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NRC Order No. EA-12-049

RS-15-061

February 20, 2015

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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R. E. Ginna Nuclear Power Plant
Renewed Facility Operating License No. DPR-18
Docket No. 50-244

Subject: February 2015 Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)

References: (1) NRC Order Number EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, dated March 12, 2012 (ML12054A735)

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued Order EA-12-049 (Reference 1) to Constellation Energy Nuclear Group, LLC (CENG) for R.E. Ginna Nuclear Power Plant, LLC (Ginna). Reference (1) requires submission of a status report at six-month intervals following submittal of the overall integrated plan. Attachment (1) provides the fourth Six-Month Status Report for Ginna pursuant to Section IV, Condition C.2, of Reference (1). This report updates the milestone accomplishments since the submittal of the last status report, including any changes to the compliance method, schedule, or need for relief and the basis, if any.

There are no regulatory commitments contained in this letter.

If there are any questions regarding this letter, please contact Thomas Harding Jr. at 585-771-5219.

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NRR

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 20th day of February 2015.

Respectfully,

Mary G. Korsnick

Mary G. Korsnick

MGK/STD

Attachment (1) Six-Month Status Report (February 2015) for Mitigation Strategies for Beyond-Design-Basis External Events

cc: Regional Administrator, Region I, USNRC
NRC Project Manager, NRR – R. E. Ginna Nuclear Power Plant
NRC Senior Resident Inspector – R. E. Ginna Nuclear Power Plant
Director, Office of Nuclear Reactor Regulation
J. A. Kratchman, NRC

ATTACHMENT (1)

SIX-MONTH STATUS REPORT (FEBRUARY 2015)

FOR MITIGATION STRATEGIES FOR

BEYOND-DESIGN-BASIS EXTERNAL EVENTS

R. E. GINNA NUCLEAR POWER PLANT, LLC
February 20, 2015

1 Introduction

The R.E. Ginna Nuclear Power Plant, LLC (Ginna) Overall Integrated Plan (OIP) was submitted to the Nuclear Regulatory Commission (NRC) in February 2013 (Reference 1), documenting the diverse and flexible strategies (FLEX), in response to NRC Order Number EA-12-049 (Reference 2). Subsequently, a supplement to the Ginna OIP for FLEX was submitted to the NRC in March 2013 (Reference 3). This attachment provides an update of milestone accomplishments since submittal of the last status report, including any changes to the compliance method, schedule, or need for relief/relaxation and associated basis (if applicable).

Since submittal of the last status report in August 2014 (Reference 4), Ginna FLEX strategy implementation has progressed with engineering analyses, calculations, and construction that support the mitigation strategies.

2 Milestone Accomplishments

The following milestone(s) have been completed since submittal of the last status report in August 2014 (Reference 4) and are current as of January 30, 2015.

- None

3 Milestone Schedule Status

Table 1 provides an update to Attachment 2 of the Ginna OIP (Attachment 1 - References 1 and 3). It provides the activity status of each item, and whether the expected completion date has changed. The dates are planning dates subject to change as design and implementation details are developed.

Table 1
Status of Ginna FLEX OIP Milestones

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Commence Engineering and Design	July 2013	Started	May 2015
Commence Procurement of Equipment	July 2013	Started	September 2015
Commence Installation of Equipment	July 2013	Started	November 2015
Submit 6-Month Status Report	August 2013	Complete	
Develop Strategies/Contract with the National SAFER Response Center	November 2013	Started	March 2015
Submit 6-Month Status Report	February 2014	Complete	
Complete Engineering and Design	March 2014	Started	May 2015
Create Maintenance and Testing Procedures	June 2014	Started	October 2015
Submit 6-Month Status Report	August 2014	Complete	
Procedure Changes Training Material Complete	September 2014	Started	March 2015
Develop Training Plan	November 2014	Started	July 2015
Submit 6-Month Status Report	February 2015	Complete	
Issue FLEX Support Guidelines	April 2015	Started	November 2015
Perform Walk-throughs or Demonstrations	May 2015	Started	
Provide onsite and augmented staffing assessment considering functions related to Near-Term Task Force (NTTF) Recommendation 4.2.	May 2015	Not Started	
Implement Training	June 2015	Started	November 2015*
Submit 6-Month Status Report	August 2015	Not Started	
Complete Procurement of Equipment	September 2015	Started	
Full compliance with EA-12-049 is achieved	Fall 2015	Not Started	
Submit Completion Report	December 2015	Not Started	

* Change since submittal of last six month status report.

4 Changes to Compliance Method

The following is a list of the coping strategies that have been changed since the last six month status report with an explanation of the changes. Additional details on how Ginna's OIP complies with the guidance in NEI 12-06 (Reference 5) are also provided:

a) NEI 12-06 Section 6.2.3.2 consideration 1 states: "For external floods with warning time, the plant may not be at power. In fact, the plant may have been shut down for a considerable time and the plant configuration could be established to optimize FLEX deployment. For example, the portable pump could be connected, tested, and readied for use prior to the arrival of the critical flood level. Further, protective actions can be taken to reduce the potential for flooding impacts, including cooldown, borating the RCS, isolating accumulators, isolating RCP seal leak off, obtaining dewatering pumps, creating temporary flood barriers, etc. These factors can be credited in considering how the baseline capability is deployed."

The probable maximum flood at Ginna is caused by an extreme regional precipitation event. NEI 12-06 table 6-1 states that floods caused by regional precipitation events have days of warning time associated with them.

