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ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

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

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

References:

1. Nuclear Regulatory Commission (NRC) Order Number EA-12-049, Order Modifying Licensees With Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, Revision 0, dated March 12, 2012, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12054A735).
2. NRC Interim Staff Guidance JLD-ISG-2012-01, Compliance with Order EA-12-051, Order Modifying Licenses with Regard to Requirements for Mitigation strategies for Beyond-Design-Basis External Events, Revision 0, dated August 29, 2012 (ADAMS Accession No. ML12229A174).
3. NEI 12-06, *Diverse and Flexible Coping Strategies (FLEX) Implementation Guide*, Revision 0-A, dated August 2012.
4. Duke Energy Letter, *Carolina Power and Light Company and Florida Power Corporation's Initial Status Report in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049),* dated October 29, 2012, (ADAMS Accession No. ML12307A021).
5. Duke Energy Letter, *Carolina Power and Light Company's Overall Integrated Plan in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated February 26, 2013.
6. Duke Energy Letter, *H. B. Robinson Steam Electric Plant, Unit No. 2, First Six-Month Status Report in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated August 28, 2013 (ADAMS Accession No. ML13252A243).

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NRR

Ladies and Gentlemen,

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued Order EA-12-049 (Reference 1) to Duke Energy Progress, Inc. Reference 1 was immediately effective and directs Duke Energy to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities in the event of a beyond-design-basis external event. Specific requirements are outlined in Attachment 2 of Reference 1.

Reference 1 required submission of an initial status report 60 days following issuance of the final interim staff guidance (Reference 2) and an overall integrated plan pursuant to Section IV, Condition C. Reference 2 endorses industry guidance document NEI 12-06, Revision 0 (Reference 3) with clarifications and exceptions identified in Reference 2. Reference 4 provided the Duke Energy initial status report regarding mitigation strategies at the Brunswick and Robinson Steam Electric Plants and the Shearon Harris Nuclear Power Plant. Reference 5 provided the Duke Energy overall integrated plan for H. B. Robinson Steam Electric Plant, Unit No. 2.

Reference 1 requires submission of a status report at six-month intervals following submittal of the overall integrated plan. Reference 3 provides direction regarding the content of the status reports. Reference 6 provided the first six-month status report for H. B. Robinson Steam Electric Plant, Unit No. 2. The purpose of this letter is to provide the second six-month status report pursuant to Section IV, Condition C.2, of Reference 1, that delineates progress made in implementing the requirements of Reference 1. The attached report provides an update of milestone accomplishments since the last status report, including any changes to the compliance method, schedule, or need for relief and the basis, if any.

This letter contains no new Regulatory Commitments and no revision to existing Regulatory Commitments.

Should you have any questions regarding this submittal, please contact Mr. Richard Hightower, Manager, Nuclear Regulatory Affairs at (843) 857-1329.

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

Executed on 2/24/14.

Sincerely,

W. R. Gideon
Site Vice President

WRG/shc

Enclosure: Second Six-Month Status Report (Order EA-12-049), H. B. Robinson Steam Electric Plant, Unit No. 2

cc: Mr. K. M. Ellis, NRC Senior Resident Inspector
Mr. S. P. Lingam, NRC Project Manager, NRR
Mr. V. M. McCree, NRC Region II Administrator

SERIAL RNP/RA-14-0008

ENCLOSURE

SECOND SIX MONTH STATUS REPORT (ORDER EA-12-049) H.B. ROBINSON STEAM ELECTRIC PLANT (RNP), UNIT 2

DOCKET NO. 50-261

RENEWED LICENSE NO. DPR-23

1. Introduction

RNP developed an Overall Integrated Plan (Reference 1 in Section 8), documenting the diverse and flexible strategies (FLEX), in response to NRC Order EA-12-049 (Reference 3 in Section 8). The Overall Integrated Plan was submitted to the NRC on February 26, 2013. The first six-month update was provided to the NRC on August 28, 2013 (Reference 2 in Section 8). This enclosure provides an update of milestone accomplishments including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any, that occurred during the period July 31, 2013 to January 31, 2014 (hereafter referred to as "the update period"). This update is based on an approved formal Engineering Change-Evaluation (88926R2) (Reference 5 in Section 8) that is discipline reviewed and design verified.

2. Milestone Accomplishments

The following milestone(s) have been completed since the development of the Overall Integrated Plan (Reference 1), and are current as of January 31, 2014.

- Complete Strategy Development
- Submit Integrated Plan
- Complete Modification Identification
- Submit First 6-month Status Update

3. Milestone Schedule Status

The following provides an update to Attachment 2 of the Overall Integrated Plan. It provides the activity status of each item, and whether the expected completion date has changed. The dates are planning dates subject to change when design and implementation details are developed. The revised milestone target completion dates do not impact the order implementation date.

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Complete Strategy Development	February 2013	Complete	Date Not Revised
Submit Integrated Plan	February 2013	Complete	Date Not Revised
Submit 6-month Status Update	August 2013	Complete	Date Not Revised
	February 2014	Started	Date Not Revised
	August 2014	Not Started	Date Not Revised
	February 2015	Not Started	Date Not Revised
Complete Modification Identification	March 2013	Complete	Date Not Revised
Complete Modification Development	February 2015	Started	Date Not Revised
Complete Equipment Procurement	February 2015	Started	Date Not Revised
Complete Equipment PM Development	February 2015	Not Started	Date Not

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
			Revised
Complete FSG Development	July 2014	Started	Date is Revised
Issue FSGs	June 2015	Not Started	Date is Revised
Complete Training Development	May 2014	Started	Date Not Revised
Initiate Training Implementation	May 2014	Not Started	Date Not Revised
Complete Training	May 2015	Not Started	Date Not Revised
Complete Staffing Assessment	November 2014	Not Started	Date Not Revised
Issue Regional Response Center Playbook for RNP	May 2015	Not Started	Date Not Revised
Complete Communications Integrated Plan	November 2014	Started	Date Not Revised
Complete Online Modification Implementation	May 2015	Not Started	Date Not Revised
Complete Outage Modification Implementation (R229)	June 2015	Not Started	Date Not Revised
RNP FLEX Implementation Complete	June 2015	Not Started	Date Not Revised

4. Changes to Compliance Method

The following summarizes the changes to the strategies as documented in the Overall Integrated Plan (Reference 1 in section 8) that were made during the update period. These changes do not impact RNP compliance with NEI 12-06.

1) Change:
The First Six-Month Update to the OIP stated in Item 2):

> Due to location restrictions and proximity to other equipment, it is not feasible to protect the current Condensate Storage Tank (CST) against high winds and missiles. In lieu of hardening the CST and level instrumentation, the proposed Alternate CST will be sized to allow time for Regional Response Center support without a need to transition to several water sources.

The proposed Alternate CST that was intended to provide all AFW inventory for up 72 hours and account for all RNP hazards is not viable and will not be installed. Two AFW inventory strategies are planned; the phase 1 coping strategy using the existing CST is seismically qualified, and the phase 2 strategy to access the ultimate heat sink (UHS), Lake Robinson, is protected against high wind and missile hazards applicable to RNP. Both strategies use the installed Steam Driven Auxiliary Feedwater Pump (SDAFWP) as the motive force to feed the steam generators (SGs). The SDAFWP is protected against the RNP hazards.

