



February 27, 2014
RC-14-0030

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555-0001

Dear Sir/Madam:

Subject: VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) UNIT 1
DOCKET NO. 50-395
OPERATING LICENSE NO. NPF-12
SOUTH CAROLINA ELECTRIC & GAS COMPANY'S 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) (TAC NO. MF2338)

- References:
1. NRC Order Number EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, dated March 12, 2012
 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
 3. NEI 12-06, Diverse and Flexible Coping Strategies (FLEX) Implementation Guide, Revision 0, dated August 2012
 4. South Carolina Electric & Gas Company'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 17, 2012
 5. South Carolina Electric & Gas Company's Overall Integrated Plan as Required by 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 28, 2013

On March 12, 2012, the Nuclear Regulatory Commission ("NRC" or "Commission") issued an order (Reference 1) to South Carolina Electric & Gas Company (SCE&G). Reference 1 was immediately effective and directs SCE&G 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.

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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 SCE&G initial status report regarding mitigation strategies. Reference 5 provided the SCE&G overall integrated plan.

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. 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. If you have any questions regarding this report, please contact Bruce L. Thompson at (803) 931-5042.

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

2/27/2014
Executed on

Thomas D. Gatlin
Thomas D. Gatlin

TS/TDG/wm

Attachment I SCE&G's Second Six 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

Attachment II Conceptual Sketches of Strategies

c: K. B. Marsh
S. A. Byrne
J. B. Archie
N. S. Carns
J. H. Hamilton
J. W. Williams
W. M. Cherry
V. M. McCree
E. J. Leeds

S. A. Williams
J. T. Polickoski
NRC Resident Inspector
K. M. Sutton
NSRC
RTS (CR-12-01078)
File (815.07)
PRSF (RC-14-0030)

**VIRGIL C. SUMMER NUCLEAR STATION UNIT 1
DOCKET NO. 50-395
OPERATING LICENSE NO. NPF-12**

ATTACHMENT I

**SOUTH CAROLINA ELECTRIC & GAS COMPANY'S SECOND SIX 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**

1 Introduction

South Carolina Electric & Gas Company (SCE&G) developed an Overall Integrated Plan (Reference 1 in Section 8), and first six-month status report (Reference 3 in Section 8) documenting the diverse and flexible strategies (FLEX), in response to Reference 2. This attachment provides an update of milestone accomplishments since submittal of the Overall Integrated Plan, including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any. This update also incorporates Virgil C. Summer Nuclear Station's (VCSNS) responses to NRC's Mitigating Strategies Regulatory Audit Questions discussed in our December 6, 2013 teleconference.

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 February 7, 2014.

The development of the FLEX Strategies have been completed and provided as input to the scoping of the FLEX Modification Engineering development.

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 as design and implementation details are developed.

Validation: No RAIs have been issued to VCSNS relative to the FLEX Overall Integrated Plan.

Walk-throughs or Demonstration(s) – Completion of training implementation precedes completing the walk-throughs and demonstration of the FLEX Support Guidelines scheduled for August 2015.

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Submit 60 Day Status Report	Oct 2012	Complete	
Submit Overall Integrated Plan	Feb 2013	Complete	
Submit 6 Month Updates:			
Update 1	Aug 2013	Complete	
Update 2	Feb 2014	Complete	
Update 3	Aug 2014	Not Started	
Update 4	Feb 2015	Not Started	
Update 5	Aug 2015	Not Started	
Update 6	Feb 2016	Not Started	
Update 7	Aug 2016	Not Started	
FLEX Strategy Evaluation	Aug 2013	Complete	
Walk-throughs or Demonstrations	Aug 2015	Not Started	

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Perform Staffing Analysis	Jul 2014	Not Started	
Modifications:			
Modifications Evaluation	Dec 2013	Complete	
Unit 1 Design Engineering Evaluation	Jan 2015	In Progress	
Unit 1 Implementation Outage	Nov 2015	Not Started	
Storage:			
Design Storage Building	Jul 2014	In Progress	
Storage Implementation	Jul 2015	In Progress	
FLEX Equipment:			
Procure On-Site Equipment	Oct 2014	In Progress	
Develop Strategies with RRC	Nov 2014	Not Started	
Install Off-Site Delivery Station (if Necessary)	Aug 2013	Complete	
Procedures:			
PWROG issues NSSS-specific guidelines	May 2013	Complete	
Create Site-Specific FSGs	Feb 2014	In Progress	Feb 2015
Create Maintenance Procedures	Oct 2014	Not Started	
Training:			
Develop Training Plan	Jan 2015	Not Started	
Training Complete	Jul 2015	Not Started	
Unit 1 FLEX Implementation	Nov 2015	Not Started	
Submit Completion Report	Jan 2016	Not Started	

4 Changes to Compliance Method

This section describes and documents changes to the information provided in the SCE&G Overall Integrated Implementation Plan that meet NEI 12-06 compliance methods and addresses Mitigating Strategies Regulatory Audit Questions. Each change is listed with the justification provided.

In Section 1: Determine Applicable Hazards:

1A. Subsection “*Seismic:*” was revised to clarify that there is no impact from non-seismically robust downstream dams.

Justification: This change is in response to Audit Question #5.

1B. Subsection “*External Flooding:*” was revised to clarify which of the NEI 12-06 section 6.2.3.2 considerations are applicable and how they are being addressed.

Justification: This change is in response to Audit Question #8.

1C. Subsection "*High Wind:*" was revised to clarify which of the NEI 12-06 section 7.3.2 considerations are applicable and how they are being addressed.

Justification: This change is in response to Audit Question #9.

1D. Subsection "*Extreme Heat:*" was revised to clarify which of the NEI 12-06 section 9.3.2 considerations are applicable and how they are being addressed.

Justification: This change is in response to Audit Question #10.

1E. Note 1 was revised to clarify how the seismic information of the VCSNS combined operating license has been utilized in the seismic hazard evaluations.

Justification: This change is in response to Audit Question #7.

1F. Note 2 was revised to clarify how the flooding analysis of the VCSNS combined operating license has been utilized in the flooding hazard evaluations.

Justification: This change is in response to Audit Question #7.

In Section 2: Key Site Assumptions:

2A. The fourth paragraph was changed to provide greater detail of the characteristics of the Flowserve N9000, provide the maximum leak-off values for each Reactor Coolant Pump (RCP) seal, discuss the pressure-dependant seal leakage rates, and provide justification for the analysis being performed.

Justification: This change is in response to Audit Questions #11, #12a, #12b, and #12c.

2B. The paragraph was added after paragraph four to provide justification for the RCP seal analysis being performed.

Justification: This change is in response to Audit Question #11.

2C. A new assumption was added to clarify the primary extended loss of AC power (ELAP) strategy is to perform symmetric cooldown.

Justification: This change is in response to Audit Question #12g.

In Section 4: Sequence of Events and Technical Basis:

4A. In subsection "*General:*" paragraph 1 was changed to incorporate seal leakage rates for the Flowserve N9000 seals.

Justification: This change clarifies the affect of reduced seal leakage on the cooldown timeline.

4B. In subsection "*General:*," paragraphs 2 and 3 were changed to incorporate revised values for load stripping.

Justification: These changes clarify the dc load stripping timeline.

4C. Subsection "*General:*" was revised by adding a new paragraph that provides additional information to demonstrate NEI 12-06 Section 3.2.2. (10) and (11) regarding the local room environment on the Turbine Driven Emergency Feedwater (TDEFW) Pump and operators.

Justification: This change is in response to Audit Question #40.

4D. Subsection "*General:*" was revised by adding a new paragraph that clarifies the affects of ambient noise, such as exiting steam, on communications necessary for coordination of manual actions for the TDEFW Pump.

Justification: This change is in response to Audit Question #40.

4E. Subsection "*General:*" was revised by adding a new paragraph to address electrical isolation of Class 1E equipment from portable equipment.

Justification: This change is in response to Audit Question #35a.

4F. Subsection "*General:*" was revised by adding a new paragraph to clarify procedural methods will be used to prevent inadvertently powering electrical buses from multiple sources.

Justification: This change is in response to Audit Question #35b.

4G. Subsection "*General:*" was revised by adding two new paragraphs that identifies and summarizes non-safety related electrical and mechanical equipment and the methods available to credit survive ELAP events.

Justification: This change is in response to Audit Question #38.

4H. Subsection "*Table Item 8,12 – Complete DC Load Shed:*" was renamed and revised to provide the reference for the dc load profile for required loads for the mitigating strategies, dc loads to be shed, and timeframes for operator actions.

Justification: This change is in response to Audit Questions #32 and #33.

4I. Subsection "*Table Item 13 – Start Cooldown:*" was revised to provide greater detail on timing of cooldown and depressurization and to remove inconsistencies with WCAP 17601 recommendations.

Justification: This change is in response to Audit Question #14.

4J: Subsection "Table Item 25 - Begin Boration" was added to provide greater detail on boration time dependency during cooldown and core life.

Justification: This change provides clarification for the RCS boration strategy.

4J: Subsection "Table Item 19 – Complete Damage Assessment Walkdowns" was added to provide greater detail and timeframe for damage assessment.

Justification: This change provides clarification of damage assessment timeline.

In Section 5: Strategy Deployment:

5A: The first paragraph was expanded to clarify the potential impact of soil liquefaction on deployment pathways.

Justification: This change is in response to Audit Question #1.

5B: The second paragraph was expanded to provide additional information regarding equipment that will be available to transport of FLEX equipment and for clearing debris.

Justification: This change is in response to Audit Question #3.

5C: Two paragraphs were added to clarify that additional supplemental power will not be required to access storage locations of connection points on current or proposed doors for FLEX structures.

Justification: This change is in response to Audit Question #2.

5D: A new paragraph was added to provide information on access to the protected area and internal locked areas.

Justification: This change is in response to Audit Question #23.

5E: A new paragraph was added to confirm VCSNS will incorporate generic shutdown/refueling guidance.

Justification: This change incorporates NRC's endorsement of the Shutdown / Refueling Modes approach to this generic item.

In Section 7: Programmatic Controls:

7A: The bullet "• *Maintenance and Testing:*" was revised to provide details of the EPRI industry program for maintenance and testing of FLEX equipment and reference NRC's endorsement of the approach to this generic item.

Justification: This change is in response to Audit Question #30 and to identify resolution of this generic item.

7B: The bullet "• *Design Control:*" was expanded to address how instrumentation will be identified and used to monitor portable FLEX equipment to ensure equipment is performing as intended.

Justification: This change is in response to Audit Question #25.

In Section 9: Regional Response Plan:

9A: A new paragraph was added to provide additional details regarding the transportation of Regional Response Center (RRC) equipment from offsite to the onsite staging area. Two new figures were added and referenced to provide regional and site specific views of the staging areas.

Justification: This change is in response to Audit Question #6.

9B: A new paragraph was added to provide additional information to demonstrate conformance with NEI 12-06, Section 12.2 guidelines 2 through 10.

Justification: This change is in response to Audit Question #31.

In Section 10: Maintain Core Cooling & Heat Removal:

10A. The fourth paragraph in subsection "*Maintain Core Cooling & Heat Removal: PWR Installed Equipment Phase 1*" was expanded to clarify that the Condensate Storage Tank (CST), TDEFW exhaust, and S/G PORV exhausts are not susceptible to tornado missiles; and to address concerns of crimping of the Emergency Feedwater (EFW) mini-flow recirculation line.

Justification: This change is in response to Audit Questions #42 and #55b.

10B. The fifth paragraph in subsection "*Maintain Core Cooling & Heat Removal: PWR Installed Equipment Phase 1*" was expanded to clarify that the Steam Generator Power Operated Relief Valve (S/G PORV) and upstream piping is safety related and protected from all hazards.

Justification: This change is in response to Audit Question #56.

10C. Subsection "*Maintain Core Cooling & Heat Removal: PWR Portable Equipment Phase 2, Repower Motor Driven EFW Pump*" have been revised to include the strategy to repower the motor driven emergency feed water pumps using both 1 megawatt combustion turbine generators.

Justification: This change reflects an alternate strategy to makeup to the steam generators.

10D. In subsection "*Maintain Core Cooling & Heat Removal: PWR Installed Equipment Phase 2, SG Makeup/FLEX Feed Header*," the second paragraph was expanded to discuss the accessibility of the north connection point rollup door and to clarify that diversity and protection of the north and east connection points.

Justification: This change is in response to Audit Question #43.

10E. In subsection "*Maintain Core Cooling & Heat Removal: PWR Installed Equipment Phase 2, CST Makeup Strategy*," the second paragraph was expanded to clarify that

straining will be utilized to protect the Ultimate Heat Sink (UHS) pump and the use of UHS water for SG makeup is part of the present licensing basis.

Justification: This change is in response to Audit Question #44.

10F. Subsections "*Maintain Core Cooling & Heat Removal: PWR Portable Equipment Phase 2,*" and "Phase 2 Details:" have been revised to include the strategy to repower the motor driven emergency feed water pumps using both 1 megawatt combustion turbine generators.

Justification: This change reflects an alternate strategy to makeup to the steam generators.

In Section 11: Maintain RCS Inventory Control:

11A. Subsection "*Maintain RCS Inventory Control: PWR Installed Equipment Phase 1,*" has been revised to: (1) reflect additional analysis completed to determine required boration time 24 hours after ELAP under the conservative conditions of end-of-life and cooldown to 350 degrees Fahrenheit and (2) incorporate a 1 hour boron mixing time into the strategy timeline.

Justification: This change reflects additional analysis and its impact on the RCS inventory and boration strategy and incorporated NRC's endorsement of the boron mixing approach to this generic item.

11B. Various parts of subsection "*Maintain RCS Inventory Control: PWR Portable Equipment Phase 2,*" have been revised to reflect: (1) a change in the RCS inventory control strategy utilizing a diesel driven portable positive displacement RCS makeup pump – stored in a diverse location from the Alternate Seal Injection (ASI) pump and similar to the pump to be delivered from the RRC (60 gallons per minute at 2000 pounds per square inch gauge discharge pressure), (2) storage of the Reactor Coolant System (RCS) makeup pump in the Emergency Response Building (ERB), (3) the identification of diverse, protected RCS makeup connection points, and (4) the modifications for making RCS makeup connections to the Boric Acid Tank (BAT) and Refueling Water Storage Tank (RWST).

Justification: This change reflects additional boration analysis and its impact on the RCS inventory and boration strategy. It satisfies requisite N+1 diversity of RCS makeup sources, connections, and methods in response to Audit Questions #45, #46, and #47

11C. Subsection "*Maintain RCS Inventory Control: PWR Portable Equipment Phase 3,*" has been expanded to clarify the use of the diesel driven RCS makeup pump for indefinite coping.

Justification: This change reflects changes to the RCS inventory control strategy.

In Section 12: Maintain Containment:

12A. In subsection, "*Maintain Containment: PWR Installed Equipment Phase 1,*" the reference has been provided for modeling containment response to an ELAP.

Justification: This change is in response to Audit Question #54.

12B. Subsection "*Maintain Containment: PWR Portable Equipment Phase 3,*" has been revised to clarify (1) the method to provide water from the UHS to the Reactor Building Cooling Units (RBCUs), (2) the modification for the water connections, and (3) the powering the RBCU fan will utilize the combustion turbine generators repowering 1DA or 1DB.

Justification: This change reflects changes to the strategy to maintain containment.

In Section 13: Maintain Spent Fuel Cooling:

13A. Subsection "*Maintain Spent Fuel Cooling: PWR Installed Equipment Phase 1,*" has been revised to update the projected spent fuel pool temperature of approximately 150 degrees Fahrenheit at 8 hours after start of the event.

Justification: This change reflects new analysis completed for spent fuel pool cooling.

13B. Subsections "*Maintain Spent Fuel Cooling: PWR Portable Equipment Phase 2,*" and "*Maintain Spent Fuel Cooling: PWR Portable Equipment Phase 3,*" have been revised to clarify: (1) the procedures to be utilized, and (2) the modifications necessary to utilize the referenced equipment and connections.

Justification: This change is in response to Audit Question #16.

In Section 14: Safety Function Support:

14A. Subsection "*Safety Function Support: PWR Installed Equipment Phase 1: Station 125VDC Batteries supplying DC and 120VAC vital AC*" has been revised to provided a basis for the minimum dc bus voltage required to ensure proper operation of required electrical equipment.

Justification: This change is in response to Audit Question #34.

14B. Subsection "*Safety Function Support: PWR Installed Equipment Phase 1: Backup Strategy for Extending DC Power Availability*" has been revised to show the recalculated dc load shedding timeframes.

Justification: This change reflects new analysis completed for dc load shedding.

14C. Subsection "*Safety Function Support: PWR Installed Equipment Phase 1: Main Control Room and Plant Ventilation*" has been revised clarify the methods for battery room ventilation in phase 1.

Justification: This change is in response to Audit Question #49.

14D. In subsection "*Safety Function Support: PWR Installed Equipment Phase 1*" a new section was added to address internal flooding and groundwater intrusion. This new section provides additional information to demonstrate conformance NEI 12-06 Section 5.3.3 considerations 2, 3, and 4 regarding non-seismically robust internal flooding sources and known groundwater intrusion rates.

Justification: This change is in response to Audit Question #5.

14E. Subsection "*Safety Function Support: PWR Installed Equipment Phase 1: Identify Modifications*" has been revised to include the strategy to repower the 1E battery chargers using the 1 megawatt combustion turbine generators.

Justification: This change reflects an alternate strategy to charge the 1E batteries.

14F. Subsection "*Safety Function Support: PWR Portable Equipment Phase 2, Alternate Portable Battery Charger for Extending DC Power Availability*" has been revised to include a confirmatory statement regarding calculated station battery run-time margin of 20 hours as outlined in the NEI white paper on Extended Battery Duty Cycles.

Justification: This change incorporates NRC's endorsement of the Battery Life generic item.

14G. Subsection "*Safety Function Support: PWR Portable Equipment Phase 2, Alternate Portable Battery Charger for Extending DC Power Availability*" has been revised clarify the methods for battery room ventilation and to provide information on the adequacy of the ventilation to protect the batteries from the effects of extreme temperatures.

Justification: This change is in response to Audit Questions #49 and #50.

14H. Subsection "*Safety Function Support: PWR Portable Equipment Phase 2, Refueling of FLEX Diesels*" has been revised to add information regarding fuel supply locations, capacities, and strategies for fuel delivery to portable FLEX equipment. The revision also describes how fuel quality will be assured if stored for extended periods.

Justification: This change is in response to Audit Question #39.

14I. In subsection "*Safety Function Support: PWR Portable Equipment Phase 3, Groundwater Intrusion*," a new section was added to address groundwater intrusion and provide additional information to demonstrate conformance NEI 12-06 Section 5.3.3 regarding portable sump pumps.

Justification: This change is in response to Audit Question #5.

In References:

The following references were added:

30. VCSNS Technical Report TR02060-003 Revision 0
31. VCSNS Calculation DC02060-005
32. VCSNS Calculation DC02060-006
33. VCSNS Calculation DC02060-007
34. VCSNS Calculation DC02060-008
35. VCSNS Calculation DC00080-001
36. VCSNS Calculation DC08340-002
37. VCSNS Design Calculation DC0398B-002
38. VCS EIR-81436 (basis for addressing NRC Inspection Report 2005-006)
39. EPRI Report 3002000623 entitled "Nuclear maintenance Applications Center: Preventive Maintenance Basis for FLEX Equipment"
40. U. S. Nuclear Regulatory Commission (NRC) letter to NEI (Joseph E. Pollock) endorsing Position paper: Shutdown/Refueling Modes, dated September 30, 2013
41. EPRI Report 3002000623 entitled "Nuclear maintenance Applications Center: Preventive Maintenance Basis for FLEX Equipment"
42. U. S. Nuclear Regulatory Commission (NRC) letter to NEI (Joseph E. Pollock) endorsing EPRI Report 3002000623 entitled "Nuclear maintenance Applications Center: Preventive Maintenance Basis for FLEX Equipment", dated October 7, 2013
43. U. S. Nuclear Regulatory Commission (NRC) letter to NEI (Jack Stringfellow) endorsing Westinghouse position paper entitled "Westinghouse Response to NRC Generic Request for Additional Information (RAI) on Boron Mixing in Support of the Pressurized Water Reactor Owners Group (PWROG)", dated January 8, 2014
44. NEI position Paper entitled "Battery Life Issue" and letter to NRC dated August 27, 2013
45. U. S. Nuclear Regulatory Commission (NRC) letter to NEI (Joseph E. Pollock) endorsing "Battery Life Issue" White Paper, dated September 16, 2013

The following references were deleted:

21. AOP-123.4 Loss of Spent Fuel Pool Cooling
22. AOP-123.5 Decreasing Level in the Spent Fuel Pool with the Fuel Transfer Canal Transfer Tube Valve Closed
23. BDMG-1.0, Spent Fuel Pool Makeup and Spray Strategies

In Attachment 1A: Sequence of Events Timeline

Several of the Action Items were moved to reflect starting cooldown at +3 hours and starting RCS boration at +22 hours.

Justification: This change reflects new analysis completed.

Attachment 1B: NSSS Significant Reference Analysis Deviation Table

Several of the Action Items were moved to reflect starting cooldown at +3 hours and starting RCS boration at +22 hours.

Justification: This change reflects new analysis completed.

Item Seal Leakage was revised to provide greater detail in expected N9000 seal leakage.
Item Cooldown was revised to reflect cooldown time at 2-4 hours after the event.
Item Makeup Capacity was revised to clarify that 20 gallons per minute would be adequate with N9000 low leakage seals at elevated RCS pressures.

Justification: These changes reflect new analysis completed.

In Attachment 3: FLEX Portable Equipment

In Table "PWR Portable Equipment Phase 2," the "Two (2) 480 VAC Diesel Generators" have been replaced with "Two 7.2 kV ac Combustion Turbine Generators (diesel)" and the number of 80kW generators was reduced from 4 to 2.

Justification: This change reflects a revised strategy for size, location, and number of generators

In Table "PWR Portable Equipment Phase 2," two new rows were added to clarify that debris clearing equipment and FLEX transport equipment will be available in diverse locations.

Justification: This change is in response to Audit Questions #3, 8, and #9.

Figures

Figure 1 – Conceptual Phase 1&2 Coping for SG Feed Makeup was revised and reissued in Attachment II of this submittal. The significant changes to the figure are as follows: (1) added FLEX Booster Pump between CST and FLEX SG Makeup Pump and (2) replaced reference to FLEX Feed Header to Building connection (Intermediate Building-East or Auxiliary Building-North).

Figure 2 – Conceptual Diverse Strategy for Supplying FLEX SG Makeup was revised, renamed, and reissued in Attachment II of this submittal. The significant changes to the

figure are as follows: (1) revised the figure name to reflect the strategy for supplying the FLEX SG Makeup Pump, (2) revised location and name for FLEX Booster Pump, (3) changed Suction of East FLEX SG Makeup Pump to be from CST via FLEX Booster Pump instead of from EFW Supply Lines, and (4) made note that FLEX SG Pump can be used for RCS makeup in modes 5/6.

Figure 3 – Conceptual Phase 2 Coping for Refilling of CST was revised and reissued in Attachment II of this submittal. The significant changes to the figure are as follows: (1) changed pump to directly feed SG from TDEFW to EFW Pump to make generic and (2) added Booster Pump between CST and FLEX SG Makeup Pump.

Figure 4 – Conceptual Strategy for Reactor Makeup and Reactivity Control was revised and reissued in Attachment II of this submittal. The significant changes to the figure are as follows: (1) changed the suction and discharge connections to be consistent with the revised RCS makeup strategy using a portable RCS makeup pump or FLEX SG Makeup Pump (mode 5/6) and (2) removed power sources for pumps and incorporated into notes.

Figure 5 – Conceptual Coping Strategies for Support Functions from Electrical Building (EB) was revised, renamed, and reissued in Attachment II of this submittal. The significant changes to the figure are as follows: (1) revised name of EEB to reflect new name as EB, (2) added storage location of portable 300 kilowatt Diesel Generator in the Auxiliary Electrical Building (AEB), and (3) removed the previously envisioned series of transfer switches and RXMU FLEX Pump in the AB.

Figure 6 – Conceptual FLEX UHS Water Supply Routing to Containment Cooling was revised, renamed, and reissued in Attachment II of the first six-month status report. The figure was renamed to remove reference to Spent Fuel Pool cooling in the title.

Figure 7 – was previously deleted

Figure 8 – Conceptual FLEX Feed Header Layout was revised and reissued in Attachment II of this submittal. The significant changes to the figure are as follows: (1) eliminated FLEX SG Makeup Pump from CAR and placed near east feed connection, (2) revised FLEX header to indicate it is portable, and (3) identified possible water sources for SG makeup.

Figure 9 – Conceptual Coping Strategy to Repower 7.2kV bus was revised, renamed, and reissued in Attachment II of this submittal. The significant changes to the figure are as follows: (1) renamed figure to reflect repowering 7.2 kilovolt bus, (2) revised size, type, and number of generators in the CAR storage, and (3) eliminated repowering ASI Pump and Reactor Makeup (RXMU) FLEX Pump.

Figure 10 – Conceptual Coping Strategy to Repower RBCU Fan(s), Batteries, ASI/RXMU FLEX Pump was deleted since the strategy or need for repowering these components has changed. Figure 9 provides the strategy to repower a 7.2 kilovolt 1E bus.

Figure 12 also provides an overview of the conceptual electrical distribution and repowering strategies.

Figure 11 – FLEX Strategy Conceptual Mechanical Diagram was added in Attachment II of this submittal to provide a conceptual diagram of the interactions between strategies, water sources, and equipment.

Figure 12 – FLEX Strategy Conceptual Electrical Diagram was added in Attachment II of this submittal to provide a conceptual diagram of the interactions between strategies, generators, and equipment.

Figure 13 – FLEX Off-Site Response Map was added in Attachment II of this submittal to provide a regional view of the area with major roads, local airports, and the off-site staging area.

Figure 14 – FLEX Storage and Deployment Site Plan was added in Attachment II of this submittal to provide an aerial view of the site layout identifying the onsite RRC staging area B and the onsite robust haul path.

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

SCE&G 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 generic concerns have been addressed by NEI, accepted by the NRC, and incorporated into the appropriate section of the Overall Integrated Plan:

- Position Paper: Shutdown/Refueling Modes – endorsed by NRC in September 30, 2013 letter to NEI was incorporated into Section 5: Strategy Deployment.
- EPRI Report 3002000623 entitled “Nuclear maintenance Applications Center: Preventive Maintenance Basis for FLEX Equipment” – endorsed by NRC in October 7, 2013 letter to NEI was incorporated into Section 7: Programmatic Controls.
- Westinghouse position paper entitled “Westinghouse Response to NRC Generic Request for Additional Information (RAI) on Boron Mixing in Support of the Pressurized Water Reactor Owners Group (PWROG), – endorsed by NRC in January 8, 2014 letter to NEI was incorporated into Section 11: Maintain RCS Inventory Control.
- Battery Life Issue White Paper – endorsed by NRC in September 16, 2013 letter to NEI was incorporated into Section 14: Safety Function Support.

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. SCE&G'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 28, 2013.
2. 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.
3. SCE&G's 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.

**VIRGIL C. SUMMER NUCLEAR STATION UNIT 1
DOCKET NO. 50-395
OPERATING LICENSE NO. NPF-12**

ATTACHMENT II

CONCEPTUAL SKETCHES OF STRATEGIES

Figure 1 – Conceptual Phase 1&2 Coping for SG Feed Makeup

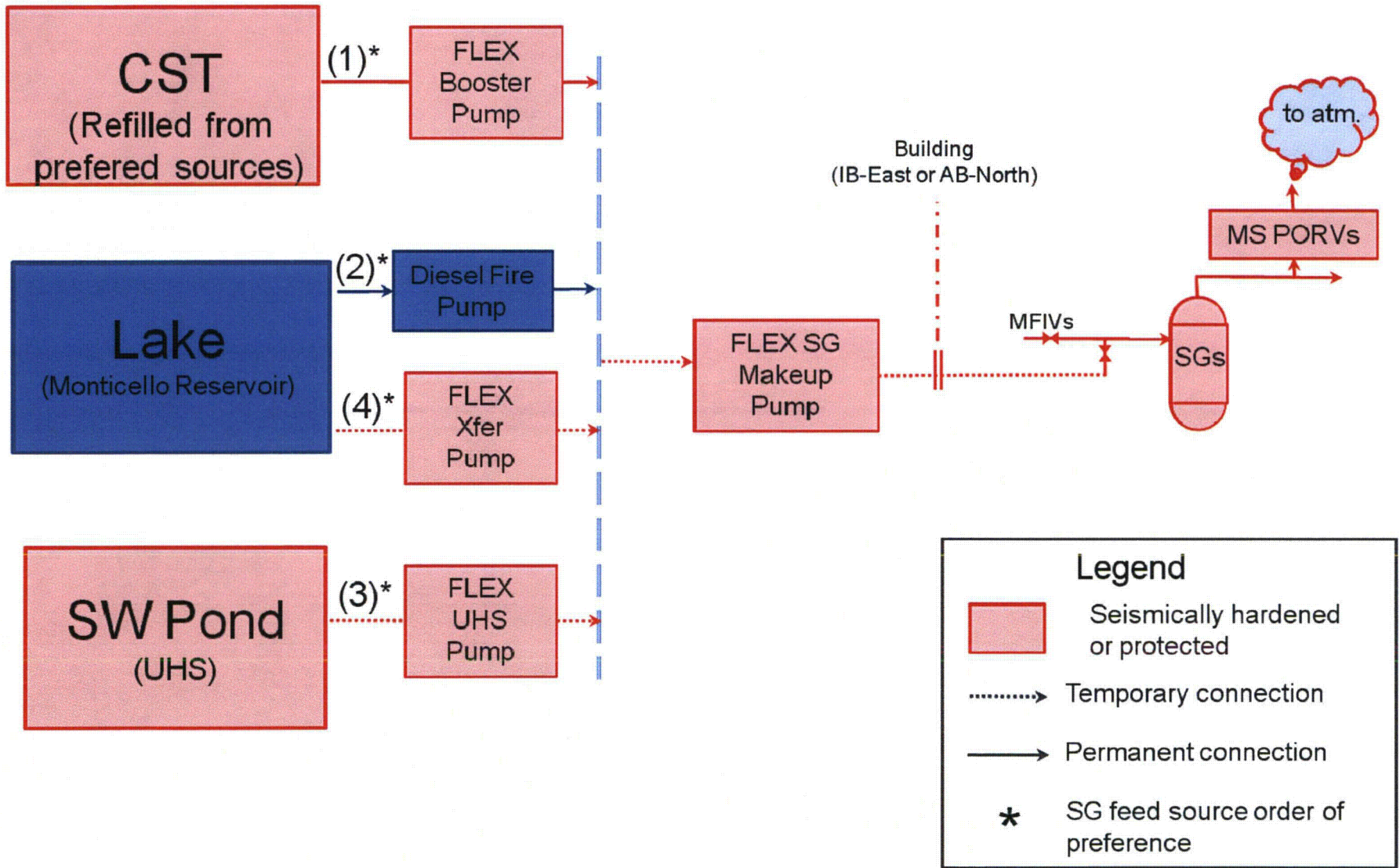


Figure 2 – Conceptual Diverse Strategy for Supplying FLEX SG makeup

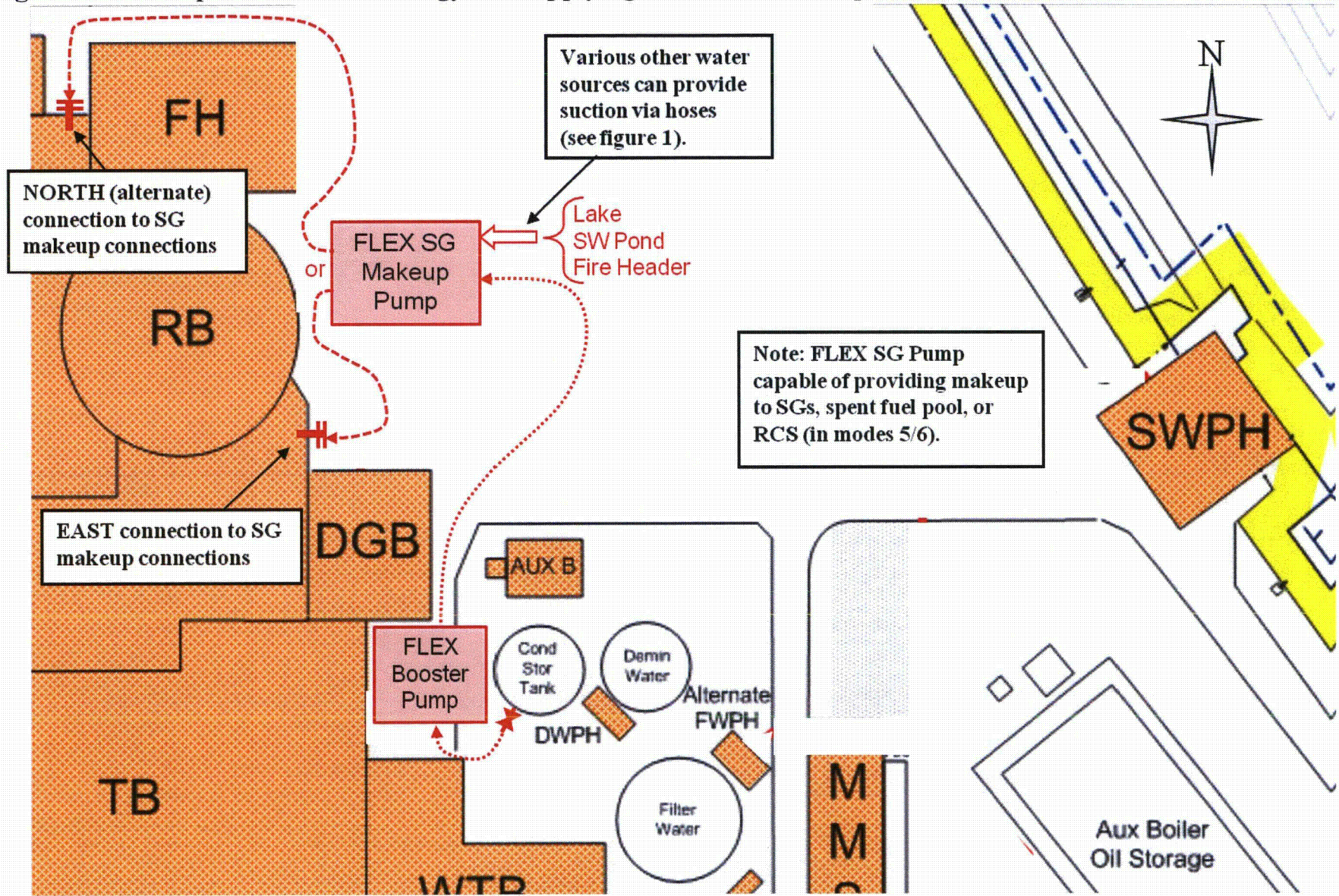


Figure 3 – Conceptual Phase 2 Coping for Refilling of CST

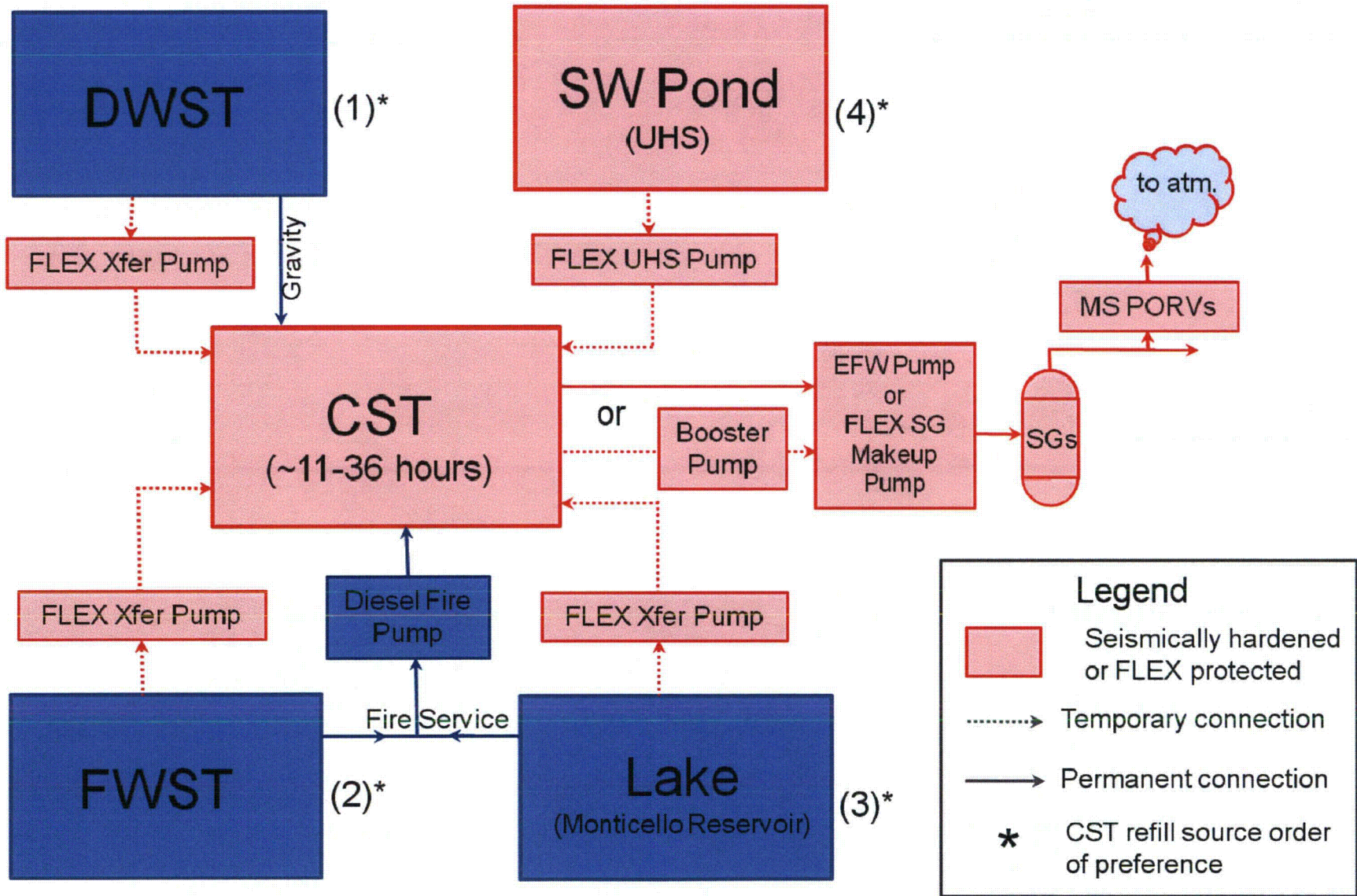
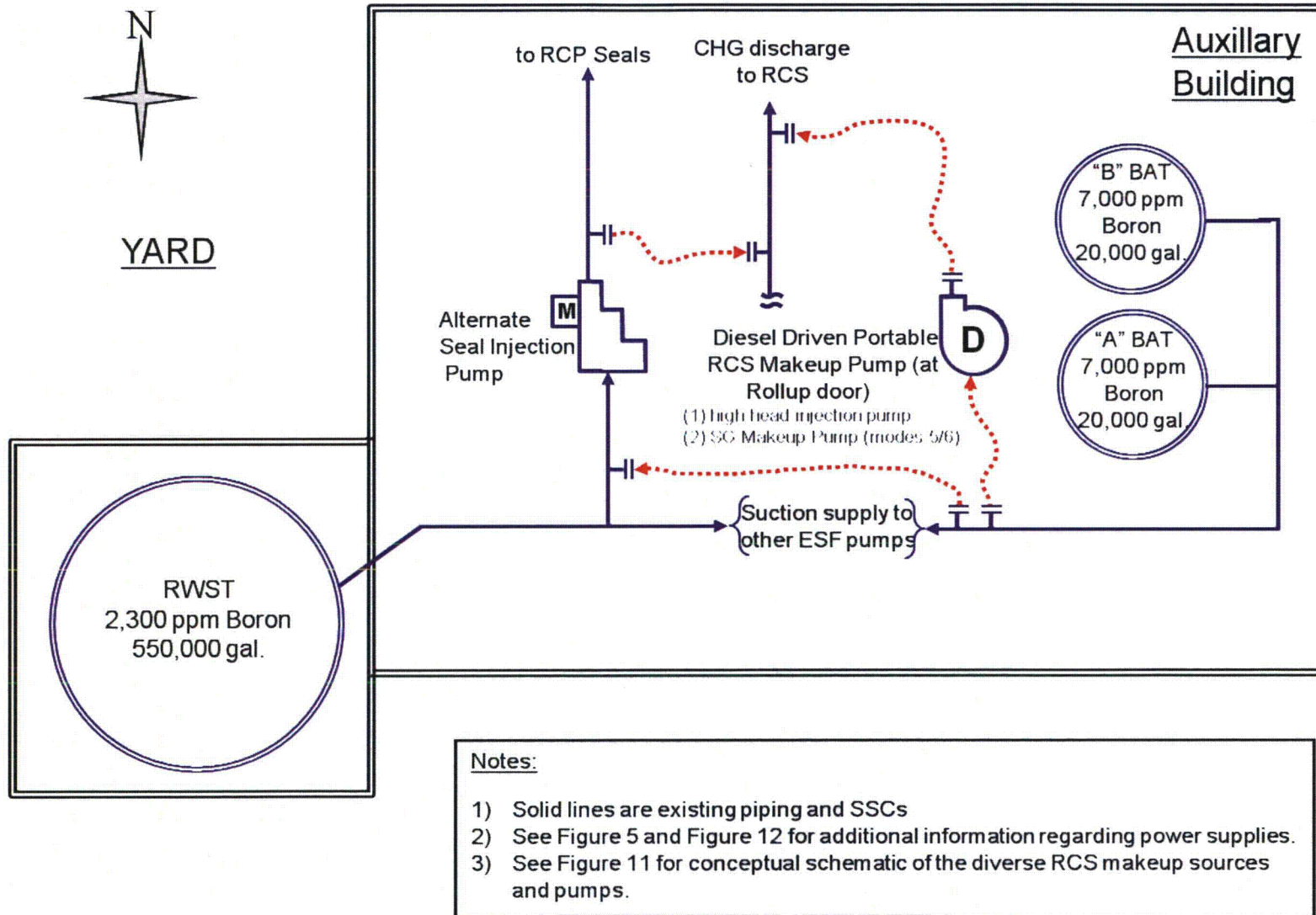


Figure 4 – Conceptual Strategy for Reactor Makeup and Reactivity Control



- Notes:**
- 1) Solid lines are existing piping and SSCs
 - 2) See Figure 5 and Figure 12 for additional information regarding power supplies.
 - 3) See Figure 11 for conceptual schematic of the diverse RCS makeup sources and pumps.

Figure 5 – Conceptual Coping Strategies for Support Functions from EB

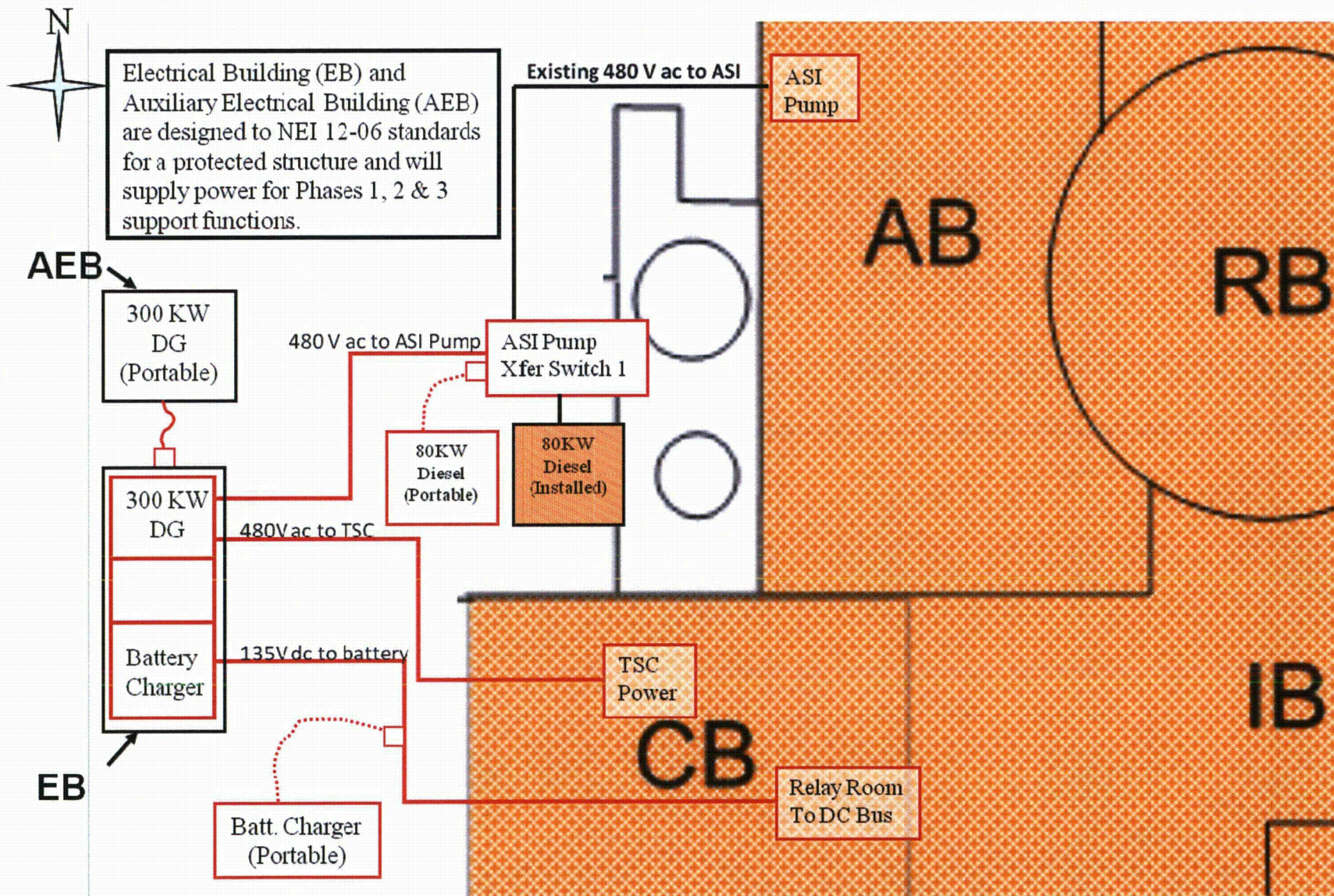


Figure 6 – Conceptual FLEX UHS Water Supply Routing to Containment Cooling

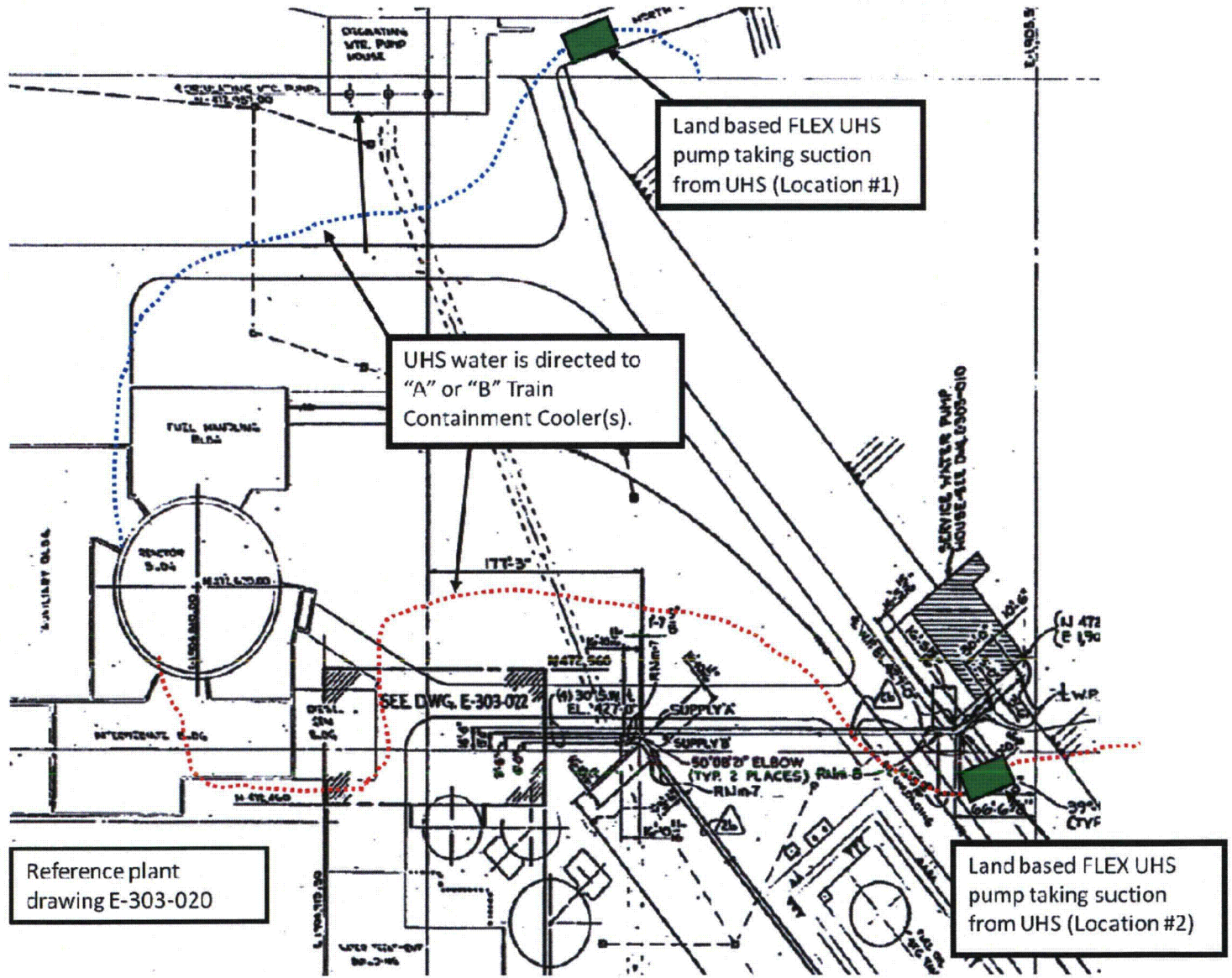


Figure 8 – Conceptual FLEX Feed Header Layout

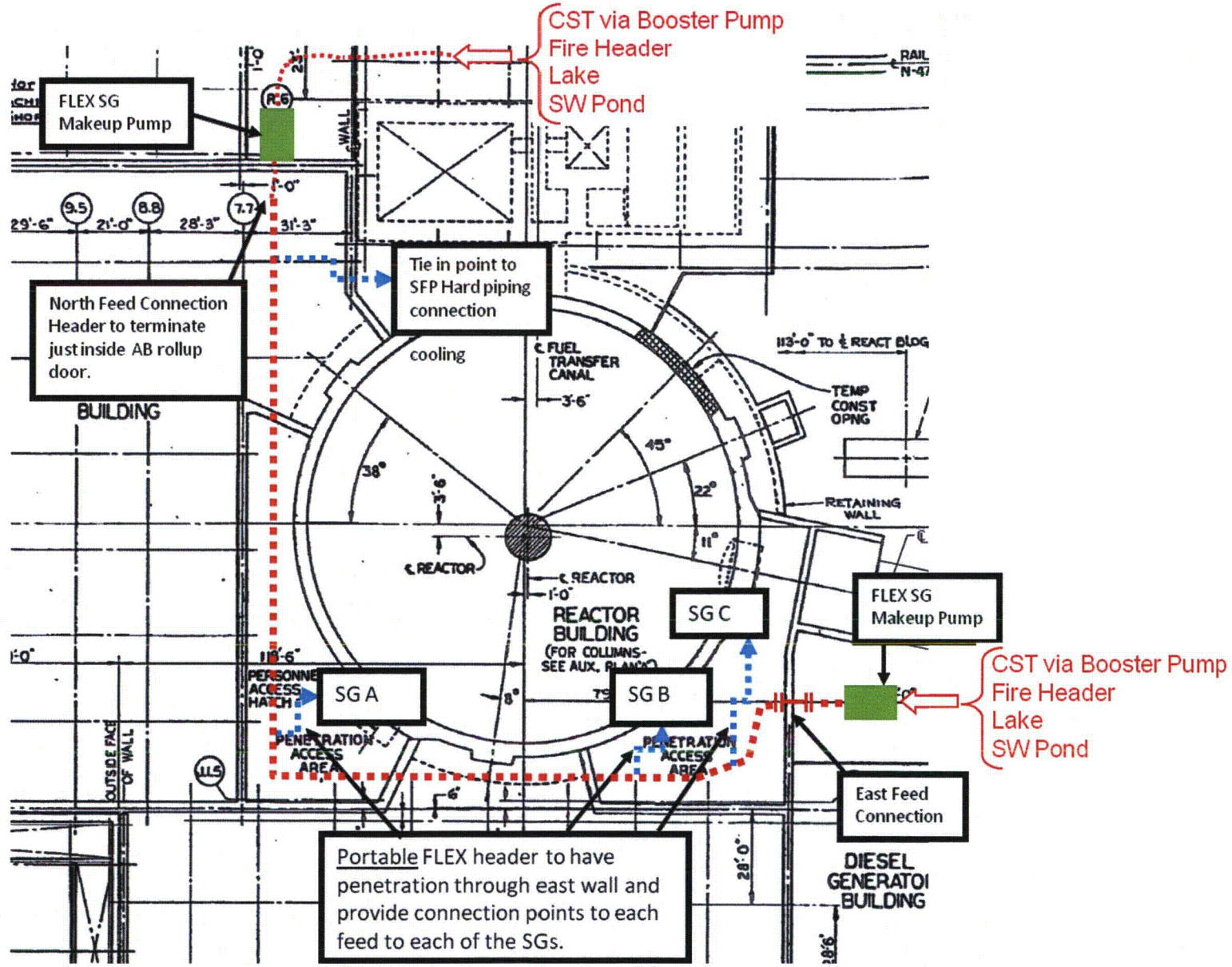


Figure 9 – Conceptual Coping Strategy to Repower 7.2kV bus

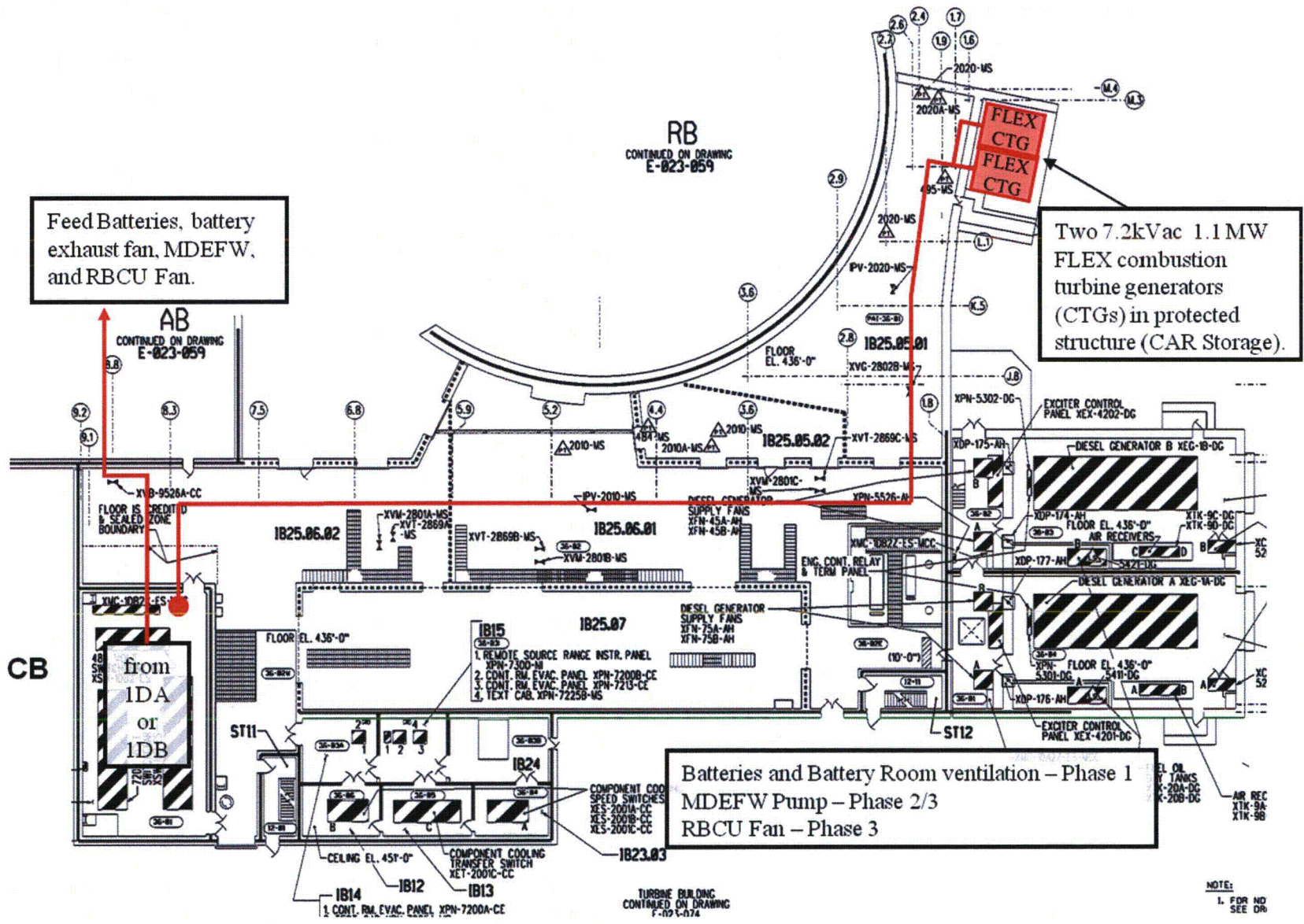


Figure 11 – FLEX Strategy Conceptual Mechanical Diagram

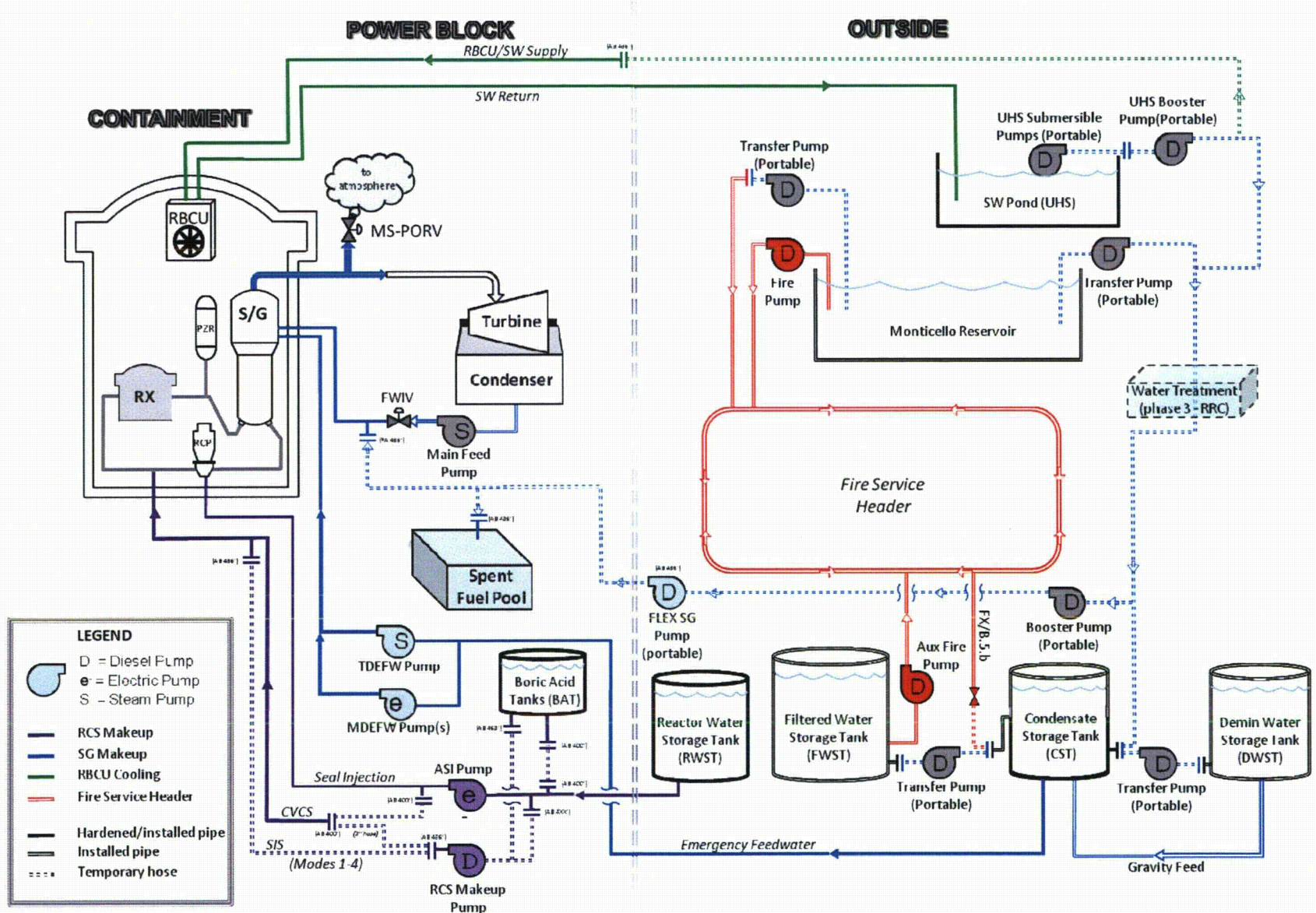