Ginna will procedurally pre-stage FLEX equipment prior to the flood in accordance with ER-SC.2, "High Water (Flood) Plan" (Reference 6). The procedure has two (2) severity levels. Both of these levels can be entered based on either forecasted conditions, or actual conditions. For a lower severity event, the procedure ensures that Diesel Fuel and FLEX Pumps are pre-staged and protected. For a more severe event, the same actions occur, and the unit is brought to hot shutdown. These actions ensure the FLEX equipment remains available for a flooded condition. Additional plant equipment that is not credited during a flood is not credited for Fukushima response.

b) NEI 12-06 Section 6.2.3.2 consideration 2 states: "The ability to move equipment and restock supplies may be hampered during a flood, especially a flood with long persistence. Accommodations along these lines may be necessary to support successful long-term FLEX deployment."

Procedural guidance contained within ER-SC.2 (Reference 6) directs operators to pre-stage equipment prior to an impending flood. Equipment to be pre-staged includes a portable diesel generator, diesel fuel, and FLEX pumps. The event which causes floodwater at plant grade is caused by extreme regional precipitation. NEI 12-06 table 6-1 states that the event would have days of warning time associated with it. This warning time will be accounted for in the development of the detailed event timelines. All actions to pre-stage equipment will be capable of being implemented within the warning time available.

The most bounding flood at Ginna has a relatively short persistence. This has been evaluated per NTTF recommendation 2.1 (Reference 7). The persistence of the flood will not preclude restocking supplies such as diesel fuel.

NEI 12-06 Section 6.2.3.2 consideration 3 states: "Depending on plant layout, the ultimate heat sink may be one of the first functions affected by a flooding condition. Consequently, the deployment of the FLEX equipment should address the effects of LUHS, as well as ELAP."

During a flood, access to the ultimate heat sink will be temporarily unavailable due to floodwater on site. Results of the NTTF Recommendation 2.1 flooding reevaluation (Reference 7) show that the persistence of the flood is approximately 10 hours. Ginna has installed a 160,000 gallon Condensate Storage Tank which has adequate inventory for greater than 23 hours of heat removal. This tank will be protected from all events (seismic, tornado and flood), and will be used as a heat sink until the ultimate heat sink is available.

c) NEI 12-06 Section 6.2.3.2 consideration 7 states: "Since installed sump pumps will not be available for dewatering due to the ELAP, plants should consider the need to provide water extraction pumps capable of operating in an ELAP and hoses for rejecting accumulated water for structures required for deployment of FLEX strategies."

Ginna has purchased dewatering pumps and hoses for rejecting accumulated water for structures required for deployment of FLEX strategies. Their use is prescribed within procedure ER-SC.2 (Reference 6).

NEI 12-06 Section 6.2.3.2 consideration 8 states: "Plants relying on temporary flood barriers should assure that the storage location for barriers and related material provides reasonable assurance that the barriers could be deployed to provide the required protection."

The required flood barriers used by Ginna are stored immediately adjacent to the openings in which they are to be installed. The installation of these barriers is performed on an annual frequency for testing. Ginna has also validated that the barriers can be installed rapidly during a reasonable simulation performed per Recommendation 2.3 of the March 12, 2012 50.54(f) letter (Reference 8). Additional barriers were purchased for defense-in-depth protection of the Diesel Generator Rooms and the Battery Rooms. These are not required to mitigate a flood, and are stored in a storage building on-site.

d) The Phase 3 strategy for core cooling, including what equipment will be needed and how, when, and where it will be deployed is basically the Phase 2 strategy supplemented by equipment available from the National SAFER Response Center (NSRC).

The Phase 2 strategy was provided in the August 2014 OIP Update (Reference 4). Under Phase 3 natural circulation will continue to be maintained via heat removal performed by the S/Gs using a Standby Auxiliary Feedwater (SAFW) pump taking suction on the new SAFW DI Water Storage Tank; or a portable diesel driven pump connected to a primary or alternate SAFW system connection point will be used to provide make-up water to the S/Gs from the new SAFW DI Water Storage Tank or the Discharge Canal.

To refill the SAFW DI Water Storage Tank, any existing source of demineralized water on site will be preferentially used until the NSRC water treatment system arrives. The bounding FLEX scenario to refill the SAFW DI Water Storage Tank will be to deploy a FLEX diesel driven portable pump with a hard suction hose to take suction from the Discharge Canal and, via a discharge hose connected to the SAFW DI Water Storage Tank, refill the SAFW DI Water Storage Tank. When the NSRC water treatment system arrives, water will be pumped from the discharge canal through the water treatment system to the SAFW DI Water Storage Tank. Alternatively, water can be pumped from the discharge canal through the water treatment system directly to the S/Gs via a SBAFW system connection point. NSRC delivered portable diesel driven pumps provide backup capability to the on-site FLEX pumps.

Connections will be available to supply the 480 Volt vital buses from an NSRC supplied D/G and for connecting NSRC supplied portable pumps and the NSRC supplied water processing unit.

e) The Phase 2 strategy for RCS makeup, including what equipment will be needed and how, when, and where it will be deployed is as follows:

A newly installed charging pump powered from the new 1 MW Standby Auxiliary Feedwater (SAFW) Diesel Generator (DG), taking suction from the Refueling Water Storage Tank (RWST) and discharging to the Reactor Coolant System (RCS), will be used to provide borated makeup to the RCS. This charging pump will be located in the SAFW Building (SAFWB). This arrangement will include one discharge line routed through a protected portion of the Auxiliary Building to newly installed Safety Injection (SI) line connections on both trains (i.e. primary and alternate connections). The new charging pump will be manually aligned as required. The alternate FLEX strategy is to use a diesel driven portable FLEX charging pump taking suction from the RWST, connected at the SAFWB via a high pressure hose, to a staged connection to the newly installed SI line connections.