Justification:
A gap exists for the provision of sustained cooling water. The primary source of AFW inventory is the condensate storage tank (CST) and its level instrumentation, which are seismically qualified, but are not protected from wind or missiles. Due to structures in the immediate vicinity of the existing CST, as well as potential obstructions and hazards above the CST, it is not recommended to attempt to harden the CST against high winds and tornado missiles. The CST is expected to survive a seismic event and is the installed source of AFW to the SDAFWP, however, its inventory is insufficient for indefinite coping (mission time is approximately 4 hours). The only other assured water source is the Ultimate Heat Sink (Lake Robinson), which, per the restrictions outlined in NEI 12-06, can only be accessed using portable equipment (assumes normal access to UHS is lost). Given these limitations, the Phase 2 seismic strategy to provide an indefinite supply of water to the CST/SDAFWP is to stage a portable diesel pumper at the lake with hoses routed to the CST FLEX connection at valve C-66, CST Drain Valve to provide an indefinite water supply to the CST. This can be accomplished during the initial CST mission time of 4 hours.

As noted above, the CST is not protected against wind-generated missiles. An engineering change (EC) is initiated to modify the circulating water (CW) inlet bay or outlet bay at the main condenser to install a FLEX connection in the bay to access the UHS from within the turbine building which provides protection from wind-generated missiles. A portable low pressure diesel pumper will be staged in the turbine building protected by the turbine pedestal structure and easily deployable at the CW inlet or outlet bays. The Phase 2 wind/missile strategy for AFW supply will connect the pre-staged pumper to the CW inlet bay FLEX connection and discharge directly to the suction of the SDAFWP between check valve AFW-105 and isolation valve AFW-4. The CW bays will remain filled from the lake as long as lake level is above 217' (normal level is 221'). This strategy can be accomplished in less than 1 hour.

Documentation:

- EC EVAL 88926 Rev. 2, FLEX Strategies and Implementation Plan (Reference 5 in Section 8), Table 1, Item 1

2) Change:
The First Six-Month Update to the OIP stated in part in Item 5):
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 added to the Alternate CST to satisfy alternate criteria (Open item 21).

In lieu of using DW-285, CST Emergency Fill Connection Valve, as the CST fill FLEX connection, CST-66, CST Drain Valve, will be used as the CST fill FLEX connection.

See Change 1) above for an explanation regarding the Alternate CST.

Justification:
DW-285, CST Emergency Fill Connection Valve, was used as the tie-in point for the 4th train of AFW modification ('C' AFW Pump) and is not the best choice for this service.

The proposed Alternate CST that was intended to provide all AFW inventory for up 72 hours and account for all RNP hazards is not viable and will not be installed.

Documentation:

- EC EVAL 88926 Rev. 2, FLEX Strategies and Implementation Plan (Reference 5 in Section 8), Table 1, Item 1

3) Change:
The First Six-Month Update to the OIP stated in Item 6), UPDATE:
The RCS cooldown strategy will maintain SG pressures greater than 300 psig until RRC support is provided in Phase 3. The SI Accumulator Isolation valves will not have to be closed until that time. The Safety Injection (SI) Accumulator Isolation Valves will be powered in Phase 3 by Regional Response Center (RRC) supplied diesel generators to be connected to E1 and E2. MCC5 and MCC6 are powered from E1 and E2 respectively; FLEX connections will not be added to MCC5 and MCC6 directly. Open Item 47 is deleted and Open Item 25 is revised account for this strategy.

UPDATE:
The RCS cooldown strategy will include the ability to close the SI Accumulator Isolation Valves if SG pressure cannot be maintained above 300 psig. The SI Accumulator Isolation valves will not have to be closed until that time. The Safety Injection (SI) Accumulator Isolation Valves can be powered in Phase 2 by either of the two diesel generators that will be connected to the Vital Battery Chargers. The strategy would power E1 and E2 using the 480VAC Switchgear Backfeed Adapter designed for Phase 3 powering of the emergency busses. MCC5 and MCC6 are powered from E1 and E2 respectively; each MCC will be powered and loads will be managed such that each SI Accumulator Isolation Valve can be closed sequentially. Open Item 47 is revised to account for this strategy and Open Items 25 and 86 are revised to note that EC95137 (EC-EVAL) is started.

Justification:

After depressurization is initiated, it is desirable to isolate the SI accumulators in order to prevent Nitrogen injection into the RCS, which would impede natural circulation cooldown. During an ELAP, however, power to the SI accumulator isolation valves is lost. Though the valves can be manually operated, they are located in containment and it is undesirable to enter at this time with regards to personnel safety. The valves are powered by MCC 5 and MCC 6 and will be repowered via E1 and E2 with portable diesel generators when required to be closed. Steam Generator pressure will be maintained above the pressure corresponding to SI Accumulator injection until the SI Accumulator Isolation Valves are closed.

Documentation:

- EC EVAL 88926 Rev. 2, FLEX Strategies and Implementation Plan (Reference 5 in Section 8), Table 1, Item 1

4) Change:

The First Six-Month Update to the OIP stated in part in Item 8):

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).**

UPDATE:

1. This strategy is moved to Phase 3 when high capacity, low head pumpers will be supplied by the RRC and connected to the SW headers at the intake structure. The portable pumpers will not be stored in a robust structure near the intake structure. AFW supply will be satisfied by sizing the Alternate CST appropriately based on decay heat removal requirements, Lake Robinson water quality, and RRC response times. Open Item 30 is deleted.

The strategy to use the Robinson SW piping to transfer Lake Robinson water to the steam generators will not be used as described. A separate pumper deployed to the Lake and routed directly to the CST FLEX connection using hoses will be employed starting in Phase 2. See the complete AFW strategy in Change 1) above.

Justification:

The use of high volume, low head pumpers and SW FLEX connections to supply AFW is a complex and time consuming evolution. The original strategy assumed an Alternate CST with up to 72 hours coping time. The time constraints required in CST makeup cannot be satisfied using this strategy. As noted above, the Alternate CST is not a viable Robinson strategy. See the complete AFW strategy in Change 1) above.

Documentation:

- EC EVAL 88926 Rev. 2, FLEX Strategies and Implementation Plan (Reference 5 in Section 8), Table 1, Item 1

5) Change:
The First Six-Month Update to the OIP stated in part in Item 13):

1. In lieu of installing additional station batteries as backup to the existing vital batteries, RNP is installing a FLEX power connection point to each of the 4 station battery chargers that can be quickly connected to one of 2 diesel generators that will be staged in their protected deployed positions. Preliminary ELAP battery coping analysis indicates there is sufficient time to accomplish this strategy when all equipment and connections are pre-staged.

RNP-E-6.032, Fukushima Flex 4.2 Phase 1 – Load Profile Calculation for Battery A and B (Reference 6 in Section 8) is completed to support this strategy.

Justification:
Duke Energy Progress, Inc. confirms that the FLEX strategy station battery run-time was calculated in accordance with the IEEE-485 methodology using manufacturer discharge test data applicable to the licensee's flex strategy as outlined in the NEI white paper on extended battery duty cycles (Reference 7 in Section 8). The detailed licensee calculations, supporting vendor discharge test data, flex strategy battery load profile, and other inputs/initial conditions required by IEEE-485 will be available on the licensee's web portal for documents and calculations. The time margin between the calculated station battery run-time for the flex strategy and the expected deployment time for flex equipment to supply the DC load is approximately 1.25 hours, determined as follows:

- Limiting battery duty cycle is 3.25 hours for Battery B
- T-0 thru T-1 hr. is for load shedding
- T-1 hr. thru T-2hrs. is for deploying the cables and aligning the pre-staged diesel generators to the battery chargers

Documentation:

- EC EVAL 88926 Rev. 2, FLEX Strategies and Implementation Plan (Reference 5 in Section 8), Table 1, Item 4
- RNP-E-6.032, Fukushima Flex 4.2 Phase 1 – Load Profile Calculation for Battery A and B (Reference 6 in Section 8)
- NEI Battery White Paper (Reference 7 in Section 8)

6) Change:
The OIP and the first six-month update did not address freeze protection issues.

