Detroit River International Wildlife Refuge
DSIRE	Database of State Incentives for Renewables and Efficiency
DSM	demand-side management
DTE	DTE Electric Company
Ducks Unlimited	Ducks Unlimited, Inc.
DWCA	Detroit Wayne County Airport
ECCS	emergency core cooling system
EDG	emergency diesel generator
EFH	essential fish habitat
EIA	Energy Information Administration
EIS	environmental impact statement
EMF	electromagnetic field
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
EPT	Ephemeroptera-Plecoptera-Trichoptera index
EPZ	emergency planning zone
ER	Environmental Report
ERC	Energy Recovery Council

ESA	Endangered Species Act of 1973, as amended
ESBWR	economic simplified boiling water reactor
°F	degrees Fahrenheit
FDC	floor drain collector
FDCT	floor drain collector tank
FEIS	final environmental impact statement
Fermi 2	Fermi, Unit 2
Fermi 3	Fermi, Unit 3
FES-C	final environmental statement–construction
FES-O	final environmental statement–operation
FIVE	fire-induced vulnerability evaluation
FLIGHT	Facility Level Information on Green House Gases Tool
FR	*Federal Register*
FRN	*Federal Register* Notice
ft	foot (feet)
ft^3	cubic foot (feet)
FWS	U.S. Fish and Wildlife Service
g C_{eq}/kWh	gram(s) of carbon equivalent per kilowatt-hour
gal	gallon(s)
GEIS	generic environmental impact statement
GI	generic issue
GL	generic letter
GLC	Great Lakes Commission
gpm	gallon(s) per minute
GSW	general service water
ha	hectare(s)
HCLPF	high confidence in low probability of failure
HFO	high winds, floods, and other
HRA	human reliability analysis
HRSG	heat recovery steam generator
IEA	International Energy Agency
IEEE	Institute of Electrical and Electronics Engineers
IGCC	integrated gasification combined-cycle
in.	inch(es)
IFSI	independent spent fuel storage installation

IPE	individual plant examination
IPEEE	individual plant examination(s) of external events
ISLOCA	interfacing-systems loss-of-coolant accident
kg	kilogram(s)
km	kilometer(s)
km^2	square kilometer(s)
kph	kilometer(s) per hour
kV	kilovolt(s)
kW	kilowatt(s)
$kWh/m^2/d$	kilowatt hours per square meter per day
L	liter(s)
LaMP	(Lake Erie) Lakewide Management Plan Work Group
L_{DN}	day-night sound intensity level
L_{EQ}	equivalent sound intensity level
L_n	statistical sound level
lb	pound(s)
LERF	large early release frequency
LLMW	low-level mixed waste
LOCA	loss-of-coolant accident
LOOP	loss(es) of offsite power
Lpd	liter(s) per day
L/min	liter(s) per minute
LRA	license renewal application
m/s	meter(s) per second
m^3	cubic meter(s)
m^3/d	cubic meter(s) per day
m^3/s	cubic meter(s) per second
m^3/y	cubic meters per year
MAAP	Modular Accident Analysis Program
MAC	Michigan Administrative Code
MACCS2	MELCOR Accident Consequence Code System 2
MCPDC	Monroe County Planning Department and Commission
MACR	maximum averted cost risk
MATS	Mercury and Air Toxics Standards
MCL	Michigan Compiled Laws

MCR	main control room
MDEQ	Michigan Department of Environmental Quality
MDCH	Michigan Department of Community Health
MDHS	Michigan Department of Human Services
MDNR	Michigan Department of Natural Resources
mgd	million gallons per day
mgy	million gallons per year
mGy	milligray
mi	mile(s)
mi^2	square mile(s)
MIOSHA	Michigan Occupational Safety and Health Administration
MISO	Midcontinent Independent System Operator
mm	millimeter
MNFI	Michigan Natural Features Inventory
MOA	Memorandum of Agreement
mph	mile(s) per hour
mrad	millirad
mrem	millirem
MSA	Magnuson–Stevens Fishery Conservation and Management Act, as amended through 2006
MSL	mean sea level
MSUE	Michigan State University Extension
mSv	millisievert
MUR	measurement uncertainty recapture
MW	megawatt(s)
MWe	megawatt(s) electric
MWh	megawatt hour(s)
MWt	megawatt(s) thermal
NAAQS	National Ambient Air Quality Standards
NASS	National Agricultural Statistics Service (U.S. Department of Agriculture)
NAVD88	North American Vertical Datum of 1988
NCDC	National Climatic Data Center
NCES	National Center for Education Statistics
NEI	Nuclear Energy Institute

NEPA	National Environmental Policy Act of 1969, as amended
NESC	National Electrical Safety Code
NETL	National Energy Technology Laboratory
NGCC	natural gas combined-cycle
NHPA	National Historic Preservation Act of 1966, as amended
NIEHS	National Institute of Environmental Health Sciences
NMFS	National Marine Fisheries Service (National Oceanic and Atmospheric Administration)
NO_2	nitrogen dioxide
NO_x	nitrogen oxide(s)
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRC	U.S. Nuclear Regulatory Commission
NRCS	Natural Resources Conservation Service
NREL	National Renewable Energy Laboratory
NREPA	Michigan's Natural Resources and Environmental Protection Act 451 of 1994, as amended
NRR	Nuclear Reactor Regulation, Office of (NRC)
NSR	New Source Review
O_3	ozone
ODCM	Offsite Dose Calculation Manual
ODNR	Ohio Department of Natural Resources
OECR	offsite economic cost risk
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
OSSF	onsite storage facility
OW	open water
pCi/L	picocurie(s) per liter
Pb	lead
PDR	population dose risk
PDS	plant damage state
PEIS	programmatic environmental impact statement
PEM	palustrine emergent marsh
PFO	palustrine forested

PHAC	Public Health Agency of Canada
P-IBI	Planktonic Index of Biotic Integrity
PM	particulate matter
PRA	probabilistic risk assessment
PRE	principal residence exemption
PSDAR	post-shutdown decommissioning activities
PSS	palustrine scrub-shrub
PTS	post-treatment system
PV	photovoltaic
radwaste	radioactive waste
RAI	request(s) for additional information
RCRA	Resource Conservation and Recovery Act of 1976, as amended
rem	roentgen equivalent(s) man
REMP	Radiological Environmental Monitoring Program
RESA	(Wayne) Regional Educational Service Agency RHR (residual heat removal)
ROI	region(s) of influence
ROW	right-of-way(s)
RPHP	Radiation and Public Health Project
RPS	reactor protection system
RPV	reactor pressure vessel
RRW	risk reduction worth
SAMA	severe accident mitigation alternative
SAR	Safety Analysis Report
SBO	station blackout
SCPC	supercritical pulverized coal
SCR	selective catalytic reduction
SEIS	supplemental environmental impact statement
SEMCOG	Southeast Michigan Council of Government
SER	safety evaluation report
SESC	Soil Erosion and Sediment Control (Michigan
SHPO	State Historic Preservation Office
SMA	seismic margin assessment
SO_2	sulfur dioxide
SO_x	sulfur oxide(s)

SSC	structure(s), system(s), and component(s)
SSEL	Safe Shutdown Equipment List
Sv	sievert(s)
syngas	synthesis gas
TAC	technical assignment control
TEEIC	Tribal Energy and Environmental Information Clearinghouse
U.S.	United States
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
UFSAR	updated final safety analysis report
USGRCP	U.S Global Change Research Program
USGS	U.S. Geological Survey
µm	micrometer
WAPA	Western Area Power Administration
WCS	waste collector subsystem
WHC	Wildlife Habitat Council
WM	wooded marsh

APPENDIX A COMMENTS RECEIVED ON THE FERMI 2 ENVIRONMENTAL REVIEW

A. COMMENTS RECEIVED DURING THE SCOPING PERIOD

The scoping process for the environmental review of the license renewal application (LRA) for Fermi 2 began on June 30, 2014, with the publication of the U.S. Nuclear Regulatory Commission's (NRC's) Notice of Intent to conduct scoping in Volume 79 of the *Federal Register*, page 36837 (79 FR 36837). The scoping process included two public meetings held in Monroe, Michigan, on July 24, 2014. Approximately 110 people attended the meetings. After the NRC's prepared statements pertaining to the license renewal process, the meetings were open for public comments. Attendees provided oral statements that were recorded and transcribed by a certified court reporter. A summary and transcripts of the scoping meetings are available using the NRC's Agencywide Documents Access and Management System (ADAMS). The ADAMS Public Electronic Reading Room is accessible at http://www.nrc.gov/reading-rm/adams.html. The scoping meetings summary can be found under ADAMS Accession No. ML14233A450. Transcripts for the afternoon and evening meetings can be found under ADAMS Accession Nos. ML14254A465 and ML14254A470, respectively. In addition to comments received during the public meetings, comments were also received electronically and through the mail.

Each commenter was given a unique numeric identifier (001 through 063) so that every comment can be traced back to its author. Table A–1. identifies the individuals who provided comments and an accession number to identify the source document of the comments in ADAMS. Each source document was assigned an alphabetic identifier (A through CC).

Specific comments were categorized and consolidated by topic. Comments with similar specific objectives were combined to capture the common essential issues raised by commenters. Comments have been grouped into the following general categories:

- Specific comments that address environmental issues within the purview of the NRC environmental regulations related to license renewal. These comments address Category 1 (generic) or Category 2 (site-specific) issues identified in NUREG–1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), or issues not addressed in the GEIS. The comments also address alternatives to license renewal and related Federal actions.
- General comments in support of, or opposed to, nuclear power or license renewal or comments regarding the renewal process, the NRC's regulations, and the regulatory process.
- Comments that address issues that do not fall within, or are specifically excluded from, the purview of the NRC's environmental regulations related to license renewal. These comments typically address issues, such as the need for power, emergency preparedness, security, current operational safety issues, and safety issues related to operation during the renewal period.

Table A–1. Individuals Providing Comments during the Scoping Comment Period

Each commenter is identified, along with an affiliation, and how the comment was submitted.

Commenter	Affiliation (if stated)	ID	Comment Source	ADAMS Number
Gabriel Agboruche	DTE Electric Company	001	Evening Transcript (CC)	ML14254A470
Anonymous	None given	002	Comment letter (S)	ML14252A172
Mary Ann Baier	None given	003	Comment letter (O)	ML14252A142
Sandra Bihn	Lake Erie Waterkeeper	004	Comment letter (U)	ML14252A175
Paul Braunlich	Frenchtown Charter Township Resort District Authority	005	Afternoon Transcript (BB)	ML14254A465
Greg Brede	None given	006	Afternoon Transcript (BB)	ML14254A465
Barry Buschmann	The Mannik & Smith Group	007	Afternoon Transcript (BB)	ML14254A465
Joanne Cantoni	None given	008	Comment letter (N)	ML14252A141
Corinne Carey	Don't Waste Michigan	009	Comment letter (M)	ML14252A140
Connie Carroll	United Way of Monroe County	010	Afternoon Transcript (BB)	ML14254A465
Robert Clark	City of Monroe	011	Afternoon Transcript (BB)	ML14254A465
Jessie Pauline Collins	Citizens' Resistance at Fermi 2	012	Afternoon Transcript (BB)	ML14254A465
			Evening Transcript (CC)	ML14254A470
			Comment letter (F)	ML14234A189
			Comment letter (L)	ML14252A139
Valerie Crow	None given	013	Evening Transcript (CC)	ML14254A470
Eric Dover	DTE Electric Company	014	Afternoon Transcript (BB)	ML14254A465
			Evening Transcript (CC)	ML14254A470
Nancy Dover	None given	015	Afternoon Transcript (BB)	ML14254A465
Rosemary Doyle	None given	016	Comment letter (R)	ML14252A171
Michelle Dugan	Monroe County Chamber of Commerce	017	Comment letter (E)	ML14234A188
Bill Dyer	Utilities Workers Union of America, Local 223—Fermi Division	018	Afternoon Transcript (BB)	ML14254A465
Mark Farris	None given	019	Afternoon Transcript (BB)	ML14254A465

Commenter	Affiliation (if stated)	ID	Comment Source	ADAMS Number
			Evening Transcript (CC)	ML14254A470
			Comment letter (Z)	ML14252A186
Lynne Goodman	DTE Electric Company	020	Evening Transcript (CC)	ML14254A470
Martha Gruelle	Wildlife Habitat Council	021	Afternoon Transcript (BB)	ML14254A465
Keith Gunter	Alliance to Halt Fermi 3	022	Afternoon Transcript (BB)	ML14254A465
Taiya Himebauch	DTE Electric Company	023	Afternoon Transcript (BB)	ML14254A465
Sean Honell	DTE Electric Company	024	Afternoon Transcript (BB)	ML14254A465
Carol Izant	Alliance to Halt Fermi 3	025	Afternoon Transcript (BB)	ML14254A465
			Evening Transcript (CC)	ML14254A470
			Comment letter (V)	ML14252A176
Kevin Kamps	Beyond Nuclear	026	Afternoon Transcript (BB)	ML14254A465
			Evening Transcript (CC)	ML14254A470
Hedwig Kaufman	None given	027	Evening Transcript (CC)	ML14254A470
Michael Keegan	Don't Waste Michigan	028	Afternoon Transcript (BB)	ML14254A465
			Comment letter (K)	ML14252A138
			Comment letter (Y)	ML14252A180
Manfred Klein	None given	029	Evening Transcript (CC)	ML14254A470
Dustin Krasny	Office of Congressman Tim Walberg	030	Afternoon Transcript (BB)	ML14254A465
Tim Lake	Monroe County Business Development Corporation	031	Evening Transcript (CC)	ML14254A470
Bobby Lambert	Monroe County Board of Commissioners	032	Evening Transcript (CC)	ML14254A470
Ron Lankford	None given	033	Afternoon Transcript (BB)	ML14254A465
Bill LaVoy	Michigan House of Representatives	034	Evening Transcript (CC)	ML14254A470
Vic and Gail Macks	None given	035	Comment letter (J)	ML14234A339
Archana Manoharan	American Nuclear Society/DTE Electric Company	036	Afternoon Transcript (BB)	ML14254A465

Commenter	Affiliation (if stated)	ID	Comment Source	ADAMS Number
Bonnie Masserant	DTE Electric Company	037	Evening Transcript (CC)	ML14254A470
Ed McArdle	Sierra Club—Michigan Chapter	038	Comment letter (AA)	ML14259A341
Jim McDevitt	Frenchtown Charter Township	039	Comment letter (D)	ML14216A376
Rich McDevitt	DTE Electric Company	040	Afternoon Transcript (BB)	ML14254A465
			Evening Transcript (CC)	ML14254A470
Stephen McNew	Monroe County Intermediate School District	041	Comment letter (C)	ML14219A583
Floreine Mentel	Former Monroe County Commissioner	042	Afternoon Transcript (BB)	ML14254A465
Jeanne Micka	Monroe County Garden Club	043	Afternoon Transcript (BB)	ML14254A465
Richard Micka	None given	044	Afternoon Transcript (BB)	ML14254A465
			Comment letter (G)	ML14234A190
Jessica Miskena	None given	045	Evening Transcript (CC)	ML14254A470
Sandy Mull	Southern Wayne County Regional Chamber of Commerce	046	Afternoon Transcript (BB)	ML14254A465
Tracy Oberleiter	Monroe County Economic Development Corporation	047	Afternoon Transcript (BB)	ML14254A465
Phyllis Oster	None given	048	Comment letter (Q)	ML14252A170
Sandy Pierce	Monroe Center for Healthy Aging	049	Afternoon Transcript (BB)	ML14254A465
Joseph Plona	DTE Electric Company	050	Afternoon Transcript (BB)	ML14254A465
Emilio Ramos	None given	051	Evening Transcript (CC)	ML14254A470
Ken Richards	None given	052	Comment letter (T)	ML14252A173
Randy Richardville	Michigan State Senator	053	Comment letter (B)	ML14219A580
Angela Rudolph	URS	054	Afternoon Transcript (BB)	ML14254A465
David Schonberger	None given	055	Afternoon Transcript (BB)	ML14254A465
			Evening Transcript (CC)	ML14254A470

Commenter	Affiliation (if stated)	ID	Comment Source	ADAMS Number
			Comment letter (X)	ML14252A178
Robert Simpson	None given	056	Comment letter (P)	ML14252A143
			Comment letter (W)	ML14252A177
Phillip Skarbek	DTE Electric Company	057	Afternoon Transcript (BB)	ML14254A465
			Evening Transcript (CC)	ML14254A470
Jerry Sobczak	DTE Shareholders United	058	Evening Transcript (CC)	ML14254A470
Robert Tompkins	Detroit Edison Alliance of Retirees	059	Comment letter (A)	ML14205A009
Tim Walberg	U.S. Congress	060	Comment letter (I)	ML14234A192
Emily Wood	Women in Nuclear/DTE Electric Company	061	Afternoon Transcript (BB)	ML14254A465
			Evening Transcript (CC)	ML14254A470
Grace Yackee	Monroe County Community College	062	Afternoon Transcript (BB)	ML14254A465
Dale Zorn	Michigan State Representative	063	Evening Transcript (CC)	ML14254A470
			Comment letter (H)	ML14234A191

Comments that are general or outside the scope of the environmental review for the Fermi 2 license renewal are not addressed in this appendix, but they can be found in the Scoping Summary Report (ADAMS No. ML15252A015). To maintain consistency with the Scoping Summary Report, the unique identifier used in that report for each comment is retained in Appendix A. Comments addressed in Appendix A are provided in their original form at the end of the Scoping Summary Report.

Comments received during the scoping comment period applicable to this environmental review were placed into categories, which are based on topics contained in the Fermi 2 draft supplemental environmental impact statement (DSEIS). These categories and their abbreviation codes are listed in Table A–2.

Table A–2. Issue Categories

Comments were divided into the categories below.

Code	Technical Issue
AM	Air Quality
AL	Alternatives to License Renewal
AE	Aquatic Resources
CC	Climate Change
GW	Groundwater Resources
HC	Historic and Cultural Resources
HH	Human Health

Code	Technical Issue
PA	Postulated Accidents, including Severe Accident Mitigation Alternatives (SAMAs)
RW	Waste Management
SH	Special Status Species and Habitats
TE	Terrestrial Resources

The following pages contain the comments that have been copied directly from the comment source documents and are followed by the NRC staff response. Each comment is identified by the commenter's identifier (ID), comment source document (as identified in Table A–1), and comment number and is grouped by the comment issue category (as identified in Table A–2). Similar comments are grouped together with a single response. Comments are presented in the same order as listed in Table A–2.

A.1 Air Quality (AM)

Comment 029-CC-6: Number six, in 2010, the tornado that we had damaged the power plant, damaged Fermi 2 to the point where it had to be shut down. Keep that one in mind. We're not-- we have not seen the last tornado or any other natural event for that matter.

Response: *This comment voices concern regarding the impacts associated with tornadoes at Fermi. As noted by the commenter, on June 6, 2010, an EF2 tornado with maximum sustained winds of 130 to 135 miles per hour (209 to 217 kilometers per hour (km/h)) moved through Monroe County. As a result of the tornado, a partial loss of offsite power at Fermi 2 occurred, and the licensee declared an Unusual Event, the lowest of the NRC's four emergency level classifications. The reactor was shut down and stabilized. There were no radiological releases from this event, and power was restored to the site.*

The NRC requires licensees to design nuclear power plants to withstand the effects of tornado and high wind-generated missiles so as not to adversely impact the health and safety of the public in accordance with the requirements in General Design Criterion (GDC) 2, "Design Bases for Protection against Natural Phenomena," and GDC 4, "Environmental and Dynamic Effects Design Bases," of Appendix A, "General Design Criteria for Nuclear Power Plants," to Title 10 of the Code of Federal Regulations (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities." These are called design-basis requirements. Section 4.11.1.2 of the Fermi DSEIS discusses design-basis accidents and adopts the GEIS finding that the environmental impacts from externally initiated events, such as tornadoes, are SMALL.

A.2 Alternatives to License Renewal (AL)

Comment 012-F-4: DTE needs to document the viable alternatives to operating Fermi 2 another 31 years, as opposed to building and operating both wind and photovoltaic options.

Comment 028-K-5: Wind Power as a viable option. DTE Electric Company (hereinafter, DTE) Environmental Report (hereinafter, ER) does not adequately evaluate the full potential for renewable energy sources, such as wind power, to replace the loss of energy production from Fermi 2, and to make the license renewal request from 2025 to 2045 unnecessary. In violation of the requirements of 10 CFR§ 51.53(c) (3) (iii) and of the GEIS § 8.1, the DTE ER (§ 7.1.2.2.1) treats all of the alternatives to license renewal as unreasonable and does not provide a substantial analysis of the potential for significant alternatives, such as wind power, in the

Region of Interest for the requested relicensing period of 2025 to 2045. While the ER plainly states, "Whereas a single wind farm generation unit would not provide consistent power generation, multiple wind farms scattered within a reasonable region and interconnected together via the grid may potentially provide power generation that could approach base-load capacity." On page 7-8, the ER states, "Placing wind farms offshore eliminates some of the obstacles encountered when siting wind farms on shore and limits conflicts with other planning interests."

Comment 019-CC-8: It has its flaws and you know, we also have to look at the -- the Germans are using solar and, you know, so that's the direction they're going. There – there's advances taken off like gangbusters there and fortunately, the sun doesn't have to be shining for solar technology to work. Of course, it works best without clouds, but it'll work with cloud cover also.

Comment 019-CC-9: After my comments earlier, I talked to one of the folks here and they told me that Germany has a lot of problems now with particulate matter and, you know, gaseous emissions because of shutting down nuclear plants. Well, that's true, however, we have to keep in mind that Germany made the same mistake that Detroit Edison made by not putting scrubbers in when they could have. The scrubbers out here at the coal burner, you know, that's a step in the right direction and I'm sure the Germans will be working on that also.

Comment 012-CC-4: DET -- DTE also needs to document the viable alternatives to operating Fermi 2 another 31 years instead of doing it by a coal-fired plant somewhere else comparing it to -- I want them to actually do the -- the figures on -- in windmills, solar panels, sustainable energy. Do that now, not -- okay.

Comment 025-CC-3: But I -- I'm not insensitive to, you know, the -- the economic impact of a closure of Fermi 2. I -- I understand the economic impact that it would have on this community, but I also know that, you know, as we speak, more and more people around the world and in the United States are figuring out -- the cost of solar panels is coming down, wind, the whole -- the cost of the renewables is coming in cheaper and cheaper and more and more people are going to start to move off of the grid. It is -- we are going to move away from the, you know, a centralized grid and move into more of a distributed grid of energy.

And, you know, more and more people, the -- the -- you know, the low-hanging fruit of energy efficiency, I'm -- my husband and I had a very thorough, you know, attic insulation done a couple years ago and duct ceiling and air ceiling and our energy bills, our heating bills, now are 30 percent less than -- than what they were. And this was even after this cold winter that we had this last year.

And -- and also, as kind of a side perk that I never even considered, it -- it keeps the house so much cooler in the summer so that -- and I don't have A/C, but I haven't hardly -- I mean, I haven't had to run my ceiling fans. I mean, it's been -- now granted, we've had a pretty mild summer so far, but nevertheless, you know, and more and more this is what people are going to -- you know, nuclear power is such a heavily-subsidized industry. If only, you know, we could have the same opportunity to subsidize some of these other ways of generating electricity, I mean, you would see a far different, you know, picture.

And again, I -- I know, you know, the younger generation is coming up. They are definitely connecting the dots on all of this and the Passive House Movement, which is a net zero, you know, way to build a house so that it, you know, it doesn't consume any energy. If anything, it -- it produces electricity and that's – that's going to start to happen more and more.

Response *These comments are concerned with renewable energy replacement power and energy efficiency alternatives to Fermi 2. In evaluating alternatives to license renewal, the NRC staff considered energy technologies or options currently in commercial operation, as well as*

technologies not currently in commercial operation but likely to be commercially available by the time the current Fermi 2 operating license expires in 2025.

The NRC staff evaluated 17 alternatives to the proposed action in the Fermi 2 DSEIS. Alternatives that could not provide the equivalent of Fermi 2's current generating capacity and, in some cases, those alternatives whose costs or benefits did not justify inclusion in the range of reasonable alternatives, were eliminated from detailed consideration. The NRC staff explained the reasons why each of these alternatives was eliminated from further consideration in Section 2.3 of the Fermi 2 DSEIS. The 17 replacement power alternatives were narrowed to 4 alternatives considered in detail in Sections 2.2.2.1 through 2.2.2.4 of the Fermi 2 DSEIS. The NRC staff evaluated the environmental impacts of these four alternatives and the no-action alternative in Chapter 4 of the Fermi 2 DSEIS.

A.3 Aquatic Resources (AE)

Comment 012-F-2: Another issue is Fermi 2's fish kills. DTE's 2009 study stated Fermi 2's Cooling Water Intake sucked up 3,102 live fish, and 62,566,649 fish eggs and larvae in a year's time. We need another such study to show how many fish the reactor is killing now.

025-V-17: In a nine month study, the Fermi, Unit 2 Cooling Water Intake impinged 3,102 live fish and more than 62.5 million fish eggs and larvae. This significant impact to the ecosystem of Lake Erie's western basin must be addressed in the SEIS.

012-BB-3: In the 19 – 2009 study that they did on the cooling water intake, it showed the cooling water intake sucked up, in an eight-month period, 3,102 live fish, over 63 million fish eggs and fish larva in normal operations. The world depends on the fish. And the water they put out is hot, inviting in invasive species.

012-CC-2: I want to put in the scoping process another issue to -- another study on the Fermi 2 cooling water intake's fish kill. The 2009 study showed that they sucked up 3,102 live fish, 62,566,649 fish eggs and fish larvae in less than a year. Another study needs to be a part of this environmental impact statement to see how many fish - - is there any left – I hope so -- in the ocean -- or lake.

Response: *These comments refer to the "Aquatic Ecology Characterization Report Detroit Edison Company Fermi 3 Project, Final Report" prepared by AECOM Environment in November 2009 (AECOM 2009) and express concerns regarding the effects of entrainment and impingement of Lake Erie fish at Fermi 2's cooling water intake structure. This report was one of the reports reviewed by NRC staff as part of the environmental review. Entrainment and impingement of fish are discussed in Sections 3.7 and 4.7 of this draft supplemental environmental impact statement (DSEIS). As discussed in Section 4.7, entrainment and impingement of aquatic organisms for nuclear power plants with cooling towers is a generic (Category 1) issue with an impact level of SMALL for all sites. During the review of the Fermi 2 LRA, the NRC staff did not identify any new and significant information that would challenge the generic conclusion in the GEIS for this issue.*

Regarding the need for new or additional studies of entrainment and impingement at Fermi 2, the requirements of Section 316(b) of the Clean Water Act of 1977, as amended (33 U.S.C. 1251 et seq.), determine the need for studies, such as the studies requested in comments. The requirements of Section 316(b) are addressed as part of the National Pollution Discharge Elimination System (NPDES) permitting process, which is meant for protection and propagation of the waterbody's balanced, indigenous population of shellfish, fish, and wildlife. The State of Michigan, not the NRC, is responsible for administering the NPDES permitting program.

Comment 035-J-1: Thermal loading of the Great Lakes by Nuclear Reactors

The Nuclear Regulatory Commission (NRC) has stated in Draft NUREG–2105, volume 1, October 2011, page 2-228: "Public and occupational health can be compromised by activities at the Fermi site that encourage the growth of disease-causing microorganisms (etiological agents). Thermal discharges from Fermi into the circulation water system and Lake Erie have the potential to increase the growth of thermophilic organisms. These microorganisms could give rise to potentially serious human concerns, particularly at high exposure levels."

There are 48 nuclear reactors in the Great Lakes basin. Each one has added to the thermal load on the Lakes in addition to designed and non-designed radioactive releases. The water usage from Lake Erie is 56,024 million gallons per day (Draft NUREG-2105, volume 1, p. 2-24). Of that, 50,518 million gallons per day are used by power plants. Nuclear power plants release some of that in water vapor and the rest goes back into Lake Erie heated. Without water cooling, reactors would melt their cores and explode as happened to three at Dai-ichi.

Toxic plumes on Lake Erie were a repeat occurrence in August 2014, shutting down water to Toledo and surrounding areas. The only allowable water use was to flush a toilet. We cannot live with safe water being made unavailable from multiple causes and most significantly, in this instance, from Fermi 2 and Davis Bessie, near Toledo, on Lake Erie.

Comment 028-K-16: Petitioner's request a public hearing to examine the impact of daily thermal discharges from Fermi 2 as an accelerator and contributor to harmful algal blooms (HABS). The Fermi 2 releases 45 million gallons of water per day into Lake Erie. This thermal discharge averages 18 degrees (F) above ambient lake temperature 365 days per year. Petitioner's contend that the Applicant's Environmental Report (ER) fails to consider new and updated environmental and public health data, unavailable at the time of issuance of the original Operating License; further, the Petitioner contends that the Applicant fails to adequately consider Mitigation Alternatives which could significantly reduce the alleged significant environmental and public health impact of Fermi, Unit 2 operations. Therefore, the Petitioner invokes NEPA requirements and contends that further analysis is called for. Illustration: Petitioner puts forth the following NOAA Satellite Image of Lake Erie from August 10, 2014 to illustrate how severe the algal bloom crisis has become.
http://coastwatch.glerl.noaa.gov/webdata/cwops/htmi/modis/modis.php?region=e&pacge=1&itemplate=sub&image=al.14222.1852.LakeErie.143.250m.jpg

Comment 012-L-1: Earlier this month, thousands of people in the vicinity of the Fermi 2 nuclear reactor could not drink their water because of poison algae growth. And yet, back in 2011, the NRC stated, "Public and occupational health can be compromised by activities at the Fermi site that encourage the growth of disease-causing micro-organisms (etiological agents). Thermal discharges from Fermi into the circulation water system and Lake Erie have the potential to increase the growth of thermophilic organisms. These microorganisms could give rise to potentially serious human concerns, particularly at high exposure levels." (Draft NUREG–2105, Vol. 1, 10/2011, page 2-228)

So if the NRC knew if 2011 that DTE's discharges could poison the water, why did they let them? For profit, or were they/you covering the legal liability laws by declaring you make the potential degradation public, but hoping no one noticed. Your agency added in that same document, "Recent studies of the effects of climate change indicate that there could be declines in the overall Lake Erie water levels of 1 to 2 m (Hartig et al 2007). There are no known studies of potential future surface water use in the Lake Erie Basin or the entire Great Lakes Basin." (p. 2-25) Maybe you couldn't see a future for the Lake at the rate its being poisoned.

Comment 004-U-1: About 500,000 people who are provided drinking water by the City of Toledo were told not to drink the water because the toxin microcystin exceeded World Health Organization drinking water standards. Fermi 2 is located at the western end of the western basin of Lake Erie. Fermi uses up to 50 mgd for cooling purposes which means that water exiting the plant is warmer than water entering the plant. Harmful algal blooms are triggered when the water gets warmer. Lake Erie's first mass of algae each year is generally in the Monroe DTE coal and nuclear plant mixing zones. Before relicensing, there needs to be an assessment of whether or not the thermal discharge mixing zone algae creation is contributing to a larger bloom of harmful algae- cyanobacteria - and/or if the thermal discharge contributes to an increased amount of microcystin released in the water.

Comment 029-CC-3: Number three, somebody spoke about loving the lake, as I do, even though I'm not a long- term resident of Monroe. We've only been here about 16 years. The fact of the matter is that the – the temperature -- the cooling water that comes out of Fermi is above the water temperature of the lake and it contributes to the algal blooms. If anybody would like to seen one or would've liked to have seen one last year, I could invite them down to my place and you could smell it before you got there.

Response: *These comments express concerns regarding the effects of Fermi 2's thermal discharge on harmful algal blooms in Lake Erie. Harmful algal blooms are discussed in Sections 3.7, 4.7, 4.14, and 4.16 of this DSEIS. As discussed in Section 4.7, algal blooms resulting from the operation of cooling systems are addressed as part of the generic (Category 1) issue, "Infrequently Reported Thermal Impacts." As noted in Section 4.16.5 of this DSEIS, several research studies indicate that recent algal blooms in western Lake Erie are linked to nutrient loading, nutrient releases by zebra mussels, and selective feeding by zebra mussels, with much more research needed (EPA 2014). Based its review of available information for the Lake Erie algal blooms, the NRC staff determined that this information does not constitute new and significant information that would change the GEIS's conclusion of SMALL for this issue.*

DTE is required to address the thermal impacts from the operation of Fermi 2—including any possible mitigation that may be required—as part of the NPDES permitting process. The NPDES process is meant for the protection and propagation of the waterbody's balanced, indigenous population of shellfish, fish, and wildlife and for enforcing Michigan State Water Quality Standards to protect the public health and welfare, to enhance and maintain the quality of water, and to protect the State's natural resources. The State of Michigan, not the NRC, is responsible for administering the NPDES permitting process.

Comment 025-V-13: Thermal discharges into Lake Erie:

Within the Scope for review, the SEIS for the Fermi, Unit 2 LRA must include an updated and realistic analysis of current and projected public health impacts of authorized, routine, by-design thermal discharges by Fermi, Unit 2 into the surrounding environment. ATHF3 [Alliance to Halt Fermi 3] considers this issue to be in the category of "*Significant New Unknown and Unanalyzed Conditions."* The SEIS must consider new and updated environmental and public health data, unavailable at the time of issuance of the original Operating License; further, the SEIS must adequately consider Mitigation Alternatives which could significantly reduce the alleged environmental and public health impacts of Fermi, Unit 2's operations. Thus, further analysis is called for, under NEPA.

In support of this contention, ATHF3 submits into the docket the following analysis from the U.S. NRC, pertaining to the Fermi Nuclear Power Plant:

- The U.S. Nuclear Regulatory Commission (NRC) has stated in Draft NUREG–2105, volume 1, October 2011, page 2-228: "Public and occupational health can be compromised by activities at the Fermi site that encourage the growth of disease-causing microorganisms (etiological agents). Thermal discharges from Fermi into the circulation water system and Lake Erie have the potential to increase the growth of thermophilic organisms. These microorganisms could give rise to potentially serious human concerns, particularly at high exposure levels." (emphasis added).

Indeed, the U.S. NRC has been vindicated, as the above analysis has proved to be both correct and prescient. The Governor of the State of Ohio recently declared a "State of Emergency" (summer 2014) in response to a clean drinking water supply crisis in and around the City of Toledo, Ohio. There is no doubt about the significance of this public health crisis. The question is to what extent Fermi, Unit 2 operations contributed to the conditions which led to the crisis in the first place, and what are the prospects for the future. ATHF3 contends that one significant contributing factor is the routine thermal discharges from Fermi, Unit 2 which add cumulative stress impacts to the fragile ecosystem of Lake Erie's shallow western basin and shoreline. Lake Erie already suffers from numerous environmental stressors, including pollution from agricultural runoff (such as phosphorus), sewage overflows and routine, authorized releases of industrial toxic chemicals (including releases originating from Fermi, Unit 2). In addition, thermal pollution from nearby power plants is a known contributing factor to the conditions which produce toxic algal blooms and consequent hypoxic dead zones. The exact and precise extent to which Fermi, Unit 2 normal operations are directly causative, not just correlative, of significant environmental and public health impacts is "*unknown and unanalyzed.*" Therefore, ATHF3 hereby invokes NEPA requirements and contends that a "hard look" and further analysis is called for, as a precondition for approval of the Applicant/Licensee's Fermi, Unit 2 License Renewal Application (LRA).

Additionally, ATHF3 demands an SEIS analysis of the environmental and public health impacts of the NRC's decision to approve Fermi, Unit 2 License Amendment No. 196, which allows an increase in thermal power from the facility. The largest algae blooms on Lake Erie occur in the shallow, warm water near DTE's nuclear and coal-fired power plants.

Comment 028-Y-4: Algae Bloom Contribution

Algae blooms of particular concern in Lake Erie is Microcystis spp., a phytoplanktonic species of blue-green alga that can produce a substance (microcystin) that is toxic to fish and other organisms when concentrations are high enough.Mycrocystis spp. Blooms can affect water quality as well as the health of human and natural resources. General consensus is that algae blooms initiate in the western Lake Erie basin. What is the Thermal Contribution of Fermi 2 to Algae Blooms, we are requesting that there be a multivariate analysis conducted by a qualified independent third party.

Thermal Discharge Impact on Algae Blooms

Another assault on Great Lakes water degradation is due to thermal discharges. Public and occupational health can be compromised by activities at the Fermi site that encourage the growth of disease-causing microorganism (etiological agents). Thermal discharges from Fermi 2 into the circulating water system and Lake Erie have the potential to increase the growth off thermophilic microorganisms. These microorganisms could give rise to potentially serious human health concerns, particularly at high exposure levels. This would endanger the whole bio-region, yet there is only tertiary discussion in the ER of thermal contribution from Fermi 2, and how it will be mitigated. Forty-five million gallons per day of discharge averaging 18 degrees F above ambient Lake Erie temperature. This compounds the Algae Blooms

Response: *These comments express concern regarding the sensitivity of the Lake Erie ecosystem to stressors, the effects of Fermi 2's thermal discharge on harmful algal blooms in Lake Erie, and the effect of the thermal effluent on thermophilic organisms that can affect human health. Section 4.16.5 of this DSEIS addresses the sensitivity of the Lake Erie ecosystem. As discussed in Section 4.16.3, the EPA has initiated the Great Lakes Restoration Initiative, which is a consortium of 11 Federal agencies that were tasked with developing an action plan to address (1) cleaning up toxins and areas of concern, (2) combating invasive species, (3) promoting nearshore health by protecting watersheds from polluted runoff, (4) restoring wetlands and other habitats, and (5) tracking progress and working with strategic partners. More information on the Great Lakes Restoration Initiative can be found at http://greatlakesrestoration.us/.*

Sections 3.7, 4.7, 4.14, and 4.16.5 of this DSEIS discuss harmful algal blooms. As discussed in Section 4.7, algal blooms resulting from the operation of cooling systems are addressed as part of the generic (Category 1) issue, "Infrequently Reported Thermal Impacts." As noted in Section 4.16.5 of this DSEIS, several research studies indicate that recent algal blooms in western Lake Erie are linked to nutrient loading, nutrient releases by zebra mussels, and selective feeding by zebra mussels, with much more research needed (EPA 2014). Based its review of available information for the Lake Erie algal blooms, the NRC staff determined that this information does not constitute new and significant information that would change the GEIS's conclusion of SMALL for this issue.

As discussed in Section 3.11.3 of this DSEIS, heated discharge from cooling system operations can result in the presence of thermophilic microorganisms, such as enteric pathogens, thermophilic fungi, bacteria, and the free living amoeba. The presence of these microorganisms could result in adverse effects to the health of nuclear power plant workers in plants that use cooling towers and to the health of the public where thermal effluents discharge into cooling ponds, lakes, canals, or rivers.

DTE is required to address the thermal impacts from the operation of Fermi 2—including any possible mitigation that may be required—as part of the NPDES permitting process. The NPDES process is meant for the protection and propagation of the waterbody's balanced, indigenous population of shellfish, fish, and wildlife and for enforcing Michigan State Water Quality Standards to protect the public health and welfare, to enhance and maintain the quality of water, and to protect the State's natural resources. The State of Michigan, not the NRC, is responsible for administering the NPDES permitting process.

A.4 Climate Change (CC)

Comment 038-AA-5: Because of the long time line of proposed operation until 2045 and the prospect of an additional 60 years allowed for decommissioning, much care must be taken to determine the environmental impacts for at least 90 years from now (until 2105 and possibly beyond).

As a result multiple scenarios must be considered; [...]

5. Overriding all of these concerns is the ongoing crisis of global warming and its effect on Lake levels and more severe weather events that are predicted.

Response: *This comment voices concern about climate change implications, specifically the impacts on Lake levels and severe weather events. Section 4.15.3 of this DSEIS discusses projected climate change for the license renewal period of Fermi 2 (2025 to 2045) and climate change impacts to resource areas.*

As discussed in Section 4.15.3, water levels for Lake Erie have exhibited a downward trend since the 1860s, and the average lake level of Lake Erie could decrease by 7.8 to 9.8 in. (20 to 25 cm) compared to the current long-term mean by 2050 (Mackey 2012; USGCRP 2014;). However, future lake level changes are highly uncertain and climate models have a low confidence level associated with estimated water level changes. Future lake levels will depend on evaporative losses, local precipitation changes, wind speeds, and storm frequency.

Further, as discussed in Section 4.15.3, observed global changes in average surface temperature and precipitation have been accompanied by an increase in sea surface temperatures, a decrease in global glacier ice, an increase in sea level, and changes in extreme weather events. Such extreme events include increases in frequency of heat waves, heavy precipitation, and minimum and maximum temperatures.

Comment 019-CC-5: We have to look at some of the reactors, you know, with the global disruption of weather. We're going to see as we have in the past, some nuclear power plants have had to shut down for a lack of cooling water. River levels drop. The water warms up and some nuclear plants have had to be shut down and I think that that's an issue we're going to be seeing a whole lot more of down the road.

Response: *This comment voices concern about climate change implications to water resources, specifically the impacts of climate change on operation of nuclear power plants. Section 4.15.3, "Greenhouse Gas Emissions and Climate Change," of this DSEIS discusses projected climate change for the license renewal period of Fermi 2 (2025 to 2045) and climate change impacts to resource areas. However, the impacts of climate change on operations and safety of Fermi 2 are considered outside the scope of the license renewal environmental review, which documents the potential impacts of continued operation on the environment. The NRC evaluates nuclear plant operation conditions and physical infrastructure to ensure continued safe operations through its ongoing inspection and oversight process. Furthermore, plant operations are dictated by NRC-issued operating license technical specifications. Technical specifications and operating procedures exist to ensure that adequate cooling water is available and is maintained to ensure safe operation of the facility. Licensees must operate within the dictated technical specifications, or if they propose changes in operating conditions contrary to operating license specifications, the NRC staff conducts safety reviews of any such license amendment before allowing the specific licensee to continue operation.*

A.5 Groundwater Resources (GW)

Comment 012-F-5: There exists a need for explanation as to why citizens within the radiation zone are no longer allowed to use their water well, and must have water brought into them if they are unable to hook up to a public water supply.

Comment 012-L-2: Groundwater was also noted to be affected back in 2011, "In wells within a 5-mile radius of the Fermi site, elevated concentrations of arsenic above the EPA (2009a) maximum contaminate level (MCL) were found in groundwater samples (Detroit Edison 2011 a). p. 2-29

Comment 019-BB-2: And one issue I wanted to bring up momentarily, is that 2,500 gallons of diesel fuel that leaked here recently at the Fermi Plant, was this a large line or just a long-term leak that nobody paid attention to? Where was the NRC? You know, nobody mentioned, no comments from the NRC on this issue. That raises questions.

Comment 012-CC-5: There's also a great number of people within a 25-mile radius of the plant that are no longer allowed to use their water wells. They have to either buy their water or hook up to a public water supply. Why are their wells contaminated?

Response: *Section 3.5.2.3 of this DSEIS presents the NRC staff's characterization of existing groundwater quality beneath the Fermi site. As discussed in Section 3.5.2.3, the groundwater outside the Fermi site has not been impacted by Fermi 2 activities. Within the site boundary, no significant concentrations of radionuclides above background have been found in the groundwater. In addition, DTE maintains a radioactive effluent monitoring and a radiological environmental monitoring program (REMP) at Fermi 2 to assess the radiological impact (if any) to its employees, the public, and the environment around the Fermi site. As part of the license renewal environmental review, the NRC staff specifically reviewed DTE's most recent annual radiological environmental operating reports, which are submitted under the REMP, to look for any significant impacts to the environment or any unusual trends in the data. Based on the review of the radiological environmental monitoring data, the NRC staff found that there were no unusual and adverse trends and that there was no measurable impact to the offsite environment from Fermi 2 operations. The NRC's ongoing inspection program periodically evaluates DTE's programs for compliance with the NRC's radiation protection standards. The NRC's inspection program evaluates the data for compliance with radiation protection standards. If the data were to show a noncompliance with requirements, the NRC would take appropriate enforcement action.*

However, within the site boundary, a few nonradiological spills of chemicals have occurred, as noted in Section 3.5.1.3 and further described in Section 3.5.2.3. All of these spills were reported by DTE to the Michigan Department of Environmental Quality and have been remediated. During the license renewal environmental review for Fermi 2, the NRC staff specifically considered the issue of such minor chemical spills as part of its review of information for "generic" surface water issues. The use of chemicals and fuels is common at industrial facilities and spills are always a possibility. Any such spills are regulated by State and other Federal environmental agencies, rather than the NRC. As stated in Section 4.5.1.1 of the DSEIS, the NRC staff did not identify any new and significant information with regard to the Category 1 (generic) surface water issues and found, in part, that the environmental impact of minor chemical spills is SMALL.

Finally, in Monroe County and other counties in Michigan, naturally occurring concentrations in the groundwater of arsenic and some nonhazardous water quality constituents may exceed drinking water standards. In wells within a 5-mi (8-km) radius of the Fermi site, elevated concentrations of arsenic above the EPA maximum contaminant level for drinking water have been found. The Fermi site did not cause the arsenic concentrations in these wells. In the local area and in other areas of Michigan earth materials, such as bedrock, sand, and gravel may contain arsenic-bearing minerals. The arsenic in these naturally occurring materials may enter the groundwater as a dissolved constituent. If the water in a private well is found to be high in arsenic one of the corrective actions that can be taken is to close the well and connect to a public water supply.

A.6 Historic and Cultural Resources (HC)

Comment 012-F-3: Next issue needing study is why the Walpole Island First Nation, which exists on unceded lands within the 50-mile evacuation zone, is not allowed to have input into these proceedings.

Comment 028-K-6: WALPOLE ISLAND FIRST NATIONS' EXCLUSION FROM PROCEEDINGS

Statement of the Contention and Comment

Purpose of Contention: To ensure that all Native American tribes and bands and First Nations have adequate notification by NRC of the proposed Fermi 2 licensing extension and environmental review proceedings, as due to them under applicable treaties, laws, and regulations; and to ensure that individual tribal members' interests are represented whether their tribal government intervenes or not on their behalf.

Comment 025-V-19: First Nations Treaty Rights:

All of the following recognized First Nations (Native American) communities have treaty rights at Fermi, Unit 2. Each of these communities has legal standing in the Matter of the Fermi, Unit 2 LRA relicensing proceeding. ATHF3 contends that the SEIS must adequately address the impacts of continued operations at Fermi, Unit 2 on the health and well-being of the standing population:

- Grand Traverse Band of Ottawa and Chippewa
- Ottawa Tribe of Oklahoma
- Wyandotte Nation
- Saginaw Chippewa Indian Tribe of Michigan
- Sault Ste. Marie Tribe of Chippewa Indians of Michigan
- Ogema Little River Band of Ottawa Indians
- Little Traverse Bay Bands of Odawa Indians
- Delaware Nation
- Hannahville Indian Community
- Pokagon Band of Potawatomi Indians
- Bay Mills Indian Community
- Lac Vieux Desert Tribe
- Forest County Potawatomi Community of Wisconsin
- Shawnee Tribe
- Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
- Huron Potawatomi, Inc.
- Keweenaw Bay Indian Community
- Lac Vieux Desert Band of Lake Superior Chippewa Indians

Members of the above U.S. federally-recognized communities have treaty rights to hunt, fish and gather in the area of the Fermi, Unit 2 nuclear power plant. ATHF3 is concerned that if the NRC approves the proposed Fermi license extension, the health, safety and quality of life of the native population would be adversely affected. Numerous species of plants, fish, wild game and migratory birds are already being polluted by Fermi, Unit 2's routine discharges which bioaccumulate, thus making unhealthy or inedible the entire local food supply for current and future generations.

In addition, ATHF3 believes that the U.S. NRC should officially recognize the legal standing of the Walpole Island First Nations (WIFN), who reside within a 50-mile-radius of Fermi, Unit 2. WIFN is an unceded island located between Michigan and Canada, populated by natives who

were never captured and who never surrendered; they are sovereign entities. However, the NRC has refused to allow WIFN to legally intervene in Fermi licensing proceedings because the NRC considers them to be Canadians not entitled to NRC-recognition or to U.S. treaty rights.

Comment 012-CC-3: The next issue I want in the record is why Walpole Island First Nation, which exists on unceded lands and is within the 50-mile evacuation zone, is not allowed to have input into the proceedings.

Response: *These comments concern the NRC's recognition and notification of Indian tribal nations and the potential impacts from Fermi 2 license renewal on associated native populations.*

As discussed in Section 4.9 of the Fermi 2 DSEIS, the NRC initiated consultations with the Advisory Council on Historic Preservation, the Michigan State Historic Preservation Office (SHPO), and 17 Federally recognized Indian tribes. The NRC provided information about the proposed undertaking (license renewal); defined the area of potential effect; and indicated that the NRC would comply with Section 106 of the National Historic Preservation Act of 1966, as amended (54 U.S.C 300101 et seq.), through the requirements of the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.), and as outlined in 36 CFR 800.8. The NRC invited the Michigan SHPO and the tribes to participate in the identification of historic properties and any decisions potentially affecting historic properties and invited them to participate in the NEPA process.

Separate from these consultations, an Indian tribe from Ontario, Canada, the Walpole Island First Nation, sent a letter to the NRC stating that they would like an opportunity to thoroughly review the Fermi 2 license renewal process to ensure that their rights to fish and harvest resources in western Lake Erie and other nearby areas are not adversely impacted. Accordingly, the NRC invited the tribe to provide input on the Fermi 2 license renewal environmental review process.

The DSEIS addresses potential human health impacts from Fermi 2 license renewal in Section 4.11. Section 4.12.1 presents an analysis of potential impacts specific to subsistence consumption of fish and wildlife by tribal populations.

A.7 Human Health (HH)

Comment 035-J-3: Radiation Releases from Nuclear Reactors

National Academy of Sciences, Committee on the Biological Effects of Ionizing Radiation (BEIR) has stated that all ionizing radiation including low levels can produce broad spectrum non-malignant illnesses and cancer, morbidity, as well as genetic mutations. The BEIR report defines low level radiation as near zero to 100 millisieverts (mSv).

http://www8.nationalacademies.org/onpinews/newsitem.aspxRecordl D=11340

See also: http://www.radiation.org/about/index.html

This is ignored, dismissed, and trivialized by the NRC recurrently over decades of statements. Fermi 2, like all reactors has stipulated designed radiation releases into the biosphere continuously. Degraded equipment, operator error, and accidents expand the public exposure to ionizing radiation. The public is not provided with actual real time measurements and is misled by NRC/industry statements conflating "allowable" limits with "safe" or "legal" limits. "Legal limit" is also misleading in that there is no punishment, sanction, or penalty for exceeding it. The cumulative effect of release exposures, varying in dose, experienced over time, are addressed by the NRC as though each release were one time only in impact on human cell

tissue and the rest of the biosphere. The reality ignored by the NRC is that years or a lifetime of exposure to releases from nuclear reactors, added to the fallout from nuclear weapons production and testing, nuclear medicine, X-rays, (all man made sources) have been producing illness, morbidity, and genetic mutations. It is convenient for the NRC, the National Nuclear Security Administration (NNSA) and the nuclear industry to address a given ionizing radiation exposure as though it existed in isolation and is not additive to all of the rest of releases and ongoing exposures around the region, the nation, and the world currently and historically and to behave as though once forgotten, ionizing radiation ceases to exist.

There is a cynicism in the NRC, the NNSA, and the nuclear industry not being upfront in stating clearly to the public that the decision was made in the 1940s, and continuing in the present, that there will be manmade ionizing radiation releases into the biosphere, that those releases will be whatever the nuclear regulators/industry decides and that the exposures will increase. Indeed, they have increased. Ionizing radiation and radionuclide particles move about the world, are ingested and breathed in and bioaccumulate up the food chain. They assault human cell tissue and the rest of the biosphere, in accord with their dose and half-lives. A problematic issue, obfuscated, unmeasured, unstudied---to that extent and intentional----doesn't exist in the public mind. A result desired and intended by nuclear advocates beginning with the Manhattan Project.

Response: *This comment expresses concerns about the adequacy of radiation limits and the human health effects of exposure to radiation. The NRC's mission is to protect the public health and safety and the environment from the effects of radiation from nuclear reactors, materials, and waste facilities. The NRC's regulatory limits in 10 CFR Part 20 for radiological protection are set to protect workers and the public from the harmful health effects (i.e., cancer and other biological impacts) of radiation on humans. The dose limits are based on the recommendations of standards-setting organizations that reflect extensive scientific study by national and international organizations. The NRC actively participates in, and monitors the work of, these organizations to keep current on the latest trends in radiation protection.*

Regarding the comment that the National Academy of Sciences report on radiation health effects (i.e., the Biological Effects of Ionizing Radiation (BEIR) report) concluded that there is no safe dose of radiation, the NRC disagrees with that assertion. The BEIR VII report entitled, "Health Risks from Exposure to Low Levels of Ionizing Radiation: BEIR VII Phase 2," does not assert that there is no safe level of exposure to radiation. Rather, the conclusions of the report are specific to estimating cancer risk. The report does not make any statements about "no safe level or threshold." However, the report did note that the "BEIR VII Committee said that the higher the dose, the greater the risk; the lower the dose, the lower the likelihood of harm to human health." Although the linear no-threshold model is still considered valid, the BEIR VII Committee concluded that the current scientific evidence is consistent with the hypothesis that there is a linear dose-response relationship between exposure to ionizing radiation and the development of radiation-induced solid cancers in humans. Further, the Committee concluded "that it is unlikely that a threshold exists for the induction of cancers but notes that the occurrence of radiation-induced cancers at low doses will be small." The BEIR VII Committee concluded that the current scientific evidence is consistent with the hypothesis that there is a linear no-threshold dose-response relationship between exposure to ionizing radiation and the development of cancer in humans.

The linear, no-threshold dose response relationship describes the relationship between radiation dose and adverse impacts, such as incidents of cancer. Simply stated, in this model, any increase in dose, no matter how small, results in an incremental increase in health risk. This theory is accepted by the NRC as a conservative model for estimating health risks from radiation exposure, recognizing that the model probably overestimates those risks. Based on

this theory, the NRC conservatively establishes limits for radioactive effluents and radiation exposures for workers and members of the public. Although the public dose limit in 10 CFR Part 20 is 100 mrem (1 millisievert (mSv)) for all facilities licensed by the NRC, the NRC has imposed additional dose constraints on nuclear power reactors. Each nuclear power reactor has enforceable license conditions that limit the total annual whole body dose to a member of the public outside the facility to 25 mrem (0.25 mSv). The amount of radioactive material released from nuclear power facilities is well measured, well monitored, and known to be very small. The doses of radiation that are received by members of the public as a result of exposure to nuclear power facilities are so low (i.e., less than a few mrem) that resulting cancers attributed to the radiation have not been observed and would not be expected.

As part of its review of the Fermi 2 LRA, the NRC evaluated the projected environmental impacts from the operation of Fermi 2 during the license renewal term. The NRC staff reviewed Fermi 2's radiological data on effluent releases and the environmental monitoring program. The NRC concluded that the radiological impacts to human health would be SMALL during the license renewal term. The NRC staff's discussion of these issues appears in Sections 3.1.4 and 4.11.1 of this DSEIS.

Comment 035-J-4: Cancer Deaths from Fermi 2

Center for Disease Control statistical analysis shows that there is a significantly higher incidence of cancer deaths for Monroe, MI residents compared with incidences for the U.S. as a whole. This increase in Monroe cancer deaths correlates with the Fermi 2 going to full power. This is ignored by the NRC and Detroit Edison:

RISING LOCAL CANCER RATE SUGGESTS LINK WITH FERMI REACTOR

January 14, 2009 - The cancer death rate in Monroe County has been rising since the late 1980s, when the Fermi 2 nuclear reactor began operating, according to a new analysis.

The rise in cancer has been sharpest among children and adolescents, who are most susceptible to the harmful effects of radiation exposure. The analysis uses official data from the U.S. Centers for Disease Control and Prevention.

"The increasing cancer death rate among Monroe County residents, especially young people, suggests a link with the radioactive chemicals emitted from the Fermi reactor," says Joseph J. Mangano MPH MBA, Executive Director of the Radiation and Public Health Project research group. "Because Monroe County has a low risk population that is well educated, high income, and has few language barriers, rising cancer rates are unexpected, and all potential causes should be investigated by health officials."

Fermi 2 reactor began "operating" June 21, 1985. However, it ran very little after the initial low-power start-up until a warranty run in January of 1988, marking the commercial start-up of the reactor. In the early 1980s, the Monroe County cancer death rate was 36th highest of 83 Michigan counties, but by the early 2000s, it had moved up to 13th highest. From 1979-1988, the cancer death rate among Monroe County residents under age 25 was 21.2% below the U.S. rate. But from 1989-2005, when Fermi 2 was fully operational, the local rate was 45.5% above the U.S.

All nuclear reactors produce electricity by splitting uranium atoms, which creates high energy needed to heat water. This process also creates over 100 radioactive chemicals, not found in nature, including Strontium-90, Cesium-137, and Iodine-131.

While most of these chemicals are retained in reactors and stored as waste, a portion is routinely released into the local air and water. They enter human bodies through breathing and

the food chain, and raise cancer risk by killing and injuring cells in various parts of the body. They are especially harmful to children.

The findings come at a time when a new nuclear reactor has been proposed at the Fermi plant. The original Fermi 1 reactor, which was the site of a "Partial Core-Melt Accident" in 1966, shut permanently in 1972.

DATA ON CANCER RISK FROM FERMI 2 RADIOACTIVE EMISSIONS

- The Fermi 2 reactor is located in Monroe County, and started on June 21, 1985, not becoming fully operational until January 1988.
- Fermi 2 came close to a meltdown on March 28, 2001 and August 14, 2003. (1)
- Fermi 2, like all reactors, routinely emits over 100 radioactive chemicals into air and water.
- Each of these chemicals causes cancer, and is most harmful to infants and children.
- For cancer deaths for all ages (whites only), Monroe County ranked
  - 36th highest of 83 Michigan counties in 1979-1983 (before startup)
  - 13th highest of 83 Michigan counties in 2000-2005 (latest data) (2)
- The Monroe County cancer death rate age 0-24
  - was 21.1% below the U.S. in 1979-1988 (before/during startup)
  - was 45.5% above the U.S. in 1989-2005 (after startup) (3)

Monroe County has no obvious cancer risk. It has a high income, low poverty, well educated population with few language barriers and access to excellent medical care in nearby Detroit. (4)

Thus, an increase in cancer (especially to children) is unexpected. This change should be investigated, and one potential cause should be radioactive emissions from Fermi.

Sources:

1. Fermi 2 incurred "near miss" accidents on March 28, 2001 (emergency diesel generator was inoperable for over 7 days) and August 14, 2003 (loss of offsite power due to northeast blackout). Source: Greenpeace USA. An American Chernobyl: Nuclear "Near Misses" at U.S. Reactors since 1986. www.greenpeace.org, April 26, 2006.

2. U.S. Centers for Disease Control and Prevention, http://cdc.wonder.gov, underlying cause of death. Death rates are adjusted to 2000 U.S. standard population. Includes ICD-9 codes 140.0-239.9 (1979-1983) and ICD-1 0 codes COO-D48.9 (2000-2005). Whites account for over 95% of Monroe residents.

3. Cancer Death Rates, Monroe County vs. U.S. 1979-1988 and 1989-2005, age 0-24

Period	Monroe County Cancer Deaths	Avg. Pop.	Deaths/100,000 Pop.		
			Monroe	U.S.	%vs. US
1979-1988	22	56,234	3.91	4.96	-21.2%
1989-2005	42	51,407	4.86	3.79	+45.5%

Source: U.S. Centers for Disease Control and Prevention, http://cdc.wonder.gov, underlying cause of death.

Includes ICD-9 codes 140.0-239.9 (1979-1983) and ICD-10 codes COO-D48.9 (2000-2005). Increase in rate significant at p < .05.

4. Demographic Comparison, Monroe County vs. U.S.

Indicator	Monroe	U.S.
2006 Population	155,035	299,398,484
2000 % Foreign Born	1.9	11.1
2000 % Language other than English spoken at home, age 5+	4.0	17.9
2000 % High School graduates, age 25+	83.1	80.4
2000 % Homeownership	81.0	66.2
2004 Median Household Income	$53,838	$44,344
2004 % Below Poverty	8.7	12.7

Source: U.S. Census Bureau, www.census.gov, 2000 population, State and County Quick facts

Comment 028-K-15: The Petitioner requests a public hearing to consider the following Contention pertaining to "Significant New Unknown and Unanalyzed Conditions" reflected by the Applicant/Licensee's incomplete and obsolete analysis of public health impacts of authorized, routine, by-design radioactive releases by Fermi, Unit 2 into the surrounding environment. The Petitioner contends that the Applicant's ER fails to consider new and updated public health data, unavailable at the time of issuance of the original Operating License; further, the Petitioner contends that the Applicant fails to adequately consider Mitigation Alternatives which could significantly reduce the alleged significant environmental and public health impact of Fermi, Unit 2 operations. Therefore, the Petitioner invokes NEPA requirements and contends that further analysis is called for. In support of this Contention, the Petitioner submits into the docket the following public health impacts study by the Radiation and Public Health Project (RPHP): *Potential Health Risks Posed By Adding A New Reactor At The Fermi Plant: Radioactive contamination from Fermi 2 and changes in local health status*, pages 1-21, January 10, 2012, Joseph J. Mangano, MPH, MBA, Executive Director, Radiation and Public Health Project (RPHP).
http://www.beyondnuclear.org/storage/Mangano_corrected_Fermi_report_Jan_11_2012.pdf

Comment 025-V-12: Public Health Impacts:

Within the Scope for review, the SEIS for the Fermi, Unit 2 LRA must include an updated and realistic analysis of current and projected public health impacts of authorized, routine, by-design radioactive releases by Fermi, Unit 2 into the surrounding environment. ATHF3 considers this issue to be in the category of "*Significant New Unknown and Unanalyzed Conditions."* The SEIS must consider new and updated public health data, unavailable at the time of issuance of the original Operating License; further, the SEIS must adequately consider Mitigation Alternatives which could significantly reduce the alleged environmental and public health impacts of Fermi, Unit 2's operations. Thus, further analysis is called for, under NEPA.

In support of this contention, ATHF3 submits into the docket the following public health impacts study by the Radiation and Public Health Project (RPHP):

Potential Health Risks Posed By Adding A New Reactor At The Fermi Plant: Radioactive contamination from Fermi 2 and changes in local health status, pages 1-21, January 10, 2012, Joseph J. Mangano, MPH, MBA, Executive Director, Radiation and Public Health Project

(RPHP). http://www.beyondnuclear.org/storage/Mangano corrected Fermi report Jan 11 2012.pdf

Additionally, making the case for scoping and material relevance, ATHF3 submits revised excerpts from the following press release issued by the Fermi, Unit 3 COLA Intervenors:

February 2, 2012

NEW REPORT SHOWS INCREASE IN CANCERS AND MORTALITIES SINCE FERMI 2 NUCLEAR PLANT START UP

Thursday -- Monroe, MI -- A new report submitted to the U.S. Nuclear Regulatory Commission (NRC) shows dramatic increases in cancer and mortalities in Monroe County since the start-up of the Fermi 2 nuclear plant. Using data from the Centers for Disease Control and Prevention (CDC), the report was prepared by Joseph Mangano, MPH, MBA, Executive Director of the Radiation and Public Health Project (RPHP).

One of the most shocking statistics shows that cancer death rates of young people (up to age 24) living in Monroe County exceeded the U.S. national rate by 28% from 1985 to 2008, a large shift from 1979 to 1984, when the county rate was 24% below the national average. Cancer death rates for 25 to 44 year olds in Monroe County also jumped, from 22% below the U.S. national average to 4% above the national average. In 1985, Fermi 2 loaded fuel and began low power testing; full commercial operation began in January 1988.

There were nineteen (19) health indicators reviewed including infant mortalities, low birth weights and hospitalizations that showed increased incidence in Monroe County, compared to the U.S. national average. Ten (10) of these indicators were statistically significant, and four (4) others approached significance.

"These patterns in Monroe County raise serious questions about whether emissions from Fermi 2 harmed local residents," says Joseph Mangano. "Before any decision is made on the future of [nuclear power in Southeast Michigan,] unusual health patterns such as these must be studied thoroughly by federal and state health officials, and findings reported to the public," Mangano concluded.

Nuclear power plants emit numerous radioactive isotopes not only from accidents, but also as part of routine "normal" operations. In 2002, Fermi 2 was 10th highest in the U.S. for airborne emissions of Iodine-131 and 7th highest for Strontium-89. In 2007, Fermi 2 was 13th highest in emissions of Tritium. Fermi 2 experienced a serious accident Christmas Day 1993 that resulted in a discharge of two million gallons of slightly radioactive water into Lake Erie. The drinking water intakes for the City of Monroe and Frenchtown Township are located 1/4 mile downstream from the plant. Radioactive isotopes can bio-accumulate and bio-concentrate in the food chain much like DDT, PCB's and dioxins.

The Mangano Report was prepared for submission to the U.S. Nuclear Regulatory Commission (NRC) during the proposed Fermi 3 nuclear plant Draft Environmental Impact Statement (DEIS) public comment period. Mangano calls for more study before approval of a new Fermi 3 nuclear plant that is proposed adjacent to Fermi 2 and the closed Fermi 1. For these reasons, a growing Coalition of Fermi 3 Intervenors have called for Baseline Health Studies of Monroe County in order that elevated cancers from a proposed Fermi 3 could be measured.

The Mangano findings regarding Fermi 2 are consistent with studies from around the world, including:

A recent French study on childhood leukemia, posted at: http://www.beyondnuclear.org/home/2012/1 / 12/french-study-finds-childhood-leukemia-doubled-aroundnuclear.html

And the 2008 German study on childhood leukemia, posted at:
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2696975/?tool=pubmed

Both of these studies report elevated incidence of cancers associated with proximity to nuclear power plants.

Additionally, ATHF3 demands an SEIS analysis of the significant public health impacts of predictable accidental radioactive releases which can be expected to occur periodically due to human error or mechanical failure for the entire duration of Fermi, Unit 2's licensed operations. As an example, at least one hundred gallons of radioactive floodwaters (contaminated wastewater) reached the Monroe County public sewer system in December 2010 when a wastewater holding tank valve malfunctioned at Fermi, Unit 2.

Comment 055-CC-1: First, for Ms. Perkins, overseeing the NEPA environmental review, I'd like to discuss the impact of authorized routine radioactive releases at Fermi 2. I'd like to submit new and significant information into the official record, a study by Joe Mongano, NPH, of the radiation and public health project who has refuted the clean power argument.

He has documented that from 1979 to 1988, before Fermi 2 began operating, the cancer death rate among Monroe County residents under age 21 was 20 percent below the US average. However, from 1989 to 2005, after Fermi 2 became fully operational, the cancer death rate for a similar population rose to 45 percent above the US average. From 20 percent below to 45 percent above the US average, so nuclear is not clean and that should be in the public record.

Response: *These comments address a report that claims to show increases in cancer and mortalities in Monroe County attributable to the operation of Fermi 2. The NRC's mission is to protect the public health and safety and the environment from the effects of radiation from nuclear reactors, materials, and waste facilities. The NRC's regulatory limits in 10 CFR Part 20 for radiological protection are set to protect workers and the public from the harmful health effects (i.e., cancer and other biological impacts) of radiation on humans. The dose limits are based on the recommendations of standards-setting organizations that reflect extensive scientific study by national and international organizations. The NRC actively participates in, and monitors the work of, these organizations to keep current on the latest trends in radiation protection.*

The NRC staff evaluated the information contained in the report entitled, "Potential Health Risks Posed by Adding a New Reactor at the Fermi Plant: Radioactive contamination from Fermi 2 and changes in local health status" (RPHP report) (Mangano 2012). The RPHP report contains data on demographic characteristics, types of cancers, death rates, and cancer death rates for selected time periods reported for Monroe County, Michigan; the State of Michigan; and the United States. Additionally, the RPHP report contains selected data on radioactive effluent releases from Fermi 2 and other U.S. nuclear power plants.

Based on the NRC staff's review, the report is a compilation of selected data from publically available documents. The data does not provide a technical basis linking the cancer and death rate data to the radiological impacts from the operations of the Fermi 2 plant. The NRC staff found that the RPHP report does not contain information to determine the cause of the cancers.

The NRC staff reviewed the radiation doses to members of the public from radioactive effluent releases from the Fermi 2 plant in Section 3.1.4 of this DSEIS. Based on its review, the NRC staff concluded that the dose to members of the public were within the NRC's dose limits in 10 CFR Part 20.

In addition, the NRC staff evaluated data from Fermi 2's REMP in Section 3.1.4 of this DSEIS. The REMP monitors the local environment around the Fermi site, starting before the plant operates to establish background radiation levels and continues throughout its operating lifetime. The REMP provides a mechanism for determining the levels of radioactivity in the environment to determine whether there is any buildup of radioactivity from plant operations. The REMP also measures radioactivity from other nuclear facilities that may be in the area (i.e., other nuclear power plants, hospitals using radioactive material, research facilities, or any other facility licensed to use radioactive material) and from natural background radiation and fallout from atomic weapons testing and nuclear accidents. Thus, the REMP monitors the cumulative impacts from all sources of radioactivity in the vicinity of the Fermi 2 plant. Based on its review of Fermi 2's REMP, the NRC staff concluded that there was no indication of an adverse trend (i.e., increased buildup) in radioactivity levels in the area and that there is no measurable impact to the environment from operations at Fermi 2.

The NRC staff does not agree that the RPHP report contains information that supports that there are significant radiological impacts associated with Fermi 2 operations greater than those determined in the GEIS. This conclusion is based on the NRC staff's review of radiological data from Fermi 2 discussed in Section 3.1.4 of this DSEIS. Therefore, as discussed in Section 4.11.1 of this DSEIS, the radiological impact to human health (i.e., radiation exposures to the public) remains a Category 1 issue with a SMALL impact.

Comment 038-AA-1: Because of the long time line of proposed operation until 2045 and the prospect of an additional 60 years allowed for decommissioning, much care must be taken to determine the environmental impacts for at least 90 years from now (until 2105 and possibly beyond).

As a result multiple scenarios must be considered;

1. Health and ecosystem impacts on the Monroe and Frenchtown Township drinking water from radioactive releases of normal operations, refurbishment and transport of large components.

Response: *The NRC staff reviewed the radiation doses to members of the public from radioactive effluent releases from the Fermi 2 plant in Section 3.1.4 of this DSEIS. Based on its review, the NRC staff concluded that the dose to members of the public were within the NRC's dose limits in 10 CFR Part 20.*

In addition, the NRC staff evaluated data from Fermi 2's REMP in section 3.1.4 of this DSEIS. The REMP monitors the local environment around the Fermi site, starting before the plant operates to establish background radiation levels and continues throughout its operating lifetime. The REMP provides a mechanism for determining the levels of radioactivity in the environment to determine whether there is any buildup of radioactivity from plant operations. The REMP also measures radioactivity from other nuclear facilities that may be in the area (i.e., other nuclear power plants, hospitals using radioactive material, research facilities, or any other facility licensed to use radioactive material) and from natural background radiation and fallout from atomic weapons testing and nuclear accidents. Thus, the REMP monitors the cumulative impacts from all sources of radioactivity in the vicinity of the Fermi 2 plant. Based on its review of Fermi 2's REMP, the NRC staff concluded that there was no indication of an adverse trend (i.e., increased buildup) in radioactivity levels in the area and that there is no measurable impact to the environment from operations at Fermi 2.

A.8 Postulated Accidents, including SAMA (PA)

Comment 028-K-1: The Applicant's Fermi 2 Environmental Report fails to accurately and thoroughly conduct Severe Accident Mitigation Alternatives (SAMA) analysis to the

long-recognized and unaddressed design vulnerability of the General Electric Mark I Boiling Water Reactor pressure suppression containment system and the environmental consequences of a to-be-anticipated severe accident post-Fukushima Daiichi.

Comment 003-O-3: Another contention concerns the General Electric Mark I Boiling Water Reactor, and its containment's, long known, fatal design flaws. Fermi 2 is largest GE Mark I BWR in the world, almost as big as the melted down Fukushima Daiichi Units 1 and 2 reactor cores put together.

Comment 055-CC-3: Today I contend that the applicant's Fermi 2 environmental report is inadequate because it fails to accurately and thoroughly provide a severe accident mitigation alternatives analysis, a SAMA analysis that addresses the well-known and unresolved design vulnerability of the GE Mark One boiling water reactor pressure suppression containment system and severe accident consequences.

Response: *In general, the probabilistic risk assessment (PRA) is an analytical tool used to identify accident scenarios, estimate the likelihood of each accident scenario, and estimate the consequences of each accident scenario. Fermi plant-specific PRAs were used to develop the Fermi SAMA analysis. The SAMA analysis was submitted as part of the LRA and was evaluated by the NRC staff. Section 4.11.1.2 and Appendix F of the DSEIS contain the NRC staff's evaluation..*

The Fermi Level 2 PRA specifically simulates severe accident progression and containment challenges for a number of sequences that represent significant core damage scenarios and was used in the Fermi SAMA analysis to identify SAMAs. The analysis specifically addressed accident scenarios resulting in containment failures similar to those experienced at the Fukushima Dai-ichi plant and measures to mitigate or prevent those accidents. Specific design vulnerabilities of the General Electric Mark I Boiling Water Reactor pressure suppression containment system are being evaluated in the current term as part of the NRC's Fukushima lessons learned process. The Commission has ordered changes to the GE Mark I and II plants to address containment performance during design based accidents and severe accidents. Additional information regarding the NRC's actions to enhance the safety of reactors in the United States based on lessons learned from this accident may be found at http://www.nrc.gov/reactors/operating/ops-experience/japan-dashboard.html.

While SAMA is a category 2 issue for Fermi 2, this comment is actually a challenge to the adequacy of the plant's current licensing basis. The proper forum to raise safety concerns challenging the adequacy of the plant's current licensing basis is through a petition under 10 CFR 2.206 for NRC action on the current license.

Comment 028-K-4: Fermi 2 and Fermi 3's safety and environmental risks due to common mode failures, and the potential for mutually initiating/exacerbating radiological catastrophes, involving the common Transmission Corridor (TC) shared by both units' reactors and pools, have been inadequately addressed in DTE's Fermi 2 License Renewal Application (LRA) and Environmental Report (ER). Also, the cumulative impacts associated with the proposed new Fermi 3 reactor cannot be excluded from DTE's Fermi 2 LRA and ER as "remote" or "speculative," for it is DTE's own proposal, and is advanced in the Fermi 3 COLA proceeding. Such environmental and safety analysis is required on this unique local problem specific to Fermi 2 and 3. It can, and must, be dealt with in Severe Accident Mitigation Alternatives (SAMA) analyses, and must be treated as Category 2 Issues in the NRC's forthcoming Draft Supplemental Environmental Impact Statement (DSEIS), as required by NEPA and the AEA.

Comment 003-O-4: The final contention is about the interconnected risks between the age-degraded Fermi 2, and the untested, proposed new Fermi 3 atomic reactor, including the vulnerability of both sharing a common off-site electricity transmission corridor.

Response*: These comments assert that the common TC which would be shared by both Fermi 2 and 3 has been inadequately addressed in DTE's Fermi 2 LRA and ER. These comments also assert that the cumulative impacts associated with the proposed new Fermi 3 reactor cannot be excluded from DTE's Fermi 2 LRA and ER*.

Fermi 2's or Fermi 3's compliance with requirements related to offsite power or availability of diesel generators, which is embedded in the commenter's assumption that loss of the TC is a loss of defense-in-depth, is a current licensing basis issue that is being addressed now and is not unique to license renewal. Therefore, these assertions are outside the scope of license renewal.

The comments appear to assert that Fermi 3 must be considered in Fermi 2's site-specific SAMA analysis or else the SAMA analysis for Fermi 2's license renewal proceeding is inadequate. The Commission's rules regarding SAMA analysis are not so prescriptive as to require consideration of any particular method or set of events.

Comment 028-K-12: Contention 8 is regarding Severe Accident Mitigation Alternatives (SAMA) analysis: Pertaining to critical input data, as follows: The Applicant's Fermi, Unit 2 LRA Environmental Report (ER) and SAMA analysis are materially deficient in that the input data concerning evacuation time estimates (ETE) and economic consequences are incorrect, resulting in incorrect conclusions about the costs versus benefits of possible mitigation alternatives, such that further analysis is called for under NEPA.

Basis:

The first issue to address is Meteorology: The Fermi, Unit 3 COLA (Part 5, Appendix 4 "Emergency Plan: Radiological Monitoring and Assessment," Feb. 2014) incorporates the Raddose-V software program to 'provide real-time (as the release is occurring), site specific predictions of atmospheric transport and diffusion . . . determined using a variable trajectory plume simulation model, along with real-time or simulated scenario meteorological data .... Raddose-V is currently in-use at the Fermi site [that is, Fermi, Unit 2]." (Emphasis added). The Petitioner agrees that the "variable trajectory" plume distribution model is more realistic and appropriate for the Fermi site than a "straight-line Gaussian" model would be, due to the Fermi site's lakeshore and riverside location (see, for example, Dr. Bruce Egan's testimony in support of the New York Attorney General's Intervention against the Indian Point LRA); however, the Petitioner contends that, for the same reason, the Fermi site's location necessitates a wider (larger) Emergency Planning Zone (EPZ) than is currently proposed by the Applicant and endorsed by the NRC. A "variable trajectory" model recognizes the uncertainties of predicting plume behavior, especially near bodies of water, and the Fermi site is also located near many major metropolitan urban communities. In other words, a "variable trajectory" model and a larger EPZ go hand-in-hand. Thus, while the Applicant's SAMA analysis assumes a 10-mile EPZ probabilistic model, the Petitioner contends that a 50-mile EPZ would be a more realistic and appropriate starting point for Fermi, Unit 2's location and would, importantly, yield different results. In fact, the Petitioner asserts that the Applicant's arbitrary and unrealistic EPZ probabilistic modeling served conveniently for underestimating and minimizing projected consequences of a Severe Accident.

Comment 025-V-9: Meteorology**:** The Fermi, Unit 3 COLA (Part 5, Appendix 4 "Emergency Plan: Radiological Monitoring and Assessment," Feb. 2014) incorporates the Raddose-V software program to "provide real-time (as the release is occurring), site specific predictions of

atmospheric transport and diffusion... determined using a *variable trajectory*, plume simulation model, along with real-time or simulated scenario meteorological data.... Raddose-V is currently in-use at the Fermi site [that is, Fermi, Unit 2]." (Emphasis added). ATHF3 agrees that the "variable trajectory" plume distribution model is more realistic and appropriate for the Fermi site than a "straight-line Gaussian" model would be, due to the Fermi site's lakeshore and riverside location (see, for example, Dr. Bruce Egan's testimony in support of the New York Attorney General's Intervention against the Indian Point LRA); however, ATHF3 contends that, for the same reason, the Fermi site's location necessitates a wider (larger) Emergency Planning Zone (EPZ) than is currently proposed by the Applicant/Licensee (DTE) and endorsed by the NRC. A "variable trajectory" model recognizes the uncertainties of predicting plume behavior, especially near bodies of water, and the Fermi site is also located near many major metropolitan urban communities. In other words, a "variable trajectory" model and a larger EPZ go hand-in-hand. Thus, while DTE's SAMA analysis assumes a 10-mile EPZ probabilistic model, ATHF3 contends that a 50-mile EPZ would be a more realistic and appropriate starting point for Fermi, Unit 2's location and would, importantly, yield different results. In fact, ATHF3 asserts that DTE's arbitrary and unrealistic EPZ probabilistic modeling served conveniently for underestimating and minimizing projected consequences of a Severe Accident. Therefore, further analysis is called for, under NEPA.

Evacuation Time Estimates (ETE): DTE's evacuation time estimates are unrealistically low because the estimates rely on (1) an arbitrary and scientifically inappropriate probabilistic model for the Fermi site --- a 10-mile EPZ and minimal "shadow evacuation zone" and (2) the incorrect and unwise assumption that not everyone within ten miles of the Fermi site would have to evacuate, rather only those in the peak radiation plume. DTE minimized "shadow evacuation" of those outside the 10-mile EPZ, and DTE's ETE input parameters failed to consider instances of serious road construction delays, severe Michigan snow conditions (beyond 20% impairment), and other pertinent factors including questionable local preparedness response capabilities required by 10 CFR 50.47(b)(1). Even after the Fukushima Dai-ichi disaster proved that the EPZ should be significantly expanded, DTE's analysis relies on the inappropriate, absurd and discredited 10-mile EPZ --- see *Endnotes*. Ironically: (a) the NRC's inconsistent guidelines (Dec. 2013) require Emergency Planning within fifty (50) miles of each plant for preventing the ingestion of releases, "such as through bans on contaminated food and water," according to the Congressional Research Service (Jan. 2014); and, (b) while the Raddose-V program is capable of calculating deposition at receptors in the 50-mile ingestion pathway, which appears to include, in the U.S., about 8 counties in Michigan and 8 counties in Ohio, DTE's Emergency Plan executes arrangements in support of emergency preparedness with only two county governments -- Monroe Co. and Wayne Co., Michigan. Thus, ATHF3 contends that the Applicant/Licensee's Emergency Plan is inadequate, and, therefore, further analysis is called for, under NEPA.

Economic Consequences: DTE's cost calculations assume an arbitrary and scientifically inappropriate EPZ probabilistic model for the Fermi site and, as a result, that a radiological release will affect only a relatively small area. Proper inputs specific to the Fermi site indicate a far larger affected area ---- potentially including the densely populated centers of Metro Detroit (MI), Ann Arbor (MI), Monroe (MI), Toledo (OH) and Windsor (ON); such scenarios would result in longer evacuation times and greater costs and consequences. Radiation plume exposure from a prolonged or delayed evacuation and consequent projected *health-related costs* in the affected population *would be greater* if an appropriate probabilistic model and correct input parameters were used in DTE's ETE. ATHF3 contends that realistic and reasonably foreseeable scenarios were ignored or underestimated by the Applicant/Licensee's cost-benefit analysis. Importantly, a proper Severe Accident analysis significantly affects whether local communities will receive commensurate safety enhancements. Furthermore, ATHF3 contends

that actual long-term recovery, remediation and redevelopment costs in a Severe Accident could be astronomical and that no reliable or credible cost analysis currently exists, given the uncertainties about long-term habitability criteria and cleanup standards. Therefore, ATHF3 contends that the development of a long-term cleanup policy and strategy must be completed as a prerequisite for any further licensing or relicensing actions.

Endnotes:

(1) Elaborating on the inadequacy of the 10-mile Emergency Planning Zone (EPZ) as a probabilistic model or tool for properly estimating reasonably foreseeable costs and consequences of a Severe Accident, ATHF3 submits the following statement from the public record:

http://www.state.gov/p/eap/rls/rm/2011/03/158441.htm

Statement by U.S. Ambassador John V. Roos on Japan's Earthquake and Tsunamis

Remarks (excerpt) - Tokyo, Japan March 16, 2011

The United States Nuclear Regulatory Commission (NRC), the Department of Energy and other technical experts in the U.S. Government have reviewed the scientific and technical information they have collected from assets in country, as well as what the Government of Japan has disseminated, in response to the deteriorating situation at the Fukushima Nuclear Power Plant. Consistent with the NRC guidelines that apply to such a situation in the United States, we are recommending, as a precaution, that American citizens who live within 50 miles (80 kilometers) of the Fukushima Nuclear Power Plant evacuate the area or to take shelter indoors if safe evacuation is not practical.

We want to underscore that there are numerous factors in the aftermath of the earthquake and Tsunami, including weather, wind direction and speed, and the nature of the reactor problem that affect the risk of radioactive contamination within this 50 mile (80 km) radius or the possibility of lower-level radioactive materials reaching greater distances.

(2) ATHF3 contends that the Fermi site must have, at minimum, a readily-expandable 50-mile-radius evacuation plan that can be implemented instantly and effectively in a severe accident that indiscriminately exposes the public to significant radioactive releases. Southeast Michigan needs a comprehensive regional evacuation plan with routes, destinations, immediate notification, long-term housing facilities and financial support for displaced and relocated families and individuals, competent medical care for victims of radiation exposure, full disclosure of real-time radioactive release measurements and plume tracking, and funding for adequate event response capabilities including assistance and preparation for evacuation of vulnerable populations such as indigent and limited-mobility individuals of all ages and for all reasons. The evacuation plan must be coordinated with the entire Great Lakes region, including Michigan, Ohio and Ontario, Canada. The plan must be a realistic, four-season strategy with contingencies for severe weather conditions and impaired visibility/driving conditions; the plan must have flexibility to accommodate and adapt to unexpected road construction delays or other foreseeable scenarios. It should not be assumed that the residents located within the perimeter "shadow evacuation zone" will react any differently from those in the central Emergency Planning Zone (EPZ). The regional emergency communications capabilities must be augmented. During and following an emergency event, there must be no suppression of public information and no transmission delay. To meet this standard, major infrastructural

changes must be implemented immediately. The public does not accept effectively being told to shelter in place and suck it up.

(3) Evacuate Monroe County in two-lane traffic?

The Michigan Department of Transportation is considering whether the City of Monroe, MI (immediately near the Fermi site) can reconfigure S. Monroe Street (M-125) and reduce the traffic flow from five lanes to three. While this would add about 30 parking spots, it could create a serious problem if there were ever an emergency at Fermi. M-125 is an evacuation route for Fermi, as well as an alternate route should there be an accident on 1-75. More than 1,400 people have signed an on-line petition against this reconfiguration.

Comment 025-V-10: ATHF3 has a contrarian point of view on the basic validity of the MACCS and MACCS2 codes as a proper diagnostic tool to assess economic costs and consequences. ATHF3 refers to expert testimony supporting Pilgrim Watch's Petition to Intervene against the PNPS LRA: David Chanin, who coded the cost model of the MACCS and MACCS2, stated (Chanin Declaration for Pilgrim Watch, June 2007, ML071840568) that, "I have spent many many hours pondering how MACCS2 could be used to calculate economic costs and concluded it was impossible. and [sic] Speaking as the sole individual who was responsible for writing the FORTRAN in question, which was done many years prior to my original work in SAND 96-0957, I think it's foolish to think that any useful cost estimates can be obtained with the cost model built into MACCS2..The economic cost numbers produced by MACCS2 have absolutely no basis. If you want to discuss economic costs, I'd be glad to discuss SAND 96-0957, but the "cost model" of MACCS2 is not worth anyone's time."

For a cost analysis which supports ATHF3's argument, ATHF3 points to Sandia National Laboratory's CRAC-2 Report, "Calculation of Reactor Accident Consequences," (1982). The report stated that a core meltdown at Fermi, Unit 2 would have the following consequences: 8,000 "Peak Early Fatalities," 340,000 "Peak Early Injuries," 13,000 "Peak Deaths from Cancer," and $136 billion in property damage costs. Note that these 1982 numbers are unadjusted for demographic and monetary inflation trends and do not account for the current or foreseeable amount of spent fuel stored onsite.

Comment 028-BB-3: Yes, indeed, we all love the tax revenue from Detroit Edison; we appreciate the jobs and the trickle down and so on, but in a heart beat, literally a heart beat, in a super prompt criticality of 1.6 seconds, that reactor can go through the roof, and that means that we will not be just evacuating, we will be permanently relocating, the size of the state of Pennsylvania.

In 1982, the Nuclear Regulatory Commission commissioned a study from Sandia Labs called the "CRAC-II." This was the severe consequences of reactor accidents. At the Fermi 2, a reactor would be 136 billion dollars in property damage -- these are 1980 dollars -- 340,000 -- 341,000 injuries; 13,000 deaths from cancer; 8,000 immediate deaths. Yes, we like the tax revenue, we like the jobs, but in a heart beat this reactor could be gone. And there has been no mitigation, Detroit Edison refuses to put in place hardened vent which would allow for the venting of the reactor if it over-pressurized.