To provide sufficient capacity of borated water makeup to the RCS, the new charging pump will be capable of pumping 75 gallons per minute (gpm) from the RWST into the RCS at 1500 pounds per square inch (psi). A portable diesel engine driven high pressure pump will provide alternate borated makeup capability to the RCS. This pump will also be capable of pumping 75 gpm of borated water from the RWST to the RCS at 1500 psi.

The timing for RCS makeup is variable. At the maximum expected RCS and RCP seal leak rates, it is expected that natural circulation will transition from single-phase loop flow to two-phase loop flow at 2.8 hours (Reference 9) from the start of the event and that two-phase loop flow will be less than single-phase loop flow at greater than 10.7 hours from the start of the event (Reference 9). To comply with NRC endorsement of the boron mixing generic concern (Reference 10), charging will commence prior to 10.7 hours into the event.

f) The Phase 3 strategy for RCS makeup, including postulated flow paths (installed pipe, fire hose, etc.) and makeup to the RWST is basically the Phase 2 strategy supplemented by equipment available from the National SAFER Response Center (NSRC).

Prior to depleting the RWST inventory, a mobile boration unit supplied from the NSRC can be utilized to provide an indefinite source of water for Phase 3 boron control/RCS injection. The preferred source of water to supply the mobile boration unit will be the new SAFW DI Water Storage Tank. To refill the SAFW DI Water Storage Tank, any existing source of demineralized water on site will be preferentially used until the NSRC water treatment system arrives. The bounding FLEX scenario to refill the SAFW DI Water Storage Tank will be to deploy a FLEX diesel driven portable pump with a hard suction hose to take suction from the Discharge Canal and, via a discharge hose connected to the SAFW DI Water Storage Tank, refill the SAFW DI Water Storage Tank. When the NSRC water treatment system arrives, water will be pumped from the discharge canal through the water treatment system to the SAFW DI Water Storage Tank. Boron supplied from the NSRC with the mobile boration unit will be available to mix with the preferential water source for RCS boration/makeup. NSRC delivered portable diesel driven pumps provide backup capability to the on-site FLEX pumps.

Connections will be available to supply the 480 Volt vital buses from an NSRC supplied D/G and for connecting NSRC supplied portable pumps and the NSRC supplied mobile boration and water processing units.

5 Need for Relief/Relaxation and Basis for the Relief/Relaxation

Ginna expects to comply with the order implementation date and no relief/relaxation is required at this time.

6 Open Items from Overall Integrated Plan and Interim Safety Evaluation

The following is a list of the open items from the OIP that have been added, deleted, completed, or revised since the last six month status report, with an explanation of the changes:

a) Maintain Core Cooling & Heat Removal (Steam Generators Available)

Open Item 15: Develop and implement procedures to feed S/Gs using a SAFW Pump powered by the new SAFW D/G and taking suction on the new 160,000 gallon CST. Revise procedures to direct Operators to manually establish makeup to the S/Gs via this flow path if the Turbine Driven Auxiliary Feedwater (TDAFW) Pump fails to deliver water to the S/Gs.

This item is **complete.** ECA-0.0, "Loss of All AC Power," (Reference 13) Step 6 has the Operators verify adequate TDAFW flow to the S/Gs. If adequate TDAFW flow to the S/Gs is not verified and cannot be established, the Operators are directed to initiate SAFW using the SAFW D/G by referring to ATT-5.5, "Attachment SAFW with Suction from DI Water Storage Tank during SBO," (Reference 14).

b) Maintain Core Cooling & Heat Removal (Steam Generators Available)

Open Item 18: Develop and implement procedures/administrative controls to ensure that the new CST maintains a minimum usable volume at all times.

This item is **complete.** The procedures listed below provide guidance on maintaining a minimum level for the new SAFW DI Water Storage Tank to ensure greater than 23 hours of water is available:

- AR-AA-3, "STDBY Aux FW DI Stor Tank Hi Hi / Lo Lo," Rev 00802, NOTE: The following Plant Process Computer System (PPCS) Point IDs can be referenced for information:
  - L9774D – high level 320 inches
  - L9774AD – low level 312 inches
- A-52.12, "Nonfunctional Equipment Important To Safety," Rev 07400
- T-44.7, "SAFW DI Water Storage Tank (TCD05) System Alignment and Operation," Rev 00000
- T-44.3, "Standby Auxiliary Feedwater System Filling & Venting," Rev 03301
- STP-O-36-COMP-C, "Standby Auxiliary Feedwater Pump C - Comprehensive Test," Rev 01401
- STP-O-36-COMP-D, "Standby Auxiliary Feedwater Pump D - Comprehensive Test," Rev 01101
- STP-O-36QC, "Standby Auxiliary Feedwater Pump C – Quarterly," Rev 00601
- STP-O-36Q-D, "Standby Auxiliary Feedwater Pump D – Quarterly," Rev 00800

c) Maintain Core Cooling & Heat Removal (Steam Generators Available)

Open Item 20: Identify instrumentation and develop procedures to take field readings of necessary parameters, including PI-430 and LI-427.

This item is **complete.** Procedure FSG-7, "Loss of Vital Instrumentation or Control Power," (Draft, Reference 15) identifies instrumentation to take field (local) readings (i.e. containment splice boxes) of necessary parameters, including PI-430 and LI-427, along with guidance to repower instruments of necessary parameters at the instrument racks if field wiring is intact.

d) Maintain Core Cooling & Heat Removal (Steam Generators Available)

Open Item 21: Implement a strategy to connect a portable air compressor at a location/ configuration to support ARV operation.