Justification:
Steam line pressure transmitters (SG Pressure) have electrical freeze protection powered from non-safety related power panels. These sensing lines may be subject to freezing in extreme cold conditions. EC95138 is initiated to prevent the sensing lines from freezing in a BDBEE. This is Open Item 87.

Documentation:

- EC EVAL 88926 Rev. 2, FLEX Strategies and Implementation Plan (Reference 5 in Section 8), Table 1, Item 4

7) Change:
Sequence of events, OIP pages 5-7 of 74
Two drawings and a Table are uploaded with this Update to describe the revised sequence of events:

- Z30R2 FLEX Timeline 01-08-14 Poster
- Z34R2 Strategy Flowchart
- Z03R2 Table 3 - Coping Strategies

The two drawings are high level graphical representations of the mitigating strategies. The table provides a more detailed list of mitigating strategies and support activities and the times and time periods the activities are expected to occur. The drawings and table will be uploaded with this Update. Robinson will provide details to support the feasibility of time sensitive activities in a future Update.

Justification:
As described in the First Update to the OIP dated August 28, 2013 and this Update, Robinson has made significant changes to the mitigating strategies and timelines (including Sequence of Events). These changes support the requirements of NEI 12-06 and are described in EC-EVAL 88926, Rev. 2 (Reference 5 in Section 8).

Documentation:

- EC EVAL 88926 Rev. 2, FLEX Strategies and Implementation Plan (Reference 5 in Section 8)

8) Change:
SFP Cooling FLEX connections, OIP page 35 of 74
The OIP describes two Emergency Cooling Connections (ECC) in the SFP Cooling System that could be used for SFP fill using a portable pumper as an alternate strategy. Robinson will use one of the ECC connections upstream of the SFPC Heat Exchanger at valve SFP-742. This meets the requirements of NEI 12-06.

Justification:
Robinson has three strategies for SFP makeup as mitigating strategies. A portable pumper will be staged at the discharge canal and be capable of filling the SFP directly from the operating floor or through a monitor nozzle. The pumper can also be used to fill the SFP through the ECC described above.

Documentation:

- EC EVAL 88926 Rev. 2, FLEX Strategies and Implementation Plan (Reference 5 in Section 8), Item 8

9) Change:
OIP Attachment 3 Figures
All OIP Attachment 3 Figures are revised as follows:

- Figure 1 is replaced by Z25R2 E-8 HBR2-09800 Plot Plan FLEX Buildings Rev 2
- Figure 2 is replaced by Z08R2 M-2 G-190197-SH00001 Connection to CST
- Figure 3 is replaced by Z09R2 M-3 G-190197-SH00004 Connections to C AFW pump, MDAFWP discharge FLEX Conn
- Figures 4 and 4a is replaced by Z14R1 M-8 5379-01082-SH00002 Connection to RWST and Safety Injection System Header

- Figure 5 is replaced by Z15R2 M-9 5379-01485 Emergency Cooling Connection to SFP
- Figure 6 is replaced by Z20R2 E-3 G-190190 GENERAL ARRANGEMENT REACTOR AUXILIARY BUILDING – PLANS

All revised drawings will be uploaded with this Update.

Justification:
The revised drawings support the mitigating strategy changes described in the OIP Updates.

Documentation:
- EC EVAL 88926 Rev. 2, FLEX Strategies and Implementation Plan (Reference 5 in Section 8)

10) Change:
Open Item 49 (A SG WR Level local indication changes) is canceled.

Justification:
NEI 12-06 Section 3.2.1.10 states "a minimum set of parameters necessary to support strategy implementation should be defined." The document also recommends SG level and pressure as typical required parameters. This concept is further refined in the PWROG ELAP instrumentation recommendations with respect to SG levels and AFW flow indications. If WR level indication is selected, flow indication is not required. If only NR level indication is available, AFW flow is a required indication to ensure adequate heat sink prior to restoring level above the NR. In the case of RNP SG level indications, the B and C SGs will have WR level available, therefore AFW flow indication for the B and C SGs is not required. The A SG will have NR level indication and AFW flow indication available, thereby satisfying the PWROG recommendations. In this case, the A SG WR level indication is not required.

Documentation:
- EC EVAL 88926 Rev. 2, FLEX Strategies and Implementation Plan (Reference 5 in Section 8)
- LECA00BG Rev 2+ ELAP, Background Information For Westinghouse Owners Group Emergency Response Guideline ECA-0.0 LOSS OF ALL AC POWER (Reference 8 in Section 8)

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

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

6. Open Items from Overall Integrated Plan and Draft Safety Evaluation

The following table provides a summary of the open items documented in the Overall Integrated Plan. There are no open items to the Draft Safety Evaluation identified at this time.

Item #	Open Item Description	Status
1.	A Regional Response Centers (RRC) playbook will be developed to support RNP during beyond design basis events.	Started

Item #	Open Item Description	Status
2.	Figure(s) (site plot plan) showing FLEX equipment storage locations and deployment routes will be provided. Figures will be captured in EC88962 Rev. 2.	Started
3.	Deployment strategies will be incorporated into an administrative program.	Not Started
4.	RNP will implement the programmatic controls in accordance with NEI 12-06.	Not Started
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.	Started
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.	Not Started
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.	Not Started
8.	The FLEX strategies and basis will be maintained in overall FLEX basis documents.	Started
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.	Not Started
10.	Applicable training initiated through the Systematic Approach to Training (SAT) process will be completed prior to the implementation of FLEX.	Started
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.	Complete
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.	Strategy Deleted
13.	Modifications will be initiated to harden the CST against wind and missiles.	Strategy Deleted
14.	An alternate CST will be added which will be sufficiently rugged and qualified to withstand the applicable hazards.	Strategy Deleted
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.	Strategy Deleted
16.	A seismically qualified pressure source capable of supplying SG PORV operation will be installed.	Started
17.	Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4.	Started

Item #	Open Item Description	Status
18.	A portable pump will be procured and pre-staged near the condensate pump area.	Pre-staging Strategy Deleted
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.	Strategy Deleted
20.	Valve C-66 to be modified to include FLEX connections. (See Change 2) in this Update)	Started
21.	An additional connection will be provided for the Alternate CST to satisfy primary and alternate criteria.	Strategy Deleted
22.	A tee-connection will be added to the C AFW Pump discharge.	Started
23.	Sufficient nitrogen tanks (for SG PORV) for a 24 hour coping duration will be relocated to a protected location.	Started
24.	The existing connection point for the portable nitrogen tank will be modified to include quick-connects.	Started
25.	The SI accumulator isolation valves will be re-powered via switchgear E1 or E2 with portable diesel generators.	Started
26.	Modify the current 480V switchgear E1 or E2 and existing diesel generator s to include portable diesel generator connection points capable of switching between the existing diesel generator power feeds and portable FLEX generator power feeds.	Started
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	Strategy Deleted
28.	To provide primary and alternate connections for portable pumps, an alternate mechanical tee-connection will be provided.	Started
29.	Mechanical connections will be available for the south and north SW headers to allow connection of a portable pump.	Started
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.	Pre-staging Strategy Deleted
31.	During Modes 5 and 6, a portable pump will be used to take suction from the RWST or portable tanker and discharge to the SI header.	Not Started
32.	Primary and alternate mechanical FLEX connections will be added to the SI header.	Started
33.	Drain valve (SI-837) at the base of the RWST will be modified to align it to the standardized connection type.	Started
34.	Structures to provide protection of the FLEX equipment will be built prior to the FLEX implementation date.	Started
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.	Not Started
36.	Necessary modifications will be made to existing SSC connections to facilitate FLEX equipment deployment.	Started
37.	Necessary modifications will be made to existing onsite	Not Started