Response: *The information presented in these comments primarily discusses issues relating to emergency planning and cost calculations. The comments appear to assert that (1) Fermi's 10-mi (16-km) plume exposure EPZ is inadequate and (2) Fermi's SAMA analysis is inadequate because of its evacuation modeling assumptions. Regarding the first item, emergency preparedness and evacuation planning are part of the current operating license and are outside the scope of the environmental analysis for license renewal. Emergency preparedness*

programs are required at all nuclear power plants and require specified levels of protection from each licensee regardless of plant design, construction, or license date. Requirements related to emergency planning are in 10 CFR 50.47 and Appendix E to 10 CFR Part 50. These requirements apply to all operating licenses and will continue to apply to facilities with renewed licenses. The NRC has regulations in place to ensure that existing emergency preparedness and evacuation plans are updated throughout the life of all plants. For example, nuclear power plant operators are required to update their ETEs after every U.S. Census or when changes in population would increase the estimate by either 25 percent or 30 minutes, whichever is less. Additionally, the NRC assesses the capabilities of the nuclear power plant operator to protect the public by requiring the performance of a full-scale exercise—that includes the participation of various Federal, state, local government agencies, and tribes—at least once every 2 years. These exercises are performed in order to maintain the skills of the emergency responders and to identify and correct weaknesses. Within the context of license renewal, the Commission considered the need for a review of emergency planning issues during the 1991 rulemaking proceedings on 10 CFR Part 54, which included public notice and comment. As discussed in the Statements of Consideration for the rulemaking (56 FR 64943, 64966–67; December 13, 1991), the programs for emergency preparedness at nuclear power facilities apply to all nuclear power facility licensees and require the specified levels of protection from each licensee regardless of plant design, construction, or license date. As a result, the Commission determined that "[t]here is no need for a licensing review of emergency planning issues in the context of license renewal" (56 FR 64966–67). Therefore, issues related to emergency planning are outside the scope of the license renewal review.

Regarding the comments about evacuation modeling in Fermi's SAMA probabilistic models, the NRC reviewed the evacuation assumptions and analysis and found them to be reasonable and acceptable for the purposes of the Fermi 2 SAMA analysis. Fermi's evacuation modeling assumptions, as modeled in the MACCS2 computer code for offsite consequence analysis, are based on information from the Fermi Nuclear Power Plant Development of Evacuation Times Estimates (DTE 2014). This information includes time delays and travel speeds for a range of possible conditions. Fermi's ETE report was prepared based on NRC guidance in NUREG/CR–7002, Criteria for Development of Evacuation Time Estimate Studies (NRC 2011), and was reviewed for completeness. For the baseline Level 3 calculation found in Table D.1–24 of Attachment D to the ER (DTE 2014), DTE assumed 95 percent of the population within the EPZ would evacuate. To account for population increases in the future, DTE lowered the assumed evacuation speed from the determined network-wide evacuation speed of 12.8 meters per second (m/s) (28.6 mph) to 10 m/s (22.4 mph). In response to an NRC staff request for addition information on the network-wide evacuation speed and total time for evacuation, DTE affirmed that the evacuation assessment considered site-specific conditions for Fermi 2 and described how spatial dependences of the highway network, as well as population density, were modeled (DTE 2015a). In a sensitivity analysis found in Table D.1–25 of Attachment D to the ER (DTE 2014), DTE reported an increase in the population dose risk by 1 percent due to an assumed factor-of-2 reduction in the average evacuation speed from 10 m/s (22.4 mph) to 5 m/s (11.2 mph). Sensitivity values for the evacuation fraction of 90 percent and 99.5 percent were found to have very small influences on the population dose risk (< 0.005 percent) (DTE 2014). As described by DTE, evacuation applies to the EPZ with a lower population compared to other areas surrounding the Fermi 2 site. The much larger population outside of the EPZ (about 55 times larger) does not evacuate in the assessment and accounts for a majority of the total population dose. For these reasons, the total population dose is not directly proportional to the fraction of individuals in the EPZ who do not evacuate. Because DTE used site-specific information, applied more conservative (lower) fractions for the evacuating population in the EPZ compared to guidance values (NRC 1997), and considered the effect of population

increases on evacuation parameter values, NRC staff concludes that the evacuation assumptions and analysis are reasonable and acceptable for the purposes of the SAMA analysis at Fermi 2.

The commenter also contends that there are no reliable or credible severe accident cost analyses that exist, implying that Fermi's SAMA analysis is inadequate because of its analysis of economic consequence analysis. Fermi's SAMA analysis uses the MACCS2 computer code for probabilistic offsite consequence analysis of a nuclear accident postulated to occur at some unknown time in the future. The MACCS2 code is the only system that models all the components of a nuclear accident offsite consequence analysis in a fully coupled fashion, including atmospheric transport and deposition, emergency phase and long-term phase protective actions, exposure pathways, dosimetry, health effects, and economic consequences. In addition, MACCS2 enables the use of site-specific population and economic data and allows sampling of site-specific weather data to account for weather uncertainty at the time of the postulated accident. MACCS2 is an NRC-approved code for use in offsite consequence analysis in a SAMA analysis. In addition, the parameter values used by the applicant in its MACCS2 analysis were reviewed by the NRC staff and are considered reasonable for the purpose of a SAMA analysis.

The CRAC-2 report referred to by the commenters is the "Calculation of Reactor Accident Consequences" which is a study performed by Sandia Labs in 1982 for the NRC. The report estimated the consequences of the worst case accidents at nuclear power plants in the United States. The NRC has devoted considerable research resources, both in the past and currently, to evaluating accidents and the possible public consequences of severe reactor accidents. The NRC's most recent studies have confirmed that early research into the topic led to extremely conservative consequence analyses that are not useful for attempting to quantify the possible effects of very unlikely severe accidents. They often used unnecessarily conservative estimates or assumptions concerning possible damage to the reactor core, the possible radioactive contamination that could be released, and possible failures of the reactor vessel and containment buildings. These previous studies also failed to realistically model the effect of emergency preparedness. The NRC performed a state-of-the-art assessment of possible severe accidents as part of its ongoing effort to evaluate the consequences of such accidents. The State-of-the-Art Reactor Consequence Analyses (SOARCA) project incorporates the results of more than 25 years of research to analyze the realistic outcomes of postulated severe reactor accidents, even though it is considered highly unlikely that such accidents could occur. The SOARCA project combined up-to-date information about the pilot plants' layout and operations with local population and weather data and emergency preparedness plans. Plant changes that were accounted for included system improvements, training, emergency procedures, and offsite emergency response, as well as mitigation enhancements in response to the terrorist attacks of September 11, 2001. The SOARCA project is documented in NUREG–1935, State-of-the-Art Reactor Consequence Analyses Report (NRC 2012b), and in a public communications brochure, NUREG/BR–0359, Modeling Potential Reactor Accident Consequences (NRC 2012c). These reports can be accessed at http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1935/ and http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0359/, respectively. In light of these more recent and more realistic analyses, these comments do not provide any new and significant information; therefore, no changes were made to the DSEIS.

Comment 025-V-4: B) That higher power output levels at Fermi, Unit 2 increase the risk of core melt through because of reactor penetrations placed on the bottom of the reactor in the BWR design.

Comment 022-BB-3: And we've also come to realize that you don't need an earthquake or a tsunami to produce a condition on plant property known as "station blackout," where you have a failure of the primary electrical power and -- and a subsequent -- and a concurrent failure of backup electrical power.

Comment 026-CC-3: The fear being that as plants went up in flames, they would have to be abandoned and all control would be lost. And I put forth that Fermi 2, the old reactor with the breakdown phase risks, Fermi 3, the new reactor with the break-in phase risks, these are the worst of both worlds on the same site. A multiple reactor accident scenario.

Response: *These comments are concerned with different types of accidents that could occur at Fermi 2. As discussed in Section 4.11.1.2 of this DSEIS, at the time of initial licensing, an applicant must demonstrate that the plant can withstand normal and abnormal transients and a broad range of postulated accidents without undue hazard to the health and safety of the public. A number of the postulated accidents are not expected to occur during the life of the plant but are evaluated to establish the design basis for the preventative and mitigative safety systems of the plant.*

The NRC staff identified no new and significant information related to postulated accidents during the review of DTE's ER for Fermi 2 (DTE 2014a), the site audit, the scoping process, or evaluation of other available information.

A.9 Waste Management (RW)

Comment: 025-V-15: Severe Accident Analysis of Fermi, Unit 2's Spent Fuel Pool:

ATHF3 hereby appeals to the U.S. NRC for reconsideration of a misguided ASLB ruling which is described below and which pertains directly and materially to the Scope of this relicensing action, including the Fermi, Unit 2 LRA Environmental Review and SEIS.

Submitted for Reference:

--- The Petitions, Contentions and legal filings pertaining to a Petition to Intervene (Contentions 1 - 5) and subsequent adjudication, in the Matter of the Pilgrim Nuclear Power Station (PNPS) License Renewal Application (2006 -) -- Docket No. 05000293 (including Pilgrim Watch's Motion to Intervene, Contention 4, May 2006 - ADAMS Accession Number ML061630125). Petitioners included Pilgrim Watch (http://www.pilgrimwatch.org) and the Commonwealth of Massachusetts Office of Attorney General.

Basis:

The ASLB and the NRC Staff have failed to apply their own rules and regulations pertaining to Severe Accidents involving spent fuel pools, which are vulnerable structures integral to a facility's normal operation. Consistently and incorrectly, the NRC has argued that all spent fuel issues are Category 1 and, therefore, "off the table" for practical purposes, having been generically resolved for all plants and not subject to further analysis in any relicensing proceeding. However, the NRC Rules say otherwise. The NRC applies the wrong section of the Rules and consequently misinterprets the whole regulation. The correct and appropriate interpretation of 10 CFR 51.53 is found in Section 5, not Section 6, in NUREG–1437 (GEIS). Section 6 of the GEIS specifically deals with "The Uranium Fuel Cycle and Solid Waste Management" under *normal* operations; Section 5 deals with "Environmental Impacts of Postulated Accidents," including Category 1 generic "Design-Basis Accidents" and Category 2 site-specific "Severe Accidents." Section 5 includes definitions of "severe" and "accident" and does not limit these to reactor core accidents. Section 5 focuses on potential *consequences* to determine whether or not a potential accident is severe ---- and, thus, under Section 5, spent

fuel pool fires are a Category 2 issue, within the Scope of a site-specific Severe Accident Mitigation Alternatives (SAMA) analysis and, therefore, are a fundamental part of an Applicant's Environmental Report (ER) and subject to NEPA SEIS review and remedy. In other words, it is the consequences of an accident, not the source or cause, which determines whether such accident is properly categorized as “Severe.”

Of course, spent fuel pools typically contain a large inventory of high-level radioactive waste (HLRW) with an inherent and undisputed potential for catastrophic consequences in the context of an accident; ironically, a spent fuel pool event could conceivably cause a reactor core accident, thereby greatly magnifying cumulative consequences. Thus, the idea that a spent fuel pool is somehow outside the realm and scope of a SAMA analysis or SEIS and that even if mitigation alternatives are readily available and cost-effective (which they are) the plant nevertheless need not consider them, is ridiculous and absurd.

As a consequence of several re-racks implemented as part of an extremely misguided, NRC-endorsed policy, the Fermi, Unit 2 spent fuel pool currently stores approximately twice the amount of spent fuel as it was originally designed to hold (4600 vs. 2300 design), resulting in a precariously vulnerable condition which must be actively managed at all times. Indeed, Fermi, Unit 2 has the largest spent fuel pool capacity of any operating boiling water reactor in the country -- hence, the potentially greater magnitude of consequences of severe leaks, fires, or other structural breaches of the pool. Adding to the danger is the fact that the GE Mark 1 BWR design locates the spent fuel pool on the 5th floor, in an elevated, structurally vulnerable position. It is reasonable to estimate that, during the 20-year License Renewal period, Fermi, Unit 2 would generate an amount of spent fuel from normal operations equal to about fifty percent (50%) of that which it produced during the original 40-year Operating License period. At the same time, the current "structured coordination" between the Nuclear Energy Institute (NEI) and the NRC appears to be heading towards potentially indefinite "continued storage" of spent fuel with no technical specifications in place, now or for the foreseeable future.

Given that the Applicant/Licensee is charged with the primary responsibility for safely and securely handling its own high-level radioactive waste (HLRW) generated during the licensed life of the reactor, ATHF3 contends that there is a "gap of accountability" in DTE's plan as it is currently written in the Fermi, Unit 2 LRA and associated documents. The NRC's SEIS must finally address the unaddressed issue of financial accountability to the public taxpayers and utility ratepayers, who deserve a seat at the table on the issue of whether to assume new, additional, and uncertain future long-term liabilities implicit in the LRA.

Under 10 CFR 2.309, a Petitioner is required to show that the issue raised in a Contention is within the Scope of the proceeding. Contentions that seek compliance with NEPA must be based on the Applicant's Environmental Report (ER). (10 CFR 2.309(f)(2)). Under 10 CFR part 51 (c)(3)(ii), the Applicant is required to provide an ER that contains analyses of the environmental impacts of the proposed action associated with license renewal and the impacts of operation during the renewal term for those issues identified as Category 2 issues. "Severe Accidents" are listed as a Category 2 issue in the applicable section on "Postulated Accidents.” Contentions implicating Category 2 issues ordinarily are deemed to be within the Scope of License Renewal proceedings. See *Turkey Point, supra* at 11-13.

In conclusion, ATHF3 contends that DTE's Fermi, Unit 2 LRA Environmental Report (ER) utterly fails to address Severe Accident Mitigation Alternatives which could substantially reduce the risks and consequences associated with onsite storage of high level radioactive waste (HLRW), especially, spent fuel pool water loss and fires. Likewise, the NRC's site-specific SEIS must address, within the scope of review, the significant environmental and public health

consequences of a Severe Accident involving Fermi, Unit 2's spent fuel pool and include an analysis and discussion of mitigating and fundamental alternatives.

Comment 035-J-6: Withdrawn Nuclear Reactor Fuel Rods

"Spent" fuel is highly flammable as well as radioactive, yet is primarily stored in densely packed pools of water that contain several times more fuel than the nuclear reactor itself. If a fuel pool is damaged or loses its cooling system, fuel rods could be exposed, overheat, and catch fire, releasing massive quantities of radioactive material. NRC refuses to address the incredible risks these facilities pose, pretending the low likelihood of an accident makes the extreme consequences irrelevant. Hardened On-Site Storage systems (HOSS) should be used to store spent fuel more safely and securely at or near nuclear plants. HOSS reduces the immediate dangers spent fuel poses, without creating unnecessary risks.

75% of the total (72,000 metric tons, plus 2,000 tons more per year) of spent fuel is in fuel pools and allowed to remain there for as much as 60 years beyond licensed life of reactor operations. The Generic Environmental Impact Statement (GEIS) on Waste Confidence, NUREG–2157 underestimates the risk of fuel pool fires and ignores the safer alternative of hardened on site storage at the nuclear plant sites. Dry cast storage at Dai-ichi survived the number 9 earth quake, tsunami, loss of the electrical grid, and loss of back up diesel generators much better than the reactors themselves and their fuel pools.

There is a consensus among the U.S. government and the nuclear industry for more than 60 years that withdrawn spent fuel rods are lethal in minutes unless shielded. To continue to produce them and intend to abandon them into the biosphere (deep underground dump) is profoundly immoral and a burden and a curse on future generations into eternity. It is premeditated murder.

There is no basis in science, engineering, the behavior of the nuclear industry and the Nuclear Regulatory Commission (NRC) for confidence that high level radioactive withdrawn fuel rods ("spent fuel") can or will be managed with no risk to the biosphere for as long as the radioactivity last. For the NRC and the nuclear industry to assert probabilistic assessments of what will happen to radioactive material over 240,000 (plutonium) to a billion years for some radionuclides, is a fraud and a con game. There is insufficient data for such probabilistic assessments to have validity. Apart from that, even a small likelihood of the risk of a serious untoward event involving spent fuel could be catastrophic for all life forms, air, water and land. Nuclear accidents cannot be undone.

NRC's Waste Confidence policy assumes that all nuclear spent fuel is the same. This is far from the truth. The industry is moving toward new fuel types, such as MOX (mixed oxide) and high-burnup fuels, which are more radioactive, dangerous, thermally hot and difficult to store and transport safely.

Fermi 2 has an over crowded fuel pool with 600 tons of spent fuel. It is the largest GE Mark 1 reactor. It is at risk for weather events, loss of coolant, or terrorist attack. Like Dai-ichi reactors and all 23 GE Mark 1 reactors in the U.S., it's cooling pool does not have back up cooling. It has no diesel generators for cooling pool water circulation to rely on in loss of electrical grid emergency. There are 1,331 highly radioactive irradiated spent nuclear fuel assemblies in Fukushima Dai-ichi Unit 4's storage pool. Fermi 2's high-level radioactive waste storage pool contained 2,898 irradiated nuclear fuel assemblies by spring 2010, according to U.S. Department of Energy projections documented in the Yucca Mountain Final Environmental Impact Statement (Feb. 2002, Table A–7, Proposed Action spent nuclear fuel inventory). Fermi 2 could generate another 443 irradiated nuclear fuel assemblies between spring 2010 and spring 2014, meaning by then, a total of 2,898 + 443 = 3,341 irradiated nuclear fuel

assemblies. So, Fermi 2's storage pool would hold 2.5 times as much high-level radioactive withdrawn fuel rods than Fukushima Dai-ichi Unit 4's pool! A cooling pool fire at Fermi 2 would be worse than a meltdown of the Fermi 2 reactor itself in its release of a larger dose of radiation into the environment, resulting in widespread illness, deaths, and genetic mutations. If the radioactivity releases from either location (the reactor, or the irradiated nuclear fuel storage pool) are bad enough, the entire site might have to be evacuated. No intervention would then be possible. Not only could reactor meltdowns proceed out of control, but high-level radioactive spent fuel storage pool fires could result -- emitting orders of magnitude more hazardous radioactivity into the environment than even a reactor meltdown, as the pools are not contained within a radiological containment structure. Fermi 2 is lacking hundreds of structural welds on various floors of the reactor building, never put in place like they were supposed to have been some 40 years ago. This has meant that it could not safely withstand the weight of the crane and cask necessary to move the sufficiently cooled spent fuel to Hardened Onsite Storage (HOSS).

Comment 028-K-2: The Environmental Report for Fermi 2 does not satisfy the National Environmental Policy Act (“NEPA”) or 10 C.F.R. § 51.45(c) because it does not consider a range of mitigation measures to mitigate the risk of catastrophic fires in the densely packed, closed-frame spent fuel storage pools at Fermi 2.

Comment 028-K-3: The Environmental Report for Fermi 2 does not satisfy the Atomic Energy Act or NEPA because (1) it does not make any site-specific safety and environmental findings regarding the storage and ultimate disposal of the spent fuel that will be generated during the license renewal term and (2) the NRC has no valid generic findings on which the Environmental Report could rely.

Comment 003-O-1: The first is about the risk of catastrophic irradiated nuclear fuel storage pool fires. Fermi 2's storage pool holds around 600 tons of irradiated nuclear fuel, more than all four destroyed units at Fukushima Daiichi put together (419 tons).

Comment 003-O-2: The second radioactive waste contention is about the lack of safety and environmental assurances, since the U.S. Nuclear Regulatory Commission's (NRC) "Nuclear Waste Confidence" policy was declared null and void two years ago by the D.C. Circuit Court of Appeals, and NRC has not yet replaced it.

Comment 038-AA-2: Because of the long time line of proposed operation until 2045 and the prospect of an additional 60 years allowed for decommissioning, much care must be taken to determine the environmental impacts for at least 90 years from now (until 2105 and possibly beyond).

As a result multiple scenarios must be considered; [...]

(2) Assuming that the recent NRC plan to allow storage of rods in on site pools with stands court challenges, what effect does this present for the 600 tons already stored since the reactor started operation in 1988. 600 tons is beyond the design capacity now, so if DTE is unable to transfer them to outside dry casks, what plan and impacts are there for continued production of this high level waste. It is our understanding that DTE's plan to transfer the high level waste to dry casks is impaired because of defective welds.

Comment 038-AA-3: Because of the long time line of proposed operation until 2045 and the prospect of an additional 60 years allowed for decommissioning, much care must be taken to determine the environmental impacts for at least 90 years from now (until 2105 and possibly beyond).

As a result multiple scenarios must be considered; [...]

(3) If no final disposal site is developed or the disposal is projected for far into the future and DTE needs to transfer the waste to outside casks, detailed analysis must be performed.

Comment 038-AA-4: Because of the long time line of proposed operation until 2045 and the prospect of an additional 60 years allowed for decommissioning, much care must be taken to determine the environmental impacts for at least 90 years from now (until 2105 and possibly beyond).

As a result multiple scenarios must be considered; […]

(4) The impact of storage and transport of low level and intermediate level radioactive waste must also be considered.

Comment 025-BB-2: As it stands right now, there's some 700-plus tons of eradiated spent fuel, a much more dangerous substance than when it first went in. When it comes out, it is a material that is just deadly and the -- the dangers associated with this cannot be, you know, underestimated over -- anyway, you get my point.

So, and my understanding is that the welds that are in place up there, on top of the reactor and the pools that contain this spent fuel, those welds are not -- don't have enough integrity, that allow removal of the spent fuel. Even if -- even if DTE was willing to commit to a dry cask storage on site there, it's my understanding that they can't even get the material safely down, out of the existing pools, so it's just -- you know, so to continue to extend the license, continue to pile up material that has no place to go, is not logical, it's not rational; it's extremely dangerous.

Comment 028-BB-4: Meanwhile, the product out there that they are really producing, that lasts forever, is high-level nuclear waste. If you refine it a bit, you could turn it into a nuclear weapon. This is the most volatile material in the world and yet this is what they produce and this is what they don't know what to do with to this day. They have been authorized since 2010 to remove that fuel from the fuel pool, they have not been able to do so. Because when they looked at the blueprints, they found that we're missing welds on the fifth floor, 768 missing welds on -- on the fifth floor. The crane would not support the load to break it down 100 feet, five floors; they still don't know what to do with it, but yet they'll make more. They'll make promises: we'll figure it out later. We'll adhere to a human and senseless paradigm, that we are so smart today in this room that: well, we don't know what to do just yet, but we'll figure it out later.

Comment 026-BB-2: So, you know, you draw a line around Fermi 2. Fermi 2 is identically designed, only it's as big as Fukushima Daiichi Units 1 and 2 put together and scaled up. And the issue has been mentioned of the radioactive waste. The radioactive waste risks here are actually much greater than at Fukushima Daiichi and if the official version of things is true at Fukushima Daiichi, we very narrowly avoided a pool fire there. I mean, you may remember St. Patrick's Day of 2011, the desperate attempts to drop water into Unit 4 by helicopter, very reminiscent of scenes from Chernobyl. And the official version is: Oh, that wasn't necessary. It turns out there was water in the pool the whole time.

Obviously, there was a lot of concern that that was not the case, and so much so that once you lose the water, you can't send people in, because they'll get a fatal dose of radioactivity from the uncovered waste within a very short period of time.

So, here at Fermi, as was mentioned earlier by Carol Izant, there is well over 600 tons of high-level radioactive waste perched at the top of Fermi 2. They've had a permit to bring it down for several years, but they can't because of structural deficiencies in the reactor building.

And even when they bring it down, it's planned to be put into whole tech (ph) casks and an industry whistleblower named Oscar Suranyi from Hominoff (ph) Edison, an NRC whistleblower, Dr. Ross Landsman from Region 3, questioned the structural integrity of the whole tech casks sitting still, on-site storage, because of major quality assurance violations in their design and manufacture, let alone moving down the railroads at 60 miles per hour, which is the plan at some point.

So, as was mentioned earlier by Michael Keegan, radioactive waste -- you know, we may enjoy the benefits of the electricity and the money that's flowing in the present -- radioactive waste is a curse on all future generations; they're going to get to deal with this. We're 70 years into this, we have a mountain of radioactive waste 70 year high, and we don't know what to do with the first cupful that was generated by Enrico Fermi on December 2nd, 1942, as a part of the Manhattan Project.

Comment 026-CC-4: And my concluding thoughts will be about nuclear waste. The nuclear waste confidence report that came out today we look forward to reading and we will be ready to go back to court, if need be. Our coalition of environmental groups and states, including the states of New York and Vermont, are very interested in what the NRC has to say at this point about nuclear waste confidence, about expedited transfer of a radiated nuclear fuel from pools to dry casts.

We call for hardened on-site storage. The NRC staff's study of this issue revealed that a - - even a small pool fire could render 9,400 square miles uninhabitable resulting in 4.1 million nuclear evacuees. We -- we put forth a petition for rule making earlier this year calling for this license extension proceeding, its rules, to be revised in light of this new information and we called for a stay on this proceeding, but were denied just last week by the Nuclear Regulatory Commission.

Comment 013-CC-1: I'm coming also to speak on behalf of myself, but also mother earth because if we ruin the mother, we won't -- we will be homeless and soon gone the way of the dinosaurs, a failed experiment, which leads to my complaint that's been the same ever since Davis-Besse and Fermi 2 were built. What are you going to do with the waste?

We're almost through a license period and we still don't have that answer. We were all told that they'll build a place for it. Of course, we weren't in that mentality of not in my backyard. It wasn't going to stay here, but it sure looks like it's going to stay here, and until we know what we're doing, you know, we're sitting right on Lake Erie. The chance -- if we have an accident, what happens?

I'm sure you're all knowledgeable people with credentials and quite bright, but I have to question even more then: what are you thinking? Is this the legacy you want to leave for your kids and your grandkids, truly?

I guess my final word is if you don't know what you're going to do with it, don't make more. Thank you.

Comment 019-CC-1: In regards to waste storage in Yucca Mountain, we've got to realize that not only are we dealing with spent fuel rods, but you all have to understand the reactor cores themselves become high level radioactive waste. No -- I don't hear anybody talking about this. Nobody has an answer for this.

These reactors are not going to end up at Yucca Mountain and, you know, for an example of a decommissioning of a plant, the shipping port reactor, the first commercial reactor in America, a tiny reactor -- I think it was 60, 61 megawatts -- was hauled to the state of Washington for burial. Now you're not going to do that with a Fermi 2 reactor, 1,140 megawatts, whatever.

My understanding is the building – when decommissioning comes -- rolls around, the reactor building will have to be flooded and the reactor core will have to be cut up with torches underwater and then we still know -- you know, nobody knows what's going to happen.

So Yucca Mountain is not a solution either and actually if -- even if Yucca Mountain were in operation, let's say we're going to haul some fuel rods out to Nevada. I can imagine sitting in a construction zone on I-75 next to a semi carrying a - - a bunch of casts. I guarantee you're going to get a whole lot more than a dental x-ray.

Comment 025-CC-6: You -- you again, it's just -- it's wild, you know, when you think about the fact that there's 600-plus tons sitting up in those pools and not a – not a single ounce of it has been removed and placed into some kind of hardened on-site storage. I mean, there's no talk of that. It's -- you know, and to continue to just continue to produce more and stockpile it on site, this is -- this is not logical; and I thank you.

Comment 029-CC-5: Number five, the Fukushima disaster -- excuse me -- was attributable as much to the failure of their supplemental – supplemental generators as it was to the tidal wave that came over the seawall and which means in our terms, if something were to go wrong with the supplemental -- in the case of an emergency at Fermi, without electricity, the storage pool will begin -- will begin to disintegrate in about four hours and twelve minutes. This is from DTE documentation. All right.

Comment 027-CC-1: I live in a part of Frenchtown where we have septic tanks. Now, what does that have to do with Fermi? Not a whole lot, but flushing your toilet's a pretty important part of your life. Being able to flush it and have things go where they're supposed to go is pretty important and I think we're flushing the toilet of nuclear waste and we don't have a seepage bed for it. We don't have a sewage treatment plant and we don't have a seepage bed.

I don't think we should play political games with nuclear waste as I heard earlier tonight. I don't think we need to blame one party or another. I don't think that's the answer. The government unwisely assumed the job of disposing of nuclear waste from nuclear power plants a long time ago.

The -- I -- I do feel that if the nuclear power plants had to take care of their own nuclear waste, we wouldn't be here. I've also heard talk about reprocessing nuclear waste. That's not a very good answer. Look it up on the internet. You can find out a lot more about it. Bomb grade plutonium is one of the byproducts of the reprocessing of nuclear waste as is a lot of pollution of water and the bomb grade plutonium is piling up and who knows who'll get a hold of it if things go bad.

The -- oh, there -- there was talk about Yucca Mountain. There's more nuclear waste in the United States that can fill Yucca Mountain. So Yucca Mountain, even if it were filled up, wouldn't be the answer to the nuclear waste that are sitting right in the United States as we talk.

Let's see here. Oh, Manny already mentioned that the Michigan State Legislature opposes the disposal site in Ontario while they approve of a place like Fermi 2 and it's a little bit inconsistent as far as I'm concerned. I'm wondering what other industry in our country has the opportunity to have its waste products taken care of by the government? That's us, folks.

Even DTE coal plant here in Monroe is responsible for their fly ash and their emissions and they've built that responsibility into their rate structure. We're paying for it. It's being -- it's being controlled. It's meeting standards that have been set by the EPA, so I say that the cost of disposal of nuclear -- if -- if the costs of the disposal of nuclear waste were part of nuclear power's operating expenses, I doubt if we would be here.

And I hope that the environmental impact statement considers even though it isn't really legally a part of the whole picture, the fact that we do have the problem of nuclear waste. It's going to affect the environment somehow somewhere, even if -- if -- if it isn't in the official statements. Thank you.

Response: *The NRC's regulations require that spent nuclear fuel be stored and maintained in a safe and secure manner while the plant is operating and after the plant operating license expires. The spent fuel remains under the direct control of the licensee and the regulatory oversight of the NRC until its ultimate disposition.*

DTE is required to safely handle, process, and store spent fuel in accordance with NRC regulations. Spent fuel is stored onsite in a combination of two types of NRC-approved methods: storage in a spent fuel pool and in dry casks. Both of these methods maintain the spent fuel in a safe configuration. Additionally, to ensure the long-term safety of spent fuel, DTE is required by 10 CFR 50.54(bb) to maintain adequate funding for the safe long-term storage of spent fuel on site.

The issue of an accident involving spent fuel (i.e., spent fuel fire) was specifically addressed by the NRC in two Petitions for Rulemaking (PRM) (PRM 51-10 and PRM 51-12) submitted by the Attorney General of the Commonwealth of Massachusetts and the Attorney General of the State of California, respectively. The Federal Register Notice containing the details of the petitions and the NRC's evaluation are available to the public on the NRC's Web site (www.NRC.gov) under ADAMS No. ML081890124.

The Petitioners requested that the NRC initiate a rulemaking concerning the environmental impacts of the high density storage of spent nuclear fuel in spent fuel pools. The Petitioners asserted that ''new and significant information'' shows that the NRC incorrectly characterized the environmental impacts of high-density spent fuel storage as ''insignificant'' in its GEIS (NUREG–1437) for the renewal of nuclear power plant licenses. Specifically, the Petitioners asserted that spent fuel stored in high-density spent fuel pools is more vulnerable to a zirconium fire than the NRC concluded in its NEPA analysis.

The Commission denied the petition for rulemaking, concluding as follows:

> *Based upon its review of the petitions, the NRC has determined that the studies upon which the Petitioners rely do not constitute new and significant information. The NRC has further determined that its findings related to the storage of spent nuclear fuel in pools, as set forth in NUREG–1437 and in Table B–1, of Appendix B to Subpart A of 10 CFR Part 51, remain valid. Thus, the NRC has met and continues to meet its obligations under NEPA. For the reasons discussed previously, the Commission denies PRM-51-10 and PRM-51-12.*

In Section 4.11.1.2 of this DSEIS, the NRC staff concluded that the impact of design-basis accidents and severe accidents at Fermi 2 during the license renewal term would be SMALL.

For the ultimate disposal of spent fuel, the NRC is aware that geologic disposal at Yucca Mountain or elsewhere may not be available in the timeframe that was originally envisioned. As an alternative, the Commission has considered the storage of spent fuel on reactor sites where it is generated. Section 4.11.1.2, "Onsite Storage of Spent Nuclear Fuel," in the NRC's 2013 GEIS (NUREG–1437) (NRC 2013b) discusses the impacts from the onsite storage of spent fuel at nuclear power plant sites during the license renewal term. Based on its evaluation, the NRC concluded that the environmental impact for the onsite storage of spent nuclear fuel during the license renewal term was small at all nuclear power plants.

In Section 4.13 of this DSEIS, the NRC staff concluded that impacts from the onsite storage of spent nuclear fuel during the license renewal term would be SMALL.

Regarding the long-term storage of spent nuclear fuel beyond the licensed life for operation of a reactor, on August 26, 2014, the Commission approved the Continued Storage Rule at 10 CFR 51.23 and associated NUREG–2157, Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel (NRC 2014b). The Continued Storage Rule adopts the generic impact determinations made in NUREG–2157 and codifies the NRC's generic determinations regarding the environmental impacts of continued storage of spent nuclear fuel beyond a reactor's operating license (i.e., those impacts that could occur as a result of the storage of spent nuclear fuel at at-reactor or away-from-reactor sites after a reactor's licensed life for operation and until a permanent repository becomes available). Therefore, the NRC staff concludes that the information in NUREG–2157 provides the appropriate NEPA analyses of the potential environmental impacts associated with the continued storage of spent fuel beyond the licensed life for reactor operations at Fermi 2. The environmental impacts assessed in NUREG–2157 regarding continued storage are deemed incorporated by rule into the Fermi 2 license renewal DSEIS pursuant to 10 CFR 51.23(b).

On the issue of requiring DTE to store spent fuel in a hardened onsite storage (HOSS) facility, the NRC is addressing the issue of HOSS through the rulemaking process; therefore, the issue of requiring HOSS is outside the scope of the NRC's environmental review. Current status, as well as all information submitted in support of the ongoing rulemaking, can be found by accessing www.regulations.gov and searching for the docket number NRC-2009-0558.

On the issue of financial accountability, the NRC assumes that the comment is addressing financial accountability following a reactor accident. Financial liability issues resulting from a reactor accident are governed by the Price–Anderson Nuclear Industries Indemnity Act of 1957, as amended (Price–Anderson Act) (42 U.S.C. 2210). The Price–Anderson Act is a Federal law that governs liability-related issues for all nonmilitary nuclear facilities constructed in the United States before 2026. The main purpose of the Price–Anderson Act is to provide prompt and orderly compensation to the public who may incur damages from a nuclear incident, no matter who might be liable. The Price–Anderson Act provides "omnibus" coverage—the same protection available for a covered licensee or contractor indemnifies any persons who may be legally liable, regardless of their identity or relationship to the licensed activity. Because the Price–Anderson Act channels the obligation to pay compensation for damages to the licensee, any party with a claim only needs to bring its claim to the licensee or contractor.

Comment 019-CC-4: Some of the waste is being removed. They're -- they're -- they're dumping it in Iraq. They're using it as munitions, the depleted uranium munitions. We're spreading this stuff in the Middle East and the birth defect rate is skyrocketing. I think it's criminal. It's criminal.

Response: *This comment expresses concern that radiological waste generated from nuclear power plant operations is being used in the manufacture of depleted uranium munitions. Depleted uranium is produced during the uranium enrichment process and is typically found in spent fuel elements or waste material generated during uranium recovery (referred to as byproduct tailings or residues). Depleted uranium has some commercial applications, including in counterweights and in the manufacturing of ammunitions used to pierce armor plating, such as those found on tanks, in missile nose cones, and as a component of tank armor. Additionally, depleted uranium can be blended with highly enriched uranium, such as that from weapons, to make reactor fuel.*

As described in Section 3.1.4.4, spent fuel generated from the operation of Fermi 2 is stored on site in either the spent fuel pool or on an independent spent fuel storage installation pad.

Radioactive waste from commercial nuclear power plants licensed by the NRC is not used to make weapons, and there are currently no other approved uses of spent fuel that would allow for the extraction of any depleted uranium from the spent fuel. The NRC requires its licensees to maintain strict control over the use, storage, transportation, and disposal of radioactive material and waste. Spent nuclear fuel is stored at the reactor site under strict controls for its safety and security in accordance with NRC regulations.

For additional information on depleted uranium, please refer to the NRC's Web site on the topic: http://www.nrc.gov/about-nrc/regulatory/rulemaking/potential-rulemaking/uw-streams/bg-info-du.html.

A.10 Special Status Species and Habitats (SH)

Comment 025-V-16: Endangered Species at the Fermi site:

Within the Scope for review, the SEIS for the Fermi, Unit 2 LRA must include an updated analysis of current and projected impacts of operations at Fermi, Unit 2 on the threatened and endangered species of fish and wildlife (flora and fauna) which rely on the Fermi site for habitat and ecosystem services. ATHF3 considers this issue to be in the category of "Significant New Unknown and Unanalyzed Conditions." The SEIS must address the current list of state and federally-protected species, updated since the time of issuance of the original Operating License; further, the SEIS must adequately consider Mitigation Alternatives which could significantly reduce the environmental impacts of Fermi, Unit 2's operations. Thus, further analysis is called for, under NEPA.

In support of this contention, ATHF3 submits into the docket the following information:

- The Bald Eagle, the Eastern Fox Snake and the Mississauga Rattlesnake live at the Fermi site and must be included in the SEIS and the Applicant's LRA.
- Also at the Fermi site are two bird species (Red Knot and Piping Plover) and two bat species (Northern Long-Eared Bat and Indiana Bat).

Other species at the Fermi site include:

- Karner Blue Butterfly
- Eastern Prairie fringed Orchid
- Three species of mussels: Northern Riffleshell, Snuffbox Mussel, and the Rayed Bean.

Response: *The comment expresses concern regarding the impacts from operation of Fermi 2 on rare species, such as State and Federally listed species.*

*The NRC staff analyzed the potential impacts to Federally listed species in Sections 3.8 and 4.8 of this DSEIS, including potential impacts to the red knot (*Calidris canutus*), piping plover (*Charadrius melodus*), northern long-eared bat (*Myotis septentrionalis*), Indiana bat (*Myotis sodalist*), eastern prairie fringed orchid (*Platanthera leucophaea*), Karner blue butterfly (*Lycaeides melissa samuelis*), northern riffleshell (*Epioblasma torulosa rangiana*), snuffbox mussel (*Epioblasma triquetra*), and rayed bean (*Villosa fabalis*). In addition, the NRC staff is consulting with the U.S. Fish and Wildlife Service (FWS) pursuant to Section 7 of the Endangered Species Act of 1973, as amended (ESA) (16 U.S.C. 1531 et seq.) (Appendix C to the DSEIS). If the NRC staff determined that continued operations could have an adverse effect on Federally listed species, as part of the ESA Section 7 consultation process, the NRC would issue a biological assessment, and the FWS would issue a Biological Opinion in accordance*

with the provisions of formal consultation at 50 CFR 402.14. The FWS could include a list of reasonable and prudent measures in a Biological Opinion necessary or appropriate to minimize impacts on Federally listed species. However, as described in Section 4.8 and Appendix C to the DSEIS, the NRC staff determined that continued operation of Fermi 2 is not likely to adversely affect any Federally listed species. Therefore, formal consultation and mitigation measures (in the form of reasonable and prudent measures) would not be appropriate.

In Sections 3.6 and 4.6 of the DSEIS, the NRC staff analyzed the potential impacts to the bald eagle, the eastern fox snake, and other rare and State-listed species. The NRC staff determined that impacts to all terrestrial resources (including rare and State-listed species) would be SMALL for all Category 1 and Category 2 issues. For noncooling system impacts, the NRC staff made this determination because landscape maintenance activities, stormwater management, elevated noise levels, and other ongoing operations and maintenance activities that DTE might undertake during the renewal term would primarily be confined to disturbed areas of the Fermi site. In addition, these activities would not have noticeable effects on terrestrial resources, nor would they destabilize any important attribute of the terrestrial resources on, or in the vicinity of, the Fermi site. Therefore, mitigation measures would not be appropriate.

Regarding the eastern massasauga rattlesnake, in Section 3.6 of the DSEIS, the NRC staff determined that this species is not likely to occur near the Fermi site. This determination was based, in part, on consultation with FWS pursuant to ESA Section 7. During this consultation, the NRC and FWS did not identify the eastern massasauga rattlesnake as a species that has the potential to be affected by the proposed license renewal. In addition, the Michigan State University Extension (MSUE) (2013), on behalf of the Michigan Department of Natural Resources, conducted a review that included examination of records from the Michigan Natural Features Inventory natural heritage database on known occurrences and localities of rare species on and near the Fermi site. The MSUE (2013) identified seven species with known occurrences within 1.5 mi (2.4 km) of the Fermi site. This list did not include the eastern massasauga rattlesnake. Accordingly, the NRC does not specifically address this species in the DSEIS.

Comment 028-Y-2: Bald Eagle - The U.S. Fish and Wildlife inform:

Your list should also include the bald eagle, as they are documented to nest in and near the project area. Although no longer protected under the Endangered Species Act, bald eagles, along with their foraging and winter roosting habitat, remain protected pursuant to the Bald and Golden Eagle Protection Act (BGEPA) and Migratory Bird Treaty Act (MBTA). Disturbance of these birds should be minimized and any resulting take must be permitted by the U.S. Fish and Wildlife Service (Service).

Response: *This comment expresses concern regarding the NRC staff's analysis of potential impacts to the bald eagle. In Sections 3.6 and 4.6 of the DSEIS, the NRC staff examined the potential effects to the bald eagle and described the protections afforded to this species and other birds under the Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. 668 et seq.)*, *and Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703 et seq.). In Section 4.6, the NRC staff determined that impacts to all terrestrial resources would be SMALL for all Category 1 and Category 2 issues. For noncooling system impacts, the NRC made this determination because landscape maintenance activities, stormwater management, elevated noise levels, and other ongoing operations and maintenance activities that DTE might undertake during the renewal term would primarily be confined to disturbed areas of the Fermi site. In addition, these activities would not have noticeable effects*

on terrestrial resources, nor would they destabilize any important attribute of the terrestrial resources on, or in the vicinity of, the Fermi site.

A.11 Terrestrial Resources (TE)

Comment 012-F-7: And then, there is the continued issue of the Eastern Fox Snake.

Response: *The comment expresses concern for the proposed Fermi 2 license renewal's impact on the eastern fox snake. The NRC addresses the eastern fox snake in Section 3.6 of this DSEIS. Section 4.6 of this DSEIS describes the impacts of the proposed license renewal on terrestrial resources, which include the eastern fox snake. As discussed in Section 4.6 of this DSEIS, the NRC staff determined that impacts to all terrestrial resources (including rare and State-listed species) would be SMALL for all Category 1 and Category 2 issues. For noncooling system impacts, the NRC staff made this determination because landscape maintenance activities, stormwater management, elevated noise levels, and other ongoing operations and maintenance activities that DTE might undertake during the renewal term would primarily be confined to disturbed areas of the Fermi site. In addition, these activities would not have noticeable effects on terrestrial resources, nor would they destabilize any important attribute of the terrestrial resources on, or in the vicinity of, the Fermi site.*

Comment 028-Y-1: Beaver Impact On Wetlands:

No where in the Fermi 2 License Renewal Application Environment Report is mention made of the rise of beaver population in Monroe County and how their growth and presence may affect the wetlands, those to be impacted and the new ones to be built to replace the proposed destroyed ones. (Beaver Population on Rise in Monroe County, Monroe Evening News 12/4/2012) The omission leaves questions about whether other issues did not receive assessment, since beavers were not mentioned.

Detroit River again becoming home to beaver reads the AP story from March 18, 2013. The story as it appears:

"Updated 9:53 am, Monday, March 18, 2013

DETROIT (AP) There's new evidence that the Detroit River once again is becoming home to the beaver, according to officials working improve the health of the river.

A trail camera set up at DTE Energy Co.'s River Rouge Power Plant in 2013 recorded images of a beaver dragging a small tree into the river, the Detroit Free Press reported (http://on.freep.com/146tqQM) Monday. It could be part of a sustained comeback.

"They could be expanding their range," said John Hartig, manager of the Detroit River International Wildlife Refuge.

Following a long absence, a beaver sighting was reported in 2009 at DTE's Conners Creek power plant along the Detroit River. He moved on during that summer, but later was spotted having returned with a family. Beaver sightings also have been reported on Belle Isle.

http://www.seattlepi.comlbusiness/energy/article/Detroit-River-again-becoming-home-to-beaver-4362805.php

Read more: http://www.seattlepi.conmbusiness/energy/article/Detroit-River-again-becoming-home-to-beaver-4362805.php#ixzz2NvanEiJ7

Read more: http://www.seattlepi.conibusiness/energy/article/Detroit-River-again-becoming-home-to-beaver-4362805.php#ixzz2NvaTrFZS"

The Environmental Report is inclomplete [sic]. Beavers have the capability of suddenly and devastatingly altering wetlands, nothing in the Environmental Report has addressed this beaver concern. We request that a ER be done to include beaver wetland modification potential at the Fermi site through year 2045.

Response: *The comment expresses concern for the impact of beavers on wetlands in Monroe County. Although the NRC staff recognizes the potential for beavers to alter hydrological regimes and natural habitats, such as wetlands, the available wildlife surveys do not indicate the presence of beavers on, or in the vicinity of, the Fermi site. However, the NRC staff addresses the types and quality of wetland habitats on the Fermi site in Section 3.6 of this DSEIS, and Section 4.6 of this DSEIS considers the impacts of the proposed license renewal on terrestrial resources, including wetlands. As discussed in Section 4.6 of this DSEIS, the NRC staff determined that impacts to all terrestrial resources (including rare and State-listed species) would be SMALL for all Category 1 and Category 2 issues. For noncooling system impacts, the NRC made this determination because landscape maintenance activities, stormwater management, elevated noise levels, and other ongoing operations and maintenance activities that DTE might undertake during the renewal term would primarily be confined to disturbed areas of the Fermi site. In addition, these activities would not have noticeable effects on terrestrial resources, nor would they destabilize any important attribute of the terrestrial resources on, or in the vicinity of, the Fermi site.*

Comment 028-Y-3: Bird Kills From Cooling Towers

The License Renewal Application has not taken into consideration the number of bird kills resulting from two Cooling Towers at Fermi 2 that will result over extended 20 year license renewal. Please enter into the record the attached 1979 study entitled Cooling Towers as Obstacles in Bird Migration which took a look at bird kills at Davis-Besse which has one Cooling Tower. Recently the Kirkland Warbler was identified as being potentially impacted by Davis-Besse. There is no discussion of this federally endangered species in the Fermi 2 LRA. Please see that this is addressed.

Response: *The comment expresses concern for the potential for birds to collide with the Fermi 2 cooling towers during the proposed license renewal period. The comment also specifically expresses concern for the potential for the Kirtland's warbler, a Federally listed species, to be impacted by the Fermi 2 cooling towers. In the GEIS, the NRC staff determined that bird collisions with plant structures is a generic (Category 1) issue with an impact level of SMALL for all sites. During its review of the Fermi 2 ER, the NRC staff considered whether any new or significant information exists that would conflict with the generic conclusion in the GEIS that impacts would be SMALL. The NRC staff also summarized available bird collision data for the Fermi site in Section 3.6 of this DSEIS. Sections 3.8 and 4.8 of the DSEIS address Federally listed species, including all Federally listed birds that have the potential to occur within the ESA action area, as defined at 50 CFR 402.02. The potential for these species to collide with cooling towers is addressed, as appropriate. Regarding the Kirtland's warbler specifically, during consultation with the FWS pursuant to ESA Section 7, the NRC and FWS did not identify the Kirtland's warbler as a species that has the potential to be affected by the proposed license renewal. Appendix D to this DSEIS describes ESA Section 7 consultation.*

A.12 References

10 CFR Part 2. *Code of Federal Regulations*, Title 10, *Energy*, Part 2, "Agency rules of practice and procedure."

10 CFR Part 20. *Code of Federal Regulations*, Title 10, *Energy*, Part 20, "Standards for protection against radiation."

10 CFR Part 50. *Code of Federal Regulations*, Title 10, *Energy*, Part 50, "Domestic licensing of production and utilization facilities."

10 CFR Part 51. *Code of Federal Regulations*, Title 10, *Energy*, Part 51, "Environmental protection regulations for domestic licensing and related regulatory functions."

10 CFR Part 54. *Code of Federal Regulations*, Title 10, *Energy*, Part 54, "Requirements for renewal of operating licenses for nuclear power plants."

10 CFR Part 100. *Code of Federal Regulations*, Title 10, *Energy*, Part 100, "Reactor site criteria."

36 CFR Part 800. *Code of Federal Regulations*, Title 36, *Parks, Forests, and Public Property*, Part 800, "Protection of historic properties."

50 CFR 402. *Code of Federal Regulations*, Title 50, *Wildlife and Fisheries*, Part 402, "Interagency cooperation—Endangered Species Act of 1973, as amended."

79 FR 36837. U.S. Nuclear Regulatory Commission. "Notice of intent to prepare an environmental impact statement and conduct scoping process for license renewal application for Fermi 2; DTE Electric Company." *Federal Register* 79(125):36837–36839. June 30, 2014.

[AECOM] AECOM. 2009. *Aquatic Ecology Characterization Report: Detroit Edison Company Fermi 3 Project*. November. ADAMS No. ML093380373.

Bald and Golden Eagle Protection Act of 1940, as amended. 16 U.S.C. §668 et seq.

Clean Water Act of 1977, as amended. 33 U.S.C. §1251 et seq.

[DTE] DTE Electric Company. 2014. *Fermi 2 License Renewal Application. Appendix E: Applicant's Environmental Report, Operating License Renewal Stage, Fermi 2*. April 2014. ADAMS Nos. ML14121A538, ML14121A539, and ML14121A540.

[DTE] DTE Electric Company. 2015a. Letter from V Kaminskas, Site Vice President, DTE, to NRC Document Control Desk. Subject: Response to NRC Request for Additional Information for the Review of the Fermi 2 License Renewal Application—Severe Accident Mitigation Alternatives. January 9, 2015. ADAMS No. ML15037A229.

Endangered Species Act of 1973, as amended. 16 U.S.C. §1531 et seq.

[EPA] U.S. Environmental Protection Agency. 2014. "Detroit River-Western Lake Erie Basin Indicator Project. INDICATOR: Algal Blooms in Western Lake Erie. Large Lakes and Rivers Forecasting Branch." Updated December 5, 2014. Available at <http://www.epa.gov/med/grosseile_site/indicators/algae-blooms.html> (accessed 5 December 2014).

Mackey SD. 2012. *Great Lakes Nearshore and Coastal Systems. U.S. National Climate Assessment Midwest Technical Input Report*. In: Winkler J, Andresen J, Hatfield J, Bidwell D, Brown D, coordinators. *U.S. National Climate Assessment Midwest Technical Input Report*. Great Lakes Integrated Sciences and Assessments (GLISA) Center. Available at <http://glisa.umich.edu/media/files/NCA/MTIT_Coastal.pdf> (accessed 2 January 2015).

Mangano JJ. 2012. *Potential Health Risks Posed by Adding a New Reactor at the Fermi Plant: Radioactive contamination from Fermi 2 and changes in local health status*. Radiation and Public Health Project. January 10, 2012. Available at <http://static1.1.sqspcdn.com/static/f/356082/16362768/1328128276340/Mangano_corrected_Fermi_report_Jan_11_2012.pdf?token=gBLNCTkz%2B14KsQF62i1RyPquUuo%3D>

Migratory Bird Treaty Act of 1918, as amended. 16 U.S.C. §703 et seq.

[MSUE] Michigan State University Extension. 2013. Letter from M Sanders, Environmental Review Specialist/Zoologist, Michigan Natural Features Inventory (MSUE), to L Goodman, DTE Energy Company. Subject: Enhanced Rare Species Review #1271—DTE Electric Fermi 2 Nuclear Station License Renewal, Monroe County, MI T6S, R10E Sections 16, 17, 19, 20, 20, 28 & 29. September 17, 2013. ADAMS No. ML14121A540 (in DTE's Fermi 2 Environmental Report, Appendix C).

National Environmental Policy Act of 1969, as amended. 42 U.S.C. §4321 et seq.

National Historic Preservation Act of 1966, as amended. 16 U.S.C. §470 et seq.

[NRC] U.S. Nuclear Regulatory Commission. 1997. *Regulatory Analysis Technical Evaluation Handbook*. Washington, DC: NRC. NUREG/BR–0184, January 1997. 308 p. ADAMS No. ML050190193.

[NRC] U.S. Nuclear Regulatory Commission. 2011. *Criteria for Development of Evacuation Time Estimate Studies*. Washington, DC: NRC. NUREG/CR–7002. November 2011.

[NRC] U.S. Nuclear Regulatory Commission. 2012b. *State-of-the-Art Reactor Consequence Analyses (SOARCA) Report, Part 1 and Part 2.* Washington, DC: NRC. NUREG–1935. November 2012.

[NRC] U.S. Nuclear Regulatory Commission. 2012c. *Modeling Potential Reactor Accident Consequences.* Washington, DC: NRC. NUREG/BR–0359. December 2012.

[NRC] U.S. Nuclear Regulatory Commission. 2013a. *Environmental Impact Statement for the Combined License (COL) for Enrico Fermi Unit 3, Final Report*. Washington, DC: NRC. NUREG–2105, Volumes 1 and 2. January 2013. ADAMS Nos. ML12307A172 and ML12307A176.

[NRC] U.S. Nuclear Regulatory Commission. 2013b. Generic *Environmental Impact Statement for License Renewal of Nuclear Plants*. Revision 1. Washington, DC: NRC. NUREG–1437, Volumes 1, 2, and 3. June 30, 2013. 1,535 p. ADAMS No. ML13107A023.

[NRC] U.S. Nuclear Regulatory Commission. 2014a. *NRC Staff's Answer to Citizens' Resistance at Fermi 2 (CRAFT) Petition for Leave to Intervene and Request for Public Hearing.* Washington, DC: NRC. September 12, 2014. ADAMS No. ML14255A495.

[NRC] U.S. Nuclear Regulatory Commission. 2014b. *Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel: Final Report, Volume 1*. Washington, DC: NRC. NUREG–2157. September 2014.

Price–Anderson Act Nuclear Industries Indemnity Act of 1957, as amended. 42 U.S.C. §2210 et seq.

[USGCRP] U.S. Global Change Research Program. 2014. *Climate Change Impacts in the United States: The Third National Climate Assessment*. Melillo JM, Richmond TC, Yohe GW, editors. May 9, 2014. ADAMS No. ML14129A233.

FERMI 2 SCOPING MEETING

JULY 24, 2014

AFTERNOON MEETING TRANSCRIPTS

The way I typically do this and call people up is I'll announce, say three names, so you know the first person who is coming up and then the next two people kind of have a cue that, "Hey, I'm going to be up next as soon as they leave the podium," so that helps make the process go smoother, okay?

What I would like to do is start out by introducing and inviting up two, either representatives of your elected officials or actually an elected official here. So, Dustin Krasny, who is a representative of Congressman Tim Walberg, I'll have you come up to the podium first, followed by Bob Clark, the mayor of Monroe, and then, finally, I'll have Sandy Mull come up and speak, okay? So, Dustin?

MR. KRASNY: Well, sorry about that, but I'll remind myself: blessed are the brief, because they'll be asked to speak again, but I wanted to just stop by today. Obviously, Congressman Walberg is in Washington. The congressman and I have toured all the energy-producing facilities here in Monroe County and throughout the district, and Monroe County is now part of the 7th Congressional District, and it's interesting to note that the 7th Congressional District actually has -- is the biggest producer of energy from any

030-BB-1-SSR

Congressional District this side of the Mississippi, so it's very important in this district for -- for our jobs, for our local economy. And as we move this district in our state forward, it's important to create efficient, low-cost energy for our manufacturers, families, and small businesses as we get Michigan moving again. So, we'll continue to work on that, and the congressman in the next few weeks will be submitting a letter of support for this renewal process. So, I want to thank you for having this open forum for everybody to speak, and have a great day here in Monroe.

030-BB-1-SSR, cont'd

MR. CLARK: Well, thank you. I'll try not to touch the microphone. But, good afternoon, everyone. My name is Bob Clark and I am the mayor with the City of Monroe. I'm here with some comments that I've prepared, but it also comes from some personal information as well. But thanks for this opportunity to offer my comments about DTE Energy's application for the 20-year extension of the operating license for Fermi 2.

011-BB-1-SSR

I, in the City of Monroe, have long been vocal about our support for Fermi complex, most recently in public hearings concerning the proposed new unit and complex, as well as the related NRC

environmental impact statements. And now, today, in support of DTE's license renewal application.

011-BB-1-SSR, cont'd

An additional two decades of operation of a well-maintained, productive Fermi 2, it would continue to stable the base of the economic avail -- activity and all of the benefits associated with more than 800 very good jobs here in our region, but also the tax base associated with the plant and the local purchasing engaged in and by the plant. There is also, of course, the spinoff benefits associated with hundreds of contractors engaged in various projects of the plant. I can't overstate Fermi's vital importance to our city, our county, and our region.

You know, being a good neighbor requires trust, it requires communication, it requires keeping one's commitment. I promised to be so during my seven years in city government, but also during my previous 30-year career with the Michigan State Police. DTE has and continues to be a valuable partner of our community in many respects.

The City of Monroe is fortunate to have that kind of relationship with DTE Energy, and DTE Energy has demonstrated that it is proactive in

addressing issues. They communicate with elect officials and community leaders and they are true to their word. I can find that any issue or any item, either before, during, or as things are occurring, that I have contact and receive phone calls and can really make those calls myself if I have questions or if questions come to me. I believe it's because DTE isn't just a company doing business in our community, but they are also part of our community. Many of the employees live in the city of Monroe or surrounding townships and villages; they are involved in our community on a day-to-day basis as residents, patrons of our local businesses, volunteers in our community, and involved with charitable activities. And I regularly see the men and women who work at Fermi and DTE's other Monroe facilities, Monroe County facilities, and have personal connections with them as friends and neighbors. This personal commitment and engagement at all levels within DTE, to me it inspires great confidence.

011-BB-1-SSR, cont'd

As far as support, that DTE wants to extend the life of Fermi 2, so this license renewal application, and I see it as one of those instances where it wins for everybody. Our community benefits,

electric customers benefit from cost-effective source and reliable, affordable carbon-free electricity. I want to thank you again for the opportunity to make some brief comments. Thank you.

011-BB-1-SSR, cont'd

MR. BARKLEY: Thank you, Bob. Sandy?

MS. MULL: I'll stand on tiptoes so I don't have to touch the microphone. Good afternoon. I'm Sandy Mull; I'm the president and executive director of the Southern Wayne County Regional Chamber. Our organization is made up of rough -- roughly 1,000 business members who are in 21 communities that are north of Monroe County, east of Washtenaw County, and south of Dearborn. The vast majority of our members can be classified as small businesses with approximately 85 percent of them having fewer than 100 employees and fully half of them having fewer than 25 employees.

The Chamber's mission is to improve the overall business climate for our members through action that stimulates economic growth, inter- business communication, and member education.

The requested 20-year extension of Fermi 2's operating license is nothing if not a continued platform for energy and economic growth in our region

046-BB-1-SSR

and stability. It represents an opportunity for both economic growth and improved business climate, and that's why the Chamber is supporting DTE's application for a renewed license.

046-BB-1-SSR, cont'd

The south -- southern -- I'm sorry -- the Southeast Michigan Council of Government, which is SEMCOG -- that's why I stumbled over the whole name -- estimates that our region lost 210,000 manufacturing jobs in the first decade of the new millennium. And worse, those losses were -- had a ripple effect by three jobs lost for every manufacturing job that disappeared. During that dark economic period, Fermi 2 was one of the few places that remained stable.

In my perspective, our region, which is Southeast Michigan, we felt the recession first and we felt it the longer -- the longest, and we are just now beginning to get a sense that the economy is turning the corner in our region. The assurance of 20 additional years of operation at Fermi 2 would be a very positive development. First, in terms of economic stability, and it would also provide a cost- effective energy that we've come to expect from DTE. It's my understanding that Fermi 2 represents about one-fifth

of the electricity produced by DTE Energy. If the license extension was not granted, it's my belief that we would pay significantly higher fees for the necessary power to replace what Fermi 2 otherwise would have generated.

046-BB-1-SSR, cont'd

Thank you, again, for this opportunity to speak.

MR. BARKLEY: Okay, thank you. The next three people I would like to call is: Barry Buschmann, Carol Izant, and Richard McDevitt. So, Barry?

MR. BUSCHMANN: Good afternoon. My name is Barry Buschmann, and I'm the senior vice president of the Mannik & Smith Group, which is a local civil engineering, surveying, and environmental firm in Monroe, Michigan. I am also a licensed professional engineer in the state of Michigan since 1981 and a resident of Monroe County. I also wear some other hats which include: I'm the current chairman of the Monroe County Chamber of Commerce; a board member for the Monroe County United Way; vice chair of the Monroe County Economic Development Corporation; and I also am the township engineer for Frenchtown Charter Township, where the Fermi 2 Power Plant is located; and I am also the engineer for the

Frenchtown Charter Township Resort District Authority, which obtains approximately 60 percent of its revenue from the DTE Energy and Fermi 2 Power Plant, and it is situated in close proximity to the facility itself.

DTE provides a strong tax base for Monroe County, for Frenchtown Township, and the Resort Authority. They provide excellent corporate support to the Chamber of Commerce and numerous other agencies throughout Monroe County. Without their funding tax base and support, most of these agencies and municipalities would suffer. DTE provides approximately 800 jobs in our community, and we would like to see those jobs continued for another 20 years. In addition, during refueling outages, another 1,000 temporary workers are employed. This not only provides additional regional employment, but it provides a strong financial benefit to local businesses during the time period in which the workers are in town. 007-BB-1-SSR

Fermi 2 Power Plant has provided a safe, efficient, and environmentally friendly facility since its start of operation in Frenchtown Township many years ago.

DTE is also a strong supporter of the

Monroe County Community College, working with them to provide a workforce pipeline, by establishing programs and hiring local community for college students.

007-BB-1-SSR, cont'd

As chairman of the Chamber of Commerce, a representative of the Monroe County EDC, and an owner of a local engineering firm in Monroe County, I strongly support the Fermi 2 license renewal application. Renewing the license of Fermi 2 will provide the continuation of reliable power source with affordable electricity to our county for the next 20 years. Thank you.

MR. BARKLEY: Okay. Thank you, Barry. Carol, welcome.

MS. IZANT: My name is Carol Izant; I co-chair the Alliance to Halt Fermi 3 and I'm here, today, I will be submitting some written comments on behalf of our organization. But, today, I just want to say that given the decision that was handed down two years ago regarding the waste confidence ruling, I don't see how it's possible for the NRC to grant a renewal of Fermi 2.

025-BB-1-SSR

As it stands right now, there's some 700-plus tons of eradiated spent fuel, a much more dangerous substance than when it first went in. When

025-BB-2-RW

it comes out, it is a material that is just deadly and the -- the dangers associated with this cannot be, you know, underestimated over -- anyway, you get my point.

025-BB-2-RW, cont'd

So, and my understanding is that the welds that are in place up there, on top of the reactor and the pools that contain this spent fuel, those welds are not -- don't have enough integrity, that allow removal of the spent fuel. Even if -- even if DTE was willing to commit to a dry cask storage on site there, it's my understanding that they can't even get the material safely down, out of the existing pools, so it's just -- you know, so to continue to extend the license, continue to pile up material that has no place to go, is not logical, it's not rational; it's extremely dangerous. You know, you built a mansion, you forgot to put in the toilet. You know, I mean I'll tell you, if -- if word got out that, you know, I was -- I had built, you know, a house and an inspector came through and rubberstamped, you know, the fact that I was building something without a way to safely remove the waste and contain it, you know, my reputation would be seriously in the toilet. But, you know, when you're doing business with the Godfather, you know, you get away with a lot. And while I -- believe me, I -- I

understand how vitally important it is to this community in terms of jobs and income and economy. And, certainly, you know, I -- I am not unrealistic when it comes to the -- the economic impacts; however, there is a far greater impact that we must consider. And to that end, you know, I'll save the details of that for my written comments, but thank you.

MR. BARKLEY: Okay. Thank you, Carol. Rich, come on up.

MR. McDEVITT: Good afternoon. Welcome, Commission; we appreciate you coming here and giving us this opportunity to speak. My name is Rich McDevitt. I am a lifelong resident of Monroe County. I have been working with DTE Energy for over 34-35 years now, since 1988, when we went commercial, producing electricity for our communities. I have been working here, at the Fermi Powerhouse. I am also the vice chair of the Fermi Division of the Utility Workers Local 223.

During this entire period of time that I have been working at Fermi, I have been working in the Mechanical Maintenance Department. Really, the nuts and bolts of this power plant to keep us safe, reliable, organization-capable of supplying you, our community,

040-BB-1-SSR

040-BB-1-SSR, cont'd

with electricity.

Not only have I been a lifelong resident of Fermi and of Monroe County, here at Fermi, I have been involved in the nuclear industry since the early æ70s, when I was working at a tool and die shop making the tubing to manufacture and house our uranium that we use for fuel. And it's very important that in all aspects of this, that we do produce and keep a safe operating power plant. It has been my pleasure to work in such an organization that does this at all steps.

We do have for you entire sets of safety standards that every man and woman that works there abide by. We pay attention to each and every one of these steps because this is not only our occupation, this is our environment. This is our home; this is where we're raising our families. I am fortunate enough to have a new generation in my family who are building a home within three miles of the power block, because we believe this is a safe, good way to manufacture electricity.

In fact, it is probably even more amazing that when I first came to Fermi, we had a tremendous set of rules in place. We abrogated those rules to even better each and every year. Literally every month, we

are trying our best to improve -- to improve what is best for our community in the manufacturing of a safe and reliable product.

040-BB-1-SSR, cont'd

I have the opportunity to represent more than 200 members of the workforce out there on a daily basis; each and every one dedicated to our community's environment, and taking care of it in such a safe way. This is our home. This power plant is something that is good for our community; it helps each and every one of us. Many of our members and our workers are volunteers in our community, serving on many different boards. And Commission, we do look forward to having our contract license renewed, so that we can continue for many, many more, providing this community with a safe and reliable resource to keep us generating in such a way that we are moving forward in our world. Thank you.

MR. BARKLEY: The next three people I would like to call up is: Joseph Plona, Jessie Pauline Collins, and then Paul Braunlich.

MR. PLONA: Good afternoon. My name is Joseph Plona and I'm a DTE Energy employee and I've worked at the Fermi Nuclear Plant for over 30 years. I have a very close connection with the plant; I was

present at initial startup. And I can say that in all of my years of experience here, we have no higher commitment in this facility than to safety, and that's operational safety, personal safety, and safety of the public. Nothing comes before our responsibility for safety. And I know I speak for every Fermi employee, that we take this responsibility seriously. 050-BB-1-SSR

Now, every company has a purpose. The DTE Energy purpose is: we serve with our energy the life blood of communities and the engine of progress. Fermi has an important role in the company in fulfilling that purpose. The benefits of more than 25 years of safe operation are many: More than 190 million megawatt hours of electricity for DTE Energy customers in that time frame, and all that electricity with no carbon emissions; clean energy; a positive role in the local community, supporting local institutions, charitable organizations, and countless volunteer hours on the part of our employees.

Our commitment to safety also carries over to environmental responsibility as well. Our goal is to be stewards of the environmental where we work and live. More than 600 pristine acres of property on the Fermi site are part of the Detroit River International

Wildlife Refuge. That land has oversight by the U.S. Fish and Wildlife Service and is teaming with undisturbed wildlife.

050-BB-1-SSR, cont'd

Fermi has also maintained our -- our Wildlife Habitat Council certification since 2000. The council is a nonprofit organization focused on healthy ecosystems. We have provided an exhaustive environmental impact study that shows no environmental changes related to license renewal, the plant -- the plant footprint, and the operation remained the same.

Renewing Fermi 2's operating license for another 20 years provides significant future benefit: a continued supply of clean, safe energy for our customers in Southeast Michigan, providing the life blood to power our economy; an important part of the DTE balanced portfolio of energy sources -- nuclear, wind, coal, natural gas, and solar -- which all make up a generation assortment that is diverse, not dependent on one or two energy sources; a steady supply of good, well-paying jobs, at a tax base that supports the local community and the state of Michigan, economically, and; finally, license renewal supports our employees and their families, who are a vital part of this community through their efforts at the plant,

as well as in the community, in the schools, civic institutions, churches and charitable organizations, working to improve the quality of life in the area. That is where we all want to be for another 20 years. 050-BB-1-SSR, cont'd

Thank you.

MR. BARKLEY: Thank you, Joseph. Jessie, you're up.

MS. COLLINS: Hello. My name is Jessie Pauline Collins and I'm a nuclear abolitionist. I want to say, I'll speak tonight about issues, but right now I just want to say I'm glad we live in a country where we can have opposing views and bring them out and discuss them, so that we can have better knowledge.

I became a nuclear abolitionist as a young woman in Oklahoma when I attended sweat lodges and the medicine man told us they were trying to build a nuclear facility in Oklahoma, and that it was our duty as warriors to do what we could to stop it. I didn't question, I didn't know what a nuclear plant was, but I joined with the others and we did.

The first NRC meeting I went to, it was all white men; that was in '85. Over the years it changed, then we got men of color, and now we have women, and women of color. I'm glad to see this progress. This

is all progress toward a sustainable world: equal rights, equal voices. And now we have a thing of energy. It has -- Fukushima has brought to life everybody's worst fears. Over three years, still contaminating. Yes, Fermi has run without that kind of danger; it doesn't mean it always will. It means it has so far. 012-BB-1-SSR

DTE Electric -- and I must say, they are a very respectable organization, I have never been threatened by them or my personal life interfered with, as Kermagee used to do to us. As I passed and went to the cafeteria, I saw all the solar panels put up there by DTE -- yay, they are on the right track. They have to go sustainable eventually; they might as well do it now. Now is the time to put aside the dangers that we face, do not make us live in the shadow of a Fukushima-like accident for another 31 years, not even the Fukushima-like accident. 012-BB-2-SSR In the 19 -- 2009 study that they did on the cooling water intake, it showed the cooling water intake sucked up, in an eight-month period, 3,102 live fish, over 63 million fish eggs and fish larva in normal operations. The world depends on the fish. And the water they put out is hot, inviting in invasive species. 012-BB-3-AQ

At the time, it was a new technology and it seemed to be great. Now we know it's not. Let's not extend it another 20 years. Let's end it now and go on to the sustainable energy sources that are inevitable to come. Thank you. 012-BB-4-SSR

MR. BRAUNLICH: Good afternoon, ladies and gentlemen. My name is Paul E. Braunlich, and I am the attorney for Frenchtown Charter Township Resort District Authority, and I'm here this afternoon speaking on behalf of Larry Smith, the director of the Resort District Authority. I just came off of the lake with the good mayor; we were boating on the lake with many prosecutors throughout the state of Michigan, but I got elected to come here to talk this afternoon about a very important subject to all of us.

The Resort District Authority is a 005-BB-1-SSR special tax assessment district created by Frenchtown Charter Township in 1986 and allowed by Michigan Public Act 59 of 1986. Through the vision of local leaders and championed by our local state representative, this Act permitted the establishment of a defined assessment district in order to rehabilitate a special area. The boundaries of the Resort District Authority encompass a contiguous area within the township, which includes

private homeowner associations established in the æ40s and in the æ50s, locally known as the "beach communities," Fermi 2 and other businesses that opted in.

005-BB-1-SSR, cont'd

The beach communities, under their outdated organizational structures, were unable to provide for adequate municipal infrastructure and services, and were in a state of rapid decline. The Resort District Authority has a population of approximately 6,250 people representing 30 percent of the township, with approximately 2,321 housing units. Since the creation of the Resort District Authority, 42 miles of roads have been paved; over 80 miles of storm drains were installed, including six large pumping stations capable of pumping 3,469 gallons of water per minute, equipped with diesel engine power generators for backup in the possibility of a power interruption during floods. Clay berm/dikes were also built to supplement existing flood protection devices.

Currently, the Resort District Authority has launched a major project to rehabilitate the flood protection seawalls along Lake Erie shoreline. This is a 32 million dollar project funded on a pay-as-you-go

basis and not the federal government. With approximately 1 million annually being set aside for construction, the project will complete -- will be completed sometime around 2046. The Resort District Authority provides municipal services, such as: road maintenance, street lighting, snow removal, and etcetera. None of this would have been possible without Detroit Edison, Fermi 2, being an active and good corporate citizen of the Resort District Authority.

005-BB-1-SSR, cont'd

In closing, the Resort District Authority is a unique governmental entity in the state of Michigan -- there is only one of us -- and collects taxes from the district to provide municipal services and to provide flood protection and improvements to the community. DTE, Fermi 2, has been an excellent corporate citizen, but more specifically, by its local president -- presence, improving the quality of life for all of the citizens of the township, and especially the Resort District Authority.

I urge the Nuclear Regulatory Commission to renew the license of Fermi 2 Nuclear Power Plant for the requested 20 years, thereby keeping them a valuable citizen of the Resort District Authority and a

district, a representative, the place to live and raise a family. Thank you for this opportunity to address the Commission and for your attention. Thank you very much.

005-BB-1-SSR, cont'd

MR. BARKLEY: Okay. Thank you, Paul. For our next three speakers, I would like to call up Angela Rudolph, followed by Richard Micka, and then, finally, Bill Ded (sic), I believe his name is.

MS. RUDOLPH: Good afternoon, everyone. Monroe County is where I live, is where I work. I live just seven miles north of the plant and I feel safe living there. I am proud to say I do work at Fermi. Both of my children have worked at Fermi during their college years. My coworkers and I are a vital part of this community. We supply the energy to power the economy and to make all of our lives more comfortable. We do that 24 hours a day, 300 -- or 24 hours a day, 365 days a year, and we would like to see that plant produce energy for another 20 years. There will be no environmental impact changes related to the license renewal application. The plant footprint and operation will remain the same. I, like every Fermi employee, are committed to protecting the environment; it's a commitment that we live in every day. Thank you.

054-BB-1-SSR

MR. BARKLEY: Okay. Thank you, Angela. Richard?

MR. MICKA: Good afternoon. My name is Dick Micka; my wife and I live in the city of Monroe and have for many years. I am also what is somewhat called a "civic booster." I am a former hunter and avid conservationist, but not former conservationist -- still an active one. I have the great honor to serve as the chairman of the Detroit River International Wildlife Refuge Alliance, a friend's organization that helps the U.S. Fish and Wildlife Service to deliver on the mission of the refuge. I am here this afternoon offering my personal perspective.

As a resident, I believe that when it comes to electricity, we can't put all our eggs in one basket. We need something more than coal, and I don't think wind or hydro are going to be a significant help, certainly not here in the southeast corner of Michigan. 044-BB-1-SSR

While I firmly believe that more nuclear energy needs to be added to Michigan's electricity portfolio, I believe even more firmly that the life of a well-functioning plant like Fermi 2 needs to be

extended. I welcome your efforts in the process of reviewing DTE Energy's application for a 20-year license extension. As a civic booster, I have long observed and admired DTE Energy's involvement in Monroe County. I've had the pleasure to work shoulder-to-shoulder with many men and women from the company and to a person, they are great examples of what good neighbors should be.

044-BB-1-SSR, cont'd

As a conservationist, I have worked over the years with what I term the "Big 4" of local environmental stewardship of: U.S. Fish and Wildlife Service, the Michigan Department of Natural Resources, the Huron Clinton Metropolitan -- Metropolitan Parks Authority and the utilities. DTE Energy and its involvement with the Wildlife Habitat Council is a great example of environmental stewardship. Of course, DTE Energy was the first business partner with Wildlife Refuge, entering into a cooperative management agreement with the Fish and Wildlife Service, enabling the service to protect and manage wildlife and fish populations on 656 acres at Fermi.

In closing, know that the environmental community also includes many individuals like me, avid

or once avid anglers and hunters, many like me see nuclear energy, especially an existing plant like Fermi 2, as critical to meeting Michigan's long-term energy -- energy needs. As an added benefit, Fermi 2 omits virtually no greenhouse gases. 044-BB-1-SSR, cont'd

MR. BARKLEY: Okay. Thank you, Richard. Bill, are you still there?

I wondered how that -- D-y-e-r?

MR. DYER: Yeah, that's it.

MR. BARKLEY: It didn't look like it on my card.

MR. DYER: I'm a little nervous here, so -- I'll put my glasses on. Hello, everyone. I'm Bill Dyer, by the way. I'm the chairman of local -- the Fermi Division, Local 223. Fermi 2 is quite, literally in the hands of Local 223, and I am the chairman of the division of Local 223. We are the men and women who operate and maintain the plant. We take our work very seriously; our workers are highly trained professionals -- professional nuclear workers, and we are honored to serve our friends and families and neighbors by powering the community. 018-BB-1-SSR

Local 223 represents hundreds of members and we all know the responsibility we have at Fermi 2.

We accept the responsibility and honor it by keeping safe -- safety our top priority. Safety isn't an abstract thing for us; we live it. We live here, our families live here, our friends live here, and our neighbors depend on us keeping them safe. I, and the rest of Local 223, look forward to operating Fermi 2 for the next three decades and should -- and the community should rest assured knowing the plant is safe in our hands. Thank you.

018-BB-1-SSR, cont'd

MR. BARKLEY: Okay. Thanks, Bill. The next three people I would like to call are: Sean Honell, Michael Keegan, and then Eric Dover. Sean?

MR. HONELL: Hello. My name is Sean Honell; I'm a Monroe County resident and a mechanical engineer at Fermi 2. I was born and raised in Monroe County and am proud to say it's my home, today.

As a Bedford High School graduate in 2006, the economy in Michigan and throughout the country was at a point of economic downturn. The automotive industry was struggling and the prospects for career-level jobs were dwindling. I started my college education right here at Monroe County Community College, taking general engineering credits. Now I was intrigued when the college offered a Nuclear

Engineering Technology Program. I had long known that Fermi was a single place of employment and I enrolled and graduated at the first class of nuclear engineering technology students. As a result, I earned a coop position at Fermi 2 in 2008. I have since gone on to get my bachelor's of science in mechanical engineering at the University of Toledo. I am now working at a job that I love at DTE Energy.

The one principle that has been so clear 024-BB-1-SSR from the beginning is that more than anything, Fermi is committed to safety. Every single day, the work that I perform reflects the core values of safety. It is my personal duty, and every employee's duty, to ensure that we perform our work to the highest standards of safety in protecting the environment around us. I can proudly say that I go home at night to my wife and eight-month-old son feeling safe and secure, even with an operational nuclear facility just three miles from my home.

My coworkers and I are a vital part of this community. We supply -- we supply clean energy to power the economy and to make all of our lives more comfortable. We do that every day, 365 days a year, and I want to continue to do that for the next 20 years.

Thank you.

MR. BARKLEY: Thanks, Sean. Michael?

MR. KEEGAN: My name is Michael Keegan, I reside in Monroe, Michigan; I have lived here all my life. I have been tracking nuclear power since 1980 when I attended a public meeting before the County Commissioners where there were promises about an evacuation plan, an exercise that could be conducted. The more they presented, it occurred to me it was -- that these were falsehoods; there really is not an operable evacuation plan in Monroe County. If you were asked to evacuate, it would be a permanent relocation. I'm troubled by the fact that in this community, it's the largest MARC 1 reactor in the world, nearly identical to the Fukushima reactors. And what's more disturbing is it was known in 1972, by the Atomic Energy Commission, that this reactor design was faulty. There were hearings, congressional hearings in 1976, where three General Electric engineers came forward and spoke about the fault of this reactor design. The containment is simply too small.

028-BB-1-SSR

028-BB-2-SSR

Yes, indeed, we all love the tax revenue from Detroit Edison; we appreciate the jobs and the trickle down and so on, but in a heart beat, literally

028-BB-3-PA

a heart beat, in a super prompt criticality of 1.6 seconds, that reactor can go through the roof, and that means that we will not be just evacuating, we will be permanently relocating, the size of the state of Pennsylvania.

028-BB-3-PA, cont'd

In 1982, the Nuclear Regulatory Commission commissioned a study from Sandia Labs called the "CRAC-II." This was the severe consequences of reactor accidents. At the Fermi 2, a reactor would be 136 billion dollars in property damage -- these are 1980 dollars -- 340,000 -- 341,000 injuries; 13,000 deaths from cancer; 8,000 immediate deaths. Yes, we like the tax revenue, we like the jobs, but in a heart beat this reactor could be gone. And there has been no mitigation, Detroit Edison refuses to put in place hardened vent which would allow for the venting of the reactor if it over-pressurized. Meanwhile, the product out there that they are really producing, that lasts forever, is high-level nuclear waste. If you refine it a bit, you could turn it into a nuclear weapon. This is the most volatile material in the world and yet this is what they produce and this is what they don't know what to do with to this day. They have been authorized since 2010 to remove that fuel from

028-BB-4-RW

the fuel pool, they have not been able to do so. Because when they looked at the blueprints, they found that we're missing welds on the fifth floor, 768 missing welds on -- on the fifth floor. The crane would not support the load to break it down 100 feet, five floors; they still don't know what to do with it, but yet they'll make more. They'll make promises: we'll figure it out later. We'll adhere to a human and senseless paradigm, that we are so smart today in this room that: well, we don't know what to do just yet, but we'll figure it out later. 028-BB-4-RW, cont'd

So, those are the tradeoffs. Lose everything you have, everything you've known, every family going forward, or just roll the dice one more time. The quality assurance at the Fermi 2 is abysmal, it's been abysmal; I have records demonstrating that. The Fermi 3 quality assurance is abysmal. 028-BB-5-SSR We're going to go to court. So, I'm here today to tell you that there will be intervention at the legal front and there will be comments made. It's not going to be a cakewalk; we will be raising those issues.

I would also like to point out that you have a regulator which is a captured lapdog; they have been 028-BB-6-SSR

captured by the industry. In fact, there have been 73 applications for license renewal, all 73 have been approved, and there have been vehement legal interventions at many of those. It does not matter to the NRC; nobody really cares at the NRC, they rubberstamp it. They've been captured by the industry and we play this musical pretense and -- "I come out here and legitimize this process for you, I get patted on the head, thanks for coming out, public," but you live in this community with this threat hanging over your head every day. There are better ways to do it. If we take the money going forward, if we renew -- renewable is an alternative, these are labor-intensive technologies, there will be more jobs. There would be replacement for the jobs that are lost at the Fermi 2. Phase it out, time to go. You don't know what to do with the waste; it's a con game, stop producing. Thank you.

028-BB-6-SSR, cont'd

028-BB-7-SSR

MR. BARKLEY: All right. Thank you, Michael. Welcome, Eric.

MR. DOVER: I - don't touch the microphone, right? My name is Eric Dover. I want to thank the NRC for -- ooh, that moves, too -- I would like to thank the NRC for letting me speak, today. I

am a proud member of the Fermi 2 family, but that's not the family I want to talk about.

I'm a local boy, I was born and raised just south of here in La Salle. My father was also a local boy; his love for boating and the water, he passed right on to me. My mother may not have been local; she's been here for over 50 years. My entire family is here, my extended family is here; we all live around this plant. And being a history buff, we've had to make sacrifices in the Lake Erie basin, for the environment, for the economy.

Fermi 2, we have a strong environmental storage shed; we do great things for the environment in my opinion, I see it firsthand. I am motivated, because of my family, to make sure we care for our environment. I'm a boater, I love the Great Lakes; I love spending time on the Great Lakes. Fermi not only provides the job and economy for me to enjoy that lifestyle, but also takes care of the environment around it, so the environment will continue to be there, so I can enjoy that lifestyle. That was probably the most proud moment of my professional career, is to be a part of that.

014-BB-1-SSR

I would like to keep it short. I'm in

strong support of us extending this another 20 years. Thank you very much. 014-BB-1 cont'd

MR. BARKLEY: Thank you, Eric. The next three people I would like to call up: Ron Lankford, followed by Emily Wood and then Keith Gunter. Ron, are you still here? Welcome. Glad we got to talk earlier.

MR. LANKFORD: Hello, everybody. My name is Ron Lankford; I'm a graduate of the Lawrence Institute of Technology, also hold a master's in health service administration.

I am going to do a little extemporaneous thing. Here, the First Nation people had it right: live with nature, don't try to change it. I'm also going to have you use your minds. Picture the Continental United States; all across the nation, the states have different situations where some are against a foreign country, some of them are surrounded by other states. Michigan, though, is unique, because Lower Peninsula has water on three sides. This means that the evacuation routes can't be to the west; we have a narrow ribbon across the Mackinaw Bridge to the north and we have a foreign country to our east. So, all of the evacuation routes would have to go south, which happens to be close to where the 033-BB-1-SSR

Fermi Nuclear Plant is. 033-BB-1-SSR, cont'd

As a consideration for extending the operating license of a nuclear power plant, the ability to successfully evacuate residents from the area must be included. Berlin Township clearly resides within the blast area of the Newport Fermi Power Plant. NRC needs to look at the lack of additional escape routes and the failure of the State of Michigan, Monroe County, and Wayne County, to maintain or improve evacuation routes in light of population increases in this township.

On the east end of Berlin Township, a Class A roadway, commonly known as "Jefferson," is supposed to carry traffic across the Huron River. Its bridges are crumbling and portions of this road have water on each side. In the past, flooding from Lake Erie has covered this road making it impassable. Flooding from Lake Erie could also challenge the Newport site, as it is essentially the same body of water.

Population increases are significant. Around 1970, there were 5,510 people in Berlin Township, 6,488 in 1980, and currently we have 9,600 residents. More importantly, the increase is not due solely to more people in old homes, but due to increase

033-BB-1-SSR, cont'd

in new houses. As of 2010, four years ago, 693 new homes were added to the township. This may not sound like a lot, but for us it was a 37 percent increase in dwellings. Some projections to the year 2040 predict another 20 percent increase in population. This would seem to be very modest, but it also means that you have a 37 percent increase in traffic because there is no public transportation in Berlin Township. No new roads have been built and no roads have been widened to provide a consistent third turn lane, which might be used in an evacuation. Many roads run parallel to rivers and creeks and they do flood.

The lack of snow removal by the government would have trapped many residents on the roads, that were in their homes this past winter. The area had the winter of the century -- record snowfall and record sustained cold temperatures impeded movement. Roads leading to even the Berlin Township offices offered only three-quarter to one- and-a-quarter lanes on their two-lane surfaces after plowing, and this condition went on for several weeks. These are the roads the evacuation people need to travel. These are the roads emergency service needs to go down. Yet, the government knows that Fermi Nuclear Plant is

operating and that people need to use the roads to evacuate. If the NRC had requirements laid out in its original license regarding evacuation routes, adequate snow removal machines and manpower should have appeared to ensure the safety of Berlin Township residents. 033-BB-1-SSR, cont'd

Now, in business you have internal strengths and weaknesses. I have heard a lot of things here about what goes on within the fenced area of Detroit Edison, but the other problem we have is what goes on, on the outside: opportunities and threats. Manpower to the Monroe County Sheriff's area has been cut to three patrolmen for the whole county on afternoon shift. The State Police Post we used to have in Erie, Michigan and Flat Rock have been either eliminated or relocated to Taylor. So, just who would Fermi call in the event they needed officers out there?

You have to look at not only the licensing requirement for what's within the perimeter of your plant, but you have obligations to maintain evacuation routes. And you can't just say, like in a failed evacuation, "Oh, I thought you were going to do it. Oh, isn't it your job to do it?"

In a way, we're fortunate that this renewal process has come up right now, because this

would run through to 2025 without anybody having the opportunity to look at all the budget cuts, all of the external factors, and see how they might affect the environmental part of nuclear licensing. There could be conditions in there where organizations are required to maintain manpower and they haven't. So, this is something that needs to be corrected and I would -- I would say that's a conditional approval of this license because we can't have this situation continue. Thank you.

033-BB-1-SSR. cont'd

MS. WOOD: Good afternoon. My name is Emily Wood and I appreciate the opportunity to share my viewpoint as an employee of North American Young Generation Nuclear member, Women in Nuclear member, a customer of DTE Energy, resident and active member of the Monroe County community.

I was born and raised in Monroe, Michigan. For me, Fermi 2 is a familiar place. My father has been working at the plant for the past 35 years. In 2008, I graduated summa cum laude. As many of you know, it was the worst economic time to be a recent college graduate. Never in a million years would I have anticipated having such a difficult time finding full-time employment. After countless hours

of searching, I was forced to leave my hometown of Monroe and relocate for an employment opportunity.