This item is **deleted.** The use of air to operate an ARV is not necessary. Local manual operation of the ARVs will be performed to control position.

e) Maintain Core Cooling & Heat Removal (Steam Generators Available)

Open Item 23: Implement a design change as part of the installation of the new CST to install a mechanical connection that will allow the tank to be refilled from a portable diesel driven pump.

This item is **complete.** ECP-13-000424, "DDSAFW Project Piping Design and Installation," (Reference 16) installed V-9782, "DI Water Tank Supply Hose Connection Isolation Valve," as part of the modification that allows filling of the SAFW DI Water Storage Tank from a portable diesel driven pump.

f) Maintain RCS Inventory Control / Long Term Subcriticality

Open Item 35: Implement a design change to install a pump capable of pumping 75 gallons per minute (gpm) of borated water from the RWST into the RCS at 1575 psi, with discharge piping connected to the Safety Injection System.

This item is **revised** to state: **Implement a design change to install a pump capable of pumping 75 gallons per minute (gpm) of borated water from the RWST into the RCS at 1500 psi, with discharge piping connected to the Safety Injection System.**

The injection pressure was reduced from 1575 psi to 1500 during development of the modification package.

g) Maintain RCS Inventory Control / Long Term Subcriticality

Open Item 37: Implement a design change to connect a portable diesel engine driven high pressure pump to the RWST and the Safety Injection System, which is capable of pumping 75 gpm of borated water from the RWST to the RCS at 1575 psi.

This item is **revised** to state: **Implement a design change to install a pump capable of pumping 75 gallons per minute (gpm) of borated water from the RWST into the RCS at 1500 psi, with discharge piping connected to the Safety Injection System.**

The injection pressure was reduced from 1575 psi to 1500 during development of the modification package.

h) Maintain Containment

Open Item 51: Implement a strategy to determine containment pressure after a Tornado Missile event.

This item is **complete.** Procedure FSG-7, "Loss of Vital Instrumentation or Control Power," (Reference 15) implements a strategy to take a field (local) reading of containment pressure at a containment pressure transmitter using a pressure test gauge, along with guidance to repower a containment pressure instrument if field wiring is intact.

i) Maintain Spent Fuel Pool Cooling

Open Item 57: Perform an analysis to determine if a vent pathway from the SFP is needed for steam and condensate to minimize the potential for steam to cause access and equipment problems in the Auxiliary Building.

This item is **complete.** Calculation CALC-2014-0006, "Auxiliary Building Environmental Conditions during ELAP," (Reference 17) evaluates the temperature response of Auxiliary Building areas in response to a loss of forced ventilation (HVAC) during an Extended Loss of AC Power (ELAP). The purpose of this analysis is to establish the necessary mitigating actions and required timing of those actions to support the FLEX Overall Integrated Plan (OIP). This GOTHIC calculation evaluates the bounding extreme high and low outside air temperature cases. Compensatory actions are required to maintain the Auxiliary Building within acceptable temperatures. These actions include opening doors and backdraft dampers and will be incorporated into the FLEX strategy and procedures.

The temperature limits for the Auxiliary Building Operating level and above are driven by the limits for the spent fuel level indicator and associated equipment. There are no significant operator actions to be taken on the operating floor of the Auxiliary Building (only traversing the area and opening doors/dampers). For this reason, there are no explicit acceptance criteria for temperatures at this level. All lower level temperatures where work is being performed should be below 110 degrees Fahrenheit which is an acceptable temperature per NUMARC 87-00 (Reference 18). NEI 12-06 allows for reasonable judgments for beyond design basis scenarios; therefore, short durations that cause the temperature to slightly exceed 110 degrees Fahrenheit are deemed acceptable for operator comfort.

j) Safety Function Support

Open Item 69: Develop a strategy to protect onsite consumables for use after a BDBEE.

This item is **deleted.** The current storage locations are adequate for the onsite consumables that are not required for use in a mitigation strategy.

k) Maintain Spent Fuel Pool Cooling

Open Item 72: Install wide range SFP level instrumentation in accordance with NRC Order EA-12-051.

This item is **complete.** Modification ECP-13-000547 (Reference 19) installed two fixed channels of wide-range level indication for the Spent Fuel Pool. (Note: This is not notification that compliance with Order EA-12-051 (Reference 20) is achieved.)

Table 2 provides a summary of the open items documented in the OIP and those added in a subsequent six month status report, and the status of each item.

Table 2
Status of FLEX OIP Open Items

Ginna OIP Open Items	Status
1. Implement a design change to install permanent protected FLEX equipment connection points. (also see OI 23)	Started (8/2013)
2. Provide for onsite storage of Phase 2 FLEX components that is protected against external events by design or location. Implement a design change to provide a protected storage location for transportation (equipment and fuel) and debris removal equipment. Evaluate deployment strategies and deployment routes for hazards impact. Evaluate requirements and options and develop strategies related to the storage onsite of the FLEX portable equipment. Establish deployment routes from FLEX equipment storage locations to connection points. Develop a strategy and purchase equipment to respond to events that may require debris removal such as following a flood, tornado, or snow storm. Develop a strategy to move FLEX equipment, including providing reasonable protection from a BDBEE.	Started (2/2014)
3. Exceptions for the site security plan or other (license/site specific – 10 CFR 50.54x) requirements of a nature requiring NRC approval will be communicated in a future 6-month update following identification.	**Complete** (See the 2/2014 OIP Update)
4. Develop and implement procedures to commence feeding the steam generators (S/Gs) from Standby Auxiliary Feedwater (SAFW) powered by the new SAFW Diesel Generator (D/G) and taking suction from the new Condensate Storage Tank (CST) prior to reaching 5 ft in the existing CSTs.	Started (2/2015)
5. Develop and implement a FLEX method / procedure to refill the new SAFW CST prior to losing suction.	Started (2/2015)

