William R. Gideon
H. B. Robinson Steam
Electric Plant Unit 2
Site Vice President

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10 CFR 50.4

RNP-RA/13-0022

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H.B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/RENEWED LICENSE NO. DPR-23

SUBJECT: CAROLINA POWER AND LIGHT COMPANY'S OVERALL INTEGRATED PLAN IN REPONSE 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)

REFERENCE:

1. NRC Letter, E.J. Leeds (NRC) to All Power Reactor Licensees and Holders of Construction Permits in Active or Deferred Status, *Order to Modify Licenses With Regard To Requirements for Mitigation Strategies for Beyond Design Basis External Events, EA-12-049*, dated March 12, 2012, Accession No. ML12054A736
2. NRC Interim Staff Guidance JLD-ISG-2012-01, *Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, Revision 0,* dated August 29, 2012, Accession No. ML12229A174

Ladies and Gentlemen:

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued an order (i.e., Reference 1) to Carolina Power & Light Company (CP&L). Reference 1 was immediately effective and directs CP&L to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool capabilities in the event of a beyond-design-basis external event. Specific requirements are outlined in Attachment 2 of Reference 1.

Reference 1 requires submission of an overall integrated plan, including a description of how compliance with the requirements described in Attachment 2 will be achieved, to the Commission for review by February 28, 2013, and subsequent submission of interim status reports at six-month intervals following submittal of the overall integrated plan. Pursuant to Section IV, Condition C.1 of Reference 1, CP&L hereby submits to the Commission, for its review, the enclosed overall integrated plan for H. B. Robinson Steam Electric Plant, Unit No. 2, including a description of how compliance with the requirements described in Attachment 2 of Reference 1 will be achieved.

The Enclosure contains the current design information as of the writing of this letter, much of which is still preliminary, pending completion of on-going evaluations and analyses. As further design details and associated procedure guidance are finalized, supplemental information will be communicated to the Staff in the six-month status reports required by Reference 1.

This letter contains no new regulatory commitments.

A151
NRR

If you have any questions or require additional information, please contact Mr. Richard Hightower, Supervisor – Licensing/Regulatory Programs at (843) 857-1329.

I declare under the penalty of perjury that the foregoing is true and correct. Executed on:

2/26/13

Sincerely,

William R. Gideon
Site Vice President
H. B. Robinson Steam Electric Plant, Unit No. 2

WRG/am

Enclosure: Overall Integrated Plan

cc: Mr. V. M. McCree, NRC, Region II
USNRC Resident Inspector -
Eric Leeds, Director, Office of Nuclear Reactor Regulation
Ms. Araceli Billoch-Colón, NRC Project Manager, NRR
Steven R. Jones, NRR/DSS/SBPB, NRC

ENCLOSURE 1

OVERALL INTEGRATED PLAN:

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

DOCKET NO. 50-261

75 Pages Including Cover Page

General Integrated Plan Elements	
Determine Applicable Extreme External Hazard **Ref: NEI 12-06 section 4.0 - 9.0** **JLD-ISG-2012-01 section 1.0**	*Input the hazards applicable to the site; seismic, external flood, high winds, snow, ice, cold, high temps.* *Describe how NEI 12-06 sections 5 – 9 were applied and the basis for why the plant screened out for certain hazards.* <u>Seismic Hazard Assessment</u>: NEI 12-06 Table 4-2 states that all sites will consider seismic events. Per the Robinson Nuclear Power Plant (RNP) Updated Final Safety Analysis Report (UFSAR), "... this site is located in Zone 1 of the Uniform Building Codes' Map and Equal Seismic Probability (UFSAR Section 2.5.2.1.2). Zone 1 is characterized as a zone of light earthquake activity which would result in minor damage. Therefore, on an historical basis, it would appear that the site will not experience damaging earthquake motion during the life of the planned facilities." The dynamic analyses of all Seismic Category I structures include the operating basis earthquake (OBE) and safe shutdown earthquake (SSE) with design values of maximum horizontal ground acceleration of 0.1g (UFSAR Section 2.5.2.7) and 0.2g (UFSAR Section 2.5.2.6), respectively. <u>External Flood Hazard Assessment:</u> This hazard is not applicable to RNP since the plant is built above the design basis flood level. As stated in the RNP UFSAR Chapter 2 (Sections 2.4.2 and 2.4.4) the maximum flood elevation is 222 ft while the grade level at RNP is 225 ft. Per NEI 12-06 (Section 6.2.1), RNP is classified as a dry site and the external flood hazard is, therefore, not applicable. <u>High Wind Hazard Assessment:</u> The high wind hazard is applicable for RNP. RNP is located in Darlington County, SC with coordinates Latitude 34° 24' 02" N, Longitude 80° 09' 05" W (UFSAR Section 2.1.1.1). Peak-gust wind speed, per NEI 12-06 Figure 7-1, is 170 mph. Tornado design wind speed per NEI 12-06 Figure 7-2, Block #172 (Region 1) is 200 mph. These values indicate that RNP has the potential to experience severe winds from hurricanes and tornadoes with the capacity to do significant damage, which are generally considered to be winds above 130 mph as defined in NEI 12-06 Section 7.2.1. <u>Extreme Cold Hazard Assessment:</u> RNP is located in Darlington County, SC with coordinates

	Latitude 34° 24' 02" N, Longitude 80° 09' 05" W (UFSAR Section 2.1.1.1). RNP is located below the 35th parallel. Per NEI 12-06, Figure 8-1, RNP is in an area corresponding to "low to significant snow accumulations" and "low temperatures." The area represents a record snowfall that is approximately 18-25 inches accumulation over three days. Such snowfalls are considered unlikely to present a significant problem for deployment of FLEX equipment. RNP is not required to address extreme snowfall. Per NEI 12-06, Figure 8-2, RNP is located in a Level 5 area, which is characterized as "Catastrophic destruction to power lines and/or existence of extreme amount of ice." RNP is required to consider the adverse effects of ice on the deployment of FLEX equipment. <u>Extreme High Temperature Hazard Assessment:</u> The extreme high temperature hazard is applicable for all sites in the United States based on NEI 12-06 Section 9.2. Virtually every state in the lower 48 contiguous United States has experienced temperatures in excess of 110°F and many in excess of 120°F. RNP will consider the impacts of extreme high temperature conditions of 130°F on the procurement, storage, and deployment of FLEX equipment. The applicable extreme external hazards at RNP are seismic, high wind, extreme cold with ice, and high temperature.
Key Site assumptions to implement NEI 12-06 strategies. **Ref: NEI 12-06 section 3.2.1**	*Provide key assumptions associated with implementation of FLEX Strategies:* Key assumptions associated with implementation of the RNP FLEX Strategies: 1. Any future Station Blackout (SBO) or Extended Loss of AC Power (ELAP) rule is assumed to be consistent with Order EA-12-049 (Reference 1) and JLD-ISG-2012-01 (Reference 2). Different or additional requirements in the rule may necessitate a change in the plans made in the RNP response to the Order, (Reference 1). 2. The 10CFR50.54(f) seismic and flood re-evaluations do not result in changes to the current design basis. It is assumed that RNP remains dry subsequent to the external flood event. Additionally, it is assumed that the seismic re-evaluation does not adversely impact the equipment that forms a part of the RNP FLEX

	strategy. Any changes to the seismic or flood design basis may require a change to the plans in the RNP response to the Order, (Reference 1). 3. All installed alternating current (AC) power supplies (emergency on-site and SBO Alternate AC power sources as defined by 10CFR50.2) will be considered not available and not imminently recoverable. 4.a Systems, structures, and components (SSC) will be considered seismically robust if seismic requirements are imposed by current site licensing requirements. 4.b Where non-safety, non-seismically designed, permanently installed equipment is used for FLEX strategies, SSCs will be considered seismically robust if: • Seismic Qualification Utility Group (SQUG) methods are applied per existing plant licensing basis. • Testing, analysis or experience-based methods are applied for the equipment class at design basis seismic levels. • Methodologies in EPRI 1019199, Experience Based Seismic Verification Guidelines for Piping and Tubing Systems (Reference 4) can be successfully applied relative to the SSE. • Other industry recognized codes such as AWWA D100 (Reference 5) are applied to demonstrate functionality at SSE level ground motion. • High Confidence of a Low Probability of Failure (HCLPF) capacities are determined (e.g. EPRI NP-6041-SL Rev. 1), (Reference 5) conservative compared to the SSE. 5. Personnel access to and qualification of equipment that forms a part of the FLEX strategy assumes no core damage. 6. For events with no advanced warning, per NEI 12-06 Section 12.1, on-site resources will be used to cope with the first two phases of the event and for a minimum of the first 24 hours of the event. Emergency Response Organization (ERO) personnel are assumed to begin arriving at 6 hours and the site ERO will be staffed at 24 hours after the event. 7. Phase 3 resources (personnel and equipment) are assumed to start arriving within 24 hours of the request in accordance with the proposed Regional Resource Center (RRC) playbook, (Open Item 1). All resources from the RRC are assumed to be available within 72 hours of the request. 8. This plan defines strategies capable of mitigating a simultaneous loss of all alternating current (ac) power and loss of normal access to the ultimate heat sink resulting from a beyond-design-basis event by providing

	adequate capability to maintain or restore core cooling, containment, and SFP cooling capabilities at all units on a site. Though specific strategies are being developed, due to the inability to anticipate all possible scenarios, the strategies are also diverse and flexible to encompass a wide range of possible conditions. These pre-planned strategies developed to protect the public health and safety will be incorporated into the unit emergency operating procedures in accordance with established EOP change processes, and their impact to the design basis capabilities of the unit evaluated under 10 CFR 50.59. The plant Technical Specifications contain the limiting conditions for normal unit operations to ensure that design safety features are available to respond to a design basis accident and direct the required actions to be taken when the limiting conditions are not met. The result of the beyond-design-basis event may place the plant in a condition where it cannot comply with certain Technical Specifications and/or with its Security Plan, and, as such, may warrant invocation of 10 CFR 50.54(x) and/or 10 CFR 73.55(p).
Extent to which the guidance, JLD-ISG-2012-01 and NEI 12-06, are being followed. Identify any deviations to JLD-ISG-2012-01 and NEI 12-06. **Ref: JLD-ISG-2012-01 NEI 12-06 13.1**	*Include a description of any alternatives to the guidance, and provide a milestone schedule of planned action.* RNP has no known deviations to the guidelines in JLD-ISG-2012-01(Reference 2) and NEI 12-06. If deviations are identified, then the deviations will be communicated in a future six-month update following identification.
Provide a sequence of events and identify any time constraint required for success including the technical basis for the time constraint. **Ref: NEI 12-06 section 3.2.1.7** **JLD-ISG-2012-01 section 2.1**	*Strategies that have a time constraint to be successful should be identified with a technical basis and a justification provided that the time can reasonably be met (for example, a walk-through of deployment).* *Describe in detail in this section the technical basis for the time constraint identified on the sequence of events timeline Attachment 1A* *See attached sequence of events timeline (Attachment 1A).* *Technical Basis Support information, see attached NSSS Significant Reference Analysis Deviation Table (Attachment 1B)* In response to the Fukushima Dai-ichi accident in Japan in March of 2011, WCAP-17601-P (Reference 6) was prepared to address the PWR Owners Group (PWROG) members' Nuclear Steam Supply Systems response to an extended loss of AC power (ELAP). The Robinson Unit 2 plant site was a participating member for this project. The

	WCAP provided generic Reactor Coolant System response analyses for an ELAP scenario. These analyses determined the available time for adequate core cooling when reactor coolant pump seal leakage is considered under current design conditions. This WCAP is applicable to all PWROG plants. Robinson Unit 2 is enveloped by the WCAP conclusions in that rated thermal power and secondary heat removal characteristics are bounded by the reference plant assumptions cited in the WCAP (UFSAR Table 4.1.2-2, Thermal-Hydraulic Design Values). See Attachment 1A for sequence of events. The following provides the technical basis for time constraint items that are identified in the sequence of events in Attachment 1A: 1. Approximately 1 hour – Swap over to the supplementary batteries at approximately one hour. This is a manual alignment and must be completed prior to the safety batteries being depleted. (Item 5 in Attachment 1A) 2. 1-6 hour - Manually align alternate Condensate Storage Tank (CST) to the Steam Driven Auxiliary Feedwater (SDAFW) pump suction. This must be performed within 1 hour of loss of CST to ensure Steam Generators (SGs) do not dry out. Providing a hard-piped CST capable of 24 hours of cooling, aligned with minimal manual valve operations, ensures that this time constraint can be met. (Item 6 in Attachment 1A) 3. 1-4 hours – Modes 5-6, connect and operate portable FLEX pump to provide borated makeup. Borated makeup is from the RWST to the RCS for core cooling through evaporation and boiling. (Item 7 in Attachment 1A) 4. 1-24 hours - Align portable pumps and hoses to water sources as available (CST, Alternate CST, 'D' Deepwell, A & B condenser hotwells) and AFW for SG makeup (contingency based on primary strategy and SDAFWP availability). This action is used as needed to keep the SG from drying out. This portable pump will be pre-staged in an area close to the AFW system tie-in points (i.e., readily available and easily aligned within one hour). (Item 8 in Attachment 1A) 5. 2-5 hours – Modes 1-4; depressurize the SGs to 300 psia. This is an action that is associated with the philosophy of WCAP-17601-P Rev. 0, (Reference 6). This time constraint is based on an early depressurization. SG Power Operated Relief Valves (PORVs) would be operated using the nitrogen in the

	new robust accumulator and the cooldown will be symmetric due to power to all three PORVs. (Item 9 in Attachment 1A) 6. 2-12 hours - Align portable nitrogen tanks to operate SG PORV's (contingency for installed, robust nitrogen accumulator). The nitrogen is needed to operate the SG PORVs and the SGs are being subjected to an early depressurization. (Item 10 in Attachment 1A) 7. 2-16 hours - Align the portable pump from the discharge canal with hose to Emergency Cooling Connections (contingency based on availability of the SFP deck). The strategy used for this action is based on an Extreme Damage Mitigation Guideline (EDMG), (Reference 7), procedure to address SFP makeup. The time available to perform this activity is based on the decay heat load in the SFP and time to fuel uncovery, which will vary throughout the core cycle. (Item 12 in Attachment 1A) 8. 2-16 hours - Align portable pump from discharge canal with hose and spray monitors (time to deploy is dependent on plant mode). The strategy used for this action is based on an EDMG procedure to address SFP makeup. The time available to perform this activity is based on the decay heat load in the SFP and time to fuel uncovery, which will vary throughout the core cycle. (Item 13 in Attachment 1A) 9. 4-5 hours - Manually align alternate CST to the SDAFW pump suction (time based on CST inventory). As noted, this action is dependent upon the CST level. This is the normal swapover based on the available inventory of the existing CST. This is not a contingent activity and will be performed as a Phase 1 activity to access the inventory in the alternate CST. Manual switchover must occur prior to completely draining all CST inventory. (Item 15 in Attachment 1A) 10. 5-7 hours - Restore power to the safety battery chargers, using a portable generator. This must be completed prior to battery depletion (at 8 hours) and after or simultaneously with re-powering the Battery Room exhaust fans (for hydrogen buildup). (Item 16 in Attachment 1A) 11. 5-7 hours - Restore power to the Battery Room exhaust fans. This must be performed prior to battery depletion (at 8 hours) and must be performed prior to or simultaneously with re-powering the battery chargers (for hydrogen buildup concerns). (Item 17 in Attachment 1A)