While living and working outside of Monroe County, I met someone who is now my fianc©. When we met, he was enrolled in college and I told him about the field of nuclear power, which he was unfamiliar with at the time. He thought it sounded interesting and I told him to look into it. He graduated from the Monroe County Community College Nuclear Engineering Technology Program and was hired into the Fermi 2 Nuclear Power Plant. Shortly thereafter, I was hired into the Fermi 2 Nuclear Power Plant to work in Human Resources. With both of us being fortunate enough to have job opportunities in Monroe County, it allowed us to move back to my hometown. The Fermi 2 Nuclear Power Plant brought me back as a resident and acquired him as a new resident to Monroe County. We have truly been blessed by the financial and employment opportunities. Last year, we built a brand -- a brand-new beautiful home just three miles from the Fermi 2 Nuclear Power Plant.

When I'm talking to friends and neighbors, they are proud to live by a nuclear power plant and they realize that Fermi 2 is an economic rock

061-BB-1-SSR

for Monroe County and all Southeast Michigan, providing well-paying jobs for thousands of employees, contributing millions of dollars in tax revenue, and donating millions of dollars to nonprofit organizations that nurture our community. These are all things that I am proud of and I know my neighbors are proud of, too.

061-BB-1-SSR, cont'd

Although I work in Human Resources, I'm the president of the North American Young Generation Nuclear, also known as NAYGN. NAYGN is a group of young workers who will be the ones operating the Fermi 2 and other nuclear power plants across the nation for decades to come. And let me tell you all, your nuclear power plants are in good hands. Our young professionals are dedicated and intelligent; we are an innovative group and we bring many new ideas to help make nuclear power more efficient and reliable for the customers of Southeast Michigan.

In addition to NAYGN, I am also the vice president of Women in Nuclear, also known as WIN. Each year, the members of WIN participate in a women's build week for Habitat for Humanity, as an opportunity to give back to other women in the communities in which we live and serve. Fermi 2 employees, myself

included, are active supporters of the local community, raising funds for local charities and providing countless volunteer hours for local community organizations. License renewal is critical to the future success of Monroe County and the surrounding areas. That is why every day at Fermi 2, we maintain the safety of the public and the environment as our top priorities.

061-BB-1-SSR, cont'd

Through my recruiting efforts, I have seen firsthand what closing a nuclear facility does to the community and surrounding areas: economic devastation. Businesses are forced to close and people are forced to leave the area and relocate. I never expect or want this to happen in the area I call home. I am thankful to know that Fermi will continue to operate and support Monroe County and Southeast Michigan. My passion for clean energy starts and ends with nuclear power. I look forward to the future of Fermi 2 as a safe, clean, and reliable source for base load power generation. Thanks again for your time and have a wonderful day.

MR. BARKLEY: Okay. Thank you, Emily. Keith?

MR. GUNTER: Thank you. My name is Keith Gunter -- careful with that power. My name is

Keith Gunter and I am the other co-chair of Alliance to Halt Fermi 3, which is a union of concerned citizens in 15 Southeast Michigan organizations that are opposed to the construction of a third Fermi Nuclear Plant near Monroe, Michigan.

Forty-eight years ago, in September of 1966, I was an 11-year-old sixth grader at Taylor -- Fairlane Elementary School in Taylor, Michigan, and our teacher took us to a place called Fermi 1; a wondrous, brand-new technological marvel that was going to help pave the way for inexhaustible, clean energy for all humanity. Needless to say, after 48 years, quite a lot has changed.

On March the 11th, 2011, early in the morning, my phone rang at home; it was my brother, Paul, who is the director, reactor watchdog project director at D.C. area, Beyond Nuclear, and my brother told me that there had been a terrible earthquake in -- in Tsunami, in Japan, and that it was likely there was at least one meltdown now underway. And he told me that he had just gotten a call from a cable news network and was being asked to come directly over to the studio. He didn't have time to go home and throw on a suit, so he went to the studio in street clothes

022-BB-1-SSR

and he did a 10-minute interview with Jeanne Meserve who was, at that time, a senior homeland security correspondent for a cable news network. And of that 10-minute interview, they used approximately eight seconds of that interview at the very end of Wulf Flitzer's Situation Room program on March the 11th, 2011. And my brother, Paul, said at the end of that -- at the end of that story, which spanned about eight minutes -- the eight seconds they used, he essentially said, "The concern here is that we could literally blow the roof off of this reactor."

022-BB-1-SSR, cont'd

Now, right after his snippet of film was used, a spokesperson for the Nuclear Energy Institute, whose name I'm not recalling at the moment, said that the probability of that happening was extremely remote. The next morning, when I turned on CNN, the first thing, I saw the first Fukushima reactor building exploding and I thought to myself: you know, brother, you called that one. But my brother was not clairvoyant; such special powers were not needed, because as my friend and colleague, Michael Keegan, indicated a little while ago, the shortcomings, the flaws of the General Electric boiling water reactor MARC 1 containment design had been known for decades. As a matter of

fact, Harold Benton (ph), a former senior reactor safety specialist at the U.S. NRC, once estimated that the probability of catastrophic failure of the General Electric MARC 1 boiling water reactor containment design was 90 percent probability of failure under severe accident conditions. In other words, with the pressure suppression system that was already installed at the plant, in addition to the back- fitting of a special vent stack to relieve excess pressure under accident conditions, the failure rate at Fukushima Daiichi was 100 percent, because the three reactors that were operating at the site, at the time of the disaster, all exploded before the eyes of the world.

022-BB-1-SSR, cont'd

So, I certainly -- I certainly appreciate the arguments, as my colleague, Carol Izant, said earlier; I certainly appreciate the -- the need for -- for jobs and economic security and certainly appreciate the need for safe production and distribution of electricity, but as we have seen in over the last few decades, nuclear power is failing that test. Because the fact is, that nuclear plants are not insurable. The best risk assessors, inside the insurance companies, will not touch nuclear power

022-BB-2-SSR

with a 10-foot pole. And that's the reason that in 1957, the U.S. Congress passed the -- the Price- Anderson Act, which essentially leaves the federal government and U.S. taxpayers on the hook for the vast, vast, vast majority of potential damages.

022-BB-2-SSR, cont'd

And we've also come to realize that you don't need an earthquake or a tsunami to produce a condition on plant property known as "station blackout," where you have a failure of the primary electrical power and -- and a subsequent -- and a concurrent failure of backup electrical power.

022-BB-3-PA

So, given all we know, it is my opinion that to relicense a reactor that has a known flawed containment design, to say nothing of the issues of the waste, which we are literally back to square one in dealing with, it would be utterly reckless and irresponsible for the U.S. Nuclear Regulatory Commission to relicense a reactor that we know has a flawed design.

022-BB-4-SSR

I'll just close with a couple of more comments. In today's New York Times, there -- on the front page of the business page, there is a huge article about an electrical distribution system that is being constructed in the Texas Panhandle, designed

to transmit the power from vast wind farms that are being constructed there, and that is where the future is. The future is not with nuclear power; the future is with renewables, energy efficiency, and energy conservation.

022-BB-4-SSR, cont'd

Now, the late Dr. John Gofman, who was the co-discoverer of uranium-233, the winner of the Stauffer Prize for heart research, and a former member of the nuclear establishment, who later recanted, once said -- and I'm paraphrasing here -- he said: My particular combination of scientific credentials are very handy in the nuclear controversies, but advance degrees confirm no special expertise in either commonsense or morality, that's why so many laypeople are as qualified, if not more so, to judge nuclear power than the so-called experts.

And by the way, "expert," an interesting term. "Ex" is a has-been and "spurt" is a drip under pressure. Thank you.

MR. BARKLEY: Okay. Thank you, Keith.

the speakers and we're progressing along just fine. The next three people are: Mark Farris, Jeanne Micka, and Grace Yackee. So, Mark, welcome.

MR. FARRIS: Hello, everybody. My name

is Mark Farris, a lifelong resident of Monroe. I did not intend on speaking until the afternoon session; I'm not really prepared, but no big deal, I'll wing it.

Up front, I think I have to offer some advice that maybe the people in the nuclear industry might want to take a look at what's happening in Germany. Once the population in the country realize what a scam nuclear energy is, you might want to be looking for another line of work down the road. One of the reasons for job loss in Michigan, from the auto industry in particular, was the high cost of electricity. I retired out of the auto industry, and so if we're going to talk about jobs, we have to look at that. 019-BB-1-SSR

Nobody complained when they -- you know, too much, when the Ford factory left Monroe and we were looking at what, 12-1,400 high-paying jobs there. The nuclear industry, I hate to say it, but it's an antiquated technology. If you go to some of these TED Talks, you can see the advances being made in alternatives; you can -- you know, you can get affordable (indecipherable) cells are about as thick as a piece of paper these days, and this is going to

019-BB-1-SSR, cont'd

continue to advance.

You know, Michigan, it's the only state in the union that's actually losing people, there's a reason for that, and that falls back on the deindustrialization that's taking place, in my opinion, because of the high cost of electricity in this state.

The issue of nuclear energy, you have to consider the company General Electric. General Electric is one of the -- I think they're the number one company in America who does not pay taxes. If we're considered about rebuilding roads and bridges and spending money on infrastructure, how about if these corporations start paying taxes?

You know, you've got these wind turbines that are being installed here in Michigan, up in the thumb area. Well, some of these are General Electric turbines. What a shame they're built in Germany and Holland. We've got a tower factory here in Monroe, it employs quite a few people at good paying jobs. I suspect that maybe if some of our politicians would demand General Electric bring these jobs back to America, we could create some jobs in this community, in this country.

And one issue I wanted to bring up momentarily, is that 2,500 gallons of diesel fuel that leaked here recently at the Fermi Plant, was this a large line or just a long-term leak that nobody paid attention to? Where was the NRC? You know, nobody mentioned, no comments from the NRC on this issue. That raises questions. 019-BB-2-GW

And I guess that's about all I have to say. I'll be speaking again this afternoon and I'll try to polish it up a little bit better, but nuclear energy is a mistake; there is no doubt in my mind. I, along with a lot of other people, are going to continue to stress to the populations that they're the ones that have to vote politicians out that are supporting this industry. Thank you very much. 019-BB-3-SSR

MR. BARKLEY: Okay. Thank you, Mark. I'll try to find somebody who can speak to that diesel fuel leak after the meeting. Jeanne, welcome.

MS. MICKA: Good afternoon, and thank you for the privilege of appearing before all of you. My name is Jeanne Micka. I guess I'm what you could call a "civic booster," I give a hoot. I'm a member of the Lotus Garden Club, the Michigan Garden Clubs, and the National Garden Clubs, and a variety of other

localiza -- local organizations that care about the community, such as: the Women in Philanthropy through the Community Foundation in Monroe County; Ducks Unlimited, the hen side of it; Monroe County Historical Society; Friends of the Library; Friends of the Museum; Friends of the River Race and National Battlefield; the Monroe City County Fine Arts Council, and others. It's a privilege to be American. It's good to give back in whatever way you can.

We've been in a somewhat unique position to witness the level of community devel -- excuse me -- community engagement and commitment as demonstrated -- demonstrated by DTE Energy employees and company. The hundreds of men and women employed at Fermi enrich our community with the dollars they spend, but their contributions in time, energy, are every bit as important to the fabric of our community as is all of us who volunteer. 043-BB-1-SSR

The job of generating electricity, including the use of nuclear power, is a very important process. As a member of the Lotus Garden Club, I have personally witnessed what DTE Energy does in protecting the environment and preserving and enhancing it.

You know, the American lotus is North America's largest native aquatic wildflower; it grows about this high in the water -- waters along the shores of Lake Erie and other lakes. It's a prehistoric plant; it's been here a long time. Believe it or not, it's related to the sycamore tree -- you talk about an interesting family history -- and the lotus is rather like a canary in the cave. If you see lotus, they're nice, big, yellow blooms of round parasol-shaped leaves and your water quality and your air quality is good. If the quality of your environment decreases, they die. So, we have a Lotus Tour on Saturday, come and see them, there's lots of them.

043-BB-1-SSR, cont'd

Dick and I were flying over Detroit Edison and Enrico Fermi some years ago in a B-17 World War II bomber, and it's an interesting site when you look out the bay, and Dick's camera had a lens on it like this and I'm looking at the thing with my toes holding onto my shoes like this. My God, there's lotus down there. So, we went to see the people out at Edison and said, "Do you know you've got lotus?" They said, "No, we don't."

"Yeah, you do." And, so this started a partnership that was unbelievable. It tied in with

the Port of Monroe, Consumers Energy, DTE Energy, Fermi, Ford, the entire Lake Erie western shore. And what's really strange: these corporate bodies weren't really talking with one another, and one very important gentleman out at the port said to me, when I was young and skinny a long time ago, before life has brought me -- "Why don't the little old ladies of the Lotus Garden Club go home and plant petunias?" while we were saying, you know, "Your dike out here is leaking, will you please fix it?" They did. And when I got home I was pretty mad; I took the kid and put her in the station wagon, went to Kmart and bought a lady's size 12 pair of sneakers, took them to the local greenhouse and had the filled with 50 red, white, and blue petunias, and delivered to somebody very important with a note, "Put your best foot where it fits." And you know what? It worked. A little humor does work. We have a fine partnership; people really care about the environment. They really care about the economic background of our community and we work together. And we would invite all of you to join us in that regard. There are lessons to be learned.

043-BB-1-SSR, cont'd

My dad was a medical officer in the Medical Officer Corps, in the United States Army Air

Corps, and in the Air Force, and as was my husband, and we've lived in a lot of countries. There hasn't been one, that I've had the privilege to visit, that doesn't like to turn on the light. I can remember as a kid when they were talking about, at the end of the World War II -- yeah, I'm a fossil -- blood transfusions were bad. I can remember seeing emergency situations in Alaska where they took a Coke bottle and they took the blood from the artery of one GI, put it in the Coke bottle to give it to the other GI to save his life -- it did, and much has improved from that time. So again, it's a lesson to be learned.

043-BB-1-SSR, cont'd

From the perspective of civic booster, I do endorse the 20-year extension as a continuing process. Our community and our environment would be so much poorer without the jobs provided by Fermi and our other industrial leaders and corporate leaders, without the community leadership of DTE Energy plant management, without the community involve -- involvement and philanthropic support of the men and women who work there. Of course, we would all benefit from 20 years at low-cost, reliable electricity in a variety of manners.

Thank you for the opportunity to speak

about Fermi 2. And one additional thought: There is a gentleman named John Ed Croy (ph), that's a friend of ours, and he lives right across Swan Creek from Fermi. He was one of the designing engineers for Fermi, and he's not here this evening because of his age, but he is so proud of the work that he did at Fermi -- his house is right across from it, and it's amazing to watch what he sees.

And one other point: I was one of the first people on earth to be treated with nuclear medicine; I am still here. Thank you very much, and I thank you all for your opinions.

MR. BARKLEY: Okay. Thank you, Jeanne. Grace, are you still here? There we go.

MS. YACKEE: Good afternoon. My name is Grace Yackee, and I'm the Vice President of Instruction at Monroe County Community College. It is my honor to welcome the NRC to Monroe County and to our campus. I think it is especially fitting for the Board to host these public meetings here, because this institution itself has become a hub of nuclear energy-related educational activity.

At Monroe County Community College, a successful candidate for an associate in applied

062-BB-1-SSR

science degree, with a specialization in nuclear engineering technology, are prepared for entry-level employment as mechanical technicians, electrical technicians in instrumentation control, or IMC technicians. Those who go for additional training will have opportunities as radiation protection technicians, non-licensed operators, and senior reactor operators.

062-BB-1-SSR, cont'd

DTE Energy personnel were instrumental and invaluable in working with us to develop the program to the benefit not only of our students, but the entire industry. Today, this relatively new program enlists 17 students annually, and nearly all graduates find employment in the industry, mostly local.

When MCCC partnered with DTE Energy to offer this selective program, it was decided that we would rise to a level of national standard by participating in the Nuclear Energy Institute's Nuclear Uniform Curriculum. This MCCC DTE Energy partnership facilitates the transitioning of graduates into the nuclear energy industry utility training programs in accordance with the requirements of the Uniform Curriculum Guide for nuclear power plant technicians, maintenance, and non-licensed

operations personnel associate degree program, as developed by NEI.

062-BB-1-SSR, cont'd

In 2012, we expanded the curriculum to include additional courses: Unit 120, Radiation Protection, and Unit 130, Plant Systems. It should be no surprise, then, if Monroe County Community College speaks in favor of a 20-year license extension that DTE Energy is seeking.

I am also pleased to say that a hub of nuclear energy-related activity, this institution is proud to be partnering with DTE Energy to preserve the history of Fermi 1 through displays of artifacts at our Career Technology Center, an archiving of significant records.

From a broader perspective, Monroe County Community College sees nuclear energy as a clean energy source. We do not agree that like conventional renewable energy technologies, like wind solar, should be counted as clean energy sources. We want to see Fermi to continue to contribute in so many ways to our institution, our community, and our region's efforts to reduce greenhouse gas emissions. I commend you, the staff of the NRC, for your contributions and involvement in the license renewal process, and hope

that you find my comments constructive. Thank you.

MR. BARKLEY: Okay. Thank you, Grace. And on behalf of the NRC, I would like to thank the community college for hosting this year; this is a great facility. It's one of the nicest facilities I've ever had a public meeting in. The next three people I would like to call are: Kevin Kamps, Connie Carroll and, finally, Phil Skarbek. Kevin, welcome.

MR. KAMPS: Hello, everybody. Good afternoon. My name is Kevin Kamps and I serve as a radioactive waste specialist at Beyond Nuclear, based in Tacoma Park, Maryland, right outside of Washington, D.C., but I'm from Kalamazoo, Michigan, and did this environmental work in Michigan as a volunteer for the 1990s as a board member of Don't Waste Michigan, representing the Kalamazoo Chapter. I got involved because of problems at Palisades on Lake Michigan. And I guess the theme of what I would like to address with these short five minutes is Fukushima lessons learned, or not learned, as the case may be.

I have the odd experience, I guess, of having visited Fukushima Daiichi seven months before the catastrophe began. It was Hiroshima Day of 2010 and I was invited to Japan by a coalition of

026-BB-1-SSR

environmental groups to speak at different nuclear power plants about a program called "Mixed Oxide Plutonium Fuel." In Japan, they call it "fluid thermal" and I have a banner from Japan that I picked up on this tour that says, "Stop Plutonium Thermal" in Japanese. So, I traveled the country and my first stop was Fukushima Daiichi, because Unit 3 was planning on installing plutonium fuel in its core, in the near future, and local concerned citizens and environmentalists hoped to stop that from happening; in fact, they had stopped it for a decade, but it was loaded a month after I visited in September of 2011. And, so Unit 3 experienced the largest of the explosions during the catastrophe.

026-BB-1-SSR, cont'd

So, it's just an odd experience because a lot of the things that have been said by employees here, today, by local elected officials, Chamber of Commerce folks, I've heard the same thing in Futaba and Okuma. Fukushima Daiichi is so big, six reactors, that it straddles two towns; it has two host towns. I met with the mayor of one of the towns, I met with the vice mayor of another town and, you know, a lot of confidence -- and I guess that's the question I put out there to you all is: do you think that the people in Futaba, in Okuma,

the employees, the management, the elected officials, were any less confident than you are that everything was fine? And in fact, I suppose if I had met with them on March 10th of 2011, the same would have been the case. They were very confident that it was safe; they were very confident in their ability to keep it safe. They certainly enjoyed the money that flowed. In fact, Tokyo Electric had built a giant City Hall that the town couldn't afford to even maintain, that's how big the City Hall was. Another community received a semipro baseball stadium from the local nuclear utility, that was used once a week by the local Little League Team, so the money was flowing in Japan. And as powerful, economically and politically, as the nuclear power industry is in this country, especially in a community like this, in Japan it was much more so. Whereas the U.S. used to get 20 percent of its electricity from nuclear, in Japan it used to be 30 percent. And, of course, that all changed.

026-BB-1-SSR, cont'd

Everyone that I met over a couple, three days' period of time, when I was there, is now a nuclear refugee, including the former mayor of Futaba whose name is Katsutaka Idogawa. And the entire town of Futaba was moved to an abandoned school on the

outskirts of Tokyo, where they still live three-and-a-half years later. There are still tens of thousands of nuclear refugees. So, there is a 12.4 mile dead zone around Fukushima Daiichi.

026-BB-1-SSR, cont'd

So, you know, you draw a line around Fermi 2. Fermi 2 is identically designed, only it's as big as Fukushima Daiichi Units 1 and 2 put together and scaled up. And the issue has been mentioned of the radioactive waste. The radioactive waste risks here are actually much greater than at Fukushima Daiichi and if the official version of things is true at Fukushima Daiichi, we very narrowly avoided a pool fire there. I mean, you may remember St. Patrick's Day of 2011, the desperate attempts to drop water into Unit 4 by helicopter, very reminiscent of scenes from Chernobyl. And the official version is: Oh, that wasn't necessary. It turns out there was water in the pool the whole time.

026-BB-2-RW

Obviously, there was a lot of concern that that was not the case, and so much so that once you lose the water, you can't send people in, because they'll get a fatal dose of radioactivity from the uncovered waste within a very short period of time.

So, here at Fermi, as was mentioned

earlier by Carol Izant, there is well over 600 tons of high-level radioactive waste perched at the top of Fermi 2. They've had a permit to bring it down for several years, but they can't because of structural deficiencies in the reactor building. And even when they bring it down, it's planned to be put into whole tech (ph) casks and an industry whistleblower named Oscar Suranyi from Hominoff (ph) Edison, an NRC whistleblower, Dr. Ross Landsman from Region 3, questioned the structural integrity of the whole tech casks sitting still, on-site storage, because of major quality assurance violations in their design and manufacture, let alone moving down the railroads at 60 miles per hour, which is the plan at some point.

026-BB-2-RW, cont'd

So, as was mentioned earlier by Michael Keegan, radioactive waste -- you know, we may enjoy the benefits of the electricity and the money that's flowing in the present -- radioactive waste is a curse on all future generations; they're going to get to deal with this. We're 70 years into this, we have a mountain of radioactive waste 70 years high, and we don't know what to do with the first cupful that was generated by Enrico Fermi on December 2nd, 1942, as a part of the Manhattan Project. And the speaker from the

community college mentioned preserving an archive of the history of Fermi 1 and we have made, on the record, suggestions for contributions to that history, one of which was the original plan for Fermi 1 to supply weapons-grade plutonium to the U.S. Nuclear Weapons Arsenal; that was a document we would like included in that archive. And, of course, another classic document would be We Almost Lost Detroit by John Fuller, a 1975 book, which chronicled the Fermi 1 partial meltdown in 1966, that Keith Gunter mentioned.

So, a lot of risks have been taken here over the decades. Twenty more years of a General Electric boiling water reactor with a MARC 1 containment is really a risk this community should not enter into lightly. Thank you.

026-BB-3-SSR

MR. BARKLEY: Thank you, Kevin. Connie?

MS. CARROLL: Good afternoon. My name is Connie Carroll and I'm the executive director of the United Way of Monroe County. We talk about the money flowing in Monroe County, but let me assure you that we still have plenty of homeless and plenty of hungry to go around.

Looking around Monroe County, you can see we're still struggling to recover from our previous

010-BB-1-SSR

economic levels. While there has been some improvement, the slow economic recovery continues to have significant effect on local support for the United Way and other philanthropic efforts in this community.

010-BB-1-SSR, cont'd

Latest statistics show us that 68 percent of Monroe County's workforce is employed outside this community. Once upon a time, that was at a moderate rate of only 50 percent working outside the community, but with the increase in Monroe County's residents leaving the county for work each and every day, it stands to reason that they are also taking with them their retail business and even their community charitable contributions are going somewhere else.

The renewal of the Fermi 2 license would ensure continued employment for many here in the future of Monroe County. Over the past 30 years, corporate contributions to charities in the United States have fallen swiftly. Against this backdrop, DTE Energy, the DTE Energy Foundation, and the company's employees, are a continuing resource and support system for the economic growth and stability needed in Monroe County. DTE Energy remains the largest single employer in Monroe County. The company and its employees are

also the single largest charitable contributors we have. Not only do they contribute monetarily to the United Way of Monroe County and many other nonprofit organizations, but they give freely of their volunteer time and services; everything from holding coat drives for children to serving community meals and -- and food drives for those who are still homeless and hungry.

010-BB-1-SSR, cont'd

Recently, they partnered with a great project in the City of Monroe, partnered with Michigan Gas Utility employees on a beautification project, planting flowers and bringing growth to a very ugly, for lack of a better term, little corner in Monroe.

Fermi 2 and DTE Energy have over the years given tens of thousands and tens of millions of dollars to the charities in Southeast Michigan. In 2013 alone, they contributed more than 20 percent of the entire United Way of Monroe County campaign.

Monroe County is a better place to live because of DTE Energy and their employees. Many employees sat on our nonprofit Board of Directors, they volunteer their time and their services. Renewal of this license will most definitely and positively affect the economic environment of Monroe County. It

will mean sustained employment and additional jobs for our community. Outages and annual maintenance will bring in additional skilled work forces that will enhance rental and retail income. 010-BB-1-SSR, cont'd

The typical nuclear energy plant annually produces 430 million dollars in local sales of goods and services, providing millions of dollars in federal, state, and local tax -- tax revenue. Excuse me. I am certain that this renewal will have a positive impact on the local philanthropic community as well. As a representative of the nonprofit sector, I endorse the renewal of the license for Fermi 2. Thank you very much.

MR. BARKLEY: Thanks, Connie. Phil?

MR. SKARBEK: Thank you. Good afternoon. My name is Phillip Skarbek and I've been a resident of Monroe since 1993 with my wife. I am also a shift manager of Fermi 2. 057-BB-1-SSR What that means, most people probably don't know, is that during my operating shift, whether it's dayshift or nightshift, I'm in charge of all plant operations and the operating crew in the main control room. After many years of study and passing a demanding test given by the federal government, I was -- I earned a senior reactor operator license,

which gives me the position of shift manager. The NRC has placed a great responsibility on me to operate the plant with just one overriding concern, and that is the health and safety of the public. Nothing comes before that responsibility. I now speak for every shift manager at Fermi 2 and, in fact, for every Fermi employee, that we take this responsibility very seriously. The standards are higher here because we know they have to be. And those standards are always rising through continuous improvement, sharing lessons learned throughout the industry, and a constant self-critical assessment of our own performance. Being self- critical means you can't have thin skin of a nuclear business. We criticize ourselves and our peers, and this is with one overriding factor, and that is safety. I'm glad that's the way it is, because my family lives right there, near the plant, and I want the best for my family: the best air to breathe, the best water to drink, the most reliable power, and the best community to live in, Monroe. Fermi 2 contributes to all of that.

057-BB-1-SSR, cont'd

Our energy is clean, our energy is safe, and our energy is abundant. And best of all, with a 20-year license renewal, I know that my family will

be able to enjoy everything this plant provides to the community for many years to come. They will be able to enjoy the energy and the commitment of protecting the environment, where they live, work, and play. That makes me proud and it also makes me even more committed every day I step foot on the Fermi 2 property to protect it and the health and safety of everyone who lives here. I thank you for the opportunity to speak.

057-BB-1-SSR, cont'd

MR. BARKLEY: Thanks, Bill. The next three people I would like to have speak are: Floreine Mentel, Sandy Pierce, and Martha Gruelle. So, Floreine, thanks for making such an effort to come see us and talk.

MS. MENTEL: Good afternoon, everyone. I had to ask to be a little bit ahead because I have many 4-H'ers waiting for me to bring in their projects at the Monroe County Fair.

My name is Floreine Mentel and I am a former Monroe County commissioner and I really appreciate this opportunity to offer the perspective of a lifelong member of the county and someone who has been involved in this community for decades.

I support the DTE Energy's application

042-BB-1-SSR

for an extension for its license for Fermi 2. Despite the concerns expressed whenever nuclear power is discussed, it is my belief that there are no reasons, environmental or otherwise, why DTE Energy's application for a license extension should not be approved.

042-BB-1-SSR, cont'd

Fermi 2 has been in operation for a quarter century. During that time it has demonstrated that it is committed to enlightened operation and environmental stewardship. They have demonstrated that they are good stewards of the environment through their involvement with the Detroit River International Wildlife Refuge and the attention that they devote to their property in partnership with the Wildlife Habitat Council. I can say with great certainty that if DTE Energy says they are going to do something, they do it.

There are many reasons why the license extension should be approved. Thinking of my lifelong home here in Monroe County, the construction and operation of Fermi 2 would be good for Monroe County. I am thinking specifically and first of the great number of jobs involved; hundreds of good paying jobs for current DTE Energy employees, the hundreds of

contractors employed at any given time, as well as the indirect jobs supported by Fermi 2 related spending.

042-BB-1-SSR, cont'd

Second, it will continue to provide much needed electricity for our homes, offices, and business. This is the electricity on which we have come to depend. Replacing it would not necessarily be easy or less costly. My confidence in nuclear power, in DTE Energy, is built on my experience taking school children on field trips to the plant in the years before 9/11, getting to see things up close and getting to talk with their employees.

Additionally, in my many years of involvement in the community, I am hard pressed to think of any significant endeavor that did not involve DTE Energy or its employees. In fact, as chairman of Monroe County Michigan Week, I nominated DTE Energy and Fermi 2 with the Minuteman and Corporate Citizens Awards. They are interested and active in the community. DTE Energy is always there for help. In a rather small town like Monroe, being described as a good neighbor is a high-valued compliment. DTE Energy is a very, very good neighbor. I am confident that the vast majority of Monroe County residents will want the peace of mind that they will have from renewing Fermi

2's operating license for 20 additional years. Thank you very much. 042-BB-1-SSR, cont'd

MR. BARKLEY: Thanks again, Floreine.

MS. MENTEL: Thank you.

MR. BARKLEY: Welcome, Sandy.

MS. PIERCE: Thank you for the opportunity to be here. My name is Sandy Pierce and I am the director of the Monroe Senior Citizens Center and a lifelong resident of Monroe County. I am here, today, to offer my wholehearted support of the license renewal for Fermi 2. 049-BB-1-SSR

DTE and its employees are to be commended for its commitment to safety. I know people who work out there and they really -- that's what they talk, safety. In addition, DTE is a long supporter of the Monroe Center. Every year we have volunteers come out and serve our Thanksgiving dinner to the older folks of our community; it's something they do on their own time because of their commitment to making our world a better place. Employees serve on the Board of Directors of many agencies; they are vital to the United Way campaign, which human services rely on. Additionally, DTE has supported our health care, which has provided health services to older adults in the

community, to be -- DTE is vital to our community; they provide jobs and they are committed to our community. 049-BB-1-SSR, cont'd

So, again, thank you for this opportunity and I offer my support. Thank you.

MR. BARKLEY: Thank you, Sandy.

MS. GRUELLE: Hi. My name is Martha Gruelle. I work for Wildlife Habitat Council as the director of the Huron to Erie Waterways for Wildlife Project. Wildlife Habitat Council is a 26-year-old coalition of companies and conservation groups that promotes and certifies habitat conservation and management on working lands through partnerships and education. We focus on voluntary action by companies to support, by diversity, by providing and enhancing habitat for native species. Wildlife Habitat Council is headquartered near Washington, D.C. and works internationally. My position is based in Detroit; it involves communications with corporate habitat programs in the U.S., in Canada, within the Lake Huron to Lake Erie corridor.

One of Wildlife Habitat Council's current activities is our certification of corporate efforts to manage parts of their property for the use of native species and for nature education. We call this 021-BB-1-SSR

"Wildlife at Work Certification" and more than 665 corporate habitat programs in 17 countries are now certified by Wildlife Habitat Council, and that includes the program at DTE Energy's Fermi 2 Nuclear Power Plant, so that is how I am equated with the history of land stewardship at Fermi 2, and that's the context for my comments, today. 021-BB-1-SSR, cont'd

Wildlife Habitat Council certification requires documentation of valid voluntary habitat activities. DTE Energy's Fermi 2 Plant has provided this documentation regularly since the year 2000. Most recently, in 2011, the wildlife team at Fermi 2 achieved its fourth Wildlife at Work recertification. All of the activities that contribute to Wildlife at Work certification are voluntary; that is, they are not done to meet any regulatory or legal requirements. As part of the wildlife program at Fermi 2, DTE Energy employees currently help maintain about 650 acres of wildlife habitat, including forested wetlands, coastal wetlands, wood lots, open fields, and quarry lakes. Our understanding is that a renewal of the Fermi 2 operating license will not change the footprint at the plant and, thus, will not impede the Wildlife Habitat Program on site. And that program is extensive.

Activity includes: creation and maintenance of wildfowl, minnow, an annual bird count, and shelter includes sources for local bird and bat populations. Native wildflowers planted in the meadow area include: perennial lupine, Lanceleaf coreopsis, purple coneflower, black-eyed Susan, prairie cone flower. The meadow is maintained and monitored for invasive plants. Fermi 2 employees, with assistance from U.S. Fish and Wildlife Service, evaluated problems with invasive plant species on site and decided to release Galerucella beetles. Those beetles are a predator of the invasive plant purple loosestrife. Site employees and volunteers monitor the program to evaluate its effectiveness and also have taken measures to control common reed, or phragmites.

021-BB-1-SSR, cont'd

In 2003, as has been mentioned, about 650 acres at Fermi 2 site were designated as a Laguna Beach Unit of the Detroit River International Wildlife Refuge, so the U.S. Fish and Wildlife Service and DTE Energy co-managed this area. Rafter platforms have been erected at the site. Plant employees actively participate in National Audubon's Annual Christmas Bird Count since 1990, and wildlife habitat programs there are, like anywhere, not just about habitat.

Corporate programs that are certified by Wildlife Habitat Council include community partnerships and elements of nature education.

021-BB-1-SSR, cont'd

At Fermi, the wildlife team has partnered with scout troops from local school systems to use the habitats on their site for education. Through its wildlife program at Fermi 2, as well as other sites, DTE Energy has shown a long-term commitment to stewardship of the available natural areas. This past -- past commitment is a reasonable predictor of future actions. I thank the Commission for your efforts in evaluating the application for a license renewal and for this opportunity to come in. Thank you.

MR. BARKLEY: Thank you, Martha. I would say, at this point in the meeting we're kind of in the seventh-inning stretch. We have seven people left to speak, so we'll call three next, and then I'll give the last four names. The first person is Archana Manoharan, the second is Tracy Oberleiter, and the third is David Schonberger. Archana, you want to come up?

MS. MANOHARAN: Good afternoon. My name is Archana Manoharan and I'm a licensing engineer at

036-BB-1-SSR

Fermi 2. My role is to ensure work done at Fermi is safe and compliant with stringent -- stringent regulations, which is to say, my top priority is the health and safety of the public. It is a top priority not only for me, but for the entire Fermi workforce. 036-BB-1-SSR, cont'd

I'm here, today, to express my immense pride in being a part of this dedicated and hard- working group of people. Our dedication is evident in the several initiatives we have championed over the years. We take pride in being a certified wildlife habitat. As a result of our continuing efforts to improve our environment, we are certified as a 1401 institution.

I am active member of Women in Nuclear, an organization dedicated to promoting diversity and encouraging women and girls to pursue the sciences.

Several Fermi engineers are teachers and mentors at the Monroe County Community College, right here, and are devoted to the success of the Nuclear Engineering Technology Program, what's commonly known as the NET program. Fermi provides reliable, safe, and clean electricity that helps power the lives, businesses, and communities in Southeast Michigan. I am proud that in my role I help ensure we operate with

the health and safety of our public as our top most priority. I appreciate this opportunity. Thank you.

036-BB-1-SSR, cont'd

MR. BARKLEY: Thank you. Tracy?

MR. OBERLEITER: At this point, I think it's probably more appropriate to say good early evening. I'm Tracy Oberleiter, chairman of the Monroe County Economic Development Corporation. I thank you for having the opportunity to have me before you this afternoon, or this early evening. My comments are going to be in two perspectives: One, professional, and the other, very personal.

Professionally, Monroe County Economic Development Corporation is dedicated to promoting the county-wide economic growth, and employment stability, and to improve the quality of life for all people living and working here in Monroe County. We do this by attracting and retaining business development through effective partnerships with government units, business industry, and labor. There can be no doubt that the availability of a reliable, affordable electricity is absolutely essential to our economy and to our way of life. The proposed 20-year license extension for the Fermi 2 Nuclear Power Plant will help to ensure the

047-BB-1-SSR

supply for decades to come, the business that we intend to bring into this community. For that reason, the Monroe County Economic Development Corporation supports the proposed renewal of a Fermi 2 license extension for 20 years.

047-BB-1-SSR, cont'd

Secondly, we recognize that we can only achieve our economic development objectives through effective partnerships. In this regard, I can say with great confidence that there is probably no more effective partnerships anywhere in Monroe County than the one we enjoy with the men and women of DTE Energy. You have heard this time and time again; I am here to reinforce that. The efforts of DTE Energy's officers and employees have been leveraged in the ongoing effort to improve the quality of life here in Monroe County.

Finally, on a personal level, I'm an active and dedicated outdoorsman. I have long been deeply involved with Ducks Unlimited organization in this community and throughout the state in its efforts to conserve North American waterfall habitat. Monroe County and its Lake Erie wetlands are an important part of the Mississippi Flyway, providing important migration, breeding, and wintering areas for many of the continent's waterfall, including wood ducks,

mallards, canvasbacks. Ducks Unlimited has worked with a variety of partners to restore and enhance thousands of acres of wetlands in more than 30 counties across Michigan, all to maximize the amount and quality of nesting habitat and, more generally, the conditions for migrating waterfall. Monroe County is prominent on that list and here, too, DTE Energy has been an instrumental partner. DTE takes environmental stewardship extremely seriously -- we've heard this time and time again. The Fermi Complex hosts the Laguna Beach Unit of the Detroit River International Wildlife Refuge; in addition, DTE and the U.S. Fish and Wildlife Service has a special cooperative agreement by which the Fish and Wildlife Service manages probably 650 of Fermi's, roughly, 750 acres, a far majority part of the complex.

047-BB-1-SSR, cont'd

Thank you for affording me this opportunity to speak on behalf of extending the Fermi 2's licensing for an additional 20 years.

MR. BARKLEY: Thank you, Tracy. David? Welcome, David.

MR. SCHONBERGER: Hello, Ms. Colon, Ms. Perkins, and everyone. My name is David Schonberger, I live in Ann Arbor, Michigan, and I'm speaking today

as an individual member of the general public.

First, please note that all of the previous speakers representing local governments, and civic boosters, and Yahoos who fly planes over the facility, everyone failed to mention any issues which are pert -- pertinent -- pertinent to the scope of today's meeting, about significant health, safety, and environmental impacts, and it would be delusional to suggest that license renewal has no significant adverse impacts.

If this meeting were about jobs, you lose the argument, but this meeting is actually about NEPA, and there are many issues of contention. And today, 055-BB-1-SSR I would like to spend my five minutes focusing on a fundamental and egregious failure of safety- related quality assurance which occurred during a 20- year period from 1986 to 2006 at the Fermi Plant, at Unit 2, and which remains unresolved to this day, thus warranting a hard look as part of any NEPA review or safety review process pertaining -- thus warranting a hard look as part of any NEPA review or safety review process pertaining to the Fermi 2 license renewal application. And, therefore, I submit that this item is well within the scope of today's NRC meeting, unlike

055-BB-1-SSR, cont'd

many of the previous comments.

I am specifically referring to the 20- year period during which Detroit Edison, now DTE Electric Company, repeatedly tested the Fermi Unit 2 emergency diesel generator protection safety system using the wrong answer key, resulting in the operation of a facility with inaccurate technical specifications, as a result of gross negligence, incompetence, and pervasive mismanagement at Detroit Edison by employees who have not been held accountable and are probably sitting here, today. As a result of their actions, for 20 years fundamental process flaws -- fundamental process flaws went undetected, uncorrected, creating new problems and sustaining old ones. Ominously, the root cause of this fiasco remains unresolved and continues to constitute a systemic failure of regulatory oversight, as well as an ongoing weak -- ongoing weakness throughout the entire fleet; this issue must be revisited. Whereas, under the contemptible leadership of individuals, such as Mr. J. Todd Conner, Mr. Joseph H. Plona, and Mr. Peter W. Smith, DTE Electric Company will surely shirk corporate responsibility and not initiate such a review, therefore the NRC lead project manager overseeing the

safety review of the Fermi 2 LRA -- and I believe that would be Ms. Colon, as well as her boss's boss's boss -- must take the lead as the regulator and demand a revisiting of that issue. Thank you.

055-BB-1-SSR, cont'd

MR. BARKLEY: David, you made a fairly serious accusation. I need to have the staff review that, and I would like to have them get back to you on the details of the matter. Since it's 2006 or earlier, it predates some of the staff who work on the facility now. So, I would like to get your name and address afterwards, so we can re-contact you after this. Thank you.

We have four other speakers who want to speak this evening. The four are: Taiya Himebauch, Greg Brede, Nancy Dover, and finally, Michael Smith. So, is it "Tai-ya"?

MS. HIMEBAUCH: "Tai-ya."

MR. BARKLEY: Okay, thank you.

MS. HIMEBAUCH: Good afternoon. My name is Taiya Himebauch. I have worked at DTE for about 20 years in radiation protection, chemistry, and now nuclear training, as a senior training instructor, and my husband also works there as a senior reactor operator. We actually came to the area in 1995 for the

023-BB-1-SSR

job opportunity and would like to stay for another 20 years, a good three decades, so we definitely would like to support the license extension for Fermi 2.

023-BB-1-SSR, cont'd

I also have two middle schoolers that attend Airport Community Schools. Based on my experience in my areas that I work at, at Fermi 2, and my husband's intimate knowledge of process safety as the senior reactor operator, I am confident in their safety to attend the school, which is in such a close proximity to the plant. I am very proud to work at DTE as a member of the community; it provides a lot for the area.

One thing I would like to mention is the DTE Energy Foundation. As employees at Fermi 2, we can volunteer for different community organizations, as has been mentioned before. We spend a few hours with the organization as a volunteer, and the foundation then rewards that effort, as employees to the organization, with a grant that the organization can use to then further serve the community. And I just, I am proud of that effort.

Personally, I have been involved in grants that have been given to Meadow Montessori, which is just across the street; Airport Community Schools; the March

of Dimes, and other organizations that -- and I am just one of 800 employees that is at the Fermi 2 site that contributes in this way.

023-BB-1-SSR, cont'd

Thank you for the opportunity to speak.

MR. BREDE: Hello. My name is Greg Brede. I live in Newport, Michigan, within three miles from the Fermi Nuclear facility. I support the 20-year license renewal of Fermi 2 generating clean, reliable, and safe energy. If I was not completely confident of the safety and no adverse environmental impact, I would not live here with my family. This is understanding what occurred in Fukushima. Thank you.

006-BB-1-SSR

MS. DOVER: Hello, my name is Nancy Dover, and I am a member of the general public. I came here, today, because I was interested in seeing what the process was. There has been a lot in the paper, I was curious, so I came here, today, to see what the process was. I have to say, after seeing this process, I really do have a lot of faith in it. I have a lot of faith in the people that I have heard speak. I think there is a lot of opinions, but I think this renewal process seems to be very safe, I guess is the word. I think that there is ability of people -- there is the ability of people to express their opinions and I think they

015-BB-1-SSR

will be considered. So, I guess after seeing this, after seeing the employees and their obvious passion for safety, I'd say I support the process and, therefore, support the renewal of the license. Thank you.

015-BB-1-SSR, cont'd

MR. BARKLEY: Thank you. Michael, our last speaker. He stepped out, by chance? All right, was there anyone else in the audience that wanted to speak?

(No verbal response)

MR. BARKLEY: Okay. At this point, I would like to wrap up. There are a couple of issues that were brought up; I would like to try to have the staff speak with some of the people who did bring the issues up. One was on a diesel fuel oil leak at the facility in the last year or so. One was issues regarding the ability to transfer spent fuel from the reactor building into dry casks, and I understand that's an issue that has been corrected in the last several years. So, I would like to have you connect with the staff and understand how that was resolved. There were some emergency preparedness concerns raised here and we need to handle those with staff afterwards and discuss that. And, again, there was an issue with

FERMI 2 SCOPING MEETING

JULY 24, 2014

EVENING MEETING TRANSCRIPTS

the names of three people to come up so that the next two people in line know they're going to be up and so they're not caught by surprise. It worked very smoothly this afternoon and I hope to have it work the same way this evening.

This, again, is, like the afternoon group, not a shy group. We have roughly 40 members of the public in the audience and 21 of you has signed up to speak, so we'll move through and make sure we cover all of you this evening.

So, the first three people I'd actually like to call up here would be Bobby Lambert, Dale Zorn, and then Tim Lake. Okay. Bobby?

We have a much better microphone than we did this afternoon. You can adjust it as need to based on your heighth.

MR. LAMBERT: Thank you. Good evening. My name is Bobby Lambert, I am the vice chairman of the Monroe County Board of Commissioners. I'm here this evening to speak in support of the license renewal application submitted by TE -- DTE Energy to extend the operating life of the Fermi 2 nuclear plant.

032-CC-1 SSR

Monroe County Board of Commissioners has been steadfast in its support of Fermi 2 since it was

constructed to meet the energy needs of our community.

While we know that the Nuclear Regulatory Commission will be thorough in its examination of the license extension application, the Board of Commissioners has confidence that DTE Energy will do what is necessary to address any concerns that may emerge during the course of the review.

032-CC-1-SSR, cont'd

The County has had a long partnership with DTE working to help ensure the plant operates safely and meets the stringent regulatory requirements. We have witnessed the response from DTE to any issue that has arisen since the plant began operations.

As community leaders, we are engaged with DTE officials on the important matters involving the plant. We know that the company dedicates significant resources each year to proactive maintenance ensuring that the plan remains capable of producing electricity safely and efficiently.

DTE Energy is the County's biggest employer with roughly 1,500 employees. They earn a living and support their families and support our local economy. The corporation also is the largest taxpayer in the County helping fund critical public services throughout our communities.

While I recognize Fermi's original license doesn't expire until 2025, I, for one, believe it is a wise decision to approve the license extension. Among the many benefits of confirming this direction now, the primary one is the continuance of hundreds of well-paying jobs -- jobs as well, as hundreds of other contractor jobs.

032-CC-1-SSR, cont'd

I encourage the NRC to do its part by expeditiously acting on DTE's licensing renewal request. Thank you.

MR. BARKLEY: Thanks, Bobby. Dale?

MR. ZORN: Thank you and good evening especially to the panel. I was expecting to see a -- a panel here tonight. It's a little different format than we've had in the past, but, again, thank you for this opportunity to address you this evening.

My name is Dale Zorn. I've had for the past several years the honor of representing the residents and businesses of District 56 in the Michigan House of Representatives. I have no doubt that the Commission will hear from many Monroe County residents on this matter. The vast majority of these comments, I believe, will be supportive of the license renewal.

I would like to add my own personal

063-CC-1-SSR

perspective for the record. Like many of the individuals from whom you will hear as the NRC considers the 20-year extension, I am a lifetime -- lifelong resident of Monroe County, a small business person. My father opened a business in 1953 and my brother and I took it over in 1978. I have also been fortunate to have an insider's view of Monroe County's history and development as it has unfolded over the years and decades.

063-CC-1-SSR, cont'd

My background includes ten years in local elective office with the Raisinville Township Board, 20 years as a Monroe County Board of Commissioners, and for the past three-and-a-half years as state representative.

While a County Commissioner, I led the reorganization of the Monroe County Economic Development Corporation and created the Monroe First program to assist existing and new businesses and the development in this County.

The term Monroe First is especially important in the context of this matter and I hope the Commission will give extra credence to the views and perspectives offered by residents of this region.

Additionally, I was Chief Executive for

the Monroe County Emergency Operations Center having extensive training in emergency services such as Fermi 2 drills and -- and exercises and have actual experience in emergency events such as Comair Airline accident in 1997.

063-CC-1-SSR, cont'd

My perspective is shaped by the experiences as Fermi 1 and Fermi 2 were built and operated. They brought ways of investment, new development and growth to this County. I have seen Detroit Edison and DTE Energy responsibly manage the construction and operation of these plants. In the case of Fermi 1, I have also been witness to its decommissioning.

I have witnessed DTE Energy's stewardship of both the Fermi complex and the Monroe Power Plant property. By virtue of my responsibilities of the local -- as a local elected official, I have been fortunate to have been afforded a special view of these facilities.

In addition to safely generating more than 190 million megawatts of electricity, which is about 20 percent of the total of DTE Energy's generating capacity, it employs about 850 full-time employees and hundreds of supplemental contract workers.

Throughout the years, DTE Energy has proven to be an environmental-friendly neighbor that has taken an active part to protect our natural resources and to improve the quality of our environment.

063-CC-1-SSR cont'd

DTE has exemplified itself by successfully completing a ISO 14001 international standard for environmental quality management in both Fermi 2 and the Monroe Power Plant. It has received the Michigan Occupational Safety and Health Administration coveted Michigan Voluntary Protection Program, the Star Award, by working over five million safe hours. It has -- it has been designated a clean corporate citizen from the Michigan Department of Environmental Quality. It is a designated supporter of the Downriver International Wildlife Refuge and was awarded the wildlife site of the year by the Wildlife Habitat Council.

Let us not forget the proud tradition of the community service by the DTE Foundation and the DTE employees that fulfill public improvement projects such as wildlife habitats, helps with United Way of Monroe County, Habitat for Humanity, Lotus Garden Club, Monroe Red Cross, local public schools, Salvation Army, the list goes on.

There is no doubt that Fermi 2 is a significant economic asset to Monroe County and all southeast Michigan. Like all US nuclear plants, Fermi 2 was originally licensed to operate 40 years which reflects the capital amortization period utilized by most utilities rather than the expected operational life of the plant. 063-CC-1-SSR cont'd

In short, Fermi 2 has many more useful years ahead of it if the, you know, NRC approves the renewal license application as it has for 70 other nuclear units.

Michigan has a well-rounded energy portfolio which includes natural gas, hydroelectric coal, and, of course, nuclear power. In more recent years, solar and wind renewals has made its way into the Michigan energy portfolio. The Michigan renewable energy production is on track to meet to the state mandate goal of 10 percent by the year 2015. Wind energy has been the primary source of the renewal energy in Michigan. At the end of 2013, more than 1,100 milliwatts of utility scale wind projects were in operation in Michigan. 063-CC-2-SSR

Michigan's wind generation is expected to increase to more than 1,400 milliwatts by the end of

2014. However, renewables are not expected to meet the base load energy demands and with the expected closing of several coal plants in the state due to the federal emission requirements, it is essential to Michigan, especially southeast Michigan, to foster an energy program that will meet the needs of the region without going outside the state to purchase electricity.

063-CC-2-SSR, cont'd

There is one last thought that I wish for you to take back to Washington. Expanding America's nuclear energy industry is vital to meeting a growing electricity demand, reducing greenhouse gas emissions, and enhancing the US energy security. Developing advanced technologies and ensuring that there is sustainable use fuel management policy is an important part of America's nuclear future.

063-CC-3-SSR

Under its own federal law and after collecting 10 billion dollars from rate payers, the federal government has failed to own up to its policy to develop a disposal facility for used fuel and for the nation's nuclear power plants in high level radioactive waste from US defense programs. The law set a 1998 deadline for the federal government to begin accepting used fuel, but has not done so.

In 1987, the Congress directed the DOE to

study Yucca Mountain, a remote desert location, as a site for potential repository for geologic disposal of used nuclear fuel. Extensive study by leading scientists from around the world demonstrated that the site is usable and suitable as -- and in 2002, Congress approved the site. The DOE submitted a license application to the US Nuclear Regulatory Commission in 2008 to build a repository site, however, in 2010, the Obama Administration announced plans to terminate Yucca Mountain -- the Yucca Mountain project and nothing has happened since except to continue to put local American communities at risk.

063-CC-3-SSR, cont'd

I have had the opportunity to visit Yucca Mountain twice during the construction and the research phase. I am not a nuclear engineer, but after being there, after extensive personal research, and lobbying Congress to take control of nuclear waste, I am convinced a disposal site such as Yucca Mountain would provide a safe storage environment and I believe someday, maybe not in my day, but in the future there will be a use for stored waste and it could be retrieved to benefit our country. To me, this is reusable energy product.

I encourage the Commission to move quickly

063-CC-4-SSR

through the process and to approve the requested license extension. As I have commented earlier -- in earlier proceedings involving the application for a construction and operation license for a new unit at the Fermi complex, I believe that nuclear energy is critical to Michigan's energy portfolio.

063-CC-4-SSR, cont'd

Again, thank you very much for this opportunity.

MR. BARKLEY: Thank you, Dale. Tim?

MR. LAKE: Good evening. Thank you to the NRC staff for allowing me this opportunity to speak tonight.

My name is Tim Lake and I am the president and CEO of the Monroe County Business Development Corporation. Monroe County has long been viewed as a crossroads for commerce and for more than three decades, our organization, the BDC, has been helping industry and businesses capitalize on the opportunities to grow and expand in this dynamic area of southeast Michigan.

The proposed 20-year license extension for Fermi 2 nuclear power plant is really a remarkable opportunity for us. This is not the first time that I've had the privilege of addressing representatives

031-CC-1-SSR

of the NRC. I spoke here when the NRC was taking public comments on the draft environmental impact statement concerning the proposed new reactor at the Fermi complex and I offered comments last year during the Atomic Safety and Licensing Board hearing on Fermi 3. My com -- my comments tonight are equally applicable today in terms of the renewal of the license for Fermi 2.

031-CC-1-SSR, cont'd

Fermi 2's economic impact on our region cannot be discounted nor dismissed. It's a source of thousands of stable, highly-skilled, well- paying jobs. The continuance of those jobs for another two decades will be a source of economic stability for hundreds of households in a large number of communities in Monroe County.

And as important as that is, and it is very important, it's the power that Fermi 2 will continue to provide that's even more important. From my vantage point working with small businesses and especially our larger manufacturing concerns, affordable, reliable power is an essential commodity. For some of our companies, electricity represents one of their largest costs. Additionally, some of these companies happen to be among our largest employers. It's vitally

important to retain those that -- those that we have and to attract more of those -- something we work hard at every single day.

031-CC-1-SSR, cont'd

Stable, reliable electric rates are critical and nuclear is a path to low-cost, reliable, high-quality power. My personal belief is that nuclear power is one of the smartest things we can do to prepare for the future. My personal fear is that we're falling behind other countries that are developing nuclear power more aggressively than we are.

Nuclear power is so efficient and so clean, it just makes sense to keep it in our portfolio and to even add more when the time is right. I respectfully suggest that the NRC renew the license for another 20 years for the Fermi 2 power plant. Thank you.

MR. BARKLEY: Thank you, Tim. The next three speakers I'd like to call are Kevin Kamps, Jerry Sobczak, and Bonnie Masserant. Kevin? Welcome again, Kevin.

MR. KAMPS: Thanks. My name is Kevin Kamps with Beyond Nuclear and Don't Waste Michigan and I'm just going to pick up where I left off in the earlier session.

So I was speaking about Fukushima lessons

026-CC-1-SSR

learned and I wanted to mention the Japanese parliamentary investigation of the catastrophe. Their determination of the root cause was not the earthquake, was not the tsunami, but rather it was the complicity and the collusion of a captured regulator with the nuclear industry as well as with elected officials and I would put forth that there is plenty of that right here in Monroe County.

026-CC-1,SSR cont'd

So one example of that, across the country anyway, would be the fact that NRC has rubber stamped 22 of 23 20-year license extensions on these General Electric Mark One boiling water reactors which is quite amazing given their age and demonstrated safety vulnerability post-Fukushima, but not everybody's standing for it and the state of Vermont has forced the shutdown of Entergy's Vermont Yankee Reactor, which is a Mark One.

I wanted to mention that NBC had a headline today and I quote, "Nuclear industry should plan for another Fukushima say experts." And this article was in reference to a National Academy of Sciences report that just came out today, Fukushima Lessons Learned. One of the recommendations that they have made is that beyond-design-basis accidents be taken into

026-CC-2-SSR

consideration in licensing proceedings as for the proposed new Fermi 3 as well as in license extension proceedings like the subject matter tonight. 026-CC-2,SSR cont'd

Regarding the Mayor of Futaba, the host town of Fukushima Daiichi, Mayor Idogawa -- I needed to finish the thought from earlier today that he was pro-nuclear when I met with him in 2010. He listened respectfully to what I had to say, but he didn't agree. Now, he is a leading outspoken anti- nuclear advocate in Japan and it's a tremendous credit to the Japanese people and people like Mayor Idogawa who have seen the light. And the Japanese has -- the country of Japan has remained largely nuclear-free for the past three years despite the economic and political power of the nuclear industry in that country.

And I wanted to talk about the Fukushima 50, but probably not the Fukushima 50 that you may have heard of at the time of the accident, the workers who stood by their posts, to their credit, to try to prevent things from getting worse. This is the Fukushima 50 who were some of the first to die from the nuclear catastrophe. And I'm reading from Fukushima, The Story of a Nuclear Disaster, by Union of Concerned Scientists.

026-CC-2-SSR, cont'd

And I quote, "Hours after the second evacuation notice was issued early in the morning of March 12th, preparations got underway to move the 209 ambulatory patients and staff out of Futaba Hospital located about three miles from the plant. Left behind, however, were 130 bedridden hospital patients and 98 residents of a nearby nursing home. The self- defense forces reportedly were en route to transport them. Owing to a series of bureaucratic errors and communication mix ups, the troops didn't arrive for two days during which time the facilities had no power or heat and caregivers had departed. By then, four patients were dead. When the troops finally showed up, the patients began a grueling odyssey spending hours on the road before the troops found a shelter that would accept them. Fourteen more died during the trip, but the 35 patients -- but 35 patients were accidentally left behind, forgotten and not rescued until March 16th. By the end of that month, officials reported that among the Futaba evacuees, a total of 40 patients and 10 nursing home residents had died."

So that's a different Fukushima 50 than was reported about at the time of the crisis -- the

beginning of the crisis. 026-CC-2,SSR, cont'd

I mentioned that 12.4 mile dead zone around Fukushima Daiichi. It should be much bigger. There have been radioactive hot spots documented in Fukushima City, 50 miles to the northwest. There have been hot spots documented in southwestern Tokyo, 200 miles to the -- to the south of Fukushima Daiichi.

Fukushima Unit 1 had only recently gotten its license extension before the catastrophe struck. The world was lucky that Fukushima Daiichi Units 4, 5, and 6 were not operating that day. The world is also lucky that Fukushima Daini, located just seven miles south, units 1, 2, 3, and 4, survived this catastrophe by a single off-site power line. Several power lines were lost to the earthquake just as at Daiichi and the tsunami was actually bigger at Daini taking out the diesel generators.

And it was for this reason that another investigation of the catastrophe published by the Rebuild Japan Initiative Foundation documented that in February -- documented in February of 2012 that Prime Minister Khan had contingency plans in place to evacuate metropolitan Tokyo and he has since spoken publicly about this. He had plans in the works to

evacuate 30 to 50 million people from metropolitan Tokyo in the event of Daiichi going up in flames, including the pools. There are seven pools at Daiichi, as well as the four reactors, and four pools at Daini, and then Tokai, one pool and one reactor, closer to Tokyo.

026-CC-2,SSR, cont'd

The fear being that as plants went up in flames, they would have to be abandoned and all control would be lost. And I put forth that Fermi 2, the old reactor with the breakdown phase risks, Fermi 3, the new reactor with the break-in phase risks, these are the worst of both worlds on the same site. A multiple reactor accident scenario.

026-CC-3-PA

And my concluding thoughts will be about nuclear waste. The nuclear waste confidence report that came out today we look forward to reading and we will be ready to go back to court, if need be. Our coalition of environmental groups and states, including the states of New York and Vermont, are very interested in what the NRC has to say at this point about nuclear waste confidence, about expedited transfer of a radiated nuclear fuel from pools to dry casts.

026-CC-4-RW

We call for hardened on-site storage. The NRC staff's study of this issue revealed that

a - - even a small pool fire could render 9,400 square miles uninhabitable resulting in 4.1 million nuclear evacuees. We -- we put forth a petition for rule making earlier this year calling for this license extension proceeding, its rules, to be revised in light of this new information and we called for a stay on this proceeding, but were denied just last week by the Nuclear Regulatory Commission.

026-CC-4-RW, cont'd

So I would just close by saying this is Faustian fission. It's a joyride. It's a power trip. The money's great until it's not as has happened at Fukushima. Thank you.

MR. BARKLEY: Thank you, Kevin. Jerry?

MR. SOBCZAK: Thank you for the opportunity to address you this evening. My name is Jerry Sobczak. I am the chairman of an organization called DTE Shareholders United. This is an organization of more than 12,000 DTE share -- energy shareholders across the country, and when you include spouses and family members, that number is closer to 25,000.

Our organization was formed in 1997 and is committed to making sure that the public policy proposals debated and enacted by public officials treat

customers, employees, retirees, and shareholders fairly and to protect the reliability of the energy delivery system and Michigan's economic security.

The requested 20-year license extension 058-CC-1-SSR that DTE Energy has put forth is critical to preserving the reliability of the electric service in the state of Michigan and to enhance our state's economy.

I know, from firsthand experience from the Fermi 2 plant, the benefits of nuclear power in terms of diversifying the company's generating portfolio and its impressive service performance. As the EPA action concerning greenhouse gas emissions intensifies, the continued operation of a well- functioning plant like Fermi 2 becomes even more important.

Nuclear plants like Fermi 2 are large base load plants that emit virtually no greenhouse gases. Nuclear energy is an important part of a balanced, common sense approach to clean energy and energy diversity, which means energy security.

Our organization, DTE Shareholders United, applauds DTE Energy for the foresight in applying for the license extension and we support the idea of extending the Fermi 2 operating license to the year 2045.

Thanks again for the chance to present our position.

MR. BARKLEY: Thanks, Jerry. Welcome, Bonnie.

MS. MASSERANT: Hi, my name is Bonnie Masserant and I'm a lifelong resident of Monroe County. I was raised and grew up in the shadows of the cooling tower and always wondered their purpose. Today, I know their purpose.

Unfortunately, I work -- I'm -- I am 037-CC-1-SSR fortunate to work in the community I live. I have been employed with DTE Energy for almost 29 years. One thing that has not changed throughout the years is safety. Our number one priority at DTE Energy is the health and safety of the public which is good for me because my entire immediate family lives within the five-mile radius of the plant.

I work in nuclear training and I'm well aware of the -- of the regulatory requirements to have qualified employees. Our employees are highly skilled and knowledgeable employees. Every member of our site is a lifelong learner. Every employee, from CNO to our plant cleaners attend annual training. Our operators are in the classroom and simulator every six weeks

continuously learning and improving. We learn from our peers throughout the industry.

037-CC-1-SSR, cont'd

Our operational standards are among the highest standards in the world. DTE Energy is lifeblood of the community. My co-workers and I are a vital part of this community and are active supporters of local communities raising funds for local charities and providing countless voluntary hours in local community organizations.

We're an energy of progress. We aspire to be the best operated energy company in North America and -- and a force for growth and prosperity in the communities where we live and serve.

There are no environmental change related to the license renewal. License renewal is a cost effective way to ensure that power and employment will be available for future generations. I am very proud to be part of DTE Energy and work in the community I live.

MR. BARKLEY: Thank you, Bonnie. The next three people I'd like to call up are Bill LaVoy, Greg Brede, and Phil Skarbek. Bill?

MR. LAVOY: Good evening. My name is Bill LaVoy and I thank you for this opportunity to address

you this evening.

I have the honor and privilege of representing families and businesses located in the 17th House District in the Michigan House of Representatives.

Fermi 2, which is the subject of today's hearing, is, in fact, in my district. Perhaps that is the reason why one of the committees I serve on is the Michigan House's Energy and Technology Committee. 034-CC-1-SSR

As a member of that committee, I've had the opportunity to tour both the Fermi complex and DTE Energy's other major facility in my district, the coal fired Monroe Power Plant. I've had the opportunity to see firsthand DTE Energy's efforts to generate safe, reliable, affordable electricity with as little impact as possible on the environment.

As a lifelong resident of Monroe, I've witnessed and benefitted from the contributions of DTE Energy's employees to our community. This is in addition to benefits in the form of employment and tax revenues to local units of government and school districts and the economic impact multipliers that positively affect the local, state, and US economy.

The license extension for Fermi 2, if

approved, will ensure that those contributions continue for two additional decades. In the fast- paced, rapidly-changing economy, the kind of stability afforded by a facility like Fermi 2 is very welcome and appreciated.

034-CC-1-SSR, cont'd

I also want to point out that I'm also raising a family and have lived within the -- the ten-mile EPZ pretty much all of my life. I was born before the plant was actually built, but -- and I chose to stay here and raise my family here.

It is clear that Michigan's fleet of electric generating plants, which is one of the oldest in the United States, will see changes in the years ahead. Older coal-fired units will be retired in favor of natural gas-fired plants and more renewable energy, both of which will reduce the amount of emissions into Michigan's air. I believe that a diverse portfolio of electric power generation is necessary to ensure a clean, reliable, and economically stable energy future for Michigan and the United States.

With your approval and that of the Nuclear Regulatory Commission, I'm hopeful that Fermi 2 will continue to be a critical part of the mix. Thank you.

MR. BARKLEY: Thank you, Bill. Greg?

Here you go, Greg. And after Greg, again, it's Phil.

MR. SKARBEK: Good evening and thank you. My name is Phil Skarbek and I've been a resident of Monroe with my wife, Kelly, and two grown children, Jake and Jennifer, since 1993. I'm also a shift manager at Fermi 2. What that means is that during my operating shift, whether it be days or nights, I'm in charge of all plant operations and the operating crew in the control room producing electricity as the lifeblood of our community. 057-CC-1-SSR

I spent six years serving honorably in the United States Nuclear Navy aboard Navy submarines where I received specialized training in nuclear power. Then at Fermi after my many years of study and rigorous training and after passing the demanding license test given by the federal government, the Nuclear Regulatory Commission placed a great responsibility upon me to direct and operate the plant with just one overriding concern and that is the health and safety of the public. Nothing comes before that responsibility to me.

I know I speak for every shift manager at Fermi and, in fact, for every Fermi employee that we take this responsibility very seriously. The standards in the nuclear industry are higher because

we know we have to be and those standards are always rising through continuous improvement, sharing lessons learned through the industry, and a constant self-critical assessment of our own performance. 057-CC-1-SSR, cont'd

Being self-critical means you can't have thin skin in the nuclear business. We criticize ourselves and our peers with one overriding factor, again, and that is safety.

I'm glad that's the way it is because my family lives right here near the plant and I want the best for my family: the best air to breathe, the best water to drink, the most reliable power and the best community to live in, Monroe. Fermi 2 contributes to all of that. Our energy is clean. Our energy is safe and our energy is abundant. And best of all with a 20-year license renewal, I know that my family will be able to enjoy everything this plant provides the community for many years to come.

That makes me proud and even more committed every day I set foot on the Fermi 2 property to protect it and the health and safety of everyone who lives here in Monroe. I encourage the Commission to renew the license of Fermi 2 and thank you for the opportunity to provide my input and comments. Thank you.

MR. BARKLEY: Okay. Thanks, Phil. I guess I'll call Greg Brede one last time if he's still here. If not, then we'll move on.

Okay. Our next three speakers will be Michael Keegan, Rich Devitt -- or Rich McDevitt and Emily Wood. So, Michael?

UNIDENTIFIED SPEAKER: Mike's not here.

MR. BARKLEY: Mike's not here? Think he's coming back later?

UNIDENTIFIED SPEAKER: No.

MR. BARKLEY: Okay. All right. You're up, Rich.

MR. McDEVITT: Good evening. Welcome everybody, the Commission. We do appreciate your coming here tonight. I, Rich McDevitt, am the vice chairman of the Utility Workers Local 223, the Fermi Division. I represent the leadership of all the organized labors that we have at Fermi for DTE Energy. 040-CC-1-SSR

I also am a lifelong resident of this community. I grew up there on Brest Bay. I have lived the majority of my life within the five-mile radius, if you want to call it that, and my wife and I are presently building a new house even closer to the plant.

What people talk about when they're

040-CC-1-SSR, cont'd

talking about safety of our environment, of our community relies heavily on the shoulders of the men and women that I am one of the leaders of. And it's very important to us, day in/day out, that we do critical self-assessments, challenge each other, make sure that what we do is proper and correct to protect our community.

This is our home. This is where we raise our children and some of us are very fortunate enough to be able to raise our grandchildren here. With that, I'd like to tell you a little bit more about the involvement that we have here at the plant and what we are for your community.

More than anything, we are committed to safety at Fermi. In order for me to be safe and nuclear safety, employee safety, I must be also conscious in safety of my community.

So a little anecdote of that, a few years ago, we had a minor spill of oil on site. We went out and dug the oil loose from the ground. That was in the middle of the winter. The oil that we were concerned about affecting our ground was vegetable oil. We take even the most minute possibility of interference in our environment very serious.

Now, that may sound a little bit trivial, but no, it's not. Each and every thing that we do is to protect this community, to make safe reliable energy for both this community -- the company that we work for -- because yes, we're in business to make money and it's very important to do that, but also for the vibrant communities around us. If you do not have a good power, you are not going to be able to have the businesses that we need in this area.

040-CC-1-SSR, cont'd

Along those lines, we have provided electricity for our residents and businesses in southeast Michigan -- we've provided more than 190 million megawatt hours during the past 25 years of good, safe, reliable functioning of a nuclear power plant. When we have challenges, we shut it down and fix it. We do not wait for that challenge to become an issue that will affect our environment. We are very serious about that.

When I look at my operators and that, one thing that I know, their job is to make sure that if there's something of question, before anything else, we put our community as safe. That is of the utmost importance to each and every one of us.

Nuclear energy, when you think about it,

is the only carbon-free based low source of power that we have available for us in this world. I enjoy solar energy. I enjoy wind energy, but I do not have the capability and confidence to give them -- say that they could be a baseline energy because both the sun doesn't shine at all times and the wind doesn't blow at all times. We need a good, safe, reliable energy source for that baseline.

040-CC-1-SSR, cont'd

No one in this room or in our communities goes over and flips a switch and not expecting the power to come on. Our job is to give you safe, reliable power, day in/day out. And when I'm talking to my friends and neighbors, even casual acquaintances, you ask me what I'm concerned about in radiation, this is -- this subject has been brought up many times.

Nuclear energy and radiation is something that science and engineering have been dealing with and understands through decades of work. It's something that we can control and we monitor. We make sure of it each and every day.

I work in the plant nearly every day and my total exposure in a given year is a fraction - - think about this -- a fraction of the exposure a passenger receives in a cross-country

airplane flight. We monitor and make sure safety of our community, the safety of our workers, and that is very important to us on each and every day to have a good, safe, reliable power plant.

040-CC-1-SSR, cont'd

I, too, am a shareholder. Why? Because I believe in the company that I work for. I believe in the men and women that I work with. The next generation of employees are coming up. I do believe that they need a good solid place and decent workable conditions. In the nuclear industry, it offers that. We are very serious about what we do. We take the best and make them better. Each and every period, every employee of a nuclear power plant goes through rigorous training. We have to requalify on a regular basis and if an employee is not able to make those standards, we seek to try to find other places in the company that they may be available. If it's not available, there's other issues that we deal with, but safety is the utmost concern of each and every one of us.

Fermi 2 is an economic rock for this community. It's important for our community. I do believe that you will be seeing a different story if this renewal doesn't go through because we're looking at what the future is for our children and our

grandchildren. This is something each and every one of us need. We are deeply involved and serious about the energy that we produce in a safe and reliable manner.

040-CC-1-SSR, cont'd

This is where I work. This is where I live with my family. I am proud to say that I, like every Fermi employee, take the serious commitment to protect our environment. It's not a slogan. It's a commitment that we live to day in/day out.

With that, I thank you.

MR. BARKLEY: Thanks, Rich. Emily?

MS. WOOD: Good evening. My name is Emily Wood and I appreciate the opportunity to share my viewpoint as an employee, a North American Young Generation in Nuclear member, a Women in Nuclear member, a customer of DTE Energy, resident and active member of the Monroe County community.

I was born and raised in Monroe, Michigan. For me, Fermi 2 is a familiar place. My father has been working at the plant for the past 35 years. In 2008, I graduated summa cum laude.

As most of you know, it was the worst economic time to be a recent college graduate. Never in a million years would I have anticipated having such

a difficult time finding full-time employment. After countless hours of searching, I was forced to leave my hometown of Monroe and relocate for an employment opportunity.

While living and working outside of Monroe County, I met someone who is now my fianc©. When we met, he was enrolled in college and I told him about the field of nuclear power which he was unfamiliar with at the time. He thought it sounded interesting and I told him to look into it. He graduated from the Monroe County Community College's nuclear engineering technology, NUET, program, and was hired into the Fermi 2 nuclear power plant. Shortly thereafter, I was hired into Fermi, too.

With both of us being fortunate enough to have job opportunities in Monroe County, it allowed us to move back to my hometown. The Fermi 2 nuclear power plant brought me back as a resident and acquired him as a new resident to Monroe County.

We have truly been blessed economically by the employment opportunities. Last year, we built a beautiful brand new home only three miles from the Fermi 2 nuclear power plant. The plant is literally in my backyard and the backyard of all my neighbors.

When I'm talking to friends and neighbors, 061-CC-1-SSR they are proud to live by a nuclear power plant and realize that Fermi 2 is an economic rock for Monroe County and all of southeast Michigan providing well-paying jobs for thousands of employees contributing millions of dollars in tax revenue and donating millions of dollars to nonprofit organizations that nurture our community. These are all things that I am proud of and I know my neighbors are proud, too.

Although I work in human resources, I am the president of North American Young Generation in Nuclear, also known as NAYGN. It is a group of young nuclear workers who will be the ones operating the nuclear power plants across the nation for decades to come and let me tell you, your nuclear power plants are in good hands. Our young professionals are dedicated and intelligent. We are an innovative group and we bring many new ideas to make nuclear power more efficient and reliable for the customers of southeast Michigan.

In addition to NAYGN, I am the vice president of Women in Nuclear. Each year, the members of WIN, Women in Nuclear, participate in the women's

build week for Habitat for Humanity to give back to other women in the communities in which we live and serve.

061-CC-1-SSR, cont'd

Fermi 2 employees, myself included, are active supporters of the local community raising funds for local charities and providing countless volunteer hours with local community organizations. License renewal is critical to the future success of Monroe County and the surrounding areas. That is why every day at Fermi 2, we maintain the safety of the public and the environment as our top priorities.

Through my recruiting efforts, I've seen firsthand what the closing of a nuclear facility does to the community and surrounding areas: economic devastation. Businesses are forced to close and people are forced to leave and relocate the area. I never expect or want this to happen in the area I call home. I am thankful to know that Fermi will continue to operate and support Monroe County and southeast Michigan.

My passion for clean energy starts and ends with nuclear power. I look forward to the future of Fermi 2 as a safe, clean, and reliable source for base load power generation.

Thanks again for your time and have a wonderful evening.

MR. BARKLEY: Thank you, Emily. Okay. Our next three commenters this evening will be Valerie Crow, David Schonberger, and Lynne Goodman. Valerie?

MS. CROW: Good evening. My name is Valerie Crow. I'd like to thank the Commission for coming to listen to what all of us have to say, even those of us who aren't employees, government representatives, or business owners; just the common people in Monroe County.

I'm coming also to speak on behalf of myself, but also mother earth because if we ruin the mother, we won't -- we will be homeless and soon gone the way of the dinosaurs, a failed experiment, which leads to my complaint that's been the same ever since Davis-Besse and Fermi 2 were built. What are you going to do with the waste?

013-CC-1-RW

We're almost through a license period and we still don't have that answer. We were all told that they'll build a place for it. Of course, we weren't in that mentality of not in my backyard. It wasn't going to stay here, but it sure looks like it's going to stay here, and until we know what we're doing, you

know, we're sitting right on Lake Erie. The chance -- if we have an accident, what happens? 013-CC-1-RW, cont'd

I'm sure you're all knowledgeable people with credentials and quite bright, but I have to question even more then: what are you thinking? Is this the legacy you want to leave for your kids and your grandkids, truly?

I guess my final word is if you don't know what you're going to do with it, don't make more. Thank you.

MR. BARKLEY: Thanks, Valerie. David?

MR. SCHONBERGER: Hello. My name is David Schonberger. I live in Ann Arbor, Michigan. I'm speaking today as an individual member of the general public.

If this -- if this were a meeting about jobs, you lose the argument, but this meeting is actually about NEPA and there are many issues of contention and I would like to focus my five minutes on one environmental issue and one or two safety issues.

First, for Ms. Perkins, overseeing the NEPA environmental review, I'd like to discuss the impact of authorized routine radioactive releases at Fermi 2. I'd like to submit new and significant 055-CC-1-HH

information into the official record, a study by Joe Mongano, NPH, of the radiation and public health project who has refuted the clean power argument.

055-CC-1-HH, cont'd

He has documented that from 1979 to 1988, before Fermi 2 began operating, the cancer death rate among Monroe County residents under age 21 was 20 percent below the US average. However, from 1989 to 2005, after Fermi 2 became fully operational, the cancer death rate for a similar population rose to 45 percent above the US average. From 20 percent below to 45 percent above the US average, so nuclear is not clean and that should be in the public record.

For Ms. Colon, pertaining to the safety review, I contend that any intellectually- honest review of the Fermi 2 license renewal application must include a hard look at risks and uncertainties pertaining to multi-unit system failures given that DTE electric company is seeking approval of the Fermi 3 COLA.

055-CC-2-SSR

Currently, the ACRS is independently reviewing multi-unit concerns as part of the Fermi 3 COLA safety review and my point today is that an entirely separate analysis of multi-unit concerns is necessary as an integral part of the Fermi 2 LRA safety

review. 055-CC-2-SSR, cont'd

The -- the safety review must start with the assumption that Fermi 2 might not remain a standalone reactor for the remainder of its licensed operating life and indeed I believe that the Fermi 3 COLA review is proceeding quite hastily. So I submit that consideration of such inherent risks and uncertainties are well within the scope of today's meeting and as referenced by Mr. Kevin Kamps earlier, I would like to submit into the official record of these proceedings a new report released today by the National Academy of Sciences committee on the implications of Fukushima Daiichi, specifically for US GE Mark One and Mark Two boiling water reactors.

The analysis, recommendations, and conclusions of this NAS report inherently pertain to the scope of today's NRC meeting on Fermi 2. Today I contend that the applicant's Fermi 2 environmental report is inadequate because it fails to accurately and thoroughly provide a severe accident mitigation alternatives analysis, a SAMA analysis, that addresses the well-known and unresolved design vulnerability of the GE Mark One boiling water reactor pressure suppression containment system and severe accident

055-CC-3-PA

consequences. 055-CC-3-PA, cont'd

And I would also like to submit onto the record the following comments from an NRC Region Three 055-CC-4-SSR administrator, Mr. Chuck Casto, C-a-s-t-o, on March -- March 16th, 2011, at NRC's Fukushima operation center. To quote Mr. Casto, "If we end up with a molten core and then you talk about the time for the concrete to dissociate, you know that new reg says it's a couple of inches an hour, you know, and of course that Mark One containment is the worst one of all the containments we have and it's literally -- you know, this -- this new reg tells you that in a station blackout, you're going to lose containment. There's no doubt about it," unquote.

I submit that Fukushima Daiichi lessons learned including station blackout have not been incorporated into the Fermi 2 design. Thank you.

MR. BARKLEY: Thank you, David. Lynne?

MS. GOODMAN: Hello. Good evening. My name is Lynne Goodman. I'm an employee at Fermi and a resident of Monroe relatively recently, only 26 years ago.

I've been working in the nuclear field for 020-CC-1-SSR about 40 years. I work on the license renewal project

for Fermi 2. I asked to work on this project because I think renewing the license will provide continued use of safe, clean, nuclear generated electricity. That's base load electricity.

020-CC-1-SSR, cont'd

I'm glad my company is using renewables. We have about 10 percent renewables now in our electricity mix. I personally have a geothermal system in my house, so I really do believe in renewables and I've had an earth-sheltered house in the past, but we also need base load power.

We need power when the sun isn't shining and the wind isn't blowing and wind won't do that now. That's why I think we need to continue to use the nuclear power as the best clean source and safe source of -- of electricity that we can generate.

I do know that we have performed a thorough environmental review for our license renewal and based on that, I just think that continued operation of Fermi 2, if our license is renewed and should be, will provide the cleanest available base load that there is. Thank you.

MR. BARKLEY: Thank you, Lynne. The next three people I'd like to call up are Mark Farris, Eric Dover, and finally Jessie Pauline Collins. So, Mark?

MR. FARRIS: De ja vu everybody. My name is Mark Farris, lifelong resident of Monroe County. I wanted to comment on a few things. I didn't really polish up what I had to say. It's going to be a little herk and jerk, but I wanted to clarify some points.

In regards to waste storage in Yucca Mountain, we've got to realize that not only are we dealing with spent fuel rods, but you all have to understand the reactor cores themselves become high level radioactive waste. No -- I don't hear anybody talking about this. Nobody has an answer for this. 019-CC-1-RW

These reactors are not going to end up at Yucca Mountain and, you know, for an example of a decommissioning of a plant, the shipping port reactor, the first commercial reactor in America, a tiny reactor -- I think it was 60, 61 megawatts -- was hauled to the state of Washington for burial. Now you're not going to do that with a Fermi 2 reactor, 1,140 megawatts, whatever.

My understanding is the building -- when decommissioning comes -- rolls around, the reactor building will have to be flooded and the reactor core will have to be cut up with torches underwater and then we still know -- you know, nobody knows what's going

to happen.

019-CC-1-RW, cont'd

So Yucca Mountain is not a solution either and actually if -- even if Yucca Mountain were in operation, let's say we're going to haul some fuel rods out to Nevada. I can imagine sitting in a construction zone on I-75 next to a semi carrying a - - a bunch of casts. I guarantee you're going to get a whole lot more than a dental x-ray.

019-CC-2-SSR

And as far as jobs, the issue of jobs, my gosh, in my opinion, nuclear energy has destroyed the economy of the state of Michigan. I worked in the auto industry. I retired out of the auto industry and, you know, over and over the auto industry used high electric rates as one of the reasons to leave the state of Michigan. Michigan is the only state in the union that is losing population. The only.

You look at Detroit, at one time 1.8 million people. It's struggling to maintain 700,000. It looks like a war zone and interestingly, I understand today the Canadians came over with drinking water for the people of Detroit. This is amazing.

019-CC-3-SSR

Nuclear energy is not a solution. If you talk about jobs, let's take a look at Germany. The employ about 250,000 people building alternative

energy and I'm going to go back to a comment earlier. General Electric are manufacturing wind turbines. They're putting them up here in the thumb area. The problem is those GE turbines are manufactured in Germany and Holland.

019-CC-3-SSR, cont'd

There's something wrong here and I -- I would really appreciate the state representatives to publicly state -- to chastise these US corporations like General Electric and Verizon and Bank of America who don't pay any taxes. There's something wrong here. There's something seriously wrong here.

Some of the waste is being removed. They're -- they're -- they're dumping it in Iraq. They're using it as munitions, the depleted uranium munitions. We're spreading this stuff in the Middle East and the birth defect rate is skyrocketing. I think it's criminal. It's criminal.

019-CC-4-RW

We have to look at some of the reactors, you know, with the global disruption of weather. We're going to see as we have in the past, some nuclear power plants have had to shut down for a lack of cooling water. River levels drop. The water warms up and some nuclear plants have had to be shut down and I think that that's an issue we're going to be seeing a whole lot more of

019-CC-5-CC

down the road. 019-CC-5-CC, cont'd

So I just think that the issue of decommissioning -- going back to the issue of 019-CC-6-SSR decommissioning, this is going to be a financial crisis for the United States of America when all these reactors reach their end of their operating lives. When we -- America has to start decommissioning plants the size of Fermi, we're going to see -- it's going to probably cost more to decommission a plant than it did to build the thing in the -- in the -- you know, to -- to start with. And I just -- I just don't think that everybody has really thought this all through.

The few jobs created here in Monroe County, that's great. That's fine; however, we've got the 019-CC-7-SSR tower -- the tower factory here in Monroe. I think it employs about 140 people. They're making over 20 bucks an hour. We should be manufacturing those GE turbines at the -- maybe -- maybe at the empty Ford factory down here and put those jobs in down here and employ people doing that. solution. It has its flaws and you know, we also have to look at the -- the Germans are using 019-CC-8-AL solar and, you know, so that's the direction they're going. There -- there's advances taken off like gangbusters there and fortunately, the sun doesn't have

to be shining for solar technology to work. Of course, it works best without clouds, but it'll work with cloud cover also.

019-CC-8-AL, cont'd

After my comments earlier, I talked to one of the folks here and they told me that Germany has a lot of problems now with particulate matter and, you know, gaseous emissions because of shutting down nuclear plants. Well, that's true, however, we have to keep in mind that Germany made the same mistake that Detroit Edison made by not putting scrubbers in when they could have. The scrubbers out here at the coal burner, you know, that's a step in the right direction and I'm sure the Germans will be working on that also.

019-CC-9-AL

So anyway, that's about all I have to say. I think nuclear energy is a mistake. It's ruined the economy. It's good for the -- the economy here in Monroe, however, it's not the solution that I'm looking for and thank you very much. Have a good night.

019-CC-10-SSR

MR. BARKLEY: Thank you, Mark.

MR. FARRIS: Thank you.

MR. BARKLEY: Eric?

MR. DOVER: Good evening. Oh, crowd's getting light tonight. Again, I'd like to thank the NRC for giving us the opportunity to speak today. I

think it's great that we have the opportunity for all of us to voice our opinions and I appreciate all the comments we've had tonight.

I am a local boy. I'm also a member of the Fermi 2 family. I'm very proud to be a part of the Fermi 2 family. My family's been a part of this community for a very long time. In fact, my grandfather, soil conservation state of Michigan, was the first one to take soil samples when they were first thinking about building Fermi 2. Now, my father was part of the construction crews that actually built the plant and today, I'm part of the maintenance crews that maintain the plant. 014-CC-1-SSR

What I really want to talk about is not what I do, not my family's history at the plant, but I want to talk about the environment around the plant.

My father was an avid boater. He passed that on to me. I love the Great Lakes, especially Lake Erie Basin. Unfortunately, in the past, we've had to make a sacrifice for the environment, for the economy. It's either one or the other.

At Fermi 2, I see firsthand -- I'm proud of the fact we don't have to sacrifice our environment to have a strong economic engine that we do have at Fermi

2. The part of that, why it's so important to me, is not just that I live here, my family lives here, my friends lives here. It's the fact that I enjoy spending time out on a lake that has improved over the years in part because we have an industry in the Fermi 2 nuclear power plant that leaves it -- the area better than it found it. 014-CC-1-SSR cont'd

My maintenance crews, we go out to a jobsite and our goal is to leave the jobsite better than we found it. Our wildlife programs are leaving the area around the plant better than we found it. Our care for the waters around the plant, we're leaving it better than we found it. This is our goal. I believe in this. I enjoy the fact that we do this, but that is probably the aspect of my job that I'm most proud.

I love spending time on the lake. My wife and I are actually moving even closer to the plant. I live 13 miles away. Now, we're going to live three miles away just so we have the opportunity to enjoy the lake even more and I strongly believe that keeping the Fermi 2 power plant operational for an additional 20 years will allow us to continue to enjoy these things because the alternative industries that might come in here might not be as good of environmental stewards as

we are to our environment. 014-CC-1-SSR, cont'd

So with that, thank you for the time.

MR. BARKLEY: Thanks, Eric. Jessie? Welcome again.

MS. COLLINS: My name is Jessie Pauline Collins. I am not a lifelong resident of Monroe. I graduated high school in Belleville in 1961. Recently, I moved to Redford, but I'm still concerned about the safety of the Fermi plant because my daughter and her family still live in Sumter Township, but I'm concerned about environment, period.

I'm a member of Citizens Resistance at Fermi 2, but I'm entering my own comments tonight. I will -- by the deadline, I will file for them in a lead to intervene in a public hearing.

Everybody seemed to introduce theirself, so I want to. I have no political power besides -- but they talked about their activist and community support. I'm a member of the Eastern Star. I'm on the advisory council of the Indian Center. I make quilts to donate to environmental groups that raffle them for -- and so I, too, am active, but this is not -- and I appreciate that you all are concerned about your jobs and -- and I'm sure that you do your best for safety, but I'm sure

that the Japanese workers did their best at Fukushima, too.