Ginna OIP Open Items	Status
6. Develop and implement a program and/or procedure to keep FLEX equipment deployment pathways clear or with identified actions to clear the pathways.	Not Started
7. Determine schedule for when NSRCs will be fully operational.	**Complete** (See the 8/2013 OIP Update)
8. Define criteria for the local NSRC staging area by June 2013.	**Complete** (See the 2/2014 OIP Update)
9. Establish a suitable local staging area for portable FLEX equipment to be delivered from the NSRC to the site.	**Complete** (See the 8/2014 OIP Update)
10. Develop site specific playbook for delivery of portable FLEX equipment from the NSRC to the site.	Started (8/2013)
11. Perform an analysis to determine the diesel driven portable high pressure pump upper and lower head requirements to provide for a minimum of 215 gpm to a S/G without causing Reactor Coolant System (RCS) pressure to decrease to the point where nitrogen will be injected from the SI Accumulators, assuming suction is directly from the Ultimate Heat Sink (UHS).	Started (8/2014)
12. Develop and implement procedures to close Safety Injection (SI) Accumulator injection valves or vent the SI Accumulators prior to nitrogen injection into the RCS.	Not Started
13. Perform an analysis to determine the time to restore feed to a S/G if only one S/G was able to be supplied with feedwater after a trip and then feed is lost to that one S/G. This is to account for the reduction in water available for heat removal.	**Deleted** (See the 2/2014 OIP Update)
14. Implement the design change to install the 1 MW SAFW D/G, 160,000 gallon Condensate Storage Tank (CST), and enclosure meeting the reasonable protection requirements of NEI 12-06.	Started (8/2013)
15. Develop and implement procedures to feed S/Gs using a SAFW Pump powered by the new SAFW D/G and taking suction on the new 160,000 CST. Revise procedures to direct Operators to manually establish makeup to the S/Gs via this flow path if the Turbine Driven Auxiliary Feedwater (TDAFW) Pump fails to deliver water to the S/Gs.	**Complete** (This OIP Update 2/2015)
16. Implement a design change to protect a S/G Atmospheric Relief Valve (ARV) from Tornado Missiles to address reactor core cooling and heat removal using a high capacity portable diesel driven pump.	Started (2/2015)

Ginna OIP Open Items	Status
17. Perform an analysis to demonstrate adequate manpower, communications capability, and habitability for local operation of the S/G ARVs. If this cannot be demonstrated, implement a design change to provide for ARV control from the Control Room for seismic and tornado missile events.	Started (8/2013)
18. Develop and implement procedures/administrative controls to ensure that the new CST maintains a minimum usable volume at all times.	**Complete** (This OIP Update 2/2015)
19. Perform an analysis or implement a design change to qualify S/G Pressure instrumentation for a Tornado Missile event.	Started (2/2014)
20. Identify instrumentation and develop procedures to take field readings of necessary parameters, including (Pressure Indicator) PI-430 and (Level Indicator) LI-427.	**Complete** (This OIP Update 2/2015)
21. Implement a strategy to connect a portable air compressor at a location/ configuration to support ARV operation.	**Deleted** (This OIP Update 2/2015
22. Develop and implement procedures to refill the new CST from an alternate water source prior depleting the usable volume (approximately 15 hours after the event).	**Revised** (See the 2/2014 OIP Update) Not Started
23. Implement a design change as part of the installation of the new CST to install a mechanical connection that will allow the tank to be refilled from a portable diesel driven pump.	**Complete** (This OIP Update 2/2015)
24. Perform an analysis to establish plant conditions in Phase 1 that will allow diesel driven high capacity portable pump to be utilized as soon as plant resources are available to provide defense in depth for maintaining an adequate heat sink should SAFW fail.	Started (2/2014)
25. Implement a design change to install a new isolation valve upstream of the FLEX connection to S/G B in case a tornado missile impacts a section of unprotected piping between the SAFW Building and the connection point.	Started (2/2015)
26. Implement a strategy to provide a sustainable source of nitrogen and/or air to the Power Operated Relief Valves (PORVs) to protect RCS Integrity during a BDBEE while in Mode 4 or Mode 5, loops filled.	**Revised** (See the 2/2014 OIP Update) Started (2/2014)
27. Develop and implement procedures to provide guidance for water solid S/G cooldown using FLEX equipment.	Not Started
28. Ensure NSRC can supply D/Gs capable of powering vital bus loads.	**Complete** (See the 2/2014 OIP Update)

