February 22, 2013

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10 CFR 50.54(f)

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

Point Beach Nuclear Plant, Units 1 and 2
Docket 50-266 and 50-301
Renewed License Nos. DPR-24 and DPR-27

NextEra Energy Point Beach, LLC'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)

References:

(1) NRC Order Number EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Effective Immediately), dated March 12, 2012 (ML12056A045)
(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 (ML12229A174)
(3) NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 0, dated August 2012 (ML12242A378)
(4) NextEra Energy Point Beach, LLC'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 28, 2012 (ML12305A201)

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued an order (Reference 1) to NextEra Energy Point Beach, LLC. Reference (1) was immediately effective and directed NextEra Energy Point Beach, LLC 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) requires submission of an Overall Integrated Plan by February 28, 2013. NRC Interim Staff Guidance (ISG) (Reference 2) endorses industry guidance document NEI 12-06, Revision 0 (Reference 3) with clarifications and exceptions identified in Reference (2). Reference (3) provides direction regarding the content of this Overall Integrated Plan.

Reference (4) provided the NextEra Energy Point Beach, LLC initial status report regarding mitigation strategies, as required by Reference (1).

The Enclosure to this letter provides the Overall Integrated Plan pursuant to Section IV, Condition C.1, of Reference (1). This letter confirms NextEra Energy Point Beach, LLC has received Reference (2) and has an Overall Integrated Plan developed in accordance with the guidance for defining and deploying strategies that will enhance the ability to cope with conditions resulting from beyond-design-basis external events.

The information in the enclosure provides the NextEra Energy Point Beach, LLC Overall Integrated Plan for mitigation strategies pursuant to Reference (3). The enclosed Integrated Plan is based on conceptual design information that is current as of this letter. As design details and associated procedural guidance are finalized, additional information, as well as revisions to the information contained in the Enclosure to this letter, will be communicated to the NRC in the 6-month Integrated Plan updates as required by Reference (1).

This letter contains no new Regulatory Commitments.

If you have any questions please contact Mr. Michael Millen, Licensing Manager, at 920/755-7845.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on February 22, 2013.

Very truly yours,

NextEra Energy Point Beach, LLC

Larry Meyer
Site Vice President

Enclosure

cc: Director, Office of Nuclear Reactor Regulation
Administrator, Region III, USNRC
Resident Inspector, Point Beach Nuclear Plant, USNRC
Project Manager, Point Beach Nuclear Plant, USNRC

ENCLOSURE

NEXTERA ENERGY POINT BEACH, LLC
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

NEXTERA ENERGY POINT BEACH, LLC'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)

I. General Integrated Plan Elements (PWR)

Determine Applicable Extreme External Hazard **Ref: NEI 12-06 section 4.0 -9.0** **JLD-ISG-2012-01 section 1.0**	Point Beach Nuclear Plant (PBNP) will utilize Nuclear Energy Institute (NEI) 12-06, Sections 4.0-9.0, and Appendix B to evaluate applicable external hazards. PBNP is located at longitude 87° 32.5′W and latitude 44° 17.0′N (Reference 1). Each of the five classes of hazards identified applies to the PBNP site. Seismic: • The seismic design of PBNP safety related structures is discussed in Final Safety Analysis Report (FSAR) Appendix A.5, "Seismic Design Analysis." • The seismic loading conditions are established by the "Operating Basis Earthquake" (OBE) and "Safe Shutdown Earthquake" (SSE). The former is selected to be typical of the largest probable ground motion based on the site seismic history. The later is selected to be the largest potential ground motion at the site based on seismic and geological factors and their uncertainties. Earthquake loading is derived from an OBE at the site having a horizontal ground acceleration of 0.06g. In addition, a SSE having a horizontal ground acceleration of 0.12g is used to check the design to assure no loss of function. A vertical component of ground acceleration of 2/3 of the magnitude of the horizontal component is applied in the load equations simultaneously (Reference 2). • Post-earthquake or liquefaction stability analyses indicate that a liquefaction stability failure is highly unlikely regardless of the magnitude of the earthquake at PBNP. This conclusion was based on studies performed in support of the PBNP Individual Plant Examination of External Events (IPEEE) response (Reference 3). This conclusion is also supported by studies performed in relation to the PBNP Independent Spent Fuel Storage Installation (ISFSI) (References 4 and 5). Based on the above information provided, liquefaction screens out. • Seismic re-evaluations pursuant to the Code of Federal Regulations (CFR), 10 CFR 50.54(f) letter, dated March 12, 2012, are not completed and therefore not assumed in this submittal. As the re-evaluations are completed, appropriate issues will

	be entered into the Corrective Action Process (CAP) and addressed on a schedule commensurate with other licensing bases changes. External Flooding: • There are no rivers or large streams at or near PBNP (Reference 6). • The most plausible flooding hazard at PBNP is the probability of a simultaneous melting of a large amount of snow in the spring combined with sustained heavy rains (Reference 6). • Assuming conservatively, that the maximum wave height occurs simultaneously with the maximum Lake Michigan level, the run-up would be to the elevation +8.42 feet on a vertical structure (Reference 6). PBNP has procedures in place to address Lake Michigan induced flooding (References 7 and 8). • Flood re-evaluations pursuant to the Code of Federal Regulations (CFR), 10 CFR 50.54(f) letter, dated March 12, 2012, are not completed and therefore not assumed in this submittal. As the re-evaluations are completed, appropriate issues will be entered into the CAP and addressed on a schedule commensurate with other licensing bases changes. Storms and High Winds: • PBNP is not a coastal site and thus not exposed to hurricane hazards. • Regional history with tornadoes does exist for PBNP. PBNP location falls in Region 1 of Figure 7.2 of NEI 12-06. This would correspond to a location with a one in a million probability of tornado wind speeds approaching 200 mph. The PBNP design basis for Class I safety related structures is a tornado with winds of 300 mph plus a forward velocity of 60 mph and corresponding missiles (References 2, 9, and 10). Snow, Ice, Low Temperatures: • Regional experience with snow, ice and low temperatures does exist for PBNP. From Figure 8.2 of NEI 12-06, the PBNP location falls under Region 5, corresponding to the highest region for ice severity. The hazard would include frost, ice cover, frazil ice, snow and extreme low temperature. It does not include an avalanche for PBNP. An outside

air temperature of -25.0°F has been used in the PBNP design (Reference 11).