You know, they had no clue something like that was going to happen. Over 3,000 years and it's still going on, but that's -- griping about Fukushima's not what this is about. Having a pep rally for Detroit Edison is not what this is about. Detroit Edison's not going anywhere. They're going to convert to sustainable energy eventually. They might as well do it in the next 11 years, but what this about tonight is the scoping process to talk about what's supposed to be in the environmental impact statement and so these are the things I want to put and have the environmental impact statement look at.

The first issue is the continued degradation of the safety rules. Just this week, the NRC approved DTE's request to relax the in-service testing program and I quote the document after they killed all those trees to print it all off and then they say, "All periods specified may be reduced at the discretion of the owner." There is no minimum period requirement.

012-CC-1-SSR

I read the document to say they'll only have to test once every 10 years. Once every 10 years

on faulty, old, defective equipment and just today a report came in. There was a license event report that GE is making more bad solenoids and sure enough, they're at Fermi. 012-CC-1-SSR, cont'd

It seems that publicly the NRC states they want to be sure this reactor won't be dangerous to run another 31 years with parts not designed for that length of service and then privately, they allow DTE to do less testing, more cover-up.

I want to put in the scoping process another issue to -- another study on the Fermi 2 cooling water intake's fish kill. The 2009 study showed that they sucked up 3,102 live fish, 62,566,649 fish eggs and fish larvae in less than a year. Another study needs to be a part of this environmental impact statement to see how many fish - - is there any left -- I hope so -- in the ocean -- or lake. 012-CC-2-AE

The next issue I want in the record is why Walpole Island First Nation, which exists on unceded lands and is within the 50-mile evacuation zone, is not allowed to have input into the proceedings. 012-CC-3-HC

DET -- DTE also needs to document the viable alternatives to operating Fermi 2 another 31 years instead of doing it by a coal-fired plant 012-CC-4-AL

somewhere else comparing it to -- I want them to actually do the -- the figures on -- in windmills, solar panels, sustainable energy. Do that now, not - - okay. 012-CC-4-AL, cont'd

There's also a great number of people within a 25-mile radius of the plant that are no longer allowed to use their water wells. They have to either buy their water or hook up to a public water supply. Why are their wells contaminated? 012-CC-5-GW

There's also the bad parts issue that I told you about, the solenoid. These are the things the environmental impact statement should look at, not just yay, DTE has provided good jobs. Yes, they're good jobs, but there will also be more jobs in sustainable energy. Thank you. 012-CC-6-SSR

MR. BARKLEY: Okay. Thank you, Jessie. I'm distinctively interested in the issue of the well contamination that you mentioned. I hopefully can talk to some folks in the state to find -- learn more about that.

We have six other people who would like to speak, so let's call the first three and then we'll go to the last three. Gabriel Agboruche. Is that how you say it?

MR. AGBORUCHE: Agboruche

MR. BARKLEY: Agboruche. Okay. Jessica Miskena and Carol Izant. Okay. Gabriel? I ought to just call people by their first names and not butcher the last ones.

MR. AGBORUCHE: Hi everybody. My name is Gabriel Agboruche. Just for the record and I wanted to speak more today about safety. That seems to be the theme that we're talking about here today.

I'm a nuclear engineer in the area of cybersecurity at Fermi 2 and I'm speaking on behalf of the NAYGN, the North American Young Generation in Nuclear, and I guess just to start off, to give some background information about myself, I grew up in Detroit, Michigan. I've been a customer of DTE and the power that they provide all of my life. I went to Detroit Public Schools and from there, I matriculated to college at Michigan Technological University, which is in the upper peninsula of Michigan, where I studied engineering.

001-CC-1-SSR

And as I started my course work going into study, I learned a lot about -- a lot of different ways to produce energy and one specifically was nuclear energy. Then kind of going into that class, I had a mindset of preconceived notions that I was given

concerning the nuclear industry such as individuals glowing green or people touching nuclear waste and gaining super powers or even irresponsible nuclear operators that eat doughnuts named Homer Simpson.

001-CC-1-SSR, cont'd

These were some preconceived notions that I had, but as I studied more and more on the subject of the way that the power is generated that I learned that through a technical understanding of the subject, engineers and scientists are able to safely harness nuclear energy for the benefit of us all.

I guess even giving some more background infor -- information about myself, as I went through college, I had several internships and co-ops in different industries. One was Ford Motor Company, automotive industry. Another, I worked for Compuware, a software company down -- downtown Detroit. Also worked for Caterpillar in Peoria, Illinois in the construction industry and then I went to the Department of Defense in Warren, Michigan. I worked at the Detroit Arsenal for a company -- for a division of the government called TARDAEC, Tank Army Research Development and Engineering Center, so that's government. And then after I graduated, I worked for Yazaki, which is a automotive supplier, so back to the

automotive and now I'm at Fermi 2.

And one thing that I can say is that out of my experiences working for these different industries, that the nuclear field has had the greatest focus upon the safety of its workers and for the general public. I mean, every -- every single day we come into work, we -- we have a safety message, a safety brief every single morning that the supervisors do with the employees and we also go through strenuous training. I'm sure Bonnie can speak more upon that or has spoken more upon that about the training that we go, CBTs, computer-based training. We also have hands-on training, classroom training, and we have to go through this in order to have a focus of safety for the employees, our co- workers, and for the environment.

001-CC-1-SSR, cont'd

And I guess one thing that I can definitely say and a concluding thought is that through -- through working for multiple industries, I can say that I feel extremely comfortable and secure to know that I work for a company and industry that prioritizes my safety as number one and the safety of the environment, so I am in support of the renewal of the Fermi 2 contract -- its renewal. Thank you.

MR. BARKLEY: Thank you, Gabriel.

Jessica?

MS. MISKENA: Good evening ladies and gentlemen. I'm here to please ask that you do not relicense Fermi 2. I think enough is enough and the reactor has had too many close calls with disintegrating water pump, a bird mishap, you know, all of these unplanned shutdowns in which, by the way, the lights were still on.

045-CC-1-SSR

So I could go on and on about that and I could have stood here and gave you a list of all of them and their dates, but I'm not going to do that because DTE knows, the NRC knows, I know, and a lot of people know these facts.

So what I fear is that if you relicense Fermi 2, it will melt down, as its predecessor has and as Fukushima Daiichi has. Fermi 2, as most of us know here, is the world's largest GE Mark One reactor and it melted down three years ago and all of that radioactive waste, you know, that's been dumping into the ocean has completely contaminated the Pacific Ocean and there are a lot of fish that, you know, you can't eat anymore and that's a shame because I love fish and I'm sure some of you love fish.

And when you look at Fermi 2, there's over

600 tons of radioactive waste which is high level and it is sitting outside of the containment many stories up in a very precarious vulnerable condition and we could have our very own Fukushima right here. That's more tons than what blew up at Fukushima. 045-CC-1-SSR, cont'd

So that wouldn't be a very good thing for the Great Lakes because that is, you know, arguably, the world's largest fresh source of water and, you know, I'm practicing to become a naturopath and I'm always advising people, you know, be careful what kind of seafood you're eating nowadays because, you know, the Pacific Ocean is contaminated. And I fear one day maybe we'll be saying that about the Great Lakes, you know, I wouldn't really want to eat fish from Lake Erie anyway at this point.

And so right here in this town we have all of that radioactive waste and the reality is that meltdowns have occurred. So Fermi 1 happened. There was book called "We Almost Lost Detroit" that was written about it. Three Mile Island happened. Chernobyl happened. Fukushima all happened. And meltdowns will continue to occur because if you keep relicensing them, the decrepit facilities will melt down. It's only a matter of time. I think we're

playing a game of Russian roulette here, you know, like, let's see who's going to melt down first. 045-CC-1-SSR, cont'd

I think that the foreshadowing has been well established. This isn't like one of the final environmental impact statements or a nuanced English literature book we're talking about here. We're talking about unstable radioactive isotopes, widespread contamination, places that are completely uninhabitable, an entire ocean's population affected, fish that you can't eat or have been killed off, more cases of thyroid issues, more children dying from environmentally-induced rare cases of cancer and that's been documented right here in Monroe.

This is all real. It's not a document. People shouldn't have to live even for a moment of their lives as an example of Fermi 2's destructive power or any nuclear reactor's destructive power for that matter.

Speaking of jobs, yeah, a good job is a truly clean job and nuclear power is not clean. There are other options to take into account. First of all, energy efficiency. There's solar, there's wind, there's hydroelectric, there's geothermal. Somebody here who works for Fermi 2 has geothermal and more and

more people will be starting to come off of the grid as well and then what are you going to do about that?

So why are we discussing the relicensing of Fermi 2? It can't be for money; right? That's not the reason.

045-CC-1-SSR, cont'd

So because it's a safe way of creating energy? Nope. You can never guarantee the safety of a nuclear reactor.

Because it's a cheap way of creating energy? No. Guess again.

Because it will never kill or injure a living being? No. And I'm an Iraqi by blood and I take it personally that we are using radioactive waste in military weapons and causing all of these birth defects. If you've never seen any of them, I would really advise you to go and look them up, please.

Nuclear power is not clean. The uranium mining is not clean and it is not carbon free. High level radioactive waste is not clean. Allowable, low-level, radioactive releases into the environment, into the water, into the air, and people breathing it downwind is not clean.

So I would ask that you please find it within yourselves to do the right thing and honor this

mission statement of protecting people and the environment and do not relicense Fermi 2. Thank you. 045-CC-1-SSR, cont'd

MR. BARKLEY: Okay. Thank you, Jessica. Carol? While Carol's making her way down here, the final three people who have to come speak are Manfred Klein, Hedwig Kaufman, and Emilio Ramos.

MS. IZANT: Good evening. My name is Carol Izant. I co-chair the Alliance to Halt Fermi 3. I live in the 50-mile radiation zone from Fermi 2.

I'm -- my colleagues have been able to point out time and again that nuclear power is not a clean source of electricity, know it's dirty, dangerous, exorbitantly expensive. It has a significant carbon footprint and leaves its legacy of deadly radia -- radioactive material for tens of thousands of years. 025-CC-1-SSR

The continued operation and relicensing of aging nuclear reactors leaves us at risk for catastrophic accidents.

Nuclear power is not sustainable because it's not economically viable without subsidies. The -- the irradiated, quote, "spent fuel" can continues to collect in leaking cooling pools near major water bodies and along fault lines. Phasing our nuclear power makes sense when we replace it with 100

percent energy efficiency conservation, clean, renewable energy.

025-CC-1-SSR, cont'd

It's time to retire these old nuke plants. In fact, the former NRC Chair, Gregory Jaczko, a year ago, March of 2013, called for a complete phase out of the existing nukes and because of safety concerns. This is one of your own who has come out now in public and is calling for a complete phase out.

Now, I've got to ask myself if Fermi 2's license to operate doesn't expire until 2025, why are we here today, 11 years ahead of the game, if this is such a viable source of, you know, producing electricity and a viable business, why -- why are we here 11 years before we need to be? There's something fishy going on. There's something that the, you know, Board of Directors of DTE, people that operate seriously behind closed doors know that we don't know and all of you that work, you know, for the company, you don't know.

025-CC-2-SSR

You know, I guess -- I would guess because it's all about the money, that it's all about the money and there's a good likelihood that because of the amount of money that it's going to take to decommission Fermi 2, you know, maybe they haven't -- maybe they haven't

earmarked and don't have the 400 million to a billion dollars earmarked for decommissioning. 025-CC-2-SSR, cont'd

You know, it could be that they are rethinking the proposed Fermi 3 and so, you know, they're going to try to get in now, you know, and they're also trying to get in because they know that the ruling that was handed down two years ago regarding waste confidence is very problematic for an industry that in 70 years hasn't been able to figure out what to do with even a cupful of radioactive waste.

Yeah, I have a lot of questions. We will be, you know, submitting our formal comments before the August 18th to petition for a hearing and we'll be able to, you know, spell these out point by point.

But I -- I'm not insensitive to, you know, the -- the economic impact of a closure of Fermi 2. I -- I understand the economic impact that it would have on this community, but I also know that, you know, as we speak, more and more people around the world and in the United States are figuring out -- the cost of solar panels is coming down, wind, the whole -- the cost of the renewables is coming in cheaper and cheaper and more and more people are going to start to move off of the grid. It is -- we are going to move away from the, you 025-CC-3-AL

know, a centralized grid and move into more of a distributed grid of energy.

025-CC-3-AL, cont'd

And, you know, more and more people, the -- the -- you know, the low-hanging fruit of energy efficiency, I'm -- my husband and I had a very thorough, you know, attic insulation done a couple years ago and duct ceiling and air ceiling and our energy bills, our heating bills, now are 30 percent less than -- than what they were. And this was even after this cold winter that we had this last year.

And -- and also, as kind of a side perk that I never even considered, it -- it keeps the house so much cooler in the summer so that -- and I don't have A/C, but I haven't hardly -- I mean, I haven't had to run my ceiling fans. I mean, it's been -- now granted, we've had a pretty mild summer so far, but nevertheless, you know, and more and more this is what people are going to -- you know, nuclear power is such a heavily-subsidized industry. If only, you know, we could have the same opportunity to subsidize some of these other ways of generating electricity, I mean, you would see a far different, you know, picture.

And again, I -- I know, you know, the younger generation is coming up. They are definitely

connecting the dots on all of this and the Passive House Movement which is a net zero, you know, way to build a house so that it, you know, it doesn't consume any energy. If anything, it -- it produces electricity and that's -- that's going to start to happen more and more.

025-CC-3-AL, cont'd

D -- DTE knows all of this information. I mean, they -- they are well ahead of, you know, the whole game here and again, that's why I would ask -- I mean, all of us, we need to ask ourselves why are we here 11 years prior to, you know, the -- the expiration of this license?

025-CC-4-SSR

You know, you know and -- you know, I mean, I -- I don't -- I don't mean to be cynical, but, you know, it's like -- you know, I was here earlier today and, you know, we listened to the 34 people, you know, present and this -- this evening another 20 people have presented and, of course, the majority are all Fermi 2 employees, representatives of, you know, nonprofit organizations that I know are funded heavily by DTE.

So, you know, I mean, it's a -- you know, this -- this has to be more than just a pep rally, you know, for -- for Fermi and I would -- I'd like to believe that the NRC is going to take a serious, you know, look at some of the actual serious concerns that we have

025-CC-5-SSR

025-CC-5-SSR, cont'd

about the ongoing, you know, operation of Fermi 2.

You -- you again, it's just -- it's wild, 025-CC-6-RW you know, when you think about the fact that there's 600-plus tons sitting up in those pools and not a -- not a single ounce of it has been removed and placed into some kind of hardened on-site storage. I mean, there's no talk of that. It's -- you know, and to continue to just continue to produce more and stockpile it on site, this is -- this is not logical; and I thank you.

MR. BARKLEY: Okay. Thank you, Carol. Manfred?

MR. KLEIN: Good evening. I -- I think I'm addressing a loaded situation here, but you will forgive my somewhat informal attire. I wasn't expecting to speak, but all the same, I'm one of the people in the target zone. I'm -- as the crow flies, I'm probably about two-and-a-half miles away from Fermi.

And I have not so much statements as 029-CC-1-SSR questions that are unanswered and let me just go down the list. Jobs at Fermi, well and good. The only problem is that those jobs can evaporate in an instant and become meaningless if something goes wrong. I will become meaningless. My -- my family will become

meaningless and so will my grandchildren. If anybody has any visions of evacuation in the case of a disaster, please, I have a bridge I want to sell you. Let me go on.

029-CC-1-SSR, cont'd

The other thing is the electricity that comes from Fermi mostly does not benefit the residents of this area. It goes elsewhere. So in short, we're taking the risk for somebody else's electricity elsewhere.

029-CC-2-SSR

Number three, somebody spoke about loving the lake, as I do, even though I'm not a long- term resident of Monroe. We've only been here about 16 years. The fact of the matter is that the -- the temperature -- the cooling water that comes out of Fermi is above the water temperature of the lake and it contributes to the algal blooms. If anybody would like to seen one or would've liked to have seen one last year, I could invite them down to my place and you could smell it before you got there.

029-CC-3-AE

Number four, Germany is getting away from nuclear power and plans to have it completely phased out by I believe -- I believe 2050 at which time I'll probably be pushing up the daisies, but all the same, the Germans have made some notable mistakes in their

029-CC-4-SSR

history, but being stupid is not one of them. So what is it that they know that we don't know or what is it they're looking at that we're not looking at? They're, after all, a highly- industrialized nation. They depend on their exports, so they're -- they're not doing this willy-nilly. 029-CC-4-SSR, cont'd

Number five, the Fukushima disaster -- excuse me -- was attributable as much to the failure of their supplemental -- supplemental generators as it was to the tidal wave that came over the seawall and which means in our terms, if something were to go wrong with the supplemental -- in the case of an emergency at Fermi, without electricity, the storage pool will begin -- will begin to disintegrate in about four hours and twelve minutes. This is from DTE documentation. All right. 029-CC-5-RW

Number six, in 2010, the tornado that we had damaged the power plant, damaged Fermi 2 to the point where it had to be shut down. Keep that one in mind. We're not -- we have not seen the last tornado or any other natural event for that matter. 029-CC-6-AM

Number seven, there's a huge nuclear complex, which I'm sure most of you are aware, up near Goderich, Ontario, on Lake Huron. That project is 029-CC-7-SSR

proposing to bury its nuclear waste within I think about a five-mile radius of Lake Huron. The US is strenuously objecting. The state of Michigan is objecting. However, the nuclear people operating that plant assure us that this is all completely safe. Does that sound familiar?

029-CC-7-SSR, cont'd

In short, if something goes wrong there, the entire lower lakes are contaminated. So we're resisting that, but we're proposing to relicense Fermi 2 and possibly build Fermi 3. Not logical. Okay.

Number eight, Davis-Besse. A few years ago, the reactor cap of Davis-Besse came within a few inches of being eaten through by an acid that had not been detected. Now you can say, "Okay, that's Davis-Besse. We're better than that." I'm not going to argue that. We may be better. The fact of the matter is there are always possibilities for errors or unforeseen circumstances and the consequences are unimaginable.

And finally -- and well know this or if we don't, we should. If anything can go wrong, it will. So something going wrong at Fermi 2 or perhaps its successor is not a question of ifs, but when. Thank you.

MR. BARKLEY: Thank you, Manfred. Hedwig? Welcome Hedwig.

MS. KAUFMAN: I didn't -- wasn't planning on saying anything, but I've got a lot of messy notes here. Well, I live next to Fermi as well. I lived there before there was a Fermi plant. I lived there before there was a Fermi 1, a Fermi 2, and -- well, I hope there won't be a Fermi 3, but anyway I live there.

I've lived there all my life and I'm grateful for people like Rich and for all the employees who say that they're committed to safety. I believe that they are. I believe every word they say. I know they work hard. I know Rich. Maybe he doesn't know this about me, but now he does. And they are committed to safety not only for the public's good, but for their own. They wouldn't go home at night if they weren't committed to safety.

I live in a part of Frenchtown where we have 027-CC-1-RW septic tanks. Now, what does that have to do with Fermi? Not a whole lot, but flushing your toilet's a pretty important part of your life. Being able to flush it and have things go where they're supposed to go is pretty important and I think we're flushing the toilet of nuclear waste and we don't have a seepage bed

for it. We don't have a sewage treatment plant and we don't have a seepage bed.

027-CC-1-RW, cont'd

I don't think we should play political games with nuclear waste as I heard earlier tonight. I don't think we need to blame one party or another. I don't think that's the answer. The government unwisely assumed the job of disposing of nuclear waste from nuclear power plants a long time ago.

The -- I -- I do feel that if the nuclear power plants had to take care of their own nuclear waste, we wouldn't be here. I've also heard talk about reprocessing nuclear waste. That's not a very good answer. Look it up on the internet. You can find out a lot more about it. Bomb grade plutonium is one of the byproducts of the reprocessing of nuclear waste as is a lot of pollution of water and the bomb grade plutonium is piling up and who knows who'll get a hold of it if things go bad.

The -- oh, there -- there was talk about Yucca Mountain. There's more nuclear waste in the United States that can fill Yucca Mountain. So Yucca Mountain, even if it were filled up, wouldn't be the answer to the nuclear waste that are sitting right in the United States as we talk.

Let's see here. Oh, Manny already mentioned that the Michigan State Legislature opposes the disposal site in Ontario while they approve of a place like Fermi 2 and it's a little bit inconsistent as far as I'm concerned. I'm wondering what other industry in our country has the opportunity to have its waste products taken care of by the government? That's us, folks.

027-CC-1-RW, cont'd

Even DTE coal plant here in Monroe is responsible for their fly ash and their emissions and they've built that responsibility into their rate structure. We're paying for it. It's being -- it's being controlled. It's meeting standards that have been set by the EPA, so I say that the cost of disposal of nuclear -- if -- if the costs of the disposal of nuclear waste were part of nuclear power's operating expenses, I doubt if we would be here.

And I hope that the environmental impact statement considers even though it isn't really legally a part of the whole picture, the fact that we do have the problem of nuclear waste. It's going to affect the environment somehow somewhere, even if -- if -- if it isn't in the official statements. Thank you.

MR. BARKLEY: Thank you. Emilio, you're

the last person up. If anybody else wants to speak, please see me. Otherwise, we'll wrap up with Emilio.

MR. RAMOS: Good evening. Like the previous few, I wasn't planning on speaking, but after listening to other people talk, a few things came to mind that I wish to talk about.

One is, if I understand the point of this meeting correctly, is to question the safety and environmental going forward with extending Fermi 2's license. And to the NRC and to DTE, I would ask that -- them to remember that knowledge is safety. How many -- you, the NRC, how many statements have you heard from other people that you know is not to be true? If we would be educating the community around us, we wouldn't be having these problems. They would better understand us. We would have less problems.

051-CC-1-SSR

I know the NRC's plans for everything. We have to plan if every single one of our systems fail. Why are we not informing the 10-mile radius of everyone in our community that yes, we have blackout procedures? We have blackout procedures before Fukushima. We even have more blackout procedures now. We have an entire flex program where we can call up additional resources to either drive or fly additional supplies to our plant.

051-CC-1-SSR, cont'd

How come the people in the community do not know what we're doing to protect them?

I've lived in -- I've lived in Monroe most of my life. My father is former nuke Navy and was a -- apparently a nuclear ops trainer at Fermi. In my entire life, I've been dealing with people when I tell them where my dad works, they ask all the same stupid things: does he grow -- glow green? Isn't it harmful? And I've had to explain to these people that no, that just isn't how nuclear power works.

I mean, just listening to other people -- the bird mishap. That is a safety system. We lost -- a bird actually somehow flew into one of our transformers off-site and was able to shut it down. And as a safety precaution, the entire plant of the emergency diesels start up to make up the power and we shut down. It's a safety system. How come the public doesn't know that we are protecting them? All these things they think that we're not doing, we are doing.

I plan -- I'm in the NUET program here and I plan to eventually go into Fermi or another power facility, but we have to inform the people around us. Why doesn't the community know the difference between Fermi 2 and Fukushima Daiichi? How do they not know

the facts of Fukushima Daiichi? Why are they just going off of the initial news reports? I just read the INPO report last week. There were 70 people that stayed behind. The highest rates was with two operators: 60 REM and I believe 67 REM. When I tell someone in the community that, they should know what I'm talking about.

051-CC-1-SSR, cont'd

They don't have -- when I tell people that currently, they're surprised of how high it is, but they have no idea how that actually affects them. They do not understand the difference between radiation and contamination areas. Yes, they're related, but they're slightly different. A contamination area is just where radiation where we don't want it to be. It may not -- not necessarily be high radiation.

And -- excuse me -- another difference -- I'm addressing the public now -- between Fukushima Daiichi is that they kept their emergency generators below grade. So when the tsunami hit, their generators were flooded out. That was a safety flaw they didn't consider. Our diesels are built in a separate seismic category one bunker. There's no other word for it. It is a bunker. Your -- I'm pretty sure that thing can take missile heads and it's designed

051-CC-1-SSR, cont'd

to be that way for your safety.

With the people in Chernobyl, when Chernobyl happened, we started reviewing it, you guys, the NRC, INPO, WANO, all those organizations started observing it, get as much information as we can and we create new policies, but we didn't really inform the community that we were doing that. Even now, most people don't realize that a lot of people moved back to Chernobyl.

There's people living within the Chernobyl evacuation zone because it's low enough levels. Yes, there are still parts that are high radiation, but a lot of it you can still live one. They garden there. They make all their own food in the gardens. They have their own animals there in the contamination zone. No increase in cancer.

Now, that's not like me just saying there's no increase in cancer. That's INPO, NRC, the World Health Organization has reviewed this. Fifty people died because of the Fukushima -- I'm not -- sorry -- fifty people died because of the Chernobyl accident. That's it. The thousands of people that they talk about dying are the people that were evacuated safely.

It just -- being a NUET student and having to go through all of this NRC, INPO, all this regulation, it doesn't make sense to me that you're not relating any of this to the community. I understand Fermi 2 used to have a information center. Actually, when Fermi first opened, you could actually do -- take tours of the actual plant. You could go, just drive up into the information center. Since September 11, of course, since it was on-site, they closed that down.

051-CC-1-SSR, cont'd

Shouldn't we still be informing the community? Shouldn't we still be reaching out teaching them about radiation? Concerning they're ready -- even if there wasn't a nuclear power plant, it would still be getting 700 millirem of radiation. That's -- that's perfectly acceptable. You have people think that's ridiculous. They panic.

So the point of this meeting was to review the safety of it and I would encourage you guys to look more on educating the community because if something were to happen, people in the community need to know what to do. Thank you.

MR. BARKLEY: Thank you, Emilio. Emilio, you did make a number of good points regarding education of the public. We do have a lot of information on our

FERMI 2 SCOPING COMMENTS

COMMENTS FROM ANNOYMOUS

6/30/2014
79FR36837

(19)

PUBLIC SUBMISSION

As of: September 03, 2014
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Comment On: NRC-2014-0109-0003
DTE Electric Co., Fermi 2; Notice of Intent to Prepare an Environmental Impact Statement

Document: NRC-2014-0109-DRAFT-0013
Comment on FR Doc # 2014-15281

Submitter Information

Name: anonymous anonymous

General Comment

PLEASE do NOT! allow the extension of permits for the Fermi 2 site in Michigan. For the sake of my family's health and for their children, this is certainly not a good idea to continue using nuclear power plants. By reviewing the catastrophe of the damage at Fukushima Japan, knowing that the site will continue to poison Japan (& the world's oceans) for thousands of years to come, you will certainly realize that the impact of nuclear power plants is a disaster for our world's future.

002-S-1-SSR

FERMI 2 SCOPING COMMENTS

COMMENTS FROM MARY ANN BAIER

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15

Docket: NRC-2014-0109
License Renewal Application; Fermi 2

Comment On: NRC-2014-0109-0003
DTE Electric Co., Fermi 2; Notice of Intent to Prepare an Environmental Impact Statement

Document: NRC-2014-0109-DRAFT-0009
Comment on FR Doc # 2014-15281

Submitter Information

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Generál Comment

Bi-national coalition opposes Fermi 2 license extension on Great Lakes shore

NRC file photo of Fermi 2
Multiple environmental groups have met an arbitrarily short, 11:59pm Eastern deadline, and officially intervened against the application by DTE (Detroit Edison) to extend the operating license at its Fermi 2 atomic reactor (photo, left) for an additional 20 years. Fermi 2's operating license is currently set to expire in 2025.

DTE's Fermi nuclear power plant, most infamous for the October 5, 1966 "We Almost Lost Detroit" partial meltdown of its Unit 1 experimental plutonium breeder reactor, is located on the Lake Erie shore of southeast Michigan, in Monroe County.

Beyond Nuclear has entered into coalition with Citizens Environment Alliance of Southwestern Ontario, as well as Don't Waste Michigan, to file four contentions against Fermi 2's license extension.

003-O-1-RW

Two of the contentions concern radioactive waste. The first is about the risk of catastrophic irradiated nuclear fuel storage pool fires. Fermi 2's storage pool holds around 600 tons of irradiated nuclear fuel, more than all four destroyed units at Fukushima Daiichi put together (419 tons). The second radioactive waste contention is about the lack of safety and environmental assurances, since the U.S. Nuclear Regulatory Commission's (NRC) "Nuclear Waste Confidence" policy was declared null and void two years ago by the D.C. Circuit Court of Appeals, and NRC has not yet replaced it.

003-O-2-RW

E-RFDS = ADM-03
Add = L. Perkins (HPA)

SUNSI Review Complete
Template = ADM-013

Another contention concerns the General Electric Mark I Boiling Water Reactor, and its containment's, long-known, fatal design flaws. Fermi 2 is largest GE Mark I BWR in the world, almost as big as the melted down Fukushima Daiichi Units 1 and 2 reactor cores put together. 003-O-3-PA

The final contention is about the interconnected risks between the age-degraded Fermi 2, and the untested, proposed new Fermi 3 atomic reactor, including the vulnerability of both sharing a common off-site electricity transmission corridor. 003-O-4-PA

The three groups, joined by Citizens for Alternatives to Chemical Contamination, as well as the Sierra Club, Michigan Chapter, have also been intervening against the Fermi 3 proposed new reactor since March, 2009.

Both coalitions challenging Fermi 2, and Fermi 3, are represented by Toledo-based attorney Terry Lodge.

FERMI 2 SCOPING COMMENTS

COMMENTS FROM SANDRA BIHN

(21)

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Document: NRC-2014-0109-DRAFT-0015
Comment on FR Doc # 2014-15281

Submitter Information

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General Comment

About 500,000 people who are provided drinking water by the City of Toledo were told not to drink the water because the toxin microcystin exceeded World Health Organization drinking water standards.
Fermi 2 is located at the western end of the western basin of Lake Erie. Fermi uses up to 50mgd for cooling purposes which means that water exiting the plant is warmer than water entering the plant.
Harmful algal blooms are triggered when the water gets warmer. Lake Erie's first mass of algae each year is generally in the Monroe DTE coal and nuclear plant mixing zones.
Before relicensing, there needs to be an assessment of whether or not the thermal discharge mixing zone algae creation is contributing to a larger bloom of harmful algae- cyanobacteria - and/or if the thermal discharge contributes to an increased amount of microcystin released in the water. 004-U-1-AE

Sandra Bihn, Executive Director Lake Erie Waterkeeper

FERMI 2 SCOPING COMMENTS

COMMENTS FROM JOANNE CANTONI

6/30/2014
79FR 36837

14

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Docket: NRC-2014-0109
License Renewal Application; Fermi 2

Comment On: NRC-2014-0109-0003
DTE Electric Co., Fermi 2; Notice of Intent to Prepare an Environmental Impact Statement

Document: NRC-2014-0109-DRAFT-0008
Comment on FR Doc # 2014-15281

Submitter Information

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General Comment

To build another nuclear plant in the same design as the failed Fukushima plants is not a good idea. In the ideal world, it might be ok, but the reality of experience with nuclear power plants - with their millions of little parts that all must work together WITH their human controllers - is that whatever might go wrong sometimes does. Because the consequences are so severe, we need to move to another kind of power generation for our nation's electrical needs.

008-N-1-SSR

FERMI 2 SCOPING COMMENTS

COMMENTS FROM CORINNE CAREY

6/30/2014
79FR36837

PUBLIC SUBMISSION

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Comment On: NRC-2014-0109-0003
DTE Electric Co., Fermi 2; Notice of Intent to Prepare an Environmental Impact Statement

Document: NRC-2014-0109-DRAFT-0007
Comment on FR Doc # 2014-15281

Submitter Information

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General Comment

Sirs:

Again, and still, you would increase the hazardous threat of extending the operation of the Fermi Nuclear Power Plant, on Lake Erie and about halfway between the manufacturing centers of Detroit and Toledo, and their large populations.
[See: "We Almost Lost Detroit". See "The Plutonium File" a Pulitzer Prizewinner by Eileen Welsome.]

It is general knowledge that current nuclear power plants were designed for about 30 years of service, though the Nuclear Regulatory Commission granted the original license for an extra 10 years. Now your 20 year extension would double the original design period, despite the many problems over the years, and the unsolvable continuing world contamination of the similar Fukushima Plant. The limited information being allowed by commercial news media is an example of what we, the concerned public, fear and expect as typical irresponsibility of nuclear development and system.

009-M-1-SSR

Is this acceptable? Is this acceptable for ourselves? Is this acceptable for my precious great-grand-daughter, Amelia Rose, now approaching her second birthday, or her future birthdays, or her grandchildren's?????... and for the nondisposable deadly radioactive wastes of the present and future????.... and for your descendants????

Can you claim "That's their problem".....much less expect that solutions will be found Someday, though these many years of some of the most competent minds of our Earth have failed to date?

009-M-1-SSR, cont'd

Surely, solutions should/could have already been found.

Therefore, public and scientific wisdom must ban all nuclear developments until/unless they ARE found !!!

Previous Environmental Impact Statements have been alarmingly similar, basically "no significant impacts". How many "no significant"s does it take to make "SIGNIFICANT" , as in the cases of multiple nuclear power catastrophes, such as Chernobyl, 4 Mile Island, Hiroshima, Nagasaki, Fukushima and the many others?????

Most sincerely, most urgently,

Corinne Carey,
Grand Rapids Michigan coordinator for Don't Waste Michigan [or Anywhere!]

FERMI 2 SCOPING COMMENTS

COMMENTS FROM JESSIE PAULINE COLLINS

6/30/2014
79FR 36837

RULES AND DIRECTIVES BRANCH

(6)

2014 AUG 20 PM 2:13

24 July 2014

Re: NRC/DTE Scoping Meeting

I wish to list the following issues to be considered in the Draft Environmental Impact Statement.

RECEIVED

First issue is the continuing degradation of safety rules. For example, the recent NRC approval of DTE Electric's request to relax the in-service testing program (TAC NO. MF2967). I quote the 7/16/14 document, "All periods specified may be reduced at the discretion of the owner (i.e., there is no minimum period requirement)." 012-F-1-SSR

It seems that publicly, the NRC states they want to be sure that the reactor won't be dangerous to run another 31 years with parts not designed for that length of service, privately they allow DTE Electric to do less testing.

Another issue is Fermi 2's fish kills. DTE's 2009 study stated Fermi 2's Cooling Water Intake sucked up 3,102 live fish, and 62,566,649 fish eggs and larvae in a year's time. We need another such study to show how many fish the reactor is killing now. 012-F-2-AE

Next issue needing study is why the Walpole Island First Nation, which exists on unceded lands within the 50-mile evacuation zone, is not allowed to have input into these proceedings. 012-F-3-HC

DTE needs to document the viable alternatives to operating Fermi 2 another 31 years, as opposed to building and operating both wind and photovoltaic options. 012-F-4-AL

There exists a need for explanation as to why citizens within the radiation zone are no longer allowed to use their water well, and must have water brought into them if they are unable to hook up to a public water supply. 012-F-5-GW

There is the Bad Parts issue, and just today there was an event notification on defective solenoids at Fermi. Are defective parts on an ageing reactor an accident waiting to happen? 012-F-6-SSR

And then, there is the continued issue of the Eastern Fox Snake. 012-F-7-TE

For a Sustainable Future,

Jessie Pauline Collins

Jessie Pauline Collins

SUNSI Review Complete
Template = ADM – 013
E-RIDS= ADM-03
Add= L. Perkins (LTP1)

Gallagher, Carol

From: Jessie Collins <jessiepauline@gmail.com>
Sent: Friday, August 29, 2014 4:00 PM
To: Perkins, Leslie; Gallagher, Carol; Bladey, Cindy
Subject: comments re: Fermi 2, NRC-2014-0109
Attachments: commentsf2.docx

Greetings,
Please find my personal comments in the Enrico Fermi Unit 2 license extension process.
--
Jessie Pauline Collins

6/30/2014
79FR36837
(12)

SUNSI Review Complete
Template = ADM – 013
E-RIDS= ADM-03
Add= L. Perkins (LTP1)

29 August 2014

To: Leslie Perkins, NRC; Carol Gallagher, NRC; Cindy Bladey, NRC

Re: Personal Comments in the Enrico Fermi Unit 2 license extension application
Docket No. 50-341; NRC Docket 2014-0109

Greetings,

Although I submitted a Petition for Leave to Intervene and Request for Public Hearing on behalf of Citizens' Resistance At Fermi Two (CRAFT), I now wish to submit my personal comments, which may contain statements not sanctioned by the general CRAFT membership or steering committee. However, I wish to express my frustrations at the NRC's continually collaboration with the nuclear industry to avoid public oversight and input into what's in the best interest of future generations.

Earlier this month, thousands of people in the vicinity of the Fermi 2 nuclear reactor could not drink their water because of poison algae growth. And yet, back in 2011, the NRC stated, "Public and occupational health can be compromised by activities at the Fermi site that encourage the growth of disease-causing micro-organisms (etiological agents). Thermal discharges from Fermi into the circulation water system and Lake Erie have the potential to increase the growth of thermophilic organisms. These microorganisms could give rise to potentially serious human concerns, particularly at high exposure levels." (Draft NUREG-2105, Vol. 1, 10/2011, page 2-228) 012-L-1-AE

So if the NRC knew if 2011 that DTE's discharges could poison the water, why did they let them? For profit, or were they/you covering the legal liability laws by declaring you make the potential degradation public, but hoping no one noticed. Your agency added in that same document, "Recent studies of the effects of climate change indicate that there could be declines in the overall Lake Erie water levels of 1 to 2 m (Hartig et al 2007). There are no known studies of potential future surface water use in the Lake Erie Basin or the entire Great Lakes Basin." (p. 2-25) Maybe you couldn't see a future for the Lake at the rate its being poisoned.

Groundwater was also noted to be affected back in 2011, "In wells within a 5-mile radius of the Fermi site, elevated concentrations of arsenic above the EPA (2009a) maximum contaminate level (MCL) were found in groundwater samples (Detroit Edison 2011a). p. 2-29 012-L-2-GW

Enough of what was said – and seemingly discounted back in 2011, I now wish to focus on the present. CRAFT filed 14 contentions on August 18th, and one of them (No. 3, NRC Cannot Legally Extend Reactor Licenses) was cancelled before the week was out. This legality was referred to during the Fermi 3 licensing hearing, "the NRC will not issue the COL prior to completion of the ongoing rulemaking to update the Waste Confidence Decision and Rule." One is then referred to Sec. 6.1.6 which deals with radioactive waste. There, it states (p 6-16) "On June 8, 2012, the US Court of Appeals for the district of Columbia circuit vacated the 2010 waste confidence decision and rule, finding that it did not comply with the NEPA." 012-L-3-SSR

The NRC then proceeded to have Waste Confidence hearings all around the country, before they made a new law saying they can now license new reactors, and extend operating licenses for the aged reactors. I can't help but remind people that everything the Nazis did was legal. They merely changed the laws to justify their actions.

012-L-3-SSR, cont'd

Now, within days of one new law to legalize the continued poisoning of our biosphere in place, your agency has started on another law change to suit the industry's needs – and knock out another of CRAFT's contentions, No. 7: Aging Management Plan Does not Adequately Inspect and Monitor for Leaks. I refer to the July 29, '14 meeting between NRC Staff, Nuclear Energy Institute, and "various representatives from the industry" (including DTE) to change the guidelines for plant reporting including a "new category for age-related degradation." And does this improve the safety of aging nuclear reactors?

No, it doesn't, and I quote the Aug. 22, '14 document. "The NRC and industry are in alignment on the identifications of the major technical issues for operation from 60-80 years, but the NRC does not see from the roadmap that all of the technical issues will be addressed in time for the first SLR application."

012-L-4-SSR

As David Schonberger so aptly put it, "The gist of this is that we need to learn a new term: "SLR," or Subsequent License Renewal. SLR refers to the roadmap for issuing License Renewals for the 60 - 80 year timeframe of operations. The NRC Staff meeting included representatives from NEI and all of the major nuclear utility companies, including DTE Energy. Take note that DTE's participation indicates that DTE will probably apply for a Subsequent License Renewal (SLR) for Fermi, Unit 2 in order to extend the reactor's licensed life for the 2045 - 2065 timeframe. The notes from the meeting indicate that there are still technical hurdles to work out before the NRC is ready to approve a Generic Aging Management Program to apply to SLR relicensing actions --- however, the NRC and NEI are engaged in what the NEI calls "structured coordination," moving full-speed ahead to develop the technical basis for eventually approving U.S. fleetwide 80-year reactor lifetimes."

Could it be that the Nuclear Energy Institute is the puppet masters of NRC, and that they both want to quickly implement a generic process on the Aging Management Program? Are they basically looking to streamline and lock out site-specific concerns by redefining aging degradation as generic? Is the next step getting blanket approval from the NRC to do so? That would eliminate our Aging contention, as well as lock out the public, and create an illusion that these Aging problems are adequately dealt with. And is the rhetoric about 60-80 years designed to alleviate any concerns the public has by raising the numbers from 40 to 60 years?

Since the inception of the Manhattan Project, government has been shielding the nuclear cartel from public knowledge and in-put. That needs to change, and the time for change is now.

Sincerely,

Jessie Pauline Collins
17397 Five Points Street

FERMI 2 SCOPING COMMENTS

COMMENTS FROM ROSEMARY DOYLE

6/30/2014
79FR 36837

PUBLIC SUBMISSION

18

As of: September 03, 2014
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Docket: NRC-2014-0109
License Renewal Application; Fermi 2

Comment On: NRC-2014-0109-0003
DTE Electric Co., Fermi 2; Notice of Intent to Prepare an Environmental Impact Statement

Document: NRC-2014-0109-DRAFT-0012
Comment on FR Doc # 2014-15281

Submitter Information

Name: Rosemary Doyle

General Comment

The renewal of the Fermi 2 license puts the people in the 50 mile radius in Harms Way. This is due to the fact that there is no safe storage for radioactive waste in Michigan or in the world. Currently, Fermi 2 is moving it's radioactive waste to an onsite storage container. I request he NRC to deny the license renewal for the safety of Michigan residents.

016-R-1-SSR

Rosemary Doyle

SUNSI Review Complete
Template = ADM – 013
E-RIDS= ADM-03
Add= L. Perkins (HHI)

FERMI 2 SCOPING COMMENTS

COMMENTS FROM MICHELLE DUGAN

Michelle Dugan, Executive Director, Monroe County Chamber of Commerce
Fermi 2 License Extension
July 24, 2014

6/30/2014
79FR 36837
5

Good afternoon.

My name is Michelle Dugan and I am Executive Director of the Monroe County Chamber of Commerce, an organization dedicated to being a resource for businesses in Monroe County.

017-E-1-SSR

The Chamber supports the Fermi 2 license renewal application and so do I.

Since its inception, Fermi has been an economic powerhouse in Monroe County. The high quality jobs that they have provided Since it was licensed in 1985, have pumped hundreds of millions of dollars into our local economy. Even more importantly, the plant has helped provide a reliable supply of electricity to the residents and businesses of Monroe County and the rest of southeast Michigan. DTE generates over 40% of the state's power supply right here in Monroe County.

Renewing the license of Fermi 2 is a cost-effective way to ensure that DTE Energy is able to continue providing reliable, affordable electricity to our county and region for decades to come.

Thank you.

SUNSI Review Complete
Template = ADM – 013
E-RIDS= ADM -03
Add= L. Perkins (LTP1)

FERMI 2 SCOPING COMMENTS

COMMENTS FROM MARK FARRIS

6/30/2014
79 FR 36837

PUBLIC SUBMISSION

26

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Docket: NRC-2014-0109
License Renewal Application; Fermi 2

Comment On: NRC-2014-0109-0003
DTE Electric Co., Fermi 2; Notice of Intent to Prepare an Environmental Impact Statement

Document: NRC-2014-0109-DRAFT-0022
Comment on FR Doc # 2014-15281

Submitter Information

Name: Mark Farris
Address:
419 E 2nd St
Monroe, MI, 48161
Email: rpddog@sbcglobal.net

General Comment

To whom it may concern,

019-Z-1-SSR

The cost of solar energy has declined by 90% in the last decade as the construction costs of the 4 reactors in South Carolina and Georgia increase by 2 million dollars a day. At some point it will be necessary to eliminate the NRC and turn your duties over to the EPA. Base load energy needs are illusory as demand continues to drop. LED technology will negate the need for new generating capacity and de-industrialization is your dissolution.
Mark Farris

FERMI 2 SCOPING COMMENTS

COMMENTS FROM CAROL IZANT

6/30/2014
79FR36837

PUBLIC SUBMISSION

22

As of: September 03, 2014
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Submission Type: Web

Docket: NRC-2014-0109
License Renewal Application; Fermi 2

Comment On: NRC-2014-0109-0003
DTE Electric Co., Fermi 2; Notice of Intent to Prepare an Environmental Impact Statement

Document: NRC-2014-0109-DRAFT-0016
Comment on FR Doc # 2014-15281

Submitter Information

Name: Carol Izant
Submitter's Representative: Carol Izant
Organization: Alliance to Halt Fermi 3

General Comment

To Whom It May Concern:

Attached are the comments being submitted by the Alliance to Halt Fermi 3 (ATHF3) in regard to Fermi 2 Docket ID NRC-2014-0109 License renewal Application. Please confirm receipt by return email. Thank You.

Sincerely,
Carol Izant, Co-Chair
Alliance to Halt Fermi 3
19455 Middlesex
Southfield, MI 48076
cogknot@yahoo.com

Attachments

Docket ID NRC-2014-0109

U.S. Nuclear Regulatory Commission (NRC)
Docket No. 50-341; NRC-2014-0109

Fermi Nuclear Power Plant, Unit 2 (Fermi 2)
License Renewal Application (LRA)
Applicant/Licensee: DTE Electric Co. (DTE Energy Co.)

Draft Supplemental Environmental Impact Statement (SEIS) Scoping Process
Public Comment

August 29, 2014

Submitted to:
http://www.regulations.gov
Docket ID NRC-2014-0109

Submitted by:
Alliance To Halt Fermi-3 (ATHF3)
Board of Directors
Livonia, Michigan U.S.A.
http://www.nofermi3.org

Introduction:

The Alliance To Halt Fermi-3 (ATHF3) is a 501(c)3 organization located in Southeast Michigan, representing numerous individual and organizational members residing or located within a fifty (50) mile radius of Fermi, Unit 2. According to the Bylaws, the stated Purpose of the organization is, in part, to: "Encourage and demand the shutdown of DTE Energy's existing Fermi-2 nuclear reactor as soon as possible; [and] Encourage and advocate development of renewable energy sources, energy efficiency, and conservation programs as alternatives to nuclear power."

Preface:

The *Atomic Energy Act (AEA)* precludes the U.S. NRC from licensing any new nuclear power plant or re-licensing any existing nuclear power plant if it would be "inimical . . . to the health and safety of the public." 42 U.S.C. § 2133(d).

The Alliance To Halt Fermi-3 (ATHF3) unconditionally opposes the relicensing of Fermi, Unit 2 and expects the following standards to be met regardless, with the ultimate goal of shutting down and decommissioning the nuclear reactor as soon as possible:

025-V-1-SSR

1) Heightened security to protect against attack from the air, water, and land.
2) Safer storage of spent fuel until all spent fuel is moved offsite; this entails reducing the spent fuel pool to its original low-density, open-frame design and placing the bulk of the spent fuel in hardened dry casks (Hardened On-Site Storage -- HOSS).
3) Reduction of allowable radioactive emissions/releases into the environment.
4) Monitors ---- real-time air monitors installed offsite in sufficient numbers linked by computer to the State with regular public reports; enhanced environmental monitoring by the State with regular public reports.
5) Replacement of the water cooling system with one not harmful to Lake Erie's fragile ecosystem.

6) Updated, post-Fukushima Emergency Planning, including expanding the Emergency Planning Zone (EPZ).
7) Installation of a hardened, filtered vent in order to address the well-known and unresolved design vulnerability of the GE Mark 1 BWR pressure suppression containment system. 025-V-1-SSR, cont'd
8) Conformance and compliance with all technical specifications required for new reactors.
9) The NRC must follow and enforce its own regulations and become a more effective regulator to protect people and the environment --- Severe Accident consideration of spent fuel pools is a prime example.
10) Independent reevaluation and audit of the need for continued electric power generation from Fermi, Unit 2 in the first place.

(The above principles are adapted from Pilgrim Watch.)

Public Comment:

It is the official position of the Alliance To Halt Fermi-3 (ATHF3) that each of the following **ITEMS** must be admitted **within the Scope** for consideration by the U.S. NRC as part of the SEIS and Environmental Review of the Fermi, Unit 2 LRA. ATHF3 contends that the issues raised here, new and old alike, are material, significant, central (not peripheral), site-specific, and, in some cases, unanalyzed. Federal law (NEPA) requires the NRC to apply a "hard look" analysis for evaluating the reasonably foreseeable environmental and public health consequences of the proposed relicensing action and to consider the potential impacts of mitigating or fundamental alternatives. ATHF3 believes that a 20-year License Renewal of Fermi, Unit 2 (2025 - 2045) would inherently have significant and potentially catastrophic implications which have been incompletely or erroneously analyzed; therefore, ATHF3 contends that further analysis is called for.

ITEM #1

GE Mark 1 BWR design flaws:

Three General Electric (GE) nuclear engineers resigned their well-paid positions in the 1980's due to their strong fears and misgivings about Severe Accident consequences resulting from inherent safety design deficiencies in the GE Mark 1 Boiling Water Reactor (BWR) --- Fermi, Unit 2's reactor and spent fuel pool as well as the Fukushima Dai-ichi reactors and pools are all based on the GE Mark 1 BWR design. In fact, Fermi, Unit 2 is the largest reactor of its kind in the world, with an unusually large quantity of spent fuel re-racked and stored precariously in an elevated and vulnerable pool. 025-V-2-SSR

Mr. Harold Denton, a former senior NRC reactor safety official, forecasted that the GE Mark 1 BWR design has a probability of catastrophic containment failure of 90%.

On March 11, 2011, an official of the Nuclear Energy Institute (NEI) proclaimed to millions worldwide on CNN's "Situation Room" with Wolf Blitzer that a catastrophic rupture at Fukushima Dai-ichi was extremely unlikely. However, three (not just one) catastrophic explosions and meltdowns occurred there, constituting a 100% failure rate at the multi-unit site, as opposed to Mr. Denton's predicted percentage of 90%.

Yet, even in the wake of that unprecedented radiological disaster in Japan, the U.S. NRC has still failed to issue an Order to require installation of hardened, filtered vents on all GE Mark 1 BWR's. Thus, the NRC's response approach remains utterly deficient and inadequate, and ATHF3 contends that this unresolved Matter must be addressed within the Scope of the Safety and Environmental Reviews of the Fermi, Unit 2 LRA. The SEIS must address the potential impacts of Severe Accident scenarios involving catastrophic failure of Fermi, Unit 2's pressure suppression containment system and must provide a thorough analysis of mitigation and fundamental alternatives to the proposed relicensing action.

In support of the above contention, ATHF3 submits into the docket the following comments from the public record:

025-V-2-SSR, cont'd

U.S. NRC Senior Official, Chuck Casto
NRC's Operation Center Fukushima Transcript, ML12052A108
March 16, 2011

CHUCK CASTO [Deputy Regional Administrator]: "[. . .] if we end up with a molten core and then you talk about the time for the concrete to disassociate, you know, that NUREG says it's a couple of inches an hour, you know. And, of course, that Mark 1 containment is the worst one of all the containments we have, and it's literally, you know, this NUREG tells you that in a station blackout you're going to lose containment. There's no doubt about it."

Also in support of this contention, ATHF3 puts forth and believes the following statements to be factual based on the public docket:

A) That the Fukushima Dai-ichi Lessons Learned Recommendations, including station blackout mitigation, have not been incorporated into the Fermi, Unit 2 design. 025-V-3-SSR

B) That higher power output levels at Fermi, Unit 2 increase the risk of core melt through because of reactor penetrations placed on the bottom of the reactor in the BWR design. 025-V-4-PA

Furthermore, ATHF3 submits into the docket the following article:

025-V-5-SSR

"*Nuclear Safety:* Jaczko Calls for Phaseout in US, Says Plants Aren't Safe,"
Stephanie Cooke, *Nuclear Intelligence Weekly*, March 29, 2013.

The overwhelming weight of evidence presented in the above cited article, including statements attributed to two former NRC Commissioners including a former Chairman, argues strongly and compellingly for an extremely cautionary approach to considering any further reactor License Renewal Applications. The SEIS must genuinely address fundamental alternatives.

ITEM #2

Electricity Demand Forecast in Michigan:

It is the official position of ATHF3 that the NRC must independently **reevaluate and audit** the need for continued electric power generation from Fermi, Unit 2 in the first place (and apply the same principle to assess the need for constructing the new Fermi, Unit 3 as well). A proper SEIS analysis of supply and demand would conclude that the State of Michigan does not need to add any new baseload electric generating capacity now or for the foreseeable future. 025-V-6-SSR

In 2006, the Michigan Public Service Commission (MPSC) published a study called "Michigan's 21st Century Electric Plan." The essential conclusion is: "Michigan's total electric generation requirements are expected to grow at an annual average rate of **1.3 percent** from 2006 to 2025 – from 112,183 gigawatt hours (GWh) to 143,094 GWh."

GWh is the abbreviation for **G**iga**W**att-**h**ours, a reasonable unit for measuring the amount of electrical power consumed each year in Michigan. 100,000 GWh is equal to 100 million megawatt-hours (MWh) or 100 billion

of the more familiar (to those of us who pay household electrical bills) kilowatt-hours (KWh).

The MPSC forecast is the basis for everything else in the report. It is the forecast DTE Energy Co. (DTE) accepted and used as the justifying reason for adding Fermi, Unit 3's generating capacity of roughly 11,000 GWh per year. In other words, DTE said this new nuclear power plant would be needed to supply some 7.7% of Michigan's electrical demand in 2025, the year in which Fermi, Unit 3 was supposed to come on line, according to DTE's initial license application.

025-V-6-SSR, cont'd

As we are now eight years past the publication date of the MPSC study, we can get an idea of how accurate the forecast has been. The most recent year for which actual data about electrical demand in Michigan is available from the U.S. Energy Information Administration is 2012; information for 2013 should be available in the fall of 2014.

In 2012, actual electrical demand in Michigan was 104,107 GWh. According to the MPSC's projection, it was supposed to be 131,746 GWh for that year. Reality was short of the projection by 27,639 GWh, or 26.50% below where the MPSC and DTE imagined it would be. What in fact happened is that electrical demand in Michigan peaked in 2007 at 109,927 GWh. During the next two years, because of the global economic crisis and recession, electrical demand declined sharply, bottoming out at 98,121 GWh in 2009. In 2010, demand recovered a bit, to 103,649 GWh, and has remained essentially flat (plus or minus less than 1%) during the shaky economic "recovery" since then.

The number to which we should pay close attention is 27,639 GWh. That is the difference, in 2012, between the MPSC/DTE expectations and actual demand. Given the potential generating capacity of Fermi, Unit 3 and the actual power currently produced by Fermi, Unit 2, Michigan's actual demand for electricity indicates that even if Fermi, Unit 3 is never built and Fermi, Unit 2 is permanently shut down, DTE still has the margin to close a couple of its dirtiest coal-fired generators as well.

Even if Michigan's electrical demand were magically to resume a growth rate of 1.3% per year, actual absolute demand would be short of imagined demand by significantly more than 27,639 GWh per year by 2025. As there is no particular reason to believe that growth in electrical demand will resume at all, the obvious conclusion is that the Fermi nuclear reactors are not needed.

In addition, Michigan Governor Snyder's energy task force report (published 2013) concluded the electrical grid can carry up to 30% of its power from renewable sources (wind, solar and hydro) without needing to be upgraded. The actual experience of Germany, as well as other nations in Europe which have less solar potential than Michigan, has shown that an upgraded electrical grid can carry 50% or more energy from renewable sources. Note that the cost of upgrading Michigan's electrical grid to this standard is far less than the $15 Billion projected cost (before typical overruns) of building Fermi, Unit 3.

Of course, Fermi's uranium fuel is not mined in Michigan, so nuclear fuel importation permanently drains money out of the state. On the other hand, fuel for alternatives such as wind and solar costs nothing, so long as the sun shines on Michigan. The cost of generating electricity in Michigan from wind and solar is purely the cost of building and maintaining the turbines and solar panels. For comparison, $15 Billion would purchase a little over $3,900 in solar panels for every household in Michigan -- that includes every household in the entire state, not just every household in DTE's service area. **The Fermi, Unit 2 SEIS must adequately discuss alternatives to the proposed action.**

Furthermore, the potentially astronomical cost of permanently managing Fermi, Unit 2's spent fuel and the inherent danger of a reactor core meltdown during the reactor's operating life must be properly considered **within the Scope of this Environmental Impact Statement**. Even if everything goes according to plan – no meltdown or other serious accident – nuclear reactors mean enormous cleanup costs in the future. California Edison recently estimated the cost of decommissioning its two reactors at San Onofre, California at $4

025-V-7-SSR

Billion. There is no long-term solution for disposing the spent fuel, so the $4 Billion plan anticipates only temporary, onsite, dry cask storage; real permanent disposal will cost more. It is reasonable to comparably estimate the decommissioning cost for Fermi, Unit 2 at $2 Billion; however, the actual cost might be more since there is more spent fuel. If Fermi, Unit 2's operating license is extended, then the best-case decommissioning cost will rise because more spent fuel will be generated. Whatever the actual cost, the public is stuck with it. It's the price of avoiding a Fukushima-type disaster. Extending Fermi, Unit 2's license for twenty more years also greatly increases the chance of a serious core meltdown. 025-V-7-SSR. cont'd

In summary, the State of Michigan does not need electrical power supply from DTE's Fermi facility. Insurmountable dangers and decommissioning costs will continue to increase as long as Fermi, Unit 2 is operated. The only sensible course is to let Fermi, Unit 2's operating license expire without renewal and start the decommissioning process at the earliest possible date --- and, likewise, abandon the misguided plan to build Fermi, Unit 3. Nuclear power reactors are an irreversible mistake we do not need to keep repeating. It is certainly possible and sensible to get most of Michigan's electrical power from clean and renewable sources. That's the plan both business and government should be pursuing. We should not be subsidizing DTE Energy Co.'s obsolete 20th Century business plan in the 21st Century. 025-V-8-SSR

ITEM #3

Emergency Planning:

Within the Scope for review, the SEIS for the Fermi, Unit 2 LRA must include an updated and realistic analysis of **evacuation time estimates (ETE)** and **economic consequences** of a Severe Accident, using correct input data and assumptions in order to draw correct conclusions about the costs versus benefits of possible mitigation alternatives or fundamental alternatives to the proposed action.

ATHF3 contends that the following information must be considered in order to prepare a proper EIS assessment:

025-V-9-PA

Meteorology: The Fermi, Unit 3 COLA (Part 5, Appendix 4 "Emergency Plan: Radiological Monitoring and Assessment," Feb. 2014) incorporates the Raddose-V software program to "provide real-time (as the release is occurring), site specific predictions of atmospheric transport and diffusion . . . determined using a *variable trajectory* plume simulation model, along with real-time or simulated scenario meteorological data. . . . Raddose-V is currently in-use at the Fermi site [that is, **Fermi, Unit 2**]." (emphasis added). ATHF3 agrees that the "variable trajectory" plume distribution model is more realistic and appropriate for the Fermi site than a "straight-line Gaussian" model would be, due to the Fermi site's lakeshore and riverside location (see, for example, Dr. Bruce Egan's testimony in support of the New York Attorney General's Intervention against the Indian Point LRA); however, ATHF3 contends that, for the same reason, the Fermi site's location necessitates a wider (larger) Emergency Planning Zone (EPZ) than is currently proposed by the Applicant/Licensee (DTE) and endorsed by the NRC. A "variable trajectory" model recognizes the uncertainties of predicting plume behavior, especially near bodies of water, and the Fermi site is also located near many major metropolitan urban communities. In other words, a "variable trajectory" model and a larger EPZ go hand-in-hand. Thus, while DTE's SAMA analysis assumes a 10-mile EPZ probabilistic model, ATHF3 contends that a 50-mile EPZ would be a more realistic and appropriate starting point for Fermi, Unit 2's location and would, importantly, yield different results. In fact, ATHF3 asserts that DTE's arbitrary and unrealistic EPZ probabilistic modeling served conveniently for underestimating and minimizing projected consequences of a Severe Accident. Therefore, further analysis is called for, under NEPA.

Evacuation Time Estimates (ETE): DTE's evacuation time estimates are unrealistically low because the estimates rely on (1) an arbitrary and scientifically inappropriate probabilistic model for the Fermi site --- a 10-

mile EPZ and minimal "shadow evacuation zone" and (2) the incorrect and unwise assumption that not everyone within ten miles of the Fermi site would have to evacuate, rather only those in the peak radiation plume. DTE minimized "shadow evacuation" of those outside the 10-mile EPZ, and DTE's ETE input parameters failed to consider instances of serious road construction delays, severe Michigan snow conditions (beyond 20% impairment), and other pertinent factors including questionable local preparedness response capabilities required by 10 CFR 50.47(b)(1). Even after the Fukushima Dai-ichi disaster proved that the EPZ should be significantly expanded, DTE's analysis relies on the inappropriate, absurd and discredited 10-mile EPZ --- **see *Endnotes***. Ironically: (a) the NRC's inconsistent guidelines (Dec. 2013) require Emergency Planning within fifty (50) miles of each plant for preventing the ingestion of releases, "such as through bans on contaminated food and water," according to the Congressional Research Service (Jan. 2014); and, (b) while the Raddose-V program is capable of calculating deposition at receptors in the 50-mile ingestion pathway, which appears to include, in the U.S., about 8 counties in Michigan and 8 counties in Ohio, DTE's Emergency Plan executes arrangements in support of emergency preparedness with only two county governments -- Monroe Co. and Wayne Co., Michigan. Thus, ATHF3 contends that the Applicant/Licensee's Emergency Plan is inadequate, and, therefore, further analysis is called for, under NEPA.

025-V-9-PA, cont'd

Economic Consequences: DTE's cost calculations assume an arbitrary and scientifically inappropriate EPZ probabilistic model for the Fermi site and, as a result, that a radiological release will affect only a relatively small area. Proper inputs specific to the Fermi site indicate a far larger affected area ---- potentially including the densely populated centers of Metro Detroit (MI), Ann Arbor (MI), Monroe (MI), Toledo (OH) and Windsor (ON); such scenarios would result in longer evacuation times and greater costs and consequences. Radiation plume exposure from a prolonged or delayed evacuation and consequent projected *health-related costs* in the affected population *would be greater* if an appropriate probabilistic model and correct input parameters were used in DTE's ETE. ATHF3 contends that realistic and reasonably foreseeable scenarios were ignored or underestimated by the Applicant/Licensee's cost-benefit analysis. Importantly, a proper Severe Accident analysis significantly affects whether local communities will receive commensurate safety enhancements. Furthermore, ATHF3 contends that actual long-term recovery, remediation and redevelopment costs in a Severe Accident could be astronomical and that no reliable or credible cost analysis currently exists, given the uncertainties about long-term habitability criteria and cleanup standards. Therefore, ATHF3 contends that the development of a long-term cleanup policy and strategy must be completed as a **prerequisite** for any further licensing or relicensing actions.

ATHF3 has a contrarian point of view on the basic validity of the MACCS and MACCS2 codes as a proper diagnostic tool to assess economic costs and consequences. ATHF3 refers to **expert testimony** supporting Pilgrim Watch's Petition to Intervene against the PNPS LRA: David Chanin, who coded the cost model of the MACCS and MACCS2, stated (Chanin Declaration for Pilgrim Watch, June 2007, ML071840568) that, "I have spent many many hours pondering how MACCS2 could be used to calculate economic costs and concluded it was impossible. (and) Speaking as the sole individual who was responsible for writing the FORTRAN in question, which was done many years prior to my original work in SAND 96-0957, I think it's foolish to think that any useful cost estimates can be obtained with the cost model built into MACCS2..The economic cost numbers produced by MACCS2 have absolutely no basis. If you want to discuss economic costs, I'd be glad to discuss SAND 96-0957, but the "cost model" of MACCS2 is not worth anyone's time."

025-V-10-PA

For a cost analysis which supports ATHF3's argument, ATHF3 points to Sandia National Laboratory's CRAC-2 Report, "Calculation of Reactor Accident Consequences," (1982). The report stated that a core meltdown at Fermi, Unit 2 would have the following consequences: 8,000 "Peak Early Fatalities," 340,000 "Peak Early Injuries," 13,000 "Peak Deaths from Cancer," and $136 billion in property damage costs. Note that these 1982 numbers are unadjusted for demographic and monetary inflation trends and do not account for the current or foreseeable amount of spent fuel stored onsite.

Thus, given all of the above, ATHF3 contends that there are facts at issue which can affect whether or not the proposed action or any particular alternative is cost-effective, and, therefore, further analysis is called for, under NEPA. 025-V-11-SSR

Endnotes:

(1)

Elaborating on the inadequacy of the 10-mile Emergency Planning Zone (EPZ) as a probabilistic model or tool for properly estimating reasonably foreseeable costs and consequences of a Severe Accident, ATHF3 submits the following statement from the public record:

025-V-9-PA, cont'd

http://www.state.gov/p/eap/rls/rm/2011/03/158441.htm

Statement by U.S. Ambassador John V. Roos on Japan's Earthquake and Tsunamis

Remarks (excerpt) - Tokyo, Japan

March 16, 2011

The United States Nuclear Regulatory Commission (NRC), the Department of Energy and other technical experts in the U.S. Government have reviewed the scientific and technical information they have collected from assets in country, as well as what the Government of Japan has disseminated, in response to the deteriorating situation at the Fukushima Nuclear Power Plant. Consistent with the NRC guidelines that apply to such a situation in the United States, we are recommending, as a precaution, that American citizens who live within 50 miles (80 kilometers) of the Fukushima Nuclear Power Plant evacuate the area or to take shelter indoors if safe evacuation is not practical.

We want to underscore that there are numerous factors in the aftermath of the earthquake and Tsunami, including weather, wind direction and speed, and the nature of the reactor problem that affect the risk of radioactive contamination within this 50 mile (80 km) radius or the possibility of lower-level radioactive materials reaching greater distances.

(2)

ATHF3 contends that the Fermi site must have, at minimum, a readily-expandable 50-mile-radius evacuation plan that can be implemented instantly and effectively in a severe accident that indiscriminately exposes the public to significant radioactive releases. Southeast Michigan needs a comprehensive regional evacuation plan with routes, destinations, immediate notification, long-term housing facilities and financial support for displaced and relocated families and individuals, competent medical care for victims of radiation exposure, full disclosure of real-time radioactive release measurements and plume tracking, and funding for adequate event-response capabilities including assistance and preparation for evacuation of vulnerable populations such as indigent and limited-mobility individuals of all ages and for all reasons. The evacuation plan must be coordinated with the entire Great Lakes region, including Michigan, Ohio and Ontario, Canada. The plan must be a realistic, four-season strategy with contingencies for severe weather conditions and impaired visibility/driving conditions; the plan must have flexibility to accommodate and adapt to unexpected road construction delays or other foreseeable scenarios. It should not be assumed that the residents located within the perimeter "shadow evacuation zone" will react any differently from those in the central Emergency Planning Zone (EPZ). The regional emergency communications capabilities must be augmented. During and following

an emergency event, there must be no suppression of public information and no transmission delay. To meet this standard, major infrastructural changes must be implemented immediately. The public does not accept effectively being told to shelter in place and suck it up.

025-V-9-PA, cont'd

(3)

Evacuate Monroe County in two-lane traffic?
The Michigan Department of Transportation is considering whether the City of Monroe, MI (immediately near the Fermi site) can reconfigure S. Monroe Street (M-125) and reduce the traffic flow from five lanes to three. While this would add about 30 parking spots, it could create a serious problem if there were ever an emergency at Fermi. M-125 is an evacuation route for Fermi, as well as an alternate route should there be an accident on I-75. More than 1,400 people have signed an on-line petition against this reconfiguration.

ITEM # 4

Public Health Impacts:

025-V-12-HH

Within the Scope for review, the SEIS for the Fermi, Unit 2 LRA must include an updated and realistic analysis of current and projected public health impacts of authorized, routine, by-design radioactive releases by Fermi, Unit 2 into the surrounding environment. ATHF3 considers this issue to be in the category of *"Significant New Unknown and Unanalyzed Conditions."* The SEIS must consider new and updated public health data, unavailable at the time of issuance of the original Operating License; further, the SEIS must adequately consider Mitigation Alternatives which could significantly reduce the alleged environmental and public health impacts of Fermi, Unit 2's operations. Thus, further analysis is called for, under NEPA.

In support of this contention, ATHF3 submits into the docket the following public health impacts study by the Radiation and Public Health Project (RPHP):

Potential Health Risks Posed By Adding A New Reactor At The Fermi Plant: Radioactive contamination from Fermi 2 and changes in local health status, pages 1 - 21, January 10, 2012,
Joseph J. Mangano, MPH, MBA, Executive Director, Radiation and Public Health Project (RPHP).
http://www.beyondnuclear.org/storage/Mangano_corrected_Fermi_report_Jan_11_2012.pdf

Additionally, making the case for **scoping and material relevance**, ATHF3 submits revised excerpts from the following press release issued by the Fermi, Unit 3 COLA Intervenors:

February 2, 2012

NEW REPORT SHOWS INCREASE IN CANCERS AND MORTALITIES SINCE FERMI 2 NUCLEAR PLANT START UP

Thursday -- Monroe, MI -- A new report submitted to the U.S. Nuclear Regulatory Commission (NRC) shows dramatic increases in cancer and mortalities in Monroe County since the start-up of the **Fermi 2** nuclear plant. Using data from the Centers for Disease Control and Prevention (CDC), the report was prepared by Joseph Mangano, MPH, MBA, Executive Director of the Radiation and Public Health Project (RPHP).

One of the most shocking statistics shows that cancer death rates of young people (up to age 24) living in Monroe County exceeded the U.S. national rate by 28% from 1985 to 2008, a large shift from 1979 to 1984, when the county rate was 24% below the national average. Cancer death rates for 25 to 44 year olds in Monroe County also jumped, from 22% below the U.S. national average to 4% above the national average. In 1985,

Fermi 2 loaded fuel and began low power testing; full commercial operation began in January 1988.

025-V-12-HH cont'd

There were nineteen (19) health indicators reviewed including infant mortalities, low birth weights and hospitalizations that showed increased incidence in Monroe County, compared to the U.S. national average. Ten (10) of these indicators were statistically significant, and four (4) others approached significance.

"These patterns in Monroe County raise serious questions about whether emissions from Fermi 2 harmed local residents," says Joseph Mangano. "Before any decision is made on the future of [nuclear power in Southeast Michigan,] unusual health patterns such as these must be studied thoroughly by federal and state health officials, and findings reported to the public," Mangano concluded.

Nuclear power plants emit numerous radioactive isotopes not only from accidents, but also as part of routine "normal" operations. In 2002, **Fermi 2** was 10th highest in the U.S. for airborne emissions of Iodine-131 and 7th highest for Strontium-89. In 2007, **Fermi 2** was 13th highest in emissions of Tritium. **Fermi 2** experienced a serious accident Christmas Day 1993 that resulted in a discharge of two million gallons of slightly radioactive water into Lake Erie. The drinking water intakes for the City of Monroe and Frenchtown Township are located 1/4 mile downstream from the plant. Radioactive isotopes can bio-accumulate and bio-concentrate in the food chain much like DDT, PCB's and dioxins.

The Mangano Report was prepared for submission to the U.S. Nuclear Regulatory Commission (NRC) during the proposed Fermi 3 nuclear plant Draft Environmental Impact Statement (DEIS) public comment period. Mangano calls for more study before approval of a new Fermi 3 nuclear plant that is proposed adjacent to Fermi 2 and the closed Fermi 1. For these reasons, a growing Coalition of Fermi 3 Intervenors have called for Baseline Health Studies of Monroe County in order that elevated cancers from a proposed Fermi 3 could be measured.

The Mangano findings **regarding Fermi 2** are consistent with studies from around the world, including:

A recent French study on childhood leukemia, posted at:
http://www.beyondnuclear.org/home/2012/1/12/french-study-finds-childhood-leukemia-doubled-around-nuclear.html

And the 2008 German study on childhood leukemia, posted at:
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2696975/?tool=pubmed

Both of these studies report elevated incidence of cancers associated with proximity to nuclear power plants.
--
Additionally, ATHF3 demands an SEIS analysis of the significant public health impacts of predictable accidental radioactive releases which can be expected to occur periodically due to human error or mechanical failure for the entire duration of Fermi, Unit 2's licensed operations. As an example, at least one hundred gallons of radioactive floodwaters (contaminated wastewater) reached the Monroe County public sewer system in December 2010 when a wastewater holding tank valve malfunctioned at Fermi, Unit 2.

ITEM #5

Thermal discharges into Lake Erie:

025-V-13-AE

Within the Scope for review, the SEIS for the Fermi, Unit 2 LRA must include an updated and realistic analysis of current and projected public health impacts of authorized, routine, by-design thermal discharges by Fermi, Unit 2 into the surrounding environment. ATHF3 considers this issue to be in the category of *"Significant New*

Unknown and Unanalyzed Conditions." The SEIS must consider new and updated environmental and public health data, unavailable at the time of issuance of the original Operating License; further, the SEIS must adequately consider Mitigation Alternatives which could significantly reduce the alleged environmental and public health impacts of Fermi, Unit 2's operations. Thus, further analysis is called for, under NEPA.

In support of this contention, ATHF3 submits into the docket the following analysis from the U.S. NRC, pertaining to the Fermi Nuclear Power Plant: 025-V-13-AE, cont'd

- The U.S. Nuclear Regulatory Commission (NRC) has stated in Draft NUREG-2105, volume 1, October 2011, page 2-228: "Public and occupational health can be compromised by activities at the **Fermi site** that encourage the growth of disease-causing microorganisms (etiological agents). **Thermal discharges** from Fermi into the circulation water system and **Lake Erie** have the potential to increase the growth of thermophilic organisms. These microorganisms could give rise to potentially serious human concerns, particularly at high exposure levels." (emphasis added).

Indeed, the U.S. NRC has been vindicated, as the above analysis has proved to be both correct and prescient. The **Governor of the State of Ohio** recently declared a "State of Emergency" (summer 2014) in response to a clean drinking water supply crisis in and around the City of Toledo, Ohio. There is no doubt about the significance of this public health crisis. The question is to what extent Fermi, Unit 2 operations contributed to the conditions which led to the crisis in the first place, and what are the prospects for the future. ATHF3 contends that one significant contributing factor is the routine thermal discharges from **Fermi, Unit 2** which add cumulative stress impacts to the fragile ecosystem of Lake Erie's shallow western basin and shoreline. Lake Erie already suffers from numerous environmental stressors, including pollution from agricultural runoff (such as phosphorus), sewage overflows and routine, authorized releases of industrial toxic chemicals (including releases originating from **Fermi, Unit 2**). In addition, thermal pollution from nearby power plants is a known contributing factor to the conditions which produce toxic algal blooms and consequent hypoxic dead zones. The exact and precise extent to which Fermi, Unit 2 normal operations are directly causative, not just correlative, of significant environmental and public health impacts is "*unknown and unanalyzed*." Therefore, ATHF3 hereby invokes NEPA requirements and contends that a "hard look" and further analysis is called for, as a precondition for approval of the Applicant/Licensee's Fermi, Unit 2 License Renewal Application (LRA).

Additionally, ATHF3 demands an SEIS analysis of the environmental and public health impacts of the NRC's decision to approve Fermi, Unit 2 License Amendment No. 196, which allows an increase in thermal power from the facility. The largest algae blooms on Lake Erie occur in the shallow, warm water near DTE's nuclear and coal-fired power plants.

ITEM # 6

Radiation Protection Standards: 025-V-14-SSR

With attribution to Beyond Nuclear, a recognized Fermi Intervenor, ATHF3 demands a "hard look" review of environmental radiation protection standards for nuclear power operations at **Fermi, Unit 2** in order to assess the adequacy of current and proposed U.S. EPA guidelines.

Citation:
40 CFR 190 EPAHQ OAR 2013-0689; FRL-9902-20OAR "Environmental Radiation Protection Standards for Nuclear Power Operations," U.S. Environmental Protection Agency (EPA).

025-V-14-SSR, cont'd

If EPA issues new radiation exposure guidelines for nuclear facilities, it needs to protect women and children, particularly the vulnerable female infant, from exposure. Current EPA standards do not do this.

EPA itself recognizes that "the risk per unit dose [for radiation induced cancer] has generally increased over the years." This is why it is important that human health, not the financial health of the nuclear industry, drive any changes that EPA makes to radiation exposure standards. Any changes need to not only reflect this increase risk per unit dose, but also need to protect humans during their most vulnerable life stage: childhood.

The current EPA averaged risk of cancer could underestimate the risk to children and infants by 2-5 times, possibly more. A female infant is seven times more vulnerable than an adult male. Since she is the most sensitive to radiation, the standards should be set to protect her. Falling short of this goal would fail to afford the female infant the equal protection she deserves.

EPA must also begin to integrate longer-term strategies for assessing multi-generational impacts of chronic exposure to low radiation doses. These impacts, although they show up much more slowly, could represent a weakening of the human genome and an increase in diseases such as cystic fibrosis, muscular dystrophy, neural tube defects, congenital heart defects, coronary heart disease, essential hypertension, diabetes mellitus and more. Cancer isn't the only disease endpoint EPA should be considering, especially since artificial radioactivity has been continually released for three or four generations now.

If EPA turns a blind eye to longer-term genetic impacts, or refuses to set standards to protect the female infant, it will fail in its duty to protect public health and the environment. It will instead be allowing industry to "take" the health of our children in service of industry profits.

ITEM #7

Severe Accident Analysis of Fermi, Unit 2's Spent Fuel Pool:

025-V-15-RW

ATHF3 hereby appeals to the U.S. NRC for reconsideration of a misguided ASLB ruling which is described below and which pertains directly and materially to the Scope of this relicensing action, including the Fermi, Unit 2 LRA Environmental Review and SEIS.

Submitted for Reference:
--- The Petitions, Contentions and legal filings pertaining to a Petition to Intervene (Contentions 1 - 5) and subsequent adjudication, in the Matter of the Pilgrim Nuclear Power Station (PNPS) License Renewal Application (2006 -) -- Docket No. 05000293 (including **Pilgrim Watch's Motion to Intervene, Contention 4**, May 2006 - ADAMS Accession Number ML061630125). Petitioners included Pilgrim Watch (http://www.pilgrimwatch.org) and the Commonwealth of Massachusetts Office of Attorney General.

Basis:

025-V-15-RW, cont'd

The ASLB and the NRC Staff have failed to apply their own rules and regulations pertaining to Severe Accidents involving spent fuel pools, which are vulnerable structures integral to a facility's normal operation. Consistently and incorrectly, the NRC has argued that all spent fuel issues are **Category 1** and, therefore, "off the table" for practical purposes, having been generically resolved for all plants and not subject to further analysis in any relicensing proceeding. However, the NRC Rules say otherwise. The NRC applies the wrong section of the Rules and consequently misinterprets the whole regulation. The correct and appropriate interpretation of 10 CFR 51.53 is found in Section 5, not Section 6, in NUREG - 1437 (GEIS). Section 6 of the GEIS specifically deals with "The Uranium Fuel Cycle and Solid Waste Management" under ***normal*** operations**;** Section 5 deals with "Environmental Impacts of Postulated **Accidents**," including Category 1 generic "Design-Basis Accidents" and Category 2 site-specific "Severe Accidents." Section 5 includes definitions of "severe" and "accident" and does not limit these to reactor core accidents. Section 5 focuses on potential ***consequences*** to determine whether or not a potential accident is severe ---- and, thus, under Section 5, **spent fuel pool fires** are **a Category 2 issue, within the Scope** of a site-specific Severe Accident Mitigation Alternatives (SAMA) analysis and, therefore, are a fundamental part of an Applicant's Environmental Report (ER) and subject to NEPA SEIS review and remedy. In other words, it is the **consequences** of an accident, not the **source or cause**, which determines whether such accident is properly categorized as "Severe."

Of course, spent fuel pools typically contain a large inventory of high-level radioactive waste (HLRW) with an inherent and undisputed potential for catastrophic consequences in the context of an accident; ironically, a spent fuel pool event could conceivably **cause** a reactor core accident, thereby greatly magnifying cumulative consequences. Thus, the idea that a spent fuel pool is somehow outside the realm and scope of a SAMA analysis or SEIS and that even if mitigation alternatives are readily available and cost-effective (which they are) the plant nevertheless need not consider them, is ridiculous and absurd.

As a consequence of several re-racks implemented as part of an extremely misguided, NRC-endorsed policy, the **Fermi, Unit 2** spent fuel pool currently stores approximately twice the amount of spent fuel as it was originally designed to hold (4600 vs. 2300 design), resulting in a precariously vulnerable condition which must be actively managed at all times. Indeed, Fermi, Unit 2 has the largest spent fuel pool capacity of any operating boiling water reactor in the country -- hence, the potentially greater magnitude of consequences of severe leaks, fires, or other structural breaches of the pool. Adding to the danger is the fact that the GE Mark 1 BWR design locates the spent fuel pool on the 5th floor, in an elevated, structurally vulnerable position. It is reasonable to estimate that, during the 20-year License Renewal period, Fermi, Unit 2 would generate an amount of spent fuel from normal operations equal to about fifty percent (50%) of that which it produced during the original 40-year Operating License period. At the same time, the current "structured coordination" between the Nuclear Energy Institute (NEI) and the NRC appears to be heading towards potentially indefinite "continued storage" of spent fuel with no technical specifications in place, now or for the foreseeable future.

Given that the Applicant/Licensee is charged with the primary responsibility for safely and securely handling its own high-level radioactive waste (HLRW) generated during the licensed life of the reactor, ATHF3 contends that there is a "gap of accountability" in DTE's plan as it is currently written in the Fermi, Unit 2 LRA and associated documents. The NRC's SEIS must finally address the unaddressed issue of financial accountability to the public taxpayers and utility ratepayers, who deserve a seat at the table on the issue of whether to assume new, additional, and uncertain future long-term liabilities implicit in the LRA.

Under 10 CFR 2.309, a Petitioner is required to show that the issue raised in a Contention is within the **Scope** of the proceeding. Contentions that seek compliance with NEPA must be based on the Applicant's Environmental Report (ER). (10 CFR 2.309(f)(2)). Under 10 CFR part 51 (c)(3)(ii), the Applicant is required to provide an ER that contains analyses of the environmental impacts of the proposed action associated with license renewal and the impacts of operation during the renewal term for those issues identified as **Category 2** issues. **"Severe Accidents"** are listed as a **Category 2** issue in the applicable section on "Postulated Accidents." Contentions implicating Category 2 issues ordinarily are deemed to be within the Scope of License Renewal proceedings. *See Turkey Point, supra* at 11-13.

025-V-15-RW cont'd

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In conclusion, ATHF3 contends that DTE's Fermi, Unit 2 LRA Environmental Report (ER) utterly fails to address Severe Accident Mitigation Alternatives which could substantially reduce the risks and consequences associated with onsite storage of high level radioactive waste (HLRW), especially, spent fuel pool water loss and fires. Likewise, the NRC's site-specific SEIS must address, within the scope of review, the significant environmental and public health consequences of a Severe Accident involving Fermi, Unit 2's spent fuel pool and include an analysis and discussion of mitigating and fundamental alternatives.

ITEM #8

Endangered Species at the Fermi site:

025-V-16-SH

Within the Scope for review, the SEIS for the Fermi, Unit 2 LRA must include an updated analysis of current and projected impacts of operations at Fermi, Unit 2 on the threatened and endangered species of fish and wildlife (flora and fauna) which rely on the Fermi site for habitat and ecosystem services. ATHF3 considers this issue to be in the category of *"Significant New Unknown and Unanalyzed Conditions."* The SEIS must address the current list of state and federally-protected species, updated since the time of issuance of the original Operating License; further, the SEIS must adequately consider Mitigation Alternatives which could significantly reduce the environmental impacts of Fermi, Unit 2's operations. Thus, further analysis is called for, under NEPA.

In support of this contention, ATHF3 submits into the docket the following information:

The Bald Eagle, the Eastern Fox Snake and the Mississauga Rattlesnake live at the Fermi site and must be included in the SEIS and the Applicant's LRA.

Also at the Fermi site are two bird species (Red Knot and Piping Plover) and two bat species (Northern Long-Eared Bat and Indiana Bat).

Other species at the Fermi site include:
Karner Blue Butterfly
Eastern Prairie fringed Orchid
Three species of mussels: Northern Riffleshell, Snuffbox Mussel, and the Rayed Bean.

In a nine month study, the Fermi, Unit 2 Cooling Water Intake impinged 3,102 live fish and more than 62.5

025-V-17-AE

million fish eggs and larvae. This significant impact to the ecosystem of Lake Erie's western basin must be addressed in the SEIS. 025-V-17-AE, cont'd

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ITEM #9

Fukushima Lessons Learned: 025-V-18-SSR

U.S. NRC Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (BDBEE)" (ML12054A736), pertains to this contention, in part, as follows:

Fukushima Near-Term Task Force Tier 1 Recommendation:

- Mitigating Strategies for BDBEE (4.2)

Related reference:
Fermi, Unit 3 COLA Part 10 License Condition 3.8.2 states:

The strategies for mitigating prolonged station blackout conditions "must be capable of: [in part] Maintaining core cooling, containment, and spent fuel pool cooling capabilities for Fermi 3 during and after an event affecting both Fermi Units 2 and 3." In other words, DTE must be prepared to handle a multi-unit emergency event.

ATHF3 believes that such plans are a necessary and desirable goal but mere fantasy and delusion; therefore, the NRC must not endorse thinning overall safety margins by locating a new reactor and spent fuel pool (Fermi, Unit 3) immediately adjacent to an aging, Fukushima-style GE Mark 1 BWR with all of its well-known inherent design flaws augmented by a re-racked, overpacked, elevated spent fuel pool. Fermi, Unit 2 has generated nearly 600 metric tons of high-level radioactive waste containing 90 million curies, stored onsite.

In the context of Fukushima Lessons Learned, and presuming the Fermi, Unit 3 COLA as it actively stands, ATHF3 raises the issue of safety margins for multi-unit events, including Design-Basis Threats and Events (DBT) as well as Beyond-Design-Basis External Events (BDBEE). Indeed, multi-unit risks and uncertainties include unexpected events, accidents or occurrences, which may produce synergistic, compounding and emergent scenarios involving catastrophic failure of mission-critical systems. ATHF3 contends that the NRC's site-specific SEIS must comprehensively analyze reasonably foreseeable risks, consequences, mitigation strategies and fundamental alternatives to the extent required by NEPA. ATHF3 considers this issue to be in the category of *"Significant New Unknown and Unanalyzed Conditions"* such that further analysis is called for, based on NEPA "hard look" requirements and previous federal court rulings.

For the purpose of assessing the Scoping admissibility of this issue for the SEIS, the simple fact that, by any reasonable measurement, the environmental and public health costs and consequences of the Fukushima Dai-ichi disaster were/are "significant" means that the legal threshold is met for this SEIS Scoping Process. As

radioactive debris from the March 2011 Japanese tsunami continues to wash ashore along the West Coast of North America, nobody can doubt the "significance" of the 2011 Fukushima Dai-ichi multi-unit nuclear power plant disaster or its applicability to every nuclear power plant on earth, particularly those reactors of the Fukushima-design including the Fermi, Unit 2 GE Mark 1 BWR. Therefore, ATHF3 contends that the scoping threshold is met and exceeded for the purpose of determining issue admissibility for the SEIS. Of course, ATHF3 reserves the prerogative to comment further on the adequacy and completeness of the NRC's analysis of this or any other relevant concern upon issuance of the Draft SEIS in 2015. 025-V-18-SSR, cont'd

ITEM #10

First Nations Treaty Rights: 025-V-19-HC

All of the following recognized First Nations (Native American) communities have treaty rights at Fermi, Unit 2. Each of these communities has legal standing in the Matter of the Fermi, Unit 2 LRA relicensing proceeding. ATHF3 contends that the SEIS must adequately address the impacts of continued operations at Fermi, Unit 2 on the health and well-being of the standing population:

Grand Traverse Band of Ottawa and Chippewa
Ottawa Tribe of Oklahoma
Wyandotte Nation
Saginaw Chippewa Indian Tribe of Michigan
Sault Ste. Marie Tribe of Chippewa Indians of Michigan
Ogema Little River Band of Ottawa Indians
Little Traverse Bay Bands of Odawa Indians
Delaware Nation
Hannahville Indian Community
Pokagon Band of Potawatomi Indians
Bay Mills Indian Community
Lac Vieux Desert Tribe
Forest County Potawatomi Community of Wisconsin
Shawnee Tribe
Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
Huron Potawatomi, Inc.
Keweenaw Bay Indian Community
Lac Vieux Desert Band of Lake Superior Chippewa Indians

Members of the above U.S. federally-recognized communities have treaty rights to hunt, fish and gather in the area of the Fermi, Unit 2 nuclear power plant. ATHF3 is concerned that if the NRC approves the proposed Fermi license extension, the health, safety and quality of life of the native population would be adversely affected. Numerous species of plants, fish, wild game and migratory birds are already being polluted by Fermi, Unit 2's routine discharges which bioaccumulate, thus making unhealthy or inedible the entire local food supply for current and future generations.