Ginna OIP Open Items	Status
29. Implement a strategy to provide connections to 480 Volt vital busses to be able to connect to NSRC supplied D/Gs.	**Revised** (See the 8/2014 OIP Update) Started (2/2015)
30. Ensure NSRC can supply a water processing unit.	**Complete** (See the 8/2014 OIP Update)
31. Implement a design change to install low leakage Reactor Coolant Pump (RCP) seals. The new seals need to be able to withstand T_{hot} for an extended period of time.	**Deleted** (See the 2/2014 OIP Update)
32. Perform an analysis to validate that a FLEX Boric Acid Storage Tank (FBAST) with a boron concentration of at least 2750 parts per million (ppm) and no more than 3050 ppm, and containing a minimum usable volume of 7000 gallons, is sufficient to maintain the reactor subcritical at Beginning of Life (BOL) or End of Life (EOL) conditions with T_{ave} at or near no-load T_{ave}, and at EOL conditions with a cooldown to 350°F. (Analysis must be bounding for current and future cycles.)	**Deleted** (See the 2/2014 OIP Update)
33. Implement a design change to connect a new pre-staged high pressure charging pump and FLEX diesel driven portable charging pump to the RWST.	**Revised** (See the 8/2014 OIP Update) Started (8/2014)
34. Implement a strategy to batch mix boron in the FBAST.	**Deleted** (See the 8/2014 OIP Update)
35. Implement a design change to install a pump capable of pumping 75 gallons per minute (gpm) of borated water from the RWST into the RCS at 1500 pounds per square inch (psi), with discharge piping connected to the Safety Injection System.	**Revised** (This OIP Update 2/2015) Started (8/2013)
36. Develop and implement procedures to initiate RCS boration prior to commencing RCS cooldown to provide margin to prevent re-criticality.	Started (2/2015)
37. Implement a design change to connect a portable diesel engine driven high pressure pump to the RWST and the Safety Injection System, which is capable of pumping 75 gpm of borated water from the RWST to the RCS at 1500 psi.	**Revised** (This OIP Update 2/2015) Started (8/2014)
38. Ensure the NSRC can supply a mobile boration unit.	**Revised** (See the 8/2014 OIP Update) Started (2/2014)
39. Perform an analysis to determine minimum RCS makeup flow sufficient for simultaneous core heat removal and boron flushing for Mode 5, loops not filled and pressurizer manway not removed.	Started (2/2014)
40. Perform an analysis to determine the transition point from gravity fill of the refueling cavity to when forced makeup is required.	Started (2/2015)

Ginna OIP Open Items	Status
41. For Mode 5, Loops Not Filled, and Pressurizer Manway Not Removed, RCS Heat Removal will be by RCS Bleed and Feed. Items under consideration are: • Establish RCS feed path using low pressure pump capable of [To Be Determined] gpm at > 50 psig and a maximum discharge pressure of 410 psig to the RCS. • Establish sufficient RCS bleed path (PORVs, Reactor Head Vents) • Implement a strategy to provide a connection point for Instrument Air to Containment (OI 47) • Establish feed to available S/Gs Partial strategy for consideration - Fill available S/Gs to provide limited heat sink function and additional time before boiling of the coolant occurs. Existing procedural guidance for Water Solid S/G Cooldown provides guidance that can be modified for use with a high flow portable diesel driven pump to maintain the limited heat sink function. • If Water Solid S/G Cooldown is effective to maintain core cooling and heat removal, secure RCS Bleed and Feed and maintain Pressurizer Level.	Started (2/2014)
42. Perform an analysis to determine RCS vent path requirements for Mode 5 with PORV vent path.	Started (2/2014)
43. Develop and implement procedures to makeup to the refueling cavity from the new CST, UHS, or RWST to maintain refueling cavity level and boron concentration.	**Revised** (See the 8/2014 OIP Update) Not Started
44. Perform a boron mixing analysis for the effects on RCS boron concentration by providing unborated water to the refueling cavity via the transfer canal from the Auxiliary Building to Containment.	**Deleted** (See the 2/2014 OIP Update)
45. Evaluate the viability of feed and bleed for available S/Gs to provide a limited heat sink function and additional time before boiling of the coolant occurs as a parallel mitigating strategy during Modes 5 & 6. This analysis must address reflux condensation and its potential effects on reactor shutdown margin.	Started (2/2014)
46. Implement a design change to establish provisions for refilling the FBAST with borated water.	**Deleted** (See the 8/2014 OIP Update)
47. Implement a strategy to provide a connection point for Instrument Air to Containment.	**Revised** (See the 2/2014 OIP Update) Started (2/2014)
48. Perform an evaluation to determine a method for recirculation cooling of the RCS if the Auxiliary Building Sub-basement is flooded by Tornado Missiles damaging non-protected tanks on the Auxiliary Building Operating Floor.	Started (2/2014)

Ginna OIP Open Items	Status
49. Perform an analysis to determine the containment pressure profile during an ELAP / Loss of Ultimate Heat Sink (LUHS) event and determine the mitigating strategies necessary to ensure the instrumentation and controls in containment which are relied upon by the Operators are sufficient to perform their intended function.	**Revised** (See the 2/2014 OIP Update) Started (2/2014)
50. Perform an analysis of the containment function to determine the mitigating strategy acceptance criteria for an ELAP / LUHS event.	Started (8/2014)
51. Implement a strategy to determine containment pressure after a Tornado Missile event.	**Revised** (See the 8/2013 OIP Update) **Complete** (This OIP Update 2/2015)
52. Develop the Phase 3 strategy after the containment pressure analysis is completed as described in Maintain Containment, PWR Portable Equipment Phase 2.	Started (2/2015)
53. Ensure the NSRC will provide additional portable pumps and equipment to spray water into containment or supply water to the Containment Recirculation Fans / Coolers.	**Complete** (See the 8/2014 OIP Update)
54. Implement a strategy to provide for a protected makeup connection to the Spent Fuel Pool (SFP) cooling piping to provide makeup to the SFP that exceeds SFP boil-off and provide a means to supply SFP makeup without accessing the SFP walkway.	**Revised** (See the 2/2014 OIP Update) Started (2/2014)
55. Provide the necessary connecting hoses and/or equipment to work with existing pumps and water sources for filling the SFP.	Started (2/2014)
56. Implement new FSG-11, Alternate SFP Makeup and Cooling, to provide multiple strategies for establishing a diverse means of SFP makeup and cooling for at least 72 hours.	**Revised** (See the 8/2014 OIP Update) Started (2/2015)
57. Perform an analysis to determine if a vent pathway from the SFP is needed for steam and condensate to minimize the potential for steam to cause access and equipment problems in the Auxiliary Building. (also see OI 62)	**Complete** (This OIP Update 2/2015)
58. SFP Water Level instrument numbers will be provided upon detailed design completion.	**Complete** (See the 2/2014 OIP Update)
59. Ensure the NSRC will provide additional portable pumps and equipment to: • provide water from the UHS to the Standby SFP Heat Exchanger to remove heat from the SFP cooling system with the Standby SFP Recirculation Pump; or • provide water to SFP Heat Exchanger A to remove heat from the SFP Cooling System with the Standby SFP Recirculation Pump or SFP Pump A.	**Complete** (See the 8/2014 OIP Update) **Revised** (See the 8/2014 OIP Update)