Item #	Open Item Description	Status
	fences, structures or security parameters to facilitate flex equipment deployment.	
38.	The equipment connection points will be designed to withstand the applicable external hazards.	Started
39.	The means for connecting the Phase 3 generator will be identified based on the selected onsite location of the generator.	Started
40.	Low leakage Reactor Coolant Pump (RCP) seals will be installed.	Not Started
41.	Harden the RWST against wind and missiles.	Strategy Deleted
42.	Actual size of generator to be determined at a later time.	Started
43.	A containment over-pressure and over-temperature analysis will be performed.	Completed Calculation RNP-M/MECH-1877
44.	The resolution of method for SFP level determination is being addressed by the actions taken in response to Order 12-051.	Started
45.	To maintain SFP inventory, a portable pump equipped with suction and discharge lines and compatible hose connections will be available.	Started
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.	Started
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.	Revised/Started
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.	Strategy Deleted
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.	Strategy Deleted
50.	Applicable areas of the Turbine Building will be analyzed or hardened to provide an adequate level of assurance of critical instrumentation availability.	Started
51.	Calculations will be performed for extending the time before HVAC is needed to beyond eight hours.	Started
52.	Emergency plant lighting modifications to incorporate LED technology will be initiated thereby increasing the effective	Strategy Deleted

Item #	Open Item Description	Status
	life of the battery packs.	
53.	Additional portable lighting will be procured to facilitate implementation of the FLEX strategies.	Not Started
54.	Strategies to mitigate the loss of communications systems will be developed per NEI 12-06 Section 3.2.2(8).	Not Started
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.	Not Started
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.	Started
57.	Manual disconnects, compatible for quick portable diesel generator connection, will be installed to directly power the battery chargers.	Started
58.	Permanent cable and raceway will be installed to make cable deployment directly to the battery chargers feasible.	Revised/Started
59.	Existing instrument racks will be modified to enable monitoring of key parameters using portable equipment.	Strategy Deleted See Open Item 72
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.	Not Started
61.	An analysis of HVAC requirements for operating equipment will be performed based on area heat-up times without cooling available for indefinite coping.	Started
62.	Portable fan blowers/generators will be procured and used to provide forced convection.	Started
63.	RNP will acquire a fuel pumping vehicle/trailer that can be used to extract and deliver fuel oil.	Not Started
64.	An analysis to determine the fuel consumption rate of all portable generators/equipment will be performed.	Started
65.	Provisions will be made for an offsite fuel delivery to RNP before all onsite fuel is depleted.	Not Started
66.	Results of the PWROG task will be used in determining the minimum flow rate and pumping capacity required for borated water makeup.	Started
67.	Portable equipment maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5.	Not Started
68.	An analysis will be performed to determine the radiation protection equipment requirements.	Not Started
69.	An analysis will be performed to determine the commodities requirements.	Not Started
70.	Transportation equipment will be provided to move large skid/trailer mounted equipment provided from off-site.	Not Started
71.	Additional or revised conceptual sketches will be provided in future updates as engineering packages mature from	Started

Item #	Open Item Description	Status
	conceptual design to final design.	
72.	Develop procedures, references, and tables to determine key parameters using a portable DVM in the instrument racks.	Started
73.	Order EA-12-049, requires that status reports be submitted on six month intervals, following the submittal of the Overall Integrated Plan, until compliance is achieved. Provide the six month status report to licensing for processing.	Complete New Open Item 83 will track the 2/28/14 Update.
74.	Implement the RNP integrated plan for Order EA-12-049 as stated in the submittal. If plans change, ensure that the changes are reflected in future six month status reports that are required to be submitted per the Order. Ensure Open Items listed in RNP-RA/13-0022 (i.e., 588978), are addressed.	Started
75.	Modify the SDAFW pump seal leakoff to recover the leakoff volume in the CST. Note that this strategy to conserve CST water supply may be accomplished by sizing the alternate CST to accommodate for the lost leakoff volume.	Strategy Deleted
76.	Construct a portable flex manifold for use at or near the 'D' deepwell pump that will accommodate fire hoses for SFP cooling/makeup and a backup suction supply for containment spray.	Strategy Deleted
77.	Modify the PAP DG switchgear to allow for a portable diesel generator tie-in and manual transfer switch to power the security system, EOF, and TSC in an ELAP event.	Strategy Deleted
78.	Move the existing "C" Inverter loads to the "A" inverter and disconnect the "C" Inverter from the "A" Station Battery.	Strategy Deleted
79.	Revise SAMG and other RNP Emergency procedures to include FLEX response and related setpoints. Note: This activity / scope does not include revision of other site procedures as they will be revised as part of the mods that impact them. Mod estimates include budget for associated procedure revisions.	Started
80.	FI-6416 installed per EC83801 is a safety related instrument and is currently used in DSP-002, "Hot Shutdown Using the Dedicated/Alternate Shutdown System" Attachment 6. Ensure use of this instrument is accounted for in the new FSGs.	Not Started
81.	Ensure no credited SBO circuits are removed from operation when determining which additional loads can be shed for a deep load shedding strategy. Refer to 8S19-P-101, Station Blackout Coping Analysis Report, Table 1 for credited SBO equipment.	Not Started
82.	When new load shedding strategies are developed, perform manual action walk-throughs and validation (simulated) to demonstrate the proposed operator actions are feasible and achievable.	Not Started

The following table provides a summary of new open items added to the Overall Integrated Plan.

Item #	Open Item Description	Status
83.	Order EA-12-049 requires that status reports be submitted on six month intervals following the submittal of the overall integrated plan until compliance is achieved. Provide six month status report to licensing for processing.	Started
84.	Ensure the following text is incorporated in the next six-month update of the OIP for the Fukushima Mitigating Strategies, scheduled to be submitted in Feb. 2014. Prior to incorporation, ensure the ["X"] in the paragraph below is replaced with the value obtained from the NEI white paper – consistent calculation note, upon issuance of the calculation note. Duke Energy Progress, Inc., formerly known as Carolina Power & Light, confirms that the flex strategy station battery run-time was calculated in accordance with the IEEE-485 methodology using manufacturer discharge test data applicable to the licensee's flex strategy as outlined in the NEI white paper on extended battery duty cycles. The detailed licensee calculations, supporting vendor discharge test data, flex strategy battery load profile, and other inputs/initial conditions required by IEEE-485 will be available on the licensee's web portal for documents and calculations. The time margin between the calculated station battery run-time for the flex strategy and the expected deployment time for flex equipment to supply the DC load ["X"] hours.	Completed
85.	NRC has endorsed the NEI white paper related to battery capability for an Extended Loss of AC Power (ELAP) event (see attachments in the world folder). Consistent with requirements and expectation prescribed in the NRC letter, develop an NEI white paper-consistent calculation note to support submittal of the 6-month status report for the implementation of Order EA-12-049, Order Modifying Licenses With Regard To Requirements For Mitigation Strategies For Beyond Design Basis External Events. Also, ensure the calculation note's analysis, methodology & approach, documentation of the inputs, assumptions & references, and the development, review & approval processes, supports validation of the following text (text below will be incorporated in the next six-month update of the OIP for Fukushima mitigating strategies, scheduled to be submitted in Feb 2014). Duke Energy Progress, Inc., formerly known as Carolina Power & Light, confirms that the flex strategy station battery run-time was calculated in accordance with the IEEE-485 methodology using manufacturer discharge test data applicable to the licensee's flex strategy as outlined in the NEI white paper on extended battery duty cycles. The detailed licensee calculations, supporting vendor discharge test data, flex strategy battery load profile, and other	Completed