	12. 6-12 hours - Restore power to a charging pump for borated makeup to RCS from Refueling Water Storage Tank (RWST) (Primary strategy for RCS makeup). This must be performed in accordance with boration needs which will vary throughout the core cycle. (Item 18 in Attachment 1A) 13. 6-12 hours - Align portable pumps and hoses from the RWST to the Safety Injection (SI) header for makeup to RCS (contingency based on charging pump availability). This must be performed in accordance with boration needs which will vary throughout the core cycle. (Item 19 in Attachment 1A) 14. 12-16 hours - Manually isolate cold leg accumulators to prevent nitrogen injection. This must be performed after re-powering the SI accumulator isolation valves, but before the SI accumulators empty or reach a low level. (Item 20 in Attachment 1A) 15. 12-24+ hours - Align portable fan blowers and exhaust ducting to charging pump room. This becomes a time constraint because it has not yet been determined how long the equipment can continue to function without HVAC. (Item 21 in Attachment 1A) 16. 12-24+ hours - Install portable fan blowers and exhaust ducting for HVAC (non-Control Room areas; Electrical Equipment Area, Switchgear Room, and Battery Room). This becomes a time constraint because it has not yet been determined how long the equipment can continue to function without HVAC. (Item 22 in Attachment 1A) 17. 16-72 hours - Align portable pumps to service water piping and make necessary valve alignments for SG makeup (contingency for inventory availability of CST and/or alternate CST). This must be performed prior to the CST and alternate CST inventory emptying or reaching a low level (assumes makeup to the SGs is still required). This is the only means to provide SG makeup indefinitely, (i.e., from the lake). (Item 24 in Attachment 1A)
Identify how strategies will be deployed in all modes. **Ref: NEI 12-06 section 13.1.6**	*Describe how the strategies will be deployed in all modes.* Deployment routes shown in Figure 1 (Open Item 2) are expected to be utilized to transport FLEX equipment to the deployment areas. The identified paths and deployment areas will be accessible during all modes of operation. This deployment strategy will be included within an administrative program in order to keep pathways clear or

	actions to clear the pathways, (Open Item 3).
Provide a milestone schedule. This schedule should include: • **Modifications timeline** o **Phase 1 Modifications** o **Phase 2 Modifications** o **Phase 3 Modifications** • **Procedure guidance development complete** o **Strategies** o **Maintenance** • **Storage plan (reasonable protection)** • **Staffing analysis completion** • **FLEX equipment acquisition timeline** • **Training completion for the strategies** • **Regional Response Centers operational** **Ref: NEI 12-06 section 13.1**	*The dates specifically required by the order are obligated or committed dates. Other dates are planned dates subject to change. Updates will be provided in the periodic (six month) status reports.* Attachment 2 provides the RNP FLEX Milestone Schedule.
Identify how the programmatic controls will be met. **Ref: NEI 12-06 section 11** **JLD-ISG-2012-01 section 6.0**	*Provide a description of the programmatic controls for equipment protection, storage and deployment and equipment quality. See section 11 in NEI 12-06. Storage of equipment, 11.3, will be documented in later sections of this template and need not be included in this section.* *See section 6.0 of JLD-ISG-2012-01.* RNP will implement the programmatic controls in accordance with NEI 12-06 as defined below, (Open Item 4). Procedures and guidelines will be reviewed and revised and/or generated as required to address additional programmatic controls as a result of FLEX requirements. Equipment associated with these strategies will be procured as commercial equipment with design, storage, maintenance, testing, and configuration control in

	accordance with NEI 12-06, Section 11.1, (Open Item 5). Installed structures, systems and components pursuant to 10CFR50.63(a) will continue to meet the augmented guidelines of RG 1.155 Station Blackout, (Reference 8). The unavailability of equipment and applicable connections that directly perform a FLEX mitigation strategy will be managed using plant equipment control guidelines developed in accordance with NEI 12-06, Section 11.5, (Open Item 6). Programs and processes will be established to ensure personnel proficiency in the mitigation of beyond-design-basis events as developed and maintained in accordance with NEI 12-06, Section 11.6, (Open Item 7). The FLEX strategies and basis will be maintained in overall FLEX basis documents, (Open Item 8). Existing plant configuration control procedures will be modified to ensure that changes to the plant design, physical plant layout, roads, buildings, and miscellaneous structures will not adversely impact the approved FLEX strategies in accordance with NEI 12-06, Section 11.8, (Open Item 9).
Describe training plan	*List training plans for affected organizations or describe the plan for training development* Training will be initiated through the Systematic Approach to Training (SAT) process. Training will be developed and provided to all involved plant personnel based on any procedural changes or new procedures developed to address and identify FLEX activities. Applicable training will be completed prior to the implementation of FLEX, (Open Item 10).
Describe Regional Response Center plan	*Discussion in this section may include the following information and will be further developed as the Regional Response Center development is completed.* • *Site-specific RRC plan* • *Identification of the primary and secondary RRC sites* • *Identification of any alternate equipment sites (i.e. another nearby site with compatible equipment that can be deployed)* • *Describe how delivery to the site is acceptable* • *Describe how all requirements in NEI 12-06 are identified* The industry will establish two (2) Regional Response Centers to support utilities during beyond design basis events. Each RRC will hold five (5) sets of equipment, four (4) of which will be able to be fully deployed when requested, the fifth set will have equipment in a

	maintenance cycle. Equipment will be moved from an RRC to a local Assembly Area, established by the Strategic Alliance of FLEX Emergency Response (SAFER) team and the utility. Communications will be established between the affected nuclear site and the SAFER team and required equipment moved to the site as needed. First arriving equipment, as established during development of the nuclear site's playbook, will be delivered to the site within 24 hours from the initial request. A contract has been signed between the site and the Pooled Equipment Inventory Company to provide Phase 3 services and equipment, (Open Item 11).
Notes: None	

Maintain Core Cooling & Heat Removal

Determine Baseline coping capability with installed coping[1] modifications not including FLEX modifications, utilizing methods described in Table 3-2 of NEI 12-06:

- **AFW/EFW**
- **Depressurize SG for Makeup with Portable Injection Source**
- **Sustained Source of Water**

Ref: JLD-ISG-2012-01 section 2 and 3

PWR Installed Equipment Phase 1

Provide a general description of the coping strategies using installed equipment including station modifications that are proposed to maintain core cooling. Identify methods (AFW/EFW) and strategy(ies) utilized to achieve this coping time.

The Auxiliary Feedwater (AFW) System provides feedwater to the steam generators (SGs) as required to perform a Reactor Coolant System (RCS) cooldown, maintain safe shutdown, and mitigate the consequences of all transient and accident scenarios in which AFW system operation is credited.

At the initiation of the event, operators will enter the existing Station Blackout (SBO) Emergency Operating Procedures (EOPs). The Flex Support Guidelines (FSGs) will be entered when on-site and off-site power cannot be readily restored and an Extended Loss of Alternating Current Power (ELAP) is thus established.

The Steam Driven Auxiliary Feedwater Pump (SDAFWP) will deliver Condensate Storage Tank (CST) inventory to the SGs. The AFW System is required to be in operation within 27.5 minutes of event initiation, (Reference 9). With AC power lost, the steam supply valves to the SDAFWP must be manually operated. Additionally, with AC power lost, the AFW regulating valves must be manually operated. To limit the required post-event operator actions, one of the three trains of the steam supply and regulating valves will be modified to operate on DC power and will be capable of being operated from the Control Room, (Open Item 12).

The CST is the source of AFW. The tank and its level instrumentation are seismically qualified, (Reference 10); however, they are not protected from wind or missiles. In order to cope with an ELAP for an indefinite time, the CST inventory must be made-up to; current coping time is approximately 4-5 hours. Normal access to the Ultimate Heat Sink (UHS) (i.e., Lake Robinson), per the restrictions outlined in NEI 12-06, Section 3.2.1.3, is assumed to be unavailable and the UHS can only be accessed using portable equipment. Modifications will be initiated to harden the CST against wind and missiles, (Open Item 13), and to add an alternate CST which will be sufficiently rugged and qualified to withstand the applicable hazards, (Open Item 14). This alternate CST may be hard-piped to the existing CST and/or to a new header such that the existing CST could be bypassed in the event it is unavailable. This alternate CST will be located at a higher elevation to allow gravity feed to the plant.

[1] Coping modifications consist of modifications to increase initial coping time, i.e. generators to preserve vital instruments or increase operating time on battery powered equipment.

Alternate means of reducing or eliminating potential loss of CST inventory such as modifying valve LCV-1417A, have also been considered. Valve LCV-1417A is a fail-open valve that provides connectivity between the CST and the condenser hotwells. LCV-1417A will be converted from a fail-open valve to a fail-closed valve to preclude loss of CST inventory, (Open Item 15).

RNP has elected to follow the WCAP-17601-P, (Reference 6), guidance. RNP's depressurization capability includes the SG Pressure Operated Relief Valves (PORVs) which are normally operated using the Instrument Air System or with the backup Nitrogen System. However, neither the primary Instrument Air nor the backup Nitrogen System are robust and are not qualified to all applicable hazards. A seismically qualified pressure source (accumulator) capable of supplying 8 hours of SG PORV operation will be installed, (Open Item 16).

Details:

Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation.* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4, (Open Item 17).
Identify modifications	*List modifications and describe how they support coping time.* • One of the three trains of steam supply and regulating valves modified to operate with a DC powered actuator, (Open Item 12). • Harden the existing CST and CST level instrumentation, (Open Item 13). • Build alternate, robust, hardened, CST with a capacity to provide cooling for approximately 24 hours, (Open Item 14). • Change LCV-1417A from fail-open to fail-closed, (Open Item 15). • Add seismically qualified pressure source for SG PORV operation, (Open Item 16).
Key Reactor Parameters	*List instrumentation credited for this coping evaluation phase.* The key instrumentation for core cooling includes:

Instrumentation	Safety Function
RCS Hot Leg Temperature (Thot)	Core cooling
RCS Cold Leg Temperature (Tcold) (Not available in Phase 1)	Core cooling
RCS Wide Range (WR) Pressure	Core cooling
SG Narrow Range (NR) Level	Core cooling
SG WR Level	Core cooling
Core Exit Thermocouple Temperature	Core cooling
RCS Passive Injection	Core cooling

	(Accumulator) Level	
	Pressurizer Level	Core cooling
	Reactor Vessel Level Indicating System	Monitor reactor vessel inventory
	AFW Pump Flow	Core cooling
	SG Pressure	Core cooling
	CST Level	Core cooling
	Battery Capacity/DC Bus Voltage (Battery capacity indication does not exist at RNP)	Support cooling and monitoring
	Neutron Flux	Maintain sub-criticality
	Most of the essential instrumentation to maintain core cooling and heat removal is connected to the safety related instrumentation buses. The power supply to the instrumentation buses is discussed in the Safety Functions Support section of this document.	

Notes:

None

Maintain Core Cooling & Heat Removal
PWR Portable Equipment Phase 2
Provide a general description of the coping strategies using on-site portable equipment including station modifications that are proposed to maintain core cooling. Identify methods and strategy(ies) utilized to achieve this coping time. An additional, portable backup for SG makeup is required per NEI 12-06, Section 3.2.2(13). RNP does not currently possess a portable pump for this purpose or have the necessary system connections at primary and alternate locations. The requirement is to be able to provide feedwater to the Steam Generator prior to dryout. Steam Generator makeup must be provided within one hour of a loss of all feedwater per the PWROG Core Cooling Position Paper, (Reference 11). Primary Strategy A portable pump will be procured and pre-staged near the condensate pump area, (Open Item 18). To meet N+1 requirements, an additional pump will be stored in a building designed per the criteria of NEI 12-06 Section 11.3, (Open Item 19). These portable pumps will be capable of taking suction from a variety of plant sources (preferred source is the CST) and can be connected directly into the AFW System. Makeup to the CST can be via the six inch emergency fill connection valve, DW-285, (which will be modified to accommodate a standard FLEX fitting), (Open Item 20). An additional connection will be provided for the CST to satisfy primary and alternate criteria, (Open Item 21). A tee-connection will be added to the C AFW Pump discharge line, (Open Item 22), which will allow the portable pump to supply the AFW system. Strategies currently exist to align portable nitrogen tanks to the SG PORV air supply header. The tanks, however, are not stored in a protected location. To maintain this method as a viable strategy, sufficient nitrogen tanks for a 24 hour coping duration will be relocated to a protected location, (Open Item 23). Additionally, the existing connection points for the portable nitrogen tanks will be modified to include quick-connects, (Open Item 24). After depressurization is initiated, it is desirable to isolate the Safety Injection (SI) accumulators in order to prevent nitrogen injection into the RCS, which would impede natural circulation cooldown. After an ELAP, however, power to the SI accumulator isolation valves is unavailable. Though the valves can be manually operated, their location inside containment precludes accessibility. The valves are powered by MCC 5 and MCC 6 and will be re-powered via switchgear E1 or E2 or directly to the MCC's with portable diesel generators, (Open Item 25). Reactor core cooling and heat removal with the SGs unavailable during Modes 5 and 6 were also considered. The primary strategy to supply power to the charging pumps is by energizing 480V switchgear E1 or E2. The switchgear will be powered by modifying the current 480V switchgear E1 or E2 to include connection points near the existing diesel generator that will be capable of switching between the existing diesel generator power feeds and the portable FLEX generator power feeds, (Open Item 26). If E1 or E2 are unavailable, the secondary method will entail utilizing a manual transfer switch with portable generator connections that will be installed for a charging pump, (Open Item 27). The source of water for the charging pumps is the RWST. Currently, the RWST is seismically qualified, but is not protected from wind or missiles. The RWST will be hardened to protect against these hazards, (Open Item 41).

Alternate Strategy
To provide primary and alternate connections for portable pumps, an alternate mechanical tee-connection will be provided for the AFW system, (Open Item 28).

The ultimate source of core cooling water (and the only one capable of providing indefinite functionality) is Lake Robinson. The UHS will withstand a seismic event as the earthen dam is seismically robust, (Reference 12). Due to a relatively long distance between the lake and the plant, it is desirable to use Service Water (SW) piping as a flow path. The SW System is connected to the AFW System via two locked valves (SW-118 and AFW-24) located off the south SW header which will be opened, if needed, to transfer water from Lake Robinson to the suction of the SDAFWP. Mechanical connections will be added directly into both the south and north SW headers to allow a portable pump to connect, while taking suction directly from Lake Robinson and bypassing the SW pumps, (Open Item 29). To enable this strategy, the necessary N+1 portable pumps will be stored in a robust structure in a protected location near the intake structure, (Open Item 30).