- Design Basis Document (DBD)-29 "Auxiliary Building and Control Building HVAC," specifies a winter temperature of -15°F (Reference 12).
  FSAR Figure 2.6-1 "Climate of Point Beach Site Region," shows a minimum temperature of less than -20°F.
- The current 50 year low is -28.1°F per the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) 1% data (1% of the hours, 7 hours, in a month of 50 years exceed that value). The average temperature swing is approximately 12°F in the coldest months.
- For our Diverse and Flexible Coping Strategies (FLEX) and FLEX equipment, a minimum temperature of -28.1°F will be used.
- Per the PBNP FSAR Section 2.6, "Meteorology," snowfall averages 45 inches per year with a maximum of 15 inches in 24 hours recorded in January 1947 (Reference 13).
- Ice storms are infrequent in this region of Wisconsin (Reference 13).

Extreme High Temperature:

- Regional experience with high temperatures does exist for PBNP.
- DBD-29 "Auxiliary Building and Control Building HVAC" specifies a summer temperature of 95°F (Reference 12). FSAR Figure 2.6-1 "Climate of Point Beach Site Region," shows a max temperature of greater than 100°F (Reference 13).
- The current 50 year high is 105.5°F per ASHRAE 1% data (1% of the hours, 7 hours, in one month of 50 years exceed that value) with an average temperature swing of approximately 17°F in the hottest months.
- Based on the previous information, PBNP will use 105.5°F for extreme environmental conditions. However, portable FLEX equipment will be designed for a maximum temperature of 110.0°F.

Key Site assumptions to implement NEI 12-06 strategies. **Ref: NEI 12-06 section 3.2.1**	• Considerations and assumptions for the Extended Loss of Alternating Current Power (ELAP) at PBNP are consistent with Section 3.2.1, "General Criteria and Baseline Assumptions" of NEI 12-06 (Reference 14). • No additional events or failures are assumed to occur immediately prior to or during the event, including security events. • Off-site resources (personnel, equipment, etc.) are assumed to begin arriving at hour 6 and full staffing is expected by 24 hours into the event. • This plan defines strategies capable of mitigating a simultaneous loss of all alternating current (AC) power and loss of normal access to the ultimate heat sink resulting from a beyond-design-basis event by providing adequate capability to maintain or restore core cooling, containment, and spent fuel Pool (SFP) cooling capabilities at all units on a site. Though specific strategies are being developed, the strategies are diverse and flexible to encompass a wide range of possible conditions. These pre-planned strategies will be incorporated into the unit emergency operating procedures in accordance with established EOP change processes, and their impact to the design basis capabilities of the unit evaluated under 10 CFR 50.59. The plant Technical Specifications contain the limiting conditions for normal unit operations to ensure that design safety features are available to respond to a design basis accident and direct the required actions to be taken when the limiting conditions are not met. The result of the beyond-design-basis event may place the plant in a condition where it cannot comply with certain Technical Specifications and/or with its Security Plan, and, as such, may warrant invocation of 10 CFR 50.54(x) and/or 10 CFR 73.55(p) (Reference 22). • Spent fuel in dry cask storage is outside the scope of Nuclear Regulatory Commission (NRC) "Order To Modifying Licenses With Regard To Requirements For Mitigation Strategies For Beyond-Design Basis External Events," EA-12-049, and are not addressed in the response strategies described in this report. Initial requested portable equipment is assumed to arrive at the site staging area from the Regional Response Center (RRC) within 24 hours and the remainder of larger equipment arriving after 72 hours.

Extent to which the guidance, JLD-ISG-2012-01 and NEI 12-06, are being followed. Identify any deviations to JLD-ISG-2012-01 and NEI 12-06. **Ref: JLD-ISG-2012-01 NEI 12-06 13.1**	Full compliance with the Japan Lessons-Learned Project Directorate (JLD) Interim Staff Guidance (ISG) 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," and NEI 12-06 is expected with no deviations identified at this time. Where there are interpretations of NEI-12-06 or the NRC Interim Staff Guidance requirements, PBNP will follow those interpretations jointly developed by the NRC and NEI.
Provide a sequence of events and identify any Time Constraint required for success including the technical basis for the Time Constraint. **Ref: NEI 12-06 section 3.2.1.7 JLD-ISG-2012-01 section 2.1**	The sequence of events time line is provided in Attachment 1-A. The following actions have Time Constraints: • Shift Manager determines that an ELAP condition exists. • Monitor vital area room temperatures. • Establish Service Water (SW) flow to the Turbine Driven Auxiliary Feedwater (TDAFW) pump via the Diesel Driven Fire pump (DDFP). • Complete load stripping to conserve battery life. • Complete deployment of Portable Driven Diesel Pump (PDDP) and Route 5 inch hose for Spent Fuel Pool (SFP) makeup prior to Spent Fuel uncovery. • Energize 480 Volt safeguards buses. • Energize the required station battery chargers and align to the batteries. • Refuel Diesel Driven Fire Pump and commence refueling schedule for all portable equipment. <u>Shift Manager Determines that an ELAP Condition Exists</u> The Shift Manager will determine that an ELAP condition exists by the first half hour following the Beyond Design Basis External Event (BDBEE). The Time Constraint associated with this action is initiating DC load shedding procedure(s) within the first hour following the BDBEE. <u>Monitor Vital Area Room Temperatures</u> Room temperatures in areas containing equipment required to mitigate a Station Black Out (SBO) event, do not increase to values impacting operability following a loss of

	ventilation. Reasonable assurance of equipment operability is based on calculated maximum room temperature less than or equal to 120°F (Reference 15) for a period of at least an hour. PBNP Calculation 2005-0054 (Reference 16) verifies the times which control building rooms (which includes the TDAFW room) reach 120°F. The Cable Spreading Room is the most limiting and could require an action to increase area cooling prior to 76 minutes. The Control Room could require an action to increase area cooling in approximately 4 hours. Monitoring temperatures in the vital areas will ensure the proper actions of AOP-30, "Temporary Ventilation for Vital Areas," are performed. Specific actions per AOP-30, "Temporary Ventilation for Vital Areas," will be developed to account for the loss of all Alternating Current (AC). Actions may include blocking open doors and providing a portable diesel generator to provide power for portable fans (Reference 17). <u>Establish SW Flow to the TDAFW pump via the DDFP</u> The PBNP Condensate Storage Tanks (CSTs) will be modified to qualify them as seismic and tornado missile protected up to the 6 foot level (see Attachment 3, Figure 4), (Pending Action 18). This will provide the initial qualified source of water for the TDAFW pumps. The CST at 6 feet provides 14,100 gallons of available water per tank (Reference 18). The TDAFW pump flow rate is assumed to be the Design Basis Accident (DBA) flow rate of 230 gallons per minute (gpm) for 20 minutes. This brings the CST level down to the 4 foot level. A CST level of 4 feet provides enough volume for one hour of decay heat removal from a reactor trip without a cool down (References 19 and 30). The DDFP will be modified to upgrade its seismic qualifications and provide a cross connect to the SW system (see Attachment 3, Figures 5a and 5b), (Pending Action 19). The DDFP takes suction from the SW pump bays in the Circulating Water Pump House. The Circulating Water Pump House is a robust structure and can take water from Lake Michigan through the discharge flumes in the event the normal intake piping is damaged (see Attachment 3, Figure 6) (Reference 20). The DDFP starts automatically on a loss of AC and will switch over to supply SW via remote manual operator actions. An evaluation will be performed to determine whether SW system return and