In addition, ATHF3 believes that the U.S. NRC should officially recognize the legal standing of the Walpole Island First Nations (WIFN), who reside within a 50-mile-radius of Fermi, Unit 2. WIFN is an unceded island located between Michigan and Canada, populated by natives who were never captured and who never surrendered; they are sovereign entities. However, the NRC has refused to allow WIFN to legally intervene in Fermi licensing proceedings because the NRC considers them to be Canadians not entitled to NRC-recognition or to U.S. treaty rights.

025-V-19-HC, cont'd

FERMI 2 SCOPING COMMENTS

COMMENTS FROM MICHAEL KEEGAN

Gallagher, Carol

To: Gallagher, Carol
Subject: FW: Fermi 2 License Renewal Application Comments to NRC August 29, 2014 / Correction
Attachments: Final Fermi 2 License Renewal Application Comments to NRC August 29, 2014 - Final.docx

From: Perkins, Leslie
Sent: Wednesday, September 03, 2014 8:22 AM
To: Gallagher, Carol
Subject: FW: Fermi 2 License Renewal Application Comments to NRC August 29, 2014 / Correction

Hi Carol,

I am not sure if you receive this already. If not, please process the attached comment for Fermi 2 license renewal; Docket ID NRC-2014-0109

6/30/2014
79FR36897

Thanks,
Leslie

From: mkeeganj@comcast.net [mailto:mkeeganj@comcast.net]
Sent: Friday, August 29, 2014 9:19 PM
To: Perkins, Leslie; LCarol Gallagher
Cc: Kevin Kamps; rickcoronado; dcoronado derek; Jessie Collins; Terry Lodge; Diane Curran; mkeeganj
Subject: Re: Fermi 2 License Renewal Application Comments to NRC August 29, 2014 / Correction

(11)

Dear Leslie Perkins and Carol Gallagher,

Regarding the previous message with Comments please do add to the Organizational List

Nuclear Information Resource Service, Takoma Park, MD, Tim Judson.

I am entering below and I have now attached the Final Fermi 2 License Renewal Application which includes this correction -

Thank You

Michael J. Keegan

Don't Waste Michigan

SUNSI Review Complete
Template = ADM – 013
E-RIDS= ADM-03
Add= L. Perkins (LTP1)

1

Leslie Perkins
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Carol Gallagher
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Cindy Bladey
Office of Administration
Mail Stop: 3WFN-06- A44M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001.

Regarding: Fermi 2 Docket ID NRC-2014-0109 License Renewal Application

Dear Leslie Perkins, Carol Gallagher, Cindy Bladey,

We the undersigned submit these Comments into the Fermi 2, 20 year License Renewal Application record pertaining to Environmental Impact Statement and Safety Evaluation Review process Docket ID NRC-2014-0109.

Approval of the Fermi 2 will result in 20 additional years of highly irradiated nuclear fuel perpetuating the Waste Con that one day there will be a solution. The Emperor still has no clothes.

We acknowledge, accept and adopt as our own Comments the Contentions listed below. Please adopt these Contentions submitted here in part as our Comments by the undersigned. In addition we submit into the EIS and SER record the full docketed request for Public Hearings based on Contentions brought forward in two separate requests. (1) The Public Hearing request made by Don't Waste Michigan (DWM), Citizens Environment Alliance (CEA) and Beyond Nuclear (BN) docketed at:

http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML14230B040

(2) The Public Hearing request made by Citizen's Resistance at Fermi Two (CRAFT) docketed at: http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML14231B142

Please enter into the Fermi 2 (LRA) EIS and SER record the request for Public Hearing based on concerns raised by DWM/CEA/BN:

(ENVIRONMENTAL) CONTENTION 1: INADEQUATE SAMA ANALYSIS OF MARK I BWR VULNERABILITIES

028-K-1-PA

Statement of the Contention and Comment

The Applicant's Fermi 2 Environmental Report fails to accurately and thoroughly conduct Severe Accident Mitigation Alternatives (SAMA) analysis to the long-recognized and unaddressed design vulnerability of the General Electric Mark I Boiling Water Reactor pressure suppression containment system and the environmental consequences of a to-be-anticipated severe accident post-Fukushima Daiichi.

(ENVIRONMENTAL) CONTENTION 2: INADEQUATE CONSIDERATION UNDER NEPA OF DENSELY-PACKED SPENT FUEL STORAGE POOLS

Statement of the Contention and Comment 028-K-2-RW

The Environmental Report for Fermi 2 does not satisfy the National Environmental Policy Act ("NEPA") or 10 C.F.R. § 51.45(c) because it does not consider a range of mitigation measures to mitigate the risk of catastrophic fires in the densely packed, closed-frame spent fuel storage pools at Fermi 2.

(ENVIRONMENTAL AND TECHNICAL) CONTENTION 3: LACK OF SITE-SPECIFIC SAFETY AND ENVIRONMENTAL FINDINGS REGARDING STORAGE AND DISPOSAL OF SPENT FUEL

Statement of the Contention and Comment

The Environmental Report for Fermi 2 does not satisfy the Atomic Energy Act or NEPA because (1) it does not make any site-specific safety and environmental findings regarding the storage and ultimate disposal of the spent fuel that will be generated during the license renewal term and (2) the NRC has no valid generic findings on which the Environmental Report could rely. 028-K-3-RW

(ENVIRONMENTAL) CONTENTION 4: INSUFFICIENT SEVERE ACCIDENT MITIGATION ANALYSIS (SAMA) OF POTENTIAL FERMI 2 AND 3 COMMON-MODE FAILURES AND MUTUALLY EXACERBATING CATASTROPHES

Statement of the Contention and Comment 028-K-4-PA

Fermi 2 and Fermi 3's safety and environmental risks due to common mode failures, and the potential for mutually initiating/exacerbating radiological catastrophes, involving the common Transmission Corridor (TC) shared by both units' reactors and pools, have been inadequately addressed in DTE's Fermi 2 License Renewal Application (LRA) and Environmental Report (ER). Also, the cumulative impacts associated with the proposed new Fermi 3 reactor cannot be excluded from DTE's Fermi 2 LRA and ER as "remote" or "speculative," for it is DTE's own proposal, and is advanced in the Fermi 3 COLA proceeding. Such environmental and safety analysis is required on this unique local problem specific to Fermi 2 and 3. It can, and must, be dealt with in Severe Accident Mitigation Alternatives (SAMA) analyses, and must be treated as Category 2 Issues in NRC's forthcoming Draft Supplemental Environmental Impact Statement (DSEIS), as required by NEPA and the AEA.

Please enter into the Fermi 2 (LRA) EIS and SER record the request for Public Hearing based on concerns raised by CRAFT:

1) WIND ENERGY IS A VIABLE ALTERNATIVE

Statement of the Contention and Comment 028-K-5-AL

Wind Power as a viable option. DTE Electric Company (hereinafter, DTE) Environmental Report (hereinafter, ER) does not adequately evaluate the full potential for renewable energy sources, such as wind power, to replace the loss of energy production from Fermi 2, and to make the license renewal request from 2025 to 2045 unnecessary. In violation of the requirements of 10 CFR§ 51.53© (3) (iii) and of the GEIS § 8.1, the DTE ER (§ 7.1.2.2.1) treats all of the alternatives to license renewal as unreasonable and does not provide a substantial analysis of the potential for significant alternatives, such as wind power, in the Region of Interest for the requested relicensing period of 2025 to 2045. While the ER plainly states, "Whereas a single wind farm generation unit would not provide consistent power generation, multiple wind farms scattered within a reasonable region and interconnected together via the grid may potentially provide power generation that could approach base-load capacity." On page 7-8, the ER states, "Placing wind farms offshore eliminates some of the obstacles encountered when siting wind farms on shore and limits conflicts with other planning interests."

2) WALPOLE ISLAND FIRST NATIONS' EXCLUSION FROM PROCEEDINGS 028-K-6-HC

Statement of the Contention and Comment

Purpose of Contention: To ensure that all Native American tribes and bands and First Nations have adequate notification by NRC of the proposed Fermi 2 licensing extension and environmental review proceedings, as due to them under applicable treaties, laws, and regulations; and to ensure that individual tribal members' interests are represented whether their tribal government intervenes or not on their behalf.

028-K-6-HC, cont'd

3) The NRC HAS NOW EXTENDED REACTOR LICENSES

Statement of the Contention and Comment

In brief, the U.S. NRC's recently lifted moratorium on licensing and renewal actions as part of the ongoing Waste Confidence rulemaking now allows for the possibility of the NRC Commission granting issuance of License Renewal in the Matter of the Fermi 2 License Renewal Application (hereinafter LRA). The Petitioner's requests an ASLB recommendation to the Commission to reinstate the moratorium until all legal appeals through the federal courts have been exhausted or resolved, pertaining to the expected appeal of the pending 2014 Waste Confidence Rule by the same Coalition of U.S. States and Organizations which successfully appealed the previous 2010 version of the Waste Confidence Rule. In good faith, the NRC should defer to the multiple intervening parties who together represent millions of U.S. persons, American citizens and residents. (*New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012)

028-K-7-SSR

Scope and Materiality of Waste Confidence issue To the Fermi LRA Contention:

It is reasonable to estimate that, during the 20-year License Renewal period, Fermi, Unit 2 would generate an amount of spent fuel from normal operations equal to about fifty percent (50%) of that which it produced during the original 40-year Operating License period. At the same time, the current "structured coordination" between the Nuclear Energy Institute (NEI) and the NRC appears to be heading towards potentially indefinite "continued storage" of spent fuel with no technical specifications in place, now or for the foreseeable future.

4) ENRICO FERMI UNIT 2 TRANSMISSION CORRIDOR OFFSITE AC POWER SUPPLY

Statement of the Contention and Comment

Fukushima Lessons Learned: U.S. NRC Order EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool (SFP) Instrumentation," March 12, 2012 (ML12054A679), pertains to Fermi 2.

Basis:

Petitioners contend that the Applicant has failed to provide the NRC Staff with an acceptable final configuration of the offsite AC power supply, including sources, routing and termination points (transmission corridor) for each channel/circuit, so the Staff may conclude that the channels/circuits are independent (physically separate commensurate with the hazard) from a power supply assignment perspective, for the purpose of ensuring reliable and uninterrupted electric power for the Fermi Nuclear Reactor, Unit 2, within and as part of the inseparable context of the same Applicant's active and pending Fermi, Unit 3 COLA as submitted. The Petitioner contends that the Applicant's pending arrangement explicitly violates the Acceptance Criteria of the Mitigation Strategies Directorate (NRR) Audit Plan to Review Licensee Submittals in response to the Commission's Issuance of Orders with regard to Beyond-Design-Basis External Events (BDBEE) mitigation response and recovery actions.

028-K-8-SSR

5) SPENT FUEL POOL INSTRUMENTATION IS DEFICIENT

Statement of the Contention and Comment

The Petitioner requests a public hearing to consider the following Contention pertaining to U.S. NRC Commission Order EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool (SFP) Instrumentation," March 12, 2012 (ML12054A679):

028-K-9-SSR

Basis:

Spent fuel is stored in high-density pools at every reactor in the United States. No spent fuel pool is protected by containment or is required to have independent redundant cooling; they were meant for short-term cooling (~5 years) and weren't intended for multi-decade storage of 4-5 times more spent fuel than their original designs. Pools are not only vulnerable to accidents – as witnessed by the Fukushima accident – but they are prime terrorist targets. In the NRC's Draft Consequence Study, the NRC admits that a pool fire could displace more than 4 million people from their homes. After both 9/11 and the Fukushima accident, the NRC recognized the potential for a catastrophic pool fire. Furthermore the NRC's Office of Nuclear Security and Incident Response uses a predictive tool to aid emergency responders during nuclear accidents which indicates that the radiological release from a pool fire following an earthquake would dwarf that of a reactor meltdown. It also indicates that the consequence of the breach of a dry cask is thousands of times less severe. (U.S. Nuclear Regulatory Commission, Office of Nuclear
Security and Incidence Response, RASCAL 3.0.05 Workbook, NUREG-1889, September 2007).

028-K-9-SSR, cont'd

6) MITIGATION STRATEGIES FOR BEYOND-DESIGN-BASIS EXTERNAL EVENTS

Statement of the Contention and Comment

Contention 6 deals with the inadequacies in DTE's response to U.S. NRC Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond - Design - Basis - External - Events (BDBEE)" (ML12054A736). As of November 25, 2013 DTE Electric had failed to implement the plan, as revealed in NRC Staff Evaluation (TAC No. MF0770). DTE had not complied with the order and had three Open Items. An "Open item" is defined as "an item for which the licensee has not presented a sufficient basis for NRC to determine that the issue is on a path to resolution. The intent behind designating an issue as an open item is to document significant items that need resolution during the review process, rather than being verified after the compliance date through the inspection process." (TAC No. MF0770, page 6) In addition to Open Items, the Fermi 2 plan had thirty-three (33) Confirmatory Items. According to the TAC, a "confirmatory item" is "an item that the NRC considers conceptually acceptable, but for which resolution may be incomplete."

028-K-10-SSR

7) AGING MANAGEMENT PLAN DOES NOT ADEQUATELY INSPECT AND MONITOR FOR LEAKS

Statement of the Contention and Comment

The Aging Management program proposed in the DTE Electric Company (hereafter, DTE) license extension application for the Fermi 2 nuclear reactor is inadequate because (1) it does not provide for adequate inspection of all systems and components that may contain radioactively contaminated water and (2) there is no adequate monitoring to determine if and when leakage from these areas occurs. Some of these systems include underground pipes and tanks which the current aging management and inspection programs do not effectively inspect and monitor.

028-K-11-SSR

The Contention is within the Scope of these proceedings

This Contention raises concerns of inspection of underground leaks: Pertaining, in part, to buried pipes and tanks that fall within those described in 10 CFR part 54, as follows: The Aging Management Plan (AMP) program, as proposed by the Applicant, is inadequate with regard to aging management of buried pipes and tanks that contain radioactively contaminated water, because the AMP program does not provide for adequate monitoring wells that would detect leakage. Furthermore, the Petitioner contends that the Aging Management Plan does not adequately inspect and monitor for leaks in all buried systems and components within scope or in the partially buried sections of systems and components within scope, to include not only buried components that may contain radioactive liquids but also the buried pipes and tanks for the fuel oil system, the station blackout diesel generator system, the fire protection system and the water inflow piping that do not contain radioactive material but are within scope.

8) SEVERE ACCIDENT MITIGATION ALTERNATIVES (SAMA) ARE MATERIALLY DEFICIENT

Statement of the Contention and Comment

Contention 8 is regarding Severe Accident Mitigation Alternatives (SAMA) analysis: Pertaining to critical input data, as follows: The Applicant's Fermi, Unit 2 LRA Environmental Report (ER) and SAMA analysis are materially deficient in that the input data concerning evacuation time estimates (ETE) and economic consequences are incorrect, resulting in incorrect conclusions about the costs versus benefits of possible mitigation alternatives, such that further analysis is called for under NEPA. 028-K-12-PA

Basis:

The first issue to address is Meteorology: The Fermi, Unit 3 COLA (Part 5, Appendix 4 "Emergency Plan: Radiological Monitoring and Assessment," Feb. 2014) incorporates the Raddose-V software program to "provide real-time (as the release is occurring), site specific predictions of atmospheric transport and diffusion . . . determined using a *variable trajectory* plume simulation model, along with real-time or simulated scenario meteorological data. . . . Raddose-V is currently in-use at the Fermi site [that is, Fermi, Unit 2]." (Emphasis added). The Petitioner agrees that the "variable trajectory" plume distribution model is more realistic and appropriate for the Fermi site than a "straight-line Gaussian" model would be, due to the Fermi site's lakeshore and riverside location (see, for example, Dr. Bruce Egan's testimony in support of the New York Attorney General's Intervention against the Indian Point LRA); however, the Petitioner contends that, for the same reason, the Fermi site's location necessitates a wider (larger) Emergency Planning Zone (EPZ) than is currently proposed by the Applicant and endorsed by the NRC. A "variable trajectory" model recognizes the uncertainties of predicting plume behavior, especially near bodies of water, and the Fermi site is also located near many major metropolitan urban communities. In other words, a "variable trajectory" model and a larger EPZ go hand-in-hand. Thus, while the Applicant's SAMA analysis assumes a 10-mile EPZ probabilistic model, the Petitioner contends that a 50-mile EPZ would be a more realistic and appropriate starting point for Fermi, Unit 2's location and would, importantly, yield different results. In fact, the Petitioner asserts that the Applicant's arbitrary and unrealistic EPZ probabilistic modeling served conveniently for underestimating and minimizing projected consequences of a Severe Accident.

9) QUALITY ASSURANCE IS FAULTY

Statement of the Contention and Comment

The Petitioner requests a public hearing to consider the following Contention pertaining to a fundamental and egregious failure of Safety-Related Quality Assurance which occurred during a 20-year-period from 1986 to 2006 at the Fermi Nuclear Power Plant, Unit 2 and which remains unresolved to this day in the eye of the public, thus warranting a fresh, "hard look" as part of any credible NEPA Review or Safety Review process associated with the Fermi, Unit 2 LRA; and, therefore, the Petitioner respectfully argues that this Item is well within the Scope of Consideration for the LRA Review and is Material to the proceeding. 028-K-13-SSR

10) SAFETY ASSURANCE VIOLATION.

Statement of the Contention and Comment

The Petitioner requests a public hearing to consider the following Contention pertaining to ensuring compliance with reasonable safety and security standards, precautionary principles, and administrative controls and procedures at the Fermi Nuclear Power Plant, Unit 2, in order to prevent a potentially significant unauthorized release over the entire licensed life for operations of the reactor. 028-K-14-SSR

Safety/Security and Quality Assurance Violation:

The Petitioner's forward-looking, long-term confidence in the Applicant/Licensee has been severely compromised by a recent incident at the Fermi Nuclear Power Plant, Unit 2, which resulted in the U.S. NRC putting DTE Electric Co. on probation for significantly violating the NRC's security requirements at a Greater than Green level, thus initiating an escalated enforcement action. The regulatory compliance

violation happened during a February 2014 inspection that could have resulted in unauthorized and unmonitored access to a protected area, according to an NRC report. As a result of the investigation and finding, Fermi, Unit 2 will move down in the plant ranking system from the licensee response column to the regulatory response column for the rest of this year (2014). The irony is that the probationary period is ongoing concurrently, even as DTE pushes forward with the Fermi, Unit 2 LRA as well as the Fermi, Unit 3 COLA. 028-K-14-SSR, cont'd

11) DTE'S ENVIRONMENTAL REPORT IGNORES PUBLIC HEALTH DATA

Statement of the Contention and Comment

The Petitioner requests a public hearing to consider the following Contention pertaining to "*Significant New Unknown and Unanalyzed Conditions*" reflected by the Applicant/Licensee's incomplete and obsolete analysis of public health impacts of authorized, routine, by-design radioactive releases by Fermi, Unit 2 into the surrounding environment. The Petitioner contends that the Applicant's ER fails to consider new and updated public health data, unavailable at the time of issuance of the original Operating License; further, the Petitioner contends that the Applicant fails to adequately consider Mitigation Alternatives which could significantly reduce the alleged significant environmental and public health impact of Fermi, Unit 2 operations. Therefore, the Petitioner invokes NEPA requirements and contends that further analysis is called for. In support of this Contention, the Petitioner submits into the docket the following public health impacts study by the Radiation and Public Health Project (**RPHP**):
Potential Health Risks Posed By Adding A New Reactor At The Fermi Plant: Radioactive contamination from Fermi 2 and changes in local health status, pages 1 - 21, January 10, 2012, Joseph J. Mangano, MPH, MBA, Executive Director, Radiation and Public Health Project (RPHP). 028-K-15-HH
http://www.beyondnuclear.org/storage/Mangano_corrected_Fermi_report_Jan_11_2012.pdf

12) THERMAL DISCHARGE INCREASE ALGAE BLOOMS

Statement of the Contention and Comment

Petitioner's request a public hearing to examine the impact of daily thermal discharges from Fermi 2 as an accelerator and contributor to harmful algal blooms (HABS). The Fermi 2 releases 45 million gallons of water per day into Lake Erie. This thermal discharge averages 18 degrees (F) above ambient lake temperature 365 days per year. 028-K-16-AE

Petitioner's contend that the Applicant's Environmental Report (ER) fails to consider new and updated environmental and public health data, unavailable at the time of issuance of the original Operating License; further, the Petitioner contends that the Applicant fails to adequately consider Mitigation Alternatives which could significantly reduce the alleged significant environmental and public health impact of Fermi, Unit 2 operations. Therefore, the Petitioner invokes NEPA requirements and contends that further analysis is called for. Illustration: Petitioner puts forth the following NOAA Satellite Image of Lake Erie from August 10, 2014 to illustrate how severe the algal bloom crisis has become.
http://coastwatch.glerl.noaa.gov/webdata/cwops/html/modis/modis.php?region=e&page=1&template=sub&image=a1.14222.1852.LakeErie.143.250m.jpg

13) INADEQUATE RADIATION PROTECTION STANDARDS.

Statement of the Contention and Comment

The following Contention pertains to inadequate environmental radiation protection standards for nuclear power operations at the Fermi Nuclear Power Plant, Unit 2. The Petitioner seeks an ASLB recommendation to the NRC Commission to issue an Order to independently assess the adequacy of current and proposed U.S. EPA guidelines. 028-K-17-SSR

Thank you

Respectfully Submitted:

Organizational Endorsement

Alliance to Halt Fermi 3
Detroit, MI
Carol Izant

Beyond Nuclear
Takoma Park, MD
Kevin Kamps

The Carrie Dickerson Foundation
Tulsa, OK
Marilyn McCulloch, Secretary

Citizens to End Nuclear Dumping in Tennessee
Memphis, TN
Kathleen Ferris, Co-Founder

Citizens Environment Alliance Southwestern Ontario
Windsor, Ontario. Canada
Rick Coronado, Derek Coronado

Citizens for Alternatives to Chemical Contamination
Lake Station, MI
Victor McManemy, Chair

Citizen's Resistance at Fermi Two
Redford, MI
Jessie P. Collins

Concerned Citizens for Nuclear Safety
Santa Fe, NM
Joni Arends, Executive Director

Coalition for a Nuclear Free Great Lakes
Monroe, MI
Michael J. Keegan, Chair

Crabshell Alliance of Greater Baltimore
Baltimore, MD
Dagmar Fabian, Secretary

Don't Waste Arizona
Phoenix, AZ
Stephen Brittle

Don't Waste Michigan

Grand Rapids, MI
Corinne Carey

Don't Waste Michigan
Holland, MI
Alice Hirt

Don't Waste Michigan
Kalamazoo, MI
Kevin Kamps

Don't Waste Michigan
Monroe, MI
Michael J. Keegan

Don't Waste Michigan
Sherwood, MI
Kathy Barnes

Energia Mia
San Antonio, TX
Cynthia Weehler

Environmentalists Inc.
Aiken, SC
Ruth Thomas

Friends of the Earth
Washington, D.C.
Ben Schreiber, Program Director

Friends of the Earth
Washington, D.C.
Katherine Fuchs

GE Stockholder's Alliance for Sustainable, Nuclear-Free Future
Sandy Spring, MD
Patricia T. Birnie, Chair

Great Northern Solar
Port Wing, WI
Christopher LaForge

The Guacamole Fund
Hermosa, CA
Tom Campbell

Home for Peace Justice
Saginaw, MI
Joan McCoy

Musicians for Safe Energy
Mountain View, CA
Tom Campbell

North American Water Office
Lake Elmo, MN
George Crocker

Nuclear Energy Information Service
Evanston, IL
David Kraft, Executive Director

Nuclear Information Resource Service
Takoma Park, MD
Tim Judson, Executive Director

Nukewatch
Luck, Wisconsin
John LaForge, Co-director

Physicians for Social Responsibility
Chesapeake Chapter
Gwen DuBois

Proposition One Campaign
Tryon, NC
Ellen Thomas

The Rachel Carson Council, Inc.
Bethesda, MD
Robert K. Musil, Ph.D., M.P.H.

San Luis Obispo Mothers For Peace
San Luis Obispo, CA
Linda Seeley

Sinnissippi Alliance for the Environment
Rockford IL
Stanley Campbell

Stand Up / Save Lives Campaign

Burr Ridge, IL
Maureen K. Headington, President

Toledo Coalition for Safe Energy
Toledo, OH
Terry J. Lodge

Waste Action Project
Seattle, WA
Greg Wingard, Executive Director

Individual Endorsement

Gerson Lesser, M.D.
New York, NY

Janette D. Sherman, M.D.
Baltimore, Maryland

Susan Michelli
Mt. Horeb, WI

David Schoenberger
Ann Arbor, MI

Zack Ruiter
Toronto, ONT Canada

James Sherman
Waterford, MI

Tom Ferguson
Marquette, MI

Steve Ferguson
Marquette, MI

Sarah Moore
Belleville, MI

Carol Kurz
Evanston, IL

Ziggy Kleinow
Binbrook ONT, Canada

Rosalie Riegle
Lansing, MI

Kay Cumbow
Brown City, MI

Keith Gunter
Livonia, MI

Please Contact Michael J. Keegan, Don't Waste Michigan mkeeganj@comcast.net should you have any questions. Thank you.

PUBLIC SUBMISSION

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License Renewal Application; Fermi 2

Comment On: NRC-2014-0109-0003
DTE Electric Co., Fermi 2; Notice of Intent to Prepare an Environmental Impact Statement

Document: NRC-2014-0109-DRAFT-0021
Comment on FR Doc # 2014-15281

Submitter Information

6/30/2014
79 FR 36837

25

Name: Michael Keegan
Submitter's Representative: Michael J. Keegan
Organization: Don't Waste Michigan

General Comment

Please accept these Comments into the record for Fermi 2 License Renewal Application.

028-Y-1-TE

Beaver Impact On Wetlands:

No where in the Fermi 2 License Renewal Application Environment Report is mention made of the rise of beaver population in Monroe County and how their growth and presence may affect the wetlands, those to be impacted and the new ones to be built to replace the proposed destroyed ones. (Beaver Population on Rise in Monroe County, Monroe Evening News 12/4/2012) The omission leaves questions about whether other issues did not receive assessment, since beavers were not mentioned.

Detroit River again becoming home to beaver reads the AP story from March 18, 2013. The story as it appears:
"Updated 9:53 am, Monday, March 18, 2013
DETROIT (AP) There's new evidence that the Detroit River once again is becoming home to the beaver, according to officials working improve the health of the river.
A trail camera set up at DTE Energy Co.'s River Rouge Power Plant in 2013 recorded images of a beaver dragging a small tree into the river, the Detroit Free Press reported (http://on.freep.com/146tqQM) Monday. It could be part of a sustained comeback.
"They could be expanding their range," said John Hartig, manager of the Detroit River International Wildlife Refuge.
Following a long absence, a beaver sighting was reported in 2009 at DTE's Conners Creek power plant along the Detroit River. He moved on during that summer, but later was spotted having returned with a family. Beaver sightings also have been reported on Belle Isle.

E-RIDS = ADM-03
Add = L. Perkins (HPI)

SUNSI Review Complete
Template = ADM-013

http://www.seattlepi.com/business/energy/article/Detroit-River-again-becoming-home-to-beaver-4362805.php
Read more: http://www.seattlepi.com/business/energy/article/Detroit-River-again-becoming-home-to-beaver-4362805.php#ixzz2NvanEiJ7
Read more: http://www.seattlepi.com/business/energy/article/Detroit-River-again-becoming-home-to-beaver-4362805.php#ixzz2NvaTrFZS " The Environmental Report is inclomplete.
Beavers have the capability of suddenly and devastatingly altering wetlands, nothing in the Environmental Report has addressed this beaver concern. We request that a ER be done to include beaver wetland modification potential at the Fermi 2 site through year 2045.

028-Y-1-TE, cont'd

Bald Eagle - The U.S. Fish and Wildlife inform:
Your list should also include the bald eagle, as they are documented to nest in and near the project area. Although no longer protected under the Endangered Species Act, bald eagles, along with their foraging and winter roosting habitat, remain protected pursuant to the Bald and Golden Eagle Protection Act (BGEPA) and Migratory Bird Treaty Act (MBTA). Disturbance of these birds should be minimized and any resulting take must be permitted by the U.S. Fish and Wildlife Service (Service).

028-Y-2-SH

Bird Kills From Cooling Towers
The License Renewal Application has not taken into consideration the number of bird kills resulting from two Cooling Towers at Fermi 2 that will result over extended 20 year license renewal. Please enter into the record the attached 1979 study entitled Cooling Towers as Obstacles in Bird Migration which took a look at bird kills at Davis-Besse which has one Cooling Tower. Recently the Kirkland Warbler was identified as being potentially impacted by Davis-Besse. There is no discussion of this federally endangered species in the Fermi 2 LRA. Please see that this is addressed.

028-Y-3-TE

Algae Bloom Contribution
Algae blooms of particular concern in Lake Erie is Microcystis spp., a phytoplanktonic species of blue-green alga that can produce a substance (microcystin) that is toxic to fish and other organisms when concentrations are high enough.Mycrocystis spp. Blooms can affect water quality as well as the health of human and natural resources. General consensus is that algae blooms initiate in the western Lake Erie basin. What is the Thermal Contribution of Fermi 2 to Algae Blooms, we are requesting that there be a multivariate analysis conducted by a qualified independent third party.

028-Y-4-AE

Thermal Discharge Impact on Algae Blooms
Another assault on Great Lakes water degradation is due to thermal discharges. Public and occupational health can be compromised by activities at the Fermi site that encourage the growth of disease-causing microorganism (etiological agents). Thermal discharges from Fermi 2 into the circulating water system and Lake Erie have the potential to increase the growth off thermophilic microorganismsThese microorganisms could give rise to potentially serious human health concerns, particularly at high exposure levels. This would endanger the whole bio-region, yet there is only tertiary discussion in the ER of thermal contribution from Fermi 2, and how it will be mitigated. Forty-five million gallons per day of discharge averaging 18 degrees F above ambient Lake Erie temperature. This compounds the Algae Blooms

Thank you

Michael J. Keegan
Don't Waste Michigan

FERMI 2 SCOPING COMMENTS

COMMENTS FROM VIC AND GAIL MACKS

Vic and Gail Macks
20318 Edmunton St.
St. Clair Shores, MI 48080-3748
586-779-1782 vicmacks3@gmail.com

August 18, 2014

Comments Regarding DTE Electric Company Relicense Application For Fermi 2 Nuclear Reactor near Monroe, MI:
License Renewal Application; Fermi 2; Docket ID: NRC-2014-0109-0003

Submission to:
U.S. Nuclear Regulator Commission
http://www.regulations.gov/#!submitComment;D=NRC-2014-0109-0003

Thermal loading of the Great Lakes by nuclear Reactors
The Nuclear Regulatory Commission (NRC) has stated in Draft NUREG-2105, volume 1, October 2011, page 2-228: "Public and occupational health can be compromised by activities at the Fermi site that encourage the growth of disease-causing microorganisms (etiological agents). Thermal discharges from Fermi into the circulation water system and Lake Erie have the potential to increase the growth of thermophilic organisms. These microorganisms could give rise to potentially serious human concerns, particularly at high exposure levels."

035-J-1-AE

There are 48 nuclear reactors in the Great Lakes basin. Each one has added to the thermal load on the Lakes in addition to designed and non-designed radioactive releases. The water usage from Lake Erie is 56,024 million gallons per day (Draft NUREG-2105, volume 1, p. 2-24). Of that, 50,518 million gallons per day are used by power plants. Nuclear power plants release some of that in water vapor and the rest goes back into Lake Erie heated. Without water cooling, reactors would melt their cores and explode as happened to three at Dai-ichi.

Toxic plumes on Lake Erie were a repeat occurrence in August 2014, shutting down water to Toledo and surrounding areas. The only allowable water use was to flush a toilet. We cannot live with safe water being made unavailable from multiple causes and most significantly, in this instance, from Fermi 2 and Davis Bessie, near Toledo, on Lake Erie.

50 Mile Fermi Evacuation Plan

035-J-2-SSR

The Fermi site must have a 50 mile evacuation plan that can be implemented instantly and effectively in a nuclear accident that exposes the public to radioactive releases. We need an evacuation plan with routes, destinations, immediate notification, long term housing facilities, competent medical care for radiation exposures, funding for large displaced populations and full disclosure of real time radioactive release measurements. There must be no suppression of information and no delay. To meet this standard, major infrastructure changes must be implemented immediately. We do not accept that we be effectively told to shelter in place and suck it up.

1.

When the three GE Mark 1 reactors exploded and damaged a fourth reactor on March 11, 2011 at Dai-ichi, Fukushima Prefecture, Japan, the U.S. advised Americans within 50 miles to leave.

035-J-2-SSR, cont'd

Statement by U.S. Ambassador John V. Roos on March 16, 2011:
"The United States Nuclear Regulatory Commission (NRC), the Department of Energy and other technical experts in the U.S. Government have reviewed the scientific and technical information they have collected from assets in country, as well as what the Government of Japan has disseminated, in response to the deteriorating situation at the Fukushima Nuclear Power Plant. Consistent with the NRC guidelines that apply to such a situation in the United States, we are recommending, as a precaution, that American citizens who live within 50 miles (80 kilometers) of the Fukushima Nuclear Power Plant evacuate the area or to take shelter indoors if safe evacuation is not practical."
http://www.whitehouse.gov/issues/foreign-policy/japan-earthquake-tsunami

We recognize that a 50 mile evacuation zone could be insufficient and is only a starting point in addressing risk to the public. At Dai-ichi "....What if the already severely- damaged (and, as it seems, slightly leaning) reactor building collapses and the spent fuel pool {no. 4} crashes down, perhaps triggering a spent fuel fire? This could lead to a worst case scenario that was drawn up in March 2011 by Prof. Kondo, Chairman of the Japan Atomic Energy Commission (JAEC), would still apply. Evacuation of over 10 million residents in the wider Tokyo megalopolis within a 250-km radius of Fukushima Daiichi, depending on wind direction, may be required." page 62. http:// www.worldnuclearreport.org .

Like Dai-ichi reactors, there are 23 GE Mark 1 reactors in the U.S. including Fermi 2, Monroe, MI. It has a problematic history and the same highly criticized weak containment design. It has a cooling pool 4 stories up outside the containment that is overcrowded with highly radioactive withdrawn fuel rods. Fermi 2 has the same risk of loss of coolant accident from weather related damage or terrorist attack as the Dai-ichi reactors. DTE's proposed unsafe reactor, Fermi 3, offers additional serious risk.

Our present unacceptable situation:

- Can millions of people be quickly evacuated from the proposed 50 mile zone around Fermi? No.
- What provision or plan is there for you and others if you must be evacuated, can't return to your home or your job and have no assets to turn to? None.
- Will the reactor owner or a governmental entity notify the public of an accident in a timely manner? No. That hasn't happened around the world in the 28 reactor accidents on record.
- Would the U.S. government license, finance (federal loan guarantees), and indemnify (Price-Anderson Act) a reactor knowing it is unsafe? Yes. Fermi 1, 23 GE Mark 1 reactors, and NRC's positive appraisal of Fermi 3. Other documented problematic reactors are allowed to continue operating. Unsafe reactors have been documented by Beyond Nuclear http: www.beyondnuclear.org and Nuclear Information and Resource Service http://www.nirs.org/reactorwatch/aging/aginghome.htm

Alliance to Halt Fermi 3 P.O. Box 511001, Livonia, MI 48151 AFTH3.ORG
Vic Macks vicmacks3@gmail.com 586-779-1782 Map created by Art Myatt, Sierra Club

2.

Radiation Releases From Nuclear Reactors

National Academy of Sciences, Committee on the Biological Effects of Ionizing Radiation (BEIR) has stated that all ionizing radiation including low levels can produce broad spectrum non-malignant illnesses and cancer, morbidity, as well as genetic mutations. The BEIR report defines low level radiation as near zero to 100 millisieverts (mSv).
http://www8.nationalacademies.org/onpinews/newsitem.aspxRecordID=11340 035-J-3-HH
See also: http://www.radiation.org/about/index.html

This is ignored, dismissed, and trivialized by the NRC recurrently over decades of statements. Fermi 2, like all reactors has stipulated designed radiation releases into the biosphere continuously. Degraded equipment, operator error, and accidents expand the public exposure to ionizing radiation. The public is not provided with actual real time measurements and is misled by NRC/industry statements conflating "allowable" limits with "safe" or "legal" limits. "Legal limit" is also misleading in that there is no punishment, sanction, or penalty for exceeding it. The cumulative effect of release exposures, varying in dose, experienced over time, are addressed by the NRC as though each release were one time only in impact on human cell tissue and the rest of the biosphere. The reality ignored by the NRC is that years or a lifetime of exposure to releases from nuclear reactors, added to the fallout from nuclear weapons production and testing, nuclear medicine, X rays, (all man made sources) have been producing illness, morbidity, and genetic mutations. It is convenient for the NRC, the National Nuclear Security Administration(NNSA) and the nuclear industry to address a given ionizing radiation exposure as though it existed in isolation and is not additive to all of the rest of releases and ongoing exposures around the region, the nation, and the world currently and historically and to behave as though once forgotten, ionizing radiation ceases to exist.

There is a cynicism in the NRC, the NNSA, and the nuclear industry not being upfront in stating clearly to the public that the decision was made in the 1940s, and continuing in the present, that there will be man made ionizing radiation releases into the biosphere, that those releases will be whatever the nuclear regulators/industry decides and that the exposures will increase. Indeed, they have increased. Ionizing radiation and radionuclide particles move about the world, are ingested and breathed in and bioaccumulate up the food chain. They assault human cell tissue and the rest of the biosphere, in accord with their dose and half lives. A problematic issue, obfuscated, unmeasured, unstudied——to that extent and intentional——doesn't exist in the public mind. A result desired and intended by nuclear advocates beginning with the Manhattan Project.

Cancer Deaths from Fermi 2

Center for Disease Control statistical analysis shows that there is a significantly higher incidence of cancer deaths for Monroe, MI residents compared with incidences for the U.S. as a whole. This increase in Monroe cancer deaths correlates with the Fermi 2 going to full power. This is ignored by the NRC and Detroit Edison: 035-J-4-HH

RPHP
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4.

Joseph J. Mangano, MPH, MBA, is Director, Secretary, and the Executive Director of the Radiation and Public Health Project.

Mr. Mangano is a public health administrator and researcher who has studied the connection between low-dose radiation exposure and subsequent risk of diseases such as cancer and damage to newborns.
He has published numerous articles and letters in medical and other journals in addition to books, including Low Level Radiation and Immune System Disorders: An Atomic Era Legacy. There he examines the connection between radiation exposure and current widespread health problems.

RISING LOCAL CANCER RATE SUGGESTS LINK WITH FERMI REACTOR

January 14, 2009 - The cancer death rate in Monroe County has been rising since the late 1980s, when the Fermi 2 nuclear reactor began operating, according to a new analysis.

The rise in cancer has been sharpest among children and adolescents, who are most susceptible to the harmful effects of radiation exposure. The analysis uses official data from the U.S. Centers for Disease Control and Prevention.

"The increasing cancer death rate among Monroe County residents, especially young people, suggests a link with the radioactive chemicals emitted from the Fermi reactor," says Joseph J. Mangano MPH MBA, Executive Director of the Radiation and Public Health Project research group. "Because Monroe County has a low risk population that is well educated, high income, and has few language barriers, rising cancer rates are unexpected, and all potential causes should be investigated by health officials."

035-J-4-HH cont'd

Fermi 2 reactor began "operating" June 21, 1985. However, it ran very little after the initial low-power start-up until a warranty run in January of 1988, marking the commercial start-up of the reactor. In the early 1980s, the Monroe County cancer death rate was 36th highest of 83 Michigan counties, but by the early 2000s, it had moved up to 13th highest. *From 1979-1988, the cancer death rate among Monroe County residents under age 25 was 21.2% below the U.S. rate. But from 1989-2005, when Fermi 2 was fully operational, the local rate was 45.5% above the U.S.*

All nuclear reactors produce electricity by splitting uranium atoms, which creates high energy needed to heat water. This process also creates over 100 radioactive chemicals, not found in nature, including Strontium-90, Cesium-137, and Iodine-131.

While most of these chemicals are retained in reactors and stored as waste, a portion is routinely released into the local air and water. They enter human bodies through breathing and the food chain, and raise cancer risk by killing and injuring cells in various parts of the body. They are especially harmful to children.

The findings come at a time when a new nuclear reactor has been proposed at the Fermi plant. The original Fermi 1 reactor, which was the site of a "Partial Core-Melt Accident" in 1966, shut permanently in 1972.

DATA ON CANCER RISK FROM FERMI 2 RADIOACTIVE EMISSIONS

- The Fermi 2 reactor is located in Monroe County, and started on June 21, 1985, not becoming fully operational until January 1988.
- Fermi 2 came close to a meltdown on March 28, 2001 and August 14, 2003. (1)
- Fermi 2, like all reactors, routinely emits over 100 radioactive chemicals into air and water.
-Each of these chemicals causes cancer, and is most harmful to infants and children.
- For cancer deaths for all ages (whites only), Monroe County ranked
  36th highest of 83 Michigan counties in 1979-1983 (before startup)
  13th highest of 83 Michigan counties in 2000-2005 (latest data) (2)
- The Monroe County cancer death rate age 0-24
  was 21.1% below the U.S. in 1979-1988 (before/during startup)
  was 45.5% above the U.S. in 1989-2005 (after startup) (3)

035-J-4-HH, cont'd

Monroe County has no obvious cancer risk. It has a high income, low poverty, well educated population with few language barriers and access to excellent medical care in nearby Detroit. (4) Thus, an increase in cancer (especially to children) is unexpected. This change should be investigated, and one potential cause should be radioactive emissions from Fermi.

Sources:

1. Fermi 2 incurred "near miss" accidents on March 28, 2001 (emergency diesel generator was inoperable for over 7 days) and August 14, 2003 (loss of offsite power due to northeast blackout). Source: Greenpeace USA. An American Chernobyl: Nuclear "Near Misses" at U.S. Reactors Since 1986. www.greenpeace.org, April 26, 2006.

2. U.S. Centers for Disease Control and Prevention, http://cdc.wonder.gov, underlying cause of death. Death rates are adjusted to 2000 U.S. standard population. Includes ICD-9 codes 140.0-239.9 (1979-1983) and ICD-10 codes C00-D48.9 (2000-2005). Whites account for over 95% of Monroe residents.

3. Cancer Death Rates, Monroe County vs. U.S.
1979-1988 and 1989-2005, age 0-24

	Monroe County		Deaths/100,000 Pop.		
Period	Cancer Deaths	Avg. Pop.	Monroe	U.S.	%vs. US
1979-1988	22	56,234	3.91	4.96	- 21.2%
1989-2005	42	51,407	4.86	3.79	+45.5%

Source: U.S. Centers for Disease Control and Prevention, http://cdc.wonder.gov, underlying cause of death.
Includes ICD-9 codes 140.0-239.9 (1979-1983) and ICD-10 codes C00-D48.9 (2000-2005). Increase in rate significant at p<.05.

4. Demographic Comparison, Monroe County vs. U.S.

Indicator	Monroe	U.S.
2006 Population	155,035	299,398,484
2000 % Foreign Born	1.9	11.1
2000 % Language other than English spoken at home, age 5+	4.0	17.9
2000 % High School graduates, age 25+	83.1	80.4

6.

2000 % Homeownership	81.0	66.2
2004 Median Household Income	$53,838	$44,344
2004 % Below Poverty	8.7	12.7

Source: U.S. Census Bureau, www.census.gov, 2000 population, State and County Quick facts

035-J-4-HH, cont'd

Nuclear Accidents, Explosions and Meltdowns Are Not Only Historical But Also Current Events In Accord With The Dose and Half Lives of The Radionuclides Released

Kyshtym: Deaths occurred in the Soviet Union From this Nuclear Reactor Explosion.
"...Catastrophe at Kyshtym Soviet Union Ural Mountains 1957 a massive explosion at radioactive dump site: "There was an enormous explosion, like a violent volcano," Medvedev explained. "The nuclear reactions had led to an over-heating in the underground burial grounds. The explosion poured radioactive dust and materials high up into the sky." The human fallout was "terrible. . . . Tens of thousands of people were affected, hundreds dying, though the real figures have never been made public. The large area, where the accident happened, is still considered dangerous and is closed to the public." p.166 http://www.ratical.org/radiation/KillingOurOwn/KOO.pdf
This is rated 6 (scale 1 to 7) on the International Nuclear Events Scale.

035-J-5-SSR

Deaths at Three Mile Island March 28, 1979 http://www.ratical.org/radiation/KillingOurOwn/KOO.pdf
"... Radiation escaped through the containment. Radioactive water leaked into the Susquehanna River. Finally, a hydrogen bubble developed in the core, apparently threatening an explosion. ....unknown quantities of radiation escaped into the air of central Pennsylvania." (p.186)

"....It was impossible to tell how much radiation really escaped. The monitors merely recorded a minimum amount..." according to NRC " ....Inside the building readings showed a minimum of a million millirems per hour, a lethal dose. On site, the day of the accident, monitors 1000 feet from the vent stack showed levels of 365 millirems of beta and gamma rays per hour. A helicopter directly over the vent stack measured emissions three times as high. Even those measurements were "very inconclusive," said Gibson. They showed dose rates "only at the moments the measurements were made." Without full knowledge of weather patterns, he admitted, "we don't know if they were made at the appropriate locations." Thus Gibson had told his NRC superiors that one of the key methods of measuring emissions—the stack monitors—had been essentially useless during and after the accident." p. 188 This is rated 5 on the International Nuclear Events Scale.

Animals died at Three Mile Island. People Died at Three Mile Island. See Chapters 13 and 14.
"In December of 1979, Sternglass carried his conclusions much further. In a paper delivered to the Fifth World Congress of Engineers and Architects at Tel Aviv, he said that data from the U.S. Bureau of Vital Statistics showed that there were "242 [infant] deaths (from TMI) above the normally expected number in Pennsylvania and a total of 430 in the entire northeastern area of the United States," a rise of clear statistical significance. The linkage with TMI was clear because "large amounts of radioactive Iodine-131 were released from the plant" and the peak of infant mortality came within a matter of months thereafter. The greatest rises took place near the plant, with effects decreasing as a function of distance away from Harrisburg."
".....But I-131 was not the only radioactive element released from TMI—nor were infants the only humans likely to be harmed. Strontium 90, cesium 137, noble gases, and other disease-causing isotopes may also have escaped. Overall, said Sternglass, increases in cancers, leukemia, and a wide range of other diseases were "likely to occur.....many thousands over the next 10 to 20 years."
Additional Health studies at Three Mile Island: http://www.tmia.com/taxonomy/term/12

7.

Chernobyl 1986: meltdown with multiple explosions and release of radioactive material. 100,000 people evacuated from the immediate area and 300,000 from areas of heavy fallout in Ukraine, Belarus, and Russia. Exclusion zone of approximately 1,000 square miles indefinitely off limits for human habitation.
Excerpts from: CHERNOBYL Consequences of the Catastrophe for People and the Environment Yablokov, Vassily Nesterenko, and Alexey Nesterenko published by license from New York Academy of Sciences March 15, 2011 http://www.strahlentelex.de/Yablokov%20Chernobyl%20book.pdf

"Emissions from this one reactor exceeded by hundredfold the radioactive contamination of the bombs dropped on Hiroshima and Nagasaki. No citizen of any country can be assured that he or she can be protected from radioactive contamination. One nuclear reactor can pollute half the globe. Chernobyl fallout covered the entire Northern Hemisphere..." page 2

Thousands of reports and studies in Russia, Belarus, and Ukraine document a wide range of illness and death from the Chernobyl explosion. Excerpts below are marked with page notation where the subject addressed is found in the book:

035-J-5-SSR, cont'd

p. 27 "....contamination not less than 300 years for Cs-137 and Sr-90, more than 200,000 years for Pu, and several thousand years for Am-241.....tens of millions of people will live under measurable chronic radioactive contamination for decades to come...."
p. 32 ".... nearly 400 million human beings have been exposed to Chernobyl's radioactive fallout and for many generations, they and their descendants will suffer the devastating consequences...."
42-50 ".... comparing heavily contaminated with less contaminated areas: general morbidity increased significantly....range of illness increased: Weakness, dizziness, headache, fainting, nose bleeds, fatigue, heart arrhythmia's, stomach pain, vomiting, heartburn, loss of appetite, allergy, chronic gastroenteric pathology, dodentitis, gallbladder inflammation, vascular and heart syndromes, low birth weight...."

p. 55 ".... Chernobyl catastrophe produced accelerated aging. multiple illnesses characteristic of aging were seen many years sooner...."

p. 58 ".... there is a high incidence of non-malignant diseases in people heavily contaminated including: brain damage, premature cataracts, tooth and mouth abnormalities, blood, lymphetic, heart, lung, gastrointestinal, urologic, bone, and skin diseases. endocrine dysfunction, thyroid disease including cancer, genetic damage and birth defects, immunological abnormalities and increases in viral, bacterial and parasitic disease...."

p. 65 ".... a common reason for functional impairment of blood, blood forming organs, and circulatory system is radioactive destruction of the endothelium, the covering surface of vessels...."
"....incidence of chromosomal aberrations is significantly higher in all the territories contaminated by Chernobyl...."

p. 71 ".... there is a high increases of Down Syndrome, 30-49%..."

p.75 "....the 2nd and 3rd generations of children whose parents were irradiated by the atomic bomb explosion in Japan in 1945 suffered 10 fold more circulatory system diseases and impaired liver function and 3.3 fold more respiratory system illness than a control group...."

p. 76 "The overwhelming majority of Chernobyl induced genetic changes will not become apparent for several generations."

8.

p. 77 "The Chernobyl radiation is genetically much more dangerous than that released in Hiroshima and Nagasaki as the quantity of radionuclides emitted from the chernobyl meltdown was several hundred fold higher and there were more different kinds of radionuclides."

"The genetic consequences of the Chernobyl catastrophe will impact hundreds of millions of people, including:(a)those who were exposed to the first release of short-lived radionuclides in 1986, which spread worldwide...(b) those who live and will continue to live in the territories contaminated by Sr-90 (strontium)and Cs-137 (cesium), as it will take no fewer than 300 years for the radioactive level to decrease to background; (c) those who will live in the territories contaminated by Pu (plutonium) and Am (Americum) as millennia will pass before that deadly radioactivity decays; and (d)children of irradiated parents for as many as seven generations (even if they live in areas free from Chernobyl radionuclide fallout)...."

035-J-5-SSR, cont'd

83 "In all of the contaminated territories, there is a marked increase in nonmalignant thyroid diseases....delayed healing of wounds and ulcers, delay in growth of hair, dryness, fragility, hair loss, increased susceptibility to respiratory infections, night blindness, ringing in the ears, headaches, fatigue and lack of energy, lack of appetite (anorexia) delayed growth in children, male impotence, increased bleeding...."

p. 87 ".... Chernobyl radiation suppresses immunity..."

p. 92 "....marked increase in respiratory system morbidity everywhere in the territories contaminated by Chernobyl."

p. 96 "For children of the hibakusha who were not irradiated directly, the incidence of respiratory system illnesses was higher compared to controls some decades after the bombardment."

p. 102 "Urogenital tract diseases and reproductive disorder: abnormalities in spermatozoa, reproductive failures, birth abnormalities in children... '

p. 102 ".... bone and muscle diseases: cases of children born practically without bones ("jelly fish-children"), a condition seen previously only in the Marshall Islands after the nuclear tests of the 1950s"

p. 105 "....diseases of the nervous system and sense organs and their impact on mental health: low levels of ionizing radiation changes in both central and autonomic nervous systems and can cause encephalopathy.....significant morbidity was documented in contaminated territories...."

p.112 "...45% of children born to mothers who went through Hiroshima and Nagasaki nuclear bombardment were diagnosed with intellectual retardation...."

p. 133 "The occurrence of congenital malformations continues to increase in several of the contaminated territories and correlates with the level of irradiation..."

p. 162 "There are 2 ways to define the scale of cancer morbidity associated with the Chernobyl catastrophe: (1) on the basis of calculated received doses (with application of appropriate risk factors) and (2) by direct comparison of cancer morbidity in the heavily and less contaminated territories."

p.174 "In Connecticut there were two separate fallouts of Chernobyl radionuclides (in the middle of May and the second half of June, 1986), resulting in a 7 to 28-fold increased level of I-131 in milk.

9.

The rate of thyroid cancer among Connecticut children under the age of 15 years rose sharply (from 0.16 to 0.31 per 100,000) from 1985-1989 to 1990-1992. During the same period rates of thyroid cancer for all age groups jumped to 23% (from 3.46 to 4.29 per 100,000), after 10 previous years without change."

p.174 "The added risk of thyroid cancer after Hiroshima and Nagasaki radiation was highest 10-15 years later, with cases appearing 40-50 years afterward."

035-J-5-SSR, cont'd

p. 192 " Mortality after Chernobyl: "A detailed study reveals that 3.8-4% of all deaths in the contaminated territories of Ukraine and Russia from 1990 to 2004 were caused by the Chernobyl catastrophe. The lack of evidence of increased mortality in other affected countries is not proof of the absence of effects from the radioactive fallout. Since 1990, mortality among liquidators (mitigation workers) has exceeded the mortality rate in corresponding populations groups. From 112,000 to 125,000 liquidators died before 2005---that is, some 15% of the 830,000 members of the Chernobyl cleanup teams. The calculations suggest that the Chernobyl catastrophe has already killed several hundred thousand human beings in a population of several hundred million that was unfortunate enough to live in territories affected by the fallout. The number of Chernobyl victims will continue to grow over many future generations."

210 "The overall mortality for the period april 1986 to 2004....estimated at 985,000 deaths....Given the half-life of the two main radionuclides (Cs-137 {Cesium} and Sr-90 {Strontium}),of approximately 30 years each, the radioactive load in the contaminated territories will decrease about 50% for each human generation. The concentration of Pu {Plutonium},Cl-36 {Chlorine}, and Tc-99 {Technetium} will remain practically the same forever (half-lives consequently more than 20,000 and 200,000 years), and the concentration of Am-241 {Americum} which is a decay product of Pu-241, will increase over several generations."

p. 223 "Air particulate activity over all of the Northern Hemisphere reached its highest levels since the termination of nuclear weapons testing---sometimes up to 1 million times higher than before the chernobyl contamination. There were essential changes in the ....structure of the surface air in heavily contaminated territories....Many years after the catastrophe aerosols from forest fires have dispersed hundreds of kilometers away...."

p. 225 "Three Chernobyl clouds entered eastern Canada...(in 1986). The fallout included..."(15 radionuclides).

p. 226 3 radionuclides from Chernobyl reached the U.S. and were measured and recorded by the U.S. EPA.

p. 232 "Levels of radioactive contamination even in North America and Asia are above the maximun levels that were found in the wake of weapons testing in the 1960s"

p. 237 "Chernobyl irradiation has caused structural anomalies and tumor like changes in many plant species. Unique pathological complexes are seen...."

p. 255 "Radioactive shock when the Chernobyl reactor exploded in 1986 combined with chronic low dose contamination has resulted in morphologic, physiologic, and genetic disorders in every animal species that has been studied----mammals, birds, amphibians, fish, and invertebrates."

10.

p. 273 "...an enormous amount of many different radionuclides was absorbed by animals through food, water and air. Levels were sometimes hundreds of times higher than precatastrophe ones....The levels of incorporated radionuclides in some areas of Europe remain dangerous for mammals, birds, amphibians, and fish."

035-J-5-SSR, cont'd

287 "The reluctance on the part of officialdom to acknowledge the truth about Chernobyl's consequences has led to concerned citizens organizing to find additional sources of information to help those who are suffering. Hundreds of such public local, national, and international organizations have been created,,,"

p. 287 Andrei Sakharov and 2 others "....in 1987 initiated the Belorussian Institute for Radiation Safety (BELRAD), an independent public organization devoted to helping Belorussian children---those suffering most from the catastrophic contamination. BELRAD has collected an extensive database for 24 years and is unique as a center for scientific and practical information."

p .289 "In many European countries level of I-131,Cs-134/137, Sr-90 and other radionuclides in milk, dairy products, vegetables, grains, meat, and fish increased dramatically (sometimes as much as 1,000 fold) immediately after the catastrophe. Up until 1991, the United States imported food products with measurable amounts of Chernobyl radioactive contamination, mostly from Turkey, Italy, Austria, West Germany, Greece, Yugoslavia, Hungary, Sweden, and Denmark....Given that more than 90% of the current radiation fallout is due to Cs-137, with a half-life of about 30 years, we know that the contaminated areas will be dangerously radioactive for roughly the next three centuries."

311 "Owing to internally absorbed radionuclides, radiation levels for individuals living in the contaminated territories of Belarus, Ukraine, and Russia hae been increasing steadily since 1994."

p. 316 "Today the most serious contaminating agents are Cs-137 and Sr-90. In coming years the situation will change and Am-241 will present a serious problem....constant monitoring and control (will be) required for Cs-137 and Sr-90 for at least 150-300 years....The contamination from the wider spectrum of radioisotopes is dynamic and will require constant monitoring and control essentially forever."

p. 318 "More than 50% of Chernobyl's radionuclides were dispersed outside of Belarus, Ukraine, and European Russia.....nearly 5 million people are still being exposed to dangerous contamination. The increase in morbidity, premature aging, and mutations is seen in all the contaminated territories that have been studied. The increase in the rates of total mortality for the first 17 years in European Russia was up to 3.75% and in Ukraine is was up to 4.0% Levels of internal irradiation are increasing owing to plants absorbing and recycling Cs-137, Sr-90, Pu, and Am.

p. 319 The claim by the International Atomic Energy Agency (IAEA), the united Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) and several other groups that the Chernobyl radioactive fallout adds "only" 2% to the natural radioactive background ignores several facts: First, many territories continue to have dangerously high levels of radiation. Second, high levels of radiation were spread far and wide in the first weeks after the catastrophe. Third, there will be decades of chronic low-level contamination after the catastrophe. Fourth, every increase in nuclear radiation has an effect on both somatic and reproductive cells of all living things....There is no justification for the fact that specialists from IAEA and the World Health Organization (WHO) (Chernobyl Forum, 2005) completely neglected to cite the extensive data on the negative consequences of radioactive contamination in areas other than Belarus, Ukraine, and European Russia, where about 57% of the Chernobyl radionuclides were deposited."

11.

50% of Chernobyl's fallout was outside of European Russia, Belarus, and the Ukraine.
Heavily contaminated agricultural land taken out of use: Belarus, 265,000 hectares (654,550 acres); Ukraine, 130,000 hectares (321,100 acres); Russia, 17,000 hectares (41,990 acres) total equals 1,017,640 acres withdrawn (page 312)

035-J-5-SSR cont'd

Chernobyl: Consequences of the catastrophe 25 years later
by Janette D. Sherman, M.D., and Alexey V. Yablokov, Ph.D.
published April 26, 2011 article and interview by Democracy Now at
http://sfbayview.com/2011/chernobyl-consequences-of-the-catastrophe-25-years-later/print/

In the first 25 years after the multiple Chernobyl explosions, mitigating costs reached 500 billion dollars and Belarus spends 20% of its national annual budget to mitigate some of the consequences.

"Data from multiple scientists estimate the overall mortality from the Chernobyl catastrophe, for the period from April 1986 to the end of 2004, to be 985,000, similar to those of Gofman (1994a) and Bertell (2006) and a hundred times more than the WHO/IAEA estimate."

An agreement signed on May 28, 1959, at the 12th World Health Assembly obligates the World Health Organization (WHO) to submit public releases bearing on nuclear energy to the International Atomic Energy Agency (IAEA) for approval. The IAEA's mandate is to promote nuclear energy. Chernobyl is rated 7 on the International Nuclear Events Scale.

Dai-ichi, Fukushima
Three GE Mark 1 reactors exploded and damaged a fourth reactor and 2 cooling pools holding withdrawn fuel rods on March 11, 2011. Fatal doses of radiation have been acknowledged near reactors 1 and 2 and measuring devices gave their maximum possible reading (off scale) of 10 sieverts per hour. This followed crippling explosions that destroyed the reactor buildings. The reactors have continued to spew radiation since the disaster. Food and agricultural land contamination prevents use of land and food crops and one group of 1000 children were found to have radioactive iodine thyroid contamination. Evidence shows that cooling pipes were known to be deteriorated, and that the earth quake caused loss of cooling and the melt down before the tsunami hit which in turn knocked out the back-up generators. This puts at risk all of the other aging reactors of this same design in Tokyo as well as here in the U.S---including Fermi 2---., especially those on earth quake faults. Fall out from Dai-ichi reactors has been measured across the U.S.
The Japanese government and the IAEA are protecting the nuclear industry and not the people of Japan by claiming that Fukushima is stable when it is not; by substantially raising the "allowable limit" of radiation for the people; by allowing return to evacuated areas; and by planning on incinerating radioactive material and dumping the radioactive ash into Tokyo Bay. The U.S. State Department exuded support stating that Japan had made "the right decision". The Japanese people will now be "allowed" to experience up to 20 millisieverts. This is 10 times higher than allowable dose for U.S. nuclear workers. The claim that a "cold shut down" has been achieved is misleading. The jury rigged piping cooling the damaged reactors is not earth quake safe and there is a high likelihood of an earth quake that would return the reactors to meltdown again. The IAEA is not a UN agency as is often claimed. It's purpose as expressed in article 2 of its mission statement is to "...seek to accelerate and enlarge atomic energy..." around the world. The current head of the IAEA is a former Japanese nuclear regulator. Japan has and continues to put large amounts of radiated water into the ocean. The assault on people and the rest of the biosphere represented by the Fukushima catastrophe is a current reality that will be played out into the indefinite future. This is rated 7 on the International Nuclear Events Scale.
http://fairewinds.com/content/tepco-believes-mission-accomplished-regulators-allow-radioactive-dumping-tokyo-bay

12.

"...Both short-lived radioactive elements, such as iodine-131, and longer-lived elements — such as cesium-137, with a half-life of 30 years — can be absorbed by phytoplankton, zooplankton, kelp, and other marine life and then be transmitted up the food chain, to fish, marine mammals, and humans. Other radioactive elements — including plutonium, which has been detected outside the Fukushima plant — also pose a threat to marine life....The Tokyo Electric Power Company (TEPCO) has reported that seawater containing radioactive iodine-131 at 5 million times the legal limit has been detected near the plant. According to the Japanese news service, NHK, a recent sample also contained 1.1 million times the legal level of radioactive cesium-137. Studies from previous releases of nuclear material in the Irish, Kara and Barents Seas, as well as in the Pacific Ocean, show that such radioactive material does travel with ocean currents, is deposited in marine sediment, and does climb the marine food web. In the Irish Sea — where the British Nuclear Fuels plant at Sellafield in the northwestern United Kingdom released radioactive material over many decades, beginning in the 1950s — studies have found radioactive cesium and plutonium concentrating significantly in seals and porpoises that ate contaminated fish. Other studies have shown that radioactive material from Sellafield and from the nuclear reprocessing plant at Cap de la Hague in France have been transported to the North Atlantic and Arctic Oceans. A study published in 2003 found that a substantial part of the world's radioactive contamination is in the marine environment....So far, the Japanese government and TEPCO have provided only limited data on marine contamination from the Fukushima plant. Given the emergency situation, independent monitoring along the coast is difficult, said Jan Beránek, director of Greenpeace International's nuclear energy project. On April 5, the Japanese government set its first standards for allowable levels of radioactive material in seafood. A number of countries have banned seafood imports from Japan. The U.S. has barred food imports from the prefectures closest to Fukushima and the Food and Drug Administration says it is closely monitoring imported food products, including seafood, for radiation contamination....
http://e360.yale.edu/feature/radioactivity_in_the_ocean_diluted_but_far_from_harmless/2391/

The New York Times reported on 8-8-11: "....In interviews and public statements, some current and former government officials have admitted that Japanese authorities engaged in a pattern of withholding damaging information and denying facts of the nuclear disaster — in order, some of them said, to limit the size of costly and disruptive evacuations in land-scarce Japan and to avoid public questioning of the politically powerful nuclear industry. As the nuclear plant continues to release radiation, some of which has slipped into the nation's food supply, public anger is growing at what many here see as an official campaign to play down the scope of the accident and the potential health risks....Meltdowns at three of Fukushima Daiichi's six reactors went officially unacknowledged for months. In one of the most damning admissions, nuclear regulators said in early June that inspectors had found tellurium 132, which experts call telltale evidence of reactor meltdowns, a day after the tsunami — but did not tell the public for nearly three months. For months after the disaster, the government flip-flopped on the level of radiation permissible on school grounds, causing continuing confusion and anguish about the safety of schoolchildren here in Fukushima...On July 4, the Atomic Energy Society of Japan, a group of nuclear scholars and industry executives, said, "It is extremely regrettable that this sort of important information was not released to the public until three months after the fact, and only then in materials for a conference overseas." 035-J-5-SSR, cont'd
http://www.nytimes.com/2011/08/09/world/asia/09japan.html?_r=1&sq=japan%20radiation&st=cse&scp=1&pagewanted=print#
Japan, in response to the Dai-ichi reactor explosions, has raised the civilian exposure to nuclear radiation 20 times higher to 20 millisieverts per year to allow habitation of contaminated areas. At that rate, one young girl in every 100 would develop cancer for every year they are exposed. However, examining BEIR VII, National Academies of Science, Committee on the Biological Effects of Ionizing

13.

Radiation, in relation to 20 millisieverts yearly exposure, at least one out of 20 girls with that exposure for 5 years will develop cancer. http://www.fairewinds.org/?s=Cancer+Risk+To+Young+Children+Near+Fukushima+Daiichi+Underestimated

035-J-5-SSR, cont'd

"Total atmospheric releases from Fukushima so far are between 5.6 and 8.1 times that of Chernobyl, according to the 2013 World Nuclear Industry Status Report. Prof. Komei Hosokawa, who wrote the Fukushima section, (said)....Japan has decided that fish contaminated with fewer than 100 Becquerels per kilogram (Bq/kg) of cesium-137 is good enough to eat. Some local officials have set a stricter bar of 50 Bq/kg.
In the U.S. the permissible level of cesium in food is 1,200 Bq/kg. Canada allows 1,000 Bq/kg. The difference is startling. The huge discrepancy allows importation by the U.S. and Canada of what Japan considers highly contaminated fish, vegetables and meat. Rice, fish, beef and other Japanese exports poisoned by nuclear power's single worst nightmare is doubtless being consumed in the United States....The Seattle Times reported last October that researchers found small amounts of Fukushima's cesium in albacore tuna caught off the coasts of Washington and Oregon. The albacore warning followed the May 2012 and Feb. 2013 findings of cesium-contamination in Blue fin tuna caught off California.
The Huffington Post said Aug. 28 that out of 170 types of fish tested in the Fukushima area, 42 species were put off limits. CBS News put it a little differently Aug. 20, noting that in the same region only 16 types of fish are considered safe to catch, compared with 150 types before the catastrophe. Japanese public television reported July 11 that sea bass were found with 1,037 Bq/kg, or ten times the allowed contamination. The Tokyo daily Asahi Shimbun noted Aug. 29, 2013 that a greeling had 25,800 Bq/kg cesium, an all-time record in the 2 ½ years since the radiation gusher began. Pacific cod and black sea bream had 3,300 Bq/kg...." http://www.counterpunch.org/2013/10/23/fukushimas-radiation-gusher/print

7-24-14 "TEPCO has announced that they estimate some 1.1 trillion becquerels of radiation was released during debris cleanup operations at the Fukushima Dai-ichi Unit 3 reactor. According to TEPCO's estimates the removal work generated 280 billion becquerel per hour releases.
Some of the radioactive cesium which was released during the debris removal operations was found over 12 miles away in Minami Soma rice fields..."
http://enformable.com/2014/07/fukushima-daiichi-unit-3-debris-removal-operations-released-280-billion-becquerels-per-hour/?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+Enformable+%28Enformable%29

Seventy-nine U.S. sailors or their relatives sued the plant operator, Tokyo Electric Power Co., for $1 billion in medical costs and damages this week, alleging that the sailors were exposed to dangerous levels of radiation when the aircraft carrier USS Ronald Reagan was diverted to Japan to help with evacuation and rescue efforts. http://www.nbcnews.com/news/world/two-quakes-strike-near-fukushima-us-sailors-sue-over-cleanup-n25271

"Fukushima Meltdown Driving Increased Abnormalities Among US Infants....According to a new study (.pdf) published in the Open Journal of Pediatrics, children born in Alaska, California, Hawaii, Oregon and Washington between one week and 16 weeks after the meltdown began are 28 percent more likely to suffer from congenital hypothyroidism (CH) than were kids born in those states during the same period one year earlier...."
http://www.commondreams.org/search/site/Fukushima%20Meltdown%20Driving%20Increased%20Abnormalities%20Among%20US%20Infants

14.

Other reactor incidents, malfunctions and accidents:

Chalk River, Ontario: 1952 and 1958: 1000 rads per hour exposure to a large number of people and area for days as a fuel rod had burned. 300 Canadian Armed Forces personnel were brought in for the clean up effort. This is rated 5 on the International Nuclear Events Scale (INES).

Idaho Falls, Idaho 1955; 1961 An explosion occurred and worker radiation meters read 1000 rads. Three workers were dead, one impaled on a fuel rod stuck to the ceiling. Even those well suited in protective clothing and limited to 60 seconds time of exposure in addressing the crisis absorbed 30 rads of radiation.

1957 Windscale, England: Information withheld from the public. The public lied to. Contaminated food, animals and agricultural land. A cover up occurred and fallout reached London, 300 miles away. This is rated 5 on the International Nuclear Events Scale.

1958 Vinca, Serbia A criticality excursion radiated 6 scientists with doses of 2-4 Sv This was rated 5 on the International Nuclear Events Scale.

1959 Santa Susana, CA Partial core meltdown resulting in release of radioactive gases.

1960 Westmoreland County, Pennsylvania A core meltdown resulted in release of 2 million gallons of contaminated water, some of which resulted in Sr-90 detected in ground water and soil contamination.

1964 Charlestown, Rhode Island A criticality accident in which one worker was exposed to 10,000 rad of radiation and two others 100 rad.

1966 The Soviet ship Lenin experienced a (likely) meltdown resulting in the death of at least 30 crew and the dumping of the reactor and fuel into the Kara Sea.

035-J-5-SSR, cont'd

1967 Dumfries and Galloway, Scotland Fuel meltdown and fire.

1969 Lecens, Switzerland Power excursion contaminated containment area resulting in it being permanently sealed off.

1975 Greifswald, Germany Excessive heating damaged 10 fuel rods, attributed to poor construction. INES level 3.

1977 Jaslovske Bohunice, Slovakial Accident damaged fuel integrity and resulted in reactor decommissioning. INES Level 4.

1980 Orleans, France Rupture of fuel bundles resulted in a release of nuclear materials. Rated level 4 on INES.

1981 Tsuruga, Japan Radioactive materials released into the Sea of Japan. More than 100 workers exposed to doses of up to 155 millirems per day of radiation during repairs. Level 2 on the INES.

1983 Buenos Aires, Argentina Accidental criticality resulting in fatal 2000 rad of gamma and 1700 rad of neutron radiation to one worker and up to 35 rad to 17 people outside the reactor. INES level 4.

1986 Hamm-Uentrop, Germany Reactor malfunction resulted in radioactive release detected two kilometers away.

1993 Tomsk, Russia Explosion at this plutonium reprocessing facility caused release of Pu 239 and other radionuclides 20 km beyond the facility property exposing the village of Georgievka and 160 on-site workers and 2,000 cleanup workers to doses of up to 50 mSv. INES level 4.

1999 Ishikawa Prefecture, Japan Uncontroled sustained reaction due to operator error. Reactor owner did not report this incident and falsified records, covering it up until 2007. INES level 2.

1999 Ibaraki Prefecture, Japan Accidental criticality due to operator error resulting in neutron exposure to 3 workers. Two died. 16 other workers received lesser doses of 1 mSv or greater. INES level 4.

2003 Paks, Hungary Rupture of fuel rods releasing radionuclides. INES level 3.

2005 Sellafield, England Twenty metric tons of uranium and 160 kilograms of plutonium disolved in 83,000 litres of nitric acid leaked over several months from a cracked pipe into a stainless steel sump chamber at this reprocessing plant. INES level 3.

15.

2005 Braidwood, Illinois Tritium contamination of groundwater at Exelon reactor.
2006 Erwin, TN Thirty-five litres of highly enriched uranium solution leaked during transfer into a lab at Nuclear Furl Services Plant. INES level 2.

Fermi 1: On October 5, 1966, "when Fermi 1 over heated and released radiation into and out side of the containment building operators were uncertain of what to do. Fuel had melted. Fuel distribution had shifted which could threaten a secondary major explosion. This was already beyond designed parameters and predictions that it was impossible for this to happen. The reactor had not shut down automatically. It had to be shut down manually. Operators were in a quandary as to what to do next to stave off a larger catastrophe. They did not know the cause of the problem or how to fix it. The best nuclear experts from around the country and the world were called and consulted. In 1968, a year and a half after the meltdown, after tedious efforts to examine the core of the reactor, with the risk of a severe explosion at each step and the prospect of hundreds of thousands of deaths, the piece of zirconium metal that had blocked coolant was retrieved from the bottom of the reactor. It had broken off from its installation. Its presence did not appear on the blueprints of the reactor design. In May of 1970, Fermi 1 was allowed to resume operation when 200 pounds of radioactive sodium burst out of the pipes and was doused with water causing it to flash and burn. It was doused with argon gas. Fermi 1 was closed forever on August 27, 1972. The AEC (Atomic Energy Commission) was building a new breeder reactor at Oak Ridge, TN as though Fermi 1 had never existed." Fermi 1 sits radioactive and needing to be monitored indefinitely with no resolution possible. See We Almost Lost Detroit by John Fuller 1975 Readers Digest Press. Crowell Company New York. 035-J-5-SSR, cont'd

Unsafe 23 GE Mark 1 and 8 GE Mark II Reactors
On March 21, 2013, Beyond Nuclear with 27 co-signers addressed a PETITION TO REVOKE THE OPERATING LICENSES AT GE MARK I & II BOILING WATER REACTORS IN VIOLATION OF LICENSED CONDITIONS FOR SAFE OPERATION AND RELIABLE CONTAINMENT to the Nuclear Regulatory Commission (NRC). It contained 25 petitioner concerns asserting that 23 GE Mark I and 8 GE Mark II reactors do not meet requirements for loss of offsite power, reactor cooling systems, and other events leading to nuclear fuel damage, overpressure and over-operating events challenging the containment system. Additional concerns specified were fuel pool risks, seismic risks, and unacceptable evacuation plans for accident situations.

Excerpts from the Petition:
"Whereas, all Mark I and Mark II reactor containment structures do not comply with NRC General Design Criteria 16 "Containment Design" which requires "an essentially leak tight containment against uncontrolled releases of radioactivity to the environment," as the result of a to-be anticipated accident involving reactor core fuel damage and the overpressure and over-temperature events of the Mark I and Mark II containment system.
Whereas, the NRC currently intends to mitigate by a severe accident capable containment vent the release of high pressure, high temperature, non- compressible gases including explosive hydrogen gas generated by an accident stemming from reactor core fuel damage and overheated zircoloy [zircalloy] fuel cladding interaction with water, the Commission is diversely divided by professional opinion and has by majority vote unduly and significantly delayed so as to effectively reject the timely implementation of the professional judgment of the agency's Japan Lessons Learned Project Directorate and Nuclear Reactor Regulation staff on the value to public health and safety to simultaneous vent radiation from fuel damage to the atmosphere without effective filtration by deliberately and principally defeating the conceptually flawed and structurally vulnerable Mk I and II containment system to preserve it from permanent failure;...."

16.

The NRC response: "It was determined that the proposed order requiring engineered filters was not a matter of assuring adequate protection of the public, but instead addressed very low-probability, beyond-design-basis events."

More excerpts from the Petition:
"Whereas, the Petitioners raise an issue of the undue risk to public health and safety introduced by the lack of timeliness on the part of NRC and industry as evident by Order (EA 2012-050) which requires no action on an enhanced reliable vent (specifically excluding any service for enhancing containment reliability for post-fuel damage events) before December 31, 2016, SECY 2012- 0157 for containment upgrades with no requirement for action for Options 2 through 4 before December 31, 2017, and now the undue and indeterminate delay introduced by majority the Commission Notation Vote announced March 19, 2013, with no effective Orders with deadlines specified for reliably operable containment strategies and therefore extended non-compliance with the licensed agreements established under General Design Criteria 10 and General Design Criteria 16.

Therefore, the Petitioners call for the revocation of the operating licenses for boiling water reactors with the Mark I and Mark II containment systems.
The Commission is making decisions based on financial burden to licensees that overshadows public safety.
The evacuation plan, at Limerick Generating Station, will not work.
Various plants with GE Mark I & II BWRs cannot withstand potential flooding hazards."

035-J-5-SSR, cont'd

The NRC Petition Review Board (PRB) issued a response on 3-26-14 rejecting the petition: The NRC stated: "The petition is rejected, because the concerns raised did not reveal that the licensees of the Mark I and II BWRs are in violation of their current licensing basis nor warrant that the licenses need to be revoked."
http://www.beyondnuclear.org/storage/kk-links/3%2027%2014%20ML13338A612-1.pdf

The nature of this petition was to specify failures of the GE Mark I demonstrated at Dai-ichi and to raise the human consequences and the long term impacts to the rest of the biosphere. To read this response by the Petition Review Board is to see that the NRC ignores the fact that we have the potential for a Level 7 (on a scale of 1 to 7) or greater nuclear disaster here. The NRC response is very telling in that, if it wants to say these reactors are in compliance with licensing requirements, then those requirements are meaningless for human survival. To assert, as the NRC does, that what happened at Dai-ichi can't happen here is provocative and terrifying. It lets us know that we are profoundly vulnerable not only due to nuclear reactors but also because the NRC and the nuclear industry stand in the way of our safety.

Withdrawn Nuclear Reactor Fuel Rods

035-J-6-RW

"Spent" fuel is highly flammable as well as radioactive, yet is primarily stored in densely packed pools of water that contain several times more fuel than the nuclear reactor itself. If a fuel pool is damaged or loses its cooling system, fuel rods could be exposed, overheat, and catch fire, releasing massive quantities of radioactive material. NRC refuses to address the incredible risks these facilities pose, pretending the low likelihood of an accident makes the extreme consequences irrelevant. Hardened On-Site Storage systems (HOSS) should be used to store spent fuel more safely and securely at or near nuclear plants. HOSS reduces the immediate dangers spent fuel poses, without creating unnecessary risks. http://ieer.org/wp/wp-content/uploads/2010/03/HOSS_PRINCIPLES_3-23-10x.pdf

75% of the total (72,000 metric tons, plus 2,000 tons more per year) of spent fuel is in fuel pools and allowed to remain there for as much as 60 years beyond licensed life of reactor operations.

17.

The Generic Environmental Impact Statement (GEIS) on Waste Confidence, NUREG 2157 http://pbadupws.nrc.gov/docs/ML1322/ML13224A106.pdf underestimates the risk of fuel pool fires and ignores the safer alternative of hardened on site storage at the nuclear plant sites. Dry cast storage at Dai-ichi survived the number 9 earth quake, tsunami, loss of the electrical grid, and loss of back up diesel generators much better than the reactors themselves and their fuel pools.

There is a consensus among the U.S. government and the nuclear industry for more than 60 years that withdrawn spent fuel rods are lethal in minutes unless shielded. To continue to produce them and intend to abandon them into the biosphere (deep underground dump) is profoundly immoral and a burden and a curse on future generations into eternity. It is premeditated murder.

035-J-6-RW, cont'd

There is no basis in science, engineering, the behavior of the nuclear industry and the Nuclear Regulatory Commission (NRC) for confidence that high level radioactive withdrawn fuel rods ("spent fuel") can or will be managed with no risk to the biosphere for as long as the radioactivity last . For the NRC and the nuclear industry to assert probabilistic assessments of what will happen to radioactive material over 240,000 (plutonium) to a billion years for some radionuclides, is a fraud and a con game. There is insufficient data for such probabilistic assessments to have validity. Apart from that, even a small likelihood of the risk of a serious untoward event involving spent fuel could be catastrophic for all life forms, air, water and land. Nuclear accidents cannot be undone.

NRC's Waste Confidence policy assumes that all nuclear spent fuel is the same. This is far from the truth. The industry is moving toward new fuel types, such as MOX (mixed oxide) and high-burnup fuels, which are more radioactive, dangerous, thermally hot and difficult to store and transport safely.

Fermi 2 has an over crowded fuel pool with 600 tons of spent fuel. It is the largest GE Mark 1 reactor. It is at risk for weather events, loss of coolant, or terrorist attack. Like Dai-ichi reactors and all 23 GE Mark 1 reactors in the U.S., it's cooling pool does not have back up cooling. It has no diesel generators for cooling pool water circulation to rely on in loss of electrical grid emergency. There are 1,331 highly radioactive irradiated spent nuclear fuel assemblies in Fukushima Dai-ichi Unit 4's storage pool. Fermi 2's high-level radioactive waste storage pool contained 2,898 irradiated nuclear fuel assemblies by spring 2010, according to U.S. Department of Energy projections documented in the Yucca Mountain Final Environmental Impact Statement (Feb. 2002, Table A-7, Proposed Action spent nuclear fuel inventory). Fermi 2 could generate another 443 irradiated nuclear fuel assemblies between spring 2010 and spring 2014, meaning by then, a total of 2,898 + 443 = 3,341 irradiated nuclear fuel assemblies. So, Fermi 2's storage pool would hold 2.5 times as much high-level radioactive withdrawn fuel rods than Fukushima Dai-ichi Unit 4's pool! A cooling pool fire at Fermi 2 would be worse than a meltdown of the Fermi 2 reactor itself in its release of a larger dose of radiation into the environment, resulting in widespread illness, deaths, and genetic mutations. If the radioactivity releases from either location (the reactor, or the irradiated nuclear fuel storage pool) are bad enough, the entire site might have to be evacuated. No intervention would then be possible. Not only could reactor meltdowns proceed out of control, but high-level radioactive spent fuel storage pool fires could result -- emitting orders of magnitude more hazardous radioactivity into the environment than even a reactor meltdown, as the pools are not contained within a radiological containment structure. Fermi 2 is lacking hundreds of structural welds on various floors of the reactor building, never put in place like they were supposed to have been some 40 years ago. This has meant that it could not safely withstand the weight of the crane and cask necessary to move the sufficiently cooled spent fuel to Hardened Onsite Storage (HOSS).

18.

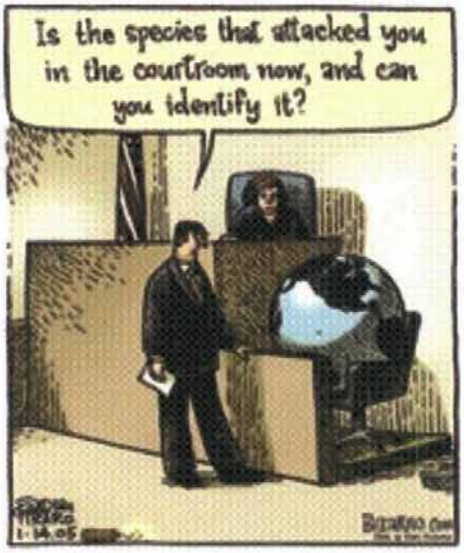
Conclusions

Nuclear Reactors came into being and exist because they were the route to nuclear weapons material. The two are joined at the hip, spawning each other. The U.S. will continue producing nuclear weapons material at the Watts Bar commercial nuclear reactor and downplays the release of thousands of curies of tritium into the Tennessee River. http://orepa.org/public-comment-period-on-nnsa-tritium-plan-open-now/ Commercial reactors and nuclear weapons depend on ***two lies successfully told*** for their shared vitality: 035-J-7-SSR

First, that nuclear weapons are useable. They combine homicide and suicide in one act.

Second, that nuclear reactors are safe, clean, and carbon free. They are profoundly dangerous. Their damage is permanent into eternity and an immoral burden on future generations. Their carbon foot print is visible beginning with uranium mining. The cost of nuclear power exceeds the value of the electricity produced. And that is without calculating the cost of monitoring the radioactive materials produced and shielding the biosphere through every generation into eternity. Without federal loan guarantees, outright gifts of taxpayer dollars, higher utility rates to pay for construction in progress, and indemnification provided to reactor owners by the Price-Anderson Act, amended in 2005, the nuclear power industry would not have come into being and continue to exist. The American nuclear industry has done great damage to the biosphere which we are a part of and on which we all depend. And we weren't asked for our permission, in the beginning or now. Reading the NRC response to the Petition to Revoke the Operating Licenses of GE Mark I and II reactors cited above, one sees that the Petition Review Board accurately states that the NRC is the creation of and supported by the U.S. Congress. That takes the problem back to the citizens of the country who are, understandably, uninformed, misinformed, lied to, systematically, but also the potential voice saying, "We're not having it!"

Vic Macks Gail Macks



FERMI 2 SCOPING COMMENTS

COMMENTS FROM ED MCARDLE

6/30/2014
79FR36837

(27)

RECEIVED
2014 SEP -8 PM 3 11
RULES AND DIRECTIVES BRANCH USNRC

Dear Ms. Leslie Perkins
Environmental Project Manager
Office of Nuclear reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555 –0001

August 28, 2014
Re; docket #I.D. NRC- 2014-0109
DTE Fermi 2 re-license

The Sierra Club Michigan Chapter enters the following comments concerning the proposed 20-year re-license for continued operation of the Fermi 2 nuclear reactor. Because of the long time line of proposed operation until 2045 and the prospect of an additional 60 years allowed for decommissioning, much care must be taken to determine the environmental impacts for at least 90 years from now (until 2105 and possibly beyond).

As a result multiple scenarios must be considered;

1. Health and ecosystem impacts on the Monroe and Frenchtown Township drinking water from radioactive releases of normal operations, refurbishment and transport of large components. 038-AA-1-HH

2. Assuming that the recent NRC plan to allow storage of rods in on site pools with stands court challenges, what effect does this present for the 600 tons already stored since the reactor started operation in 1988. 600 tons is beyond the design capacity now, so if DTE is unable to transfer them to outside dry casks, what plan and impacts are there for continued production of this high level waste. It is our understanding that DTE's plan to transfer the high level waste to dry casks is impaired because of defective welds. 038-AA-2-RW

3. If no final disposal site is developed or the disposal is projected for far into the future and DTE needs to transfer the waste to outside casks, detailed analysis must be performed. 038-AA-3-RW

4. The impact of storage and transport of low level and intermediate level radioactive waste must also be considered. 038-AA-4-RW

5. Overriding all of these concerns is the ongoing crisis of global warming and it's effect on Lake levels and more severe weather events that are predicted 038-AA-5-CC

SUNSI Review Complete
Template = ADM – 013
E-RIDS= ADM-03
Add= L. Perkins (LTP1)

Thank you for considering our comments and we hope to review draft and final documents when available.