Item #	Open Item Description	Status
	inputs/initial conditions required by IEEE-485 will be available on the licensee's web portal for documents and calculations. The time margin between the calculated station battery run-time for the flex strategy and the expected deployment time for flex equipment to supply the DC load ["X"] hours.	
86.	Re-evaluate SI Accumulator Isolation Valve closure as a phase 2 strategy (determine how to get power to the valves by possibly using the battery charger diesel generators.	Started
87.	Loss of heat tracing on significant required instrumentation sensing lines has been identified. The heat tracing is not safety related and it is not robust. Develop strategies to address the loss of heat tracing on instrument sensing lines.	Started
88.	Verify that AC power is not required for access to all areas of the plant in an ELAP event.	Completed
89.	Develop an ELAP boration strategy that includes rates, times, and SDM calculations for all times in core life.	Started
90.	Develop a one-line electrical sketch of the RNP battery bus power scheme showing connections for the FLEX portable equipment to be used in an ELAP event.	Started
91.	Describe how electrical isolation will be maintained such that (a) Class 1E equipment is protected from faults in portable/FLEX equipment and (b) multiple sources do not attempt to power electrical buses.	Started
92.	Develop a formal strategy for refueling of all FLEX portable equipment during an ELAP event. Explain how fuel quality will be assured if it stored for extended periods of time. See Open Item 64 also. Include the strategy in FSG-005.	Started
93.	Provide details in the OIP of how RNP will incorporate the EPRI industry program for maintenance and testing of FLEX electrical equipment such as batteries, cables, and diesel generators.	Not Started
94.	Discuss the reliability of the SDAFWP with respect to the following: • The steam traps are all ganged into one line to the condenser that has the potential to be pinched or crimped in an event and render the SDAFWP inoperable. • The SDAFWP miniflow recirculation line has the same exposure to being pinched or crimped in an event and render the SDAFWP inoperable.	Not Started

Item #	Open Item Description	Status
95.	Evaluate the SG PORVs for an Uncontrolled Cooldown scenario as follows: (a) Clarify whether the ADV or upstream associated piping is a safety-related system, protected from external events such as tornadoes. If not, address the following questions: (b) Clarify whether damage to an ADV or upstream associated piping could occur during an ELAP that would result in an uncontrolled cooldown of the reactor coolant system and provide a basis for the response. (c) Clarify whether postulated damage would be limited to a single ADV and/or associated piping, or whether failures could be postulated resulting in an uncontrolled cooldown affecting both steam generators, and provide a basis for the response. (d) If ELAP scenarios involving the uncontrolled cooldown of one or more steam generators may be postulated, describe key operator actions that would be taken to mitigate these events. (e) If ELAP scenarios involving the uncontrolled cooldown of one or more steam generators may be postulated, provide analysis demonstrating that the intended mitigating actions would lead to satisfaction of the requirements of Order EA-12-049 for these cases. (f) As applicable, if the operator actions to mitigate an ELAP event involving an uncontrolled cooldown results in an asymmetric cooldown of the reactor coolant system, address the consequences of the asymmetric cooldown on the mixing of boric acid that is added to the reactor coolant system to ensure sub-criticality.	Not Started
96.	The issue of how to control critical equipment without control power must be assessed as part of the response to load shedding.	Started
97.	Purchase portable gas or propane heaters to replace the 480 VAC heaters used for freeze protection in cold weather operations. The portable heaters will be stored in the FLEX storage facility.	Not Started
98.	Provide documentation of high wind and missile	Not Started

Item #	Open Item Description	Status
	protection for the components associated with EC94741.	
99.	Procure a diesel driven sump pump to dewater the Intake SW Strainer Pit following a rain event.	Not Started
100.	Evaluate the Rad Waste building to determine if it is robust against the high wind and missile hazard.	Not Started
101.	Develop a formal calculation to determine the time to boil off the SFP inventory to 10' above the fuel racks and to the top of the fuel racks assuming: • 1/3 Core Offload 100 hours after refueling • Mode 6 Full Core Offload	Not Started
102.	Evaluate the Lake Robinson dam to determine if it is robust against the high wind and missile hazard.	Not Started
103.	Determine if it is required to store HazMat equipment in the FLEX storage facility to cope with an acid or caustic tank rupture/spill.	Not Started
104.	Perform walkdowns and simulations to verify and validate that time critical actions required for mitigating strategies for core cooling are feasible.	Not Started
105.	Perform walkdowns and simulations to verify and validate that time critical actions required for mitigating strategies for RCS boration and inventory are feasible.	Not Started
106.	Perform walkdowns and simulations to verify and validate that time critical actions required for mitigating strategies for SFP cooling are feasible.	Not Started
107.	Revise drawing Z25R2 to specify all 'A' staging areas, deployment routes from storage to staging, equipment to be staged in each area, and distance to the related FLEX connection points.	Started
108.	Add a section to the FLEX/Fukushima Program document to list all SSCs affected by FLEX implementation. See EC 88926, Rev. 2, Design Verification Comment #81.	Not Started
109.	Determine which of the following instruments located in the Turbine Class 1 Bay are critical to FLEX response strategies for core cooling. 1. Secondary Control Panel on the mezzanine LI-607A-2 LI-607B-2 LI-607C-2 LI-607D-2 PI-607E-2 LI-1454C TI-410B TI-413B 2. Instruments, LI-477A, 487A and 497A on the mezzanine 3. Instrument FI-6416 on the mezzanine 4. Main Steam Line Pressure transmitters Cabinet on	Started

Item #	Open Item Description	Status
	the mezzanine PT-474 PT-475 PT-484 PT-485 PT-495 PT-496 Ensure critical instruments are included in EC 90627 before the 30% Design Review.	

7. Potential Draft Safety Evaluation Impacts

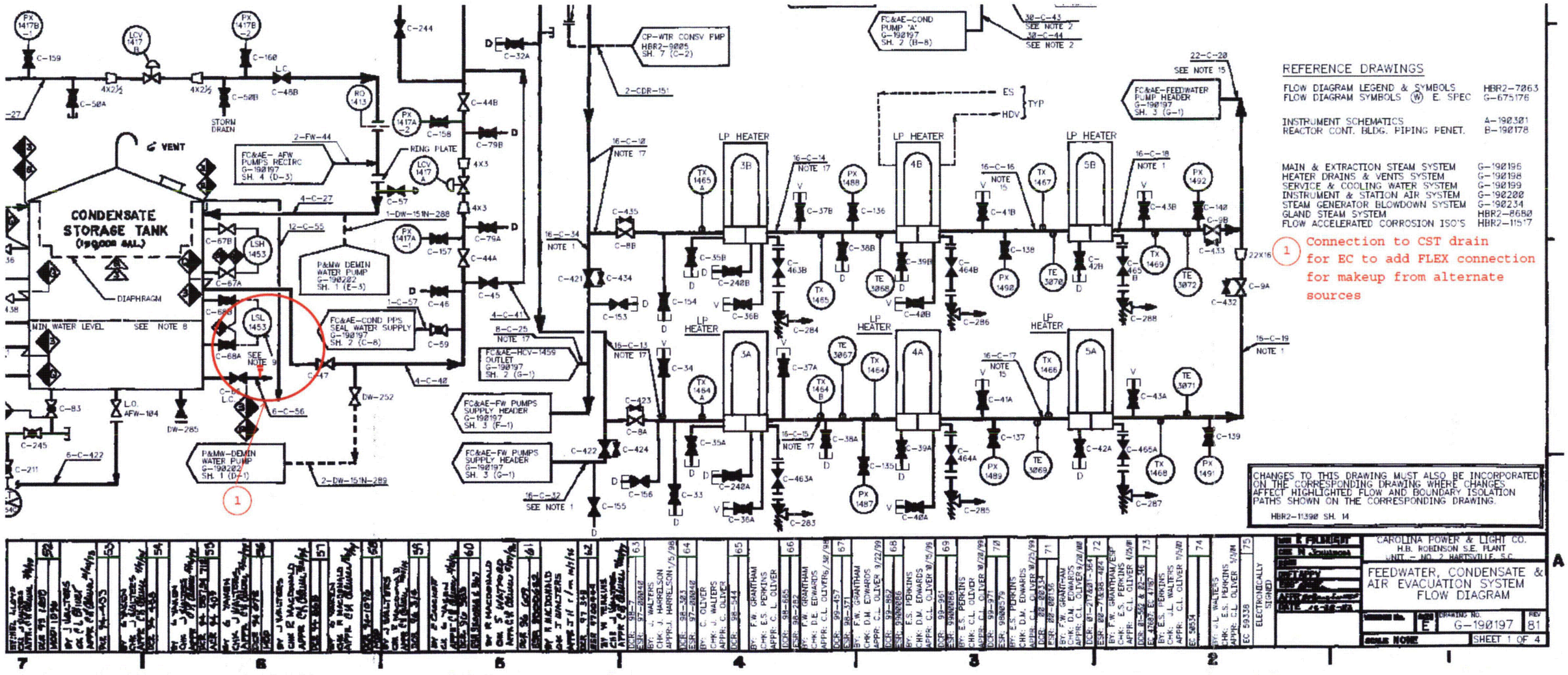
There are no potential impacts to the Draft Safety Evaluation identified at this time.