	non-seismic/missile protected portions of the SW system will need to be isolated to ensure adequate flow to the suction of the TDAFW pump (Pending Action 2). Based on the results of the evaluation required operator actions will be time validated (Pending Action 3). <u>Complete Load Stripping to Conserve Battery Life</u> The safety-related (SR) 125V system consists of four main distribution buses: D-01, D-02, D-03, and D-04. The D-01 (train A) and D-02 (train B) main Direct Current (DC) distribution buses supply power for control, emergency lighting, and the red and blue 120 Voltage Alternating Current (VAC) Vital Instrument bus (Y) inverters. The D-03 (train A) and D-04 (train B) main DC distribution buses supply power for control and the white and yellow 120 VAC Vital Instrument (Y) buses. In addition, there exists a swing safety-related battery D-305 which is connected to swing DC distribution bus D-301. This swing battery is capable of being aligned to any one of the four main distribution buses to take the place of the normal SR battery. There are also two non-safety related (non-SR) 125V distribution buses (1/2D-201), and batteries installed (Attachment 3, Figure 7). These buses and ancillary equipment are dedicated to a specific unit, and supply power to non-safety related loads. A connection is provided from swing bus D-301 to both non-SR buses and batteries (Reference 21). All five of the SR batteries are located within SR seismic class I, tornado missile protected structures. If the non-safety related batteries are required to be credited as part of the battery load management strategy, they will be evaluated and upgraded as necessary to make them seismically robust and tornado missile protected (Pending Action 35). A battery load management strategy will be developed to provide power to credited installed equipment (e.g., DC Motor Operated Valves (MOV), Solenoid Operated Valves (SOV), etc), and at least one channel of credited instrumentation during Phase 1 (Pending action 1). The strategy will include initial load stripping to extend battery life. The DC load stripping will be initiated at 1 hour into the event and will be completed within the next hour. As the connected batteries become depleted, the batteries with remaining capacity will be switched in to replace them. Based on initial evaluation, the battery load management strategy is expected to provide greater than 18 hours of DC

	power before battery charger restoration will be required. A formal evaluation will be performed to verify available DC power time as part of Pending Action 1. <u>Complete Deployment of PDDP and Route 5 Inch Hose for SFP Makeup Prior to Spent Fuel Uncover</u> Assuming a loss of SFP cooling with the worst case design heat load (including a full core offload) the time-to-boil is approximately 10 hours (Reference 23). PBNP tracks the SFP heat load on a real time basis. Based on current SFP heat loading, and assuming a full core offload with an initial SFP temperature of 100°F, the projected time for the SFP to reach 200°F is 11 hours (References 24 and 25). After reaching the boiling point, it would take an additional 71 hours for the SFP to boil down to 6 inches above the fuel (Reference 26). As noted in the NextEra Energy Point Beach, LLC Overall Integrated Plan in Response to March 12, 2012 Commission Order to Modify Licenses with Regard to Reliable Spent Fuel Instrumentation (Reference 61), action will be initiated prior to the spent fuel pool lowering to a level of 2 feet 11 inches above the fuel. This level corresponds to the height of the east west wall opening that separates the northern and southern areas of the pool. The level was chosen to ensure the SFP continues to function as a single pool for level monitoring reliability. After reaching the boiling point, the estimated time to a level of 2 feet 11 inches above the fuel would be an additional 64 hours. Opening the Primary Auxiliary Building (PAB) doors and the deployment of FLEX PDDP will be completed prior to the SFP boiling. <u>Energize 480 Volt Safeguards Buses</u> The Time Constraint for re-powering the 480V Safeguards Buses is associated with re-powering the battery chargers. The battery load management strategy to be developed will provide power to credited installed equipment (e.g., DC MOVs, SOVs, etc) and at least one channel of credited instrumentation during Phase 1 (Pending Action 1).

	<u>Energize the Required Station Battery Chargers and Align to the Batteries</u> The Time Constraint for energizing the battery chargers is based on a preliminary evaluation that indicates the battery load management strategy will provide greater than 18 hours of DC power before battery charger restoration will be required. Based on this, a goal of 10 hours to re-power the battery chargers has been established. A formal evaluation will be performed to verify available DC power time (Pending Action 1). <u>Refuel Diesel Driven Fire Pump and Commence Refueling Schedule for All Portable Equipment</u> Technical Specification requirements ensure greater than 64,000 gallons of fuel oil is maintained on site in SR seismic class I underground tanks. This fuel would be available to supply permanently installed and/or portable diesel powered equipment credited for a FLEX mitigation strategy. At full capacity, the DDFP will use approximately 11.4 gallons per hour (gph). The DDFP has a 250 gallon fuel tank which will provide a minimum of 13 hrs of operation at full capacity (Reference 60). The Portable Diesel Generator (PDG) connected to 1B-03 and 2B-04 will also require periodic refueling. The refueling frequency will be determined based on the fuel oil consumption and the capacity of the installed tank of the equipment purchased (Pending Action 13). Other small diesel powered equipment may also require periodic refueling. The refueling frequency will be determined based on the fuel oil consumption and the capacity of the installed tank of the equipment purchased (Pending Action 13). The capability will exist to refuel required permanently installed and portable FLEX equipment within the time required. The DDFP pump is the first major diesel requiring refueling following an event. The refuelings will be accomplished by the use of an approximately 500 gallon fuel tank trailer capable of being towed by a FLEX dedicated truck. The trailer/truck combination will have the capability to draw fuel oil from robust on-site fuel oil tanks.

