
Safety Evaluation Report

with Open Items Related to
the License Renewal of
McGuire Nuclear Station, Units 1 and 2
Catawba Nuclear Station, Units 1 and 2

Docket Nos. 50-369, 50-370, 50-413 and 50-414

Duke Energy Corporation

U.S. Nuclear Regulatory Commission

Office of Nuclear Reactor Regulation

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ABSTRACT

This safety evaluation report documents the Nuclear Regulatory Commission's (NRC's) review of Duke Energy Corporation's (Duke's) application to renew the operating licenses for McGuire Nuclear Station, Units 1 and 2 (McGuire 1 and 2), and Catawba Nuclear Station, Units 1 and 2 (Catawba 1 and 2). The NRC's Office of Nuclear Reactor Regulation has reviewed the McGuire 1 and 2 and Catawba 1 and 2 license renewal application for compliance with the requirements of Title 10 of the *Code of Federal Regulations*, Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," and prepared this report to document its findings.

On June 13, 2001, Duke submitted applications for renewal of McGuire 1 and 2 Operating License Nos. NPF-9 and NPF-17, which were issued pursuant to Section 103 of the Atomic Energy Act of 1954, as amended, for a period of up to 20 years beyond the current license expiration dates of June 12, 2021, and March 3, 2023, for McGuire 1 and 2, respectively. The McGuire nuclear facility is located 17 miles north-northwest of Charlotte, North Carolina, in Mecklenburg County. McGuire 1 and 2 are four-loop, Westinghouse pressurized-water reactors with nuclear steam supply systems designed to generate 3411 megawatts thermal, or 1129 megawatts electric.

In the same submittal of June 13, 2001, Duke requested renewal of the Catawba 1 and 2 Operating License Nos. NPF-35 and NPF-52, which were issued under Section 103 of the Atomic Energy Act of 1954, as amended, for a period of up to 19 years beyond the current license expiration dates of December 6, 2024, and February 24, 2026, respectively. The Catawba nuclear facility is located 18 miles southwest of Charlotte, North Carolina, in York County. Catawba 1 and 2 are four-loop, Westinghouse pressurized-water reactors with nuclear steam supply systems designed to generate 3411 megawatts thermal, or 1129 megawatts electric.

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ABBREVIATIONS

<u>Abbreviation</u>	<u>Definition</u>
ACI	American Concrete Institute
ACRS	Advisory Committee for Reactor Safeguards
AFW	auxiliary feedwater (system)
AMP	aging management program
AMR	aging management review
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
BMI	bottom mounted instrumentation
BTP	Branch Technical Position
BWI	Babcock and Wilcox International
CASS	cast austenitic stainless steel
CCW	condenser circulating water (system)
CFR	Code of Federal Regulations
CIV	containment isolation valve
CLB	current licensing basis
CRDM	control rod drive mechanism
CSS	containment spray system
CUF	cumulative usage factor
CVS	chemical and volume control system
DBA	design basis accident
DBD	design basis documents
ECCS	emergency core cooling systems
ECT	eddy current test
EFPY	effective full power years
EOC	end of cycle
EPL	vital batteries system
EPQ	diesel generator batteries system
EPRI	Electric Power Research Institute
EQ	environmental qualification
EQD	standby shutdown facility diesel batteries system
ETM	standby shutdown facility batteries system
FAC	flow-accelerated corrosion
FD	(system) flow diagram
FI	filtration
FP	fire protection
FSAR	Final Safety Analysis Report
GALL	Generic Aging Lessons Learned (Report)
GDC	General Design Criterion or General Design Criteria
GEIS	Generic Environmental Impact Statement
gpm	gallons per minute
GSI	generic safety issue
HAZ	heat-affected zone
HELB	high energy line break
HVAC	heating, ventilation, and air conditioning
HT	heat transfer

IASCC	irradiation-assisted stress corrosion cracking
ID	inner diameter
IR	insulation resistance
ISI	inservice inspection
ITS	Improved Technical Specifications
LBB	leak-before-break (analysis)
LEFM	linear elastic fracture mechanics
LER	Licensee Event Report
LOCA	loss of coolant accident
LRA	license renewal application
LWR	light water reactor
MeV	million electron volts
MIC	microbiologically induced corrosion
Mpa	mega pascals
MW	megawatts
NC	reactor coolant
NDT	nil ductility temperature
NEI	Nuclear Energy Institute
NEPA	National Environmental Protection Act
NFPA	National Fire Protection Association
NRC	Nuclear Regulatory Commission
NSAC	Nuclear Safety Analysis Center
NSD	Nuclear System Directive
NSSS	nuclear steam supply system
NSW	nuclear service water (system)
NW	containment valve injection water (system)
OSHA	Occupational Safety and Health Administration
P&ID	pipng and instrumentation diagram
PB	pressure boundary
PIP	Problem Investigation Process
PORV	power-operated relief valve
ppb	parts per billion
ppm	parts per million
psig	pounds per square inch gauge
PTS	pressurized thermal shock
PWHT	post-weld heat treated
PWSCC	primary water stress corrosion cracking
RAI	request for additional information
RCCA	rod cluster control assembly
RCP	reactor coolant pump
RCS	reactor coolant system
RG	regulatory guide
RHR	residual heat removal (system)
RSG	replacement steam generator
RT	reference temperature
RV	reactor vessel
RVI	reactor vessel internals
RWST	refueling water storage tank
SBO	station blackout (event)
SCs	structures and components

scfm	standard cubic feet per minute
SG	steam generator
SER	safety evaluation report
SFP	spent fuel pool
SIS	safety injection system
SLC	Selected Licensee Commitments
SNSW	standby nuclear service water (system or pond)
SR	Surveillance Requirement
SRP	Standard Review Plan
SCC	stress corrosion cracking
SCV	steel containment vessel
SE	safety evaluation
SER	Safety Evaluation Report
SSs	systems and structures
SSCs	systems, structures and components
SSE	safe shutdown earthquake
SSF	standby shutdown facility
SSS	standby shutdown system
TFMP	Thermal Fatigue Management Program
TH	throttle
TAA	time-limited aging analysis or analyses
TR	Testing Requirement
TS	Technical Specifications
TSSR	Technical Specification Surveillance Requirement
UFSAR	Updated Final Safety Analysis Report
UHI	Upper Head Injection
UT	ultrasonic testing
VA	auxiliary building ventilation (system)
VE	annulus ventilation (system)
VF	spent fuel pool building ventilation (system)
VC	control area ventilation (system)
VCP	Control Rod Drive Mechanism Nozzle and Other Vessel Closure Penetrations (Nozzle Inspection Program)
VD	diesel building ventilation (system)
VHP	vessel head penetration
VK	miscellaneous structures ventilation (system)
W	Westinghouse
WCAP	Westinghouse Topical Report
WOG	Westinghouse Owner's Group
YC	Control Area Chilled Water (System)