Ginna OIP Open Items	Status
60. Implement a strategy to supply the battery chargers from the 1 MW D/G using existing plant equipment connection points.	**Revised** (See the 8/2014 OIP Update) Started (2/2014)
61. Implement a strategy to supply the battery chargers from a 100 kW D/G using existing plant equipment connection points.	**Revised** (See the 8/2014 OIP Update) Started (2/2014)
62. Perform GOTHIC calculations consistent with NUMARC 87-00, *Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors*, to determine the effects of a loss of HVAC during an ELAP for the following areas: • Intermediate Building, TDAFW Pump and ARV/ (Safety Valve (SV) areas • Auxiliary Building, Refueling Water Storage Tank (RWST) area • Battery Rooms, Relay Room, and Control Room • Standby Auxiliary Feedwater Building	Started (8/2013)
63. Perform an analysis to evaluate the Battery Room low temperature for an ELAP event, assuming -16°F air temperature to determine if, and when, Battery Room heating is required.	Started (2/2014)
64. Implement a strategy for accessing the UHS for all BDBEEs and to meet required deployment times. This must also address how debris in the UHS or other raw water sources will be filtered / strained and how the resulting debris will effect core cooling.	**Revised** (See the 2/2014 OIP Update) Started (2/2014)
65. Implement a strategy to provide for transferring diesel fuel from the D/G A and D/G B Fuel Oil Storage Tanks (FOSTs) to a fuel transfer vehicle.	**Revised** (See the 2/2014 OIP Update) Started (2/2014)
66. Perform an analysis to provide a basis that the Offsite D/G FOSTs are reasonably protected from BDBEEs.	Started (8/2014)
67. Develop the strategy to transfer fuel from protected fuel storage locations to FLEX equipment.	Started (8/2014
68. Develop strategies to provide for emergency lighting to support Operator actions after a BDBEE.	Started (2/2014)
69. Develop a strategy to protect onsite consumables for use after a BDBEE.	**Deleted** (This OIP Update 2/2015)
70. Develop and implement procedures to establish battery room ventilation within 72 hours of the event to prevent exceeding the unacceptable hydrogen concentration limit of 2%, once the GOTHIC analysis has been completed as discussed in Phase 2.	Not Started

Ginna OIP Open Items	Status
71. Table 3 lists Phase 3 Response Equipment / Commodities that are being considered for pre-staging at an offsite location. These include: • Radiation Protection Equipment • Commodities – Food, Potable Water • Diesel Fuel • Heavy Equipment – Transportation, Debris Removal • Boric Acid • Portable Lighting • Portable Toilets	**Deleted** (See the 2/2014 OIP Update)
72. Install wide range SFP level instrumentation in accordance with NRC Order EA-12-051.	**Complete** (This OIP Update 2/2015)
73. Implement a strategy to provide cooling water to the RHR Heat Exchangers using a portable diesel driven pump.	Started (2/2014)
74. Any additional non-safety equipment will be identified and evaluated for suitability in the mitigation strategies	Started (2/2014)

Table 3 provides a summary of the open and confirmatory items documented in the Ginna Interim Staff Evaluation (ISE) (Reference 21) and the status of each item following the issuance of the ISE.

Table 3
Status of Interim Safety Evaluation (ISE) Open and Confirmatory Items

ISE Open Items	Status
None	

ISE Confirmatory Items	Status
1. **ISE Confirmatory Item 3.1.1.A** – Confirm that the licensee addresses the results of the seismic and flooding re-evaluations pursuant to the NRC's 50.54(f) letter of March 12, 2012.	Started (8/2014)
2. **ISE Confirmatory Item 3.1.1.1.A** – Protection, seismic - confirm that large portable FLEX equipment such as pumps and power supplies would be secured as appropriate to protect them during a seismic event and that stored equipment and structures would be evaluated and protected from seismic interactions to ensure that unsecured and/or non-seismic components do not damage the equipment.	Started (8/2014)