	The FLEX dedicated trucks will also have a 50 gallon fuel oil storage tank dedicated for refueling the smaller diesel generators associated with supporting miscellaneous loads (fans, battery chargers, etc.). Time validation studies will be conducted to justify the Time Constraints and resources necessary for implementing the PBNP FLEX strategies. These will be performed in accordance with PBNP Operations Manual OM 4.3.8, Control of Time Critical Operator Actions (Pending Action 15).
Identify how strategies will be deployed in all modes. **Ref: NEI 12-06 section 13.1.6**	Guidance for deployment of Phase 2 equipment will be provided in a Flex Support Guideline (FSG). Deployment routes for Phase 2 portable equipment stored in the qualified storage structure are shown in Attachment 3 Figure 10. Transport vehicles necessary to transport FLEX equipment to the deployment areas will be stored in the same structure. The identified routes and deployment areas will be accessible during all MODES of operation. The preferred and alternate deployment route shown on Attachment 3 Figure 11. The preferred route follows a portion of the route used for spent fuel storage canister transport, past the emergency diesel building and down the road above SR cable ducts. The spent fuel transport route and the G-03/G-04 building and cable route have been analyzed for soil liquefaction. Liquefaction stability failure of the deployment path is highly unlikely regardless of the magnitude of the earthquake at PBNP. This conclusion was based on studies performed in support of the PBNP IPEEE response (Reference 3). This is also supported by studies performed in relation to the PBNP ISFSI (References 4 and 5). The gate and vehicle barrier in the route will be manually opened by security in accordance with existing instructions for B.5.b deployment. The preferred route is through an open non-forested area. However, this route does have an overhead AC service line along a portion of the path. If the line is down across the path, it will be verified as dead and removed using debris removal equipment. Also non-seismic/non-tornado qualified warehouses and buildings exist alongside the deployment route. Debris along the route will be removed using designated FLEX debris removal equipment. The deployment route and staging area are located above the flood elevation or protected from Lake Michigan induced flooding (References 7 and 8).

	Some FLEX equipment will be stored within Class I seismic and missile protected structures near the location where it will be required. The equipment will be adequately secured to prevent any seismic interaction. The Technical Support Center (TSC) 18.5 foot level will be evaluated for adequacy of storing miscellaneous FLEX strategy equipment (Pending Action 28). The TSC is located within the plant protected area. This deployment strategy will be included within an administrative program and address all MODES of operation. It will also include requirements to keep routes and staging areas clear or invoke contingency actions (Pending Action 36).

Provide a milestone schedule. This schedule should include:
• **Modifications timeline**
  o **Phase 1 Modifications**
  o **Phase 2 Modifications**
  o **Phase 3 Modifications**
• **Procedure guidance development complete**
  o **Strategies**
  o **Maintenance**
• **Storage plan (reasonable protection)**
• ***Staffing* analysis completion**
• **FLEX equipment acquisition timeline**
• **Training completion for the strategies**
• **Regional Response Centers operational**
 	
Ref: NEI 12-06 section 13.1
	See attached milestone schedule (Attachment 2).

Identify how the programmatic controls will be met. **Ref: NEI 12-06 section 11 JLD-ISG-2012-01 section 6.0**	PBNP will implement a FLEX program stipulating the required administrative controls to be implemented (Pending Action 36). FLEX equipment will be procured as commercial equipment unless credited for other functions. If required for other functions; then the quality attributes of the other functions will apply. 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. Existing plant maintenance programs will be used to identify and document maintenance and testing requirements. Preventative Maintenance (PM) work orders will be established and testing procedures will be developed in accordance with the PM program. Testing and PM frequencies will be established based on type of equipment and considerations made within Electric Power Research Institute (EPRI) guidelines. The control and scheduling of the PMs will be administered under the existing site work control processes. PBNP will assess the addition of program description into the FSAR, and Technical Requirements Manual.
Describe training plan	A Systematic Approach to Training (SAT) will be used to evaluate training requirements for station personnel based upon changes to plant equipment, implementation of FLEX portable equipment, and new or revised procedures that result from implementation of the FLEX strategies (Pending Action 17). Training modules for personnel that will be responsible for implementing the FLEX strategies, and Emergency Response Organization (ERO) personnel will be developed to ensure personnel proficiency in the mitigation of beyond-design-basis external events. The training will be implemented and maintained in accordance with existing PBNP training programs. The details, objectives, frequency, and success measures will follow the plant's SAT process. FLEX training will ensure that personnel assigned to direct the execution of mitigation strategies for BDBEEs will achieve the requisite familiarity with the

	associated tasks, considering available job aids, instructions, and mitigating strategy Time Constraints. Training will be completed prior to final implementation of the requirements of this Order on Unit 1 in October of 2014 (Pending Action 17).
Describe Regional Response Center plan	The industry will establish 2 RRCs to support utilities during BDBEEs. Each RRC will hold 5 sets of equipment, 4 of which will be able to be fully deployed when requested. The fifth set will have equipment in a maintenance cycle. Equipment will be moved from an RRC to a local Assembly Area, established by the Strategic Alliance for FLEX Emergency Response (SAFER) team and PBNP. Communications will be established between PBNP and the SAFER team and required equipment moved to the site as needed. First arriving equipment, as established during development of the PBNP's playbook, will be delivered to the site within 24 hours from the initial request. A contract has been issued to the administrator of SAFER for PBNP participation (Reference 27).

Maintain Core Cooling & Heat Removal
Determine Baseline coping capability with installed coping[1] modifications not including FLEX modifications, utilizing methods described in Table 3-2 of NEI 12-06: • **AFW/EFW** • **Depressurize SG for Makeup with Portable Injection Source** • **Sustained Source of Water** Ref: JLD-ISG-2012-01 section 2 and 3
PWR Installed Equipment Phase 1
Phase 1 – MODES 1-5 Steam Generators available Upon the reactor trip, reactor core cooling is accomplished by natural circulation of the Reactor Coolant System (RCS) through the Steam Generators (SGs). The SGs are supplied by the Auxiliary Feedwater (AFW) system and steam pressure is initially controlled by the Atmospheric Dump Valves (ADVs). If Instrument Air is unavailable, steam pressure will be controlled by the operation of the Main Steam Safety Valves (MSSVs) until the ADVs are manually controlled. The main active component associated with this strategy is the TDAFW pump, which is automatically actuated to provide feedwater from the CSTs to the SGs for the removal of reactor core decay heat. This automatic action is verified at step 5 of the Emergency Contingency Actions (ECA) 0.0 (References 19 and 30). The TDAFW system is not fully protected against tornado missiles. The TDAFW system will be modified to provide redundancy to the steam exhaust for each unit's TDAFW pump turbines so that a single missile does not render the TDAFW pump inoperable. The modification will install cross connect piping between the Unit 1 and Unit 2 TDAFW pump steam exhaust lines (see Attachment 3 Figure 2). The steam exhaust cross connect is a passive design, where the cross connect valve will be open unless isolated for maintenance. The Current Licensing Basis (CLB) tornado missile protection for the AFW system is based on separation and diversity (Reference 28). This CLB applies to the routing of the TDAFW steam supply lines and the steam generator ADVs. Additional modifications will install cross connect piping between the Unit 1 and Unit 2 TDAFW pump steam supply lines (see Attachment 3 Figures 1a and 1b) and install cross connection piping between the Unit 1 and Unit 2 TDAFW pump discharge lines (see Attachment 2 Figure 3) to improve system redundancy and the capability to handle multiple failures. The discharge line cross connection will allow either unit's TDAFW pump to supply water to both unit's SGs. This modification provides redundancy for the main active component. The steam generator ADVs are physically separated and partially protected by the containment structure. The main stem safety valves provide a backup for decay heat removal. Manual action will be required to align the TDAFW pump discharge and steam supply cross connects. The steam exhaust line modification is a passive design and does not require any manual action. The modification to the steam supply and pump discharge lines to enhance redundancy will require manual action to implement. Steam Generator dry out will occur

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

at approximately 58 minutes based on scaling the standard analysis contained in Westinghouse Commercial Atomic Power (WCAP)-17601-P (Reference 29) for PBNP's 100 percent power level and SG inventory. If the event causes multiple failures, procedural guidance will be developed (Pending Action 16) to direct operators to provide flow and/or steam from the opposite unit if the TDAFW pump is not functioning. The time required to align the steam supply or pump discharge cross connections is not considered as a Time Constraint because multiple failures are not assumed at time zero. However, time and resource requirements will be evaluated (Pending Action 3).

The CSTs, located in the Turbine Building, have a usable volume of 45,000 gallons and have a Technical Specification required volume of 21,150 useable gallons per Unit; however, they are not seismically qualified or protected from tornado missiles. A modification will be performed on both CSTs to provide seismic qualification, and tornado missiles to a tank level of 6 feet which will provide a volume of 14,100 gallons of available water per tank (Reference 18). With the TDAFW pump DBA flow rate of 230 gpm for 20 minutes the CST level will be lowered to 4 feet. Operator action is initiated to swap the suction supply from the CST to SW at the 4 foot level prior to the automatic switch over that occurs at 1.5 feet. The CST level of 4 feet is based on the decay heat load for 1 hour following a reactor trip without an RCS cooldown (References19, and 30). One hour will provide sufficient time for the TDAFW pump to be aligned to the SW system. During the one hour period the DDFP will be aligned to the SW system and portions of the SW system will be isolated if required. If the alignment process is not completed in time, the TDAFW pump is protected from damage by an automatic trip on low suction pressure and/or low CST level.

When CST inventory reaches a level of 1.5 feet the TDAFW pump suction will swap over to the SW system. ECA 0.0 (References 19 and 30) foldout page directs operator action to switch to alternate AFW suction supply when CST level lowers to less than 4 feet. Prior to the swap over of the TDAFW to the SW system actions associated with the DDFP will be taken. To credit this strategy, the DDFP and associated piping will be upgraded and qualified for the BDBEE. In addition to the current configuration of the DDFP with the Fire Protection (FP) system, the DDFP will be permanently connected to the robust SW system in the SW Pump Room. New valves will be installed to connect to the SW system and isolate the fire water header (see Attachment 3 Figures 5a and 5b). An evaluation will be performed to determine whether SW system return and non-seismic/missile protected portions of the SW system will be isolated to ensure adequate flow to the suction of the TDAFW pump (Pending Action 2). Based on the results of the evaluation required operator actions will be time validated (Pending Action 3).

Upon completion of the TDAFW suction swap over from the CST to the SW system, the DDFP will take suction from the pump bay and discharge to the SW system. The discharge of the DDFP will supply SW to the suction of the TDAFW pump to feed the SGs. The DDFP will start automatically on a loss of AC and can also be started from the control room. The DDFP will take suction from the SW Pump Bay in the Circulating Water Pump House (CWPH). The CWPH is a robust structure that meets seismic and missile protection criteria. The pump house forebay design provides four connection paths to Lake Michigan, two intake pipes and two discharge flumes. Any one of the paths is capable of supplying a quantity of water well in excess of the amount required for decay heat removal. Normal water supply from Lake Michigan, the Ultimate Heat Sink (UHS), is via an intake crib located approximately ¼ mile out in the lake. If the normal supply to the UHS is lost, flow will be established through the discharge flumes to the pump bay (NRC Safety Evaluation Report (SER) (Reference 20) for PBNP Units 1 and 2 dated July 15, 1970). Sufficient water is available within the pump bay to supply the DDFP while manual actions are taken to establish the alternate connection to the UHS. Per PBNP Calculation 2003-0063 (Reference 31), 440,826 gallons are available in the forebay/pump bays. Per WCAP-17601-P (Reference 29), this would provide greater than 24 hours of decay heat makeup for both of the PBNP two loop plants. The DDFP is supplied from a 250 gallon diesel oil day tank with an operating time of 13 hours based on usable volume (Reference 60).

Lake Michigan is the source of cooling water to the PBNP (Reference 6). When the water in the CSTs is depleted, suction for the AFW pumps automatically shifts to the SW system to provide makeup water from the lake for an indefinite time period (Reference 56). The CLB for PBNP credits Lake Michigan water for long term cooling.

MODES 5 and 6, Steam Generators Unavailable

If SGs are unavailable in MODES 5 and 6 and the refueling cavity is not flooded, the RCS will heat up and boil. Makeup flow to the RCS will be established from the accumulator(s) via the fill line (see Attachment 3 Figure 18). The accumulator fill line is connected to the Safety Injection (SI) cold leg injection line and when aligned will provide make up directly to the reactor vessel. In MODE 5 and 6 and SGs are unavailable, at least one accumulator will be procedurally controlled and maintained available with a hot leg vent path established whenever possible. If a hot leg vent has not been pre-established, procedure guidelines for establishing a vent path will be provided (Pending Action 16).

The accumulator fill valve is an air operated valve with a DC solenoid. A modification will install a compressed gas backup to the accumulator fill valve if the Instrument Air supply is lost during an ELAP (Pending Action 20). The accumulator fill valve will be operated from the control room. Preliminary evaluations indicate that a single accumulator will supply water to compensate for boil off for over 2 hours based on a Technical Specification required volume between 1,100 and 1,136 cubic feet (Reference 32) and a decay heat load of 60 gpm per Attachment H to Extreme Damage Mitigation Guideline (EDMG)- 2 (Reference 33).

If in MODE 6, with the cavity flooded, the time to boil is in excess of 7 hours (References 34 and 48). With the cavity at the required refueling height of greater than 23 feet above the reactor vessel flange (Reference 57) and a volume of 12,000 gallons per foot (Reference 58), it will take greater than 72 hours to boil the cavity dry.

All MODES

Formal Modular Accident Analysis Program (MAAP) or other comparable analysis and evaluations will be performed to demonstrate the adequacy of the mitigation strategies for core cooling in all plant operating MODES (Pending Action 4).

Details:	
Provide a brief description of Procedures / Strategies / Guidelines	• Emergency Operating Procedure (EOP)-0, Unit 1 and EOP-0, Unit 2, Reactor Trip or Safety Injection, provides directions to verify proper response of the automatic protection systems following manual or automatic actuation of a reactor trip or safety injection. EOP-0 would direct a transition to ECA-0.0 following the attempt to fast start the Emergency Diesel Generators. • ECA-0.0 Unit 1 and ECA-0.0 Unit 2, Loss of All AC Power, provide directions to respond to a loss of all AC power. This is a direct entry procedure if both 4160 VAC safeguards buses or both 480 VAC safeguards buses are de-energized. ECA-0.0 will maintain core cooling by providing AFW flow to the SGs from the TDAFW pump. Steam will be released from the SGs through either the ADVs or the main steam safety valves. FLEX Support Guidelines will be developed to maintain core cooling and heat removal. • Shutdown Emergency Procedure (SEP)-3.0 Unit 1 and SEP-3.0 Unit 2, "Loss of All AC Power to a Shutdown Unit," provide directions to respond to a loss of all 480 VAC power for a shutdown unit. This is a direct entry procedure if both 4160 VAC safeguards buses or both 480 VAC safeguards buses are de-energized. SEP-3.0 maintains core cooling by providing AFW flow to the SGs from the TDAFW pump. Steam can be released from the SGs through the atmospheric steam dumps, through the safety valves or any other opening in the SGs. If the SGs are not available and the RCS is in reduced inventory, SEP-3.0 directs the performance of SEP-1.1 Unit 1 or SEP-1.1 Unit 2, Alternate Core Cooling, to be performed as directed by SEP-3.0. SEP-1.1 provides core cooling through SG reflux flow or through gravity makeup from the Refueling Water Storage Tank (RWST). The primary source of makeup cooling water for the Phase 1 FLEX strategy will be an accumulator. FSGs will be developed to maintain core cooling and heat removal. EOP-0, ECA-0.0, and SEP-3.0 will remain the entry points for ELAP Events with a Loss of Ultimate Heat Sink (LUHS). FLEX Support Guidelines will be developed and will be entered as directed by ECA-0.0, SEP-3.0 and when appropriate, other procedures. The FSGs will address FLEX equipment staging, alternate auxiliary feed water source(s), RCS makeup/cooling flow while in MODES 5 and 6, and DC load management. Emergency Operating Procedures, Shutdown Emergency Procedures, Emergency Contingency Actions, Abnormal Operating Procedures

	and when appropriate, other procedures will be revised to support the FSGs.
Identify Modifications	• Seismically harden the CSTs to provide additional coping time for aligning the DDFP to the SW System and the suction of the TDAFW pump (Pending Action 18). • Harden the existing DDFP and provide new tie in point to the SW system to supply the TDAFW pump suction. There is sufficient water in the pump house pump bay to feed the SGs for an adequate time to allow Phase 2 deployment of a portable pump to supply the TDAFW pump or inject directly into the SGs (Pending Action 19). • A compressed gas backup will be installed for the accumulator fill valves in order to allow the boric acid to be injected into the RCS in a controlled manner for use during MODES 5 and 6 when the SGs are unavailable (Pending Action 20). • Cross connect piping will be installed between the Unit 1 and Unit 2 TDAFW pumps steam exhaust lines (Pending Action 21). • Cross connect piping will be installed between the Unit 1 and Unit 2 TDAFW pumps steam supply lines (Pending Action 21). • Cross connect piping will be installed between the Unit 1 and Unit 2 TDAFW pumps discharge lines (Pending Action 21).
Key Reactor Parameters	• A and B Loop RCS Hot Leg Temperature • Core Exit Thermocouples • A and B Loop RCS Cold Leg Temperature • Wide Range RCS Pressure • A and B SG Wide Range Level • SI Accumulator Pressure • Pressurizer Level • Reactor Vessel Level • Steam Generator AFW Flow • A and B SG Pressure • CST Level • DC Bus Voltage • Neutron Flux

Maintain Core Cooling & Heat Removal
PWR Portable Equipment Phase 2

MODES 1-5 Steam Generators Available

Several actions for reactor core cooling are required during Phase 2 following the event. The main strategy is dependent upon the continual operation of the TDAFW pumps which are only capable of feeding the SGs as long as there is sufficient steam pressure to drive the TDAFW pump turbines. The DDFP will continue to supply to the suction of the TDAFW pump. The DDFP will take suction from the SW Pump Bay in the CWPH, which is a robust structure that meets seismic and missile protection criteria. The DDFP will discharge to the SW system which will supply SW to the suction of the TDAFW pump to feed the SGs. The pump house forebay design provides four connection paths to Lake Michigan, two intake pipes and two discharge flumes. Any one of the paths is capable of supplying a quantity of water well in excess of the amount required for decay heat removal. The normal water supply from Lake Michigan, the UHS, is via an intake crib located approximately ¼ mile out in the lake. If the normal supply to the UHS is lost, flow will be established through the discharge flumes to the pump bay (Reference 20). Sufficient water is available within the pump bay to supply the DDFP while manual actions are taken to establish the alternate connection to the UHS. Per PBNP Calculation 2003-0063 (Reference 31) 440,826 gallons are available in the forebay/pump bays and per WCAP-17601-P (Reference 29), this would provide greater than 24 hours of decay heat makeup for both of the PBNP two loop plants. The DDFP is supplied from a 250 gallon diesel oil day tank with an operating time of 13 hours based on usable volume (Reference 60). The modification that upgrades the DDFP and cross connects the firewater system to the service water system (Pending Action 19) will install a connection point for connecting a PDDP to the SW system in the pump house. The PDDP can be positioned in the area near the pump house with suction hoses routed to draw water from the pump house forebay or pump bay. Alternative suction paths include the ability to draw water directly from Lake Michigan using a floating strainer. If the DDFP fails, the PDDP will be used to supply water to the TDAFW pump suction. The PDDP can also be use to replenish water in the DDFP suction bay if required.

The accumulator discharge MOVs will be closed to prevent nitrogen intrusion into the RCS when the RCS pressure decays during the intended cool down. The RCS is cooled down to 350°F using an ADV and feeding the associated SG with the TDAFW pump. If a TDAFW pump becomes unavailable the other unit's TDAFW pump can be cross connected to supply feedwater to the affected unit.

Per guidance of NEI 12-06, Phase 2 also requires a baseline capability for reactor core cooling to connect an onsite, portable pump (SG FLEX pump) for injection into the SGs in the event that a TDAFW pump fails or when sufficient steam pressure is no longer available to drive the turbine. This capability will be implemented by depressurizing the SGs to allow makeup with the PDDP. To achieve the baseline capability of providing a portable pump for the Phase 2 strategy of core cooling, deployment of the PDDP will be completed so that it is available for operation coincide with RCS cooldown and SG depressurization.

Maintain Core Cooling & Heat Removal
PWR Portable Equipment Phase 2

To meet the recommendation of WCAP-17601-P (Reference 29), the portable pump designated for SG injection, or SG FLEX pump, must be rated for a minimum flow rate of 300 gpm at a discharge pressure (of 300 psig) equal to the SG pressure in addition to any line losses associated with its connecting equipment. This requirement is for a 4-loop plant. For PBNP the decay heat removal requirement is approximately 60 gpm per unit (Reference 33) thus, 300 gpm would be adequate for both units. At an RCS temperature of 350 ° F (T average) the SG pressure is approximately 150 psia (Reference 55). PPNP will be verifying that the TDAFW pump is capable of supplying the required decay heat removal flow rate at the reduced SG pressure (Pending Action 14). At this SG pressure the existing B.5.b pump should be adequate (Pending Action 32). Additional B.5.b pumps have been purchased for FLEX deployment. The PDDP will be positioned in the area near the pump house and suction hoses will be routed to draw water from the pump house forebay or pump bay. Alternative suction paths include the ability to draw water directly from Lake Michigan using a floating strainer (see Attachment 3, Figures 8a and 8b). Hose(s) from the PDDP will be routed through the 8' Elevation of the Turbine Building and PAB to existing AFW connection points for injection directly into the SGs.

At the end of Phase 2, it is expected that either the AFW pump or the PDDP will be in operation with suction from Lake Michigan and injection to the SGs.

MODES 5 and 6, Steam Generators Unavailable

For MODES 5 and 6 a PDDP, capable of at least 300 gpm to address boric acid precipitation concerns, will supply borated water from the RWST to the RCS using pre-established primary or secondary connection points on the Residual Heat Removal (RHR) system piping. A flow rate of less than 60 GPM (Reference 33) will be sufficient to remove decay heat.

The RWST has been seismically qualified however the tank is not located within a Class I structure that would protect it from tornado wind loading and missiles. A condition evaluation (Reference 35) was performed to demonstrate that the lower portion of the RWST was protected from wind loading and missiles by surrounding structures. The conclusion is that the RWST remains functional following a tornado and tornado missile event with a contained volume of approximately 160,000 gallons. With a decay heat boil off rate of 60 gpm the remaining volume in the RWST would last for greater than 40 hours and allow high flow boric acid flushing to periodically occur. The RWST is the primary source of boric acid.

The Boric Acid Storage Tanks (BASTs) are located within a Class I structure and thus protected from wind and missile hazards. The BASTs were originally designed and installed as seismic Class I but were administratively down graded to Class II when their safety related function was changed, however they are still seismically robust. The boric acid concentration is maintained between 3.5 and 4.0 Wt% boric acid and the required volume per unit is 7,470 gallons and a minimum temperature of 70°F (Reference 59). The BASTs are considered backup source of boric acid if available.

Maintain Core Cooling & Heat Removal	
PWR Portable Equipment Phase 2	
If in MODE 6, with the cavity flooded, the time to boil is in excess of 7 hours (References 34 and 48). With the cavity at the required refueling height of greater than 23 feet above the reactor vessel flange (Reference 57) and a volume of 12,000 gallons per foot (Reference 58) it will take greater than 72 hours to boil the cavity dry. Because of the significant time available a Phase 2 makeup strategy is not required for this condition. If makeup is required prior to receiving Phase 3 equipment raw water can be added to the cavity using a PDDP connected to the RHR (see Attachment 3, Figure 12) or connected to containment spray (see Attachment 3, Figure 14).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	• For MODES 1-4 with the SI Accumulators aligned for normal operation, Emergency Contingency Actions (ECA)-0.0 Unit 1 and ECA-0.0 Unit 2, "Loss of All AC Power," will be the controlling procedure and provide directions to respond to a loss of all AC power. ECA-0.0 maintains core cooling and heat removal by providing AFW flow to the SGs via the TDAFW pump. Steam is released from the SGs via the ADVs to control RCS Temperature. FLEX Support Guidelines will be developed to maintain core cooling and heat removal. • For MODES 4, 5 and 6 (SI Accumulator discharge motor operated valve shut), SEP-3.0 Unit 1 and SEP-3.0 Unit 2, "Loss of All AC Power to a Shutdown Unit," will be the controlling procedure and provide directions to respond to a loss of all 480 VAC safeguards power for a shutdown unit. When the RCS is not in reduced inventory (defined as reactor vessel level greater than 55%) and at least one SG is available and the RCS is intact for Natural Circulation, SEP-3.0 maintains core cooling and heat removal by allowing the RCS to heat up and providing AFW flow to the SGs via the TDAFW pump. Steam is released from the SGs via the ADVs or any other openings to control RCS temperature. FLEX Support Guidelines will be developed to maintain core cooling and heat removal. When the RCS is in reduced inventory (defined as reactor vessel level less than 55%) SEP-3.0 directs the performance of SEP-1.1 Unit 1 or SEP-1.1 Unit 2, "Alternate Core Cooling" in parallel with SEP-3.0. SEP-1.1 is used to evaluate and correct conditions that are causing, or could lead to an inadequate core cooling condition during residual heat

Maintain Core Cooling & Heat Removal	
PWR Portable Equipment Phase 2	
	removal system operation. SEP-1.1 utilizes Reflux Cooling if the SGs are available. If the SGs are not available, SEP-1.1 utilizes gravity drain from the RWST. The primary source of makeup cooling water for the Phase 1 FLEX strategy will be an accumulator. When the accumulator(s) is depleted makeup cooling water will be delivered using a PDDP taking suction from the RWST. FLEX Support Guidelines will be developed to maintain core cooling and heat removal. ECA-0.0 and SEP-3.0 will remain the controlling procedures for ELAP events with a LUHS. FLEX Support Guidelines will be developed and will be entered as directed by ECA-0.0, SEP-3.0 and if appropriate, other procedures. The FSGs will address initial assessment and FLEX equipment staging, alternate auxiliary feed water source, alternate low pressure feed water, RCS inventory control and RCS makeup/cooling flow while in MODES 5 and 6, borating the RCS, RCS temperature control and DC load management. Emergency Operating Procedures, Shutdown Emergency Procedures, Emergency Contingency Actions, Abnormal Operating Procedures, and if appropriate other procedures will be updated as required to support the FSGs.
Identify Modifications	• The connection points to the AFW piping and charging already exist. • The modification to harden existing diesel driven fire pump to meet seismic requirements and supply the TDAFW pump suction will also have a connection point for a PDDP (Pending Action 19). • For MODES 5 and 6 when SGs are not available, connection points for a portable diesel pump will be added to the RHR system for injecting into the RCS (Pending Action 22). The connection points to the RWST already exist.
Key Reactor Parameters	• A and B Loop RCS Hot Leg Temperature • Core Exit Thermocouples • A and B Loop RCS Cold Leg Temperature • Wide Range RCS Pressure • A and B SG Wide Range Level • SI Accumulator Pressure • Pressurizer Level • Reactor Vessel Level • Steam Generator AFW Flow