Figure 12 – FLEX Strategy Conceptual Electrical Diagram

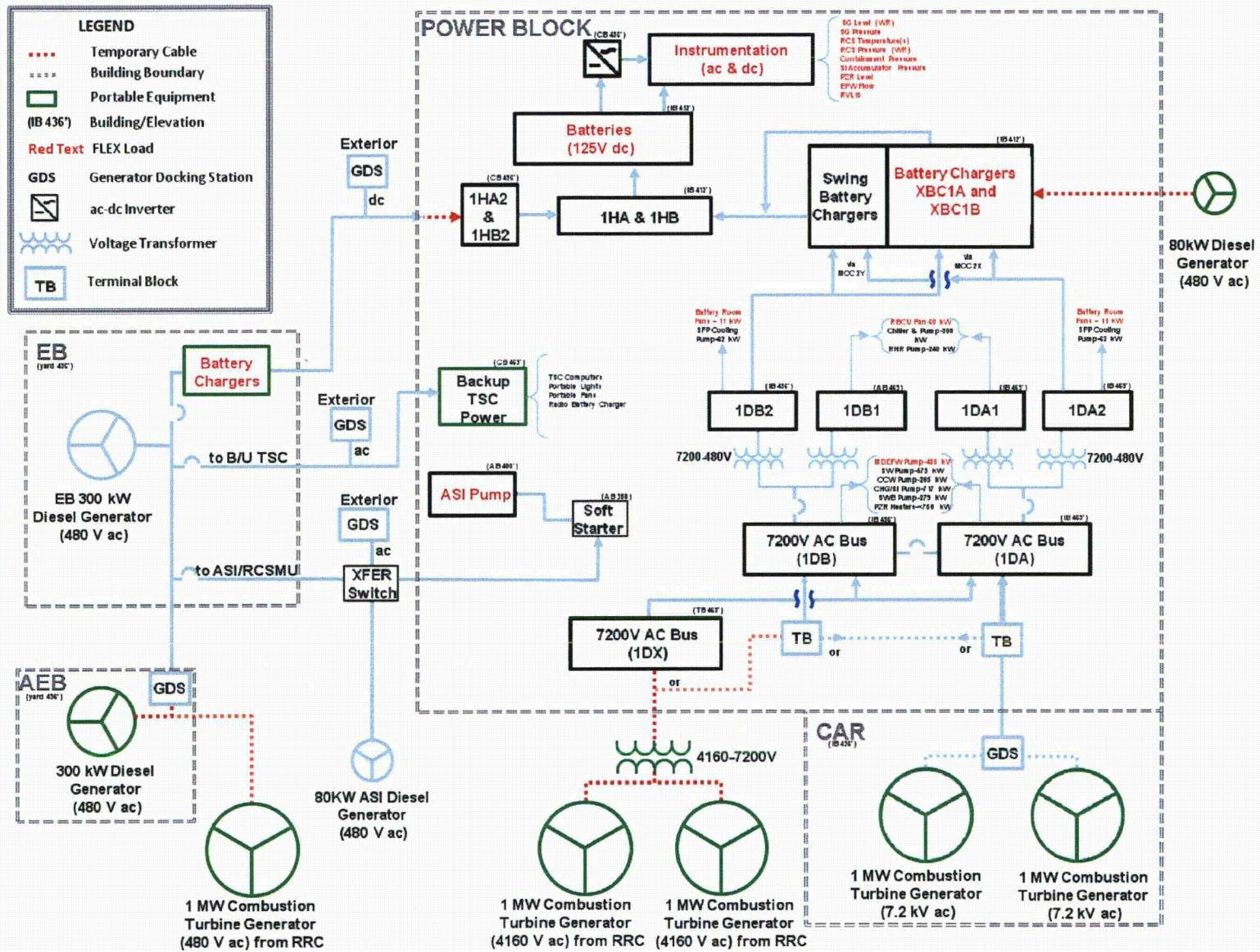


Figure 13 – FLEX Off-Site Response Map

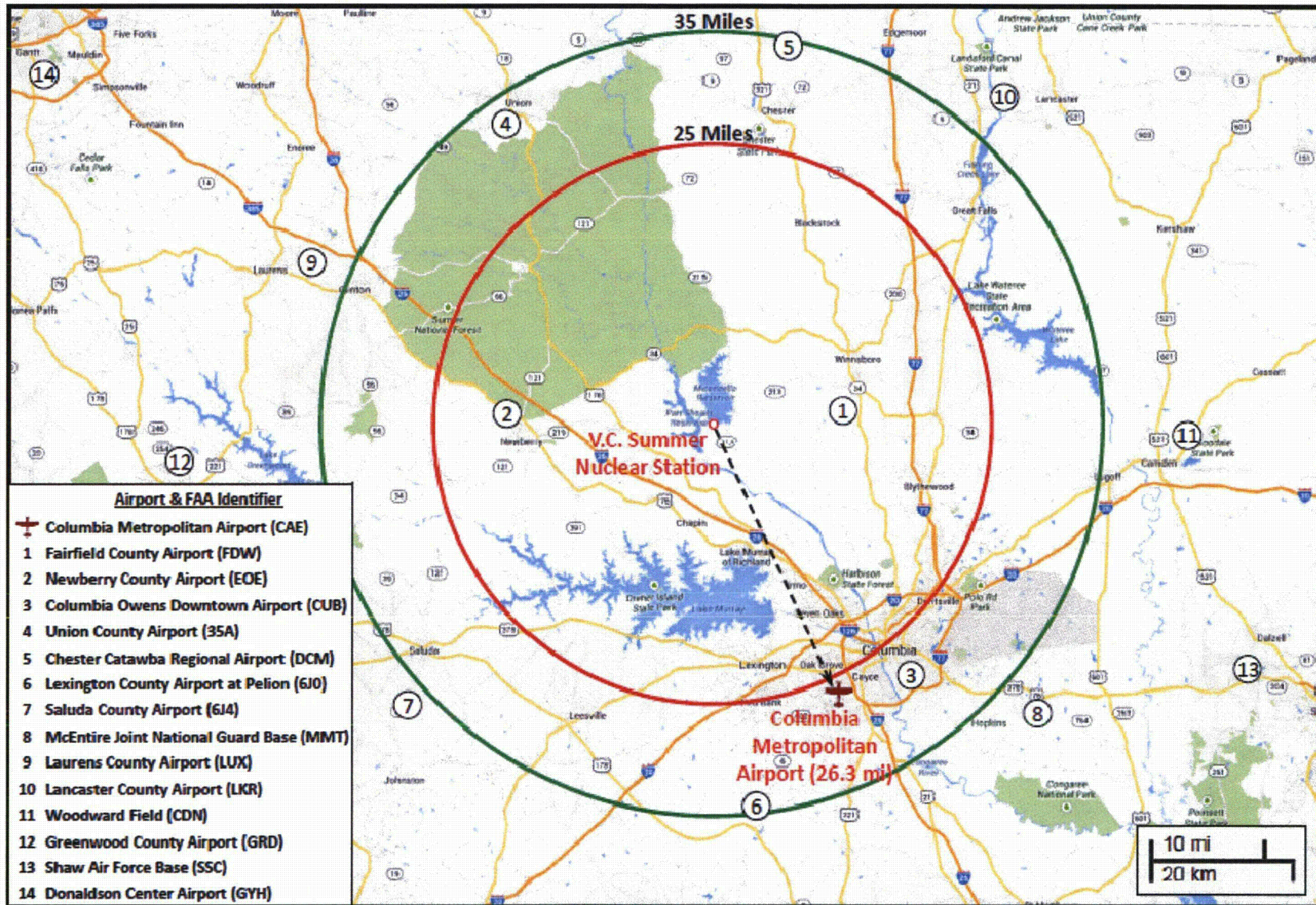


Figure 14 – FLEX Storage and Deployment Site Plan