The portable nitrogen tanks to the SG PORV air supply header will be relocated to a protected location, (Open Item 23). The existing connection points for the portable nitrogen tanks will be modified to include quick-connects, and the multiple connection points, serve as an alternate strategy, (Open Item 24).

A portable pump will be used, taking suction from the Refueling Water Storage Tank (RWST) and discharging to the SI header, during steam generator unavailability, (Open Item 31). Primary and alternate mechanical FLEX connections will be added to the SI header, (Open Item 32). A drain valve (SI-837) also exists at the base of the RWST and will be modified to align with the standardized connection type, (Open Item 33).

Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation with a description of the procedure / strategy / guideline.* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4, (Open Item 17).
Identify modifications	*List modifications necessary for phase 2* • Add a tee-connection to the C AFW Pump discharge line, (Open Item 22). • Add an alternate FLEX connection to AFW system piping, (Open Item 28). • Add primary and alternate FLEX connections to the CST, (Open Item 21). • Add primary and alternate FLEX connections to SW piping, (Open Item 29). • Stage N+1 portable pumps at intake for SG makeup via SW piping, (Open Item 30). • Build/identify protective structure for portable nitrogen

	bottles for SG PORV operation, (Open Item 23). • Relocate nitrogen tanks used for PORV operation to a protected location, (Open Item 23). • Modify existing nitrogen manifold to quick-connect fittings, (Open Item 24). • Modify MCC 5 or MCC 6 to allow connection to portable generators, (Open Item 47). • Harden the RWST, (Open Item 41). • Add primary and alternate FLEX connections to SI headers, (Open Item 32). • Standardize existing RWST FLEX connection points, (Open Item 33).
Key Reactor Parameters	*List instrumentation credited or recovered for this coping evaluation.* Same as Phase 1.
Storage / Protection of Equipment : Describe storage / protection plan or schedule to determine storage requirements	
Seismic	***List how equipment is protected or schedule to protect*** Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date, (Open Item 34). The RNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to RNP, (Open Item 35).
Flooding	*List how equipment is protected or schedule to protect* RNP is a dry site and the site elevation is above the maximum flood hazard level. Therefore, the FLEX equipment storage location onsite will be above the flood elevation. As stated in the RNP UFSAR Chapter 2, the maximum flood elevation is 222 ft while the grade level at RNP is 225 ft (UFSAR Sections 2.4.2 and 2.4.4).
Severe Storms with High Winds	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date, (Open Item 34). The RNP procedures and programs are being developed to

	address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to RNP, (Open Item 35).
Snow, Ice, and Extreme Cold	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date, (Open Item 34). The RNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to RNP, (Open Item 35).
High Temperatures	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date, (Open Item 34). The RNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to RNP, (Open Item 35).

Deployment Conceptual Design (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
The FLEX equipment storage building and location has not yet been decided. Specific deployment of the FLEX equipment to the point of use will be identified and conceptual sketches provided once storage building and location is identified and the deployment strategy is finalized, including an evaluation of the likely site hazards arising from different events. Deployment routes are shown in Figure 1, (Open Item 2).	Modifications necessary for deployment of FLEX equipment include connection points to existing SSCs, (Open Item 36). Modifications necessary for deployment of FLEX equipment include changes to existing onsite fences, structures and security, (Open Item 37).	The connection points for the FLEX equipment will be designed to withstand the applicable external hazards, (Open Item 38).
Notes: None		

Maintain Core Cooling & Heat Removal	
PWR Portable Equipment Phase 3	
Provide a general description of the coping strategies using phase 3 equipment including modifications that are proposed to maintain core cooling. Identify methods and strategy(ies) utilized to achieve this coping time. A generator of adequate capacity will be delivered to the site from the Regional Response Center and will be capable of re-powering one train of charging flow. With one emergency train powered, the plant will have greater operational flexibility and the ability to add smaller non-essential loads. Power will be supplied to all necessary equipment during a Beyond Design Basis External Event (BDBEE). Large portable pumps will continue to be required to provide water from Lake Robinson.	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation with a description of the procedure / strategy / guideline.* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4, (Open Item 17).
Identify modifications	*List modifications necessary for phase 3* The means for connecting the Phase 3 generator will be identified based on the selected onsite location of the generator, (Open Item 39).
Key Reactor Parameters	*List instrumentation credited or recovered for this coping evaluation.* Same as Phase 1.

Deployment Conceptual Design (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
The FLEX equipment storage building and location has not yet been decided. Specific deployment of the FLEX equipment to the point of use will be identified and conceptual sketches provided once storage	Modifications necessary for deployment of FLEX equipment include connection points to existing SSCs, (Open Item 36). Modifications necessary for deployment of FLEX equipment	The connection points for the FLEX equipment will be designed to withstand the applicable external hazards, (Open Item 38).

Maintain Core Cooling & Heat Removal		
PWR Portable Equipment Phase 3		
building and location is identified and the deployment strategy is finalized, including an evaluation of the likely site hazards arising from different events. Deployment routes are shown in Figure 1, (Open Item 2).	include changes to existing onsite fences, structures and security, (Open Item 37).	
Notes: None		

<table>
<tr><th colspan="2">Maintain RCS Inventory Control</th></tr>
<tr><td colspan="2">Determine Baseline coping capability with installed coping[2] modifications not including FLEX modifications, utilizing methods described in Table 3-2 of NEI 12-06:
• Low Leak RCP Seals or RCS makeup required
• All Plants Provide Means to Provide Borated RCS Makeup</td></tr>
<tr><th colspan="2">PWR Installed Equipment Phase 1</th></tr>
<tr><td colspan="2">Provide a general description of the coping strategies using installed equipment including modifications that are proposed to maintain core cooling. Identify methods (Low Leak RCP Seals and/or borated high pressure RCS makeup) and strategy(ies) utilized to achieve this coping time.

The Phase 1 strategy to cope with a BDBEE causing an ELAP is through the use of low leakage Reactor Coolant Pump (RCP) seals which will be installed prior to FLEX system implementation, (Open Item 40).</td></tr>
<tr><th colspan="2">Details:</th></tr>
<tr><td>Provide a brief description of Procedures / Strategies / Guidelines</td><td>Confirm that procedure/guidance exists or will be developed to support implementation

Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4, (Open Item 17).</td></tr>
<tr><td>Identify modifications</td><td>List modifications

• Install low leakage RCP seals, (Open Item 40).</td></tr>
<tr><td>Key Reactor Parameters</td><td>List instrumentation credited for this coping evaluation.

The key instrumentation for core cooling includes:
<table>
<tr><th>Instrumentation</th><th>Safety Function</th></tr>
<tr><td>RCS Hot Leg Temperature (Thot)</td><td>Core cooling</td></tr>
<tr><td>RCS Cold Leg Temperature (Tcold) (Not available in Phase 1)</td><td>Core cooling</td></tr>
<tr><td>RCS Wide Range (WR) Pressure</td><td>Core cooling</td></tr>
<tr><td>SG Narrow Range (NR) Level</td><td>Core cooling</td></tr>
<tr><td>SG WR Level</td><td>Core cooling</td></tr>
<tr><td>Core Exit Thermocouple Temperature</td><td>Core cooling</td></tr>
<tr><td>RCS Passive Injection (Accumulator) Level</td><td>Core cooling</td></tr>
<tr><td>Pressurizer Level</td><td>Core cooling</td></tr>
<tr><td>Reactor Vessel Level Indicating System</td><td>Monitor reactor vessel inventory</td></tr>
</table></td></tr>
</table>

[2] Coping modifications consist of modifications to increase initial coping time, i.e. generators to preserve vital instruments or increase operating time on battery powered equipment.

Maintain RCS Inventory Control		
	AFW Pump Flow	Core cooling
	SG Pressure	Core cooling
	CST Level	Core cooling
	Battery Capacity/DC Bus Voltage (Battery capacity indication does *not* exist at RNP)	Support cooling and monitoring
	Neutron Flux	Maintain sub-criticality
	Most essential instrumentation to maintain core cooling and heat removal is connected to the safety related instrumentation buses. The power supply to the instrumentation buses is discussed in detail in the Safety Functions Support section of this document.	
Notes: None		

Maintain RCS Inventory Control	
PWR Portable Equipment Phase 2	
Provide a general description of the coping strategies using on-site portable equipment including modifications that are proposed to maintain core cooling. Identify methods (Low Leak RCP Seals and/or borated high pressure RCS makeup) and strategy(ies) utilized to achieve this coping time. Primary Strategy The primary recommended Phase 2 method to accomplish inventory control is to utilize the RWST and a charging pump. Currently, the RWST is seismically qualified, but is not protected from wind or missiles. The RWST will be hardened to protect against these hazards, (Open Item 41). The primary strategy to supply power to the charging pumps is by energizing 480V switchgear E1 or E2. The switchgear will be powered by modifying the current 480V switchgear E1 or E2 to include connection points near the existing diesel generator that will be capable of switching between the existing diesel generator power feeds and the portable FLEX generator power feeds, (Open Item 26). If E1 or E2 are unavailable, the secondary method will entail utilizing a manual transfer switch that can be used with portable generator connections that will be installed for a charging pump, (Open Item 27). Cables can be connected between the portable diesel generator and primary and interface components by utilizing a quick-connect system. The actual size of the generator will be determined at a later date, (Open Item 42). Alternative Strategy An alternate method for borated water makeup is to use a portable positive displacement pump connected directly to the Safety Injection headers from the RWST. A mechanical FLEX connection will be added to the RWST and a primary and alternate connection will be added to the SI system, (Open Item 32). Guidance in WCAP 17601 specifying RCS inventory positive displacement pumps sized at >30 gpm at an estimated 1500 psig will be followed, (Reference 6).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4, (Open Item 17).
Identify modifications	*List modifications* • Harden the RWST against wind and missiles (Open Item 41) • Modify 480V switchgear E1 or E2 connection points, (Open Item 26). • Install portable generator connections on a charging pump, (Open Item 27). • Add a mechanical FLEX connection to the RWST (Open Item 33) and a primary and alternate connection to the SI system, (Open Item 32).
Key Reactor Parameters	*List instrumentation credited or recovered for this coping evaluation.*

Maintain RCS Inventory Control	
PWR Portable Equipment Phase 2	
	Same as Phase 1.
Storage / Protection of Equipment: **Describe storage / protection plan or schedule to determine storage requirements**	
Seismic	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date, (Open Item 34). The RNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to RNP, (Open Item 35).
Flooding	*List how equipment is protected or schedule to protect* RNP is a dry site and the site elevation is above the maximum flood hazard level. Therefore, the FLEX equipment storage location onsite will be above the flood elevation. As stated in the RNP UFSAR Chapter 2 (Sections 2.4.2 and 2.4.4) the maximum flood elevation is 222 ft. while the grade level at RNP is 225 ft.
Severe Storms with High Winds	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date, (Open Item 34). The RNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to RNP, (Open Item 35).
Snow, Ice, and Extreme Cold	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date, (Open Item 34). The RNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the

<table>
<tr><th colspan="3">Maintain RCS Inventory Control</th></tr>
<tr><th colspan="3">PWR Portable Equipment Phase 2</th></tr>
<tr><td></td><td colspan="2">hazards applicable to RNP, (Open Item 35.</td></tr>
<tr><td>High Temperatures</td><td colspan="2">List how equipment is protected or schedule to protect

Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date, (Open Item 34).

The RNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to RNP, (Open Item 35).</td></tr>
<tr><th colspan="3">Deployment Conceptual Modification
(Attachment 3 contains Conceptual Sketches)</th></tr>
<tr><th>Strategy</th><th>Modifications</th><th>Protection of connections</th></tr>
<tr><td>Identify Strategy including how the equipment will be deployed to the point of use.</td><td>Identify modifications</td><td>Identify how the connection is protected</td></tr>
<tr><td>The FLEX equipment storage building and location has not yet been decided. Specific deployment of the FLEX equipment to the point of use will be identified and conceptual sketches provided once storage building and location is identified and the deployment strategy is finalized, including an evaluation of the likely site hazards arising from different events. Deployment routes are shown in Figure 1, (Open Item 2).</td><td>Modifications necessary for deployment of FLEX equipment include connection points to existing SSCs,(Open Item 36).

Modifications necessary for deployment of FLEX equipment include changes to existing onsite fences, structures and security, (Open Item 37).</td><td>The connection points for the FLEX equipment will be designed to withstand the applicable external hazards, (Open Item 38).</td></tr>
<tr><td colspan="3">Notes:

None</td></tr>
</table>

Maintain RCS Inventory Control	
PWR Portable Equipment Phase 3	
Provide a general description of the coping strategies using phase 3 equipment including modifications that are proposed to maintain core cooling. Identify methods (Low Leak RCP Seals and/or borated high pressure RCS makeup) and strategy(ies) utilized to achieve this coping time. A generator of adequate capacity will be delivered to the site from the Regional Response Center and will be capable of re-powering one train of charging flow. With one emergency train powered, the plant will have greater operational flexibility and the ability to add smaller non-essential loads. Power will be supplied to necessary equipment during a BDBEE.	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4, (Open Item 17).
Identify modifications	*List modifications* There are no modifications necessary for Phase 3.
Key Reactor Parameters	*List instrumentation credited or recovered for this coping evaluation.* Same as Phase 1.

Deployment Conceptual Modification (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
The FLEX equipment storage building and location has not yet been decided. Specific deployment of the FLEX equipment to the point of use will be identified and conceptual sketches provided once storage building and location is identified and the deployment strategy is finalized, including an evaluation of the likely site hazards arising from different	Modifications necessary for deployment of FLEX equipment include connection points to existing SSCs, (Open Item 36). Modifications necessary for deployment of FLEX equipment include changes to existing onsite fences, structures and security, (Open Item 37).	The connection points will be designed to withstand the applicable external hazards, (Open Item 38).

Maintain RCS Inventory Control		
PWR Portable Equipment Phase 3		
events. Deployment routes are shown in Figure 1, (Open Item 2).		
Notes: None		

Maintain Containment

Determine Baseline coping capability with installed coping[3] modifications not including FLEX modifications, utilizing methods described in Table 3-2 of NEI 12-06:

- Containment Spray
- Hydrogen igniters (ice condenser containments only)

PWR Installed Equipment Phase 1

Provide a general description of the coping strategies using installed equipment including modifications that are proposed to maintain containment. Identify methods (containment spray/Hydrogen igniter) and strategy(ies) utilized to achieve this coping time.

Containment isolation will occur on a Station Blackout (SBO) event. The requirement for the containment safety function is the ability to maintain or re-power key containment parameters as required by NEI 12-06 Section 3.2.1.10 and PWROG recommendations. The instrumentation recommended to monitor these key containment parameters are as follows:

Containment Pressure
- Powered by both safety batteries

Containment Temperature
- Powered only by safety battery B

Battery Capacity/DC Bus Voltage
- Local indication only

(Battery capacity indication does not exist at RNP)

All channels of containment instrumentation are powered by safety batteries and will be available until battery depletion.