8. References

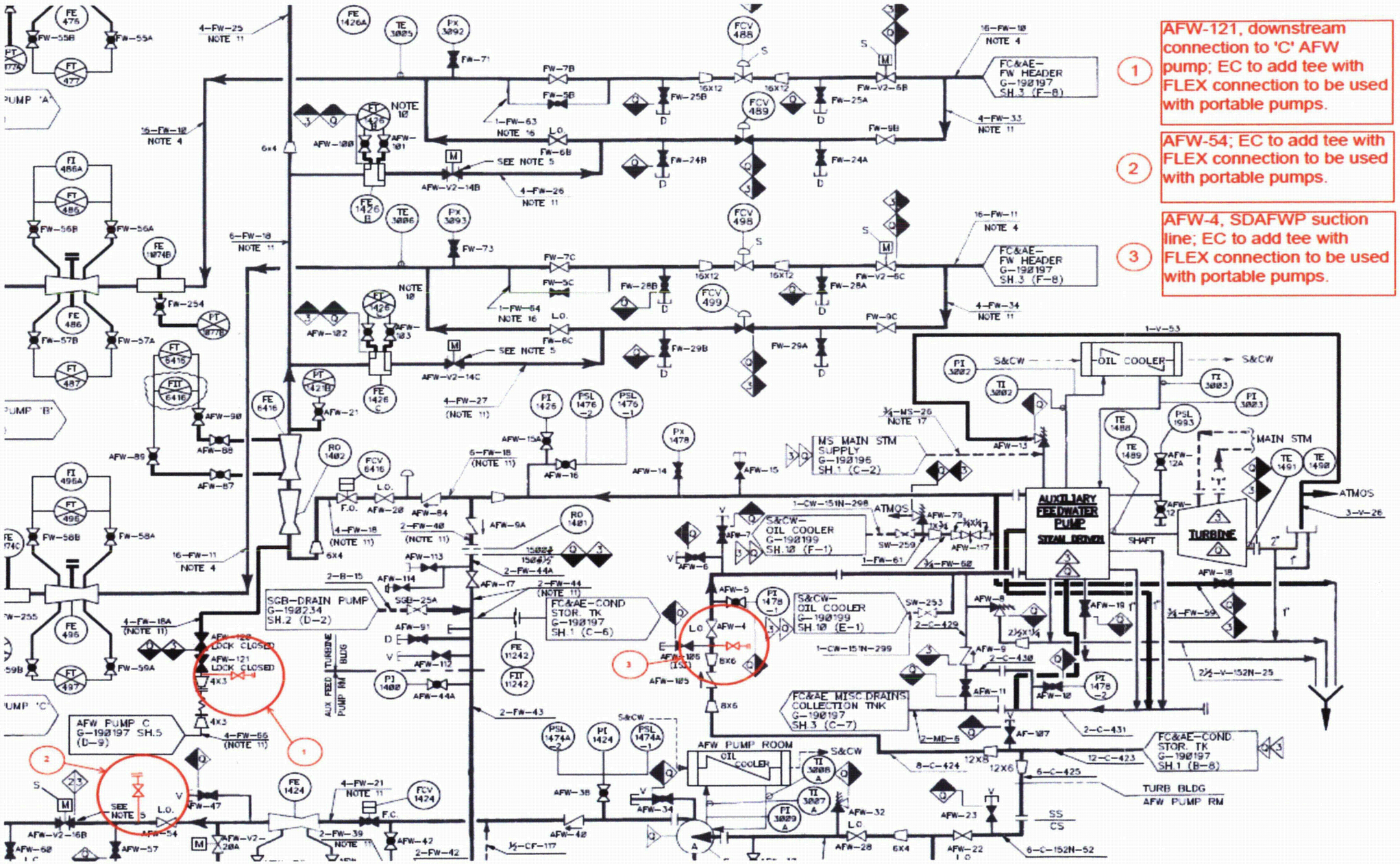
The following references support the updates to the Overall Integrated Plan described in this attachment.

1. Duke Energy Letter, Overall Integrated Plan in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)," dated February 26, 2013.
2. First Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049), dated August 28, 2013.
3. NRC Order Number EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012.
4. WCAP-17601-P, Reactor Coolant System Response to the Extended Loss of AC Power Event for Westinghouse, Combustion Engineering and Babcock & Wilcox NSSS Designs
5. EC EVAL 88926 Rev. 2, FLEX Strategies and Implementation Plan
6. Calculation RNP-E-6.032, Fukushima Flex 4.2 Phase 1 – Load Profile Calculation for Battery A and B
7. NEI Battery Life White Paper
8. LECA00BG Rev 2+ ELAP, Background Information For Westinghouse Owners Group Emergency Response Guideline ECA-0.0 LOSS OF ALL AC POWER