Ed McArdle, Michigan Chapter Co-Chair of the Conservation Committee
18841 Reed
Melvindale, MI 48122
313-388-6645 or ecoguy2@netzero.net

FERMI 2 SCOPING COMMENTS

COMMENTS FROM JIM MCDEVITT

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Supervisor - (734) 242-5904
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MARK J. BAKER
Clerk - (734) 242-5800
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FRENCHTOWN CHARTER TOWNSHIP
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KRAIG A. YOAS
TRUSTEES

ASSESSING DEPARTMENT
(734) 242-8588

July 21st, 2014

6/30/2014
79FR 36837

(4)

RECEIVED
2014 JUL 31 PM 2:50
RULES AND DIRECTIVES BRANCH USNRC

039-D-1-SSR

Cindy Bladey
Office of Administration
Mail Stop: 3WFN-06-A44M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: Docket ID NRC-2014-0109

I am submitting these comments for the record concerning Docket No. NRC-2014-0109 and the DTE Electric Company's.application for a 20-year extension of the operating license for Enrico Fermi Unit 2.

My name is Jim McDevitt and I am supervisor of Frenchtown Township, which, of course, is where DTE Energy's Fermi complex is located.

The possibility of 20 additional years of operation for Fermi 2 represents an incredible opportunity for my community. The past 15 years have been years of tremendous instability and change. The prospect for two additional decades of stable operations and employment at Fermi 2 is encouraging. It would be a great boom to our population and to the economic vitality of Frenchtown Township, Monroe County and our region.

Our past experience with Fermi 2 supports that view. The population of my community grew steadily from 12,199 in 1960 to 20,777 in the year 2000. We saw our population dip a little over the past decade to 20,428, but the decline was much less than that which had been predicted by the Southeast Michigan Council of Governments. Clearly, people have and continue to, as they say, "vote with their feet" by moving to Frenchtown and the Monroe area.

They saw the quality of life available in our community. Many of those who put down roots in our community work at the Fermi complex. They undoubtedly view Fermi 2 as I do ... a source of safe, reliable, reasonably priced power and economic opportunity and stability.

Yes, it would be a substantial boost to our area. It is no wonder that so many residents of Frenchtown, Monroe and other Monroe County communities vocally support DTE Energy's license application. That's why I support DTE Energy's proposal to extend Fermi 2's license.

Thank you for the opportunity to provide input to this process.

Sincerely,

Jim McDevitt, Supervisor
Frenchtown Charter Township

SUNSI Review Complete
Template = ADM – 013
E-RIDS= ADM-03
Add= L. Perkins (LTP2)

FERMI 2 SCOPING COMMENTS

COMMENTS FROM STEPHEN MCNEW

MCISD

Preparing today's students for tomorrow's world.

July 21, 2014

6/30/2014
79 FR 36837

(3)

Ms. Cindy Bladey
Office of Administration
Mail Stop: 3WFN-06-A44M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: Docket ID NRC-2014-0109

I am submitting these comments for the record concerning Docket No. NRC-2014-0109 and the DTE Electric Company's application for a 20-year extension of the operating license for Enrico Fermi Unit 2.

My name is Stephen McNew and I am superintendent of the Monroe County Intermediate School District. Thank-you for the opportunity to provide my input.

041-C-1-SSR

By way of background, the MCISD is a regional educational services agency providing services to 9 constituent public school districts, 2 charter schools, and 15 non-public schools. The District serves is the link between local districts and the Michigan Department of Education and provides sophisticated, specialized and costly services that local districts find impractical to provide on an individual basis.

In addition to special education services provided in students' home districts, the MCISD operates the Monroe County Educational Center for children with complex developmental disabilities, the Monroe County Transition Center for secondary students with disabilities who polish their personal living and employability skills in real-life settings, and Holiday Camp, which is a summer program that offers enrichment and respite activities for students.

First and foremost, I approach the matter of DTE Energy's plans for its Fermi Complex from the perspective of educating Monroe County children and teens. DTE Energy's presence, including Fermi, has provided resources to meet the needs of Monroe County students above and beyond those available to the average district.

Monroe County Intermediate School District
1101 South Raisinville Road • Monroe, Michigan 48161-9047
Phone: 734.242.5799 • Fax: 734.242.0567

DTE Energy's involvement in this county, in general, and it contributions to education should not be understated. The Monroe County Intermediate School District has partnered on numerous occasions with DTE Energy in the past for efforts like Educational mini-grants, energy efficiency efforts, STEM and Robotics Camps, job shadowing efforts as well.

Second, Monroe Community College's new Career Technology Center is a significant new addition to this county's educational infrastructure. Supported in part by a significant grant from the DTE Energy Foundation, the CTC will help to more fully prepare students for meaningful employment and advance the economic prosperity of Monroe County.

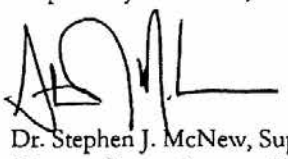
I support DTE's application for a 20-year extension to Fermi 2's operating license because it underscores and continues DTE's significant presence in Monroe County to the benefit of all our residents.

041-C-1-SSR, cont'd

On an entirely different level, I support the extension because I firmly believe that Michigan and United States need multiple options to generate the electricity that we'll need in the future. Carbon-free nuclear energy needs to play a bigger role.

I know that there are some who have great concerns about nuclear energy. Having visited the Fermi complex and counting so many neighbors and friends among those who work at the plant, I am encouraged that nuclear energy will be an even more dependable, safety source of electricity for future generations.

Respectfully submitted,



Dr. Stephen J. McNew, Superintendent
Monroe County Intermediate School District

FERMI 2 SCOPING COMMENTS

COMMENTS FROM RICHARD MICKA

FIGHT POLLUTION
Lake Erie Clean-Up Committee
47 East Elm Avenue
Monroe, Michigan 48162-2648

Fermi 2 License Extension 6/30/2014 79FR 36837 **July 24, 2014**

(7)

My name is Dick Micka. My wife and I live in the city of Monroe and have for many, years.

I am also what some would call a "civic booster." I am a former hunter and an avid conservationist. I have the great honor to serve as the chairman of the Detroit River International Wildlife Refuge Alliance, a "friends" organization that helps the U.S. Fish and Wildlife Service to deliver on the mission of the refuge. I am here this afternoon, offering my personal perspective.

As a resident, I believe that when it comes to electricity, we can't put all our eggs in one basket. We need something more than coal and I don't think wind or hydro are going to be of significant help … certainly not here in the southeast corner of Michigan.

044-G-1-SSR

While I firmly believe that more nuclear energy needs to be added to Michigan's electricity portfolio, I believe even more firmly that the life of a well-functioning plant like Fermi 2 needs to be extended.

I welcome your efforts in the process of reviewing DTE Energy's application fpor a 20-year license extension.

As a civic booster, I have long observed and admired DTE Energy's involvement in Monroe County. I've had the pleasure to work shoulder-to-shoulder with many men and women from the company and, to a person, they are great examples of what good neighbors should be.

044-G-1-SSR, cont'd

As a conservationist, I've worked over the years with what I term the "Big Four" of local environmental stewardship – the Fish and Wildlife Service, the Michigan Department of Natural Resources, the Huron-Clinton Metroparks Authority and the utilities. DTE Energy and its involvement with the Wildlife Habitat Council is a great example of environmental stewardship. Of course, DTE Energy was the first business partner within the Wildlife Refuge, entering into a cooperative management agreement with the Fish & Wildlife Service, enabling the Service to protect and manage wildlife and fish populations on 656 acres at Fermi.

In closing, know that the environmental community also includes many individuals like me – avid or once-avid hunters and anglers. Many, like me, see nuclear energy – especially an existing plant like Fermi 2 -- as critical to meeting Michigan's long-term energy needs. As an added benefit, Fermi 2 emits virtually no greenhouse gases.

Thank you.

R. B. Micka

FERMI 2 SCOPING COMMENTS

COMMENTS FROM PHYLLIS OSTER

6/30/2014
79FR 36837

(17)

PUBLIC SUBMISSION

As of: September 03, 2014
Received: August 27, 2014
Status: Pending_Post
Tracking No. 1jy-8e19-x4xt
Comments Due: August 29, 2014
Submission Type: Web

Docket: NRC-2014-0109
License Renewal Application; Fermi 2

Comment On: NRC-2014-0109-0003
DTE Electric Co., Fermi 2; Notice of Intent to Prepare an Environmental Impact Statement

Document: NRC-2014-0109-DRAFT-0011
Comment on FR Doc # 2014-15281

Submitter Information

Name: Phyllis Oster
Address:
1630 Juniper Dr.
Bowling Green, OH, 43402
Email: poster@bgsu.edu

General Comment

I would like to comment on the building of Fermi 2 being proposed. I live in Bowling Green, Ohio located due east of the existing Fermi 1 which is emitting radiation and west of Davis Besse located west of Bowling Green. Two nuclear plants emitting dangerous ionizing radiation. Having worked in Genetics I am all too award of the effects of ionizing radiation on the chromosomes and genes.

048-Q-1-SSR

I would like to express my opposition to the contruction of Fermi 2

FERMI 2 SCOPING COMMENTS

COMMENTS FROM KEN RICHARDS

6/30/2014
79FR 36837

PUBLIC SUBMISSION

20

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Docket: NRC-2014-0109
License Renewal Application; Fermi 2

Comment On: NRC-2014-0109-0003
DTE Electric Co., Fermi 2; Notice of Intent to Prepare an Environmental Impact Statement

Document: NRC-2014-0109-DRAFT-0014
Comment on FR Doc # 2014-15281

Submitter Information

Name: Ken Richards
Address:
72772
South Haven, MI, 49090
Email: kenrichards38@yahoo.com

General Comment

052-T-1-SSR

One meltdown at Fermi 1 is enough! Here I sit less than three miles from Palisades, with spent fuel piling up on the beaches, and a decades old, embrittled reactor which could meltdown at any moment; plant owners who insist on running it until it does. Enough of this too!

SUNSI Review Complete
Template = ADM – 013
E-RIDS= ADM-03
Add= L. Perkins (LTP1)

FERMI 2 SCOPING COMMENTS

COMMENTS FROM RANDY RICHARDVILLE

17TH DISTRICT
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@senate.michigan.gov

RANDY RICHARDVILLE
SENATE MAJORITY LEADER
THE MICHIGAN SENATE

6/30/2014
79FR 36837
(2)

July 22, 2014

Cindy Bladey
Office of Administration
Mail Stop: 3WFN-06-A44M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: Docket ID NRC-2014-0109

053-B-1-SSR

I am submitting these comments for the record concerning Docket No. NRC-2014-0109 and the DTE Electric Company's application for a 20-year extension of the operating license for Enrico Fermi Unit 2.

There is great interest in my district, specifically in Monroe County, in DTE Energy's application for a license renewal for Fermi 2. The NRC, I know, will hear from individuals supporting the license renewal as well as some who oppose the application. I stand firmly with those supporting the extension and add my voice to the chorus urging the Commission to move both expeditiously and prudently on this matter.

I support the license renewal because it is a cost-effective way to ensure a reliable supply of electricity for southeast Michigan for decades to come. For the past 25 years, Fermi 2 has produced more than 140 billion kilowatt hours of electricity, meeting roughly 20 percent of DTE Energy's total needs. This is energy that is vital to our region and our state. Replacing Fermi 2's more the 1,100 megawatts of generating capacity and the power that Michiganders rely upon would be an extremely costly proposition.

As important as Fermi 2 is, it and its employees are even more important to the economic and social fabric of Monroe County. Simply put, Fermi 2 is an economic stalwart, providing well-paying jobs for thousands of men and women, contributing millions of dollars in tax revenues to local units of government, donating millions of dollars to philanthropic organizations and contributing thousands of hours of volunteer times to dozens of local charitable initiatives. The early retirement of Fermi 2 through the licensing process would have devastating consequences for the county and the region.

I applaud DTE Energy for its foresight in pursuing the license renewal. Long-term, I believe that nuclear energy, in general, and Fermi 2, are critically important to Michigan's energy future. If you have any questions please feel free to contact me. Thank you for your time and consideration.

Sincerely,

Randy Richardville
Senate Majority Leader
State Senator, the 17th District

FERMI 2 SCOPING COMMENTS

COMMENTS FROM DAVID SCHONBERGER

PUBLIC SUBMISSION

As of: September 03, 2014
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Docket: NRC-2014-0109
License Renewal Application; Fermi 2

Comment On: NRC-2014-0109-0003
DTE Electric Co., Fermi 2; Notice of Intent to Prepare an Environmental Impact Statement

Document: NRC-2014-0109-DRAFT-0018
Comment on FR Doc # 2014-15281

Submitter Information

6/30/2014
79FR36837

Name: David Schonberger

General Comment

24

See attached file(s)

Attachments

NRC Docket ID NRC-2014-0109

From:
David H. Schonberger
Ann Arbor, Michigan
U.S.A.
Member of the Public

To:
Cindy Bladey
Office of Administration
Mail Stop: 3WFN-06-A44M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

August 29, 2014

Re: Docket ID NRC-2014-0109

I am submitting these comments for the record concerning Docket No. NRC-2014-0109 and the DTE Electric Company's application for a 20-year extension of the operating license for Enrico Fermi Unit 2 in Frenchtown Township, Monroe County, Michigan.

As an affected individual member of the public and a Southeast Michigan resident living within a 50-mile radius of Fermi, Unit 2, I stand firmly with those opposing the license extension and add my voice to the growing local, regional, national and global alliances coming together to end the era of nuclear electric power generation. I urge the Commission to move both expeditiously and prudently on this matter.

055-X-1-SSR

I oppose the license renewal for many reasons including the fact that nuclear power is simply not a cost-effective way to ensure a long-term reliable supply of electricity for Southeast Michigan. Actually, nuclear power is perhaps the least cost-effective option available and its competitive disadvantage is growing daily; in a free market, the nuclear industry would have long ago ceased to exist as a going concern. It is ironic that Michigan State Senator Randy Richardville, who leads an extremely conservative Republican majority, does not have the foresight to recognize his own hypocrisy and misguided position.
(Public Submission/Comment ID: NRC-2014-0109-0005; ML14219A580, posted 08/15/2014)

It is disappointing that the accomplished professional educator Dr. Stephen J. McNew, Superintendent of Monroe County Intermediate School District (MCISD), is misinformed and poorly educated on the subject of nuclear power, as he believes the myth that nuclear energy is "carbon-free." Even worse, despite his advocacy for the well-being of children and teens, Dr.

McNew ironically supports an industry which is legally authorized to release radioactivity into the environment routinely by design, bioaccumulating in the food chain and raising serious public health concerns.
(Public Submission/Comment ID: NRC-2014-0109-0006; ML14219A583, posted 08/15/2014)

055-X-1-SSR, cont'd

Fortunately, Mr. James (Jim) A. McDevitt, Supervisor, Frenchtown Charter Township, does not hold a consensus position among the Township Trustees. On the contrary, there exists deeply profound and vocal objection among many residents of Monroe County towards the policy positions of various local officials and politicians who unfortunately support DTE's Fermi, Unit 2 License Renewal Application. Many residents of Monroe County recognize that Mr. McDevitt is mistaken to view uranium (atomic fission) as "a source of safe, reliable, reasonably priced power and economic opportunity and stability."
(Public Submission/Comment ID: NRC-2014-0109-0007; ML14216A376, posted 08/15/2014)

Furthermore, I suggest that Mr. Robert Tompkins, President of DEAR (Detroit Edison Alliance of Retirees), an organization which independently represents the financial concerns of thousands of DTE retirees, should seriously consider the insurmountable financial risks and liabilities that come along with strategic investments in nuclear energy. With minimal research, Mr. Tompkins would quickly see that utility companies in the U.S. and around the world are increasingly realizing the existential threat that nuclear energy poses to their long-term viability and financial interests.
(Public Submission/Comment ID: NRC-2014-0109-0004; ML14205A009, posted 08/05/2014)

Finally, for full disclosure, I acknowledge my substantive involvement with the Coalition of Fermi Petitioners/Intervenors, and I fully endorse their work and public submissions. I also stand by my previous individual oral comments delivered at a recent NRC Public Meeting in Monroe, Michigan pertaining to the Fermi, Unit 2 LRA Environmental Review Scoping Process, although I cannot vouch for the accuracy of the written transcript.

Sincerely and respectfully submitted,

David H. Schonberger
Ann Arbor, Michigan
Member of the Public

FERMI 2 SCOPING COMMENTS

COMMENTS FROM ROBERT SIMPSON

6/30/2014
79FR36837

PUBLIC SUBMISSION

23

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License Renewal Application; Fermi 2

Comment On: NRC-2014-0109-0003
DTE Electric Co., Fermi 2; Notice of Intent to Prepare an Environmental Impact Statement

Document: NRC-2014-0109-DRAFT-0017
Comment on FR Doc # 2014-15281

Submitter Information

Name: Robert Simpson

General Comment

It is reasonable to estimate that, during the 20-year License Renewal period, Fermi, Unit 2 would generate an amount of spent fuel from normal operations equal to about fifty percent (50%) of that which it produced during the original 40-year Operating License period. At the same time, the current "structured coordination" between the Nuclear Energy Institute (NEI) and the NRC appears to be heading towards potentially indefinite "continued storage" of spent fuel with no technical specifications in place, now or for the foreseeable future. This is the official language of those involved with trying to get Fermi closed. It means, in plain language: "We still don't have any solution for the waste!" So why do we continue to produce it? Somebody is making a profit on it and I guess that's reason enough. If we could start up an atomic warhead plant, it would require only two things to make it a reality. Somebody to make a profit and the creation of some jobs. End of story.

056-W-1-SSR

SUNSI Review Complete
Template = ADM – 013
E-RIDS= ADM-03
Add= L. Perkins (LHP1)

6/30/2014
79FR36837

PUBLIC SUBMISSION

(16)

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Docket: NRC-2014-0109
License Renewal Application; Fermi 2

Comment On: NRC-2014-0109-0003
DTE Electric Co., Fermi 2; Notice of Intent to Prepare an Environmental Impact Statement

Document: NRC-2014-0109-DRAFT-0010
Comment on FR Doc # 2014-15281

Submitter Information

Name: Robert Simpson

General Comment

056-P-1-SSR

The idea of being a low growth state is not usually looked at as a positive. In the case of Michigan, it provides an opportunity that places with fast growing population do not have; to wit, changing over from destructive energy sources such as coal, natural gas and nuclear power to renewables. In the case of Fermi 3, it suffers from the typical laundry list of old reactors and with the flat near future of energy need in Michigan, it would be an ideal time to rid ourselves of much of the burden of risk, containment and disposal of this particular nuclear plant. We can begin to work toward the future that other forward looking political entities have committed to; rather than staying back, beating this nearly dead horse for 20 more years.

SUNSI Review Complete
Template = ADM – 013
E-RIDS= ADM-03
Add= L. Perkins (LTP1)

FERMI 2 SCOPING COMMENTS

COMMENTS FROM ROBERT TOMPKINS

DEAR
An Alliance of DTE Energy Retirees

Detroit Edison and MichCon retirees working to preserve our hard earned benefits

July 24, 2014

4/30/2014
79FR 36837
(1)

Cindy Bladey
Office of Administration
Mail Stop: 3WFN-06-A44M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: Docket ID NRC-2014-0109

Dear Ms. Bladey:

I am submitting these comments for the record concerning Docket No. NRC-2014-0109 and the DTE Electric Company's application for a 20-year extension of the operating license for Enrico Fermi Unit 2.

I am president of DEAR, The Detroit Edison Alliance of Retirees representing over 11,000 retirees. DEAR is dedicated to speaking in a uniform and united voice in an effort to protect and maintain retirement benefits for all Detroit Edison, MCN and DTE Energy affiliate retirees. The DEAR organization is not affiliated in any manner with DTE Energy Company.

059-A-1-SSR

While we are not "affiliated" with the company, as retirees we are very interested in anything that involves or affects the financial health of DTE Energy and its ability to honor its obligations to its retirees - we want the company to succeed. Because many of us continue to be customers, we also want to see costs to customers as reasonable as possible. A 20-year license renewal would be the most effective strategy to achieving the goal for the continued cost-effective production of the electricity upon which southeast Michigan depends.

Because our members devoted their working lives to meeting the energy needs of Michigan's residents, we also have strong feelings about the electric industry in Michigan and its future. Many DEAR members share a concern about the volatility of fossil fuel prices. That's why we are heartened that DTE Energy has formally applied to extend Fermi 2's operating license until 2045. Like all U.S. nuclear plants, Fermi 2 was licensed to operate for 40 years. We know, however, that the 40-year license is reflective of the timespan over which most utilities amortize their assets. It has little or nothing to do with the useful life of the plant. We know that with appropriate investment and preventive maintenance, the useful life of a plant like Fermi 2, can be extended for many, many years. We encourage you to take that into consideration as you conduct your examination and reach your conclusions, being mindful that 73 earlier renewal applications have already been approved.

Thank you for this opportunity to comment and for your consideration.

Sincerely,

Robert Tompkins

"By Retirees for Retirees"
www.DEARAlliance.org

FERMI 2 SCOPING COMMENTS

COMMENTS FROM TIM WALBERG

TIM WALBERG
7TH DISTRICT, MICHIGAN

EMAIL VIA WEBSITE:
walberg.house.gov

COMMITTEE ON
OVERSIGHT AND GOVERNMENT REFORM

COMMITTEE ON
EDUCATION AND THE WORKFORCE

CHAIRMAN, SUBCOMMITTEE ON
WORKFORCE PROTECTIONS

Congress of the United States

House of Representatives

Washington, DC 20515–2207

August 19, 2014

Cindy Bladey
Office of Administration
Mail Stop: 3WFN-06-A44M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: Docket ID NRC-2014-0109

I am submitting these comments for the record concerning Docket No. NRC-2014-0109 and DTE Electric Company's application for a 20-year extension of the operating license for Enrico Fermi Unit 2.

060-I-1-SSR

As the federal representative of Michigan's 7th District, I have heard significant support for the license renewal of Fermi 2, particularly in Monroe County. Fermi 2 represents a safe and reliable source of energy for our state in addition to an economic anchor for our community, and I urge the Commission to authorize the license renewal to ensure a dependable supply of electricity for southeast Michigan in the years to come.

For over 25 years, Fermi 2 has provided a substantial amount of energy to meet the needs of DTE's customers. At 1,100 megawatts of generating capacity – 30% of Michigan's total nuclear capacity - replacing this source of power would come at a great cost to many families and businesses in Michigan.

Fermi 2 has already demonstrated its ability to be a secure, reliable, long-term, and inexpensive source of electricity for southeast Michigan. Additionally, its presence and its employees contribute to the economic and social vitality of Monroe County, which has benefited from good-paying jobs, considerable philanthropic efforts, and millions of dollars in local tax revenues.

The premature retirement of Fermi 2 would have significant consequences for the people of Monroe County and the entire region and DTE Energy should be recognized for anticipating Michigan's future energy needs in pursuing the license renewal. I believe nuclear energy and Enrico Fermi Unit 2 are vitally important to my constituents and Michigan's energy future, and I hope the Commission will expeditiously approve this extension.

Sincerely,

Tim Walberg
Member of Congress

WASHINGTON, D.C.:
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WASHINGTON, D.C. 20515
(202) 225-6276
FAX: (202) 225-6281

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JACKSON, MI 49201
(517) 780-9075
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FERMI 2 SCOPING COMMENTS

COMMENTS FROM DALE ZORN

6/30/2014
79FR36837
(8)

Fermi 2 License Extension
State Representative Dale Zorn, 56th District
July 24, 2014

Good evening.

Thank you for the opportunity to address you this evening.

My name is Dale W. Zorn and I have had for the past several years the honor representing the residents and businesses of the 56th District in the Michigan House of Representatives.

I have no doubt that the Commission will hear from many Monroe County residents on this matter. The vast majority of those comments, I believe, will be supportive of the license renewal.

I would like to add my own perspective for the record.

Like many of the individuals from whom you will hear as the NRC considers the 20-year extension, I am a lifelong Monroe County resident and a small business person. My Father, opened the business in 1953, and my brother and I took the business over in 1978.

I have also been fortunate to have an "insider's" view of Monroe County's history and development as it unfolded over the years and decades.

My background includes 10 years in local elective office with Raisinville Township, 20 years as a Monroe County Commissioner and, for the past 3 ½ years as a state representative.

While a county commissioner, I lead the reorganization of the Monroe County Economic Development Corporation and created the "Monroe First" program to assist existing and new business development in the county.

The term "Monroe First" is especially important in the context of this matter and I hope the Commission will give extra credence to the views and perspectives offered by residents of this region.

Additionally, I was the Chief Executive of the Monroe County Emergency Operations Center having extensive training in emergency services (such as Fermi drills and exercises) and experience in actual emergency events such as the Comair Airline accident in 1997.

My perspective is shaped by my experiences as Fermi 1 and Fermi 2 were built and operated. They brought waves of investment, new development and growth to this county.

I have seen Detroit Edison and DTE Energy responsibly manage the construction and operation of the plants. In the case of Fermi 1, I have also been witness to its decommissioning.

I have also witnessed DTE Energy's stewardship of the both the Fermi complex and its Monroe Power Plant property.

By virtue of my responsibilities as a local elected official I have been fortunate to have been afforded a special view of these facilities.

In addition to safely generating more than 190 million megawatts of electricity which is about 20 percent of the total of DTE Energy's generating capacity, it employs 850 full-time employees and hundreds of supplemental contract workers.

Throughout the years, DTE Energy has proven to be an environmental friendly neighbor that has taken an active part to protect our natural resources and to improve the quality of our environment.

DTE has exemplified itself by successfully completing the ISO 14001 international standard for environmental quality management in both the Fermi II and Monroe Power Plant operations; has received the Michigan Occupational Safety and Health Administration (MIOSHA) coveted Michigan Voluntary Protection Program, the Star Award while working over five-million safe hours; it was designated a Clean Corporate Citizen from the Michigan Department of Environmental Quality; is a dedicated supporter of the Downriver International Wildlife Refuge; and was awarded the Wildlife site of the year from Wildlife Habit Council. 063-H-1-SSR, cont'd

Let us not forget the proud tradition of community service by the DTE Energy Foundation and the DTE employees that fulfill public improvement projects such as Wildlife Habitats, United Way of Monroe County, Habitat for Humanity, the Lotus Garden Club, The American Red Cross, local public schools, Salvation Army, and Relay for Life, and other community projects.

There is no doubt that Fermi 2 is a significant economic asset to Monroe County and all of Southeast Michigan.

Like all U.S. nuclear plants, Fermi 2 was originally licensed to operate for 40 years, which reflects the capital amortization period utilized by most utilities rather than the expected operational life of the plant.

In short, Fermi 2 has many more useful years ahead of it if the NRC approves DTE license renewal application as it has for more than 70 other nuclear units.

Michigan has a well rounded energy portfolio which includes natural gas, hydroelectric, coal, and nuclear power. And in more recent years, solar and wind renewables has made its way into the Michigan energy portfolio. The Michigan renewable energy production is on track to meet a state mandate goal of 10% by 2015.

Wind energy has been the primary source of renewable energy in Michigan. At the end of 2013, more than 1,100 MW of utility-scale wind projects were in operation in Michigan. 063-H-2-SSR

Michigan's wind generation is expected to increase to more than 1,400 MW by the end of 2014.

However, renewables are not expected to meet base load energy demands and with six expected coal plant closings in the state due to federal emission requirements, it is essential to Michigan, especially Southeast Michigan to foster an energy program that will meet the needs of the region without going outside of the state to purchase electricity.

There is one last thought that I wish for you to take back to Washington. 063-H-3-SSR

Expanding America's nuclear energy industry is vital to meeting a growing electricity demand, reducing greenhouse gas emissions and enhancing U.S. energy security.

Developing advanced technologies and ensuring that there is a sustainable used fuel management policy is an important part of America's nuclear energy future.

Under its own Federal law, and after collecting $10 billion from rate payers, the Federal government has failed its own policy to develop a disposal facility for used fuel from the nation's nuclear power plants and high-level radioactive waste from U.S. defense programs.

The law set a 1998 deadline for the federal government to begin accepting used fuel, but it has not done so.

In 1987, Congress directed DOE to study Yucca Mountain, Nev.—a remote desert location—as the site for a potential repository for geologic disposal of used nuclear fuel. 063-H-3-SSR, cont'd

Extensive study by leading scientists from around the world demonstrated that the site is suitable and, in 2002, Congress approved the site. DOE submitted a license application to the U.S. Nuclear Regulatory Commission in 2008 to build a repository at the site.

However, in 2010 the Obama administration announced plans to terminate the Yucca Mountain project and nothing has happened since, except to continue to put local American communities at risk.

I have had the opportunity to visit Yucca Mountain twice during the construction and research phase. I am not a nuclear engineer, but after being there, after extensive personal research and lobbying Congress to take control of nuclear waste, I am convinced a disposal site such as Yucca Mountain will provide a safe storage environment and, as I believe someday, maybe not in my day, but in the future there will be a use for the stored waste and it could be retrieved to benefit our country. To me, it is a reusable energy product.

I encourage the Commission to move expeditiously through the review process and approve the requested license extension. 063-H-4-SSR

As I have commented in earlier proceedings involving the application for a construction and operating license for a new unit at the Fermi Complex, I believe that nuclear energy is critical to Michigan's energy portfolio.

Again, thank you for this opportunity.

APPENDIX B
APPLICABLE LAWS, REGULATIONS, AND OTHER REQUIREMENTS

B. APPLICABLE LAWS, REGULATIONS, AND OTHER REQUIREMENTS

There are a number of Federal laws and regulations that affect environmental protection, health, safety, compliance, and/or consultation at every nuclear power plant licensed by the U.S. Nuclear Regulatory Commission (NRC). Certain Federal environmental requirements have been delegated to state authorities for enforcement and implementation. Furthermore, states have also enacted laws to protect public health and safety and the environment. It is the NRC's policy to make sure nuclear power plants are operated in a manner that provides adequate protection of public health and safety and protection of the environment through compliance with applicable Federal and state laws, regulations, and other requirements.

The requirements that may be applicable to the operation of NRC-licensed nuclear power plants encompass a broad range of Federal laws and regulations, addressing environmental, historic and cultural, health and safety, transportation, and other concerns. Generally, these laws and regulations are relevant to how the work involved in performing a proposed action would be conducted to protect workers, the public, and environmental resources. Some of these laws and regulations require permits or consultation with other Federal agencies or state, tribal, or local governments.

The Atomic Energy Act of 1954, as amended (AEA) (42 U.S.C. 2011 et seq.) authorizes the NRC to enter into agreement with any state to assume regulatory authority for certain activities (see 42 U.S.C. 2021). Michigan has not yet entered into an agreement with the NRC to assume regulatory responsibility over certain byproduct, source, and quantities of special nuclear materials not sufficient to form a critical mass. Although not an Agreement State, the Michigan Department of Environmental Quality (MDEQ) does maintain a network of environmental monitoring stations around each nuclear power plant site in the State. In addition, the MDEQ maintains a Radiological Emergency Preparedness Program to provide response capabilities to radiological accidents or emergencies at any of Michigan's commercial nuclear power plants (MDEQ undated).

In addition to carrying out some Federal programs, state legislatures develop their own laws. State statutes supplement, as well as implement, Federal laws for protection of air, water quality, and groundwater. State legislation may address solid waste management programs, locally rare or endangered species, and historic and cultural resources.

The Clean Water Act (33 U.S.C. 1251 et seq., herein referred to as CWA) allows for primary enforcement and administration through state agencies, given that the state program is at least as stringent as the Federal program. The state program must conform to the CWA and to the delegation of authority for the Federal National Pollutant Discharge Elimination System (NPDES) program from the U.S. Environmental Protection Agency (EPA) to the state. The primary mechanism to control water pollution is the requirement for direct dischargers to obtain an NPDES permit, or, as is the case for Michigan, the authority has been delegated from EPA, a State Pollutant Discharge Elimination System permit, under the CWA.

One important difference between Federal regulations and certain state regulations is the definition of waters regulated by the state. Certain state regulations may include underground waters, whereas the CWA only regulates surface waters. The MDEQ Water Resources Division provides regulatory oversight for all public water supplies, issues permits to regulate the discharge of industrial and municipal wastewaters—including discharges to groundwater and monitors State water resources for water quality (MDEQ undated).

B.1 Federal and State Requirements

Fermi 2 is subject to Federal and State requirements. Table B–1 lists the principal Federal and State regulations and laws that are used or mentioned in this supplemental environmental impact statement for Fermi 2.

Table B–1. Federal and State Requirements

Law/regulation	Requirements
Current operating license and license renewal	
Atomic Energy Act, 42 U.S.C. 2011 et seq.	The Atomic Energy Act (AEA) of 1954, as amended, and the Energy Reorganization Act of 1974 (42 U.S.C. 5801 et seq.) give the NRC the licensing and regulatory authority for nuclear energy uses within the commercial sector. These regulations give the NRC responsibility for licensing and regulating commercial uses of atomic energy and allow the NRC to establish dose and concentration limits for protection of workers and the public for activities under NRC jurisdiction. The NRC implements its responsibilities under the AEA through regulations set forth in Title 10, "Energy," of the *Code of Federal Regulations* (CFR).
National Environmental Policy Act of 1969, 42 U.S.C. 4321 et seq.	The National Environmental Policy Act (NEPA), as amended, requires Federal agencies to integrate environmental values into their decisionmaking process by considering the environmental impacts of proposed Federal actions and reasonable alternatives to those actions. NEPA establishes policy, sets goals (in Section 101), and provides means (in Section 102) for carrying out the policy. Section 102(2) contains action-forcing provisions to ensure that Federal agencies follow the letter and spirit of the Act. For major Federal actions significantly affecting the quality of the human environment, Section 102(2)(C) of NEPA requires Federal agencies to prepare a detailed statement that includes the environmental impacts of the proposed action and other specified information.
10 CFR Part 51	Regulations in 10 CFR Part 51, "Environmental protection regulations for domestic licensing and related regulatory functions," contain environmental protection regulations applicable to the NRC's domestic licensing and related regulatory functions.
10 CFR Part 54	Regulations in 10 CFR Part 54, "Requirements for renewal of operating licenses for nuclear power plants," are NRC regulations that govern the issuance of renewed operating licenses and renewed combined licenses for nuclear power plants licensed pursuant to Sections 103 or 104b of the AEA, as amended, and Title II of the Energy Reorganization Act of 1974 (88 Stat. 1242). The regulations focus on managing adverse effects of aging. The rule is intended to ensure that important systems, structures, and components will maintain their intended functions during the period of extended operation.
10 CFR Part 50	Regulations in 10 CFR Part 50, "Domestic licensing of production and utilization facilities," are NRC regulations issued under the AEA, as amended (68 Stat. 919), and Title II of the Energy Reorganization Act of 1974 (88 Stat. 1242), to provide for the licensing of production and utilization facilities. This part also gives notice to all persons who knowingly supply—to any licensee, applicant, contractor, or subcontractor—components, equipment, materials, or other goods or services that relate to a licensee's or applicant's activities subject to this part that they may be individually subject to NRC enforcement action for violation of 10 CFR 50.5.

Law/regulation	Requirements
Air quality protection	
Clean Air Act, 42 U.S.C. 7401 et seq.	The Clean Air Act (CAA) is intended to "protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population." The CAA establishes regulations to ensure maintenance of air quality standards and authorizes individual states to manage permits. Section 118 of the CAA requires each Federal agency, with jurisdiction over properties or facilities engaged in any activity that might result in the discharge of air pollutants, to comply with all Federal, state, interstate, and local requirements with regard to the control and abatement of air pollution. Section 109 of the CAA directs the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for criteria pollutants. The EPA has identified and set NAAQS for the following criteria pollutants: particulate matter, sulfur dioxide, carbon monoxide, ozone, nitrogen dioxide, and lead. Section 111 of the CAA requires establishment of national performance standards for new or modified stationary sources of atmospheric pollutants. Section 160 of the CAA requires that specific emission increases must be evaluated before permit approval to prevent significant deterioration of air quality. Section 112 requires specific standards for release of hazardous air pollutants (including radionuclides). These standards are implemented through plans developed by each state and approved by EPA. The CAA requires sources to meet standards and obtain permits to satisfy those standards. Nuclear power plants may be required to comply with the CAA Title V, Sections 501–507, for sources subject to new source performance standards or sources subject to National Emission Standards for Hazardous Air Pollutants. Emissions of air pollutants are regulated by EPA in 40 CFR Parts 50 to 99.
Michigan Compiled Laws, Chapter 324, "Natural Resources and Environmental Protection," Part 55, "Air Pollution Control"	This part of the Michigan Compiled Laws (MCLs) implements the requirements of the CAA.

Law/regulation	Requirements
Water resources protection	
Clean Water Act, 33 U.S.C. 1251 et seq., and the NPDES (40 CFR Part 122)	The Clean Water Act (CWA) was enacted to "restore and maintain the chemical, physical, and biological integrity of the Nation's water." The Act requires all branches of the Federal Government, with jurisdiction over properties or facilities engaged in any activity that might result in a discharge or runoff of pollutants to surface waters, to comply with Federal, state, interstate, and local requirements. As authorized by the CWA, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. The NPDES program requires all facilities that discharge pollutants from any point source into waters of the United States obtain an NPDES permit. A nuclear power plant may also participate in the NPDES General Permit for Industrial Stormwater due to stormwater runoff from industrial or commercial facilities to waters of the United States. EPA is authorized under the CWA to directly implement the NPDES program; however, EPA has authorized many states to implement all or parts of the national program. Section 401 of the CWA requires states to certify that the permitted discharge would comply with all limitations necessary to meet established state water quality standards, treatment standards, or schedule of compliance. The U.S. Army Corps of Engineers (USACE) is the lead agency for enforcement of CWA wetland requirements (33 CFR Part 320). Under Section 401 of the CWA, EPA or a delegated state agency has the authority to review and approve, condition, or deny all permits or licenses that might result in a discharge to waters of the state, including wetlands.
Coastal Zone Management Act of 1972, as amended (16 U.S.C. 1451 et seq.)	Congress enacted the Coastal Zone Management Act (CZMA) in 1972 to address the increasing pressures of over-development upon the Nation's coastal resources. The National Oceanic and Atmospheric Administration administers the Act. The CZMA encourages states to preserve, protect, develop, and, where possible, restore or enhance valuable natural coastal resources such as wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as the fish and wildlife using those habitats. Participation by states is voluntary. To encourage states to participate, the CZMA makes Federal financial assistance available to any coastal state or territory, including those on the Great Lakes, which are willing to develop and implement a comprehensive coastal management program.
Wild and Scenic Rivers Act, 16 U.S.C. 1271 et seq.	The Wild and Scenic River Act created the National Wild and Scenic Rivers System, which was established to protect the environmental values of free flowing streams from degradation by impacting activities, including water resources projects.
MCL, Chapter 324, "Natural Resources and Environmental Protection," Part 31, "Water Resources Protection," and Part 41, "Sewerage Systems"	These parts of the MCL implement the requirements of the CAA.

Law/regulation	Requirements
MCL, Chapter 324, "Natural Resources and Environmental Protection," Part 325, "Great Lakes Submerged Lands"	This part of the MCL sets forth the standards for the construction and maintenance—which includes dredging—of artificial waterways along the Great Lakes.
Waste management and pollution prevention	
Resource Conservation and Recovery Act, 42 U.S.C. 6901 et seq.	The Resource Conservation and Recovery Act (RCRA) requires EPA to define and identify hazardous waste; establish standards for its transportation, treatment, storage, and disposal; and require permits for persons engaged in hazardous waste activities. Section 3006 (42 U.S.C. 6926) allows states to establish and administer these permit programs with EPA approval. The EPA regulations implementing the RCRA are found in 40 CFR Parts 260 through 283. Regulations imposed on a generator or on a treatment, storage, and/or disposal facility vary according to the type and quantity of material or waste generated, treated, stored, and/or disposed. The method of treatment, storage, and/or disposal also impacts the extent and complexity of the requirements.
Pollution Prevention Act, 42 U.S.C. 13101 et seq.	The Pollution Prevention Act establishes a national policy for waste management and pollution control that focuses first on source reduction, then on environmental issues, safe recycling, treatment, and disposal.
10 CFR Part 20	Regulations in 10 CFR Part 20, "Standards for protection against radiation," establish standards for protection against ionizing radiation resulting from activities conducted under licenses issued by the NRC. These regulations are issued under the AEA of 1954, as amended, and the Energy Reorganization Act of 1974, as amended. The purpose of these regulations is to control the receipt, possession, use, transfer, and disposal of licensed material by any licensee in such a manner that the total dose to an individual (including doses resulting from licensed and unlicensed radioactive material and from radiation sources other than background radiation) does not exceed the standards for protection against radiation prescribed in the regulations in this part.
MCL, Chapter 324, "Natural Resources and Environmental Protection," Part 111, "Hazardous Waste Management"	This part of the MCL sets forth the standards for the generation, disposition, storage, treatment, and transportation of hazardous waste.
MCL, Chapter 324, "Natural Resources and Environmental Protection," Part 211, "Underground Storage Tank Regulations"	This part of the MCL sets forth the standards for underground storage tanks.
Act 429 of 1980, the South Carolina Radioactive Waste Transportation and Disposal Act	This Act sets forth the standards for the transportation of radioactive waste into or within South Carolina.
Tennessee Department of Environment and Conservation Rule 1200-2-10-32	This rule establishes the requirements for the licensing of shippers of radioactive material into or within Tennessee.

Law/regulation	Requirements
Utah Administrative Code, R313, "Environmental Quality, Radiation Control," Rule R313-26, "Generator Site Access Permit Requirements for Accessing Utah Radioactive Waste Disposal Facilities"	This rule establishes the requirements for the issuance of permits to generators for accessing a land disposal facility located within Utah and requirements for shippers.
Protected species	
Endangered Species Act, 16 U.S.C. 1531 et seq.	The Endangered Species Act (ESA) was enacted to prevent the further decline of endangered and threatened species and to restore those species and their critical habitats. Section 7 of the Act requires Federal agencies to consult with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service (NMFS) on Federal actions that may affect listed species or designated critical habitats.
Magnuson–Stevens Fishery Conservation and Management Act, 16 U.S.C. 1801-1884	The Magnuson–Stevens Fishery Conservation and Management Act, as amended, governs marine fisheries management in U.S. Federal waters. The Act created eight regional fishery management councils and includes measures to rebuild overfished fisheries, protect essential fish habitat, and reduce bycatch. Under Section 305 of the Act, Federal agencies are required to consult with NMFS for any Federal actions that may adversely affect essential fish habitat.
Historic preservation and cultural resources	
National Historic Preservation Act, 16 U.S.C. 470 et seq.	The National Historic Preservation Act was enacted to create a national historic preservation program, including the National Register of Historic Places and the Advisory Council on Historic Preservation. Section 106 of the Act requires Federal agencies to take into account the effects of their undertakings on historic properties. The Advisory Council on Historic Preservation regulations implementing Section 106 of the Act are found in 36 CFR Part 800. The regulations call for public involvement in the Section 106 consultation process, including Indian tribes and other interested members of the public, as applicable.

B.2 Operating Permits and Other Requirements

Table B–2 lists the permits and licenses issued by Federal, State, and local authorities for activities at Fermi 2.

Table B–2. Licenses and Permits

Permit	Number	Dates	Responsible Agency
Operating License	NPF-43	Issued: 07/15/1985 Expires: 03/29/2025	NRC
NPDES Permit	MI0037028	Issued: 06/03/2010 Expires: 10/01/2014[(a)]	MDEQ Water Resources Division
Industrial/Non-Domestic User Discharge Permit	1020	Issued: 08/20/2012 Expires: 8/31/2015	City of Monroe
Federal Clean Air Act Renewable Operating Permit	MI-ROP-B4321-2013	Issued: 11/01/2013 Expires: 11/01/2018	MDEQ Air Quality Division

Permit	Number	Dates	Responsible Agency
Hazardous Waste Generator Identification	MID087056685	Not Applicable	MDEQ
Great Lakes Submerged Lands Permit	11-58-0055-P	Issued: 04/25/2012 Expires: 04/25/2017	MDEQ
Underground Storage Tank Registration Certificate	00010793	Renewed annually	MDEQ
Great Lakes Submerged Lands Permit (After-the-Fact)	13-58-0013-P	Issued: 06/25/2013 Expires: 06/25/2018	MDEQ
Federal Water Pollution Control Act Section 404 Individual Permit	88-001-040-8	Issued: 05/26/2004 Expires: 12/31/2014	USACE
Federal Water Pollution Control Act Section 404 Letter of Permission	LRE-1988-10408-N13	Issued: 03/20/2013 Expires: 08/22/2023	USACE
Hazardous Materials Certificate of Registration	052412550047UW	Issued: 05/25/2012 Expires: 06/30/2015	U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration
Permit to transport radioactive waste	0233-21-13	Renewed annually	South Carolina Department of Health and Environmental Control
License to deliver radioactive material	T-MI004-L13	Renewed annually	Tennessee Department of Environment and Conservation
Permit to deliver radioactive material	0203001330	Renewed annually	Utah Department of Environmental Quality

[a] Administratively extended pending review of DTE Electric Company's application for reissuance.

Source: DTE 2014

B.3 References

10 CFR Part 20. *Code of Federal Regulations,* Title 10, *Energy,* Part 20, "Standards for protection against radiation."

10 CFR Part 50. *Code of Federal Regulations*, Title 10, *Energy*, Part 50, "Domestic licensing of production and utilization facilities."

10 CFR Part 51. *Code of Federal Regulations*, Title 10, *Energy*, Part 51, "Environmental protection regulations for domestic licensing and related regulatory functions."

10 CFR Part 54. *Code of Federal Regulations*, Title 10, *Energy*, Part 54, "Requirements for renewal of operating licenses for nuclear power plants."

40 CFR Part 122. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 122, "EPA administered permit programs: the National Pollutant Discharge Elimination System."

Atomic Energy Act of 1954, as amended. 42 U.S.C. §2011 et seq.

Clean Air Act of 1963, as amended. 42 U.S.C. §7401 et seq.

Clean Water Act of 1977, as amended. 33 U.S.C. §1251 et seq.

Coastal Zone Management Act of 1972, as amended. 16 U.S.C. §1451 et seq.

[DTE] DTE Electric Company. 2014. Applicant's Environmental Report—Operating License Renewal Stage, Fermi 2. Newport, MI: DTE. April 2014. ADAMS Nos. ML14121A538, ML14121A539, and ML14121A540.

Endangered Species Act of 1973, as amended. 16 U.S.C. §1531 et seq.

Energy Reorganization Act of 1974. 42 U.S.C. §5801 et seq.

Fish and Wildlife Coordination Act of 1934, as amended. 16 U.S.C. §661 et seq.

[MDEQ] Michigan Department of Environmental Quality, Office of Waste Management and Radiological Protection. Undated. Available at <http://www.michigan.gov/deq/0,1607,7-135-3312_4120---,00.html> (accessed 12 January 2015).

[MDEQ] Michigan Department of Environmental Quality, Water Resources Division. Undated. Available at <http://www.michigan.gov/deq/0,1607,7-135-3313---,00.html> (accessed 12 January 2015).

Marine Mammal Protection Act of 1972, as amended. 16 U.S.C. §1361 et seq.

Magnuson–Stevens Fishery Conservation and Management Act, as amended. 16 U.S.C. §1801 et seq.

National Environmental Policy Act of 1969, as amended. 42 U.S.C. §4321 et seq.

National Historic Preservation Act of 1966, as amended. 16 U.S.C. §470 et seq.

Pollution Prevention Act of 1990. 42 U.S.C. §13101 et seq.

Resource Conservation and Recovery Act of 1976, as amended. 42 U.S.C. §6901 et seq.

Wild and Scenic Rivers Act, as amended. 16 U.S.C. §1271 et seq.

APPENDIX C
CONSULTATION CORRESPONDENCE

C. CONSULTATION CORRESPONDENCE

C.1 Section 7 Consultation

C.2 Federal Agency Obligations under ESA Section 7

As a Federal agency, the U.S. Nuclear Regulatory Commission (NRC) must comply with the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.; herein referred to as ESA), as part of any action authorized, funded, or carried out by the agency, such as the proposed agency action that this supplemental environmental impact statement (SEIS) evaluates: whether to issue a renewed license for the continued operation of Fermi 2 for an additional 20 years beyond the current license terms. Under section 7 of the ESA, the NRC must consult with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) (referred to jointly as "the Services" and individually as "Service"), as appropriate, to ensure that the proposed agency action is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

The ESA and the regulations that implement ESA section 7 (Title 50 of the *Code of Federal Regulations* (50 CFR) Part 402, "Interagency cooperation—Endangered Species Act of 1973, as amended") describe the consultation process that Federal agencies must follow in support of agency actions. As part of this process, the Federal agency shall either request that the Services provide a list of any listed or proposed species or designated or proposed critical habitats that may be present in the action area or request that the Services concur with a list of species and critical habitats that the Federal agency has created (50 CFR 402.12(c)). If it is determined that any such species or critical habitats may be present, the Federal agency is to prepare a biological assessment to evaluate the potential effects of the action and determine whether the species or critical habitat are likely to be adversely affected by the action (16 U.S.C. 1536(c); 50 CFR 402.12(a)). Furthermore, biological assessments are required for any agency action that is a "major construction activity" (50 CFR 402.12(b)), which the ESA regulations define to include major Federal actions significantly affecting the quality of the human environment under the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.; herein referred to as NEPA) (50 CFR 402.02).

Federal agencies may fulfill their obligations to consult with the Services under ESA section 7 and to prepare a biological assessment in conjunction with the interagency cooperation procedures required by other statutes, including NEPA (50 CFR 402.06(a)). In such cases, the Federal agency should include the results of the ESA section 7 consultation in the NEPA document (50 CFR 402.06(b)). Accordingly, Section C.3 explains why a biological assessment was not prepared for the proposed agency action evaluated in this SEIS, and Section C.4 describes the chronology and results of the ESA section 7 consultation.

C.3 Biological Assessment

The NRC considers this SEIS to fulfill its obligation to prepare a biological assessment under ESA section 7. Accordingly, the NRC did not prepare a separate biological assessment for the proposed Fermi 2 license renewal.

Although the contents of a biological assessment are at the discretion of the Federal agency (50 CFR 402.12(f)), the ESA regulations suggest information that agencies may consider for inclusion. The NRC has considered this information in the following sections.

Section 3.8 describes the action area and the Federally listed and proposed species and designated and proposed critical habitat that have the potential to be present in the action area. This section includes information pursuant to 50 CFR 402.12(f)(1), (2), and (3).

Section 4.8 provides an assessment of the potential effects of the proposed Fermi 2 license renewal on the species and critical habitat present and the NRC's effect determinations, which are consistent with those identified in Section 3.5 of the *Endangered Species Consultation Handbook* (FWS and NMFS 1998). The NRC also addresses cumulative effects and alternatives to the proposed action. This section includes information pursuant to 50 CFR 402.12(f)(4) and (5).

C.4 Chronology of ESA Section 7 Consultation

Upon receipt of DTE Electric Company's (DTE) license renewal application (LRA), the NRC staff considered whether any Federally listed or proposed species or designated or proposed critical habitats may be present in the action area (as defined at 50 CFR 402.02) for the proposed Fermi 2 license renewal. No species under the NMFS's jurisdiction occur within the action area. Therefore, the NRC staff did not consult with the NMFS. With respect to species under the FWS's jurisdiction, the NRC staff compiled a list of ESA-protected species and critical habitats within the vicinity of the facility and requested the FWS's concurrence with this list in accordance with the ESA section 7 regulations at 50 CFR 402.12(c) in a letter dated July 1, 2014. The FWS concurred with the NRC staff's list in its letter dated July 30, 2014. The NRC staff used this list as a starting point for its analysis of effects to Federally listed species and critical habitat, which appears in Sections 3.8 and 4.8 of this SEIS. In Section 3.8, the NRC staff concludes that no critical habitat occurs in the action area. In addition, the NRC concludes that four listed species—Karner blue butterfly (*Lycaeides melissa samuelis*), northern riffleshell (*Epioblasma torulosa rangiana*), snuffbox mussel (*Epioblasma triquetra*), and rayed bean mussel (*Villosa fabalis*)—are unlikely to occur within the action area. In addition, five listed species, the red knot (*Calidris canutus*), piping plover (*Charadrius melodus*), Indiana bat (*Myotis sodalis*), eastern prairie fringed orchid (*Platanthera leucophaea*), and northern long-eared bat (*Myotis septentrionalis*), may occur within the action area. In Section 4.8, the NRC staff concludes that the proposed agency action would have no effect on critical habitat or on the four ESA-protected species that are unlikely to occur within the action area. In addition, the NRC staff determined that license renewal could have insignificant or discountable effects on the five listed species that may occur within the action area; therefore, the proposed license renewal may affect, but is not likely to adversely affect, these species. Because this SEIS constitutes the NRC's biological assessment, the NRC staff will submit a copy of this SEIS, upon its issuance, to the FWS for review in accordance with 50 CFR 402.12(j).

Table C–1 lists the letters, e-mails, and other correspondence related to the NRC's ESA obligations with respect to its review of the Fermi LRA. This table will be updated in the final SEIS, as applicable, to include correspondence transpiring between the issuance of the draft and final SEIS.

Table C–1. ESA Section 7 Consultation Correspondence

Date	Sender and Recipient	Description	ADAMS Accession No. [a]
July 1, 2014	D. Wrona (NRC) to T. Melius (FWS)	Request for concurrence with list of Federally listed species and habitats for the proposed Fermi license renewal	ML14164A037
July 30, 2014	T. Dandridge (FWS) to M. Moser (NRC)	Concurrence with the NRC's list of Federally listed species and habitats	ML14219A743

[a] These documents can be accessed through the NRC's Agencywide Documents Access and Management System (ADAMS) at http://adams.nrc.gov/wba/.

C.5 Essential Fish Habitat Consultation

The NRC must comply with the Magnuson–Stevens Fishery Conservation and Management Act, as amended (16 U.S.C. 1801–1884, herein referred to as Magnuson–Stevens Act) for any actions authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken that may adversely affect essential fish habitat (EFH).

In Sections 3.8 and 4.8 of this SEIS, the NRC staff concludes that NMFS has not designated EFH under the Magnuson–Stevens Act in Lake Erie and that the proposed Fermi 2 license renewal would have no effect on EFH. Thus, the Magnuson–Stevens Act does not require the NRC to consult with NMFS for the proposed Fermi 2 license renewal.

C.6 Section 106 Consultation

The National Historic Preservation Act of 1966, as amended (NHPA), requires Federal agencies to consider the effects of their undertakings on historic properties and consult with applicable state and Federal agencies, tribal groups, and individuals and organizations with a demonstrated interest in the undertaking before taking action. Historic properties are defined as resources that are eligible for listing on the National Register of Historic Places. The historic preservation review process (Section 106 of the NHPA) is outlined in regulations issued by the Advisory Council on Historic Preservation (ACHP) in 36 CFR Part 800. In accordance with 36 CFR 800.8(c), the NRC has elected to use the NEPA process to comply with its obligations under Section 106 of the NHPA.

Table C–2 lists the chronology of consultation and consultation documents related to the NRC Section 106 review of the Fermi 2 license renewal. The NRC staff is required to consult with the noted agencies and organizations in accordance with the statutes listed above.

Table C–2. NHPA Correspondence

Date	Sender and Recipient	Description	ADAMS Accession No. [a]
July 8, 2014	D. Wrona (NRC) to B. Conway, Michigan Historical Center	Request for scoping comments/ notification of Section 106 review	ML14157A383
July 8, 2014	D. Wrona (NRC) to R. Nelson (ACHP)	Request for scoping comments/ notification of Section 106 review	ML14155A207

Date	Sender and Recipient	Description	ADAMS Accession No. [(a)]
July 8, 2014	D. Wrona (NRC) to D. Shalifoe Sr., President, Keweenaw Bay Indian Community	Request for scoping comments concerning the Fermi 2 LRA review (notification of Section 106 review)	ML14157A354
July 8, 2014	D. Wrona (NRC) to L. Carrick, Sr., Chairman, Bay Mills Indian Community	Request for scoping comments concerning the Fermi 2 LRA review (notification of Section 106 review)	ML14157A354
July 8, 2014	D. Wrona (NRC) to A. Pedwaydon, Council Chair, Grand Traverse Band of Ottawa and Chippewa Indians	Request for scoping comments concerning the Fermi 2 LRA review (notification of Section 106 review)	ML14157A354
July 8, 2014	D. Wrona (NRC) to J. Williams Jr., Tribal Chairman, Lac Vieux Desert Band of Lake Superior Chippewa Indians	Request for scoping comments concerning the Fermi 2 LRA review (notification of Section 106 review)	ML14157A354
July 8, 2014	D. Wrona (NRC) to F. Kiogima, Tribal Chairman, Little Traverse Bay Bands of Odawa Indians	Request for scoping comments concerning the Fermi 2 LRA review (notification of Section 106 review)	ML14157A354
July 8, 2014	D. Wrona (NRC) to J. Warren, Chairman, Pokagon Band of Potawatomi Indians	Request for scoping comments concerning the Fermi 2 LRA review (notification of Section 106 review)	ML14157A354
July 8, 2014	D. Wrona (NRC) to A. Payment, Tribal Chairperson, Sault Ste. Marie Tribe of Chippewa Indians of Michigan	Request for scoping comments concerning the Fermi 2 LRA review (notification of Section 106 review)	ML14157A354
July 8, 2014	D. Wrona (NRC) to K. Meshigaud, Tribal Chairperson, Hannahville Indian Community	Request for scoping comments concerning the Fermi 2 LRA review (notification of Section 106 review)	ML14157A354

Date	Sender and Recipient	Description	ADAMS Accession No. [a]
July 8, 2014	D. Wrona (NRC) to H. Mandoka, Chairman, Nottawaseppi Huron Band of the Potawatomi	Request for scoping comments concerning the Fermi 2 LRA review (notification of Section 106 review)	ML14157A354
July 8, 2014	D. Wrona (NRC) to S. Pago, Chief, Saginaw Chippewa Indian Tribe of Michigan	Request for scoping comments concerning the Fermi 2 LRA review (notification of Section 106 review)	ML14157A354
July 8, 2014	D. Wrona (NRC) to D. Sprague, Tribal Chairman, Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan	Request for scoping comments concerning the Fermi 2 LRA review (notification of Section 106 review)	ML14157A354
July 8, 2014	D. Wrona (NRC) to L. Romanelli, Ogema, Little River Band of Ottawa Indians	Request for scoping comments concerning the Fermi 2 LRA review (notification of Section 106 review)	ML14157A354
July 8, 2014	D. Wrona (NRC) to H. Frank, Chairman, Forest County Potawatomi	Request for scoping comments concerning the Fermi 2 LRA review (notification of Section 106 review)	ML14157A354
July 8, 2014	D. Wrona (NRC) to R. Sparkman, Chief, Shawnee Tribe	Request for scoping comments concerning the Fermi 2 LRA review (notification of Section 106 review)	ML14157A354
July 8, 2014	D. Wrona (NRC) to C. Watkins, Acting President, Delaware Nation	Request for scoping comments concerning the Fermi 2 LRA review (notification of Section 106 review)	ML14157A354
July 8, 2014	D. Wrona (NRC) to B. Friend, Chief, Wyandotte Nation	Request for scoping comments concerning the Fermi 2 LRA review (notification of Section 106 review)	ML14157A354
July 8, 2014	D. Wrona (NRC) to E. Cook, Chief, Ottawa Tribe of Oklahoma	Request for scoping comments concerning the Fermi 2 LRA review (notification of Section 106 review)	ML14157A354

[a] These documents can be accessed through the NRC's Agencywide Documents Access and Management System (ADAMS) at http://adams.nrc.gov/wba/.

C.7 References

36 CFR Part 800. *Code of Federal Regulations*, Title 36, *Parks, Forests, and Public Property*, Part 800, "Protection of historic properties."

50 CFR Part 402. *Code of Federal Regulations*, Title 50, *Wildlife and Fisheries*, Part 402, "Interagency cooperation—Endangered Species Act of 1973, as amended."

Endangered Species Act of 1973, as amended. 16 U.S.C. §1531 et seq.

[FWS] U.S. Fish and Wildlife Service. 2013. "Consultations: Frequently Asked Questions." Available at <http://www.fws.gov/endangered/what-we-do/faq.html#8> (accessed 20 June 2014).

[FWS and NMFS] U.S. Fish and Wildlife Service and National Marine Fisheries Service. 1998. Endangered Species Consultation Handbook: Procedures for Conducting Consultation and Conference Activities under Section 7 of the Endangered Species Act. March 1998. 315 p. Available at <http://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf> (accessed 8 July 2013).

Magnuson–Stevens Fishery Conservation and Management Act, as amended. 16 U.S.C. §1801–1884.

National Environmental Policy Act of 1969, as amended. 42 U.S.C. §4321 et seq.

National Historic Preservation Act of 1966, as amended. 16 U.S.C. §470 et seq.

APPENDIX D
CHRONOLOGY OF ENVIRONMENTAL REVIEW CORRESPONDENCE

D. CHRONOLOGY OF ENVIRONMENTAL REVIEW CORRESPONDENCE

This appendix, along with Appendix C, contains a chronological listing of correspondence between the U.S. Nuclear Regulatory Commission (NRC) and external parties as part of its environmental review for Fermi 2. Appendix C contains the chronological listing of consultation correspondence associated with the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) and the Magnuson–Stevens Fishery Conservation and Management Act, as amended (16 U.S.C. 1801–1884). Appendix D contains all other correspondence.

All documents, with the exception of those containing proprietary information, are available electronically in the NRC's Library, which is found on the Internet at the following Web address: http://www.nrc.gov/reading-rm.html. From this site, the public can gain access to the NRC's Agencywide Documents Access and Management System (ADAMS), which provides text and image files of the NRC's public documents. The ADAMS number for each document is included in the following list. If you need assistance in accessing or searching in ADAMS, contact the Public Document Room Staff at 1-800-397-4209.

D.1 Environmental Review Correspondence

Table D–1 lists the environmental review correspondence in date order beginning with the request by DTE Electric Company (DTE or the applicant) to renew the operating license for Fermi 2.

Table D–1. Environmental Review Correspondence

Date	Correspondence Description	ADAMS No.
Apr 24, 2014	DTE Electric Company (DTE) LRA for Fermi 2	ML14121A554
May 5, 2014	U.S. Nuclear Regulatory Commission (NRC) *Federal Register* Notice (FRN) of Receipt and Availability of the LRA for Fermi 2	ML14097A168
May 5, 2014	NRC Letter to DTE, Notice of Receipt and Availability	ML14098A284
Jun 11, 2014	NRC Letter to DTE, Determination of Acceptability and Sufficiency for Docketing, Proposed Review Schedule, and Opportunity for a Hearing Regarding the Application from DTE for Renewal of the Operating License for Fermi 2	ML14150A416
Jun 11, 2014	NRC FRN of Acceptability and Opportunity Request Hearing	ML14150A340
Jun 20, 2014	NRC Letter to DTE, Notice of Intent To Prepare an Environmental Impact Statement and Conduct Scoping Process for License Renewal for Fermi 2	ML14160B055
Jun 20, 2014	NRC FRN of Notice of Intent To Prepare an Environmental Impact Statement and Conduct Scoping Process for License Renewal for Fermi 2	ML14161A016
Jul 3, 2014	NRC Letter to Michigan Department of Natural Resources (MDNR), Notice of Intent To Prepare an Environmental Impact Statement and Conduct Scoping Process for License Renewal of Fermi 2	ML14171A427
Jul 8, 2014	NRC Letter to Advisory Council on Historic Preservation, Fermi 2 LRA Review	ML14155A207
Jul 8, 2014	NRC Letter to Michigan State Historic Preservation Officer (SHPO), Fermi 2 LRA Review	ML14157A383

Date	Correspondence Description	ADAMS No.
Jul 21, 2014	Scoping Comment of Jim McDevitt on Behalf of Frenchtown Charter Township	ML14216A376
Jul 21, 2014	Scoping Comment of Dr. Stephen J. McNew on Behalf of Monroe County Intermediate School District	ML14219A583
Jul 22, 2014	Scoping Comment of Randy Richardville	ML14219A580
Jul 23, 2014	Fermi 2 License Renewal Process and Environmental Scoping Public Meeting Slides	ML14204A058
Jul 24, 2014	Scoping Comment of Michelle Dugan on Behalf of Monroe County Chamber of Commerce	ML14234A188
Jul 24, 2014	Transcript from the Fermi 2 Scoping Meeting—Afternoon Session	ML14254A465
Jul 24, 2014	Transcript from the Fermi 2 Scoping Meeting—Evening Session	ML14254A470
Jul 24, 2014	Scoping Comment of Jessie Pauline Collins	ML14234A189
Jul 24, 2014	Scoping Comment of Dick Micka	ML14234A190
Jul 24, 2014	Scoping Comment of State Representative Dale W. Zorn on Behalf of Michigan State 56th District	ML14234A191
Jul 24, 2014	Scoping Comment of Robert Tompkins on Behalf of DEAR Alliance	ML14205A009
Aug 19, 2014	Scoping Comment of Vic and Gail Macks	ML14234A339
Aug 19, 2014	Scoping Comment of U.S. Representative Tim Walberg on Behalf of State of Michigan, 7th District	ML14234A192
Aug 26, 2014	Scoping Comment of Corinne Carey on Behalf of Don't Waste Michigan	ML14252A140
Aug 26, 2014	Scoping Comment of Joanne Cantoni	ML14252A141
Aug 27, 2014	Scoping Comment of Rosemary Doyle	ML14252A171
Aug 27, 2014	Scoping Comment of Robert Simpson	ML14252A143
Aug 27,2014	Scoping Comment of Mary Ann Baier	ML14252A142
Aug 27, 2014	Scoping Comment of Phyllis Oster	ML14252A170
Aug 28, 2014	Scoping Comment of Unknown Individual	ML14252A172
Aug 28, 2014	Scoping Comment of Ed McArdle on Behalf of Sierra Club, Michigan Chapter	ML14259A341
Aug 28, 2014	Scoping Comment of Ken Richards	ML14252A173
Aug 28, 2014	Scoping Comment of Sandra Bihn	ML14252A175
Aug 29, 2014	Scoping Comment of Jessie Pauline Collins	ML14252A139
Aug 29, 2014	Scoping Comment of Carol Izant	ML14252A176
Aug 29, 2014	Scoping Comment of David Schonberger	ML14252A178
Aug 29, 2014	Scoping Comment of Michael J. Keegan	ML14252A138
Aug 29, 2014	Scoping Comment of Michael Keegan on Behalf of Don't Waste Michigan	ML14252A180
Aug 29, 2014	Scoping Comment of Robert Simpson	ML14252A177
Aug 29, 2014	Scoping Comment of Mark Farris	ML14252A186
Sep 3, 2014	NRC Letter to DTE, License Renewal Environmental Site Audit Regarding Fermi 2	ML14224A353
Sep 18, 2014	NRC Summary of Public Meeting To Discuss the License Renewal and Environmental Scoping Processes for Fermi 2	ML14233A450
Sep 22, 2014	Letter from Dan Miskokomon, Chief, Walpole Island First Nation, to NRC, Fermi 2 Nuclear Reactor License NPF-43 Extension Application	ML14265A490

Date	Correspondence Description	ADAMS No.
Oct 3, 2014	NRC Letter to DTE, License Renewal Environmental Site Audit Regarding Fermi 2 Severe Accident Mitigation Alternatives (SAMAs)	ML14252A831
Oct 15, 2014	NRC Letter to DTE, Summary of the Site Audit Related to the Review of the LRA for Fermi 2	ML14274A304
Oct 28, 2014	NRC Letter to DTE, Project Manager Change for the License Renewal of Fermi 2	ML14294A792
Oct 31, 2014	Letter from NRC to Dan Miskokomon, Chief, Walpole Island First Nation, on the Fermi 2 Nuclear Reactor License NPF-43 Extension Application	ML14295A239
Nov 10, 2014	NRC Letter to DTE, Requests for Additional Information (RAIs) for the Environmental Review of the Fermi 2 LRA	ML14275A004
Nov 17, 2014	Summary of the SAMAs Environmental Site Audit for Fermi 2	ML14294A812
Nov 18, 2014	NRC Letter to DTE, RAIs for the Review of the Fermi 2 SAMAs Review of the Fermi 2 LRA	ML14308A358
Nov 20, 2014	Summary of Telephone Conference Call Held on October 14, 2014, Between NRC and DTE Concerning RAIs Pertaining to the Fermi 2 LRA Environmental Review	ML14308A530
Nov 20, 2014	Summary of Telephone Conference Call Held on October 20, 2014, Between NRC and DTE Concerning RAIs Pertaining to the Fermi 2 LRA Environmental Review	ML14308A598
Dec 9, 2014	DTE Letter to NRC, Response to License Renewal Environmental Review RAIs	ML14344B000
Dec 15, 2014	Summary of Telephone Conference Call Held on November 17, 2014, Between NRC and DTE Concerning RAIs Pertaining to the Fermi 2 LRA Environmental Review	ML14330A263
Jan 9, 2015	DTE Letter to NRC, Response to NRC RAI for the Review of the Fermi 2 LRA—SAMAs	ML15009A358
Jan 12, 2015	Summary of Telephone Conference Call Held on December 18, 2014, Between NRC and DTE Concerning Responses to RAIs Pertaining to the Fermi 2 LRA Environmental Review	ML15005A538
Feb 3, 2015	NRC Letter to DTE, RAIs for the Environmental Review of the Fermi 2 LRA—SAMAs	ML15026A307
Mar 5, 2015	DTE Letter to NRC, Response to NRC RAI for the Review of the Fermi 2 LRA—SAMAs	ML15064A099
Apr 9, 2015	NRC Letter to DTE, RAI for the Environmental Review of the Fermi 2 LRA—SAMAs	ML15092A945
May 8, 2015	DTE Letter to NRC, Response to NRC RAI for the Environmental Review of the Fermi 2 LRA—SAMAs Set 3	ML15141A163
May 18, 2015	Summary of March 27, 2015 Telephone Conference Call Held Between the U.S. NRC and DTW Electric Company Concerning Requests for Additional Information Pertaining to the SAMA Review of the Fermi 2 License Renewal Application	ML15132A427
June 29, 2015	NRC Letter to DTE, Change in the Environmental Review Schedule	ML15160A297

APPENDIX E
ACTIONS AND PROJECTS CONSIDERED IN CUMULATIVE ANALYSIS

E. ACTIONS AND PROJECTS CONSIDERED IN CUMULATIVE ANALYSIS

Table E–1 identifies actions and projects considered in the U.S. Nuclear Regulatory Commission (NRC) staff's analysis of cumulative impacts related to the environmental analysis of the continued operation of Fermi 2. Potential cumulative impacts associated with these actions and projects are addressed in Section 4.16 of this supplemental environmental impact statement. Not all actions or projects listed in this appendix are considered in each resource area because of the uniqueness of the resource and its geographic area of consideration.

Table E–1. Actions and Projects Considered in Cumulative Analysis

Project Name	Summary of Project	Approximate Location (Relative to Fermi)	Status
Nuclear projects			
Davis-Besse Nuclear Power Station Unit 1	Nuclear power plant One 908-MWe Babcock & Wilcox pressurized water reactor	Ottawa County, OH 27 mi (43 km) southeast of Fermi site on Lake Erie	Operational (FENOC 2014)
Davis-Besse independent spent fuel storage installation	Dry spent fuel storage	On Davis-Besse site	Operational (NRC 2014)
Coal-fired energy projects			
Monroe Power Plant	3,280-MW coal-fired plant	6 mi (10 km) southwest of Fermi site on Lake Erie	Operational; includes recent and planned refurbishment (DTE 2014)
Trenton Channel Power Plant	730-MW coal-fired plant	12 mi (19 km) north-northeast of Fermi site on the Detroit River	Operational; DTE planning to retire two of the three units in 2016 and reduce plant to one 520-MW unit (News-Herald 2014)
J.R. Whiting Power Plant	328-MW coal-fired plant	14 mi (23 km) south-southwest of Fermi site on Lake Erie	Operational; scheduled to be shut down by 2016 (Consumers Energy 2014; EIA 2014)
Bayshore Power Plant	136-MW coal-fired plant	20 mi (32 km) south-southwest of Fermi site on Lake Erie at Maumee Bay	Operational (FirstEnergy 2014)
River Rouge Power Plant	540-MW coal-fired plant	26 mi (42 km) north-northeast of Fermi site on the Detroit River	Operational (DTE 2014)
Natural Gas-fired energy projects			
Oregon Clean Energy Center	799-MW natural gas combined cycle plant	21 mi (34 km) south-southwest of Fermi site	Under Construction (OPSB 2014)

Project Name	Summary of Project	Approximate Location (Relative to Fermi)	Status
Mining Projects			
Rockwood Quarry	Crushed and broken limestone quarry	2.5 mi (4 km) north-northeast of Fermi site	Closed (EPA 2014a)
Stoneco Newport	Crushed and broken limestone quarry	2.5 mi (4 km) north-northeast of Fermi site	Operational (EPA 2014b)
Sylvania Minerals	Crushed and broken limestone and crushed silica quarry	6 mi (10 km) north-northwest of Fermi site	Operational (EPA 2014c)
Stoneco Denniston	Crushed and broken limestone quarry	9 mi (14 km) southwest of Fermi site	Operational (EPA 2014d)
Stoneco Maybee	Crushed and broken limestone quarry	13 mi (21 km) west-northwest of Fermi site	Operational (EPA 2014e)
Sibley Quarry	Crushed and broken limestone quarry	14 mi (23 km) north-northeast of Fermi site	Operational (EPA 2014f)
Landfills			
Rockwood Landfill	Industrial landfill; construction and debris landfill	2.5 mi (4 km) north-northeast of Fermi site	License expired 2014 (MDEQ 2014a)
Carleton Farms	Municipal solid waste landfill	12 mi (19 km) northwest of Fermi site	Operational (MDEQ 2015)
Riverview Land Preserve	Municipal solid waste landfill	13 mi (21 km) north-northeast of Fermi site	Operational (MDEQ 2014b)
Sibley Quarry	Industrial landfill	14 mi (23 km) north-northeast of Fermi site	Operational (MDEQ 2014c)
Water supply and treatment facilities			
Berlin Township Wastewater Treatment Plant	Wastewater treatment plant that discharges to Swan Creek near its confluence with Lake Erie	1.1 mi (2 km) northwest of Fermi site	Operational (EPA 2015a)
Frenchtown Township Water Plant	Water treatment plant that withdraws water from Lake Erie	2 mi (3 km) southwest of Fermi site	Operational (Frenchtown Township 2014)
Monroe Metropolitan Wastewater Treatment Facility	Wastewater treatment plant that discharges to Lake Erie-Plum Creek-Levee Channel	6 mi (10 km) southwest of the Fermi site on Lake Erie	Operational (EPA 2015b)
Monroe Water Filtration Plant	Water treatment plant that withdraws water from Lake Erie	7 mi (11 km) southwest of Fermi site	Operational (EPA 2015c)
Carleton Wastewater Treatment Plant	Wastewater treatment plant that discharges to Swan Creek	9 mi (14 km) northwest of Fermi site	Permit expired in 2014 (EPA 2015d)

Project Name	Summary of Project	Approximate Location (Relative to Fermi)	Status
Luna Pier Wastewater Treatment Plant	Wastewater treatment plant that discharges to La Pointe Drain	14 mi (23 km) south-southwest of Fermi site	Operational (EPA 2015e)
Various minor NPDES wastewater discharges	Various businesses with smaller wastewater discharges	Within 10 mi (16 km)	Operational
Manufacturing facilities			
Spartan Steel Coating LLC	Hot-dipped galvanized steel coil processing facility	5 mi (8 km) west of Fermi site	Operational (EPA 2014g)
JCIM	Plastics injection molding facility	5 mi (8 km) west-southwest of Fermi site	Operational (EPA 2014h)
Spiratex Company	Thermoplastic extrusion manufacturing facility	5 mi (8 km) west-southwest of Fermi site	Operational (EPA 2014i)
Ventower Industries	Wind turbine tower manufacturing facility	6 mi (10 km) southwest of Fermi site	Operational (EPA 2014j)
Guardian Industries	Glass plant manufacturing facility that discharges into Swan Creek	10 mi (16 km) north-northwest of Fermi site	Operational (EPA 2014k)
Oil refineries	Plants that refine crude oil for other applications	Various locations throughout region	Operational
Transportation Projects			
Cleveland-Toledo-Detroit Passenger Rail Line	Addition to regional transportation hub with rail lines connecting Cleveland, Buffalo, Toronto, Pittsburgh, Cincinnati, and Detroit	Rail line would pass through Monroe County on its way to Detroit	Proposed; schedule undetermined (TMACOG 2011; DTE 2014)
Interstate 75 Improvements	Reconstructing 6 mi (10 km) of I-75 through Monroe County	Between Dixie Highway and I-275	Starting in late 2015-2016. (MDOT 2014)
Parks and recreation sites			
Sterling State Park	Approximately 1,300 ac (530 ha) park on Lake Erie coast with campgrounds, trails, boat launches, and swimming area	Approximately 5 mi (8 km) southwest	Operational; managed by Michigan Department of Natural Resources (MDNR 2014a)
Maumee Bay State Park	1,336 ac (541 ha) park on Lake Erie coast with campgrounds, trails, boat launches, and swimming area	Approximately 20 mi (32 km) south-southwest	Operational; managed by Ohio State Parks (ODNR 2014)

Project Name	Summary of Project	Approximate Location (Relative to Fermi)	Status
Detroit River International Wildlife Refuge	Approximately 6,000 ac (2,400 ha) of islands, coastal wetlands, marshes, shoals, and waterfront lands along 48 mi (77 km) of Detroit River and Western Lake Erie shorelines. Only international wildlife refuge in North America.	Comprised of multiple refuge units extending north and south of Fermi site. The Lagoona Beach Unit is adjacent to Fermi.	Operational; managed by U. S. Fish and Wildlife Service. The Lagoona Beach Unit is managed cooperatively by the refuge in partnership with DTE Energy. (FWS 2014)
River Raisin National Battlefield Park	National Battlefield commemorating the River Raisin Battles during the War of 1812	Approximately 7 mi (11 km) southwest	Operational; managed by U.S. National Park Service. (NPS 2014)
Point Mouillee State Game Area	4,000 ac (1,600 ha) freshwater marsh restoration project open to wildlife viewing and public hunting	Approximately 4.5 mi (7 km) northeast	Operational; managed by Michigan Department of Natural Resources (MDNR 2014b)
Recreational Areas	Various parks, boat launches, campgrounds, swimming areas	Within 10 mi (16 km)	Operational
Fermi projects			
Fermi Nuclear Power Plant Unit 1	Decommissioning of shutdown nuclear power plant	On the Fermi site	SAFSTOR (NRC 2014)
Fermi Nuclear Power Plant Unit 3	Proposed construction and operation of 1,535-MWe nuclear power plant	On the Fermi site	Combined License issued May 1, 2015 (NRC 2015)
Independent spent fuel storage installation for Fermi 2	Dry spent fuel storage	On the Fermi site	Recently completed (DTE 2014)
Other projects			
Future Urbanization	Construction of housing units and associated commercial buildings; roads, bridges, and rail; and water and wastewater treatment and distribution facilities and associated pipelines as described in local land-use planning documents	Throughout region	Construction may occur in the future as described in State and local land-use planning documents

E.1 References

Consumers Energy. 2014. J.R. Whiting Generating Complex. Available at <http://www.consumersenergy.com/content.aspx?id=1336> (accessed 19 December 2014).

[DTE] DTE Electric Company. 2014. Applicant's Environmental Report—Operating License Renewal Stage, Fermi 2. Newport, MI: DTE. April 2014. ADAMS Nos. ML14121A538, ML14121A539, and ML14121A540.

[EIA] U.S. Energy information Administration. 2014. *Today in Energy: Planned coal-fired power plant retirements continue to increase*. March 20. Available at <http://www.eia.gov/todayinenergy/detail.cfm?id=15491> (accessed 18 December 2014).

[EPA] U.S. Environmental Protection Agency. 2014a. *Envirofacts Search Results: Rockwood Quarry.* Available at <http://oaspub.epa.gov/enviro/afs_reports.detail_plt_view?p_state_county_compliance_src=261 1500110&p_plant_id=.> (accessed 22 December 2014).

[EPA] U.S. Environmental Protection Agency. 2014b. *Envirofacts Search Results: Stoneco Newport.* Available at <http://oaspub.epa.gov/enviro/multisys2_v2.get_list?facility_uin=110001843220> (accessed 22 December 2014).

[EPA] U.S. Environmental Protection Agency. 2014c. *Envirofacts Search Results: Great Lakes Aggregates, LLC–Sylvania Minerals*. Available at <http://oaspub.epa.gov/enviro/afs_reports.detail_plt_view?p_state_county_compliance_src=261 1500146&p_plant_id=> (accessed 22 December 2014).

[EPA] U.S. Environmental Protection Agency. 2014d. *Envirofacts Search Results: Stoneco Denniston.* Available at <http://oaspub.epa.gov/enviro/afs_reports.detail_plt_view?p_state_county_compliance_src=261 1500147&p_plant_id=.> (accessed 22 December 2014).

[EPA] U.S. Environmental Protection Agency. 2014e. *Envirofacts Search Results: Stoneco Maybee.* Available at <http://oaspub.epa.gov/enviro/afs_reports.detail_plt_view?p_state_county_compliance_src=261 1500029&p_plant_id=> (accessed 22 December 2014).

[EPA] U.S. Environmental Protection Agency. 2014f. *Envirofacts Search Results: Sibley Limestone Quarry.* Available at <http://iaspub.epa.gov/enviro/afs_reports.detail_plt_view?p_state_county_compliance_src=261 6305352> (accessed 22 December 2014).

[EPA] U.S. Environmental Protection Agency. 2014g. *Envirofacts Search Results: Spartan Steel Coating.* Available at <http://oaspub.epa.gov/enviro/afs_reports.detail_plt_view?p_state_county_compliance_src=261 1500155&p_plant_id=> (accessed 19 December 2014).

[EPA] U.S. Environmental Protection Agency. 2014h. *Envirofacts Search Results: JCIM.* Available at <http://oaspub.epa.gov/enviro/afs_reports.detail_plt_view?p_state_county_compliance_src=261 1505489&p_plant_id=> (accessed 19 December 2014).

[EPA] U.S. Environmental Protection Agency. 2014i. *Envirofacts Search Results: The Spiratex Company.* Available at <http://oaspub.epa.gov/enviro/multisys2_v2.get_list?facility_uin=110003687617> (accessed 19 December 2014).

[EPA] U.S. Environmental Protection Agency. 2014j. *Envirofacts Search Results: Ventower Industries.* Available at <http://oaspub.epa.gov/enviro/afs_reports.detail_plt_view?p_state_county_compliance_src=261 15P0073&p_plant_id=> (accessed 19 December 2014).

[EPA] U.S. Environmental Protection Agency. 2014k. *Envirofacts Search Results: Guardian Industries.* Available at <http://oaspub.epa.gov/enviro/afs_reports.detail_plt_view?p_state_county_compliance_src=2611500015&p_plant_id=> (accessed 19 December 2014).

[EPA] U.S. Environmental Protection Agency. 2015a. *Envirofacts Search Results: Berlin Township Wastewater Treatment Plant.* Available at <http://oaspub.epa.gov/enviro/ICIS_DETAIL_REPORTS_NPDESID.icis_tst?npdesid=MI0020826&npvalue=1&npvalue=13&npvalue=14&npvalue=3&npvalue=4&npvalue=5&npvalue=6&rvalue=13&npvalue=2&npvalue=7&npvalue=8&npvalue=11&npvalue=12> (accessed 29 April 2015).

[EPA] U.S. Environmental Protection Agency. 2015b. *Envirofacts Search Results: Monroe Metropolitan Wastewater Treatment Plant.* Available at <http://iaspub.epa.gov/enviro/ICIS_DETAIL_REPORTS_NPDESID.icis_tst?npdesid=MI0028401&npvalue=1&npvalue=13&npvalue=14&npvalue=3&npvalue=4&npvalue=5&npvalue=6&rvalue=13&npvalue=2&npvalue=7&npvalue=8&npvalue=11&npvalue=12> (accessed 29 April 2015).

[EPA] U.S. Environmental Protection Agency. 2015c. *Envirofacts Search Results: City of Monroe Water Filtration Plant.* Available at <http://oaspub.epa.gov/enviro/fii_query_dtl.disp_program_facility?pgm_sys_id_in=MIR000045922&pgm_sys_acrnm_in=RCRAINFO> (accessed 29 April 2015).

[EPA] U.S. Environmental Protection Agency. 2015d. *Envirofacts Search Results: Carleton Wastewater Treatment Plant.* Available at <http://iaspub.epa.gov/enviro/ICIS_DETAIL_REPORTS_NPDESID.icis_tst?npdesid=MI0022543&npvalue=1&npvalue=13&npvalue=14&npvalue=3&npvalue=4&npvalue=5&npvalue=6&rvalue=13&npvalue=2&npvalue=7&npvalue=8&npvalue=11&npvalue=12> (accessed 27 April 2015).

[EPA] U.S. Environmental Protection Agency. 2015e. *Envirofacts Search Results: Luna Pier Wastewater Treatment Plant.* Available at <http://iaspub.epa.gov/enviro/ICIS_DETAIL_REPORTS_NPDESID.icis_tst?npdesid=MI0058821&npvalue=1&npvalue=13&npvalue=14&npvalue=3&npvalue=4&npvalue=5&npvalue=6&rvalue=13&npvalue=2&npvalue=7&npvalue=8&npvalue=11&npvalue=12> (accessed 29 April 2015).

[FirstEnergy] FirstEnergy Corporation. 2014. Operating Power Plants. Available at <http://investors.firstenergycorp.com/OperatingPowerPlants.aspx?iid=4056944&print=1> (accessed 19 December 2014).

[FENOC] FirstEnergy Nuclear Operating Company. 2014. Review of Draft Plant-Specific Supplement 52 to the Generic Environmental Impact Statement for License Renewal of Nuclear Plants Regarding Davis-Besse Nuclear Power Station, Unit 1. April 21. ADAMS No. ML14113A214.

Frenchtown Township. 2014. *Annual Water Quality Report*. Available at <http://www.frenchtowntownship.org/water.php> (accessed 30 April 2015).

[FWS] U.S. Fish and Wildlife Service. 2014. Detroit River International Wildlife Refuge, Michigan. Available at <http://www.fws.gov/refuge/detroit_river/refuge_units.html> (accessed 22 December 2014).

[MDEQ] Michigan Department of Environmental Quality. 2014a. Solid Waste Management Disposal Areas–Rockwood Landfill. Available at <http://www.deq.state.mi.us/wdspi/SolidWaste/OperatingLicenses.aspx?w=438977> (accessed 19 December 2014).

[MDEQ] Michigan Department of Environmental Quality. 2014b. Solid Waste Management Disposal Areas—The Riverview Land Preserve. Available at

1 <http://www.michigan.gov/documents/deq/DEQ-WHMD-
2 RIVERVIEW_OpLicense_259300_7.pdf> (accessed 19 December 2014).

3 [MDEQ] Michigan Department of Environmental Quality. 2014c. Solid Waste Management
4 Disposal Areas—Sibley Quarry Landfill. Available at
5 <http://www.deq.state.mi.us/wdspi/SolidWaste/DisposalAreas.aspx?w=392616> (accessed
6 19 December 2014).

7 [MDEQ] Michigan Department of Environmental Quality. 2015. Solid Waste Management
8 Disposal Areas—Carleton Farms Landfill. Available at
9 <http://www.michigan.gov/documents/deq/DEQ-WHMD-
10 CARLETON_FARMS_OpLicense_241128_7.pdf> (accessed 10 July 2015).

11 [MDNR] Michigan Department of Natural Resources. 2014a. Sterling State Park. Available at
12 <http://www.michigandnr.com/parksandtrails/details.aspx?id=497&type=SPRK> (accessed
13 22 December 2014).

14 [MDNR] Michigan Department of Natural Resources. 2014b. Point Mouillee State Game Area.
15 Available at
16 <http://www.michigandnr.com/publications/pdfs/wildlife/viewingguide/slp/107Mouillee
17 /index.htm> (accessed 22 December 2014).

18 [MDOT] Michigan Department of Transportation. 2014. I-75 Reconstruction Project, Monroe
19 County. Available at <http://www.michigan.gov/mdot/0,4616,7-151-9621_11008-316074--
20 ,00.html> (accessed 19 December 2014).

21 [News-Herald] *The News-Herald*. 2014. "DTE Energy to close two units at Trenton Channel
22 Power Plant in 2016." Available at
23 <http://www.thenewsherald.com/articles/2014/07/24/news/doc53d18f8d00ed0609926093.txt>
24 (accessed 18 December 2014).

25 [NPS] U.S. National Park Service. 2014. River Raisin National Battlefield Park, Michigan.
26 Available at <http://www.nps.gov/rira/learn/historyculture/index.htm> (accessed
27 19 December 2014).

28 [NRC] U.S. Nuclear Regulatory Commission. 2014. Information Digest, 2014–2015.
29 NUREG-1350, Volume 26. August 2014. 216 p.

30 [NRC] U.S. Nuclear Regulatory Commission. 2015. Letter from F Akstulewicz, Director,
31 Division of New Reactor Licensing, Office of New Reactors, to P Smith, Director, Nuclear
32 Development – Licensing & Engineering, DTE Electric Company. Subject: Issuance of
33 Combined License for Enrico Fermi Unit 3. May 1, 2015. ADAMS No. ML14323B045.

34 [ODNR] Ohio Department of Natural Resources. 2014. Maumee Bay State Park. Available at
35 <http://parks.ohiodnr.gov/maumeebay> (accessed 22 December 2014).

36 [OPSB] Ohio Power Siting Board. 2014. Case No.12-2959-EL-BGN: Oregon Clean Energy
37 Center, Lucas County—Status. Available at
38 <http://www.opsb.ohio.gov/opsb/index.cfm/cases/12-2959-el-bgn-oregon-clean-energy-center-
39 lucas-county/> (accessed 19 December 2014).

40 [TMACOG] Toledo Metropolitan Area Council of Governments. 2011. Passenger Rail Service:
41 Northwest Ohio and Southeast Michigan Future High Speed Passenger Rail Corridors Map.
42 Available at
43 <http://www.tmacog.org/Transportation/Passenger%20Rail%20Committee/Ohio_Passenger_
44 Rail2.pdf> (accessed 22 December 2014).

APPENDIX F
U.S. NUCLEAR REGULATORY COMMISSION STAFF EVALUATION OF SEVERE ACCIDENT MITIGATION ALTERNATIVES FOR FERMI UNIT 2 NUCLEAR STATION, IN SUPPORT OF LICENSE RENEWAL APPLICATION REVIEW

F. U.S. NUCLEAR REGULATORY COMMISSION STAFF EVALUATION OF SEVERE ACCIDENT MITIGATION ALTERNATIVES FOR FERMI UNIT 2 NUCLEAR STATION, IN SUPPORT OF LICENSE RENEWAL APPLICATION REVIEW

F.1 Introduction

DTE Electric Company (DTE) submitted an assessment of severe accident mitigation alternatives (SAMAs) for the Fermi Unit 2 Nuclear Station (Fermi 2), as part of its Environmental Report (ER) (DTE 2014). This assessment was based on the most recent Fermi 2 probabilistic risk assessment (PRA) available at that time, a plant-specific accident progression and source term analysis performed using the Modular Accident Analysis Program (MAAP) version 4.0.7 computer code, a plant-specific offsite consequence analysis performed using the MELCOR Accident Consequence Code System (MACCS2) version 3.7.0 computer code, and insights from the Fermi 2 individual plant examination (IPE) (DECo 1992) and individual plant examination of external events (IPEEE) (DECo 1996). In identifying and evaluating potential SAMAs, DTE considered SAMAs that addressed the major contributors to core damage frequency (CDF) and release frequency at Fermi 2, as well as SAMA candidates for other operating plants that have submitted license renewal applications. DTE initially identified 220 potential SAMAs. This list was reduced to 79 unique SAMA candidates by eliminating SAMAs that are not applicable to Fermi 2 because of design differences, that have already been implemented at Fermi 2, that were combined with another SAMA candidate during the assessment, that have excessive implementation costs, that have a very low benefit to Fermi 2, or that are undergoing implementation at Fermi 2. DTE assessed the costs and benefits associated with each of the 79 potential SAMAs and concluded in the ER that one SAMA candidate was potentially cost beneficial. Sensitivity analyses performed by DTE indicated that three additional SAMA candidates had the potential to be cost-beneficial.

Based on a review of DTE's SAMA assessment and the onsite SAMA audit held on October 6–8, 2014 (NRC 2014c), the U.S. Nuclear Regulatory Commission (NRC) staff issued requests for additional information (RAI) to DTE by letters dated November 14, 2014 (NRC 2014a), February 3, 2015 (NRC 2015a), and April 9, 2015 (NRC 2015b). Key questions concerned the modeling of loss of offsite power (LOOP) and station blackout (SBO) sequences, the comparison of the results of the Fermi 2 PRA with those for other similar plants, results of the peer review on the PRA, truncation cutoff used for the Level 2 release category and Level 1 CDF analyses, additional details on the Level 2 and 3 PRA models including the basis for representative sequences for each release category, thermal power levels following a power uprate, justification of population estimates, the identification and screening of candidate SAMAs, the evaluation of the risk reduction of certain SAMAs, and the basis for the SAMA cost estimates. Subsequent followup NRC staff RAIs (NRC 2015a, 2015b) concerned: common cause failure of combustion turbine generators (CTGs) due to severe weather, the treatment and impact of unaccounted for release category frequency, the impact on SAMA cost benefit analysis of a nonconservative treatment of some accident sequences, a reanalysis of the benefit of certain SAMAs, and the development of the population within 50 miles (mi) (80 kilometers (km)) of Fermi 2. DTE submitted additional information by letters dated January 9, 2015; March 5, 2015; and May 8, 2015 (DTE 2015a, 2015b, 2015c). DTE's responses to questions by the NRC staff resulted in three new potentially cost-beneficial SAMAs. The NRC staff's concerns were addressed by DTE's responses and calculations performed by the NRC staff during its review.

An assessment of SAMAs for Fermi 2 is presented below.

F.2 Estimate of Risk for Fermi 2

DTE's estimates of offsite risk at Fermi 2 are summarized in Section F.2.1. The summary is followed by the NRC staff's review of DTE's risk estimates in Section F.2.2.

F.2.1 DTE's Risk Estimates

DTE combined two distinct analyses to form the basis for the risk estimates used in the SAMA analysis: (1) Level 1 and Level 2 PRA models for Fermi 2 and (2) a supplemental analysis of offsite consequences and economic impacts (essentially a Level 3 PRA model) developed specifically for the SAMA analysis. The Level 1 model is a significant upgrade and revision of the IPE Level 1 model while the Level 2 model is an update of the IPE Level 2 model. The SAMA analysis is based on the most recent Level 1 and Level 2 PRA models available for Fermi 2 at the time of the ER, referred to as the Fermi 2 Version 9 (FermiV9) PRA model. The scope of this Fermi 2 PRA includes internal floods but does not include a separate PRA for external events at Fermi 2.

The Fermi 2 CDF from internal events is approximately 1.5×10^{-6} per year (DTE 2014). DTE did not explicitly include the contribution from external events within the Fermi 2 SAMA risk estimates; however, it did account for the potential risk reduction benefits associated with external events by multiplying the estimated benefits for internal events by 11. This is discussed further in Section F.2.2.2.

The breakdown of CDF by initiating event is provided in Table F–1. As shown in this table, events initiated by a total LOOP, a turbine trip with bypass, and a medium loss-of-coolant accident (LOCA) below the top of the active fuel are the dominant contributors to the CDF. DTE identified that SBO contributes 8.4×10^{-8} per year, or 5.6 percent of the total internal events CDF while anticipated transients without scram (ATWS) contribute 2.0×10^{-7} per year, or approximately 13 percent, of the total CDF (DTE 2014).

Table F–1. Fermi 2 CDF for Internal Events

Initiating Event	CDF[(a)] (per year)	Percent CDF Contribution
Total LOOP	2.1×10^{-7}	14
Turbine Trip with Bypass	2.0×10^{-7}	13
Medium LOCA below the Top of Active Fuel	1.6×10^{-7}	10
Nominal Rupture in Fire Protection System Line in Auxiliary Building Propagating to Relay Room	1.1×10^{-7}	7
Medium LOCA in Low-Pressure Coolant Injection (LPCI) Line	1.1×10^{-7}	7
Medium LOCA in Feedwater (FW) Line	6.0×10^{-8}	4
Loss of Condenser Vacuum	5.3×10^{-8}	4
Major Rupture in Circulating Water Pipe or Expansion Joints in Turbine Building.	5.2×10^{-8}	3
Interfacing System LOCA in Residual Heat Removal (RHR) Shutdown Cooling Line (X-12)	5.1×10^{-8}	3
Manual Shutdown	4.4×10^{-8}	3
Partial LOOP for Division 2	3.8×10^{-8}	3

Initiating Event	CDF[(a)] (per year)	Percent CDF Contribution
Loss of Bus #301	3.7×10^{-8}	2
Nominal Rupture in Reactor Building Closed Cooling Water (RBCCW)/ Emergency Equipment Cooling Water (EECW) Division 2 Line in Direct Current (DC) Switchgear Room	3.3×10^{-8}	2
Other Initiating Events[(b)]	3.5×10^{-7}	24
Total (Internal Events)[(c)]	**1.5×10^{-6}**	**100**

[(a)] CDF based on Fussell-Vesely importance (DTE 2015a) and total CDF.

[(b)] Other initiating event each contributing less than 2 percent to total CDF.

[©] Column totals may be different because of rounding.

Source: DTE 2015a

The Fermi 2 Level 2 PRA model that forms the basis for the SAMA was "...developed as part of the FermiV9 internal events PRA model" (DTE 2014) and incorporates the significant improvement in severe accident response coupled with plant modifications and improved understanding of severe accident core melt progression since the original IPE model (DTE 2015a).

The Level 2 model utilizes containment event trees (CETs) to assess the accident progression following a core damage event and contains both phenomenological and containment system status events. The Level 1 core damage sequences are binned into plant damage states (PDSs) or accident classes, which provide the interface between the Level 1 and Level 2 CET analysis. Each PDS bin is then entered into the CET. The CET is linked directly to the Level 1 event trees, and CET nodes are evaluated using supporting fault trees.

The result of the Level 2 PRA is a set of 13 release categories, with their respective frequency and release characteristics. The results of this analysis for Fermi 2 are provided in Tables D.1–10, D.1–14, and D.1–15 of the ER (DTE 2014). The categories were defined based on the timing of release (three release time ranges) and the magnitude of release (four release magnitude ranges). One additional release category was included for an intact containment. Releases with intact containment were evaluated using the maximum design basis leakage of 0.5 percent of the containment air weight per day.

For use in the SAMA analysis, the release category for high magnitude and early timing was divided into two bins (one for containment isolation and one without). Due to the small release category contributions from 3 categories, the number of release category bins was reduced to 11 cases. The frequency of each release category was obtained by summing the frequency of the individual accident progression CET endpoints binned into the release category. Source terms were developed for each of the 13 release categories using the results of MAAP Version 4.0.7 computer code calculations (DTE 2014).

DTE computed offsite consequences for potential releases of radiological material using the MACCS2 version 3.7.0 code and analyzed exposure and economic impacts from DTE's determination of offsite and onsite risks. Inputs for these analyses include plant-specific and site-specific input values for core radionuclide inventory, source term and release characteristics, site meteorological data, projected population distribution and growth within a 50-mi (80-km) radius, emergency response evacuation modeling, and economic data. The estimation of onsite impacts (in terms of cleanup and decontamination costs and occupational dose) is based on guidance in NUREG/BR–0184 (NRC 1997a). In its calculation for

replacement power costs, DTE accounted for the increased electric power output of Fermi 2 compared to the generic reactor power output presented in NUREG/BR–0184 (NRC 1997a) and adopted by the Nuclear Energy Institute's (NEI) guidance document (NEI 2005).

In the ER, DTE estimated the dose risk to be 0.0491 person-sievert (Sv) per year (4.91 person-rem per year) to the population within 50 mi (80 km) of the Fermi 2 site. The offsite economic cost risk was calculated to be $15,600 per year. The breakdown of the population dose risk by containment release mode is summarized in Table F–2. The two categories for high magnitude, early releases accounted for approximately 78 and 68 percent of the population dose risk and offsite economic cost risk, respectively. The high magnitude, intermediate release category accounted for 14 and 24 percent of the population dose risk and offsite economic cost risk, respectively.

Table F–2. Base Case Mean Population Dose Risk and Offsite Economic Cost Risk for Internal Events

Release Mode		Population Dose Risk[a]		Offsite Economic Cost Risk	
ID[b]	Frequency (per year)	person-rem/yr	% Contribution	$/yr	% Contribution
H/E-BOC[c]	5.9×10^{-8}	1.3×10^{0}	26	1.8×10^{3}	12
H/E	3.1×10^{-7}	2.5×10^{0}	52	8.8×10^{3}	56
H/I	7.2×10^{-8}	6.9×10^{-1}	14	3.8×10^{3}	24
H/L	2.5×10^{-10}	2.2×10^{-3}	<0.1	4.1×10^{0}	<0.1
M/E	6.2×10^{-8}	1.5×10^{-1}	3	5.2×10^{2}	3
M/I[d]	3.7×10^{-8}	1.0×10^{-1}	2	2.3×10^{2}	2
L/E	4.4×10^{-8}	9.9×10^{-3}	0.2	9.9×10^{-1}	<0.1
L/I[d]	5.5×10^{-8}	1.2×10^{-1}	2	4.5×10^{2}	3
LL/E	5.0×10^{-10}	6.6×10^{-6}	<0.1	1.9×10^{-4}	<0.1
LL/I[d]	7.8×10^{-8}	1.0×10^{-2}	0.2	3.1×10^{-1}	<0.1
CI	7.8×10^{-7}	5.1×10^{-5}	<0.1	1.5×10^{-6}	<0.1
Total	**1.5×10^{-6}**	**4.9×10^{0}**	100	**1.6×10^{4}**	100

[a] Unit Conversion Factor: 1 Sv = 100 rem

[b] Release Mode Nomenclature (Magnitude/Timing)

[c] Contributions to Large Early Release Frequency from break outside containment (BOC) and interfacing system LOCA initiators

[d] The release categories for Late (L) timing were subsumed into the Intermediate (I) release categories for Medium (M), Low (L), and Low-Low (LL) releases.

Magnitude:
High (H) - Greater than 10 percent release fraction for cesium iodide (CsI)
Medium (M) - 1 to 10 percent release fraction for CsI
Low (L) - 0.1 to 1 percent release fraction for CsI
Low-Low (LL) - Less than 0.1 percent release fraction for CsI
Containment intact (CI) - Much less than 0.1 percent release fraction for CsI
Timing:
Early (E) - Less than 4 hours
Intermediate (I) - 4 to 24 hours
Late (L) - Greater than 24 hours

Source: DTE 2014

F.2.2 Review of DTE's Risk Estimates

DTE's determination of offsite risk at the Fermi 2 site is based on the following three major elements of the analysis:

(1) Level 1 risk model that supersedes the 1992 IPE submittals (DECo 1992) and the fire, seismic, and other external event analyses of the 1996 IPEEE submittal (DECo 1996);

(1) Revised Level 2 risk model and MAAP source term analysis;

(2) MACCS2 analyses performed by DTE to translate fission product source terms and release frequencies from the Level 2 PRA model into offsite consequence measures.

Each of these analyses was reviewed by the NRC staff to determine the acceptability of DTE's risk estimates for the Fermi 2 SAMA analysis, as summarized below.

F.2.2.1 Internal Events CDF Model

The NRC staff's review of the Fermi 2 IPE is described in its 1994 NRC memorandum (NRC 1994). Based on its review of the Fermi 2 nuclear power plant IPE submittal and associated documentation, the NRC staff concluded that the licensee met the intent of Generic Letter 88-20 (NRC 1988). As indicated in the NRC staff review, while the licensee concluded that no vulnerabilities exist at Fermi 2, the licensee identified many insights that were later used to identify enhancements for Fermi 2. These are discussed in Section F.3.2.

There have been numerous revisions to the Fermi 2 PRA since the original 1992 IPE submittal. A listing of the complete revision history of the Fermi 2 PRA since the original IPE submittal was provided in the ER (DTE 2014) and in response to an NRC staff request for additional information (RAI) (DTE 2015a) and is summarized in Table F–3. A comparison of the internal events CDF between the 1992 IPE and the current PRA model indicates there has been a reduction in total CDF from 5.7×10^{-6} per year to 1.5×10^{-6} per year.[1]

Table F–3. Summary of Major PRA Models and Corresponding CDF and LERF Results

PRA Model	Summary of Significant Changes from Prior Model	CDF[(a)] (per year)	LERF[(a)] (per year)
IPE (1992)	IPE Submittal	5.7×10^{-6}	Not Available
PSA97C (1997)	Numerous changes to reflect plant modification and model enhancements	7.1×10^{-6}	1.2×10^{-6}
FermiV2 (2002)	CDF Model Converted from RISKMAN to CAFTA	5.0×10^{-6}	Not Available
FermiV3 (2002)	Normal PRA model maintenance including Fermi-specific data used to update initiating event frequencies, component failure frequencies, and common cause event data Test and maintenance based upon data obtained from plant operating experience CAFTA Level 2 Model developed	3.3×10^{-6}	2.5×10^{-7}
FermiV4 (2003)	Test and maintenance unavailability based upon the Maintenance Rule performance criteria	5.8×10^{-6}	9.3×10^{-7}

[1] The 1.3×10^{-6} per year total CDF excludes the internal flood CDF as it is not included in the IPE value.

PRA Model	Summary of Significant Changes from Prior Model	CDF[(a)] (per year)	LERF[(a)] (per year)
FermiV6[(b)] (2004)	Normal PRA model maintenance Included revised HRA using HRA Calculator Incorporated several recommendations from the 1997 peer review	6.1×10^{-6}	4.8×10^{-7}
FermiV7 (2006)	Included HRA dependent action basic events Added Black Start DG with 11-2,11-3, and 11-4 CTGs Updated LOOP initiating event frequencies Incorporated additional recommendations from the 1997 peer review	1.4×10^{-5}	5.5×10^{-7}
FermiV8 (2010)	Periodic update Expanded the mutually exclusive event file to exclude many nonrepresentative maintenance configurations Updated the maintenance unavailability terms Changed RPS mechanical and electrical "failure to scram" values to align with current accepted industry benchmark values	2.3×10^{-6}	3.1×10^{-7}
FermiV9 DRAFT	Complete model upgrade including: initiating events, success criteria, data, system notebooks, HRA, internal flood, MAAP 4.0.7 analyses, and Level 2/LERF Test and maintenance unavailability based upon data obtained from plant operating experience	1.3×10^{-6}	3.9×10^{-7}
FermiV9 (2013)	Changes to respond to peer review findings including: elimination of credit for terminating certain flood events, corrected HPCI/RCIC fail to start type code failure rate, and added dependent human failure event to operate high pressure injection systems Corrected other significant modeling issues including: elimination of some ATWS and LERF non-minimal cutsets and lowered human error probability based on added time available from MAAP analysis	1.5×10^{-6}	3.7×10^{-7}

[(a)] Models FermiV4, FermiV6, FermiV7,and FermiV8 included pre-IPE internal flood initiating event modeling. The FermiV9 model includes a new internal flood analysis.

[(b)] The FermiV5 model was not issued.

Key: CDF = core damage frequency; CTG = combustion turbine generator; DG = diesel generator; HPCI = high pressure coolant injection; HRA = human reliability analysis; IPE = individual plant examination; LERF = large early release frequency; LOCA = loss-of-coolant accident; LOOP = loss of offsite power; NRC = U.S. Nuclear Regulatory Commission; PRA = probabilistic risk assessment; RCIC = reactor core isolation cooling; RPS = reactor protection system

Sources: DTE 2014 and DTE 2015a

The CDF value from the 1992 IPE (5.7×10^{-6} per year) is well below the average of the CDF values reported in the IPEs for boiling water reactors (BWR) 3/4 plant units. NUREG–1560 gives the average for the group of BWR 3/4 units to be 2×10^{-5} per year with the reported values ranging from 9×10^{-8} per year to 8×10^{-5} per year (NRC 1997b). It is recognized that other plants have updated the values for CDF subsequent to the IPE submittals to reflect modeling and hardware changes.

The current internal events CDF result for Fermi 2 (1.5×10^{-6} per year) is considerably less than that for other plants of similar vintage and characteristics. In response to an NRC staff RAI to

explain the reasons for this disparity, DTE identified the following Fermi 2 features that are responsible for this low CDF (DTE 2015a):

- Fermi 2 has a standby feedwater system that is not found at other BWRs. It consists of two motor driven pumps, although only one is needed for most scenarios. One pump is powered by Division 2 and the other pump is powered by Division 1, which has combustion turbine generators (CTGs) backup. This system is credited early in general transient and LOOP scenarios and is a backup to high-pressure coolant injection (HPCI) and reactor core isolation coolant (RCIC).
- Fermi 2 has a residual heat removal (RHR) complex, which contains two divisions of the ultimate heat sink. This facility contains the emergency diesel generators (EDGs), RHR service water (RHRSW) pumps, diesel generator service water pumps, and EESW pumps. This building is protected from design basis tornados. The ultimate heat sink has adequate inventory for 7 days without makeup.
- Fermi 2 has two independent switchyards. Division 1 offsite power is provided by a 120 kV switchyard fed from three offsite lines. Division 2 offsite power is provided by a 345 kV switchyard fed from two offsite lines. These switchyards are electrically and spatially separated. There is the ability to cross-tie from one division to the other using a maintenance tie breaker.
- Fermi 2 has four EDGs (two EDGs support Division 1 and two EDGs support Division 2). One EDG can provide adequate power to shut down the plant in general transients and LOOP. Fermi 2 also has four CTGs. The CTGs provide power to the Division 1 switchyard, which in turn can provide power to the standby feedwater system. CTG 11-1 has blackstart capability from the control room for SBOs, and units 11-2, 11-3, and 11-4 can be manually aligned for blackstart using a standby diesel generator.
- Fermi 2 has several closed cooling water systems used to cool plant systems. The benefit is that these closed cooling water systems have a finite amount of water that leads to a reduced internal flooding impact.

The NRC staff considered the peer review performed for the Fermi 2 PRA, and the potential impact of the review findings on the SAMA evaluation. In the ER (DTE 2014), DTE described the August 2012 Boiling Water Reactor Owners Group (BWROG) peer review of the Fermi 2 PRA. In response to an NRC staff RAI, DTE clarified that the peer review was performed on a draft of the FermiV9 PRA (DTE 2015a). The peer review was stated to be performed consistent with Regulatory Guide 1.200, Rev. 2 (NRC 2009) and utilized the American Society of Mechanical Engineers (ASME) PRA standards (ASME and ANS 2009). DTE stated that the peer review resulted in 28 findings and provided a tabulation of the status and resolution of each finding.

All but four of the findings were considered “closed” by DTE. The NRC staff reviewed the stated resolution of the “closed” findings. On the basis of this review and DTE’s response (DTE 2015a) to an NRC staff RAI requesting clarification, the NRC staff agrees that those findings could be considered closed for the purposes of the SAMA analysis.

The four findings not considered “closed” were described by DTE as having been “addressed.” These findings were related to the methodology employed by DTE in performing the human reliability analysis (HRA) dependency analysis and its appropriateness. Although the methodology employed was not considered an industry standard method by the peer review team, DTE stated “that a review of the quantitative results by an Expert Panel (composed of personnel from two nonaffiliated PRA consulting firms and members of the DTE PRA staff) prior

to the Peer Review concluded that the quantification results (including HRA) dependency groupings) were representative of the as-built, as-operated plant and were reasonable with respect to similar plants. Based upon this quantification analysis, findings related to the HRA dependency analysis are deemed by DTE to not significantly affect risk-informed applications including the SAMA analysis. On the basis of the conclusions of the expert panel review and DTE clarification (DTE 2015a) that the same PRA model (FermiV9 draft) was the subject of both the peer review and the expert panel review and only one change to correct an error found by the peer review was made in the HRA dependency analysis between the FermiV9 draft and the versions used for the license renewal (FermiV9), the NRC staff concludes that the Fermi 2 HRA dependency analysis is adequate for the SAMA application.

The NRC staff has determined that DTE's disposition of the peer review findings is consistent with the NEI guidance (NEI 2005). The NRC staff also finds the final resolution of the findings provides reasonable assurance of minimal impacts on the results of the SAMA analysis.

In an RAI, the NRC staff requested that DTE briefly discuss the modeling of the LOOP and SBO scenarios, including how the CTGs are incorporated in the model and if common cause loss of alternating current (AC) due to weather is considered. As discussed above, at Fermi 2 there are two separate switchyards (120 kV and 345 kV), each of which supplies offsite power to a single "division" of engineered safety feature (ESF) and balance of plant power. The LOOP initiators are referred to as "divisional Loss of Offsite Power (LOOP)" or partial LOOP events. These partial LOOP events are processed via the general transient event tree. Consequential losses of offsite power are modeled as "total" LOOPs and are processed via the LOOP event tree. The failure of the emergency AC power systems following a LOOP would result in what is commonly referred to as SBO or the complete loss of all AC power to the unit. At Fermi 2, this result requires the failure of the AC power from both switchyards, failure of the emergency diesels available to the unit, and failure of the interconnection with the onsite gas turbines. The SBO event tree considers the ability for direct current (DC)-powered high pressure systems (HPCI and/or RCIC) to provide high pressure reactor pressure vessel (RPV) makeup, manual depressurization per the emergency operating procedures, the ability to recover offsite power (at various time points in the sequence), and the ability to successfully mitigate core damage in the long term following successful recovery of offsite power.

The LOOP models include weather-centered total and partial LOOP events along with a common cause failure of all four CTGs. The model specifically includes the following: (1) common cause failure of all four CTGs in the event of a weather-centered "total" LOOP, and (2) common cause failure of all four CTGs in the event of a weather-centered loss of the 120 kV (Division 1) switchyard.

The NRC staff noted in an RAI, that the common cause failure of all four CTGs in the event of a weather-centered loss of the 345 kV switchyard is not included in the model. DTE indicated that there were several reasons for not including weather-centered loss in the model. First, the CTGs are electrically connected to the 120 kV switchyard. Second, the common cause failure of a weather-centered loss of 345 kV switchyard and all four CTGs without affecting the 120 kV switchyard is not deemed a credible scenario due to the large spatial separation between the 120 kV and 345 kV switchyards. If there were a weather phenomenon large enough to affect both the 345 kV switchyard and the CTGs, it would also affect the 120 kV switchyard (DTE 2015b).

DTE stated that the FermiV9 model reflects the Fermi 2 as-built, as-operated configuration as of June 30, 2011. One subsequent plant modification included in the model is the addition of a third breaker row to the existing ring bus configuration in the 345-kV switchyard. In addition, one planned modification, the measurement uncertainty recapture (MUR) power uprate, is

included in the SAMA analysis. The small change in the current licensed power, an increase of 1.64 percent, does not have any impact on the PRA model, but the increase in power is included in the Level 3 analysis for the calculation of maximum averted cost risk (MACR). In response to an NRC staff RAI, DTE confirmed that a review of all modifications since the freeze date have been evaluated. Other than the items discussed above, DTE indicated that pending Fukushima modifications will not have an adverse impact on the SAMA analysis, and that in addition, no operating practice/procedure changes have been identified that would have an adverse impact on the SAMA assessment (DTE 2015a).

On the basis of the NRC staff's evaluation of internal events previously described in this subsection, the NRC staff concludes that the internal events Level 1 PRA model is of sufficient quality to support the SAMA evaluation.

F.2.2.2 External Events

As previously indicated, the Fermi 2 PRA used for the SAMA analysis does not include external events. In the absence of such an analysis, DTE used the Fermi 2 IPEEE to identify the highest risk accident sequences and the potential means of reducing the risk posed by those sequences and to estimate the benefit of potential SAMAs, as discussed below and in Section F.3.2.

The Fermi 2 IPEEE was submitted in March 1996 (DECo 1996) in response to Supplement 4 of Generic Letter (GL) 88-20 (NRC 1991). The submittal included a seismic margin assessment (SMA), a fire assessment using the Electric Power Research Institute (EPRI) fire-induced vulnerability evaluation (FIVE) guidance (EPRI 1992), and a screening analysis for other external events, such as high winds, floods, and other external events (HFO). Detroit Edison did not provide a definition of a vulnerability and did not identify any vulnerabilities in the seismic, fire, or HFO areas. The licensee did, however propose various plant improvements in the seismic and fire areas. In its safety evaluation report (SER) (NRC 2000a), the NRC staff concluded that the applicant's IPEEE process is capable of identifying the most likely severe accidents and severe accident vulnerabilities for external events and, therefore, that the Fermi 2 IPEEE has met the intent of Supplement 4 to GL 88-20.

The Fermi 2 IPEEE seismic analysis was a focused-scope SMA following NRC guidance (Chen et al. 1991; NRC 1991). The SMA approach is deterministic in nature and does not result in probabilistic risk information. The SMA was performed using a Safe Shutdown Equipment List (SSEL) with plant walkdowns in accordance with the guidelines and procedures documented in EPRI Report NP-6041-SL (EPRI 1991). Two success paths, each capable of mitigating the effects of a seismically induced small break LOCA, were identified based on a review of the guidance and plant documentation. The components on the SSEL were then evaluated for seismic capacity using a review level earthquake (RLE) of 0.3 g.

EPRI Report NP-6041-SL provides a set of screening guidelines to be used by the seismic review team (SRT) to screen structures and equipment, against the RLE, during plant walkdowns. The screening also relies on the judgment and the experience of the SRT. More detailed evaluations may be required to establish the seismic capability of items (outliers) that do not meet the screening criteria or are judged by the SRT to warrant further review.

Particular emphasis was placed on equipment anchorage and identification of potential spatial interaction problems. A bounding anchorage evaluation was prepared to evaluate the capability of SSEL component anchorages to resist the RLE loads. High confidence in low probability of failure (HCLPF) calculations were performed for several critical items including masonry block and shield walls, and reactor internals.

As a result of the seismic screening evaluation and walkdown of the structures and components, several field conditions and concerns resulting in the need for plant maintenance were identified. Most of these items consisted of loose, missing, or damaged hardware and were handled by initiating plant maintenance work requests. Several conditions required design modifications. The majority of the outliers involved seismic interaction concerns that were resolved through some corrective actions. Others were resolved either by Conservative Deterministic Failure Margin (CDFM) capacity analysis to show the capacity well beyond review-level earthquake demand or by maintenance or modifications. These outliers were considered further in the Phase I SAMA identification, discussed in Section F.3 below.

As indicated by the licensee, detailed HCLPF calculations were not performed for all outliers. The approach was to utilize existing design basis documentation to extrapolate a minimum HCLPF of 0.3g PGA, based on the EPRI SMA Methodology found in Report NP-6041-SL. This was primarily accomplished by reviewing the conservative bias of the original design methods versus the guidelines in EPRI Report NP-6041-SL for determining CDFM and/or by taking advantage of existing design margins between capacity and demand.

With respect to the completion of the plant modifications and corrective maintenance activities, the licensee reached the following conclusion (DECo 1996): "all outliers identified during the seismic evaluation and walkdowns are shown to have adequate capability to withstand the prescribed RLE without degradation of the components or pertinent systems." The license further noted: "[a]s a result, this study has demonstrated, by using the above-described methodology, that the plant seismic HCLPF at Fermi 2 is equal to or greater than 0.3 g." Improvements to Fermi 2 resulting from the IPEEE were (DECo 1996, DTE 2014):

- fastening adjacent panels containing relays to prevent impacts during a seismic event;
- replacement of low ruggedness relays;
- additional seismic restraints for the large nonsafety-related air dryer tank;
- rectification of a weakness in the seismic load path for two large control center heating, ventilating, and air conditioning instrument panels;
- additional training incorporated into the continuing maintenance training program to increase the awareness level and emphasize the importance of mounting hardware installation and restoration during and after maintenance activities; and
- operations training to include a LOOP and permanent loss of CTG 11 Unit 1 (CTG 11-1) scenario and in dealing with spurious alarms resulting from low seismic ruggedness relay chatter.

DTE actions in response to the 50.54(f) letter (NRC 2012a) requesting information related to the Fukushima Daiichi Near Term Task Force (NTTF) recommendations, confirmed that all of the above items have been addressed and are considered resolved (DTE 2012a). It is further noted that the DTE response to Recommendation 2.3 identified 27 potentially adverse seismic conditions, but none were determined to have an immediate impact to the safe operation of the plant and are being addressed through the NRC's agencywide program for responding to the Fukushima Daiichi accident. This program includes additional seismic evaluations as outlined in the NRC's 50.54(f) letter dated March 12, 2012 (NRC 2012a).

Because the SMA approach used in the IPEEE does not involve the determination of seismic CDF, a seismic CDF from the Generic Issue (GI) 199 risk assessment (NRC 2010) for the Fermi 2 site was used. The weakest link seismic CDF value of 4.2×10^{-6} per year from GI-199

was used for determining the external events multiplier. The NRC staff notes that EPRI has provided initial estimates of updated seismic CDFs from new seismic hazard curves developed following the Fukushima Daiichi accident (EPRI 2014). In response to an NRC staff RAI to consider the impact of this updated seismic CDF on the Fermi 2 SAMA analysis, DTE indicated that, using the same methodology as GI-199, the new seismic hazard curves would result in a seismic CDF for Fermi 2 of 2.3×10^{-6} per year (DTE 2015a). This is discussed in more detail below.

The Fermi 2 IPEEE included an internal fire analysis employing EPRI's FIVE methodology (EPRI 1992). FIVE is fundamentally a prescriptive fire PRA-based screening approach, which uses progressively more detailed phases of screening. The Fermi 2 analysis utilized the major steps of a FIVE assessment including fire area/compartment identification, safe shutdown equipment location, qualitative screening using spatial failure analysis, a Fire Compartment Interaction Analysis (FCIA), quantitative screening, including determining the safe shutdown failure probability for unscreened fire initiators using the PRA models, a fire propagation analysis, and a confirmatory walkdown (NRC 2000a).

The CDF of the areas that did not screen out in the final screening phase totaled 1.7×10^{-5} per year in the original IPEEE submittal (DECo 1996). As a result of a response to an NRC RAI on the IPEEE, the total CDF increased to approximately 2.2×10^{-5} per year (DECo 1999). Table F–4 provides a summary of the final phase of screening results from the Fermi 2 IPEEE fire analysis. As the NRC staff noted in the Fermi 2 IPEEE SER (NRC 2000a), the CDF from the remaining (those with a CDF of less than 1×10^{-6} per year) compartments subjected to the detailed analysis is 1.5×10^{-5} per year. This yields a total fire CDF of 3.7×10^{-5} per year, the impact of which is discussed below.

Table F–4. Fermi 2 Important Contributors[(a)] to Fire CDF

Fire Area	Fire Zone Description	CDF (per year)
09AB	Control Room	7.4×10^{-6}
04ABN	Division 1 Switchgear	4.5×10^{-6}
03AB	Relay Room	2.8×10^{-6}
12AB	Division 2 Switchgear	2.5×10^{-6}
11ABE	Division 1 Portion Miscellaneous Room	1.9×10^{-6}
02RBNE	Northeast Quadrant Reactor Building	1.5×10^{-6}
RB06	Reactor Building 2nd Floor	1.0×10^{-6}
	Total	2.2×10^{-5}

Key: CDF = core damage frequency

[(a)] Fire areas are those included in the final phase of screening with a CDF of at least 1.0×10^{-6} per year.

The Fermi 2 IPEEE fire assessment does not provide a definition of the term "fire vulnerability," but concludes that the risk from fires is acceptable and thus presents no vulnerability. The single fire insight from the IPEEE fire analysis resulted from the evaluation of the second floor Reactor Building (RB06). The dominating contributors for this area are cabinets used for dedicated shutdown and whose loss would isolate the affected equipment from the main control room (MCR), thereby causing loss of the equipment function. Even though the potential for this loss was considered to be adequately addressed by the current operator training, additional fire

brigade drills in the vicinity of these cabinets were planned to increase the awareness of the brigade members to the need to quickly isolate and extinguish such cabinet fires. DTE states that this training activity was tracked with a training work request and was subsequently incorporated into the training program (DTE 2014).

The Fermi 2 IPEEE analysis of high winds and tornadoes, external floods, and transportation and other nearby facility accidents followed the screening and evaluation approaches specified in Supplement 4 to GL 88-20 (NRC 1991). For these events, the IPEEE concluded that Fermi 2, while designed prior to the issuance of the 1975 Standard Review Plan (NRC 1975), conforms to the 1975 criteria. Therefore, the contribution to CDF from these events meets the IPEEE screening criterion of 1×10^{-6} per year in NUREG–1407 (Chen et al. 1991). No vulnerabilities or enhancements were identified.

As discussed in the ER and in the NRC staff's SER of the IPEEE (NRC 2000a), an issue related to the potential for a common cause failure of diesel generator cooling function due to ice formation was identified during the same time frame that the IPEEE was performed. This was addressed subsequent to the IPEEE submittal. In order to prevent ice formation in service water pumps causing common mode failure of diesel generators, the following actions were taken (DTE 2014): (1) implemented procedures to check on this condition, (2) installed permanent temperature monitoring equipment, (3) installed fiberglass curtain to reduce wind chill effects on portion of pump columns below the RHR complex slab and above the reservoir water surface, and (4) modified terminations of RHR cold weather (bypass of mechanical draft cooling tower) lines to below reservoir water level to eliminate water forces on the curtain.

The NRC staff notes that DTE's response to the NRC's 50.54(f) letter (NRC 2012a) requesting information related to the Fukushima Daiichi NTTF recommendations includes a flooding hazards reevaluation and a flooding walkdown. The flooding hazards reevaluation (DTE 2013) concluded "...the results from the updated flood evaluations analyses for Fermi 2 are less than the design bases flood protection. Therefore, an interim evaluation is not required and there are no additional actions taken or planned." The flooding walkdown identified three conditions adverse to quality as follows: degraded boot seal, small gap between sealing surfaces in the outer railroad airlock door, and absence of seals for four electrical conduits inside the railroad airlock. Work orders were generated to resolve these issues. The walkdown also collected and documented information concerning the available physical margins (APM) for flooding. No conditions related to small APM with large consequences (indicative of a potential cliff-edge effect) were identified (DTE 2012b). The NRC staff's SER on the walkdown (NRC 2014b) stated, "The staff concludes that the licensee, through the implementation of the walkdown guidance activities and, in accordance with plant processes and procedures, verified the plant configuration with the current flooding licensing basis; addressed degraded, nonconforming, or unanalyzed flooding conditions; and verified the adequacy of monitoring and maintenance programs for protective features."

As discussed in the ER, since there are no up-to-date quantitative external event models for Fermi 2, it is necessary to develop a multiplier that can be applied to the internal events PRA results to account for the risk contribution from external events in the SAMA evaluation. For the seismic contribution to risk, DTE used the previously described GI-199 seismic CDF value of 4.2×10^{-6} per year. For the fire contribution to risk, DTE used a fire CDF of 1.08×10^{-5} per year. This value is one half of the total CDF of the unscreened fire area CDFs from the FIVE analysis given in Table F–4. DTE noted that the FIVE analysis is expected to give conservative results. In addition, the IPEEE fire analysis utilized the IPE internal events model with a CDF of 5.7×10^{-6} per year, approximately four times the current internal events CDF of 1.5×10^{-6} per year. DTE indicated that it could be reasonably assumed that an update of the FIVE analysis with the current internal events model would result in a fire CDF equal to one-fourth of the original fire

CDF. DTE conservatively utilized a factor of two reduction to arrive at the fire CDF of 1.08×10^{-5} per year.

Based on the aforementioned results, DTE indicated in the ER that the total external events CDF is approximately 1.5×10^{-5} per year (based on a seismic CDF of 4.2×10^{-6} per year, a fire CDF of 1.08×10^{-5} per year). DTE did not include CDFs for high winds, external flooding, or transportation and other nearby accidents on the basis that these events were addressed by demonstrating compliance with the 1975 Standard Review Plan (SRP) and that compliance with the SRP and no adverse finds from walkdowns, justifies the conclusion that the hazard's contribution to CDF is less than 10^{-6} per year. Therefore, these events are not significant contributors to external event risk. Because quantitative analysis of these events is not practical, the external event multiplier was developed based on seismic and fire risk (DTE 2014). The total CDF (internal and external events) is then approximately 1.65×10^{-5} per year or 11 times the internal events CDF. This multiplier was used by DTE in the SAMA analysis in the ER to account for the impact of external events on the benefits determined from the internal events PRA.

As noted in an NRC staff RAI, the NRC staff's evaluation report on the IPEEE indicated the CDF of 1.5×10^{-5} per year from the remaining areas screened (with CDFs less than 1×10^{-6} per year) was subjected to the same detailed analysis as the unscreened areas. Because this 1.5×10^{-5} per year CDF was not included in the 2.15×10^{-5} per year CDF from the unscreened fire areas, DTE was asked to provide justification for not including it in the total fire CDF used in the SAMA analysis and/or assess the impact on the SAMA cost-benefit evaluation, particularly with respect to determining the external events multiplier. In response, DTE performed two sensitivity analyses. The first analysis, similar to that described above, used the updated seismic CDF (2.26×10^{-6} per year) and the total fire CDF including the contribution from the screened areas reduced by a factor of 2 (3.65×10^{-5} per year). This resulted in an external events multiplier of 14.6. In the second sensitivity analysis, the total fire CDF including the contribution from the screened areas was reduced by the ratio of the current internal events CDF less the internal flood contribution (1.27×10^{-6} per year) to the IPEs internal events contribution (5.7×10^{-6} per year). This ratio (0.223) then yielded a fire CDF, based on the total IPEEE fire CDF, of 8.1×10^{-6} per year. Internal floods were excluded from the current CDF since they were not included in the IPE and internal flood contributions to CDF would not impact the fire CDF. This second sensitivity yields an external events multiplier of 7.9. DTE concluded that since the average of these two values for the external events multiplier of 11.3 is approximately the same as the value of 11 used in the ER, the continued use of this value is acceptable (DTE 2015a).

The NRC staff agrees with the applicant's overall conclusion concerning the multiplier used to represent the impact of external events and finds that the applicant's use of a multiplier of 11 will reasonably account for external events in the SAMA evaluation.

F.2.2.3 Level 2 Fission Product Release Analysis

The NRC staff reviewed the general process used by DTE to translate the results of the Level 1 PRA into containment releases and the results of the Level 2 analysis, as described in the ER (DTE 2014) and responses to NRC staff RAIs (DTE 2015a). DTE indicated that the Fermi 2 Level 2 PRA model used for the SAMA analysis is a full Level 2 model developed as part of the FermiV9 internal events PRA model (DTE 2014), which included the conversion of the RISKMAN-based Computer-Aided Fault Tree Analysis (CAFTA) Level 2 to an upgraded CAFTA Level 2 model based on first principles.

PDSs provide the interface between the Level 1 and Level 2 analyses. The Level 1 PRA identifies accident sequences that contribute to the CDF and represent the spectrum of possible

challenges to containment. The Level 1 sequences that result in core damage are grouped into PDS bins. Each bin collects all of those sequences for which the progression of core damage, the release of fission products from the fuel, the status of the containment and its safeguards systems, and the potential for mitigating the potential radiological source terms are similar. The PDS bins for Fermi 2 are characterized by:

- integrity of the primary system,
- primary system pressure,
- decay heat removal,
- integrity of the containment, and
- relative timing of core damage.

Based on these parameters, five accident classes were created and subsequently further divided into 19 subclasses as listed in ER Table D.1–8. The PDS designators listed in Table D.1–8 represent the core damage end-state categories from the Level 1 analysis that are grouped together as entry conditions for the Level 2 analysis. The Level 2 accident progression for each of the PDS is evaluated using a CET to determine the appropriate release category for each Level 2 sequence. In response to an NRC staff RAI relative to the definition of accident classes, DTE indicated that for Class IV (ATWS), two of the subclasses (IVT and IVV) were not used since the modeling conservatively precludes these subclasses and that the other two subclasses (IVA and IVL) were combined because the Level 2 modeling of these subclasses was very similar (DTE 2015a).

The Fermi 2 Level 2 model consists of a set of three CETs, which contain both phenomenological and containment system protection status functional nodes, and assess the accident progression following a core damage event. In response to an NRC staff RAI, DTE indicated that the Level 1 and Level 2 models are linked to ensure that dependencies on Level 1 failures and successes are appropriately accounted for (DTE 2015a).

Table D.1–4 of the ER lists the 18 functional nodes and the associated success criteria used in the Fermi 2 Level 2 CET model. The nodes are quantified using subordinate trees and logic rules that are based on deterministic analysis of physical process for a spectrum of severe accident progressions, and a probabilistic analysis component in which the likelihood of the various outcomes are assessed. In response to an NRC staff RAI to provide more information concerning the treatment of containment isolation failures and credit taken for containment sprays, DTE indicated that all containment isolation failure sequences were assumed to result in a high early (H/E) release. Relative to containment sprays, DTE indicated that drywell spray is credited as directed by the Severe Accident Guidelines in the Level 2 and associated MAAP analysis and noted that the primary functions of drywell spray in the Level 2 model are to put water on the containment floor, quench ex-vessel debris following vessel breach, and to “scrub” fission products from the containment atmosphere. (DTE 2015a)

Each CET end state represents a radionuclide release to the environment and is assigned to a release category. As previously described, the release categories were defined based on the timing and magnitude of release. In response to an NRC staff RAI, DTE discussed the basis for assigning each end state to a release category. Level 2 sequence end states were assigned to a release category based on key attributes of the Level 2 sequence (e.g., accident class, mitigating strategies employed, location of release point out of containment) that ultimately impact the timing and magnitude of a release. Based on the body of Fermi 2 specific deterministic calculations and assignment “rules,” an understanding of accident phenomenology was inferred to allow the available MAAP 4.0.7 calculations to be used to support the

determination of radionuclide release end states for all Level 2 sequences with non-negligible frequency (DTE 2015a). DTE also clarified that leakage from the drywell was modeled instead of the torus air volume because drywell leakage yielded a higher release fraction for cesium iodide (CsI) (DTE 2015a). The NRC staff finds this treatment acceptable, because it is consistent with the technical specification for the plant and inclusion of the release category for intact containment provides additional confidence that estimated releases and consequences have not been underestimated.

In an RAI (NRC 2014a), the NRC staff noted that the SAMA submittal describes a situation in which a lower release category frequency was used in the SAMA analysis compared to the value in the Fermi 2 PRA documentation. DTE indicated the cause to be "an issue with under counting of Class II contribution" in the PRA. In response to this RAI, DTE explained the cause of this "undercounting" and its potential impact on the SAMA analysis. The undercounting was caused by use of 1×10^{-12} per year as the truncation cutoff value for the Level 2 analysis. The undercounting (equal to 3.14×10^{-9} per year) was described to remove a number of Level 2 sequences when the same truncation cutoff value (1×10^{-12} per year) was used for the Level 2 release category and Level 1 CDF analyses. The undercounting was eliminated when a lower truncation cutoff is used for the Level 2 analysis (DTE 2015a). The impact of this undercounting on the overall consequence was assessed in the ER as minimal based on the assumption that the consequences were the same as the moderate/early (M/E) release category.

A followup RAI by the NRC staff (NRC 2015a), questioned the evaluation assumption that the 3.14×10^{-9} per year undercounting had a consequence equivalent to the M/E release category. In response, DTE concluded based on further evaluation that the unaccounted frequency would more appropriately split between the M/E and H/E release categories. DTE's sensitivity study assumed that the entire undercounting was attributed to the H/E category and resulted in a $16,200 increase in the MACR for both internal and external events (DTE 2015b), which represents an increase of less than a 0.5 percent in the base case MACR given in Section F.6.1. The impact of this undercounting on the SAMA cost-benefit analysis is discussed in Section F.6.2. DTE developed the accident progression and associated release characteristics for each release category, by using the results of MAAP Version 4.0.7 computer code calculations. A MAAP case was identified as a representative case for each of the Fermi 2 Level 2 PRA release categories. In response to an NRC staff RAI, DTE provided a description of the representative cases for each release category and additional information on the selection of these representative cases. DTE noted that MAAP scenarios are chosen based on a frequency-weighted approach (i.e., the MAAP scenario representing the most dominant sequence(s) or bounding the most dominant sequence is typically chosen) and that this approach provides a better representation of the release category then choosing the scenario with the very most conservative conditions, such as the highest CsI release fraction (DTE 2015a).

During the SAMA audit (NRC 2014c), it was noted that documentation of the selection of representative sequences included a situation in which an MAAP scenario or sequence with a CsI release fraction of 0.72 was subsumed into the H/E release category modeled in the ER using MAAP case with a CsI release fraction of 0.24. In response to NRC staff RAIs to discuss the potential for underestimating the benefit of any SAMA that mitigates non-dominant but higher release fraction scenarios, DTE provided additional discussion of the development of the representative scenarios for the three most important release categories (H/E-BOC, H/E, and H/I), which collectively account for 92 percent of the total offsite population dose risk and cost risk (DTE 2015a).

DTE indicated that because the H/E-BOC release category has one representative MAAP scenario, it is therefore adequately represented by that case. For the specific example cited

above, DTE indicated that the frequency of the sequence with the 0.72 CsI release fraction is less than 1 percent of the H/E release category frequency; therefore, using this sequence to represent the entire release category would not be appropriate.

In the initial RAI response (DTE 2015a), DTE showed two Accident Class IIA sequences (sequences involving a loss of containment heat removal with the RPV initially intact and core damage induced post-containment failure) included in the H/E release category with CsI and/or cesium hydroxide (CsOH) release fractions greater than those for the representative sequence chosen for this release category. If it is conservatively assumed that the Class IIA sequences have the same consequences as the high/early break outside containment (H/E-BOC) release category, the revised Class IIA contribution is 2.69 times the calculated person-rem/yr and 1.08 times the OECR contributions when they are included in the H/E base case release category. This approach increases the total dose risk by 15 percent (to 5.64 person-rem/yr) but increases the cost risk by only 0.6 percent (to $15,700/yr) over the base case values of 4.91 person-rem/yr and $15,600/yr, respectively. Refer to Table F–2 of this appendix for the base case results presented in the ER. Based on the conservatism of this analysis and considering the offsite exposure cost is only approximately 34 percent of the baseline MACR, this dose risk increase would be much less significant to the total MACR, and DTE concluded that the representative sequence used in the original ER analysis adequately represents the H/E release category even with the inclusion of Class IIA sequences in this release category (DTE 2015a). While the NRC staff agrees with the conclusion that the reassignment of the Class IIA sequences to a different, higher consequence, release category would not have a significant impact on the total base case benefit (the MACR), it would lead to an underestimate of the benefit for any SAMA that mitigates the Class IIA sequences. This topic is discussed further in Section F.6.2. DTE indicated the H/I release category is conservatively represented by a scenario that bounds all the dominant H/I sequence CsI and CsOH release fractions (DTE 2015a).

In response to an NRC staff RAI to provide the duration of the MAAP analysis for each release category and to provide an assessment of the adequacy of the time to characterize the release fractions, DTE indicated that the run times and therefore the release fraction for two (H/E-BOC and H/E) of the three (H/E-BOC, H/E, and H/I) important release categories was 40 hours (or approximately 36 hours after accident initiation), which is less than the time frame of 48 hours used in the SOARCA (State-of-the-Art Reactor Consequence Analyses) project (NRC 2012b). SOARCA assumed that adequate mitigating measures could be brought onsite, connected, and functioning within 48 hours. The run time for the third important release category (H/I) was 191 hours. DTE reported an increase of 0.01 percent of the core inventory or about 3 to 4 percent of the 36-hour release fractions for CsI and CsOH (key contributors to offsite dose and cost risk) from the 36-hour values used in the SAMA analysis. DTE concluded that this increase is not significant and the use of the release fraction values based on the 40 hour run times is adequate (DTE 2015a). On the basis of the small impact on release fractions, the NRC staff agrees that results calculated with run times of 40 hours are acceptable for the SAMA analysis.

In response to an NRC staff RAI, DTE stated that the input for the Fermi 2 MAAP 4.0.7 analysis utilizes both element masses and nuclide activities as recommended by the MAAP 4.0.7 code and is consistent with the guidance in MAAP-FLAASH #68 (DTE 2015a).

As discussed above, the draft FermiV9 PRA model was evaluated in the 2012 BWROG peer review. All findings, including those pertaining to the Level 2 large early release frequency (LERF) model, were considered by the NRC staff to be satisfactorily resolved for the SAMA application.

On the basis of the NRC staff's review of DTE's Level 2 model, the peer review performed on the draft FermiV9 PRA model, and DTE's responses to NRC staff RAIs, the NRC staff concludes that, subject to the further discussion of cost-benefit analysis in Section F.6.2, the Level 2 PRA is of sufficient quality to support the SAMA evaluation.

F.2.2.4 Level 3 Offsite Consequence Analysis

The NRC staff reviewed DTE's process to propagate the containment performance (Level 2) portion of the PRA to an assessment of offsite consequences (Level 3 PRA). Using the MACCS2 version 3.7.0 code, DTE determined the offsite consequences from potential releases of radioactive material (DTE 2014). In the Level 3 analysis, DTE combined release fractions and release categories, discussed in Section F.2.2.3, with the calculated core inventory to yield a source term of radionuclide releases to the outside environment. In response to an NRC staff RAI, DTE provided additional information on the source of the Fermi 2 radionuclide inventory that was calculated with the SCALE version 4.4 SAS2H software (DTE 2015a). The NRC staff finds the MACCS2 and SCALE codes to be acceptable for the SAMA evaluation because the codes are widely used for radiological dose calculations resulting from airborne releases of radioactive material and radionuclide source term determinations, respectively.

In response to an NRC staff RAI, DTE provided the rationale for the selection of radionuclides included in the core inventory. Specifically, DTE clarified that radioactive cobalt is not included in the core inventory for Fermi 2 (DTE 2015a) and indicated that core inventory relates to the alternative radiological source term developed in accordance with Regulatory Guide 1.183 (NRC 2000b). In response to a license amendment request, the NRC staff previously evaluated the radionuclide inventory (NRC 2004a) and stated:

> The licensee projected the core inventory of fission products using the ORIGEN-S computer code. The ORIGEN-S computer code is acceptable to the NRC staff for estimating the core inventory. The licensee assumed a core licensed power level of 3,430 megawatts thermal (MWt) and applied an uncertainty correction of 102 percent to arrive at the analysis input of 3499 MWt.

The NRC staff notes that the input power level of 3,499 MWt exceeds the approved uprated power of 3,486 MWt (DTE 2015a). Because larger power levels are conservative with respect to the source term and radiological consequences, the NRC finds the greater power level and radionuclide inventory acceptable for use in the SAMA analysis. DTE confirmed that no uprates are planned following the license amendment approval in 2014 for an MUR uprate to 3,486 MWt and that assessed impacts from increases in the power level did not result in additional SAMAs becoming cost beneficial (DTE 2015a). In response to an NRC staff RAI on thermal power levels, DTE reported the radionuclide core inventory in Table D.1–23 of the ER (DTE 2014) was based on a thermal power of 3,430 MWt, which was the licensed power level when the SAMA analysis was performed, and also indicated that a license amendment was improved in 2014 for a power uprate to 3,486 MWt (DTE 2015a). DTE performed a sensitivity analysis to assess the impacts of this power uprate on the radionuclide inventory, Level 3 offsite consequences, and averted cost risk attributable to each SAMA. DTE concluded that the increased power level to 3,486 MWt did not result in additional SAMAs becoming cost beneficial (DTE 2015a). The NRC staff finds DTE's sensitivity results to be reasonable and acceptable because no changes to the list of cost-beneficial SAMAs would be expected from the small 1.6 percent increase in thermal power considering that the original SAMA analysis results in the ER showed that SAMAs deemed as not cost beneficial using the most conservative 95th percentile values for averted cost risk were more than 2 percent below estimated costs for SAMA implementation. DTE stated there are currently no plans for further power uprates at Fermi 2 (DTE 2015a). DTE also confirmed that future fuel management practices or fuel design changes are not expected to

influence the core inventory because DTE plans to continue using the same reactor fuel and fuel cycle duration (DTE 2015a). The NRC staff finds that the SAMA analysis is consistent with DTE's plans on fuel management and concludes that the current radionuclide inventory calculations (DTE 2014, 2015a) are adequate for the estimation of offsite consequences.

DTE presented the major input parameter values and assumptions of the offsite consequence analyses in Attachment D of the ER (DTE 2014). DTE considered site-specific meteorological data for calendar years 2003, 2005, and 2007. Meteorological data from 2007 were selected for input to the MACCS2 code because they resulted in the highest population dose risk and offsite economic cost risk (DTE 2014). Meteorological data included wind speed, wind direction, atmospheric stability class, precipitation, and atmospheric mixing heights acquired from the Fermi 2 meteorological monitoring system and the U.S. Environmental Protection Agency. In response to an NRC staff RAI, DTE described the weather bin sampling for modeling precipitation events that results in a rainfall intensity distribution for the 16 compass directions and confirmed that boundary weather parameters include precipitation (DTE 2015a). The NRC staff finds the modeling of precipitation to be acceptable because it is linked to site-specific annual meteorological data and implemented using widely accepted software. Because DTE's assumption of precipitation in cells beyond the 80-km (50-mi) radial boundary would neither underestimate population doses nor economic costs, the NRC staff finds the assumed precipitation in boundary cells to be acceptable. Because selection of the 2007 meteorological data set resulted in the highest population dose risk and offsite economic cost risk, the NRC staff accepts its use in the SAMA evaluation.

DTE estimated missing meteorological data by data substitution. For 1 hour of missing data, interpolation was performed with valid data immediately before and after the data gap. For data gaps greater than 1 hour, data were replaced with data from days with similar meteorological conditions immediately before and after the data gap. In response to a question on the amount of missing data, DTE indicated that the percentages of missing data replaced by substitution were 3.59, 0.35, and 1.88 percent in the respective years 2003, 2005, and 2007. Because these percentages of missing data are reasonable and the methods used to substitute missing data are common remedies, the NRC staff finds these approaches to be acceptable for use in the SAMA analysis. As previously described, the sources of data and models for atmospheric dispersion used by the applicant are appropriate for calculating consequences from potential airborne releases of radioactive material. The NRC staff notes that results of previous SAMA analyses have shown little sensitivity to year-to-year differences in meteorological data and concludes that the selection of the 2007 meteorological data for use in the SAMA analysis is appropriate.

The NRC staff requested additional information on the modeling assumption for watershed drainage, given the Fermi 2 site is located near a large body of water. DTE described that modeling drainage by rivers was conservative compared to drainage by large bodies of water because radionuclide contaminants would have a greater retention in the area due to less removal by drainage (DTE 2015a). The NRC staff accepts this parameter selection because it is conservative and will overestimate radionuclide concentrations as well as offsite population doses.

In response to an NRC staff RAI, DTE assessed the sensitivity of Level 3 results to the 10-MW plume heat output applied to each release category (except intact containment). Specifically, DTE indicated that the modified MACR (MMACR) would increase by 0.76 percent with no plume heat output and decrease by 1.32 percent with a plume heat output of 20 MW. Because these plume heat outputs bracket sample values in SAMA guidance (NEI 2005), and DTE showed a minimal sensitivity of averted cost risk to plume heat, the NRC staff finds that DTE's modeling of

plume heat is acceptable because alternative plume heat values would not change the identification of cost beneficial SAMAs.

Because the conservative modeling assumptions were included in the assessment and input data were either obtained for the Fermi 2 site or found to be consistent with guidance values, the NRC staff concludes that data and modeling assumptions for the Level 3 analysis are appropriate for the SAMA evaluation.

DTE projected the population distribution and expected growth within a radius of 50 mi (80 km) of the Fermi site out to the year 2045 and used the areal weighting from the SECPOP2000 Version 3.13.1 code to populate the spatial elements of the computer model (DTE 2014). In response to RAIs by NRC staff (DTE 2015c), DTE clarified the accounting of the Canadian population with additional details on the distribution of U.S. permanent population, Canadian permanent, and transient populations estimated for the year 2045. These data clearly show Canadian populations to the east and northeast of the Fermi 2 site. DTE also considered transient population contributions based on tourism data for Michigan, Ohio, and Ontario, Canada. DTE reported that the total population within 50 mi (80 km) of the Fermi 2 site was projected to be 6,055,850 for the year 2045. The value of land in Canada within 50 mi (80 km) of the Fermi 2 site was also considered in the analysis (DTE 2015c). Since the original ER submittal and additional information provided by DTE satisfactorily addressed the questions raised by NRC staff and showed that population inputs would not underestimate potential consequences, NRC staff finds the methods and assumptions for estimating population reasonable and acceptable for purposes of the SAMA evaluation.

For the 16-km (10-mi) emergency planning zone at Fermi 2, DTE considered information from the Fermi Nuclear Power Plant Development of Evacuation Times Estimates report in its determination of evacuation times, time delays, and travel speeds (DTE 2014). For the baseline Level 3 calculation in Table D.1–24 of the ER (DTE 2014), DTE assumed 95 percent of the population within the emergency planning zone would evacuate. To account for population increases in the future, DTE lowered the assumed evacuation speed from the determined network-wide evacuation speed of 12.8 meters per second (28.6 miles per hour) to 10 meters per second (22.4 miles per hour). In response to an NRC staff RAI on the network-wide evacuation speed and total time for evacuation, DTE affirmed that the evacuation assessment considered site-specific conditions for Fermi 2 and described how spatial dependences of the highway network as well as population density were modeled (DTE 2015a). In a sensitivity analysis shown in Table D.1–25 of the ER (DTE 2014), DTE reported an increase in the population dose risk by 1 percent due to an assumed factor-of-2 reduction in the average evacuation speed from 10 meters per second to 5 meters per second. Sensitivity values for the evacuation fraction of 90 percent and 99.5 percent were shown in Table D.1–26 of the ER to have very small influences on the population dose risk (less than 0.005 percent) (DTE 2014). As described by DTE, evacuation applies to the emergency planning zone with a lower population compared to other areas surrounding the Fermi 2 site. The much larger population outside of the emergency planning zone (about 55 times larger) does not evacuate in the assessment and accounts for a majority of the total population dose. For these reasons, the total population dose is not directly proportional to the fraction of individuals in the emergency planning zone who do not evacuate. Because DTE used site-specific information, applied more pessimistic (lower) fractions for the evacuating population in the emergency planning zone compared to guidance values (NRC 1997a), and considered the effect of population increases on evacuation parameter values, the NRC staff concludes that the evacuation assumptions and analysis are reasonable and acceptable for the purposes of the SAMA analysis at Fermi 2.

DTE calculated land values using an economic multiplier with economic data from 2002. The economic multiplier was based on the slope of the consumer price index between 2000 and 2012. DTE extrapolated this slope to the year 2013 to obtain an economic multiplier of 1.2964 (DTE 2014). The NRC staff reviewed DTE's assessment of economic data, including the assumptions associated with land values and the destruction of crops exposed to radioactive material from modeled radionuclide releases. This crop destruction applies to the year of the event. In subsequent years, the acceptability of food production is evaluated with projected individual dose criteria to determine if loss of use of farmland is included in offsite costs (DTE 2015a). Because farmland interdiction applies to all crop categories, the cost for destruction of all crops will be included as long as the dose criterion is exceeded. Additionally, there is an implicit assumption that food doses will not increase over time. For the large areas of land modeled in the assessment, the NRC staff agrees that increases in crop doses would not be expected from a short-term release. The annual crop evaluation extends up to 8 years beyond the event. If the annual individual doses from ingestion of crops exceed the dose criterion throughout this time frame, the farmland is treated as condemned (DTE 2015a). If the dose criterion is not exceeded in one of the years evaluated, crop consumption is allowed in that year and in subsequent years, and population doses due to crop consumption are included in the assessment (DTE 2015a). For nonfarmland, a habitability criterion is used to determine whether land is habitable and suitable for economic activity, or whether the land requires interdiction and/or decontamination. If decontamination and interdiction cannot bring the dose level below the habitability criterion, the land is treated as condemned. Also, if the cost of decontamination exceeds the value of the land, decontamination is considered not cost-effective and therefore the land is treated as condemned. Because DTE's modeling of farmland and nonfarmland contamination are generally consistent with NUREG–1150 and costs are escalated to the year 2013, the NRC staff finds these assumptions to be acceptable.

As stated by DTE, nonfarm land values ranged from $198,181/person to $322,884/person, and farm land values ranged from $5,610/hectare to $17,934/hectare (DTE 2015b). The NRC staff notes that these values exceed the sample values in SAMA guidance (NEI 2005, Table 5). Because DTE used cost estimates for the region surrounding the Fermi 2 site and applied a multiplier of 1.2964 to address inflation between 2002 and 2013 (DTE 2015b), the NRC staff finds values to be reasonable ranges that would not result in underestimates of offsite cost risk. Extrapolation of economic data to the year of the assessment, and not through the period of extended operation, is consistent with guidance accepted by the NRC (NEI 2005). Because DTE's assessment included site-specific data and followed an approach that is consistent with economic guidance, the NRC staff finds the data sources used and adjustments made by the applicant in the Level 3 analysis are appropriate for the SAMA analysis.

DTE estimated present dollar values based on the internal events PRA at Fermi 2 and applied a multiplication factor of 11 to account for external events, as described in Section F.2.2.2. As shown in Table D.1–35 of the ER, offsite economic and offsite exposure costs provided the greatest contributions to the total dollar value at approximately 55 and 35 percent, respectively (DTE 2014). Onsite cleanup and replacement power costs collectively contributed 11 or 10 percent to the total dollar value for real discount rates of 7 percent (baseline) or 3 percent (sensitivity), respectively. Onsite exposure costs contributed less than 1 percent. Section F.6 provides more detailed information on the cost-benefit calculation and its evaluation.

Applicable guidance in NUREG/BR–0184 (NRC 1997a) or the NEI 05-01 report (NEI 2005) does not require that the SAMA analysis include replacement power costs from an undamaged, operational unit being shut down for a prolonged period of time following a severe accident at another unit on the same site. Nevertheless, the NRC staff performed a scoping calculation to assess if the added costs from a prolonged shutdown of Fermi 3, whose operation has not yet

begun but is planned during the license renewal period for Fermi 2, would change the determination of cost-beneficial SAMAs for Fermi 2. In response to an NRC staff RAI, DTE indicated that 1,585 MWe would be a conservative value for the maximum net electrical power of Fermi 3 (DTE 2015c). The NRC staff assumed that the 10-year outage time for Fermi 3 would occur at the worst time from a replacement power cost perspective (i.e., timing of the 10-year outage results in the largest replacement power cost) and found that the additional replacement power costs from an extended outage at Fermi 3 following a severe accident at Fermi 2 would not change the selection of cost-beneficial SAMAs for Fermi 2.

Based on its review of DTE's submissions, the NRC staff concludes that DTE's methodology to estimate offsite consequences for Fermi 2 provides an acceptable basis to assess the risk reduction potential for candidate SAMAs. Accordingly, the NRC staff based its assessment of offsite risk on the core damage frequencies, population doses, and offsite economic costs reported by DTE.

F.3 Potential Plant Improvements

The process for identifying potential plant improvements, an evaluation of that process, and the improvements evaluated in detail by DTE are discussed in this section.

F.3.1 Process for Identifying Potential Plant Improvements

DTE identified potential plant improvements (SAMAs) by reviewing industry documents and considering other plant-specific enhancements not identified in the published industry documents. Industry documents reviewed included the following:

- NEI 05-01, Severe Accident Mitigation Alternatives (SAMA) Analysis Guidance Document (NEI 2005);
- Industry BWR SAMA analysis documentation discussing potential plant improvements:
  - FitzPatrick Nuclear Power Plant SAMA Analysis,
  - Columbia Generating Station SAMA Analysis,
  - Cooper Nuclear Station SAMA Analysis,
  - Oyster Creek Nuclear Generating Station SAMA Analysis,
  - Monticello Nuclear Generating Plant SAMA Analysis,
  - Brunswick Steam Electric Plant SAMA Analysis,
  - Pilgrim Nuclear Power Station SAMA Analysis,
  - Susquehanna Steam Electric Station SAMA Analysis,
  - Vermont Yankee Nuclear Station SAMA Analysis,
  - Duane Arnold Energy Center SAMA Analysis, and
  - Grand Gulf Nuclear Station SAMA Analysis;
- The Fermi 2 IPE, Fermi 2 IPEEE reports, and their updates;
- NUREG–1742, Perspectives Gained from the Individual Plant Examination of External Events (IPEEE) Program (NRC 2002); and

- The Fermi 2 updated PRA model lists of risk significant contributors in Tables D.1–2 and D.1–5 of the ER (DTE 2014).

Based on this review DTE identified an initial set of 220 candidate SAMAs, referred to as Phase I SAMAs. In Phase I of the evaluation, DTE performed a qualitative screening of the initial list of SAMAs and eliminated SAMAs from further consideration using the following criteria:

- Not Applicable: If a proposed SAMA does not apply to the Fermi 2 design, it is not retained.
- Already Implemented: If the SAMA or equivalent was previously implemented, it is not retained.
- Combined with Another SAMA: If a SAMA is similar in nature and can be combined with another SAMA to develop a more comprehensive or plant-specific SAMA, only the combined SAMA is further evaluated.
- Excessive Implementation Cost: If the estimated cost of implementation is greater than the MMACR, the SAMA cannot be cost beneficial and is screened from further analysis.
- Very Low Benefit: If the SAMA is related to a non-risk significant system, which is known to have negligible impact on the risk profile, it is not retained.
- Implementation in Progress: If plant improvements that address the intent of the SAMA are already in progress, it is not retained.

During this process, 141 SAMA candidates were screened out based on the criteria listed above. Table D.2–1 of the ER (DTE 2014) provides a description of each of the 79 Phase II SAMA candidates.

In Phase II, a detailed evaluation was performed for each of the 79 remaining SAMA candidates, as discussed in Sections F.4 and F.6 below. To account for the potential impact of external events, the estimated benefits based on internal events were multiplied by a factor of 11, as discussed in Section F.2.2.2.

F.3.2 Review of DTE's Process

DTE's efforts to identify potential SAMAs focused primarily on areas associated with internal initiating events. The NRC staff reviewed the listing of Phase I candidate SAMAs as part of the October 2014 audit meeting at the Fermi site (NRC 2014c). The primary source of candidate SAMAs (146 of a total of 220) was the list of BWR SAMA candidates contained in NEI 05-01 (NEI 2005). The review of other SAMA analysis documentation led to identifying 48 additional candidate SAMAs. Review of the risk contribution to CDF and LERF from a risk reduction worth (RRW) perspective at Fermi 2 led to identifying 14 additional SAMAs, while review of the IPEEE lead to 12 additional SAMA candidates.

As discussed above, DTE initially identified 146 Phase I candidate SAMAs from the NEI 05-01 list of SAMA candidates. While the number of SAMA candidates resulting from the Fermi 2 PRA RRW review (14) appears rather low, the majority of the risk significant basic events in the RRW were assessed to be mitigated by the previously identified SAMA candidate.

In the ER, DTE provided a tabular listing of the Level 1 PRA basic events sorted according to their RRW (DTE 2014). These results were reviewed by DTE to identify those potential risk contributors that made a significant contribution to CDF. The RRW rankings were reviewed

down to 1.005. Events below this point would influence the CDF by less than 0.5 percent and are judged to be highly unlikely contributors for the identification of cost-beneficial enhancements. These basic events, which include component failures, operator actions, and initiating events, were reviewed to determine if additional SAMA actions may need to be considered.

The NRC staff notes that a RRW of 1.005 corresponds to a MACR (including external events) of approximately $17,000 if it is assumed that a SAMA is 100 percent effective in eliminating the event's contribution to CDF and that the total cost-risk is proportional to CDF. Even if uncertainty is included, as is discussed later, the value becomes approximately $42,000. Because this potential benefit is less than the minimum cost for a simple procedure change of $50,000, the NRC staff concludes that DTE's minimum RRW review threshold of 1.005 is acceptable for identifying potential cost-beneficial SAMAs.

DTE also provided tabular listings of the Level 2 PRA basic events for the combined LERF categories in the ER. DTE used an RRW cutoff of 1.005 when reviewing these basic events for additional SAMA candidates. As indicated in Table F–2, the LERF release categories dominate the population dose and offsite economic cost risks.

In the NRC staff's review of these importance lists and the SAMAs identified by DTE, a number of concerns with DTE's assessments were documented in RAIs. The following list summarizes these concerns and DTE's responses (DTE 2015a).

- SAMA 001 regarding the addition of DC power supplies is not a Phase II SAMA, as it was screened out on the basis of being already implemented per DTE addressing NRC Order 12-049 requirements with a FLEX (diverse and flexible coping capability) portable, DC generator. DTE clarified that FLEX includes a portable AC generator and that it would be used to supply the installed battery chargers and the combination would have the capacity to supply all necessary DC loads.

- Relative to considering a SAMA to automate the starting of the mechanical draft cooling tower fan, DTE performed a cost-benefit assessment that indicated the maximum benefit would be $682,000, including external events and uncertainty. Considering a cost of $2.4 million, such a SAMA would not be cost beneficial (DTE 2015b, 2015c).

- In DTE's ER Table D.1-2, "Correlation of Level 1 Risk Significant Terms to SAMAs," several internal flooding events relating to the failure of condenser circulating water inlet and outlet expansion joints were cited to be addressed through the External Surfaces Monitoring Program for external degradation and the Internal Surfaces Miscellaneous Piping and Ducting Components Programs for internal degradation (SAMA 129). These aging management programs are primarily visual inspections of the internal and external surfaces. DTE clarified that these license renewal programs will be fully implemented prior to the period of extended operation and that neither monitoring program is credited in the Fermi 2 PRA model. DTE also clarified that there is an existing preventive maintenance program to visually examine the condenser circulating water inlet and outlet expansion joints performed every other outage. Furthermore, DTE described the design features currently installed to detect, minimize, or mitigate the consequences of flooding due to an expansion joint failure, such as the sump alarms to detect flooding, pump switches to prevent overpressurization, and the prevention of water-hammer strategies. Thus, consideration of additional SAMAs is not warranted.

- SAMA 031 cited to mitigate HPCI or RCIC failures during subsequent cycles, is said in one place in the ER to evaluate upgrading HPCI throttling capability to reduce the number of start/stops required. In another place, SAMA 031 is said to revise procedures to allow intermittent operations of HPCI and RCIC. DTE clarified that current operating procedures allow for cycling of the HPCI/RCIC (on at reactor water Level 2 and off at Level 8) before operators take manual control of the pumps to throttle flow and maintain RPV water at a constant level, thus preventing additional cycling. A SAMA to address these HPCI or RCIC basic events would involve revision to procedures and training to allow operators to take manual control of HPCI/RCIC earlier in the event to prevent cycling on and off of the pumps. The maximum benefit of eliminating these failures was determined to be $39,300, including uncertainty, which is less than the minimum cost for a procedure change; therefore, this SAMA is not cost beneficial.
- SAMA 009 to reduce the DC dependence between high pressure injection and automatic depressurization system (ADS) is cited to mitigate failure of the turbine-driven HPCI pump to start. This SAMA would not mitigate the cited failure since the common cause failure of DC would not be included in this event. DTE agreed that SAMA 009 would not mitigate the cited failure and indicated that the maximum benefit, including uncertainty, of making a 40-percent reduction in the HPCI pump failure to start would be $12,500, which is less than the cost of potential SAMAs.
- SAMA 101 to improve leak detection procedures, is cited for a number of internal flooding events. This SAMA was not included as a Phase II SAMA because the currently in-progress implementation of a risk informed in-service inspection program based on ASME Code Case N-716 (N-716) explicitly addresses internal flooding initiators for inclusion in the program for in-service inspection. N-716 includes risk-informed in-service criteria to provide a method of ensuring that any plant-specific piping locations that are important to safety are identified. Therefore, even though ASME Section XI does not include or require any non-destructive examination requirements for Safety Class 3 and non-nuclear safety class piping, N-716 would add such piping if it were determined to be high-safety significant based on the results of an internal flooding PRA. However, DTE indicated that based on the Fermi 2 PRA results, it is not likely that the important internal flooding initiators will meet the criteria for inclusion in the N-716 program, therefore a new SAMA was evaluated. This SAMA would be the implementation of an inspection program for the piping associated with the risk-significant internal flooding initiators. This change would be implemented by adding visual inspection of these pipes to the regular shift rounds procedure. The SAMA was evaluated by assuming the inspections would result in a 25-percent reduction in the initiating event frequency for these initiators. The maximum benefit was determined to be $104,000, including external events and uncertainty. The cost of preparing the procedures and the labor to perform the inspections was estimated to be $209,000. Therefore, DTE concluded that this SAMA was not cost beneficial (DTE 2015b, 2015c).
- Regarding the potential for a flood barrier to prevent flood propagation to adjacent flood areas through openings and/or failed flood doors, DTE performed some additional cost-benefit analyses as follows (DTE 2015a, 2015b, 2015c):
  - Installing a flood/watertight door between the auxiliary building and relay room would lead to a maximum benefit of $111,000, including external events and

uncertainty. Subsequently, DTE concluded that such a SAMA would not be cost beneficial.

- Making the turbine building to auxiliary building isolation door failure-proof (presently assumed to have a failure probability of 1×10^{-4}) or adding barrier capability that would lead to a maximum benefit of $56,800, including external events uncertainty. Subsequently, DTE concluded that such a SAMA would not be cost beneficial.
- Adding a flood barrier or curb between the DC switchgear room and the Division 2 AC switchgear room would lead to a maximum benefit of $225,000, including external events and uncertainty. DTE noted that this benefit is from a revised base case that took some credit for operator isolation of the initiating pipe breaks compared to the normal base case in which no credit was conservatively taken for this action. Subsequently, DTE concluded that a SAMA to install such a flood barrier or curb between DC switchgear room and the Division 2 AC switchgear room would be potentially cost beneficial.

- The current Fermi 2 design and PRA is such that if the reactor building heating ventilation and air conditioning (HVAC) to standby gas treatment system isolation valve fails to close when the containment is vented to prevent overpressure, the HVAC duct may fail. There is then a pathway for steam and other releases to the third floor of the reactor building, which results in the potential for damage to important mitigation equipment. In the ER, DTE stated that the response to NRC Order EA-12-050 (NRC 2012c) is to include measures that would increase the likelihood of successful containment venting to prevent containment overpressure. In response to an NRC staff RAI to clarify the impact of this order on the above situation, DTE noted that the NRC has rescinded Order EA-12-050 and replaced it with Order EA-13-109, "Order to Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions" (NRC 2013), which establishes numerous functional requirements for a hardened containment venting system (HCVS). Development of a HCVS system, by modification of the existing system or installation of a new system, will result in a robust and reliable venting system and will also mitigate the valve and duct failure event. Specifically, compliance with the requirements to minimize unintended cross flow of vented fluids within a unit and to minimize the potential for hydrogen gas migration and ingress into the reactor building will prevent or significantly reduce the likelihood of this event because the flow path from the vent to the reactor building HVAC system will be reduced.

In response to an NRC staff RAI on how SAMAs from the 11 previous industry SAMA analyses were selected for incorporation into the Fermi 2 Phase I SAMA identification, DTE indicated that the review of industry SAMA analyses was focused on identifying SAMA candidates proved to be potentially cost beneficial for other plants. These SAMA candidates were then screened based on their applicability to the Fermi 2 plant design, if they had already been implemented, or if they were covered by a SAMA candidate already retained for a cost-benefit analysis. DTE noted that no potentially cost-beneficial SAMA candidates for other sites were screened from the Fermi 2 analysis based on excessive implementation costs (DTE 2015a).

As noted above, while no vulnerabilities were found in the IPE, several opportunities for enhancements were identified. The NRC staff SER on the IPE notes that the hard-piped containment venting was installed but indicates that several potential plant improvements were identified for further consideration. The NRC staff noted in an RAI that the status of these

enhancements is not addressed in the ER and are not included in the Phase I list of candidate SAMAs. DTE responded by providing a summary description of the implementation of each of the IPE-identified enhancements and confirmed that they all have been implemented (DTE 2015a).

Based on this information, the NRC staff concludes that the set of SAMAs evaluated in the ER, together with those identified in response to NRC staff RAIs, addresses the major contributors to the internal events CDF.

As discussed in Section F.2.2.2, although the IPEEE did not identify any fundamental vulnerabilities or weaknesses related to external events, a number of "outliers" were identified from the IPEEE seismic assessment (DECo 1996). The IPEEE items in the Phase I list of candidate SAMAs include the six seismic outliers identified in Section F.2.2.2. As discussed above, DTE's actions in response to the 50.54(f) letter (NRC 2012a) that requested information related to the Fukushima Daiichi NTTF recommendations, confirmed that all of these items have been addressed and are considered resolved (DTE 2012a).

DTE's review of the IPEEE fire analysis led to the development of six candidate SAMAs addressing the risk from the important fire CDF contributors listed in Table F–4. These candidate SAMAs were included in the Phase I (and Phase II) SAMA analysis.

As stated earlier, DTE's IPEEE analysis of other external hazards (high winds, tornadoes, external floods, and other external events) did not identify any opportunities for improvements for these events.

As discussed above, the NRC staff notes that the Fermi 2 external flooding design and capability was assessed in the engineering walkdowns and evaluations required for the response to the Fukushima Near-Term Task Force's Recommendation 2.3 (DTE 2012b; NRC 2012a). The NRC staff's SER on the walkdown (NRC 2014b) stated, "The staff concludes that the licensee, through the implementation of the walkdown guidance activities and, in accordance with plant processes and procedures, verified the plant configuration with the current flooding licensing basis; addressed degraded, nonconforming, or unanalyzed flooding conditions; and verified the adequacy of monitoring and maintenance programs for protective features."

As discussed above, DTE eliminated numerous Phase I SAMA candidates from further consideration using a number of criteria. As part of the onsite audit (NRC 2014c), the NRC staff reviewed the documentation of this screening and asked DTE to provide additional information concerning the basis for eliminating certain Phase I SAMAs from further consideration. The additional information provided resolved all of the NRC staff's concerns, and no additional Phase II SAMAs were identified based on this review of the Phase I screening.

The NRC staff did note in an RAI that a Phase I SAMA to install a filtered containment vent to remove decay heat was combined with Phase II SAMA 123 for an ATWS sized filtered containment vent. Because a filtered vent to remove decay heat is considerably smaller than that required for an ATWS event, the evaluation of SAMA 123 does not appear to be valid for the decay heat sized SAMA. In response, DTE indicated that the cost of the SAMA 123 ATWS-sized filtered vent was a rough conceptual cost of $40 million, estimated in 2013 from an industry group discussion on a filtered vent. At that time, the cost was assumed to be in the range of $40 million to $50 million. DTE also noted in response to an NRC request that NEI submitted cost estimates for a filtered vent with a small filter and severe accident capable water makeup and for a large filter with severe accident capable water makeup. Neither filter was sized for an ATWS. The cost estimates provided were conceptual in nature. With contingency and subtracting the estimated $3.7 million cost of the water makeup, the estimated costs were

$31.7 million for the small filter and $51.2 million for the large filter. These cost estimates were based on incremental costs of filter installation relative to current conceptual designs planned for hardened containment vent in compliance with NRC Order EA-13-109. Given these estimates are for a vent that is not specifically sized for an ATWS, the cost is appropriate for the normal decay heat SAMA and is lower than what it would cost for an ATWS-sized vent. Even considering the cost for the smaller filter of $31.7 million, the normal decay heat SAMA is not cost beneficial (DTE 2015a).

The NRC staff questioned DTE about potentially lower cost alternatives to some of the SAMAs evaluated (NRC 2014a), including:

- A SAMA to improve training specifically for basic event "Operators fail to shutdown from outside the main control room" instead of SAMA 145 regarding increased training and operating experience feedback to improve operator response, which is much broader in scope. In response to the RAI, DTE noted, that with a risk reduction worth of 1.13, the risk significance of this basic event is well known and that this event is specific to flooding events that require abandonment of the main control room (MCR). An analysis was performed to determine the benefit from increased training specifically for this event assuming a 50-percent decrease in the failure probability to shut down from outside the MCR. The analysis resulted in a maximum assessed benefit of $71,200, including external events and uncertainty. Since a simple procedure change is not anticipated to result in significant improvement for this operator action, procedure changes with training would be required. Therefore, implementation of this SAMA would not be cost beneficial (DTE 2015a, 2015b, 2015c).
- SAMAs including only leak detection as alternatives to SAMAs 213 and 214 (both of which involve providing leak detection and automatic isolation valves for emergency equipment cooling water (EECW) piping) might provide sufficient time for manual actions to isolate the flood source, thereby limiting the failures due to flooding, particularly in adjacent rooms. In response to the RAI, DTE provided a discussion of the flood scenarios in the DC switchgear room and the Division 2 switchgear room and the time associated with flood propagation into the adjacent rooms. DTE concluded that providing only leak detection might be cost beneficial. However, upon further investigation of the existing alarms on the systems associated with the flooding, the timing available to take action and the proximity of these rooms to the MCR, DTE concluded that revising existing alarm response procedures (ARPs) to direct operators to these rooms following indication of leakage in reactor building component cooling water (RBCCW)/EECW system piping could be a potentially cost-beneficial SAMA and will be retained for further evaluation (DTE 2015a).

The NRC staff notes that the set of SAMAs submitted is not all-inclusive, because additional, possibly even less expensive, alternatives can always be postulated. However, the NRC staff concludes that the benefits of any additional modifications are unlikely to exceed the benefits of the modifications evaluated and that the alternative improvements would not likely cost less than the least expensive alternatives evaluated, when the subsidiary costs associated with maintenance, procedures, and training are considered.

The NRC staff concludes that DTE used a systematic and comprehensive process for identifying potential plant improvements for Fermi 2, and that the set of potential plant improvements identified by DTE is reasonably comprehensive and, therefore, acceptable. This search included reviewing insights from the plant-specific risk studies and reviewing plant improvements considered in previous SAMA analyses. While explicit treatment of external

events in the SAMA identification process was limited, the NRC staff determined that the prior implementation of plant modifications, the absence of external event vulnerabilities, and DTE's compliance with the approved alternative approach for addressing external events provide a reasonable justification to primarily examine the internal events risk results for the purpose of identifying SAMAs.

F.4 Risk Reduction Potential of Plant Improvements

DTE evaluated the risk-reduction potential of the 79 SAMAs retained for the Phase II evaluation in the ER (DTE 2014). The SAMA evaluations were generally performed by DTE in a realistic or slightly conservative fashion that overestimates the benefit of the SAMA. In most cases, the failure likelihood with the added equipment is taken to be optimistically low, thereby overestimating the benefit of the SAMA. In other cases, it was assumed that the SAMA eliminated all of the risk associated with the proposed enhancement. The NRC staff notes that this bounding approach overestimates the benefit and is conservative.

Except for SAMAs associated with internal fires, DTE used model requantification to determine the potential benefits for most of the SAMAs. Reductions to the CDF, population dose, and offsite economic cost were estimated using the Fermi 2 PRA model. Changes made to the model to quantify the impact of each SAMA are described in Section D.2.3 of the ER. Table F–5 summarizes the assumptions used to estimate the risk reduction for each of the evaluated SAMAs, the estimated risk reduction in terms of percent reduction in CDF, population dose, and offsite economic cost, and the estimated total benefit (present value) of the averted risk. The determination of the benefits for the various SAMAs is further discussed in Section F.6.

The NRC staff reviewed the assumptions used in evaluating the benefit or risk reduction estimate of each of the SAMAs as described in the ER Section D.2.3. The resolution of RAIs that resulted from this review follow.

For SAMA 023 regarding developing procedures to repair or replace failed 4-kV breakers, the benefit was estimated by eliminating failure of the operator to cross tie non-emergency buses, failure to recover AC power from plant and switchyard-centered events, as well as failure during operation of non-emergency 4.16-kV buses. In response to an NRC staff RAI concerning other 4-kV breaker failures that can be mitigated by this SAMA, DTE responded that this SAMA originated from a vulnerability identified in the IPE at another plant. Because this vulnerability does not exist at Fermi 2, DTE concluded that this SAMA should have been screened out in Phase I (DTE 2015a). In a further response, DTE evaluated the benefit of a 20-percent reduction in the failure probabilities for all breakers greater than 600 volts. The averted cost including external events and uncertainty was found to be $35,600; therefore, DTE concluded that this SAMA is not cost beneficial (DTE 2015b, 2015c).