RNP is not an ice condenser plant and, therefore, hydrogen igniters are not required.

Details:

Provide a brief description of Procedures / Strategies / Guidelines	Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4, (Open Item 17).
Identify modifications	*List modifications* There are no modifications necessary for Phase 1.
Key Containment Parameters	*List instrumentation credited for this coping evaluation.* The essential instrumentation for containment includes:

Containment Essential Instrumentation	**Safety Function**
Containment Pressure	Monitor Containment

[3] Coping modifications consist of modifications to increase initial coping time, i.e. generators to preserve vital instruments or increase operating time on battery powered equipment.

<table>
<tr><th colspan="2">Maintain Containment</th></tr>
<tr><td></td><td>
<table>
<tr><td></td><td>Integrity</td></tr>
<tr><td>Containment Temperature</td><td>Monitor Containment Integrity</td></tr>
<tr><td>Battery Capacity/DC Bus Voltage (Battery capacity indication does not exist at RNP)</td><td>Monitor Batteries</td></tr>
</table>

All of the essential instrumentation to maintain core cooling and heat removal is connected to the safety related instrumentation buses. The power supply to the instrumentation buses is discussed in detail in the Safety Functions Support section of this document.</td></tr>
<tr><td colspan="2">Notes:

None</td></tr>
</table>

Maintain Containment	
PWR Portable Equipment Phase 2	
Provide a general description of the coping strategies using on-site portable equipment including modifications that are proposed to maintain containment. Identify methods (containment spray/hydrogen igniters) and strategy(ies) utilized to achieve this coping time. A containment over-pressure and over-temperature analysis will be performed based on the postulated ELAP event, (Open Item 43). It is anticipated that the results of this calculation will show that containment will neither over-pressurize nor reach a temperature exceeding instrumentation Environmental Qualification (EQ) limits; thus requiring no additional strategies. Should the analysis not yield the predicted results described, a primary and secondary strategy will be provided.	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4, (Open Item 17).
Identify modifications	*List modifications* There are no modifications necessary for Phase 2.
Key Containment Parameters	*List instrumentation credited or recovered for this coping evaluation.* Same as Phase 1.
Storage / Protection of Equipment: **Describe storage / protection plan or schedule to determine storage requirements**	
Seismic	*List how equipment is protected or schedule to protect* It is anticipated that the results of a containment over-pressure and over-temperature analysis will show that containment will neither over-pressurize nor reach a temperature exceeding instrumentation EQ limits; thus requiring no additional strategies.
Flooding	*List how equipment is protected or schedule to protect* It is anticipated that the results of a containment over-pressure and over-temperature analysis will show that containment will neither over-pressurize nor reach a temperature exceeding instrumentation EQ limits; thus requiring no additional strategies.

Maintain Containment	
Severe Storms with High Winds	*List how equipment is protected or schedule to protect* It is anticipated that the results of a containment over-pressure and over-temperature analysis will show that containment will neither over-pressurize nor reach a temperature exceeding instrumentation EQ limits; thus requiring no additional strategies.
Snow, Ice, and Extreme Cold	*List how equipment is protected or schedule to protect* It is anticipated that the results of a containment over-pressure and over-temperature analysis will show that containment will neither over-pressurize nor reach a temperature exceeding instrumentation EQ limits; thus requiring no additional strategies.
High Temperatures	*List how equipment is protected or schedule to protect* It is anticipated that the results of a containment over-pressure and over-temperature analysis will show that containment will neither over-pressurize nor reach a temperature exceeding instrumentation EQ limits; thus requiring no additional strategies.

Deployment Conceptual Modification (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
Not applicable	Not applicable	Not applicable

Notes:

None

Maintain Containment	
PWR Portable Equipment Phase 3	
Provide a general description of the coping strategies using phase 3 equipment including modifications that are proposed to maintain containment. Identify methods (containment spray/hydrogen igniters) and strategy(ies) utilized to achieve this coping time. No additional strategies are required for Phase 3 pending the results of the containment analysis.	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4, (Open Item 17).
Identify modifications	*List modifications* There are no modifications necessary for Phase 3.
Key Containment Parameters	*List instrumentation credited or recovered for this coping evaluation.* Same as Phase 1.

Deployment Conceptual Modification (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
Not Applicable	Not Applicable	Not Applicable
Notes: None		

Maintain Spent Fuel Pool Cooling	
Determine Baseline coping capability with installed coping[4] modifications not including FLEX modifications, utilizing methods described in Table 3-2 of NEI 12-06: • **Makeup with Portable Injection Source**	
PWR Installed Equipment Phase 1	
Provide a general description of the coping strategies using installed equipment including modifications that are proposed to maintain spent fuel pool cooling. Identify methods (makeup via portable injection source) and strategy(ies) utilized to achieve this coping time. There is no Phase 1 strategy necessary for SFP makeup on loss of power to the SFP cooling pumps other than to monitor the SFP level. Currently, there is only one channel of SFP level and only the low level alarm is available in the Control Room. Visual determination of level is achieved by dispatching an operator locally to the operating floor. The resolution of enhanced level indication is being addressed by the actions taken in response to NRC Order EA-12-051, (Reference 13), (Open Item 44). With no heat removal, the time for the SFP water to rise from 150°F to boiling for a full core discharge (fills SFP to capacity) is approximately 3.64 hours, (Reference 14). This is sufficient time to mobilize equipment for Phase 2. The estimated time to uncover any spent fuel is significantly longer. The SFP cooling loop capacity was previously evaluated and a conservative heat load of 26.0 x 10^6 Btu/hr for the full core discharge case was established as the basis for SFP cooling capacity (UFSAR Section 9.1.3.1.2). Additional actions to establish venting are not required for RNP due to the physical separation within the power block. The current design of the structure is such that opening the existing doors and roof hatch provides sufficient venting.	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4, (Open Item 17).
Identify modifications	*List modifications* Modifications will be installed for the SFP level instrumentation per NRC Order EA 12-051, (Open Item 44).
Key SFP Parameter	*List instrumentation credited or recovered for this coping evaluation.* The essential instrumentation for the spent fuel cooling includes:

[4] Coping modifications consist of modifications to increase initial coping time, i.e. generators to preserve vital instruments or increase operating time on battery powered equipment.

	SFP Essential Instrumentation	Safety Function
	SFP level instrumentation	SFP Cooling and inventory control
	The SFP level instrumentation will be installed in accordance with NRC Order EA 12-051.	

Notes:

None

Maintain Spent Fuel Pool Cooling	
PWR Portable Equipment Phase 2	
Provide a general description of the coping strategies using on-site portable equipment including modifications that are proposed to maintain spent fuel pool cooling. Identify methods (makeup via portable injection source) and strategy(ies) utilized to achieve this coping time. Refilling the SFP may be accomplished through the use of hoses on the refueling floor, use of spray nozzles or providing makeup through the use of installed SFP piping. Primary Strategy The primary strategy for providing makeup water to the SFP is through the use of a portable pump (250 gpm) with attached suction and discharge hoses. Implementation of this strategy is predicated on accessibility to the SFP operating floor including evaluation that the radiological risk is acceptable for personnel access. To deploy this strategy, at least one portable pump is obtained from the FLEX storage building, (Open Item 45), and placed at the discharge canal. Hoses of sufficient length to reach the SFP are connected to the portable pump and the attached suction line is placed in the discharge canal, (Reference 7). This enables water to be transferred directly to the SFP. Alternate Strategy The alternate strategy is to provide makeup via installed SFP piping which will require that the connections be standardized, (Open Item 46). RNP currently has two Emergency Cooling Connections (ECCs) that can be used for external filling to robust piping. The first connection is a four inch blind flange on the suction side of the B Spent Fuel Pool Cooling (SFPC) Pump and allows water to be pumped directly into the pool. This connection is located on the second level of the Fuel Handling Building in the SFPC Pump Room. Located in the SFPC Heat Exchanger room, the ECC is upstream of the SFPC Heat Exchanger which then discharges into the SFP, (UFSAR Section 9.1.3). These connections will be used with portable pumps to draw water from diverse locations (RWST, discharge canal, etc.) and discharge directly into the pool, (Open Item 46).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4, (Open Item 17).
Identify modifications	*List modifications* • Modify existing ECCs on SFP piping to accommodate standard FLEX connection, (Open Item 46).
Key SFP Parameter	*List instrumentation credited or recovered for this coping evaluation* Same as Phase 1.

Maintain Spent Fuel Pool Cooling	
Storage / Protection of Equipment: Describe storage / protection plan or schedule to determine storage requirements	
Seismic	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date, (Open Item 34). The RNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to RNP, (Open Item 35).
Flooding	*List how equipment is protected or schedule to protect* RNP is a dry site and the site elevation is above the maximum flood hazard level. Therefore, the FLEX equipment storage location onsite will be above the flood elevation. As stated in the RNP UFSAR Chapter 2 (Sections 2.4.2 and 2.4.4) the maximum flood elevation is 222 ft. while the grade level at RNP is 225 ft.
Severe Storms with High Winds	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date, (Open Item 34). The RNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to RNP, (Open Item 35).

Snow, Ice, and Extreme Cold	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date, (Open Item 34). The RNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to RNP, (Open Item 35).
High Temperatures	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date, (Open Item 34). The RNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to RNP, (Open Item 35).

Deployment Conceptual Design (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
The FLEX equipment storage building and location has not yet been decided. Specific deployment of the FLEX equipment to the point of use will be identified and conceptual sketches provided once storage building and location is identified and the deployment strategy is finalized, including an evaluation of the likely site hazards arising from different events. Deployment routes are shown in Figure 1, (Open Item 2).	Modifications necessary for deployment of FLEX equipment include connection points to existing SSCs, (Open Item 36). Modifications necessary for deployment of FLEX equipment include changes to existing onsite fences, structures and security, (Open Item 37).	The connection points for the FLEX equipment will be designed to withstand the applicable external hazards, (Open Item 38).

Notes:

None

Maintain Spent Fuel Pool Cooling	
PWR Portable Equipment Phase 3	
Provide a general description of the coping strategies using phase 3 equipment including modifications that are proposed to maintain spent fuel pool cooling. Identify methods (makeup via portable injection source) and strategy (ies) utilized to achieve this coping time. The strategy for providing makeup water to the SFP in Phase 3 involves the continued use of the Phase 2 strategies which include the use of portable pumps to deliver makeup through hoses or by using the installed SFP piping. Diesel fuel will be delivered to the site to allow for continued equipment use. Currently installed instrumentation has been determined to be insufficient for SPF level monitoring during a BDBEE. The resolution of enhanced level indication is being addressed by the actions taken in response to Order EA-12-051, (Reference 13), (Open Item 44).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4, (Open Item 17).
Identify modifications	*List modifications* • Modifications will be installed for the SFP level instrumentation per NRC Order EA 12-051, (Open Item 44).
Key SFP Parameter	*List instrumentation credited or recovered for this coping evaluation* Same as Phase 1.

Deployment Conceptual Design (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
The FLEX equipment storage building and location has not yet been decided. Specific deployment of the FLEX equipment to the point of use will be identified and conceptual sketches provided once storage building and location is identified and the deployment strategy is finalized, including an evaluation of the likely site hazards arising from different events. Deployment routes are shown in Figure 1, (Open Item 2).	Modifications necessary for deployment of FLEX equipment include connection points to existing SSCs, (Open Item 36). Modifications necessary for deployment of FLEX equipment include changes to existing onsite fences, structures and security, (Open Item 37).	The connection points will be designed to withstand the applicable external hazards, (Open Item 38).
Notes: None		

Safety Functions Support
Determine Baseline coping capability with installed coping[5] modifications not including FLEX modifications.
PWR Installed Equipment Phase 1
Provide a general description of the coping strategies using installed equipment including station modifications that are proposed to maintain and/or support safety functions. Identify methods and strategy(ies) utilized to achieve coping times. Essential Instrumentation A significant amount of instrumentation is relied upon to monitor key reactor parameters. These instrumentation channels, powered by station batteries, would be unavailable upon battery depletion. The FLEX strategies to improve battery coping are necessary as a result of the need to extend Phase 1. This will be accomplished by installing supplemental, non-safety related batteries capable of providing an overall eight hour minimum capacity (the current FLEX strategy indicates that the addition of new batteries will best meet the eight hour requirement. Since the implementation of this modification challenges the ability to comply with the two cycle commitment, early detailed engineering will evaluate whether a better design option exists. Any change to the strategy will be updated in the August 28, 2013 submittal.) (Open Item 48). It has been determined that following an ELAP, the current configuration can result in a loss of SG wide range local level indication. To retain local indication throughout an event, the power supply for the A train SG wide range level instrumentation will be moved to either the A or B safety battery, (Open Item 49). Several critical instruments recommended by the PWR Owner's Group to remain available are physically located within the Turbine Building and are not protected from wind/missile hazards. It has been determined that it will be necessary to analyze or harden this area to provide an adequate level of assurance of instrumentation availability, (Open Item 50). HVAC Upon loss of AC power, no HVAC systems are available. There are no actions to restore HVAC during Phase 1. Strategies to provide cooling to the Control Room are already in place at RNP and will be used as-is, including opening cabinet and exterior doors. All other plant areas are sufficiently cool for eight hours, as determined for the SBO scenario. Further calculations will be performed for an ELAP without installed AC power restoration for longer periods of time, (Open Item 51). Lighting Upon loss of AC power, emergency lighting is provided by installed eight hour battery packs. Emergency plant lighting modifications to incorporate LED technology will be initiated thereby

[5] Coping modifications consist of modifications to increase initial coping time, i.e. generators to preserve vital instruments or increase operating time on battery powered equipment.

increasing the effective life of the battery packs, (Open Item 52).

Safety batteries A and B provide limited plant lighting. Supplementing the existing safety batteries with additional non-safety related batteries will have the objective of providing an overall eight hour minimum capacity, (Open Item 48). This will extend Phase 1 long enough to get Phase 2 coping strategies in place for the lighting currently powered by vital buses supplied by the safety batteries.

Additional portable lighting will be procured to facilitate implementation of FLEX strategies and to reduce human error and increase safety during a BDBEE event, (Open Item 53). The additional portable lighting will augment head and hand lamps, and will be coordinated with individual FLEX strategies.

Communications
Strategies to mitigate the loss of communications systems will be coordinated with and developed in accordance with the NRC Request For Information, (Reference 15), and NEI 12-06 Section 3.2.2(8), (Open Item 54).

Staffing
An ERO Staffing Analysis will be performed in accordance with NTTF Recommendation 9.3 and NEI 12-01, *Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities,* which will include ensuring adequate on-shift and augmented staff are available to support, install, and operate FLEX mitigation strategy equipment. (Open Item 55).

Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation.* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4, (Open Item 17).
Identify modifications	*List modifications and describe how they support coping time.* • Supplementing the existing safety batteries with additional non-safety related batteries, (Open Item 48). • The power supply for the A train SG wide range instrumentation will be moved to either the A or B safety battery, (Open Item 49). • Modifications to incorporate LED technology will be initiated thereby increasing the effective life of the battery packs, (Open Item 52).
Key Parameters	*List instrumentation credited for this coping evaluation phase.* There is no additional instrumentation credited outside of that previously discussed to support the coping strategies during Phase 1.
	There is no additional essential instrumentation beyond that which has been previously discussed.

Notes:
None

Safety Functions Support

PWR Portable Equipment Phase 2

Provide a general description of the coping strategies using on-site portable equipment including station modifications that are proposed to maintain and/or support safety functions. Identify methods and strategy(ies) utilized to achieve coping times.

Essential Instrumentation

Primary Strategy

The primary strategy for Phase 2 battery coping will require portable diesel generators to power the battery chargers, (Open Item 56). The primary strategy for powering the battery chargers is by modifying the current 480V switchgear E1 or E2 and the existing diesel generators to include portable diesel generator connection points near the existing diesel generator capable of switching between the existing diesel generator power feeds and portable FLEX generator power feeds, (Open Item 26). E1 or E2 provide power to the 480V MCC's that supply the battery chargers and subsequently the essential instrument busses. One portable generator will be capable of providing approximately 130kW to power two battery chargers and room ventilation fans. The secondary method for powering the battery chargers is to power battery chargers directly with manual transfer switches compatible for quick portable diesel generator connection, (Open Item 57). When powering only one battery charger by a manual transfer switch, the diesel generator must provide 60kW. Permanent cable and raceway will need to be installed to make cable deployment directly to the battery chargers feasible, (Open Item 58). Cables can be connected by utilizing a quick-connect system.

Alternate Strategy

The alternate strategy for essential instrumentation is to attain instrument readings utilizing portable hand held equipment, (NEI 12-06 Section 5.3.3.1). The instrument racks will be modified as necessary to provide for local instrument monitoring, (Open Item 59). Procedures for obtaining the readings will be developed for all of the instruments required for FLEX, (Open Item 72).

The backup method for providing ventilation to the Battery Rooms requires installing manual transfer switches with the ability to quick-connect to portable 5kW diesel generators, (Open Item 60).

Lighting

Primary Strategy

The vital lighting in the Control Room will be restored by providing power back to the battery chargers. The primary strategy for powering the battery chargers is by modifying the current 480V switchgear E1 or E2 and to include portable diesel generator connection points near the existing diesel generator capable of switching between the existing diesel generator power feeds and portable FLEX generator power feeds, (Open Item 26). E1 and E2 provide power to the 480V MCCs that feed the battery chargers.

Alternate Strategy

The alternate method for powering the battery chargers is to power battery chargers directly with manual transfer switches compatible for quick portable diesel generator connection, (Open Item 57). When powering only one battery charger by use of a manual transfer switch the diesel generator must be capable of providing 60kW. For outside areas, portable lighting towers may be

Safety Functions Support
PWR Portable Equipment Phase 2

used.

HVAC
Primary Strategy
Control Room: Existing Plant procedures describe how portable fan blowers and exhaust ductwork will be aligned in Control Room within three hours.
Other Areas of the Plant: The Phase 2 strategy of re-powering 480V switchgear E1 or E2 and 480V MCC 5 will restore HVAC. An analysis of HVAC requirements for operating equipment will be performed based on area heat-up times without cooling available for indefinite coping, (Open Item 61).
Battery Room: The primary strategy powering the Battery Room exhaust fans to remove any hydrogen gas accumulation during charging will be through portable diesel generators at connection points near the emergency diesel generator as described for powering the essential instrument bus, (Open Item 56).

Alternate Strategy
Control Room: The Phase 2 strategy of re-powering 480V switchgear E1 or E2 and 480V MCC 5 will restore HVAC. An analysis of HVAC requirements for operating equipment will be performed based on area heat-up times without cooling available for indefinite coping, (Open Item 61).
Other Areas of the Plant: Portable fan blowers and generators will be procured and used to provide forced convection for personnel habitability in areas where needed, (Open Item 62).
Battery Room: The alternate method for providing ventilation to the Battery Rooms requires installing manual transfer switches with the ability to quick-connect to portable 5kW diesel generators, (Open Item 60).

Communications
Strategies to mitigate the loss of communications systems will be coordinated with and developed in accordance with the NRC Request For Information, (Reference 15), and NEI 12-06 Section 3.2.2(8), (Open Item 54).

Staffing
An ERO Staffing Analysis will be performed in accordance with NTTF Recommendation 9.3 and NEI 12-01, *Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities,* which will include ensuring adequate on-shift and augmented staff are available to support, install, and operate FLEX mitigation strategy equipment. (Open Item 55).

Fuel for Portable Equipment
To support the implemented strategies used during Phase 2, all portable equipment that supplies power will be refueled as needed. Since the Emergency Diesel Generators will not be available during the BDBEE, the fuel oil tanks can be used to replenish the fuel tanks of the portable equipment used during Phase 2. RNP has several onsite fuel oil storage tanks (Diesel Fuel Oil Storage Tanks, Auxiliary Fuel Oil Storage Tanks), but none are protected from all external hazards. However, since they are sufficiently separate from one other, they can be credited as being in diverse locations, unlikely to suffer from a common failure. Though the inventory can be credited, the fuel currently cannot be easily retrieved under loss of power. RNP will acquire a fuel pumping

Safety Functions Support	
PWR Portable Equipment Phase 2	
vehicle/trailer that can be used to extract and deliver fuel oil from the tanks on site to staged FLEX equipment staged at various plant locations, (Open Item 63). An analysis to determine the fuel consumption rate of all portable generators/equipment will be performed, (Open Item 64).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation with a description of the procedure / strategy / guideline.* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4, (Open Item 17).

Identify modifications	*List modifications necessary for phase 2* • Modify the current 480V switchgear E1 or E2 and existing diesel generators to include portable diesel generator connection points near the existing diesel generator capable of switching between the existing diesel generator power feeds and portable FLEX generator power feeds, (Open Item 26). • Add manual transfer switches to allow portable diesel generators to be connected directly to battery chargers, (Open Item 57). • Add manual transfer switches for Battery Room exhaust fans with ability to quick-connect to diesel generators, (Open Item 60). • Permanent cable and raceway will be installed to make cable deployment directly to the battery chargers and Battery Room exhaust fans feasible, (Open Item 58). • Modify existing instrument racks as needed to enable monitoring of key parameters using portable equipment, (Open Items 59 and 72).
Key Parameters	*List instrumentation credited or recovered for this coping evaluation.* There is no additional instrumentation credited to support the coping strategies during Phase 2.
Storage / Protection of Equipment : **Describe storage / protection plan or schedule to determine storage requirements**	
Seismic	*List how equipment is protected or schedule to protect*

	Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date, (Open Item 34). The RNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to RNP, (Open Item 35).
Flooding	*List how equipment is protected or schedule to protect* RNP is a dry site and the site elevation is above the maximum flood hazard level. Therefore, the FLEX equipment storage location onsite will be above the flood elevation. As stated in the RNP UFSAR Chapter 2 (Sections 2.4.2 and 2.4.4) the maximum flood elevation is 222 ft. while the grade level at RNP is 225 ft.
Severe Storms with High Winds	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date, (Open Item 34). The RNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to RNP, (Open Item 35).

Snow, Ice, and Extreme Cold	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date, (Open Item 34). The RNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to RNP, (Open Item 35).
High Temperatures	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date, (Open Item 34). The RNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to RNP, (Open Item 35).

Deployment Conceptual Design (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use .	*Identify modifications*	*Identify how the connection is protected*
The FLEX equipment storage building and location has not yet been decided. Specific deployment of the FLEX equipment to the point of use will be identified and conceptual sketches provided once storage building and location is identified and the deployment strategy is finalized, including an evaluation of the likely site hazards arising from different events. Deployment routes are shown in Figure 1, (Open Item 2).	Modifications necessary for deployment of FLEX equipment include connection points to existing SSCs, (Open item 36). Modifications necessary for deployment of FLEX equipment include changes to existing onsite fences, structures and security, (Open item 37).	The connection points will be designed to withstand the applicable external hazards, (Open Item 38).

Notes:

None

Safety Functions Support
PWR Portable Equipment Phase 3
Provide a general description of the coping strategies using phase 3 equipment including modifications that are proposed to maintain and/or support safety functions. Identify methods and strategy(ies) utilized to achieve coping times. Essential Instrumentation The strategy for Phase 3 battery coping will be the continuation of the Phase 2 strategy and will require portable diesel generators to power the battery chargers. The strategy for powering the battery chargers will continue to consist of modifying the current 480V switchgear E1 or E2 and the existing diesel generators to include portable diesel generator connection points near the existing diesel generator capable of switching between the existing diesel generator power feeds and portable FLEX generator power feeds. Diesel fuel will be delivered to the site to allow for the continued use of Phase 2 generators/strategy of repowering batteries. Lighting The strategy for getting power restored to critical lighting areas (other than the Control Room) in Phase 3 is a continuation of the Phase 2 strategy. This is accomplished by modifying the current 480V switchgear E1 or E2 to include portable diesel generator connection points near the existing diesel generator. These connection points will be capable of switching between the existing diesel generator power feeds and portable FLEX generator power feeds. E1 or E2 provide power to critical 480V MCC's that feed various panels that supply lighting circuits considered critical to operations, (Open Item 26). Another strategy in Phase 3 to restore lighting is to power 480V MCC's 5 and 6 by either bus modification for diesel generator connection or by addition of a new panel with diesel generator connections integrated into the vertical panel design allowing for full horizontal bus ampacity, (Open Item 47). Diesel fuel will be delivered to the site to allow for the continued use of generators. HVAC The Phase 3 strategy of re-powering 480V switchgear E1 or E2 and 480V MCC-5 will restore HVAC. This strategy is a continuation of the approach used in Phase 2. An analysis of HVAC requirements for operating equipment is required based on area heat-up times without cooling available for indefinite coping, (Open Item 61). Portable fan blowers/generators will be used to provide forced convection for personnel habitability in areas where needed, (Open Item 62). Diesel fuel will be delivered to the site to allow for the continued use of generators. Communications Strategies to mitigate the loss of communications systems will be coordinated with and developed in accordance with the NRC Request For Information, (Reference 15), and NEI 12-06 Section 3.2.2(8), (Open Item 54). Staffing An ERO Staffing Analysis will be performed in accordance with NTTF Recommendation 9.3 and NEI 12-01, *Guideline for Assessing Beyond Design Basis Accident Response Staffing and*

Safety Functions Support	
PWR Portable Equipment Phase 3	
Communications Capabilities, which will include ensuring adequate on-shift and augmented staff are available to support, install, and operate FLEX mitigation strategy equipment. (Open Item 55). Fuel for Portable Equipment To allow for coping through Phase 3, all portable equipment that supplies power will be refueled as needed. Provisions will be made for an offsite fuel delivery to RNP before all onsite fuel is depleted, (Open Item 65).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation with a description of the procedure / strategy / guideline.* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4, (Open Item 17).
Identify modifications	*List modifications necessary for phase 3* • Modify the current 480V switchgear E1 or E2 and existing diesel generators to include portable diesel generator connection points near the existing diesel generator capable of switching between the existing diesel generator power feeds and portable FLEX generator power feeds, (Open Item 26). • Restore lighting is to power 480V MCC's 5 and 6 by either bus modification for diesel generator connection or by addition of a new panel with diesel generator connections integrated into vertical panel design allowing for full horizontal bus ampacity (Open Item 47).
Key Parameters	*List instrumentation credited or recovered for this coping evaluation.* There is no additional instrumentation credited to support the coping strategies during Phase 3.

Deployment Conceptual Design (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how	*Identify modifications*	*Identify how the connection is*

Safety Functions Support		
PWR Portable Equipment Phase 3		
the equipment will be deployed to the point of use.		*protected*
The FLEX equipment storage building and location has not yet been decided. Specific deployment of the FLEX equipment to the point of use will be identified and conceptual sketches provided once storage building and location is identified and the deployment strategy is finalized, including an evaluation of the likely site hazards arising from different events. Deployment routes are shown in Figure 1, (Open Item 2).	Modifications necessary for deployment of FLEX equipment include connection points to existing SSCs, (Open Item 36). Modifications necessary for deployment of FLEX equipment include changes to existing onsite fences, structures and security, (Open Item 37).	The connection points will be designed to withstand the applicable external hazards, (Open Item 38).
Notes: None		

PWR Portable Equipment Phase 2							
Use and (potential / flexibility) diverse uses						*Performance Criteria*	*Maintenance*
List portable equipment	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / PM requirements
FLEX Portable Pump (2)	X					>300 gpm at 300 psig (Reference 11)	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5
High Capacity FLEX Portable Pump (2)	X					3000 gpm	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5
High Pressure FLEX Positive Displacement Pump (2)	X					>30 gpm at ~1500 psig (Reference 6) (Open Item 66)	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5
Portable Diesel Generators (TBD)	X	X					Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5
FLEX portable pump (2)		X				>300 gpm at 300 psig (Reference 11)	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5
FLEX portable pump (2)			X			>500 gpm (Reference 7)	Maintenance will be performed in accordance with the

PWR Portable Equipment Phase 2							
Use and (potential / flexibility) diverse uses						*Performance Criteria*	*Maintenance*
List portable equipment	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / PM requirements
							requirements of NEI 12-06, Section 11.5
Portable Fuel Pumping Vehicle (or trailer) (1)	X		X			Capacity needed to be determined	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5
Portable Fan Blower and Generator (1)					X	Capacity needed to be determined	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5
Lighting equipment (towers, cabling) (4 areas)					X	N/A	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5
Handheld Devices for Instrumentation Reading (e.g., Digital Voltmeter) (TBD)				X		Capable of reading instrumentation locally NEI 12-06, Section 5.3.3-1	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5
Debris Removal Equipment/Skid-Steer Tractor (2)					X	N/A	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5

PWR Portable Equipment Phase 2							
Use and (potential / flexibility) diverse uses						*Performance Criteria*	*Maintenance*
List portable equipment	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / PM requirements
Large Front End Loader (1)					X	N/A	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5
Communications Equipment (i.e. satellite phones) (TBD)	X	X	X	X	X	Must be capable of communications inside and outside buildings and with the Control Room/Command Center	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5

PWR Portable Equipment Phase 3							
Use and (potential / flexibility) diverse uses						*Performance Criteria*	*Maintenance*
List portable equipment	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / PM requirements
Portable Diesel Generator (1)	X	X	X	X		2.5 MW, step-down transformer to 480 VAC, Switchgear for multiple connections	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5 (Open Item 67)

Phase 3 Response Equipment/Commodities

Radiation Protection Equipment • Survey instruments • Dosimetry • Off-site monitoring/sampling	An analysis will be performed to determine the radiation protection equipment requirements, (Open Item 68).
Commodities • Food • Potable water • Sanitary Facilities	An analysis will be performed to determine the commodities requirements, (Open Item 69).
Fuel Requirements • Diesel Fuel	Amount of fuel required will be determined, (Open Item 64).
Heavy Equipment • Transportation equipment • Debris clearing equipment	Transportation equipment will be provided to move large skid/trailer mounted equipment provided from off-site, (Open Item 70).