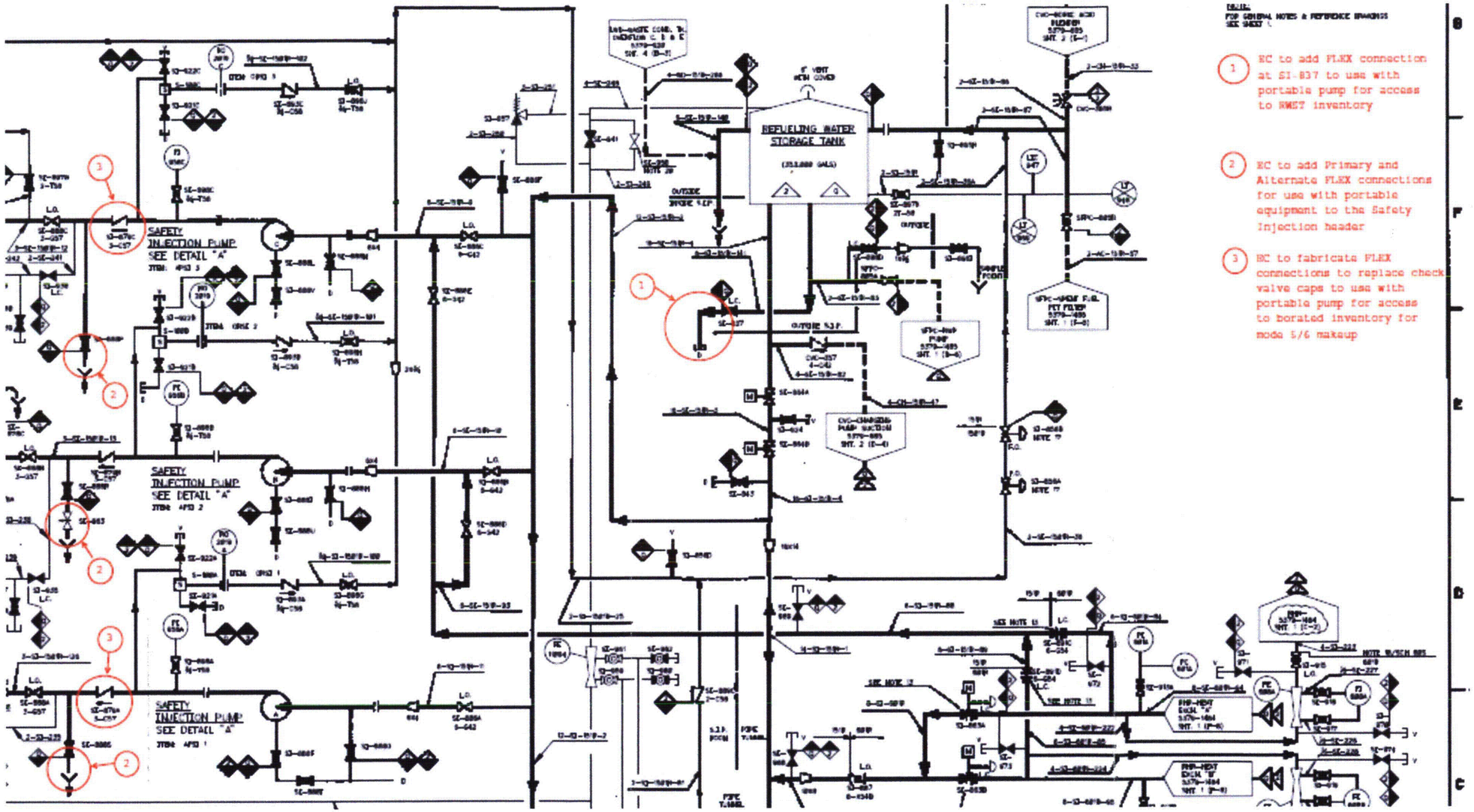
Z08R2 M-2 G-190197-SH00001 Connection to CST



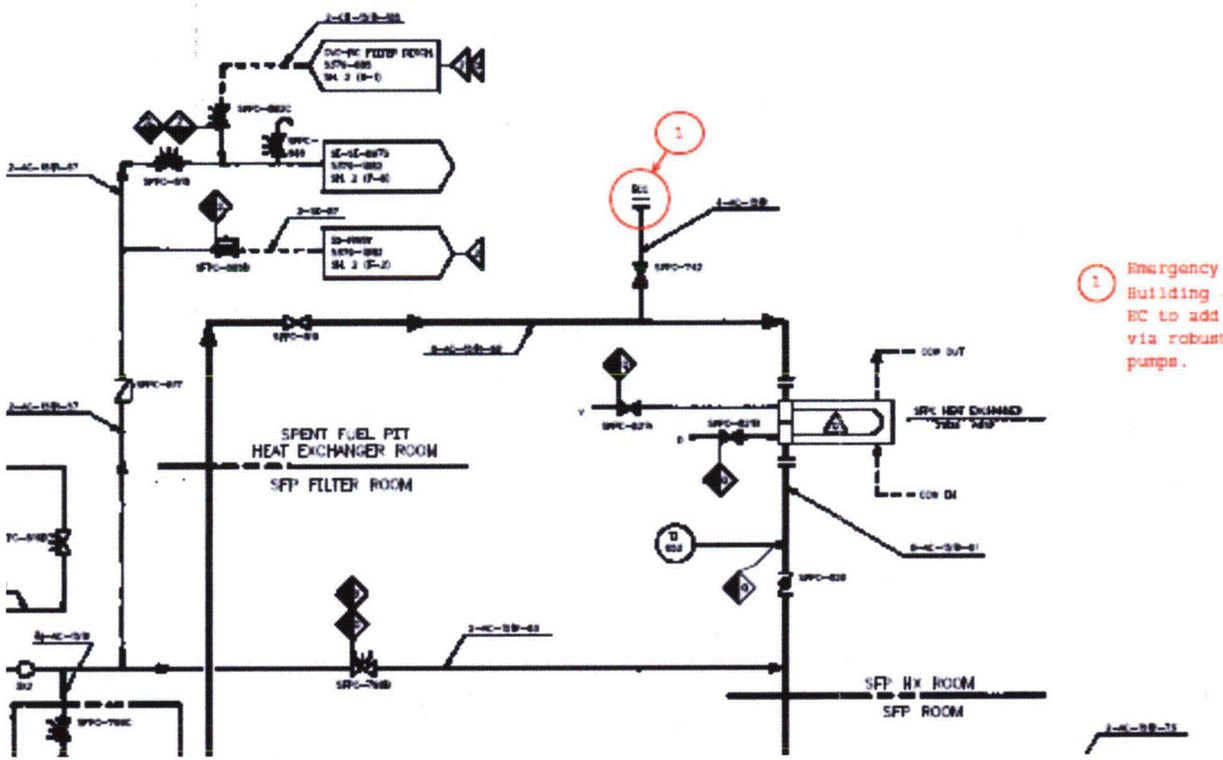
Z09R2 M-3 G-190197-SH00004 Connections to C AFW pump, MDAFWP discharge FLEX Conn



Z14R1 M-8 5379-01082-SH00002 Connection to RWST and Safety Injection System Header



Z15R2 M-9 5379-01485 Emergency Cooling Connection to SFP



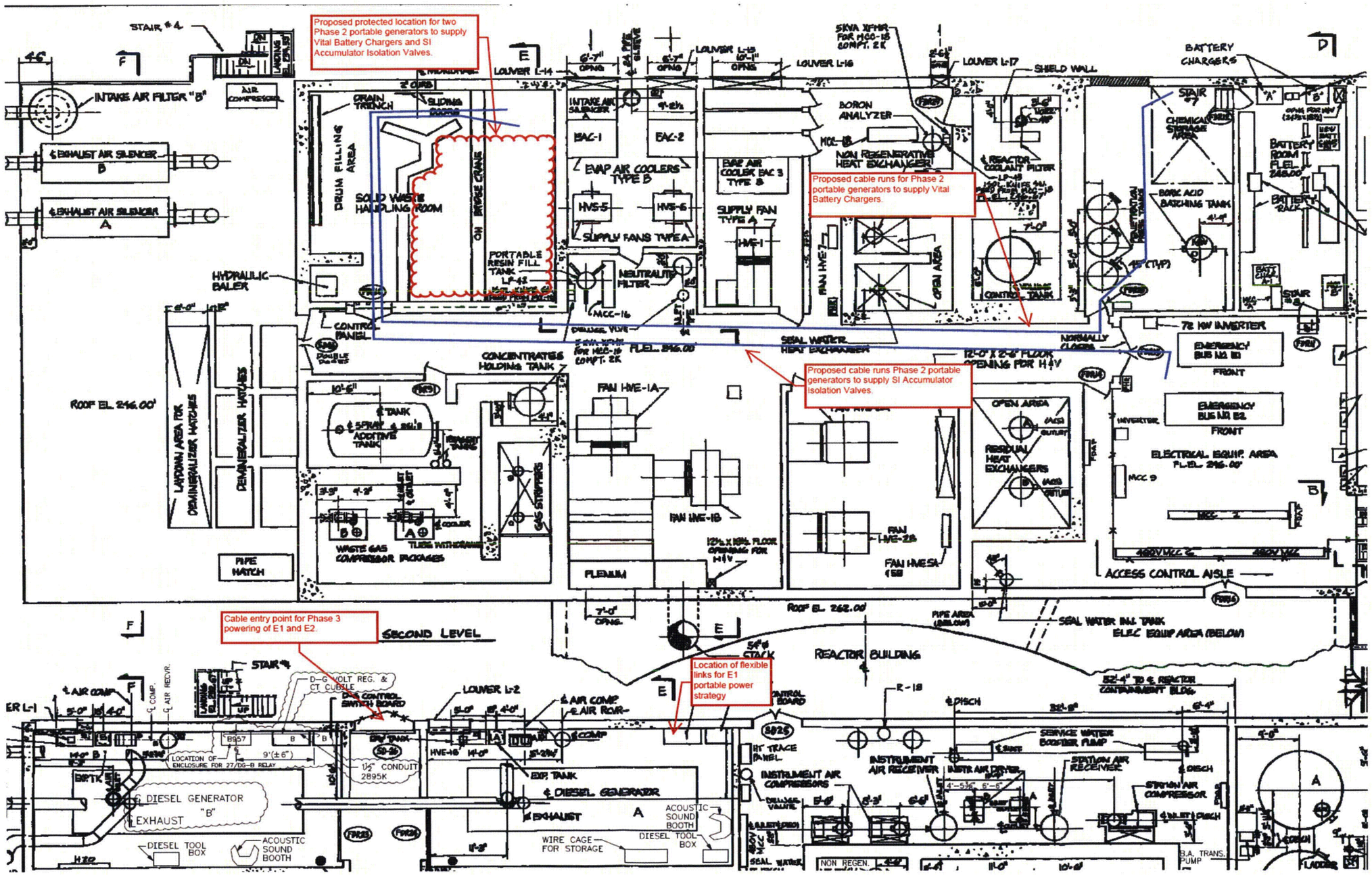
NOTES:

1. VALVES ARE NORMALLY INSTALLED WITH FLOW TOWARD TENT EXCEPTION IS NOTED.
2. LOCATE VALVE CLOSE TO SPENT FUEL PIT WALL.
3. TERMINATE PIPE CLOSE TO BOTTOM OF PIT.
4. TERMINATE PIPE 6 FT. ABOVE FUEL ASSEMBLIES.
5. WELDS
6. VALVES
7. LOCATE FIELD JOINT BELOW FLOOR ABOVE LEVEL.
8. LOCATE 4" PIPE WITH 90° VACUUM BREAK RISE ABOVE NORMAL WATER LEVEL.

1. Emergency Cooling Connection to SFP (1st floor Aux. Building - preferred location due to ease of access); EC to add FLEX Connection for external SFP makeup via robust, installed piping and portable pumps.

U. S. Nuclear Regulatory Commission
Enclosure to Serial RNP-RA/14-0008
25 Pages (including cover sheet)

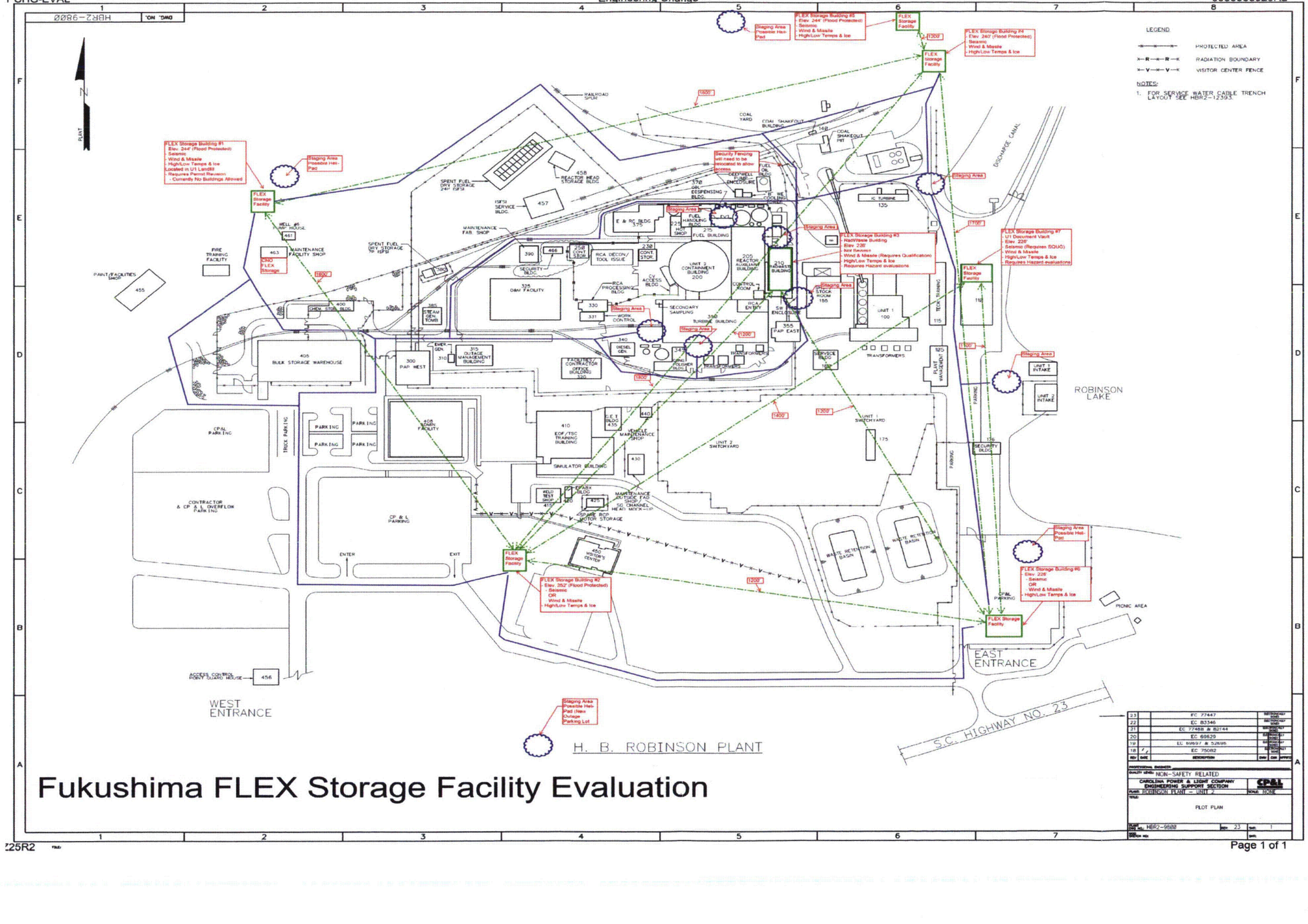
Z20R2 E-3 G-190190 GENERAL ARRANGEMENT REACTOR AUXILIARY BUILDING - PLANS



E1-24

Z25R2 E-8 HBR2-09800 Plot Plan FLEX Buildings Rev 2

PCHG-EVAL Engineering Change 0000088926R2



Fukushima FLEX Storage Facility Evaluation

REV	DATE	DESCRIPTION	DRAWN	CHKD	APPROVED
23		EC 77447			
22		EC 83346			
21		EC 77488 & 82144			
20		EC 68629			
19		EC 69697 & 52695			
18		EC 75082			

PROFESSIONAL ENGINEER
QUALITY LEVEL: NON-SAFETY RELATED
CAROLINA POWER & LIGHT COMPANY
ENGINEERING SUPPORT SECTION
PLANT: ROBINSON PLANT - UNIT 2
SCALE: NONE
TITLE: PLOT PLAN
FILE NO.: HBR2-9800 REV: 23 SHT: 1
DESIGN NO.: