WOLF CREEK
NUCLEAR OPERATING CORPORATION

John P. Broschak
Vice President Engineering

February 26, 2014
ET 14-0011

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

References: 1) Letter dated March 12, 2012, from E. J. Leeds and M. R. Johnson, USNRC, to M. W. Sunseri, WCNOC, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events"

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, August 29, 2012

3) NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 0, August 2012

4) Letter ET 12-0029, dated October 29, 2012, from J. P. Broschak, WCNOC, to USNRC

5) Letter WO 13-0014, dated February 28, 2013, from R. A. Smith, WCNOC, to USNRC

6) Letter ET 13-0027, dated August 28, 2013, from J. P. Broschak, WCNOC, to USNRC

Subject: Docket No. 50-482: Wolf Creek Nuclear Operating Corporation'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"

Gentlemen:

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued Order EA-12-049 (Reference 1) to Wolf Creek Nuclear Operating Corporation (WCNOC). Reference 1 was immediately effective and directs WCNOC to develop, implement, and maintain guidance and

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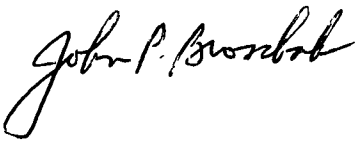
strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities in the event of a beyond-design-basis external event. Specific requirements are outlined in Attachment 2 of Reference 1.

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 (OIP) pursuant to Section IV, Condition C. Reference 2 endorses industry guidance document NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," (Reference 3) with clarifications and exceptions identified in Reference 2. Reference 4 provided the WCNOC initial status report regarding mitigation strategies. Reference 5 provided the WCNOC OIP. Reference 6 provided the first six-month status report for the implementation of Order EA-12-049.

Reference 1 requires submission of a status report at six-month intervals following submittal of the OIP. 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 submittal of Reference 6, including any changes to the compliance method, schedule, or need for relief and the basis for requests for relief, if any.

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4085, or Mr. Michael J. Westman at (620) 364-4009.

Sincerely,



John P. Broschak

JPB/rlt

Attachment I - Wolf Creek Nuclear Operating Corporation's (WCNOC) Second Six-Month Status Report for the Implementation of Order EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events"

Enclosure I - Excerpts from Draft Procedure AP 06-005, "Diverse and Flexible Coping Mitigation Strategies (FLEX) Program"

cc: M. L. Dapas (NRC), w/a
C. F. Lyon (NRC), w/a
N. F. O'Keefe (NRC), w/a
Senior Resident Inspector (NRC), w/a

STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

John P. Broschak, of lawful age, being first duly sworn upon oath says that he is Vice President Engineering of Wolf Creek Nuclear Operating Corporation; that he has read the foregoing document and knows the contents thereof; that he has executed the same for and on behalf of said Corporation with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By John P. Broschak
John P. Broschak
Vice President Engineering

SUBSCRIBED and sworn to before me this 26th day of Feb, 2014.

Gayle Shepheard
Notary Public

GAYLE SHEPHEARD
Notary Public - State of Kansas
My Appt. Expires 7/24/2015

Expiration Date 7/24/2015

Wolf Creek Nuclear Operating Corporation's (WCNOC) Second Six-Month Status Report for the Implementation of Order EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events"

1. Introduction

WCNOC developed an Overall Integrated Plan (OIP) (Reference 1), documenting the diverse and flexible strategies (FLEX), in response to Reference 2. This attachment provides an update of milestone accomplishments since submittal of the OIP, including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any.

2. Milestone Accomplishments

The following milestones have been completed since the submittal of the last six month status report (Reference 3), and are current as of January 31, 2014.

- Generation of Thermal Hydraulic Information for Containment (GOTHIC) ELAP Containment Heat-Up Evaluation – Complete
- Select Location of Off-Site Delivery Station – Complete
- Select Design of Off-Site Delivery Station – Complete
- Select Location of two (2) on-site FLEX Storage Buildings – Complete
- Select Design of two (2) on-site FLEX Storage Buildings – Complete

3. Milestone Schedule Status

The following provides an update to Attachment 2 of the OIP. It provides the activity status of each item, and whether the expected completion date has changed. The dates are planning dates and are subject to change as design and implementation details are developed.

The revised milestone target completion dates do not impact the order implementation outage. Italicized text denotes that a Milestone was updated since the first six-month status update.

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*	-
FLEX Strategy Evaluation	Apr 2013	Complete	-
Walk-Throughs or Demonstrations	*Sep 2014*	*Not Started*	-

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Perform Staffing Analysis	*Dec 2013*	*On-Going*	*Oct 2014*
Modifications:			
Modifications Evaluation	Apr 2013	Complete	-
N-1 Walkdown	Apr 2014	Not Started	-
Design Engineering	*Jan 2014*	*On-Going*	*Feb 2014*
*Implementation Outage**	*Feb 2015*	*As Scheduled*	*Mar 2015*
FLEX Equipment:			
Procure On-Site Equipment	Dec 2014	On-Going	-
Develop Strategies with Regional Response Center (RRC)	*Nov 2013*	*On-Going*	*Aug 2014*
Install Off-Site Delivery Station (if necessary)	Sep 2014	On-Going	-
Procedures:			
PWROG issues NSSS-specific guidelines	Jun 2013	Complete	-
Create Wolf Creek Flex Support Guidelines (FSG)	*Jun 2014*	*On-Going*	*Aug 2014*
Create Maintenance Procedures	Jul 2014	Not Started	-
Training:			
Develop Training Plan	Jul 2014	On-Going	-
Training Complete	Feb 2015	Not Started	-
Submit Completion Report	*Mar 2015*	*Not Started*	*Apr 2015*

**Refueling Outage 20 schedule was revised and results in the outage completing in March 2015.*

4. Changes to Compliance Method

While the OIP (Reference 1) provided the original basis for plant modifications several strategies have since been optimized. These optimized strategies are included in Enclosure I to this letter and are taken from draft procedure AP 06-005, "Diverse and Flexible Coping Mitigation Strategies (FLEX) Program. This procedure is being developed for guidance implementing the diverse and flexible coping mitigation strategies. The modification packages supporting the strategies in Enclosure I are undergoing final review.

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

As part of a separate submittal WCNOC plans to request relaxation for the implementation of the NRC Order EA-12-049. The WCGS FLEX strategies rely on the low leakage reactor coolant pump (RCP) seals and a seismic and missile protected condensate storage tank (CST).

Plant modifications associated with these two items cannot be completed within the two refueling cycles requirement.

An extension of one additional refueling cycle will be requested, which would move the implementation date to completion of the fall 2016 refueling outage, which is still within the maximum allowed timeframe of December 2016.

6. Open Items from Overall Integrated Plan and Interim Staff Evaluation

The following table provides a summary of the open items documented in the OIP and the status of each item.

Open Item #	Overall Integrated Plan Open Item	Status
OI 1	Finalize the location of the FLEX storage building. The deployment routes, distances, and times provided in this report are bounded for the currently proposed locations but will be updated as necessary.	Started - The locations of the two FLEX storage buildings have been selected. WCNOC is now working to confirm the deployment routes, distances, and times presented in the OIP bound these locations.
OI 2	Perform containment evaluation, using GOTHIC, based on the boundary conditions described in Section 2 of NEI 12-06. Based on the results of this evaluation, required actions to ensure maintenance of containment integrity and required instrument function will be developed.	Closed – The GOTHIC analysis has been completed. The containment structure and instrumentation inside containment critical to coping with an ELAP event are shown to be acceptable following a 7-day duration (Reference 5).
OI 3	The current CST and CST pipe chase are non-seismic. Therefore, WCNOC is currently pursuing two (2) options; the qualification and hardening of the existing CST, or the construction of a new 670,000 gallon seismically qualified and missile protected CST. One of these options must be completed before the volume of the CST can be credited.	Started – An evaluation was performed to show that the existing CST met current licensing basis for seismic and tornado missile hazards (References 6, 7 and 9). The CST can withstand an OBE but will require reinforcement in order to withstand an SSE. A modification plan to protect the CST valve house against tornado missiles and to reinforce the tank itself to withstand an SSE is being finalized (Reference 8). The design for the tank and the valve house is scheduled to be complete by March 2014. The CST pipe chase has been evaluated and can withstand the current licensing basis for seismic and tornado missile

Open Item #	Overall Integrated Plan Open Item	Status
		hazards (Reference 12).
OI 4	Modify the RWST to protect it from tornado missiles or identify a borated source that is protected for tornados and can be utilized to provide core cooling when steam generators are not available.	Started - An evaluation was performed which shows that the existing refueling water storage tank (RWST) meets current licensing basis for tornado missiles (Reference 6 and 11). A design to protect the RWST valve house against tornado missiles is being finalized. The design for the valve house is scheduled to be complete by March 2014 (Reference 8).
OI 5	For non-Class 1E instrumentation that will be repowered using a temporary battery, an analysis will need to be performed to determine battery life and frequency of replacing battery.	Closed – The final plant strategies do not rely on any equipment that is not powered by a Class 1E source.
OI 6	The method for isolating accumulators during RCS inventory control has not been finalized.	Closed – It was confirmed that the accumulator isolation valves are on a bus that is being re-powered for the primary electrical FLEX strategy. For the alternate electrical FLEX strategy, nitrogen injection will be prevented by venting the accumulators.
OI 7	The method for repowering the SFP cooling pumps has not been finalized.	Closed – Powering a Spent Fuel Pool (SFP) cooling pump is a Phase 3 action. The pump will be re-powered by a 4160V generator provided by the RRC.

The following table provides a summary of the open items documented in the Interim Staff Evaluation (Reference 4) and the status of each item.

Item Number	Interim Staff Evaluation Description	Status
3.1.1.2.A	Verify that the potential for liquefaction considerations to impede movement of FLEX equipment following a severe seismic event at Wolf Creek are evaluated.	Not Started – A review of the FLEX deployment paths will be completed.

Item Number	Interim Staff Evaluation Description	Status
3.1.1.2.B	Verify that power that might be required to deploy equipment, such as power to open roll up doors at a storage location, is evaluated.	Closed – The deployment of FLEX equipment will not require external power. Equipment such as roll up doors, will have provisions to be opened manually.
3.2.1.8.A	Verify resolution of the generic concern associated with the modeling of the timing and uniformity of the mixing of a liquid boric acid solution injected into the RCS under natural circulation conditions potentially involving two-phase flow.	Closed – WCNOC will conform to the position expressed by the NRC staff in the letter dated January 8, 2014 to the PWROG (Reference 13). The NRC letter states that the NRC staff has reviewed the information submitted to date and concluded that use of the industry approach in PWROG letter OG-13-284 dated August 19, 2013 (Reference 14) is acceptable with clarifications listed in the letter.
3.2.4.8.B	Verify that instrumentation that will be used to monitor portable/FLEX electrical power equipment ensures that: 1) the electrical equipment remains protected (from an electrical power standpoint - e.g., power fluctuations) and, 2) the operator is provided with accurate information to maintain core cooling, containment, and spent fuel cooling strategies.	Not Started
3.4.A	Verify that the license has fully addressed considerations (2) through (10) of NEI 12-06, Section 12.2, Minimum Capability of Off-Site Resources, which requires each site to establish a means to ensure the necessary resources will be available from off-site.	Started – When finalized, a copy of the RRC playbook will be provided to the NRC for review.

7. References

1. WCNOC Letter WO 13-0014, "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," February 28, 2013. ADAMS Accession No. ML13070A026.

2. Letter from E. J. Leeds and M. R. Johnson, USNRC, to M. W. Sunseri, WCNOC, "Issuance of Order to Modify Licenses with Regard to Requirements For Mitigation Strategies for Beyond-Design-Basis External Events," March 12, 2012. ADAMS Accession No. ML12054A735.

3. WCNOC Letter ET 13-0027, "Wolf Creek Nuclear Operating Corporation's First 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," February 28, 2013. ADAMS Accession No. ML13247A277.

4. Letter from J. S. Bowen, USNRC, to A. C. Heflin, WCNOC, "Wolf Creek Generating Station, Unit 1 – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Order EA-12-049 (Mitigation Strategies)(TAC NO. MF0788)," February 6, 2014. ADAMS Accession No. ML14002A190.

5. CN-OA-13-7, Revision 0, "Wolf Creek ELAP Containment Heat-Up," November 12, 2013.

6. 020542.13.01-C-001, Revision 0, "Condensate Storage Tank and Refueling Water Storage Tanks Tornado Missile Impact Analyses," November 2013.

7. 020542.13.01-C-002, Revision 0, "Structural Analysis of Condensate Storage Tank," November 2013.

8. 020542.13.01-C-003, Revision 0, "Condensate Storage Tank Valve House and Refueling Water Storage Tank Valve House Missile Impact and Seismic Analysis," December 2013.

9. 020542.13.01-C-004, Revision 0, "Condensate Storage Tank Pipe Stress Analysis," December 2013.

10. 020542.13.01-C-006, Revision 0, "Structural Analysis of Refueling Water Storage Tank," December 2013.

11. 020542.13.01-C-008, Revision 0, "Refueling Water Storage Tank Pipe Stress Analysis," December 2013.

12. 020542.13.01-C-009, Revision 0, "Condensate Storage Tank Pipe Tunnel Evaluation," December 2013.

13. Letter from J. Davis, USNRC, to N. J. Stringfellow, PWROG, January 8, 2013. ADAMS Accession No. ML13276A183.

14. PWROG Letter OG 13-284, "Submittal of LTR-FSE-13-46, Revision 0, P-Attachment, "Westinghouse Response to NRC Generic Request for Additional Information (RAI) on Boron Mixing in Support of the Pressurized Water Reactor Owners Gropu (PWROG)" (Proprietary) (PA-ASC-1184)," August 19, 2013.

Enclosure I to ET 14-0011

Excerpts from Draft Procedure AP 06-005, "Diverse and Flexible Coping Mitigation Strategies (FLEX) Program"
(14 pages)

2.1 REACTOR CORE COOLING AND HEAT REMOVAL

2.1.1 Phase 1

Core Cooling with Steam Generators Available:

During a station blackout (SBO), operator actions are governed by procedure EMG C-0. The Phase 1 strategy directs operators to remove heat through the steam generators using the atmospheric relief valves (ARVs) and feed the S/G's using the Turbine Driven Auxiliary Feedwater Pump (TDAFWP).

Core Cooling with Steam Generators not Available:

Reactor core cooling and heat removal with steam generators not available is provided during Phase 1 by heating up and boiling of the RCS coolant inventory. RCS inventory during Phase 1 will be maintained by gravity feed from the RWST (Reference 6.3.1). The ability of the RWST to provide a gravity feed to the RCS is limited by the RWST fluid height, line losses through the gravity feed path, and pressure within the RCS.

2.1.2 Phase 2

Core Cooling with Steam Generators Available:

The transition into Phase 2 will be required once the operating conditions of the TDAFWP cannot be maintained. A diesel driven FLEX Core Cooling Pump will be provided as an alternate AFW supply.

This pump will be deployed near the CST and a semi-rigid hose routed from the CST to the suction of the pump. The pump discharge will be routed, via medium pressure hose, to an intermediate piping connection inside the CST valve house. The final connections will be made, via medium pressure hose, inside Room 1207 of the Auxiliary building to either the Motor Driven Auxiliary Feedwater Pump (MDAFWP) header piping FLEX tie-in (primary connection) or the Non-Safety MDAFWP Suction Piping FLEX tie-in (alternate connection). Figure 2.1.4-1 provides an illustration of the hose and piping routes for both the primary and alternate flow paths.

Two diesel driven FLEX Core Cooling Pumps will be stored on-site in the FLEX storage buildings. Each pump is sized to provide the total required core cooling flow to the unit. This satisfies the N+1 requirement.

Core Cooling with Steam Generators not Available:

The transition to Phase 2 strategies will be required when gravity drain from the RWST is no longer possible and as inventory from the RCS is lost due to boil-off.

The diesel driven FLEX Core Cooling Pump can provide RCS Makeup during Modes 5 and 6 using a FLEX connection added to the RWST drain line, located in the RWST Valve House. The pump will be deployed on the west side of the fuel building, adjacent to the RWST. Semi-rigid suction hose from the RWST Valve House will be routed to the suction of the pump. The discharge of the pump will be routed through door 13011, using medium pressure hose, to either the Safety Injection System (SIS) discharge header FLEX tie-in (primary connection) or Centrifugal Charging Pump (CCP) discharge header FLEX tie-in (alternate connection). Figure 2.1.4-2 provides an illustration of the hose and piping routes for both the primary and alternate flow paths.

The same pumps used for an event with steam generators available will be used for an event with steam generators not available. Two of these FLEX Core Cooling Pumps will be stored on-site in the FLEX storage buildings. Each pump is sized to provide the total required core cooling flow to the unit. This satisfies the N+1 requirement.

2.1.3 Phase 3

For Phase 3, the plant will continue the Phase 2 coping strategies with additional assistance provided from offsite equipment/resources. Each of the Phase 3 strategies will utilize common connector types to prevent compatibility issues with offsite equipment. The connector types chosen are based on Reference 6.3.2. The pathways and areas utilized for Phase 2 deployment and staging will also be used for Phase 3. A backup to the Phase 2 equipment will be provided by the Regional Response Center and allows the Phase 2 functions for coping to continue throughout Phase 3, even if there is a failure of on-site Phase 2 equipment during the indefinite coping period.

Core Cooling with Steam Generators Available:

During Phase 3, core cooling is maintained through natural circulation heat removal from the RCS via the steam generators. Heat rejection through the steam generators is maintained via the TDAFWP or the FLEX Core Cooling pump.

Indefinite coping is successfully established once a transition from SG cooling to residual heat removal (RHR) cooling is established. Phase 3 deployments of the FLEX Essential Service Water (ESW) pump for cooling the component cooling water (CCW) system and subsequently the RHR system establishes a portion of this capability.

Core Cooling with Steam Generators not Available:

During Phase 3, core cooling is maintained by heating up and boiling of the RCS coolant inventory. The RCS coolant inventory is maintained via the FLEX Core Cooling pump.

2.1.4 Key Parameters

1. SG Level - Normal Power Source: Class 1E DC; Long-Term Power Source: Temporary DG
2. AFW Flow indication (downstream of connection points) - Normal Power Source: Class 1E DC; Long-Term Power Source: Temporary DG
3. SG Pressure - Normal Power Source: Class 1E DC; Long-Term Power Source: Temporary DG
4. RCS Hot Leg Temperature (if CETs not available)- Normal Power Source: Class 1E DC; Long-Term Power Source: Temporary DG
5. RCS Cold Leg Temperature - Normal Power Source: Class 1E DC; Long-Term Power Source: Temporary DG
6. Core Exit Thermocouple - Normal Power Source: Class 1E DC; Long-Term Power Source: Temporary DG
7. RCS Pressure - Normal Power Source: Class 1E DC; Long-Term Power Source: Temporary DG
8. Pressurizer Level - Normal Power Source: Class 1E DC; Long-Term Power Source: Temporary DG

2.1.5 Strategy Implementation

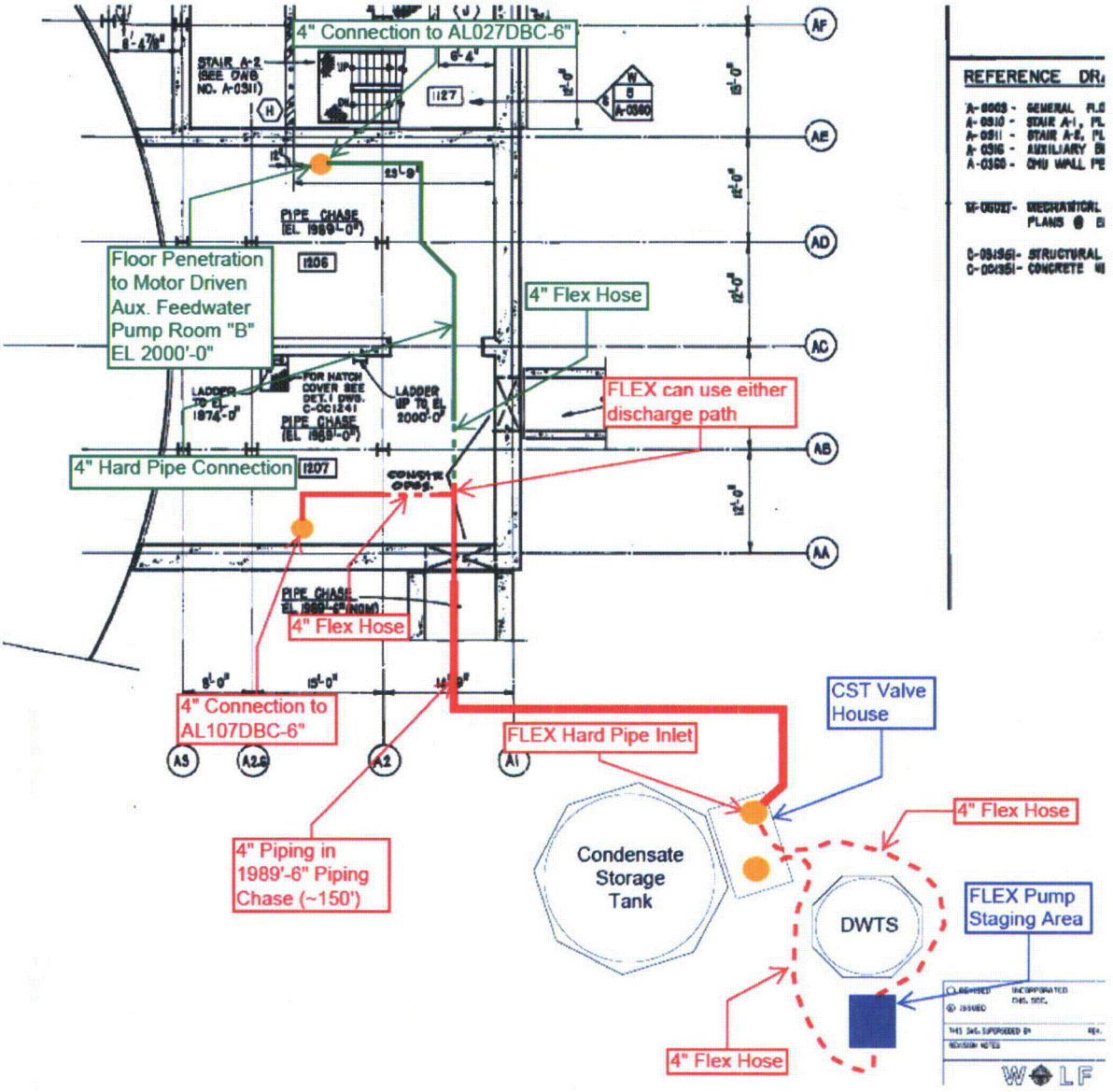


Figure 2.1.4-1 - Modes 1-4 Core Cooling & Heat Removal Strategy - 1974' El. (Ref. 6.3.4)

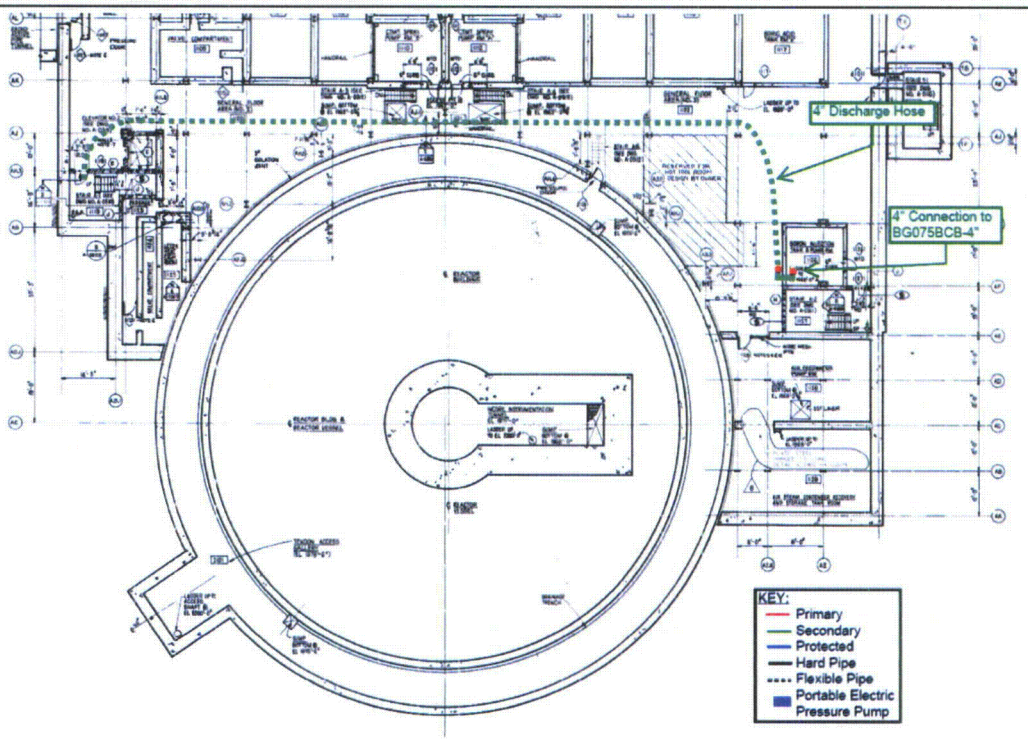


Figure 2.1.4-2 - Modes 5 & 6 Core Cooling & Heat Removal FLEX Strategy - 1974′ El. (Ref. 6.3.3)

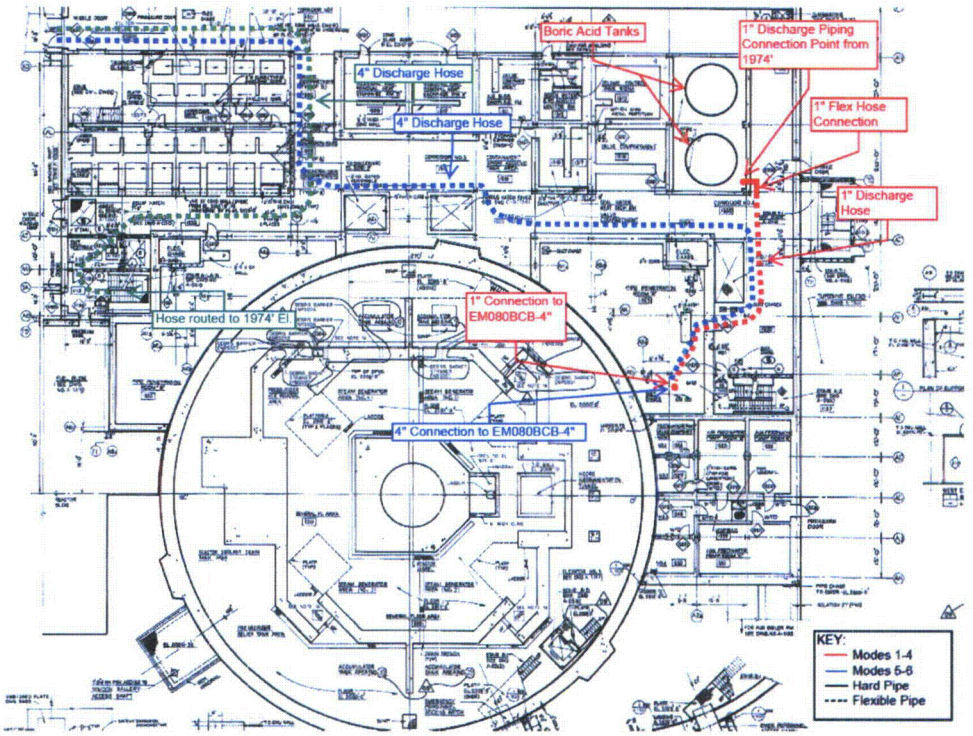


Figure 2.1.4-3 - Modes 5 & 6 Core Cooling & Heat Removal FLEX Strategy - 2000′ El. (Ref. 6.3.3)

2.2 RCS INVENTORY AND REACTIVITY CONTROL

2.2.1 Phase 1

Phase 1 activities involve plant cooldown and passive injection of the accumulators. Natural circulation is maintained by ensuring adequate RCS inventory. RCS inventory is not a significant concern for the ELAP scenario due to the installation of the low-leakage RCP seals.

2.2.2 Phase 2

During Phase 2, in order to maintain RCS inventory, a FLEX pump will be staged and aligned to ensure that single-phase natural circulation or two phase natural circulation is maintained. The installed low leakage RCP seals minimize RCS inventory loss. With the seals installed, the assumed RCP seal leakage is 1 gpm per reactor coolant pump at all RCS pressures.

The electric FLEX High Pressure RCS Makeup Pump will provide RCS makeup and boration. The normal suction source for the FLEX High Pressure RCS Makeup Pump will be the Boric Acid Tanks (BATs). The pump is stored at the point of deployment inside the Auxiliary Building. A semi-rigid hose will be routed from either of the BATs to the suction of the pump. The discharge of the FLEX High Pressure RCS Makeup Pump will be routed, using a mix of high pressure hose and installed hard piping, to either the Safety Injection System (SIS) discharge header in Room 1323 (primary connection) or Centrifugal Charging Pump (CCP) discharge header in Room 1126 (alternate connection).

The RWST can be used as an alternate RCS makeup and boration source. A FLEX connection on the RHR miniflow line provides a suction connection from the RWST inside the auxiliary building. The suction for the electric FLEX High Pressure Makeup Pump can be aligned, as needed, to the RWST. The discharge path for the pump remains unchanged. Figure 2.2.5-1 provides an illustration of the hose and piping routes for both the primary and alternate flow paths. The suction path from the BATs is shown in red while the suction path from the RWST is shown in blue. The discharge path is shown in green.

Two electric FLEX High Pressure RCS Makeup Pumps will be provided. Each pump is sized to provide the total required makeup flow to the unit. Both pumps will be stored at the point of deployment on Elevation 1974'. The N+1 requirement is satisfied by the two pumps.

2.2.3 Phase 3

Reactor level and subcriticality are adequately maintained via the Phase 2 strategy and are continued during Phase 3. With low leakage RCS seals the RWST alone can provide makeup for greater than 50 days.

2.2.4 Key Parameters

1. Core Exit Thermocouple - Normal Power Source: Class 1E DC; Long-Term Power Source: Temporary DG
2. RCS Hot Leg Temperature (if CETs not available)- Normal Power Source: Class 1E DC; Long-Term Power Source: Temporary DG
3. RCS Cold Leg Temperature - Normal Power Source: Class 1E DC; Long-Term Power Source: Temporary DG
4. RCS Wide Range Pressure - Normal Power Source: Class 1E DC; Long-Term Power Source: Temporary DG
5. Pressurizer Level - Normal Power Source: Class 1E DC; Long-Term Power Source: Temporary DG
6. Reactor Vessel Level Indicating System (Backup to Pressurizer Level) - Normal Power Source: Class 1E DC; Long-Term Power Source: Temporary DG
7. Neutron Flux - Normal Power Source: Class 1E DC; Long-Term Power Source: Temporary DG
8. RWST - Normal Power Source: Class 1E DC, Long-Term Power Source: Temporary DG
9. BAT Level - Normal Power Source: Class 1E DC, Long-Term Power Source: Temporary DG

2.2.5 Strategy Implementation

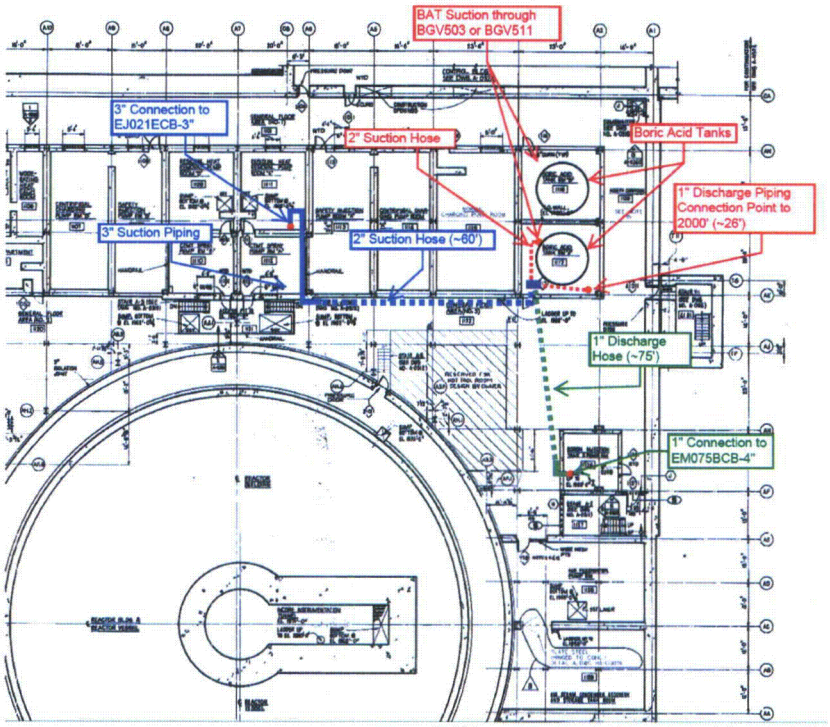


Figure 2.2.5-1 - RCS Makeup/Boration FLEX Strategy - 1974' El. (Reference 6.3.3)

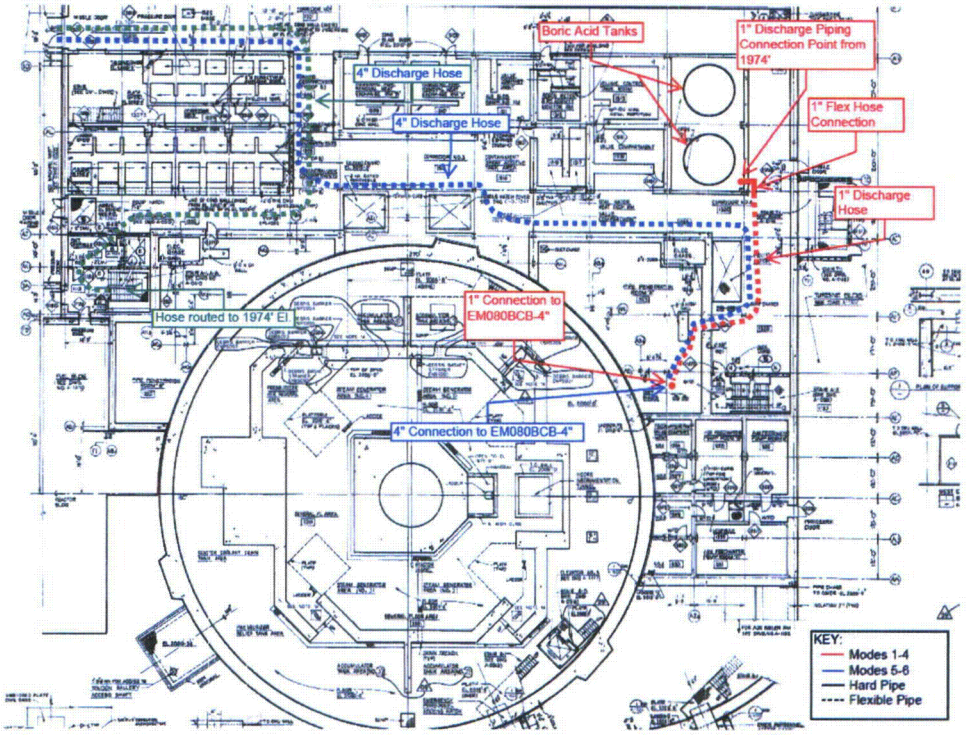


Figure 2.2.5-2 - RCS Makeup/Boration FLEX Strategy - 2000' El. (Reference 6.3.3)

2.3 CONTAINMENT INTEGRITY

2.3.1 Phases 1 - 3

Containment pressure and temperature are expected to increase during an ELAP due to loss of containment cooling and RCS leakage into containment. A GOTHIC analysis, based on the boundary conditions described in Section 2 of NEI 12-06 was performed. The evaluation determined that the pressure and temperature do not rise to levels which would challenge the containment structure during the first 7 days (Reference 6.3.16). Based on the results of this evaluation, no actions are required to ensure maintenance of containment integrity or instrument function.

Actions are provided in EMG C-0 to support isolation of containment without available AC power. This procedure will be used to provide containment isolation in support of FLEX strategies to ensure containment integrity is maintained during all phases.

2.3.2 Key Parameters

1. Containment Pressure - Normal Power Source: Class 1E DC; Long-Term Power Source: Temporary DG
2. Containment Temperature - Normal Power Source: Class 1E DC; Long-Term Power Source: Temporary DG

2.4 SPENT FUEL POOL COOLING

2.4.1 Phase 1

Operating, Pre-Fuel Transfer, or Post-Fuel Transfer

The time to boil with an initial SFP temperature of 100°F and the normal decay heat load in the pool is approximately 8.9 hours (Reference 6.3.8).

For a normal decay heat load, the inventory in the pool is lost to boiling at a rate of 58.05 gpm. With this boiling rate it will take approximately 34.93 hours until the inventory reaches 15 ft above the top of the fuel racks (Reference 6.3.8).

Fuel in Transfer or Full Core Off-Load

The time to boil with an initial SFP temperature of 140°F and the maximum decay heat load in the pool is approximately 2.4 hours (Reference 6.3.8).

For a maximum decay heat load, the inventory in the pool is lost to boiling at a rate of 135.58 gpm. With this boiling rate it will take approximately 14.95 hours until the inventory reaches 15 ft above the top of the fuel racks (Reference 6.3.8).

Based on the results of Reference 6.3.8 there are no activities required to support spent fuel pool cooling during Phase 1.

2.4.2 Phase 2

The transition to Phase 2 strategies will occur before the inventory in the spent fuel pool (SFP) drops to a level of 15 ft above the top of the fuel racks.

A diesel driven FLEX Spent Fuel Pool (SFP) Pump will be provided to supply makeup water to the SFP. The normal suction source for the FLEX SFP Pump will be the CST. Semi-rigid suction hose will be run from the connection inside the CST valve house to the suction of the pump. The pump will be staged adjacent to the fuel building. The discharge of the pump will be routed, using a mix of medium pressure hose and installed hard piping, directly into the pool using either the SFP makeup piping connection (primary) or the SFP Drain FLEX tie-in connection (alternate). Both connections are located just inside the SFP roll up door.

SFP spray, required per NEI 12-06, is available from permanently installed monitor nozzles above the refueling deck. This spray will only be required if a damage assessment determines that severe damage to the Spent Fuel Pool has occurred and spray capability is needed to mitigate the event. The SFP spray connection is located just inside the south side of the SFP roll up door along with the primary and alternate makeup connections.

2.4.3 Phase 3

In Phase 3, the spent fuel pool is initially cooled via continued boiloff and makeup. For long-term cooling, a large generator from the RRC will be used to restore power to the SFP cooling system. Along with providing alternate ESW flow to the SFP coolers this will provide indefinite coping for the SFP.

2.4.4 Key Parameters

1. SFP Level - WCNOC will be installing a wave guided level measurement system.

2.4.5 Strategy Implementation

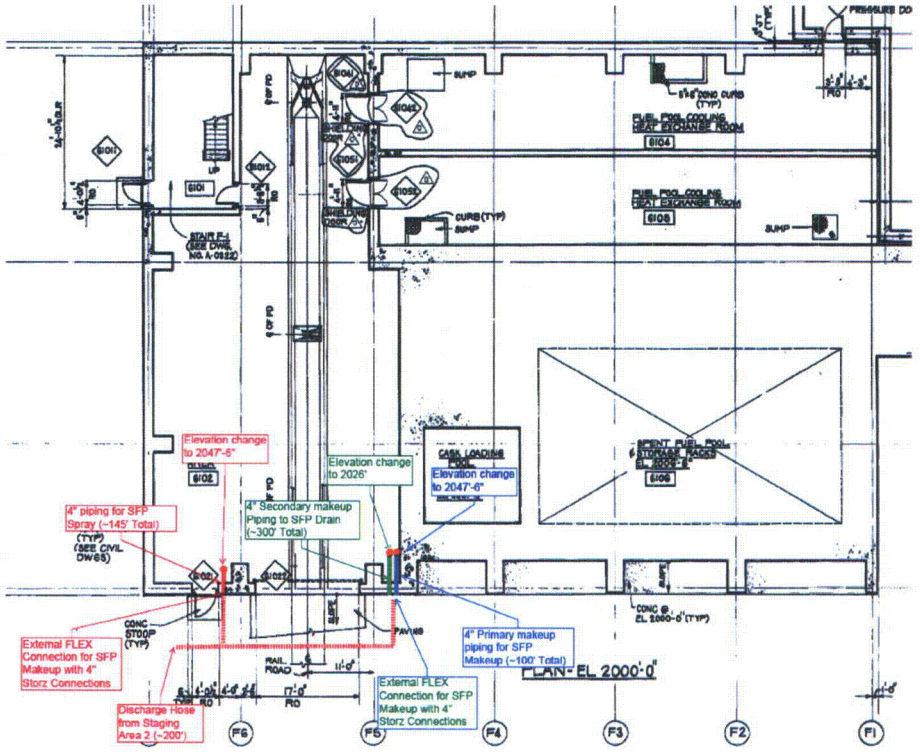


Figure 2.4.5-1 – SFP Makeup/Spray FLEX Strategy – 2000′ El. (Reference 6.3.3)

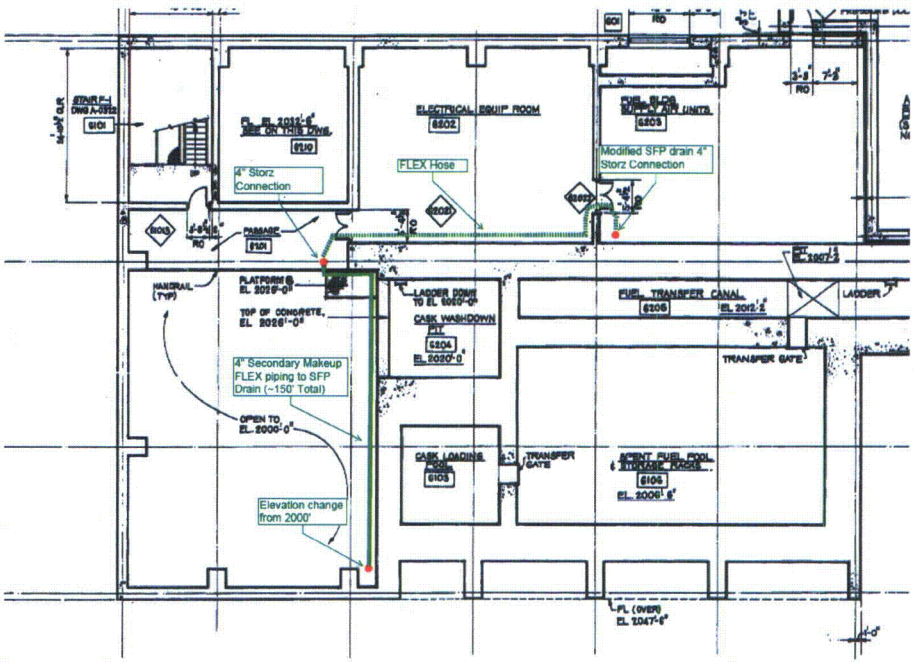


Figure 2.4.5-2 – SFP Makeup/Spray FLEX Strategy – 2026′ El. (Reference 6.3.3)

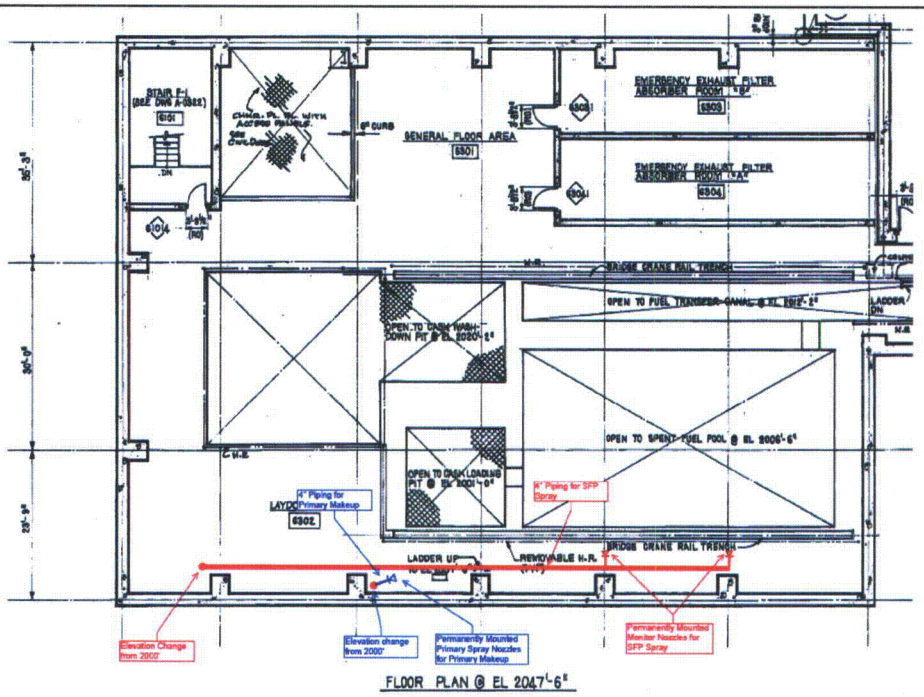


Figure 2.4.5-3 - SFP Makeup/Spray FLEX Strategy - 2047'- 6" El. (Reference 6.3.3)

2.5 CONSIDERATIONS FOR IMPLEMENTATION IN ALL MODES

All modes of plant operation were considered during the development of FLEX modifications and strategies. The strategies will be implemented in the same manner for all modes.

2.6 SUPPORT FUNCTIONS

2.6.1 Electric Power

The WCGS Class 1E DC NK battery system provides DC electrical power to Class 1E DC loads and vital instrumentation. The system consists of four batteries (NK11, NK12, NK13, and NK14) separated into two load groups. Each battery has sufficient stored energy to operate the necessary emergency loads for 4 hours after loss of AC power or charger failure without load shedding (References 6.3.14).

Load shedding will begin 45 minutes after the event and be completed within 15 minutes. Battery run time will be extended to 8 hours with implementation of load shedding using the existing EMG C-0 procedure. Calculations have been completed to confirm that the batteries can provide adequate coping during an ELAP (Reference 6.3.14).

The primary strategy is to feed Class 1E 480V switchgear and selectively power the battery charger circuits. The alternate strategy is to repower the battery chargers directly through a dedicated circuit from the portable 480V FLEX generator.

Alternate Instrument Monitoring (NEI 12-06, Section 5.3.3, Item 1)

As required by Section 5.3.3, Consideration 1 of NEI 12-06 Wolf Creek has developed procedures that will provide guidance after a Beyond Design Basis External Event (BDBEE). These procedures detail the use of portable instruments to locally obtain necessary instrument readings from qualified electrical equipment. These procedures will be attached to FSG-7, "Loss of Vital Instrumentation or Control Power," and will satisfy all the requirements of NEI 12-06 Section 5.3.3, Consideration 1.

2.6.2 Ventilation and Equipment Cooling

Strategies are being developed for temporary ventilation of vital areas such as the battery rooms, TDAFWP room and control room. The strategies, including propping open doors and staging ventilation fans, will be proceduralized.

2.6.3 Lighting

Control room lighting is powered by the Class 1E batteries and may be augmented with additional portable lighting equipment. The Appendix R lighting is also available for the first 8 hours of the event. In addition, all operators must carry a flashlight with them at all time.

Exterior areas requiring additional lighting will be illuminated using the small portable generators with attached lighting kit and/or the trailer mounted light poles.

2.6.4 Communication

In the event that onsite and offsite communication systems are lost the satellite phone system will be used to communicate with onsite organizations like security and maintenance as well as offsite organizations like federal, state and local authorities, the RRC and any other equipment vendors.

2.6.5 Fueling Portable Equipment

The site has procured four (4) DC fuel transfer pumps that will be used to move fuel from protected on-site sources into a fuel truck. The main source of diesel fuel for a BDBEE will be the safety-related underground fuel storage tanks.