Attachment 1A
Sequence of Events Timeline

Action item	Elapsed Time	Action	ELAP New Time Constraint Y/N	Remarks / Applicability
1	0	Event Starts SDAFW Pump Auto Starts on Loss of Offsite Power; Containment isolates immediately upon loss of offsite power; Containment Instrumentation	N/A	
2	0 – 0.25 hrs	Take manual control of the steam driven auxiliary feedwater pump flow	N	Currently in EPP-1
3	0 – 0.5 hrs	Open cabinet/exterior doors in CR for HVAC concerns	N	Currently in EPP-1
4	0 - 3 hrs	Install portable fan blower and exhaust ducting for Control Room HVAC per EPP-1	N	Currently in EPP-1
5	1 hour	Manually swap over to the supplementary batteries within one hour (based on indicated vital battery voltage)	Y	Align prior to depletion of safety batteries
6	1 – 6 hrs	Manually align alternate CST to the SDAFW pump suction (contingency based on CST inventory availability)	Y	Technical basis provided in previous section (see page 5)
7	1 - 4 hrs	Connect and Operate Portable FLEX Pump to provide borated makeup to RCS	Y	Technical basis provided in previous section (see page 5)
8	1 - 24 hrs	Align portable pumps/hoses to water sources as available (CST, Alt CST, 'D' Deepwell, A& B hotwells) and AFW for SG makeup (contingency based on primary strategy, SDAFWP availability)	Y	Technical basis provided in previous section (see page 5)
9	2 - 5 hrs	Modes 1-4; Depressurize SGs to 300 psia	Y	Technical basis provided in previous section (see page 5)
10	2 - 12 hrs	Align portable nitrogen tanks to operate SG PORV's (contingency for installed, robust N_2 accumulator)	Y	Technical basis provided in previous section (see page 5)
11	2-16 hr	Align portable pump from discharge canal with hose over edge of SFP (time to deploy is dependent on plant mode)	N	EDMG related and has been done in 4 hours
12	2-16 hr	Align portable pump from discharge canal with hose to Emergency Cooling Connections (contingency based on availability of SFP	Y	Technical basis provided in previous section

Action item	Elapsed Time	Action	ELAP New Time Constraint Y/N	Remarks / Applicability
		deck)		(see page 5)
13	2 - 16 hr	Align portable pump from discharge canal with hose and spray monitors (time to deploy is dependent on plant mode)	Y	Technical basis provided in previous section (see page 5)
14	2 - 24 hrs	Provide portable lighting for the following areas: • EDG Rollup Door area • Radwaste Building area • Intake Structure • AFW and Condensate pumps areas • SFP/WST area	N	Can use portable lighting (e.g., flashlights) if not immediately available
15	4 - 5 hr	Manually align alternate CST to the SDAFW pump suction (time based on CST inventory	Y	Technical basis provided in previous section (see page 5)
16	5 - 7 hrs	Restore power to safety battery chargers using a portable generator	Y	Technical basis provided in previous section (see page 5)
17	5 - 7 hrs	Restore power to Battery Room Exhaust Fans	Y	Technical basis provided in previous section (see page 5)
18	6 - 12 hrs	Restore power to charging pump for borated makeup to RCS from RWST (Primary strategy for RCS makeup)	Y	Technical basis provided in previous section (see page 5)
19	6 - 12 hrs	Align portable pumps/hoses from RWST to SI header for makeup to RCS (contingency based on charging pump availability)	Y	Technical basis provided in previous section (see page 5)
20	12 - 16 hrs	Manually isolate SI accumulator to prevent nitrogen injection	Y	Technical basis provided in previous section (see page 5)
21	12 - 24+ hrs	Align portable fan blowers and exhaust ducting to Charging Pump Room	Y	Technical basis provided in previous section (see page 5)
22	12 - 24+ hrs	Install portable fan blowers and exhaust ducting for HVAC (non Control Room areas) • Electrical Equipment Area • Switchgear Room	Y	Technical basis provided in previous section (see page 5)

Action item	Elapsed Time	Action	ELAP New Time Constraint Y/N	Remarks / Applicability
		• Battery Room		
23	12 - 72+ hrs	Refuel portable diesel equipment	TBD	As Needed
24	16 - 72 hrs	Align portable pumps to service water piping and make necessary valve alignments for SG makeup (contingency for inventory availability of CST and/or alternate CST)	Y	Technical basis provided in previous section (see page 5).
25	24 - 72+ hrs	Restore power to lighting panels providing lighting in critical plant areas	N	Can use portable lighting (e.g., flashlights) if not immediately available
26	24 - 72 hrs	Restore power to 480V Emergency Switchgear buses E1 or E2 and initiate cooldown to Cold Shutdown	N	Not time critical

Attachment 1B
NSSS Significant Reference Analysis Deviation Table

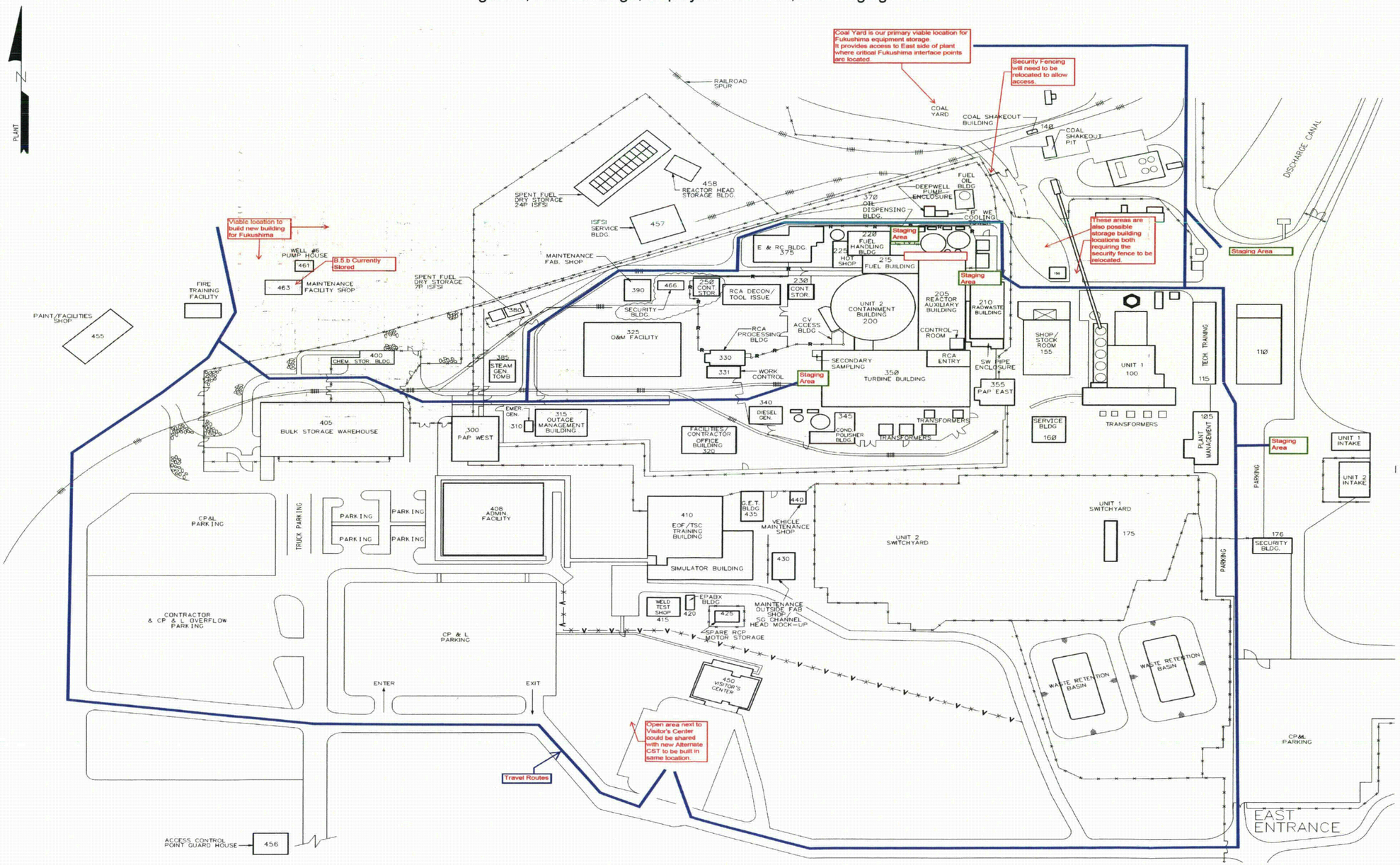
Item	Parameter of interest	WCAP value (WCAP-17601-P August 2012 Revision 0)	WCAP page	Plant applied value	Gap and discussion
	None				

Attachment 2
Milestone Schedule

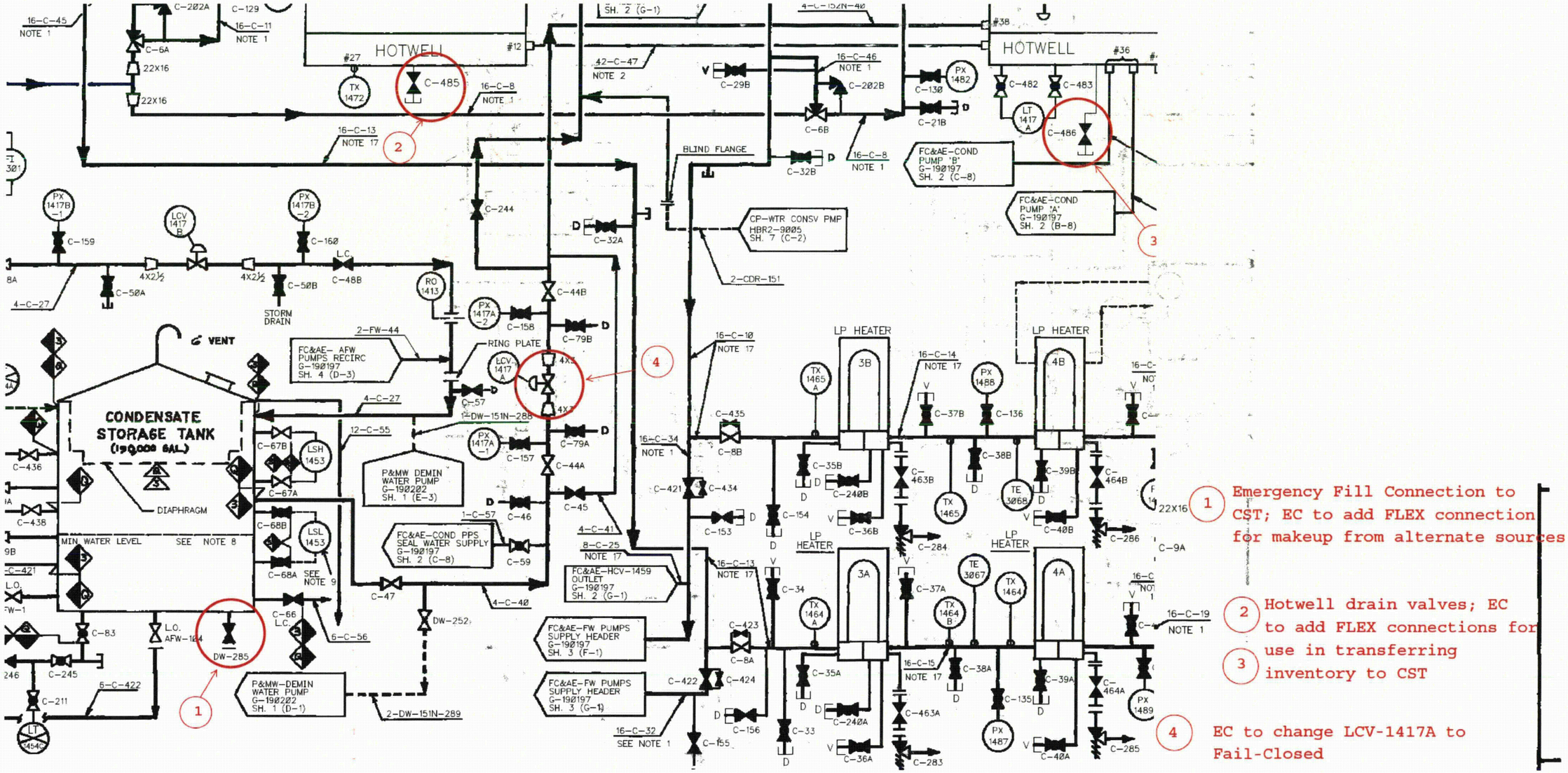
Task	Milestone Date
Complete Strategy Development	February 2013
Submit Integrated Plan	February 2013
Submit 6-month Status Update	August 2013
	February 2014
	August 2014
	February 2015
Complete Modification Identification	March 2013
Complete Modification Development	February 2015
Complete Equipment Procurement	February 2015
Complete Equipment PM Development	February 2015
Complete FSG Development	February 2014
Issue FSGs	February 2015
Complete Training Development	May 2014
Initiate Training Implementation	May 2014
Complete Training	May 2015
Complete Staffing Assessment	November 2014
Issue Regional Response Center Playbook for RNP	May 2015
Complete Communications Integrated Plan	November 2014
Complete Online Modification Implementation	May 2015
Complete Outage Modification Implementation (R229)	June 2015
RNP FLEX Implementation Complete	June 2015

The dates provided in this milestone schedule are best estimates based on information available at the time the schedule was developed and may change as designs are finalized and construction proceeds. Therefore, these dates and sequences are not considered to be regulatory commitments.

Attachment 3
Figure 1, FLEX Storage, Deployment Routes, and Staging Areas



Attachment 3
Figure 2, FLEX Connection Locations – Mechanical Core Cooling – SG Makeup (Open Item 71)



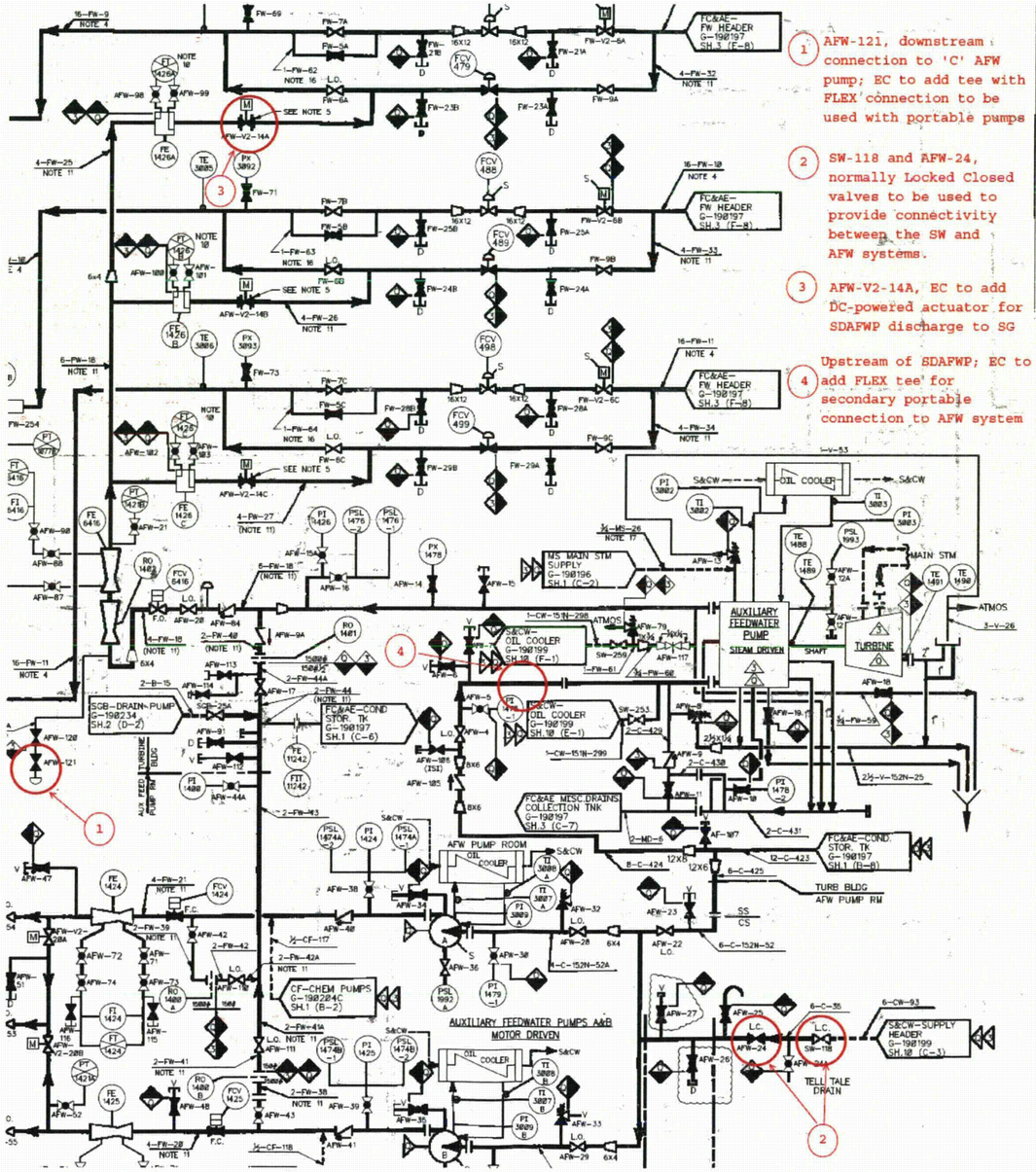
1 Emergency Fill Connection to CST; EC to add FLEX connection for makeup from alternate sources

2 Hotwell drain valves; EC to add FLEX connections for use in transferring inventory to CST

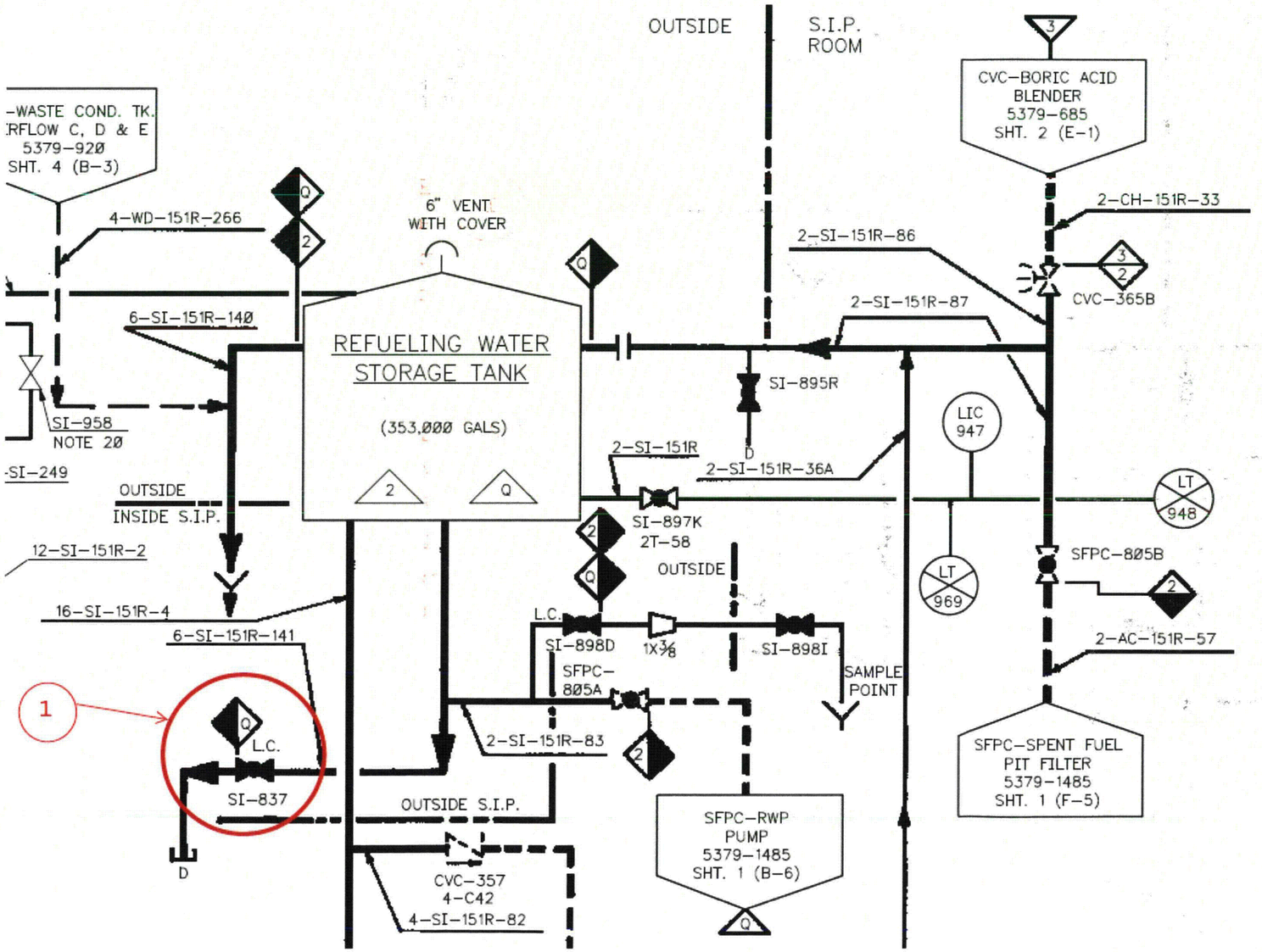
3

4 EC to change LCV-1417A to Fail-Closed

Attachment 3
Figure 3, FLEX Connection Locations – Mechanical – Core Cooling – SG Makeup (Open Item 71)



Attachment 3
Figure 4, FLEX Connection Locations – Mechanical – RCS Inventory – Borated makeup (Open Item 71)

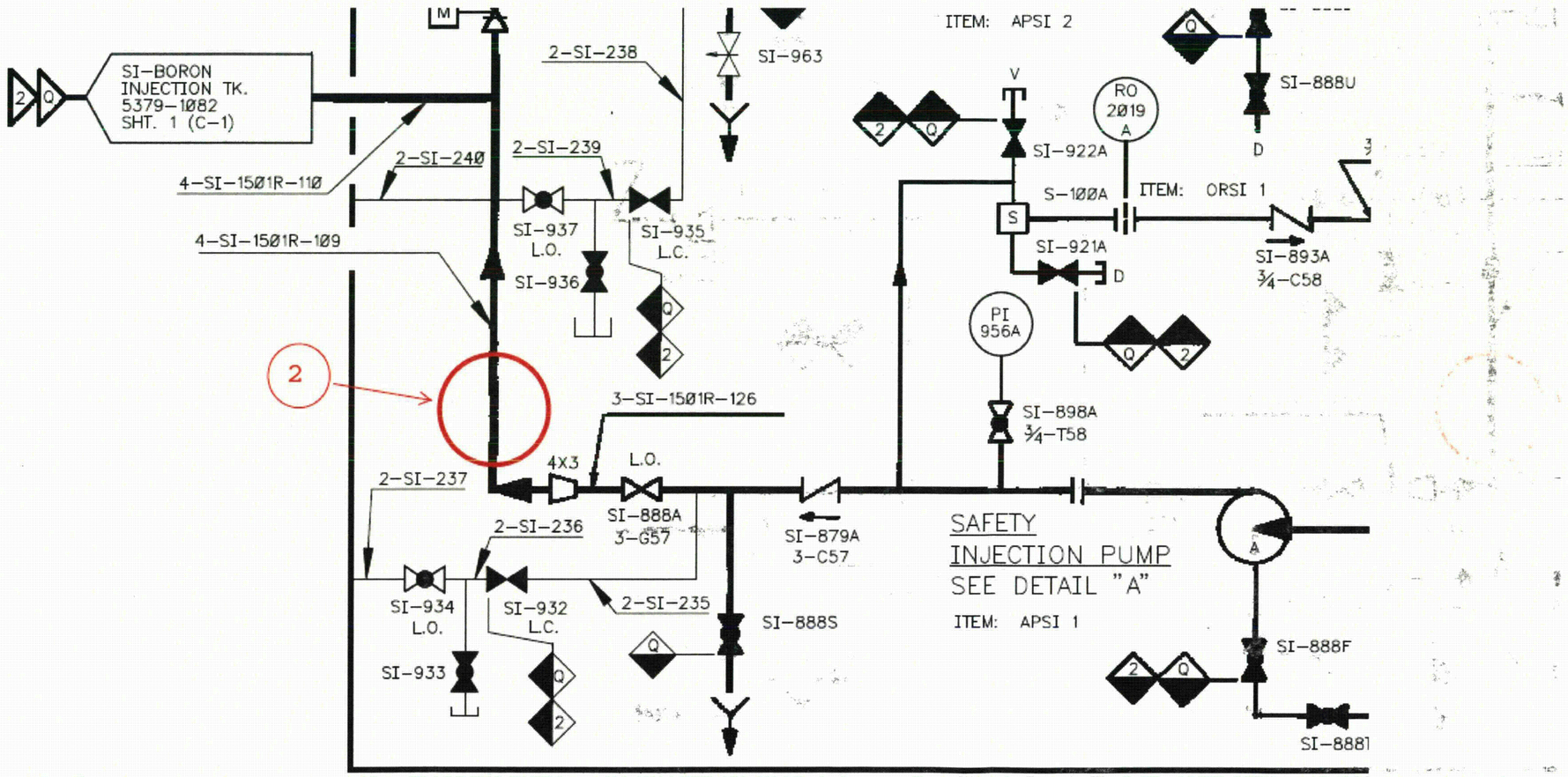


NOTE:
FOR GENERAL NOTES & REFERENCE DRAWINGS SEE SHEET 1.

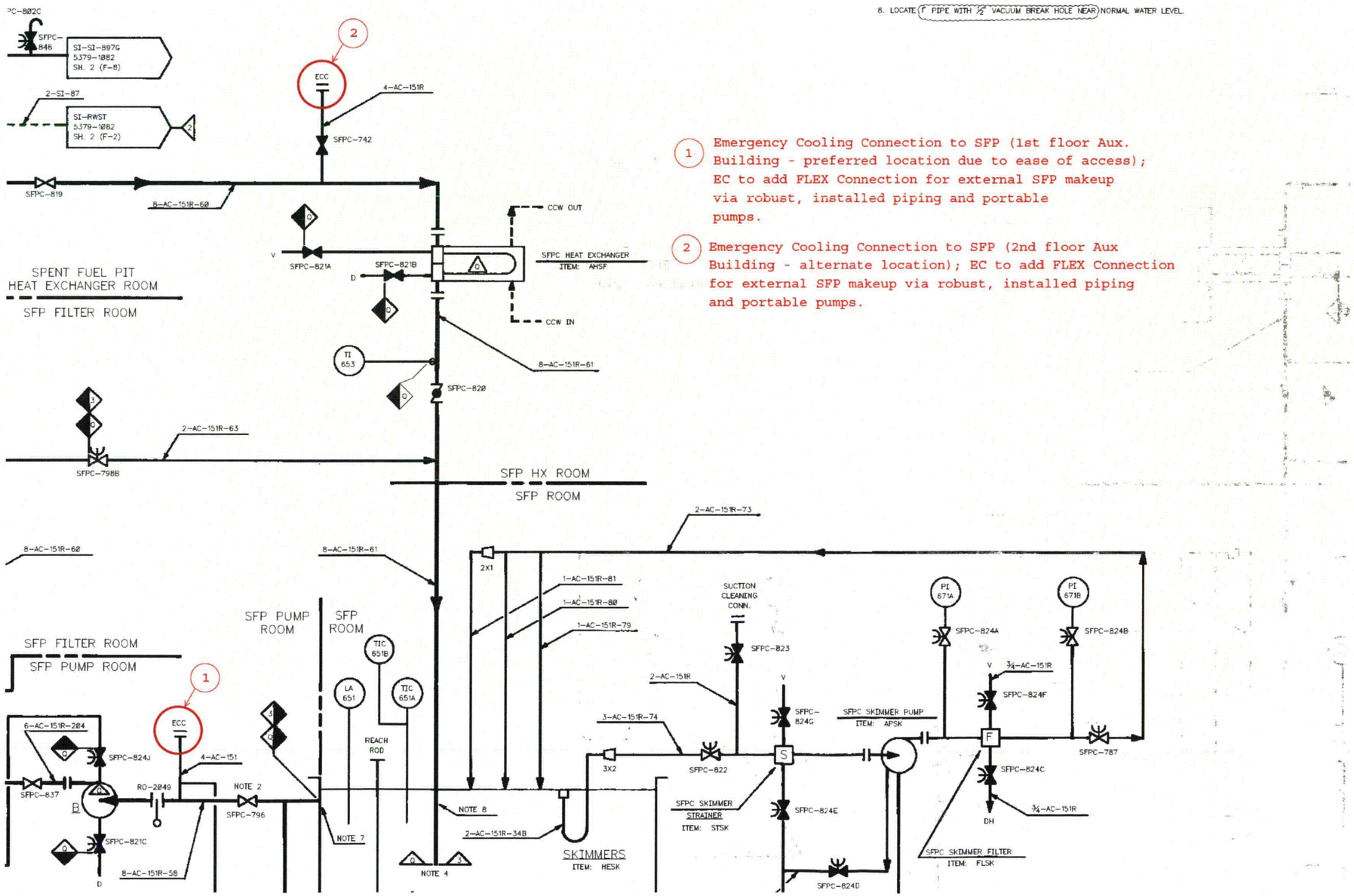
1 EC to add FLEX connection at SI-837 to use with portable pump for access to RWST inventory