The title of SAMA 031, revise procedures to allow intermittent operations of HPCI and RCIC, is not consistent with the stated intent and basis of the evaluation of the SAMA to eliminate the intermittent operation of HPCI/ RCIC by allowing flow to be throttled, thus preventing intermittent starts and stops. In response to an NRC staff RAI to clarify the SAMA description and intent indicated that SAMA 031 apparently originated from a situation at two other BWRs where it was desirable to operate HPCI or RCIC in such a manner as to slow the rate of depressurization of the RPV, thereby maintaining the vessel at a higher pressure and extending the duration at which RPV pressure can support successful operation of HPCI/RCIC. DTE indicated that this situation does not exist at Fermi 2 and consequently SAMA 031 as defined in NEI 05-01 is not applicable to Fermi 2 (DTE 2015a). As discussed above in Section F.3.2, a new SAMA

involving a procedure change aimed at reducing the number of HPCI/RCIC on/off cycles was not cost beneficial upon further evaluation.

For SAMA 074 to improve pneumatic components of safety relief valves (SRVs) and main steam isolation valves (MSIVs), the benefit was determined by eliminating the air dependency of these valves. In response to an NRC staff RAI on how this benefit models the improvement of the reliability of SRVs and MSIVs, DTE provided the results of an alternate evaluation that assumed the independent and common cause hardware (as well as AC and DC power to the valves) was improved by 15 percent. The result was a maximum benefit of $2,400, and DTE concluded that this SAMA was not cost beneficial (DTE 2015a). In addition, in response to an NRC staff RAI, DTE discussed the design and modeling features of Fermi 2 that led to this low benefit. The major factor was a high level of redundancy, particularly with respect to the SRVs. This factor combined with a low frequency of serious demands results in a relatively low importance of valve failures (DTE 2015b).

In an NRC staff RAI, DTE was asked to provide further information and justification for the modeling of the benefit of SAMA 078 to enable flooding of the drywell head seal including the expected containment failure location(s), why only Class II and IV large rupture sequences were considered and why the benefit is so small considering that Class IV (ATWS sequences) would be expected to make up a significant part of release category H/E, which is the major contributor to risk. DTE indicated that drywell head leakage, mitigated by this SAMA, is the dominant containment failure mode only for accident scenarios involving high and intermediate containment temperatures. Most of the Class II and Class IV sequences involve containment failure prior to core damage and therefore do not involve high or intermediate containment temperatures. DTE provided an alternative bounding evaluation of the benefit of this SAMA by assuming that the drywell never fails in the Level 2 analysis. This resulted in a maximum benefit of $244,000 including uncertainty. Compared to an estimated cost of $1 million (from the Vermont Yankee LRA), DTE concluded this SAMA is not cost beneficial (DTE 2015a).

In response to an NRC staff RAI concerning SAMA 154, to modify procedures to allow switching of the combustion turbines to buses while running, DTE stated that such procedures already exist and this SAMA should have been screened during Phase I (DTE 2015a).

The NRC staff in an RAI noted that while SAMAs 165 and 166 both address mitigating the failure of emergency core cooling system low pressure permissive with an order-of-magnitude improvement in the operator action to bypass the low pressure permissive resulted in a 3 percent reduction in CDF, the human error probability for this operator action does not appear in the Level 1 importance list. DTE responded that this human error basic event was mistakenly omitted from the Table D.1–2 importance list because it had a value of 1.0 and was assumed to be a flag event rather than representing an actual failure event.

DTE indicated that a search for other events omitted from the importance analyses tables for the same reason was performed. One additional Level 1 basic event was identified representing failure to terminate the flood from EECW in an AB3 switchgear room. A new SAMA evaluation was performed for this event to evaluate the potential improvement from crediting a new procedure for manually closing the valves that isolates the flood. The probability of the event was changed from 1.0 to 0.1 resulting in a maximum benefit of $302,000 including external events and uncertainty. Based on this result, DTE concluded that this SAMA would be potentially cost beneficial even when assuming a cost in the high range for procedures (e.g., $200,000) (DTE 2015a, 2015b, 2015c).

Table F–5. SAMA Cost/Benefit Screening Analysis for Fermi 2 Station[a]

Individual SAMA and Assumption	% Risk Reduction			Total Benefit ($)[b]		Cost ($)[b]
	CDF	Population Dose	OECR	Baseline (Internal + External)	Larger Result: Baseline with Sensitivity	
009 – Reduce direct current dependence between high-pressure injection systems and ADS	1	<1	<1	6K	14K	100K
Assumption: HPCI uses Division 2 direct current power while automatic depressurization system (ADS) valves are powered by Division 1; therefore, the intent of this SAMA is met with the current design. However, to assess the benefit from eliminating the direct current dependence of ADS, failure of the Division 1 130V direct current batteries was eliminated.						
012 - Improve 4.16-kV bus cross-tie ability	5	2	2	79K	200K	656K
Assumption: Improving the ability to cross-tie the 4.16-kV busses would increase the availability of onsite alternating current power. To assess the potential benefit, the existing cross-ties between the Division 1 and Division 2 engineered safety feature (ESF) buses are assumed to never fail.						
014 - Install an additional, buried off-site power source	5	8	13	345K	863K	>1M
Assumption: Installing an additional, buried offsite power source, or burying offsite power lines would decrease the probability of LOOP due to weather-related events. To assess the potential benefit, a bounding analysis was performed by eliminating all weather-related LOOP and partial LOOP events.						
016 - Install tornado protection on gas turbine generator	3	5	9	245K	612K	2.1M
Assumption: Installing tornado protection on the gas turbine generator would eliminate or reduce weather-related failures of the CTG. A bounding analysis was performed by eliminating all weather-induced failures of the CTG.						
018 - Improve uninterruptible power supplies	<0.1	<1	<1	8K	21K	100K
Assumption: Improving the reliability of uninterruptible power supplies would reduce the frequency of loss of power to essential plant instruments. A bounding analysis was performed by eliminating the failure of the modular power units, which provide the uninterruptible power supply to essential plant instruments.						
021 - Use fire water system as a backup source for diesel cooling	4	6	9	257K[d]	642K[d]	2M
Assumption: This analysis was used to evaluate the change in plant risk from improving the reliability of diesel cooling by adding a backup source of cooling. The analysis was performed by assuming that the diesel driven fire pump would be manually aligned to provide backup diesel cooling. The manual action was given a failure probability of 0.1. The benefit of adding an entirely new source of diesel cooling would be comparable to that of using the fire water system, but the cost of implementation would be much higher.						

Individual SAMA and Assumption	% Risk Reduction			Total Benefit ($)[b]		Cost ($)[b]
	CDF	Population Dose	OECR	Baseline (Internal + External)	Larger Result: Baseline with Sensitivity	
023 - Develop procedures to repair or replace failed 4-kV breakers[c]	<0.1	<1	<1	8K	20K	50K
Assumption: Developing procedures to repair or replace failed 4 kV breakers would increase the probability of recovery from failure of breakers that transfer 4.16 kV non-emergency buses from unit station transformers. An analysis was performed by eliminating failure of the operator to cross-tie non-emergency buses, failure to recover alternating current power from plant and switchyard centered events, as well as, failure during operation of non-emergency 4.16 kV buses.						
024 - In training, emphasize steps in recovery of offsite power after an SBO	<1	<0.1	<1	6K[d]	16K[d]	50K
Assumption: Increased training with emphasis on recovery could reduce the human error in steps to recover offsite power after an SBO. Because enhanced training is not likely to improve the ability to recover offsite power from grid and severe weather-related events, this evaluation assumed that only the probability to recover offsite power after plant centered and switchyard centered events would be impacted. The analysis assumed a 25-percent improvement in recovery of offsite power for Level 1 events (i.e., 30-minute, 4- and 12-hour recovery). The common failure to respond to SBO was also eliminated.						
026 - Bury offsite power lines	5	8	13	345K	863K	>1M
Assumption: Installing an additional, buried offsite power source, or burying offsite power lines would decrease the probability of LOOP due to weather-related events. To assess the potential benefit, a bounding analysis was performed by eliminating all weather-related LOOP and partial LOOP events.						
028 - Provide an additional high pressure injection pump with independent diesel	28	6	6	288K	719K	1M
Assumption: Installing an additional high pressure injection pump with an independent diesel would reduce the frequency of core melt from small LOCA and SBO sequences. To assess the change in plant risk from installing an additional high pressure injection pump, the analysis was performed by eliminating failures of the existing standby feedwater pumps to provide sufficient flow, which includes power dependencies. The analysis also conservatively eliminated standby feedwater failures induced from failure of balance-of-plant batteries.						
029 - Raise HPCI/RCIC backpressure trip set points	2	<0.1	<0.1	10K	25K	50K
Assumption: Raising the HPCI and RCIC backpressure trip set points would increase the system availability when the suppression pool temperature is high. To assess the change in plant risk, the HPCI and RCIC turbine trip and automatic turbine isolation due to high or instable exhaust pressure were eliminated.						
031 - Revise procedure to allow intermittent operations of HPCI and RCIC[c]	3	<1	<1	16K	39K	50K

Individual SAMA and Assumption	% Risk Reduction			Total Benefit ($)[b]		Cost ($)[b]
	CDF	Population Dose	OECR	Baseline (Internal + External)	Larger Result: Baseline with Sensitivity	
Assumption: This analysis was used to evaluate the change in plant risk from increasing the throttling ability of HPCI and RCIC pumps to limit the number of system stops/restarts. The analysis was performed by eliminating the failure of both HPCI and RCIC during subsequent cycles.						
034 - Modify automatic depressurization system components to improve reliability	<0.1	<0.1	<0.1	<1K	<1K	100K
Assumption: Modifying automatic depressurization system components to improve their reliability would reduce the frequency of high pressure core damage sequences. To assess the change in plant risk for this SAMA, analysis was performed by eliminating the failure to open on demand of all safety relief valves (SRVs), both ADS and non-ADS SRVs.						
041 - Provide capability for alternate injection via reactor water cleanup	<1	<1	<1	6K	15K	50K
Assumption: This analysis was used to evaluate the change in plant risk from improving injection capability through either the diesel-driven fire pump or reactor water cleanup. The analysis was performed by assuming that the diesel fire pump never failed (for injection and all other modeled functions), as well as assuming that the flowpath for RPV injection via the diesel fire pump never failed.						
046 - Improve ECCS suction strainers	2	2	2	73K	183K	>2M
Assumption: This analysis was used to evaluate the change in plant risk from improving the reliability of the ECCS suction strainers. A bounding analysis was performed by eliminating all plugging of the ECCS suction strainers.						
050 - Change procedures to allow cross connection of motor cooling for RHRSW pumps	<1	<1	<1	13K[d]	33K[d]	50K
Assumption: This analysis was used to evaluate the change in plant risk from revising procedures to increase the availability of RHRSW water by allowing cross connection of motor cooling for the RHRSW pumps. A bounding analysis was performed by eliminating all failures of both Division 1 and Division 2 RHRSW pumps.						
051 - Add redundant direct current control power for service water pumps	<0.1	<0.1	<0.1	1K	3K	100K
Assumption: Adding redundant direct current control power for service water pumps would increase the availability of service water. To analyze the change in plant risk, it was assumed that long-term power to the RHRSW pumps where battery chargers are required never fails.						
053 - Provide self-cooled ECCS seals	3	6	10	264K	661K	675K
Assumption: Providing self-cooled ECCS seals would eliminate the dependency of ECCS on the component cooling system. Because the core spray pumps are the only ECCS pumps that require pump cooling for the probabilistic risk assessment mission time, a bounding analysis was performed by eliminating the failure of core spray pump cooling.						
054 - Enhance procedural guidance for use of cross-tied component cooling or service water pumps	<1	<0.1	<0.1	3K[d]	8K[d]	50K

Individual SAMA and Assumption	% Risk Reduction			Total Benefit ($)[b]		Cost ($)[b]
	CDF	Population Dose	OECR	Baseline (Internal + External)	Larger Result: Baseline with Sensitivity	
Assumption: Enhancing procedural guidance for use of cross-tied component cooling or service water pumps would reduce the frequency of the loss of these systems. An analysis was performed by allowing cross-connection of Division 1 and 2 emergency equipment cooling/service water. Additionally, the analysis also eliminated all hardware failure initiating events of the general service water.						
055 - Implement modifications to allow manual alignment of the fire water system to RHR heat exchangers	<1	<0.1	<0.1	2K	5K	100K
Assumption: Implementing modifications to allow manual alignment of the fire water system to RHR heat exchangers would improve the ability to cool the RHR heat exchangers. To evaluate the change in plant risk, the fire water system was modeled as an additional train for both Division 1 and Division 2 RHR complex.						
067 - Enhance procedure to trip unneeded RHR or core spray pumps on loss of room ventilation	<1	<0.1	<0.1	1K[d]	3K[d]	50K
Assumption: This analysis was used to evaluate the change in plant risk from extending the availability of the RHR or core spray pumps due to reduction in room heat load. To evaluate the change in plant risk, probability of failure of the crew to limit the number of operating RHR pumps was decreased by an order of magnitude to simulate enhanced procedures.						
068 - Stage backup fans in switchgear rooms	<0.1	<0.1	<0.1	<1K	<1K	50K
Assumption: Room cooling is not required for alternating current power switchgear rooms. However, Division 2 ESF direct current battery charger room does require cooling or ventilation. An operator action currently exists to open a door per procedure in case room cooling is lost. The analysis performed decreased the failure probability of this operator action by two orders of magnitude.						
071 - Modify procedure to provide ability to align diesel power to more air compressors	<0.1	<0.1	<0.1	<1K	2K	50K
Assumption: Providing the ability to align diesel power to more air compressors would increase the availability of instrument air after a LOOP event. To evaluate the change in plant risk from providing diesel power to the air compressors, all power dependencies of the air compressors were removed.						
072 - Replace service and instrument air compressors with more reliable compressors that have self-contained air cooling by shaft driven fans	2	3	3	100K	249K	433K

Individual SAMA and Assumption	% Risk Reduction			Total Benefit ($)[b]		Cost ($)[b]
	CDF	Population Dose	OECR	Baseline (Internal + External)	Larger Result: Baseline with Sensitivity	
Assumption: Replacing the service and instrument air compressors could eliminate the instrument air system dependence on component cooling water. Providing an additional portable compressor to be aligned to the supply header would reduce the risk associated with loss of instrument air. A bounding analysis was performed by eliminating the failure of air supply from both divisions of the noninterruptible air supply, as well as failure of the station air compressors.						
074 - Improve SRV and MSIV pneumatic components[c]	<0.1	<0.1	<0.1	<1K	2K	100K
Assumption: This analysis was used to evaluate the change in plant risk from modifications to improve the reliability of SRVs and MSIVs. A bounding analysis was performed by eliminating the air dependency of MSIV components and the Division 1 SRVs (which includes all ADS valves).						
077 - Cross-tie open cycle cooling system to enhance drywell spray system	<0.1	<0.1	<1	3K	7K	100K
Assumption: This analysis was used to evaluate the change in plant risk from modifications to cross-tie the RHRSW system to increase the availability of containment heat removal. A bounding analysis was performed by eliminating the failure of both drywell spray loops.						
078 - Enable flooding of the drywell head seal[c]	<0.1	<1	<1	9K[d]	22K[d]	100K
Assumption: Enabling flooding of the drywell head seal would reduce the probability of leakage through the seal. To evaluate the change in plant risk, it was assumed that flooding the drywell head seal would eliminate all Class II or Class IV accident sequences with large drywell failures.						
083 - Enhance procedure to maintain ECCS suction on condensate storage tank as long as possible	<0.1	<0.1	<0.1	<1K	<1K	50K
Assumption: Maintaining ECCS suction on the condensate storage tank as long as possible would reduce the chance of pump failure due to high suppression pool temperature. A bounding analysis was performed by assuming that the condensate storage tank was always available for long-term makeup for HPCI and RCIC.						
091 - Improve vacuum breaker reliability by installing redundant valves in each line	<1	2	2	53K	133K	500K
Assumption: Installing redundant valves in each line would improve vacuum breaker reliability and decrease the consequences of a vacuum breaker failure to reseat. To evaluate the change in plant risk, a bounding analysis was performed by eliminating random vacuum breaker failures, tailpipe vacuum breakers sticking open, as well as common cause failure of vacuum breakers.						
093 – Provide post-accident containment inerting capability	<0.1	3	3	96K	240K	1.6M

Individual SAMA and Assumption	% Risk Reduction			Total Benefit ($)[b]		Cost ($)[b]
	CDF	Population Dose	OECR	Baseline (Internal + External)	Larger Result: Baseline with Sensitivity	
Assumption: Providing post-accident containment inerting capability, or installing a passive hydrogen control system would reduce the likelihood of hydrogen and carbon monoxide gas combustion. To evaluate the change in plant risk, a bounding analysis was performed by eliminating all hydrogen deflagrations that results in containment or drywell failure.						
100- Institute simulator training for severe accident scenarios	9	8	10	310K	774K	8M
Assumption: This analysis was used to evaluate the change in plant risk from increasing training to improve the success probability for important operator actions. The change in plant risk was evaluated by decreasing the likelihood of failure for important human actions by 10 percent. The operator actions with a risk reduction worth of greater than 1.005 were improved by 10 percent.						
103 - Install a passive hydrogen control system	<0.1	3	3	96K	240K	760K
Assumption: Providing post-accident containment inerting capability, or installing a passive hydrogen control system would reduce the likelihood of hydrogen and carbon monoxide gas combustion. To evaluate the change in plant risk, a bounding analysis was performed by eliminating all hydrogen deflagrations that results in containment or drywell failure.						
107 - Increase leak testing of valves in ISLOCA paths	<1	6	3	119K	297K	2.3M
Assumption: This analysis was used to evaluate the change in plant risk from reducing the frequency of ISLOCA events, and improving operators' ability to cope with ISLOCAs. To assess this potential benefit, the frequency of all ISLOCA-initiating events was decreased by 25 percent.						
108 - Improve MSIV design	<1	<1	<1	12K	29K	100K
Assumption: Improving the MSIV design would decrease the likelihood of containment bypass scenarios. To assess this potential benefit, failure of the inboard and outboard MSIV to close (including common cause) was eliminated. Additionally, hardware failures associated with the MSIV failing to remain open, MSIV pneumatics support failures, and random MSIV closures were all eliminated from the model.						
112 - Revise emergency operating procedures to improve ISLOCA identification	**<1**	**6**	**3**	**119K**	**297K**	**200K**
Assumption: This analysis was used to evaluate the change in plant risk from reducing the frequency of ISLOCA events, and improving operator's ability to cope with ISLOCAs. To assess this potential benefit, the frequency of all ISLOCA-initiating events was decreased by 25 percent.						
113 - Improve operator training on ISLOCA coping	**<1**	**6**	**3**	**119K**	**297K**	**200K**
Assumption: This analysis was used to evaluate the change in plant risk from reducing the frequency of ISLOCA events, and improving operator's ability to cope with ISLOCAs. To assess this potential benefit, the frequency of all ISLOCA-initiating events was decreased by 25 percent.						

Individual SAMA and Assumption	% Risk Reduction			Total Benefit ($)[b]		Cost ($)[b]
	CDF	Population Dose	OECR	Baseline (Internal + External)	Larger Result: Baseline with Sensitivity	
115 - Revise procedures to control vessel injection to prevent boron loss or dilution following standby liquid control injection	**2**	**4**	**4**	**122K**	**304K**	**200K**
Assumption: This analysis was used to evaluate the change in plant risk from controlling vessel injection to ensure adequate boron concentration is maintained in the core following an ATWS. To determine the benefit from revising procedures to improve control of vessel injection, the failure probability of the human actions control level early during an ATWS sequence and to control level late during an ATWS sequence were each improved by 10 percent.						
117 - Increase boron concentration in the standby liquid control system	1	1	1	43K	108K	400K
Assumption: This analysis was used to evaluate the change in plant risk from increasing the boron concentration in the standby liquid control system, which would reduce the time required to achieve shutdown concentration. To assess the benefit, the failure probability of the human actions to initiate the standby liquid system, both early and late, were each improved by 25 percent.						
121 - Increase SRV reseat reliability	<1	1	1	35K	89K	100K
Assumption: Increasing the reseat reliability of SRVs will reduce the risk of boron dilution due to SRV failure to reseat after standby liquid control injection. A bounding analysis was performed by eliminating all stuck open relief valve and inadvertent open relief valve events.						
123 – Install an ATWS-sized filtered containment vent to remove decay heat	<1	35	38	1.1M[d]	2.8M[d]	40M
Assumption: To evaluate the change in plant risk from installing an ATWS-sized filtered containment vent, an analysis was performed decreasing the concentration of all radionuclides, excluding noble gases, by 50 percent. Because no modifications were made to the Level 1 or Level 2 probabilistic risk assessment model, there was no change in CDF or release category frequency. The averted cost risk was calculated by comparing the base MACR to the MMACR using a 50 percent reduction in radionuclide concentrations.						
141 - Install digital large break LOCA protection system	1	2	2	68K	169K	>2M
Assumption: This analysis was used to evaluate the change in plant risk from installing digital large break LOCA (leak-before-break) protection system. The analysis was performed by eliminating all large LOCA-initiating events.						
145 - Increase training and operating experience feedback to improve operator response	9	8	10	310K[d]	774K[d]	1M
Assumption: This analysis was used to evaluate the change in plant risk from increasing training to improve the success probability for important operator actions. The change in plant risk was evaluated by decreasing the likelihood of failure for important human actions by 10 percent. The operator actions with a risk reduction worth of greater than 1.005 were improved by 10 percent.						

Individual SAMA and Assumption	% Risk Reduction			Total Benefit ($)[b]		Cost ($)[b]
	CDF	Population Dose	OECR	Baseline (Internal + External)	Larger Result: Baseline with Sensitivity	
149 - Provide a portable EDG fuel oil transfer pump: This SAMA provides additional means of supplying the EDG day tank in the event a common cause failure prevents operation of the existing pumps	<0.1	<0.1	<0.1	<1K	<1K	50K
Assumption: This analysis was used to evaluate the change in plant risk from eliminating the dependency of EDGs on diesel fuel oil. A bounding analysis was performed by eliminating all failures of the fuel oil support system for each EDG.						
151 - Provide a diverse swing diesel generator air start compressor	1	<1	<1	21K	51K	100K
Assumption: This analysis was used to evaluate the change in plant risk from installing a diverse swing diesel generator air start compressor. A bounding analysis was performed by eliminating all fails to start events, including common cause, from each diesel generator.						
152 - Proceduralize all potential 4-kV AC bus cross-tie actions	1	1	1	25K[d]	63K[d]	100K
Assumption: Proceduralizing all potential 4 kV AC bus cross-tie actions would improve the availability of the 4 kV power system. An analysis was performed by assuming a 50 percent improvement for operator actions to align 4 kV AC cross-ties.						
154 - Modify procedures to allow switching of the combustion turbines to buses while running	<1	<1	<1	7K	17K	50K
Assumption: This analysis was used to evaluate the change in plant risk from increasing the availability of onsite AC power by allowing switching of the combustion turbines to buses while running. A bounding analysis was performed by eliminating all failures during operation of the CTGs, including the startup diesel generator. Additionally, failures of the CTGs transformers during operation were also eliminated.						
155 - Protect transformers from failure	4	4	5	146K	366K	780K
Assumption: This analysis was used to evaluate the change in plant risk from reducing the LOOP frequency by protecting transformers from failure. The analysis was performed by decreasing initiating event frequencies for the LOOP by two orders of magnitude.						
165 - Modify procedures to defeat the low reactor pressure interlock circuitry that inhibits opening the LPCI or core spray injection valves following sensor or logic failures that prevent all low pressure injection valves from opening	3	<1	1	26K	64K	100K
Assumption: This analysis was used to evaluate the change in plant risk from eliminating the probability of ECCS low pressure permissive failing. An analysis was performed by improving the operator action to bypass the low pressure permissive by an order of magnitude.						

Individual SAMA and Assumption	% Risk Reduction			Total Benefit ($)[b]		Cost ($)[b]
	CDF	Population Dose	OECR	Baseline (Internal + External)	Larger Result: Baseline with Sensitivity	
166 - Install a bypass switch to allow operators to bypass the low reactor pressure interlock circuitry that inhibits opening the LPCI or core spray injection valves following sensor or logic failures that prevent all low pressure injection valves from opening	3	<1	1	26K	64K	100K
Assumption: This analysis was used to evaluate the change in plant risk from eliminating the probability of ECCS low pressure permissive failing. An analysis was performed by improving the operator action to bypass the low pressure permissive by an order of magnitude.						
167 - Improve training on alternate injection via the fire water system, increasing the availability of alternate injection	<1	<1	<1	6K	15K	50K
Assumption: This analysis was used to evaluate the change in plant risk from improving injection capability through either the diesel-driven fire pump or reactor water cleanup. The analysis was performed by assuming that the diesel fire pump never failed (for injection and all other modeled functions), as well as assuming that the flowpath for RPV injection via the diesel fire pump never failed.						
169 - Revise procedures to allow the ability to cross-connect the circulating water pumps and the service water going to the turbine equipment cooling system heat exchangers, allowing continued use of the power conversion system after service water is lost	1	1	1	22K	56K	100K
Assumption: This analysis was used to evaluate the change in plant risk from continued use of the power conversion system after service water is lost. The analysis was performed by eliminating failures of the turbine building closed cooling water, which includes failure of service water, the turbine building closed cooling water heat exchangers, and LOOP.						
175 - Operator procedure revisions to provide additional space cooling to the EDG room via the use of portable equipment	3	1	2	61K	154K	200K
Assumption: This analysis was used to evaluate the change in plant risk from revising procedures to provide additional cooling/ventilation to the EDG rooms via opening doors or through the use of portable equipment. The analysis was performed by adding an operator action to provide temporary ventilation to the EDGs.						
176 - Develop a procedure to open the door to the EDG buildings upon the high temperature alarm	3	1	2	61K	154K	200K

Individual SAMA and Assumption	% Risk Reduction			Total Benefit ($)[b]		Cost ($)[b]
	CDF	Population Dose	OECR	Baseline (Internal + External)	Larger Result: Baseline with Sensitivity	
Assumption: This analysis was used to evaluate the change in plant risk from revising procedures to provide additional cooling/ventilation to the EDG rooms via opening doors or through the use of portable equipment. The analysis was performed by adding an operator action to provide temporary ventilation to the EDGs.						
177 - Provide an alternate means of supplying the instrument air header: This SAMA involves procurement of an additional portable compressor to be aligned to the supply header to reduce the risk associated with loss of instrument air	2	3	3	99K[d]	249K[d]	489K
Assumption: Replacing the service and instrument air compressors could eliminate the instrument air system dependence on component cooling water. Providing an additional portable compressor to be aligned to the supply header would reduce the risk associated with loss of instrument air. A bounding analysis was performed by eliminating the failure of air supply from both divisions of the noninterruptible air supply, as well as failure of the station air compressors.						
183 - Improve alternate shutdown panel[c]	1	1	1	30K	76K	790K
Assumption: Installing additional transfer and isolation switches would reduce the number of spurious actuations during a fire. Upgrading the alternate shutdown panel would increase the ability to shut down the plant from outside the MCR. This SAMA was evaluated by assuming that the additional train will reduce the conditional core damage probability of operation from the alternate shutdown panel by a factor of 10.						
187 - Upgrade the alternate shutdown panel to include additional system controls for opposite division[c]	1	1	1	30K	76K	790K
Assumption: Installing additional transfer and isolation switches would reduce the number of spurious actuations during a fire. Upgrading the alternate shutdown panel would increase the ability to shut down the plant from outside the MCR. This SAMA was evaluated by assuming that the additional train will reduce the conditional core damage probability of operation from the alternate shutdown panel by a factor of 10.						
188 - Increase fire pump house building integrity to withstand higher winds so that the fire system would be capable of withstanding a severe weather event	<1	<1	<1	7K	18K	100K
Assumption: This analysis was used to evaluate the change in plant risk from increasing the ability of the building containing the electric and diesel driven fire pump to withstand higher winds. A bounding analysis was performed by eliminating all failures of both the electric and diesel driven fire pumps to perform their functions (condensate storage tank makeup and RPV injection).						
190 - Implement insights from trip and shutdown risk modeling into plant activities, decreasing the probability of trips/shutdown	4	5	6	189K	471K	500K

Individual SAMA and Assumption	% Risk Reduction			Total Benefit ($)[b]		Cost ($)[b]
	CDF	Population Dose	OECR	Baseline (Internal + External)	Larger Result: Baseline with Sensitivity	
Assumption: This analysis was used to evaluate the change in plant risk from decreasing the probability of trip/shutdown risk. The analysis was performed by decreasing manual shutdown, loss of condenser vacuum and turbine trip with bypass initiating event frequencies by 20 percent.						
194 - Provide ability to maintain suppression pool temperature lower (especially during summer months)	1	1	1	29K[d]	72K[d]	100K
Assumption: This analysis was used to evaluate the change in plant risk from improving the ability to maintain the suppression pool temperature lower. To estimate the change in plant risk, the events representing insufficient flow from RHR heat exchangers, inadequate flow from check valve to RHR complex, heat exchanger unavailable due to maintenance, and misalignment of RHRSW Division 1 were eliminated. Lowering the initial temperature of the suppression pool may give operators enough extra time to restore RHRSW before the limits are reached, especially if the system is down for maintenance or is misaligned.						
195 - Improve reliability of control rod drive mechanical components	1	2	2	77K	193K	>1M
Assumption: This analysis was used to evaluate the change in plant risk from reducing ATWS frequency by improving the reliability of control rod drive mechanical components. The analysis was performed by decreasing the failure probability of the control rod drive hydraulic components by 10 percent.						
196 - Provide redundant HPCI auxiliary oil pump or backup motive force for HPCI valves	1	<0.1	<0.1	5K	12K	100K
Assumption: This analysis was used to evaluate the change in plant risk from reducing the failure risk of the auxiliary oil pump used to provide the hydraulic force to operate the HPCI turbine valves. The analysis was performed by excluding the failure to start of the HPCI auxiliary oil pump.						
197 - Upgrade flood barrier between direct current switchgear room and Division 2 alternating current switchgear room	1	3	3	90K	224K	419K
Assumption: This analysis was used to evaluate the change in plant risk from physical upgrades to the doors between the direct current switchgear room and the Division 2 alternating current switchgear room to prevent flooding in one room from propagating to the other room. The analysis was performed by assuming that flooding in one room could not propagate to the other.						
198 - Provide automatic method of refilling the condensate storage tank	3	2	2	72K	179K	200K
Assumption: This analysis was used to evaluate the change in plant risk from physical upgrades to provide an automatic method of refilling the condensate storage tank. The analysis was performed by excluding the condensate storage tank failures caused by an initial low level or an operator failure to refill the condensate storage tank.						

Individual SAMA and Assumption	% Risk Reduction			Total Benefit ($)[b]		Cost ($)[b]
	CDF	Population Dose	OECR	Baseline (Internal + External)	Larger Result: Baseline with Sensitivity	
199 - Increase surveillance of small break LOCA initiators	1	<1	<1	15K	39K	50K
Assumption: This analysis was used to evaluate the change in plant risk from additional monitoring of piping and components that could cause a small break LOCA if failed. The analysis was performed by assuming that increased surveillance would result in a 25 percent decrease in initiating events for small break LOCAs.						
200 - Improve capability of general service water pumps to operate during summer months	2	2	2	65K	163K	1M
Assumption: This analysis was used to evaluate the change in plant risk from increasing successful operation of general service water pumps during summer months. A bounding analysis was performed by assuming that the general service water pumps never failed during summer months.						
201 - Install redundant high water level trip for RCIC	2	<0.1	<0.1	11K	27K	100K
Assumption: This analysis was used to evaluate the change in plant risk from adding a redundant Level 8 trip device for RCIC. The analysis was performed by eliminating the failure of the RCIC Level 8 Trip.						
202 - Replace or upgrade reactor building closed cooling water pressure control valve	1	1	1	37K	92K	100K
Assumption: This analysis was used to evaluate the change in plant risk from improving the reliability of the reactor building closed cooling water system by replacing or upgrading the reactor building closed cooling water pressure control valve. The analysis was performed by decreasing the initiating event frequency by two orders of magnitude for the loss of reactor building closed cooling water.						
203 - Improve EDG maintenance procedures to decrease unavailability time	1	<0.1	<0.1	16K	41K	50K
Assumption: This analysis was used to evaluate the change in plant risk from improving EDG maintenance procedures to decrease the time in which they are unavailable due to maintenance. The analysis was performed by assuming that improved procedures would decrease the unavailability due to maintenance for all EDGs by 50 percent, including times when multiple EDGs are unavailable.						
204 - Improve test and maintenance procedures on standby feedwater pumps to decrease their unavailability time	<1	<1	<1	8K	21K	50K
Assumption: This analysis was used to evaluate the change in plant risk from improving standby feedwater pump test and maintenance procedures to decrease the time in which standby feedwater is unavailable due to maintenance. The analysis was performed by assuming that improved procedures would decrease the unavailability due to test and maintenance for the standby feedwater pump by 50 percent.						

Individual SAMA and Assumption	% Risk Reduction			Total Benefit ($)[b]		Cost ($)[b]
	CDF	Population Dose	OECR	Baseline (Internal + External)	Larger Result: Baseline with Sensitivity	
205 - Improve test and maintenance procedures on HPCI pump/turbine to decrease unavailability time	2	<0.1	<1	9K	23K	50K
Assumption: This analysis was used to evaluate the change in plant risk from improving HPCI pump/turbine test and maintenance procedures to decrease the time in which HPCI is unavailable due to maintenance. The analysis was performed by assuming that improved procedures would decrease the unavailability due to test and maintenance for HPCI by 50 percent.						
206 - Improve the ability of operators to manually close a damper to isolate the third floor of the reactor building from hardened vent path	**13**	**13**	**13**	**438K**	**1.1M**	**100K**
Assumption: The SAMA is assessed by assuming the all of the fire CDF associated with the damper for the two fire areas above is removed from the results. This results in a reduction of 2.15×10^{-6} per year in the fire CDF. This reduction in CDF was applied proportionately to each release category.						
207 - Add incipient fire detection and suppression to selected cabinets in the Division 1 switchgear room	8	8	8	270K	674K	1.1M
Assumption: To determine the impact of this modification, the assumption is made that the detection/auto suppression system has a failure probability of 0.05. It is also assumed that the CCDP for a fire with successful suppression is equal to the CCDP associated with a non-severe fire. Non-severe fires will not propagate to other equipment in the room, while severe fires will result in failure of all equipment in the room. Therefore, the severe fire scenarios for these components are revised from one scenario to two scenarios: one with successful suppression and one with failed suppression. With this modification, the fire CDF is reduced by 1.36×10^{-6} per year. This reduction in fire CDF was applied proportionately to each release category.						
208 – Add incipient fire detection and suppression to selected cabinets in the Relay room	5	5	5	169K	422K	790K
Assumption: Three panels in the Relay room (03AB) account for approximately 70 percent of the fire CDF in the room. These components are P620, P613, and P622. The addition of incipient fire detection and automatic actuation systems for these components will reduce the CDF of these fires significantly. To determine the impact of this modification, the assumption is made that the detection/auto suppression system has a failure probability of 0.05. It is also assumed that the conditional core damage probability for a fire with successful suppression is reduced by an order of magnitude compared to the original conditional core damage probability. Therefore, the original fire scenarios for these components are revised from one scenario to two scenarios; one with successful suppression and one with failed suppression. With this modification, the fire CDF is reduced by 8.3×10^{-7} per year. This reduction in fire CDF was applied proportionately to each release category.						
209 – Add incipient fire detection and suppression to selected cabinets in the Division 2 switchgear room	5	5	5	179K	447K	1.1M

Individual SAMA and Assumption	% Risk Reduction			Total Benefit ($)[b]		Cost ($)[b]
	CDF	Population Dose	OECR	Baseline (Internal + External)	Larger Result: Baseline with Sensitivity	
Assumption: Five components in the Division 2 switchgear room (12AB) account for approximately 76 percent of the fire CDF in the room. These components are the 480V 72F Bus/Transformer, 480V 72E Bus/Transformer, 4160V 65F Bus, 4160V 65E Bus, and the 4160V 65G Bus. The addition of incipient fire detection and auto actuation systems for these components will reduce the CDF of these fires significantly. To determine the impact of this modification, the assumption is made that the detection/auto suppression system has a failure probability of 0.05. It is also assumed that the conditional core damage probability for a fire with successful suppression is equal to the conditional core damage probability associated with a non-severe fire. Non-severe fires will not propagate to other equipment in the room, while severe fires will result in failure of all equipment in the room. Therefore, the severe fire scenarios for these components are revised from one scenario to two scenarios; one with successful suppression and one with failed suppression. With this modification, the fire CDF is reduced by 8.74×10^{-7} per year. This reduction in fire CDF was applied proportionately to each release category.							
210 - Add incipient fire detection and suppression to selected cabinets in the Division 1 portion of the Miscellaneous room	3	3	3	98K	245K	375K
Assumption: Three cabinets in the Division 1 portion of the Miscellaneous room (11ABE) account for approximately 60 percent of the fire CDF in the room. These cabinets are MCC 2PA-1, MCC 2PB-1, and Cabinet 2PA-2. The addition of incipient fire detection and automatic actuation systems for these cabinets will reduce the CDF of these fires significantly. To determine the impact of this modification, the assumption is made that the detection/auto suppression system has a failure probability of 0.05. It is also assumed that the conditional core damage probability for a fire with successful suppression is reduced by an order of magnitude compared to the original conditional core damage probability. Therefore, the original fire scenarios for these components are revised from one scenario to two scenarios: one with successful suppression and one with failed suppression. With this modification, the fire CDF is reduced by 4.85×10^{-7} per year. This reduction in fire CDF was applied proportionately to each release category.							
211 - Add incipient fire detection and suppression to selected cabinets on the second floor of the Reactor Building (RB06)	1	1	1	44K	110K	375K
Assumption: Three cabinets on the second floor of the Reactor Building (RB06) account for approximately 50 percent of the fire CDF in the room. These cabinets are R1600S003J, H2100P627, and R1600S003D. The addition of incipient fire detection and auto actuation systems for these cabinets will reduce the CDF of these fires significantly. To determine the impact of this modification, the assumption is made that the detection/auto suppression system has a failure probability of 0.05. It is also assumed that the conditional core damage probability for a fire with successful suppression is reduced by an order of magnitude compared to the original conditional core damage probability. Therefore, the original fire scenarios for these components are revised from one scenario to two scenarios; one with successful suppression and one with failed suppression. With this modification, the fire CDF is reduced by 2.09×10^{-7} per year. This reduction in fire CDF was applied proportionately to each release category.							

Individual SAMA and Assumption	% Risk Reduction			Total Benefit ($)[b]		Cost ($)[b]
	CDF	Population Dose	OECR	Baseline (Internal + External)	Larger Result: Baseline with Sensitivity	
212 - Diversify standby liquid control explosive valve operation	2	6	7	76K	189K	370K
Assumption: This analysis was used to evaluate the change in plant risk from diversifying standby liquid control explosive valve operation to decrease the probability of common cause failures. A bounding analysis was performed by eliminating all common cause failures of standby liquid control squib valves.						
213 - Provide leak detection and automatic isolation valves on EECW piping in the direct current switchgear room	2	3	3	99K	247K	377K
Assumption: This analysis was used to evaluate the change in plant risk from providing the capability to detect and isolate floods from EECW piping in the direct current switchgear room. The analysis was performed by assuming that a flood from this piping would not result in the failure of any electrical equipment in the direct current switchgear room.						
214 - Provide leak detection and automatic isolation valves on EECW piping in the Division 2 switchgear room	1	1	1	44K	111K	377K
Assumption: This analysis was used to evaluate the change in plant risk from providing the capability to detect and isolate floods from EECW piping in the Division 2 switchgear room (Area A3G10). The analysis was performed by assuming that a flood from this piping would not result in the failure of any electrical equipment in the Division 2 switchgear room.						

[a] SAMAs in bold are potentially cost-beneficial. Refer to Section F.6.2 for three additional SAMAs determined by DTE to be potentially cost beneficial as a result of questions raised by the NRC staff during the SAMA evaluation review.

[b] DTE identified potentially cost-beneficial SAMAs by comparing the largest total benefit with sensitivity to the estimated implementation cost.

[c] In response to requests by the NRC staff for additional information, DTE updated the assessment related to SAMAs 023, 031, 074, 078, 183, and 187 as described in Section F.4.

[d] The NRC staff calculated corrected benefits in Table F–6 for SAMAs 021, 024, 050, 067, 078, 123, 145, 152, 177, and 194.

Key: ADS = automatic depressurization system; ATWS = anticipated transients without scram; CCDP = conditional core damage probability; CDF = core damage frequency; CTG = combustion turbine generator; EECW = emergency equipment cooling water; ECCS = emergency core cooling system; EDG = emergency diesel generator; gpm = gallons per minute; HPCI = high pressure coolant injection; ISLOCA = interfacing-systems loss-of-coolant accident; LPCI = low-pressure coolant injection; LOCA = loss-of-coolant accident; MCR = main control room; MSIV = main steam isolation valve; NRC = U.S. Nuclear Regulatory Commission; OECR = offsite economic cost risk; RCIC = reactor core isolation cooling; RHR = residual heat removal; SAMA = severe accident mitigation alternative; SBFW = standby feedwater; SRV = safety relief valve

Source: DTE 2014

The review of the LERF events identified four additional events that should be considered. DTE indicated that the first event, Failure of Combustible Gas Venting, will be addressed by implementation of NRC Order EA-13-109, "Order to Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions." Since DTE intends to comply with the Order, there is no need to address this event with a specific SAMA. The second event, Hydrogen Deflagration Occurs Globally, is addressed by SAMAs 93 (Provide post-accident containment inerting capability) and 103 (Install a passive hydrogen control system). A bounding analysis was performed for these SAMAs by eliminating all hydrogen deflagrations that result in containment or drywell failures. None of these SAMAs was found to be cost beneficial. Mitigating the third event, Control Rods Melt Prior to Fuel Rods, was evaluated by considering a SAMA to replace the current control rods with rods that have metal cladding with a higher melting point than the fuel. This SAMA was evaluated by revising the probability of this event from 1.0 to 5×10^{-2} and requantifying the model. The result was a maximum benefit of $33,000 including external events and uncertainty. DTE concluded that the cost of replacing control rods and disposing of the existing rods is estimated to greatly exceed the benefit of this SAMA, so this SAMA is not cost beneficial. A new SAMA evaluation was performed for the fourth event, Operator Fails to Isolate Path Given Isolation Signal Fails, assuming the probability of the event was revised from 1.0 to 0.1. This resulted in a maximum benefit of $30,000 including external events and uncertainty. DTE concluded that this SAMA is not cost beneficial even when considering low cost changes such as new procedures (DTE 2015a, 2015c).

The NRC staff noted in an RAI that SAMAs 183 and 187 both involve improvements to the alternate shutdown panel that would reduce the conditional core damage probability (CCDP) of operation from the alternate shutdown panel following control room evacuation due to fire events and that the internal events internal flooding model includes a similar basic event, "Operators fail to shutdown from outside the main control room." In response to the request to provide more information on how the benefit of these SAMAs was determined to include the potential for impacting both fire risk and internal event risk, DTE indicated that the ER reported benefit of SAMAs 183 and 187 was based only on the reduction in fire risk. If the benefit of the improved alternate shutdown panel for both fire and internal flood initiators was considered, DTE determined that the maximum benefit would be $205,000 including uncertainty. Because the cost of implementation is estimated to be $790,000 for SAMAs 183 and 187, DTE concluded that these SAMAs remain not cost beneficial (DTE 2015a).

The NRC staff noted that SAMAs 213 and 214 both involve providing leak detection and automatic isolation valves for EECW piping in the DC switchgear room or the Division 2 switchgear room, respectively. The benefit for each was indicated to be based on the assumption that a flood from the piping failure would not result in the failure of any electrical equipment in the switchgear room in which the flood occurred. Because these SAMAs were identified to mitigate important flooding events in which the flood would or could cause failures in adjacent electrical rooms, DTE was asked to confirm that the benefit assessment includes the elimination of failures in the adjacent rooms. DTE confirmed that the benefit for SAMAs 213 and 214 included the elimination of failures of equipment in the flood location room as well as due to propagation of the flood outside of the room in which it occurs (DTE 2015a).

In response to an NRC staff RAI concerning how the benefit was determined for those SAMAs that specifically mitigate fire risk (i.e., SAMAs 183, 187, and 206–211), DTE indicated it was necessary to estimate the reduction in fire CDF by the SAMA from the IPEEE compartment scenario analysis because the Fermi 2 IPEEE fire analysis was performed using FIVE and there is not an integrated quantitative model. The reduction in fire CDF determined from the IPEEE was reduced by the factor of 2 to determine the total fire CDF, as discussed above in

Section F.2.2.2. The resulting reduction in CDF was used to determine a reduction factor that is uniformly applied to the CDF and release category frequencies. Concerning the differing assumptions in the SAMA evaluation regarding the impact on the CCDP due to the SAMA modifications, DTE indicated that the SAMA was assumed to reduce the severe fires to non-severe fires and the associated CCDP, when the IPEEE analysis included both severe and non-severe fires. If the IPEEE analysis did not distinguish between severe and non-severe fires, an order-of-magnitude reduction was assumed. This was stated to be consistent with that found for those scenarios where information on the CCDPs for severe and non-severe fires was available.

The NRC staff has reviewed DTE's bases for calculating the risk reduction for the various plant improvements and concludes, with the above clarifications, that the rationale and assumptions for estimating risk reduction are reasonable and generally conservative (i.e., the estimated risk reduction is higher than what would actually be realized). Accordingly, the NRC staff based its estimates of averted risk for the various SAMAs on DTE's risk reduction estimates.

F.5 Cost Impacts of Candidate Plant Improvements

DTE estimated the costs of implementing the 79 Phase II SAMAs through the use of other licensees' estimates for similar improvements and the development of site-specific cost estimates where appropriate.

DTE indicated the following cost ranges were used based on the review of previous SAMA applications and an evaluation of expected implementation costs at Fermi 2.

Type of Change	Estimated Cost Range
Procedural only	$50K
Procedural change with engineering or training required	$50K to $200K
Procedural change with engineering and testing or training required	$200K to $300K
Hardware modification	$100K to >$1,000K

DTE stated that the Fermi 2 site-specific cost estimates were based on the engineering judgment of project engineers experienced in performing design changes at the facility and were compared, where possible, to estimates developed and used at plants of similar design and vintage.

In response to an NRC staff RAI to provide further information as to what was included in the Fermi 2 cost estimates, DTE indicated that cost estimates were developed based on initial hardware and installation costs only, not recurring costs (DTE 2015a). Replacement power, lifetime maintenance, and procedure costs were not included in the estimates. DTE indicated that the only exceptions are the cost estimates for SAMA 145 (Increase training and operating experience feedback to improve operator response) and a new SAMA evaluated in response to an RAI to implement an inspection program for the piping associated with the risk significant internal flooding initiators. SAMA 145 is training related so costs estimated by DTE included additional operator training for the life of the plant. Because the new SAMA pertains to a proposed inspection program, DTE included recurring costs associated with plant walkdowns of piping segments that are significant to the internal flooding risk (DTE 2015a).

The NRC staff reviewed the applicant's cost estimates presented in Table D.2–1 of the ER (DTE 2014). For certain improvements, the NRC staff also compared the cost estimates to

estimates developed elsewhere for similar improvements, including estimates developed as part of other licensees' analyses of SAMAs for operating reactors.

Regarding the $200,000 cost for SAMA 176 to develop a procedure to open the door to the EDG buildings upon the high temperature alarm, DTE justified the cost estimate by explaining that an evaluation on ventilation sufficiency from opening the doors would be needed in addition to the costs for procedure changes and training (DTE 2015a).

DTE also described the cost estimates for fire-related SAMAs 207 through 211, either being developed by DTE for Fermi 2 including costs for equipment, engineering design, construction, and materials with incipient detection or clarified to have been based on a Brunswick estimate for medium-sized, moderate complexity automatic fire suppression systems without incipient detection (DTE 2015a).

With the above clarifications, the NRC staff concludes that the cost estimates provided by DTE are sufficient and appropriate for use in the SAMA evaluation.

F.6 Cost-Benefit Comparison

DTE's cost-benefit analysis and the NRC staff's review are described in the following sections.

F.6.1 DTE's Evaluation

The methodology used by DTE was based primarily on the NRC's guidance for performing cost-benefit analysis, NUREG/BR–0184, *Regulatory Analysis Technical Evaluation Handbook* (NRC 1997a). This NRC guidance was adopted in the NEI 05-01 report (NEI 2005). As described in Section D.1.5.4 of the ER (DTE 2014), the MMACR was determined for each SAMA according to the following formula, which the NRC staff accepts as mathematically equivalent to the formula in the NUREG/BR–0184:

$$MMACR = EEM\ (W_{PHA} + W_{EA} + W_O + W_{CD} + W_{RP})$$

Where

EEM = external event multiplier (unit less)

W_{PHA} = present value of averted offsite exposure cost ($)

W_{EA} = present value of averted offsite economic cost ($)

W_O = present value of averted onsite exposure cost ($)

W_{CD} = present value of averted onsite cleanup cost ($)

W_{RP} = present value of averted replacement power cost ($)

DTE's derivation of each of the associated costs is presented separately in this section. For each SAMA, the applicant's analysis determined percentage reductions in population dose risk (PDR%), offsite economic cost risk (OECR%), and onsite cost risk (OCR%). The internal and external benefit from the implementation of an individual SAMA is determined from these percentage reductions and their associated present value costs according to the following formula:

$$SAMA\ Benefit = EEM\ [PDR\%\ (W_{PHA}) + OECR\%\ (W_{EA}) + OCR\%\ (W_O + W_{CD} + W_{RP})]$$

For each SAMA, the estimated benefit is compared to the cost of implementation. If the cost of implementing the SAMA is larger than the benefit associated with the SAMA, the SAMA is not

considered to be cost beneficial. If the cost of implementing the SAMA is smaller than the benefit associated with the SAMA, the SAMA is considered to be potentially cost beneficial.

Sensitivity analyses performed by the applicant can lead to increases in the calculated benefits. DTE analyzed one sensitivity case with a lower discount rate of 3 percent in accordance with NUREG/BR–0058 guidance (NRC 2004b), which states that 2 sets of present worth estimates should be developed using both the 3 percent and 7 percent discount rates. DTE conducted a baseline analysis using the 7 percent discount rate and a sensitivity analysis using the 3 percent discount rate (DTE 2014). Additional details on the sensitivity analysis are presented in Section F.6.2.

Averted Offsite Exposure Cost (W_{PHA})

DTE defined W_{PHA} cost as the monetary value of accident risk avoided from population doses after discounting (DTE 2014). The W_{PHA} costs were calculated using the following formula:

W_{PHA} = Averted public dose risk (person-rem per year)
× monetary equivalent of unit dose ($2,000 per person-rem)
× present value conversion factor (NRC 1997a)

As stated in NUREG/BR–0184 (NRC 1997a), it is important to note that the monetary value of the public health risk after discounting does not represent the expected reduction in public health risk because of a single accident. Rather, it is the present value of a stream of potential losses extending over the remaining lifetime (in this case, the 20-year renewal period) of the facility. Thus, it reflects the expected annual loss caused by a single accident, the possibility that such an accident could occur at any time over the renewal period, and the effect of discounting these potential future losses to present value. For discount rates of 7 percent and 3 percent, DTE calculated W_{PHA} costs of $105,676 and $147,667, respectively, due to internal events in Table D.1–27 of the ER (DTE 2014).

Averted Offsite Economic Cost (W_{EA})

DTE defined W_{EA} as the monetary value of risk avoided from offsite property damage after discounting (DTE 2014). The W_{EA} values were calculated using the following formula:

W_{EA} = Annual offsite property damage risk before discounting in dollars per year
× present value conversion factor (NRC, 1997a)

For discount rates of 7 percent and 3 percent, DTE calculated W_{EA} costs of $167,403 and $233,921, respectively, due to internal events in Table D.1–28 of the ER (DTE 2014).

Averted Onsite Exposure Cost (W_O)

DTE defined W_O as the avoided onsite exposure (DTE 2014). Similar to the W_{PHA} calculations, the applicant calculated costs for immediate onsite exposure. Long-term onsite exposure costs were calculated consistent with guidance in the Regulatory Analysis Handbook (NRC 1997a), which included an additional term for accrual of long-term doses.

DTE derived the values for averted occupational exposure from information provided in Section 5.7.3 of the Regulatory Analysis Handbook (NRC 1997a). Best estimate values provided for immediate occupational dose (3,300 person-rem) and long-term occupational dose (20,000 person-rem over a 10-year cleanup period) were used. The present value of these doses was calculated using the equations provided in the handbook in conjunction with a monetary equivalent of unit dose of $2,000 per person-rem, a real discount rate of 7 percent, and a time period of 20 years to represent the license renewal period. Immediate and long-term onsite exposure costs were summed to determine the W_O cost. For discount rates of 7 percent

and 3 percent, DTE calculated W_O costs of $572 and $930, respectively, due to internal events in Table D.1–31 of the ER (DTE 2014).

Averted Onsite Cleanup Cost (W_{CD})

DTE defined W_{CD} as the avoided cost for cleanup and decontamination of the site (DTE 2014). The applicant derived the values for W_{CD} based on information provided in Section 5.7.6 of NUREG/BR–0184, the Regulatory Analysis Handbook (NRC 1997a).

Averted cleanup and decontamination costs were calculated using the following formula:

W_{CD} = Annual CDF × present value of cleanup costs per core damage event × present value conversion factor.

The total cost of cleanup and decontamination subsequent to a severe accident is estimated in the Regulatory Analysis Handbook to be $\$1.5\times10^9$ (undiscounted). This value was converted to present costs over a 10-year cleanup period and integrated over the term of the proposed license extension. For discount rates of 7 percent and 3 percent, DTE calculated W_{CD} costs of $17,450 and $29,293, respectively, due to internal events in Table D.1–32 of the ER (DTE 2014).

Averted Replacement Power Cost (W_{RP})

DTE defined W_{RP} as the avoided costs of replacement power (DTE 2014). Long-term replacement costs were calculated using the following formula:

W_{RP} = Annual CDF × present value of replacement power for a single event

× factor for remaining service years for which replacement power is required

× reactor power scaling factor

DTE based its calculations on the net electric output for Fermi 2, specifically 1,170 megawatt-electric (MWe), and scaled up from reference plant value of 910 MWe specified in NUREG/BR–0184 (NRC 1997a). For discount rates of 7 percent and 3 percent, DTE calculated W_{RP} costs of $15,247 and $14,278, respectively, due to internal events in Table D.1–34 of the ER (DTE 2014).

MMACR

Using the above equations, DTE estimated the total present dollar value equivalent associated with completely eliminating severe accidents caused by internal events, referred to as the MACR, to be about $306,348 and $426,090 for respective discount rates of 7 percent and 3 percent in Table D.1–35 of the ER (DTE 2014). To account for the risk contributions from external events and yield the internal and external benefit, DTE selected an EEM value of 11 for Fermi 2 (DTE 2014), as discussed further in Section F.6.2. By multiplying MACR and EEM, DTE estimated MMACR to be about $3,369,832 and $4,686,991 for respective discount rates of 7 percent and 3 percent in Table D.1–35 of the ER (DTE 2014). As described above in the SAMA benefit formula, components of the MMACR calculation factor into the benefit determination for individual SAMAs.

DTE's Results

If the implementation costs for a candidate SAMA exceeded the calculated benefit, the SAMA was determined to be not cost beneficial. If the SAMA benefit exceeded the estimated cost, the SAMA candidate was considered to be potentially cost beneficial. The DTE's baseline cost-benefit analysis identified one SAMA candidate as potentially cost-beneficial. From the sensitivity analysis, DTE identified an additional three SAMA candidates as potentially cost

beneficial. Results of the cost-benefit evaluation are presented in Table F–5. Considering the results from the baseline and sensitivity analyses, the full set of potentially cost-beneficial SAMAs for Fermi 2 is:

- SAMA 112: Revise emergency operating procedures to improve identification of interfacing system LOCAs,
- SAMA 113: Improve operator training on coping with interfacing system LOCAs,
- SAMA 115: Revise procedures to control vessel injection to prevent boron loss or dilution following standby liquid control injection, and
- SAMA 206: Improve the ability of operators to manually close a damper to isolate the third floor of the reactor building from the hardened vent path.

DTE indicated that seven SAMAs, the four numbered SAMAs above as well as three additional unnumbered SAMAs listed in Section F.6.2 arising from the NRC staff's review, will be incorporated into the design evaluation process and evaluated considering other planned plant modifications.

F.6.2 Review of DTE's Cost-Benefit Evaluation

During its review of the cost-benefit analysis performed by DTE, the NRC staff compared the applicant's approach with guidance in NUREG/BR–0184 (NRC 1997a) and discount rate guidelines in NEI 05-01 (NEI 2005). NEI guidance states that two sets of estimates should be developed for discount rates of 7 percent and 3 percent (NEI 2005). DTE performed assessments using both discount rates. DTE provided a baseline set of results using a discount rate of 7 percent. For the other types of potential sensitivity analyses suggested (NEI 2005), the NRC staff finds that DTE's information provided in the ER submittal and subsequent RAI responses on plant modifications, peer review findings or observations, and evacuation speed have been adequately addressed in the baseline analysis, as discussed in this appendix. As previously indicated, DTE performed the cost-benefit evaluation using an analysis time period of 20 years. Because DTE explicitly accounted for uncertainty in its sensitivity analysis by applying a multiplication factor of 2.5 and the results of the sensitivity analysis were used to identify additional potentially beneficially SAMAs, the NRC staff finds that an additional sensitivity analysis for a time frame longer than 20 years is not necessary. Although longer timeframes would increase estimated benefits compared to baseline results, it is unlikely that influences from a longer timeframe would exceed the factor of 2.5 already considered by DTE. Based on its review of the applicant's cost-benefit evaluation, the NRC staff determined that the applicant's approach is consistent with the guidance and is acceptable.

The applicant considered possible increases in benefits from analysis uncertainties on the results of the SAMA assessment. In the ER (DTE 2014), DTE indicated that the 95th percentile value of the Fermi 2 CDF was greater than the mean CDF by a factor of 2.36. A multiplication factor of 2.5 was conservatively selected by the applicant to account for uncertainty. This multiplication factor was applied in addition to the separate external events multiplication factor of 11 (DTE 2014), as described in Section F.2.2.2. DTE's assessment accounted for the potential risk-reduction benefits associated with both internal and external events. The NRC staff considers the multipliers of 2.5 for uncertainty and 11 for external events at Fermi 2 provide adequate margin and are acceptable for the SAMA analysis.

Using DTE's information on the release category frequencies during the onsite audit (NRC 2014c), the NRC staff spot checked the applicant's calculations of delta CDF (i.e., percentage reduction in CDF due to accumulated differences in the release categories for

a specific SAMA candidate compared to the base case), population dose risk, and offsite economic cost risk. By applying the formula for SAMA benefit presented in Section F.6.1 and comparing the results with those presented in Table D.2–1 of the ER (DTE 2014), the NRC staff found the results to be in agreement and within small roundoff errors. Consistency also was found between the base release category frequencies and those reported in Tables D.1–9 and D.1–10 of the ER (DTE 2014).

DTE's baseline cost-benefit analysis identified one SAMA candidate as potentially cost beneficial. From a sensitivity analysis, DTE identified an additional three SAMA candidates as potentially cost beneficial. As described in Section F.3.2, the NRC staff asked the applicant to evaluate potentially lower-cost alternatives to the SAMA candidates. In response to questions raised by the NRC staff, DTE concluded that the following new SAMAs would be potentially cost beneficial (DTE 2015a):

- Install a flood barrier or curb between the DC switchgear room and Division 2 AC switchgear room.
- Develop a new procedure to close valves to terminate the flood from EECW in an AB3 switchgear room.
- Revise existing alarm response procedures to direct operators to DC switchgear room and the Division 2 AC switchgear room following indication of leakage in RBCCW/EECW system piping.

From its review of the original SAMA analysis and additional information, the NRC staff agrees with DTE's disposition of the above lower cost alternatives.

As discussed above in Section F.2.2.3, the Level 2 analysis assignment of sequences to release categories resulted in the underestimation of the consequences for Accident Class IIA sequences. As noted by the NRC staff in an RAI (NRC 2015a), the impact of this accident class assignment may not have a significant impact on the base case MACR, but it would lead to an underestimate of the benefit for any SAMA that mitigated these Class IIA sequences.

In response to the RAI and a subsequent RAI (NRC 2015b) to include in the benefit evaluation the impact of the 3.14×10^{-9} per year undercounting due to truncation discussed previously in Section F.2.2.3, DTE provided an analysis of the impact on the cost-benefit analysis of those SAMAs expected to be most impacted by these issues (DTE 2015b and 2015c). Eleven SAMAs (21, 24, 50, 54, 67, 78, 123, 145, 152, 177, and 194) were selected based on three criteria:

- The SAMA was not already considered potentially cost-beneficial in the base case analysis or in the sensitivity analysis.
- The SAMA was not specifically oriented towards other types of sequences (e.g., LOCA, ATWS, early loss of RPV injection).
- The SAMA has a non-marginal impact on Class IIA sequences relative to non-Class IIA sequences.

For this RAI response, DTE assumed that the Class IIA frequency originally included in the H/E release category (5.32×10^{-8} per year) and all the unaccounted for 3.14×10^{-9} per year have offsite population dose in person-rem and economic cost consequences equal to those for the H/E-BOC release category because MAAP analysis results were not available for these sequences. The cutsets for each of the SAMAs (except SAMAs 78 and 123, discussed below) were reviewed and the percent reduction in the Class IIA sequence frequency determined. This percent reduction was used to determine the additional benefit due to the originally

mischaracterized 5.32×10^{-8} per year and the unaccounted for 3.14×10^{-9} per year. As explained in the RAI response (DTE 2015c), this frequency reduction was multiplied by the difference between the new, higher, H/E-BOC consequence (person-rem and offsite economic cost) and the original H/E release category consequence and converting the resultant averted risk to a monetary benefit. For SAMAs 78 and 123, the analysis used the benefit analysis revised in response to an NRC staff RAI discussed above in Section F.4. For both SAMA 78 and SAMA 123, it was assumed that the SAMA was 100 percent effective in eliminating the risk from the Class IIA sequences (DTE 2015c).

The NRC staff notes that while the above described procedure to subtract the original H/E release category consequence to determine the added benefit associated with the Class IIA sequences is correct with regard to the original mischaracterized 5.32×10^{-8} per year, it is not correct with regard to the unaccounted for 3.14×10^{-9} per year because this frequency was not included in the original benefit calculations. The NRC staff calculated this added benefit as part its review and concluded that the added benefit is relatively small and does not impact the final selection of cost-beneficial SAMAs. It is further noted that DTE's analysis does not include the added onsite benefit (onsite exposure, onsite cleanup, and replacement power) associated with mitigating the unaccounted for 3.14×10^{-9} per year Class IIA sequences. Because the sequences are approximately 2 percent of the total CDF and the maximum averted onsite cost risk is only about 10 percent of the MACR, the NRC staff concludes this added contribution is negligible.

A full presentation of results from the analysis performed by DTE is reported in Table 2–2 of the RAI response (DTE 2015c). Table F–6 of this appendix summarizes some of DTE's results and presents results from the calculation performed by the NRC staff during the review of the SAMA analysis. No additional cost-beneficial SAMAs were identified as a result of the NRC staff's calculation.

Because the NRC staff reviewed the cost benefit evaluations performed by DTE, DTE satisfactorily addressed the NRC staff questions regarding the evaluations, and the NRC staff found that no additional cost-beneficial SAMAs were missed as a result of a minor correction to DTE's evaluation, the NRC staff concludes that the cost-benefit evaluations, subject to the one correction discussed above, are of sufficient quality to support the SAMA evaluation.

DTE identified three additional potential cost-beneficial SAMAs as a result of the NRC staff questions on installing a flood barrier or curb between the DC switchgear room and Division 2 AC switchgear room, developing a new procedure to close valves to terminate the flood from EECW in an AB3 switchgear room, and revising existing alarm response procedures to direct operators to the DC switchgear room and the Division 2 AC switchgear room following indication of leakage in the RBCCW/EECW system piping. For the other SAMAs that were not cost beneficial, the NRC staff concludes that their implementation costs exceed their associated benefits; therefore, those SAMAs are not cost beneficial.

Table F–6. Adjusted Cost/Benefit Analysis for SAMAs Impacted by Accident Class IIA Consequence Revisions

SAMA No.	SAMA Description	Class IIA Percent Reduction [a]	Class IIA Frequency Reduction (1/yr)[b]	Additional Offsite Dose Cost Benefit ($)[c][i]	Additional Offsite Economic Cost Benefit ($)[d][j]	Adjusted Cost Benefit ($)[e][k]	2.5 Uncertainty Factor Applied to Adj. Cost Benefit ($)[f][l]	Implementa-tion Cost ($)[g]
21	Use firewater system as a backup source for diesel cooling	58.34%	3.29×10^{-8}	$107,000 ($3,840)	$8,950 ($6,070)	$373,000 ($382,000)	$931,000 ($956,000)	$2,000,000
24	Training for offsite power recovery after SBO	0.00%[8]	0[h]	$0 ($0)	$0 ($0)	$6,270 ($6,270)	$15,700 ($15,700)	$50,000
50	Change procedures to allow cross connect of motor cooling for RHRSW pumps	2.88%	1.62×10^{-9}	$5,260 ($190)	$441 ($300)	$18,900 ($19,300)	$47,100 ($48,400)	$50,000
54	Enhance procedural guidance for use of cross-tied component cooling or service water pumps	0.02%	1.07×10^{-11}	$35 ($1)	$3 ($2)	$3,280 ($3,280)	$8,190 ($8,200)	$50,000
67	Enhance procedure to trip unneeded RHR or containment spray pumps on loss of room ventilation	0.00%[12]	0[12]	$0 ($0)	$0 ($0)	$1,190 ($1,190)	$2,960 ($2,960)	$50,000
78	Enable flooding of drywell head seal	100.00%	5.63×10^{-8}	$183,000 ($6,580)	$15,300 ($10,400)	$296,000 ($313,000)	$739,000 ($781,000)	$1,000,000
123	Install an ATWS-sized filtered containment vent to remove decay heat	100.00%	5.63×10^{-8}	$183,000 ($6,580)	$15,300 ($10,400)	$1,300,000 ($1,320,000)	$3,250,000 ($3,290,000)	$40,000,000

SAMA No.	SAMA Description	Class IIA Percent Reduction [a]	Class IIA Frequency Reduction (1/yr)[b]	Additional Offsite Dose Cost Benefit ($)[c][i]	Additional Offsite Economic Cost Benefit ($)[d][j]	Adjusted Cost Benefit ($)[e][k]	2.5 Uncertainty Factor Applied to Adj. Cost Benefit ($)[f][l]	Implementation Cost ($)[g]
145	Increase training and operating experience feedback to improve operator response	11.94%	6.73×10^{-9}	$21,800 ($786)	$1,830 ($1,240)	$333,000 ($335,000)	$834,000 ($839,000)	$1,000,000
152	Proceduralize all potential 4- kV AC bus cross-tie actions	6.01%	3.39×10^{-9}	$11,000 ($395)	$923 ($625)	$37,300 ($38,300)	$93,100 ($95,700)	$100,000
177	Provide an alternate means of supplying the instrument air header	15.84%	8.92×10^{-9}	$28,900 ($1,040)	$2,430 ($1,650)	$131,000 ($134,000)	$327,000 ($334,000)	$489,300
194	Provide ability to maintain suppression pool temperature lower	4.74%	2.67×10^{-9}	$8,660 ($312)	$727 ($493)	$38,300 ($39,100)	$95,700 ($97,700)	$100,000

Notes pertaining to values listed in the first (upper) row for each SAMA, as taken from Table 2–2 of DTE's RAI response (DTE 2015c):

[a] Class IIA percent reduction was calculated based on detailed cutset summation, except for SAMAs 78 and 123 in which 100% H/E Class IIA reduction is assumed.

[b] Values were calculated from multiplying the Class IIA Percent Reduction by the H/E Class IIA release frequency of 5.63×10^{-8} per year, which includes the 3.14×10^{-9} per year additional frequency.

[c] Values displayed without parentheses were derived from taking the difference between the H/E Class IIA release category population dose (2.18×10^{7} rem, using the H/E-BOC MACCS2 results) and the "Other" (or original) H/E release category population dose (8.10×10^{6} rem) to calculate the additional benefit (1.37×10^{7} rem) to the population dose reduction. The dose cost factor of $2,000 per person-rem and the Class IIA frequency reduction listed in Column 4 were applied in the calculation. The calculation also included multiplication by the external hazards factor (11) and the 7-percent discount rate factor (10.76).

[d] Values displayed without parentheses were derived from taking the difference between the H/E Class IIA release category offsite economic cost ($\$3.03\times10^{10}$) and the "Other" (or original) H/E release category offsite economic cost ($\$2.80\times10^{10}$) to calculate the additional benefit ($\$2.30\times10^{9}$) to the offsite economic costs assuming the Class IIA frequency reduction listed in Column 4. The calculation included multiplication by the external hazards factor (11) and the 7-percent discount rate factor (10.76).

[e] Values displayed without parentheses represent the summation of the Adjusted Benefit Portion from Offsite and Base Case Benefit Portion from Onsite in Table 2–2 of an RAI response (DTE 2015c) plus the original ER base case total benefit in Table 3–3 of an RAI response (DTE 2015b), except for SAMA 78 for which DTE's RAI response (DTE 2015a) was used as the base case benefit.

SAMA No.	SAMA Description	Class IIA Percent Reduction [a]	Class IIA Frequency Reduction (1/yr)[b]	Additional Offsite Dose Cost Benefit ($)[c][i]	Additional Offsite Economic Cost Benefit ($)[d][j]	Adjusted Cost Benefit ($)[e][k]	2.5 Uncertainty Factor Applied to Adj. Cost Benefit ($)[f][l]	Implementation Cost ($)[g]

[f] Adjusted Cost Benefit (Column 5 without parentheses) multiplied by the uncertainty factor of 2.5.

[g] Obtained from SAMA ER Table D.2–1, except for SAMA 78 with an updated implementation cost from DTE's RAI response (DTE 2015a).

[h] Class IIA percent reduction is <0.01 percent, and Class IIA frequency reduction is $<5.6\times10^{-12}$ per year. Because the reduction is so small, the impact was considered zero for the evaluation.

Notes pertaining to values in parentheses listed in the second (lower) row for each SAMA, as calculated by the NRC staff to account for the added offsite dose cost benefit, added offsite economic cost benefit, and revised total benefit for each SAMA.

[i] Values in parentheses were calculated by the NRC staff by using the "Other" (or original) H/E release category population dose (8.10×10^{6} rem) to calculate the additional benefit to the population dose reduction and applying a dose cost factor of $2,000 per person-rem and the Column 3 percentage reduction of the unaccounted for 3.14×10^{-9} per year Class IIA frequency. The calculation included multiplication by the external hazards factor (11) and the 7-percent discount rate factor (10.76).

[j] Values in parentheses were calculated by the NRC staff by using the "Other" (or original) H/E release category offsite economic cost ($\$2.80\times10^{10}$) to calculate the additional benefit to the offsite economic costs and the Column 3 percentage reduction of the unaccounted for 3.14×10^{-9} per year Class IIA frequency. The calculation included multiplication by the external hazards factor (11) and the 7-percent discount rate factor (10.76).

[k] Values in parentheses were calculated by the NRC staff by adding the additional offsite dose and economic cost benefit due to the unaccounted for 3.14×10^{-9} per year evaluated at the original H/E release category consequences to the above value for the SAMA from DTE's RAI response (DTE 2015c).

[l] Adjusted Cost Benefit calculated by the NRC staff (Column 11 in parentheses) multiplied by the uncertainty factor of 2.5.

F.7 Conclusions

DTE considered 220 candidate SAMAs based on risk-significant contributors at Fermi 2 from updated probabilistic safety assessment models, SAMA-related industry documentation, plant-specific enhancements not in published industry documentations, and its review of SAMA candidates from potential improvements primarily at eight other plants. Phase I screening reduced the list to 79 unique SAMA candidates by eliminating SAMAs that were not applicable to Fermi 2, had already been implemented at Fermi 2, were combined into a more comprehensive or plant-specific SAMA, had excessive implementation cost, had a very low benefit, or related to in-progress implementation of plant improvements that addressed the intent of the SAMA. For the remaining SAMA candidates, DTE performed a cost-benefit analysis with results shown in Table F–5. The baseline cost-benefit analysis identified one SAMA candidate as potentially cost beneficial. From a sensitivity analysis, DTE identified an additional three SAMA candidates as potentially cost beneficial. In response to questions raised by the NRC staff, DTE concluded that three new SAMAs would be potentially cost beneficial. Because the potentially cost-beneficial SAMAs do not relate to aging management during the period of extended operation, their implementation is not required as part of license renewal pursuant to Title 10 of the *Code of Federal Regulations* Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants." Nevertheless, DTE indicated that these seven SAMAs will be incorporated into the design evaluation process and evaluated considering other planned plant modifications.

The NRC staff reviewed DTE's SAMA analysis and concludes that, subject to the discussion in this appendix, the methods used and the implementation of the methods were sound. The NRC staff's concerns were addressed by DTE's responses and the NRC staff's review. Furthermore, a calculation performed by the NRC staff with DTE's information did not change the identification of cost-beneficial SAMAs. On the basis of the applicant's treatment of SAMA benefits and costs, the NRC staff finds that the SAMA evaluations performed by DTE are reasonable and sufficient for the license renewal submittal. The NRC staff agrees with DTE's conclusion that seven SAMA candidates are potentially cost beneficial for Fermi 2 and notes that DTE's assessment was based on generally conservative treatment of costs, benefits, and uncertainties. Furthermore, this conclusion of a relatively small number of potentially cost-beneficial SAMAs is consistent with a low level of residual risk indicated in the Fermi 2 PRA. Based on the NRC staff's review of DTE's SAMA evaluations, including DTE's response to NRC staff RAIs, the NRC staff concludes that DTE has adequately identified areas in which risk can be further reduced in a cost-beneficial manner through the implementation of the identified potentially cost-beneficial SAMAs. Given the potential for cost-beneficial risk reduction, the NRC staff agrees that further evaluation by DTE of the seven candidate SAMAs identified by DTE as being potentially cost beneficial is warranted.

Additionally, the NRC staff evaluated if the identified potentially cost-beneficial SAMAs are subject to aging management. The evaluation considered any structures, systems, and components associated with these SAMAs that perform intended functions without moving parts or without a change in configuration or properties and would not be subject to replacement based on a qualified life or specified time period. Because the potential cost-beneficial SAMAs are associated with procedure changes, new hardware to improve a manual action, and a new structure between switchgear rooms, the NRC staff determined that these SAMAs do not relate to adequately managing the effects of aging during the period of extended operation. Therefore, they need not be implemented as part of license renewal in accordance with 10 CFR Part 54.

F.8 References

10 CFR Part 54. *Code of Federal Regulations*, Title 10, *Energy,* Part 54, "Requirements for renewal of operating licenses for nuclear power plants."

[ASME and ANS] American Society of Mechanical Engineers and American Nuclear Society. 2009. *Addenda to ASME/ANS RA-S-2008, Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications*. New York City, New York: ASME. ASME/ANS RA-Sa-2009. February 2, 2009. 352 p. Available at <http://www.ewp.rpi.edu/hartford/~povron/EP/Other/ASME-ANS%20RA-Sa-2009.pdf> (accessed 21 October 2014).

Chen JT, Chokshi NC, Kenneally RM, Kelly GB, Beckner WD, McCracken C, Murphy AJ, Reiter L, Jeng DC. 1991. *Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities*. Washington, DC: U.S. Nuclear Regulatory Commission. NUREG–1407. June 1991. 98 p. ADAMS No. ML063550238.

[DECo] Detroit Edison Company. 1992. *Fermi 2 Individual Plant Examination (Internal Events)*. August 1992. Available via the NRC Public Document Room by e-mail to pdr@resource@nrc.gov.

[DECo] Detroit Edison Company. 1996. *Fermi 2 Individual Plant Examination (External Events).* March 1996. Available via the NRC Public Document Room by e-mail to pdr@resource@nrc.gov.

[DECo] Detroit Edison Company. 1999. Letter from DR Gibson, DECo, to the NRC Document Control Desk. Subject: Detroit Edison Response to NRC Request for Additional Information (RAI) on Fermi 2 IPEEE Report. Detroit Edison Letter NRC-99-0051. July 22, 1999. Available via the NRC Public Document Room by e-mail to pdr@resource@nrc.gov.

[DTE] DTE Electric Company, LLC. 2012a. *Fermi 2 NPP Seismic Walkdown Report, 10 CFR 50.54(f) Section 2.3 Seismic Response.* Report TMPE-12-0294, Revision 0. November 20, 2012. ADAMS No. ML12229A475.

[DTE] DTE Electric Company, LLC. 2012b. Letter from TJ Conner, DTE, to the NRC Document Control Desk. Subject: Detroit Edison's Response to March 12, 2012, Information Request Regarding Flood Protection Walkdowns. DTE letter NRC-12-0076. November 26, 2012. ADAMS No. ML12331A202.

[DTE] DTE Electric Company, LLC. 2013. Letter from TJ Conner, DTE, to the NRC Document Control Desk. Subject: DTE Electric Submittal of Flooding Hazard Reevaluation Report in Response to March 12, 2012, Information Request Regarding Flood Protection Evaluations. DTE letter NRC-13-0013. March 8, 2013. ADAMS No. ML13070A199.

[DTE] DTE Electric Company. 2014. *Fermi 2 License Renewal Application. Appendix E: Applicant's Environmental Report, Operating License Renewal Stage, Fermi 2*. April 2014. ADAMS Nos. ML14121A538, ML14121A539, and ML14121A540.

[DTE] DTE Electric Company. 2015a. Letter from V Kaminskas, Site Vice President, DTE, to NRC Document Control Desk. Subject: Response to NRC Request for Additional Information for the Review of the Fermi 2 License Renewal Application—Severe Accident Mitigation Alternatives. January 9, 2015. ADAMS No. ML15037A229.

[DTE] DTE Electric Company. 2015b. Letter from V Kaminskas, Site Vice President, DTE, to the NRC Document Control Desk. Subject: Response to NRC Request for Additional Information for the Environmental Review of the Fermi 2 License Renewal Application—Severe Accident Mitigation Alternatives Set 2. March 5, 2015. ADAMS No. ML15064A099.

[DTE] DTE Electric Company. 2015c. Letter from V Kaminskas, Site Vice President, DTE, to the NRC Document Control Desk. Subject: Response to NRC Request for Additional Information for the Environmental Review of the Fermi 2 License Renewal Application—Severe Accident Mitigation Alternatives Set 3. Letter May 8, 2015. ADAMS No. ML15141A163.

[EPRI] Electric Power Research Institute. 1991. *A Methodology for Assessment of Nuclear Power Plant Seismic Margin*. EPRI NP-6041-SL, Revision 1. August 1991. Available at <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=NP-6041-SLR1>.

[EPRI] Electric Power Research Institute. 1992. *Fire-Induced Vulnerability Evaluation (FIVE)*. EPRI-TR-100370, Final Report, April 1992, and Revision 1. September 29, 1993. Available at <http://teams.epri.com/PRA/Big%20List%20of%20PRA%20Documents/EPRI%20TR-100370%20(abstract).htm>.

[EPRI] Electric Power Research Institute. 2014. Letter from S Lewis, EPRI, to AR Petrangelo, NEI. Subject: Fleet Seismic Core Damage Frequency Estimates for Central and Eastern U.S. Nuclear Power Plants Using New Site-Specific Seismic Hazard Estimates. March 11, 2014. ADAMS No. ML14083A586.

[NEI] Nuclear Energy Institute. 2005. *Severe Accident Mitigation Alternative (SAMA) Analysis Guidance Document*. Revision A. Washington, DC: NEI. NEI 05-01. November 2005. 79 p. ADAMS No. ML060530203.

[NRC] U.S. Nuclear Regulatory Commission. 1975. *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants*. Revision 0. Washington, DC: NRC. NUREG–0800. November 1975. Available by request at <http://www.nrc.gov/reading-rm/pdr.html> (accessed 21 October 2014).

[NRC] U.S. Nuclear Regulatory Commission. 1988. *Individual Plant Examination for Severe Accident Vulnerabilities—10 CFR 50.54(f)*. Washington, DC: NRC. Generic Letter No. 88-20. November 23, 1988. Available at <http://www.nrc.gov/reading-rm/doc-collections/gen-comm/gen-letters/1988/gl88020.html> (accessed 21 October 2014).

[NRC] U.S. Nuclear Regulatory Commission. 1990. *Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants, Final Summary Report*. Washington, DC: NRC. NUREG–1150. December 1990. ADAMS No. ML100780066.

[NRC] U.S. Nuclear Regulatory Commission. 1991. *Individual Plant Examination of External Events for Severe Accident Vulnerabilities*. Washington, DC: NRC. Generic Letter No. 88-20, Supplement 4. June 28, 1991. Available via the NRC Public Document Room by e-mail to pdr@resource@nrc.gov.

[NRC] U.S. Nuclear Regulatory Commission. 1994. Memorandum from J Murphy, NRC, to SA Varga, NRC. Subject: Review of Fermi 2 Individual Plant Examination (IPE) Submittal—Internal Events. Undated.

[NRC] U.S. Nuclear Regulatory Commission. 1997a. *Regulatory Analysis Technical Evaluation Handbook*. Washington, DC: NRC. NUREG/BR–0184. January 1997. 308 p. ADAMS No. ML050190193.

[NRC] U.S. Nuclear Regulatory Commission. 1997b. *Individual Plant Examination Program: Perspectives on Reactor Safety and Plant Performance Parts 2–5, Final Report.* NUREG–1560, Volume 2. Washington, DC: NRC. December 31, 1997. ADAMS No. ML0635550228.

[NRC] U.S. Nuclear Regulatory Commission. 2000a. Letter from AJ Kugler, NRC, to WT O'Conner, DECo. Subject: Fermi 2—Completion of Licensing Action for Generic Letter (GL) 88-20, Supplement 4, "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities." (TAC No. M83621). July 5, 2000. Available via the NRC Public Document Room by e-mail to pdr@resource@nrc.gov.

[NRC] U.S. Nuclear Regulatory Commission. 2000b. *Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors*. Washington, DC: NRC. Regulatory Guide 1.183. July 2000. ADAMS No. ML003716792.

[NRC] U.S. Nuclear Regulatory Commission. 2002. *Perspectives Gained from the Individual Plant Examination of External Events (IPEEE) Program*. Washington, DC: NRC. NUREG–1742. April 2002. ADAMS No. ML021270070.

[NRC] U.S. Nuclear Regulatory Commission. 2004a. Letter from DP Beaulieu to WT O'Conner, Jr., DetroitEd. Subject: Fermi 2—Issuance of Amendment, Re: Selective Implementation of Alternative Radiological Source Term Methodology. (TAC No. MB7794). September 28, 2004. Available via the NRC Public Document Room by e-mail to pdr@resource@nrc.gov.

[NRC] U.S. Nuclear Regulatory Commission. 2004b. *Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission*. Revision 4. Washington, DC: NRC. NUREG/BR–0058. September 2004. 56 p.. Available at <http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0058/> (accessed 21 October 2014).

[NRC] U.S. Nuclear Regulatory Commission. 2009. *An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities*. Revision 2. Regulatory Guide 1.200. March 1, 2009. 191 p.. ADAMS No. ML090410014.

[NRC] U.S. Nuclear Regulatory Commission. 2010. Letter from T McGinty, Director, NRC, to all holders of an operating license. Subject: NRC Information Notice 2010-18: Generic Issue 199, "Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants." September 2, 2010. ADAMS No. ML101970221.

[NRC] U.S. Nuclear Regulatory Commission. 2012a. Letter from E Leeds, Director, NRC, to All Power Reactor Licensees. Subject: Request for information pursuant to Title 10 of the *Code of Federal Regulations* 50.54(f) regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force review of insights from the Fukushima Dai-ichi accident. March 12, 2012. ADAMS No. ML12053A340.

[NRC] U.S. Nuclear Regulatory Commission. 2012b. *State-of-the Art Reactor Consequence Analyses (SOARCA) Report.* Washington, DC: NRC. NUREG–1935. November 2012. ADAMS No. ML12332A057.

[NRC] U.S. Nuclear Regulatory Commission. 2012c. Letter from E Leeds, Director, NRC, to All Operating Boiling-Water Reactor Licensees with Mark I and Mark II Containments. EA-12-050. Subject: Issuance of Order to Modify Licenses with Regard to Reliable Hardened Containment Vents. March 12, 2012. ADAMS No. ML12054A694.

[NRC] U.S. Nuclear Regulatory Commission. 2013. Letter from E Leeds, Director, NRC, to all operating boiling-water reactor licensees with Mark I and Mark II containments. EA-13-090. Subject: Issuance of Order to Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions. June 6, 2013. ADAMS No. ML13143A321.

[NRC] U.S. Nuclear Regulatory Commission. 2014a. Letter from M Wentzel, Project Manager, NRC, to V Kaminskas, Site Vice President, DTE. Subject: Requests for Additional Information for the Review of the Fermi 2 License Renewal Application—Severe Accident Mitigation Alternatives. November 14, 2014. ADAMS No. ML14308A358.

[NRC] U.S. Nuclear Regulatory Commission. 2014b. Letter from TJ Wengert, Senior Project Manager, NRC, to JH Plona, Senior Vice President and Chief Nuclear Officer, DTE. Subject: Fermi Nuclear Plant, Unit 2—Staff Assessment of the Flooding Walkdown Report Supporting Implementation of the Near-Term Task Force Recommendation 2.3 Related to the Fukushima Dai-ichi Accident. (TAC No. MF0228). June 18, 2014. ADAMS No. ML14143A235.

[NRC] U.S. Nuclear Regulatory Commission. 2014c. Letter from M Wentzel, Project Manager, NRC, to V Kaminskas, Site Vice President, DTE. Subject: Summary of the Severe Accidents Mitigation Alternatives Environmental Site Audit Related to the Review of the License Renewal Application for Fermi 2. (TAC No. MF4064). November 17, 2014. ADAMS No. ML14294A812.

[NRC] U.S. Nuclear Regulatory Commission. 2015a. Letter from M Wentzel, Project Manager, NRC, to V Kaminskas, Site Vice President, DTE. Subject: Requests for Additional Information for the Environmental Review of the Fermi 2 License Renewal Application—Severe Accident Mitigation Alternatives. February 3, 2015. ADAMS No. ML15026A307.

[NRC] U.S. Nuclear Regulatory Commission. 2015b. Letter from B Wittick, NRC, to V Kaminskas, Site Vice President, DTE. Subject: Request for Additional Information for the Environmental Review of the Fermi 2 License Renewal Application—Severe Accident Mitigation Alternatives. April 9, 2015. ADAMS No. ML15092A945.

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11. ABSTRACT (200 words or less)

This supplemental environmental impact statement (SEIS) has been prepared in response to an application submitted by DTE Electric Company (DTE), to renew the operating license for the Fermi 2 Nuclear Power Plant for an additional 20 years.

This SEIS includes the preliminary analysis that evaluates the environmental impacts of the proposed action and the alternatives to the proposed action. Alternatives considered include: (1) natural gas combined cycle (NGCC), (2) coal integrated gasification combined cycle (IGCC), (3) new nuclear power generation, (4) a combination of NGCC, wind, and solar generation, and (5) the no action alternative (i.e., no renewal of the license).

The U.S. Nuclear Regulatory Commission (NRC) staff's preliminary recommendation is that the adverse environmental impacts of license renewal for Fermi 2 are not so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable. The NRC staff based its recommendation on the following factors: the analysis and findings in NUREG–1437 Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Volumes 1 and 2; the Environmental Report submitted by DTE; consultation with Federal, state, tribal, and local government agencies; and the NRC staff's independent environmental review; and consideration of public comments received during the scoping process.

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