ISE Confirmatory Items	Status
3. **ISE Confirmatory Item 3.1.1.3.A** – Procedural Interfaces – seismic - confirm that a reference source for the plant operators is provided that provides approaches to obtaining necessary instrument readings to support the implementation of the coping strategies.	Started (8/2014)
4. **ISE Confirmatory Item 3.1.4.2.A** – Snow, ice and extreme cold - confirm that potential loss of access to the UHS and flow path due to extreme low temperatures, e.g., due to ice blockage or formation of frazil ice, is assessed and resolved.	Started (8/2014)
5. **ISE Confirmatory Item 3.2.1.A** – Confirm resolution of open item to develop and implement procedures to close SI accumulator injection valves or vent the SI accumulators prior to nitrogen injection into the RCS.	Started (2/2015)
6. **ISE Confirmatory Item 3.2.1.B** – Confirm evaluation of the recommendation to consider the prioritization of staging portable equipment that may be required to isolate/vent the accumulators when certain cooldown maneuvers are necessitated.	Started (2/2015)
7. **ISE Confirmatory Item 3.2.1.1.A** – Confirm completion of timelines used in conjunction with the thermal hydraulic analysis to document the duration of each phase for each critical function, and the basis for the duration.	Started (8/2014)
8. **ISE Confirmatory Item 3.2.1.2.A** – RCP seals - Confirm that, if RCP seals are changed to non-Westinghouse seals, the acceptability of the use of non-Westinghouse seals is addressed, and the RCP seal leakage rates for use in the ELAP analysis are provided with acceptable justification.	Started (8/2014)
9. **ISE Confirmatory Item 3.2.1.2.B** – High temperature RCP seal concern - If applicable, confirm justification that (1) the integrity of the associated O-rings will be maintained at the temperature conditions experienced during the ELAP event, and (2) the seal leakage rate of 21 gpm/seal used in the ELAP is adequate and acceptable.	Started (8/2014)
10. **ISE Confirmatory Item 3.2.1.8.A** – The licensee informed the NRC staff of its intent to abide by the generic approach described in the PWROG August 15, 2013 position paper related to modeling the timing and uniformity of boric acid mixing within the RCS under natural circulation conditions potentially involving two-phase flow. Confirm that the additional conditions discussed in the NRC endorsement letter are satisfied, and that boration requirements are met.	Started (8/2014)

ISE Confirmatory Items	Status
11. **ISE Confirmatory Item 3.2.1.9.A** – Confirm design information and supporting analysis developed for portable equipment that provides the inputs, assumptions, and documented analyses that the mitigation strategy and support equipment will perform as intended.	Started (8/2014)
12. **ISE Confirmatory Item 3.2.3.A** – Containment analysis - Confirm completion of containment analysis and incorporation of results into mitigation strategies.	Started (8/2014)
13. **ISE Confirmatory Item 3.2.4.2.A** – Ventilation - Confirm completion of GOTHIC calculations and incorporation of results into mitigation strategies.	Started (8/2014)
14. **ISE Confirmatory Item 3.2.4.4.A** – Emergency lighting - Confirm development of lighting strategies.	Started (8/2014)
15. **ISE Confirmatory Item 3.2.4.4.B** – Communications - Confirm completion of upgrades.	Started (8/2014)
16. **ISE Confirmatory Item 3.2.4.5.A** – Protected Area Access - Confirm that strategies are in place to allow access to protected areas as needed to execute mitigation strategies.	Started (8/2014)
17. **ISE Confirmatory Item 3.2.4.8.A** – Confirm that the final electrical design has the necessary electrical isolations and protections.	Started (8/2014)
18. **ISE Confirmatory Item 3.3.1.A** – Confirm sufficient quantities of FLEX equipment to meet N+1.	Started (8/2014)

7 Potential Interim Safety Evaluation Impacts

There are no potential impacts to the Interim Safety Evaluation as this time.

8 References

The following references support the updates to the OIP described in this attachment.

1. Letter from M. G. Korsnick (CENG) to Document Control Desk (NRC), "Overall Integrated Plan for Mitigation Strategies for Beyond-Design-Basis External Events," dated February 28, 2013 (FLL-13-007).
2. NRC Order Number EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012.
3. Letter from M. G. Korsnick (CENG) to Document Control Desk (NRC), "Supplement to Overall Integrated Plan for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 8, 2013 (FLL-13-015).
4. Letter from M. G. Korsnick (Exelon Generation) to Document Control Desk (NRC), "August 2014 Six-Month Status Report in response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)," dated August 26, 2014 (FLL-14-029).
5. NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," dated August 2012.
6. ER-SC.2, "High Water (Flood) Plan," Revision 01001
7. FHR-REPORT, "Fukushima Flood Hazard Reevaluation Report," Revision 001
8. Letter from Mohan C. Thadani (NRC) to Mary G. Korsnick (CENG), "Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2, and R. E. Ginna Nuclear Power Plant - Staff Assessment of Flooding Walkdown Reports Supporting Implementation of Near-Tear Task Force Recommendation 2.3 Related to the Fukushima Dai-Ichi Nuclear Power Plant Accident," Dated June 26, 2014 (ML14170B022)
9. RWA-1323-003, "Ginna RELAP5 ELAP Analysis for Mode 1," Revision 0
10. Letter from J. Stringfellow (NRC) to PWROG Program Management Office (Westinghouse Electric Company LLC, regarding endorsement of the Westinghouse position paper entitled "Westinghouse Response to NRC Generic Request for Additional Information (RAI) on Boron Mixing in Support of the Pressurized Water Reactor Owners Group (PWROG),." (ML13276A183)
11. UFSAR, "Updated Final Safety Analysis Report," Revision 25
12. SBO-PROGPLAN, "Station Blackout Program PROGPLAN Ginna Station," Revision 008
13. ECA-0.0, "Loss of All AC Power," Revision 03900
14. ATT-5.5, "Attachment SAFW with Suction from DI Water Storage Tank during SBO," Revision 00000
15. FSG-7, "Loss of Vital Instrumentation or Control Power," DRAFT
16. ECP-13-000424, "DDSAFW Project Piping Design and Installation," Revision 0000

17. CALC-2014-0006, "Auxiliary Building Environmental Conditions during ELAP," Revision 0
18. NUMARC 87-00, "Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors"
19. ECP-13-000547, "Spent Fuel Pool Level Indication Modifications for Fukushima response," Revision 0
20. NRC Order Number EA-12-051, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," dated March 12, 2012.
21. Letter from J. S. Bowen (NRC) to M. G. Korsnick (CENG), "R. E. Ginna Nuclear Power Plant – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Order EA-12-049 (Mitigation Strategies) (TAC No. MF1152)," dated February 19, 2014 (ML14007A704).