2 EC to add "N+1" isolation valves & tees with FLEX connections on Line 4-SI-1501R-109 for use with portable equipment to the Safety Injection header

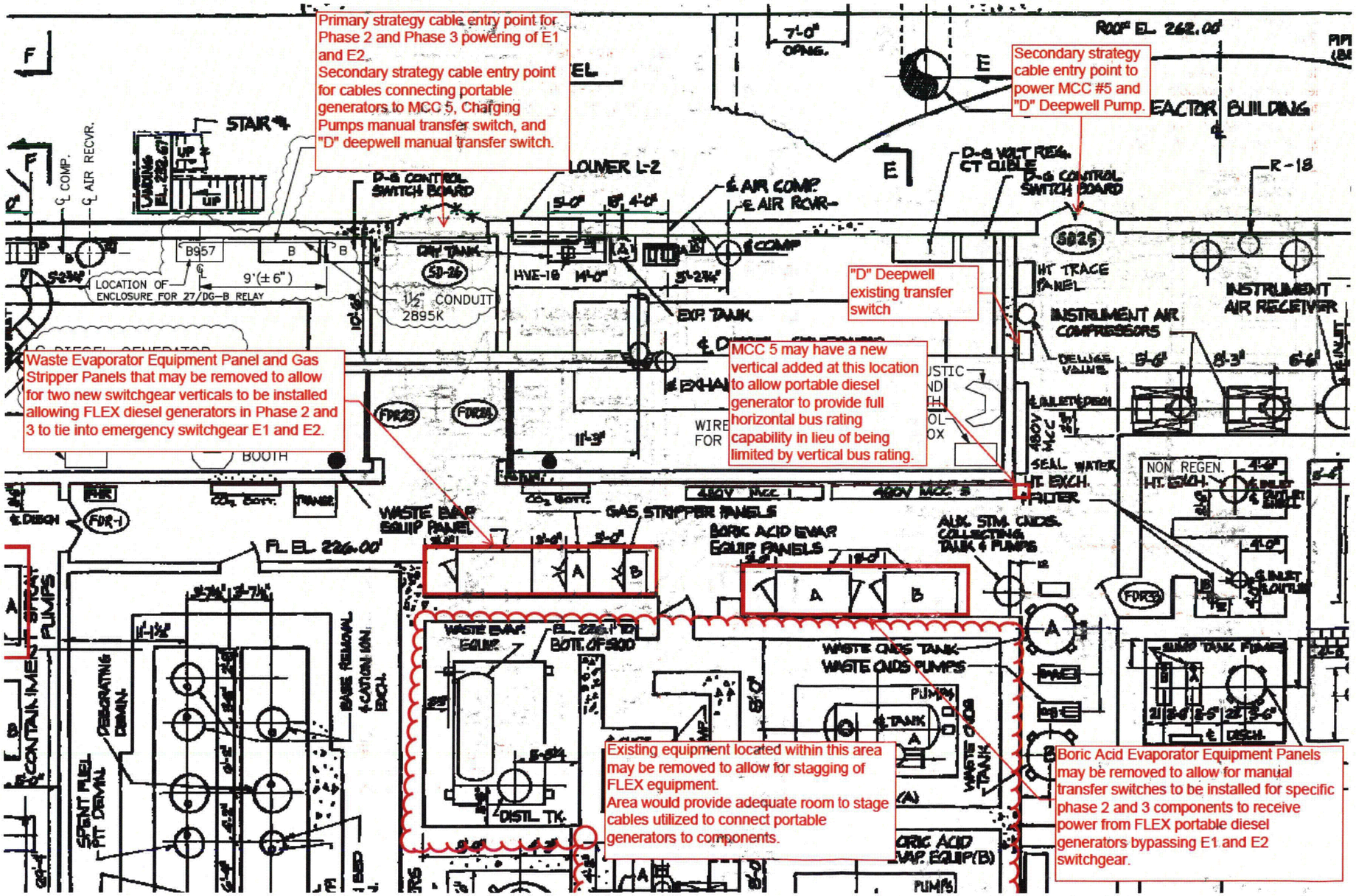
Attachment 3
Figure 4a, FLEX Connection Locations – Mechanical – RCS Inventory – Borated makeup (Open Item 71)



Attachment 3
Figure 5, FLEX Connection Locations – Mechanical – SFP Makeup/Cooling (Open Item 71)



Attachment 3
Figure 6, FLEX Connection Locations – Primary/Secondary Electrical (Open Item 71)



Attachment 4
List of References

The following references are provided for information only. Their inclusion within this document does not incorporate them into the current licensing basis (CLB) by reference nor does it imply intent to do so. References which have not been docketed are available onsite for NRC examination and inspection.

Ref #	Document Title
1	NRC Order EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events", March 12, 2012.
2	Japan Lessons-Learned Project Directorate JLD-ISG-2012-01, "Compliance with Order EA-12-049, Order Modifying License with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events", Interim Staff Guidance, Revision 0, August 29, 2012.
3	EPRI 1019199, "Experience-Based Seismic Verification Guidelines for Piping and Tubing: Volume I-Seismic Verification Procedure, and Volume II - Performance of Piping and Tubing in Strong-Motion Earthquakes," Section.
4	AWWA D100, Standard for Welded Carbon Steel Tanks for Water Storage.
5	EPRI NP-6041-SL, Revision 1, "A Methodology for Assessment of Nuclear Power Plant Seismic Margin (Revision 1)," Electric Power Research Institute, August 1991.
6	Westinghouse WCAP-17601-P, Reactor Coolant System Response to the Extended Loss of AC Power Event for Westinghouse, Combustion Engineering and Babcock & Wilcox NSSS Designs, Revision 0, August 2012.
7	EDMG-011, Revision 12, Spent Fuel Pool Casualty.
8	NRC Regulatory Guide 1.155 Station Blackout, August 1988.
9	Calculation 89-0077 Rev.0, Impact on HBR Appendix R Analysis of Reducing AFW Flow, 11/17/89.
10	Specification WELC-5379-S8 Rev. 2, Specification for Miscellaneous Tanks.
11	PWROG PA-PSC-0965, "PWROG Core Cooling Position Paper," Revision 0, November 2012.
12	Calculation 52212-C-069, Rev. 1, Updated Geotechnical Review.
13	NRC Order EA-12-051, March 12, 2012, "Issuance of Order to Modify Licenses With Regard To Reliable Spent Fuel Pool Instrumentation", see Att. 1.
14	Calculation RNP-M-Mech-1590, Rev. 5, Time-to-Boil Curves for the Spent Fuel Pool and Refueling Cavity
15	NRC Letter, 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.
16	NEI 12-01, Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications.
17	URS Study, FLEX Strategies and Implementation Plan for RNP, EC 0000088926 Rev. 0, February 2013.
18	H.B. Robinson, Unit No. 2 Station Blackout Coping Analysis Report, 8S19-P-101, Revision 7.
19	EPP-1, Loss of All AC Power, Revision 51.

Attachment 5
List of Open Items

Item #	Open Item Description
1.	A Regional Response Centers (RRC) playbook will be developed to support RNP during beyond design basis events.
2.	Figure(s) (site plot plan) showing FLEX equipment storage locations and deployment routes will be provided.
3.	Deployment strategies will be incorporated into an administrative program.
4.	RNP will implement the programmatic controls in accordance with NEI 12-06.
5.	Equipment associated with these strategies will be procured as commercial equipment with design, storage, maintenance, testing, and configuration control in accordance with NEI 12-06, Section 11.1.
6.	The unavailability of equipment and applicable connections that directly perform a FLEX mitigation strategy will be managed using plant equipment control guidelines developed in accordance with NEI 12-06, Section 11.5.
7.	Programs and processes will be established to ensure personnel proficiency in the mitigation of beyond-design-basis events as developed and maintained in accordance with NEI 12-06, Section 11.6.
8.	The FLEX strategies and basis will be maintained in overall FLEX basis documents.
9.	Existing plant configuration control procedures will be modified to ensure that changes to the plant design, physical plant layout, roads, buildings, and miscellaneous structures will not adversely impact the approved FLEX strategies in accordance with NEI 12-06, Section 11.8.
10.	Applicable training initiated through the Systematic Approach to Training (SAT) process will be completed prior to the implementation of FLEX.
11.	A contract has been signed between the site and the Pooled Equipment Inventory Company to provide Phase 3 services. A Playbook describing the coordination strategies between RNP and the Regional Response Center will be developed.
12.	To limit the required post-event operator actions, one of the three trains of the steam supply and regulating valves will be modified to operate on DC power and will be capable of being operated from the Control Room.
13.	Modifications will be initiated to harden the CST against wind and missiles.
14.	An alternate CST will be added which will be sufficiently rugged and qualified to withstand the applicable hazards.
15.	LCV-1417A will be converted from a fail-open valve to a fail-closed valve to avoid a failure to close the valve in a timely manner and thereby to preclude loss of CST inventory.
16.	A seismically qualified pressure source capable of supplying 8

	hours of SG PORV operation will be installed.
17.	Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4.
18.	A portable pump will be procured and pre-staged near the condensate pump area.
19.	To meet N+1 requirements for Item 18 above, an additional pump will be stored in a building designed per the criteria of NEI 12-06 Section 11.3.
20.	Valve DW-285 to be modified to include FLEX connections.
21.	An additional connection will be provided for the CST to satisfy primary and alternate criteria.
22.	A tee-connection will be added to the C AFW Pump discharge.
23.	Sufficient nitrogen tanks (for SG PORV) for a 24 hour coping duration will be relocated to a protected location.
24.	The existing connection point for the portable nitrogen tank will be modified to include quick-connects.
25.	The SI accumulator isolation valves will be re-powered via switchgear E1 or E2 or directly to the MCC's with portable diesel generators.
26.	Modify the current 480V switchgear E1 or E2 and existing diesel generator s to include portable diesel generator connection points near the existing diesel generator capable of switching between the existing diesel generator power feeds and portable FLEX generator power feeds.
27.	If E1 or E2 are unavailable, the secondary method will entail utilizing a manual transfer switch with portable generator connections that will be installed for a charging pump
28.	To provide primary and alternate connections for portable pumps, an alternate mechanical tee-connection will be provided.
29.	Mechanical connections will be added directly into both the south and north SW headers to allow connection of a portable pump.
30.	N+1 portable pumps will be procured and stored in a robust structure in a protected location near the intake structure in support of Item 29 above.
31.	During Modes 5 and 6, a portable pump will be used to take suction from the RWST and discharge to the SI header.
32.	Primary and alternate mechanical FLEX connections will be added to the SI header.
33.	Drain valve (SI-837) at the base of the RWST will be modified to align it to the standardized connection type.
34.	Structures to provide protection of the FLEX equipment will be built prior to the FLEX implementation date.
35.	The RNP procedures and programs must be developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to RNP.
36.	Necessary modifications will be made to existing SSC connections to facilitate FLEX equipment deployment.

37.	Necessary modifications will be made to existing onsite fences, structures or security parameters to facilitate flex equipment deployment.
38.	The equipment connection points will be designed to withstand the applicable external hazards.
39.	The means for connecting the Phase 3 generator will be identified based on the selected onsite location of the generator.
40.	Low leakage Reactor Coolant Pump (RCP) seals will be installed.
41.	Harden the RWST against wind and missiles.
42.	Actual size of generator to be determined at a later time.
43.	A containment over-pressure and over-temperature analysis will be performed.
44.	The resolution of method for SFP level determination is being addressed by the actions taken in response to Order 12-051.
45.	To maintain SFP inventory, a portable pump equipped with suction and discharge lines and compatible hose connections will be available.
46.	The alternate strategy for SFP cooling is to provide makeup via installed SFP piping which will require modifications. Two Emergency Cooling Connections (ECCs) can be used for external filling to robust piping. These connections will be used with portable pumps to draw water from diverse locations directly into the pool.
47.	Alternate methods for powering the 480V MCC 5 and 6 require either bus modification to accommodate the diesel generator connector, or the addition of a new diesel generator connection integrated into vertical panel design allowing for full horizontal bus ampacity.
48.	Install supplemental, non-safety related batteries capable of providing an overall eight hour minimum capacity (the current FLEX strategy indicates that the addition of new batteries will best meet the eight hour requirement. Since the implementation of this modification challenges the ability to comply with the two cycle commitment, early detailed engineering will evaluate whether a better design option exists.
49.	To retain SG wide range local level indication throughout an event, the power supply for the A train SG wide range level instrumentation will be moved to either the A or B safety battery.
50.	Applicable areas of the Turbine Building will be analyzed or hardened to provide an adequate level of assurance of critical instrumentation availability.
51.	Calculations will be performed for extending the time before HVAC is needed to beyond eight hours.
52.	Emergency plant lighting modifications to incorporate LED technology will be initiated thereby increasing the effective life of the battery packs.
53.	Additional portable lighting will be procured to facilitate implementation of the FLEX strategies.
54.	Strategies to mitigate the loss of communications systems will

	be developed per NEI 12-06 Section 3.2.2(8).
55.	Staffing studies will be performed in accordance with NRC RFI and NEI 12-01 to ensure adequate staffing is available to support, install, and operate FLEX equipment in the time necessary.
56.	Phase 2 battery coping will require portable diesel generators to power the battery chargers and the Battery Room exhaust fans in order to remove hydrogen gas accumulation during charging.
57.	Manual transfer switches, compatible for quick portable diesel generator connection, will be installed to directly power the battery chargers.
58.	Permanent cable and raceway will be installed to make cable deployment directly to the battery chargers and Battery Room exhaust fans feasible.
59.	Existing instrument racks will be modified to enable monitoring of key parameters using portable equipment.
60.	Manual transfer switches with the ability to quick-connect to portable 5kW diesel generators will be installed to provide ventilation to the Battery Rooms.
61.	An analysis of HVAC requirements for operating equipment will be performed based on area heat-up times without cooling available for indefinite coping.
62.	Portable fan blowers/generators will be procured and used to provide forced convection.
63.	RNP will acquire a fuel pumping vehicle/trailer that can be used to extract and deliver fuel oil.
64.	An analysis to determine the fuel consumption rate of all portable generators/equipment will be performed.
65.	Provisions will be made for an offsite fuel delivery to RNP before all onsite fuel is depleted.
66.	Results of the PWROG task will be used in determining the minimum flow rate and pumping capacity required for borated water makeup.
67.	Portable equipment maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5.
68.	An analysis will be performed to determine the radiation protection equipment requirements.
69.	An analysis will be performed to determine the commodities requirements.
70.	Transportation equipment will be provided to move large skid/trailer mounted equipment provided from off-site.
71.	Additional or revised conceptual sketches will be provided in future updates as engineering packages mature from conceptual design to final design.
72.	Develop procedures, references, and tables to determine key parameters using a portable DVM in the instrument racks.