Maintain Core Cooling & Heat Removal	
PWR Portable Equipment Phase 2	
Key Reactor Parameters (continued)	• A and B Steam Generator Pressure • CST Level • DC Bus Voltage • Neutron Flux • Credited portable equipment will be instrumented to provide Operators the required information to verify that it is functioning properly and meeting the requirements of the strategy being implemented.
Storage / Protection of Equipment: **Describe storage / protection plan or schedule to determine storage requirements**	
Seismic	Storage of portable equipment will be within existing Class I structures, within existing structures qualified in accordance with the robust seismic requirements contained in NEI 12-06 or new structures designed and constructed in accordance with the robust requirements contained in NEI 12-06. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.
Flooding Note: if stored below current flood level, then ensure procedures exist to move equipment prior to exceeding flood level.	Storage of portable equipment will be in structures located above the design flood level or within existing Class I structures in areas protected from external flooding. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.
Severe Storms with High Winds	Storage of portable equipment will be within existing Class I structures designed to withstand severe winds and tornado missiles or within existing structures qualified in accordance with the robust requirements contained in NEI 12-06. If new structures are required they will be designed and constructed in accordance with the robust and diversity requirements contained in NEI 12-06. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.
Snow, Ice, and Extreme Cold	Storage of portable equipment will be within existing structures designed to withstand snow and ice conditions and provided with heating to maintain equipment functional. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.

<table>
<tr><th colspan="3">Maintain Core Cooling & Heat Removal</th></tr>
<tr><th colspan="3">PWR Portable Equipment Phase 2</th></tr>
<tr><td>High Temperatures</td><td colspan="2">Storage of portable equipment will be within existing structures designed to withstand local high temperature conditions. Based on maximum temperature conditions expected and the equipment that will be stored no specific heat removal provisions are considered necessary to maintain equipment functional. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014</td></tr>
<tr><th colspan="3">Deployment Conceptual Design
(Attachment 3 contains Conceptual Sketches)</th></tr>
<tr><th>Strategy</th><th>Modifications</th><th>Protection of connections</th></tr>
<tr><td>The PDDP will be positioned in the area near the pump house and suction hoses will be placed to draw water from the pump house forebay or pump bay (see Attachment 3, Figures 8a and 8b). Alternative suction paths include the ability to draw water directly from Lake Michigan using a floating strainer. Hose(s) from the PDDP discharge will be routed through the 8' Elevation of the Turbine Building and Primary Auxiliary Building to an adapter on the AFW piping which would allow water to be injected to any of the Unit 1 or Unit 2 SGs once the SG pressure reduces below the shutoff head of the pump. This deployment is intended only as a backup means for supplying water to the SGs.

The use and deployment of the portable diesel driven charging pumps is discussed in the RCS Inventory Control Section.</td><td>The connection points to the AFW piping already exists.

The modification to harden existing diesel driven fire pump to meet seismic requirements and supply the TDAFW pump suction will also have a connection point for a PDDP (Pending Action 19).</td><td>The connection points to AFW are located within a Class I structure in the PAB.

The connection point to SW is located within a Class I structure in the Pump House.</td></tr>
</table>

Maintain Core Cooling & Heat Removal		
PWR Portable Equipment Phase 2		
The Motor Control Centers (MCCs) that provide power to the accumulator discharge MOVs will be energized from the B03 and B04 480 VAC busses using the normal class 1E electrical distribution system. The B03 and B04 busses will be powered from a portable PDG as described in the Safety Function Support Section (see Attachment 3, Figures 16a and 16b). Once the MCCs are energized, the accumulator MOVs can be operated from the control room. In MODE 5 and 6 when the SGs are not available, a portable diesel driven pump, capable of 300 gpm (Reference 14) is deployed near the RWST and will draw RWST water through an adapter mounted on the drain valve. A hose from the pump discharge will be routed through the 8' Elevation of the PAB to an adapter on the RHR piping which will in turn provide a flow path to the RCS (see Attachment 3 Figure 12).		

Maintain Core Cooling & Heat Removal	
PWR Portable Equipment Phase 3	
The strategies implemented during Phase 2 are capable of maintaining core cooling and heat removal for an indefinite amount of time. Phase 3 strategies are focused on providing defense in depth and the recovery of normal core cooling and heat removal capabilities. The strategy in Phase 3 is to restore the RHR, Component Cooling Water (CCW), and SW systems by using equipment provided by the RRC. The units would then be placed and maintained in cold shutdown. The primary Phase 3 strategy requires an offsite pump capable of removing heat from the reactor core in addition to other loads, including the SFP. Ideal flow paths for decay heat removal are to utilize piping in the RHR, CCW and SW systems. The RHR system would require repowering the RHR pump via an offsite diesel generator to establish recirculation in the RCS. Heat removal would be through the RHR heat exchangers which are cooled by establishing flow through the CCW system. The CCW pumps are also powered by the offsite diesel generator. The CCW heat exchangers would transfer the heat from this and other loads to lake water which is supplied by a pump provided by the RRC. The CCW system provides cooling to the RHR heat exchangers and the RHR pump seal coolers. The SW system directly cools the CCW and SFP heat exchangers and the Containment Fan Coolers. The pump would be sized to provide the flow required to remove all decay heat from irradiated fuel located in the reactor cores and SFP, as well as the heat that has been rejected to the containment atmosphere. The pump will take suction from the pump house forebay or directly from the lake. The modification to harden existing diesel driven fire pump to meet seismic requirements and supply the TDAFW pump suction will also have a connection point for a PDDP (Pending Action 19). Valves in the SW system will be aligned to maximize pump flow to the desired heat exchanger(s).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	• ECA-0.0 Unit 1 and ECA-0.0 Unit 2, "Loss of All AC Power," or SEP-3.0 Unit 1 and SEP-3.0 Unit 2, "Loss of All AC Power to a Shutdown Unit," would be the controlling procedure during ELAP Events with a LUHS. Core cooling and heat removal will be provided as it was in Phase 2. As in Phase 2 FSGs will be developed to maintain core cooling and heat removal. • EOP-0, ECA-0.0, and SEP-3.0 will remain the controlling procedures for ELAP Events with a LUHS. ECA-0.0 and SEP-3.0 contain actions to perform when power is restored. In addition to the FSGs that will be developed for Phase 2 core cooling and heat removal, FSGs will be developed to transition from flex equipment to installed plant equipment and to provide long term RCS temperature control. The FSG will be entered as directed by ECA-0.0 or SEP-3.0 and if appropriate, other procedures. Emergency Operating

Maintain Core Cooling & Heat Removal	
PWR Portable Equipment Phase 3	
	Procedures, Shutdown Emergency Procedures, Emergency Contingency Actions, Abnormal Operating Procedures, and if appropriate other procedures will be updated as required to support the FSGs.
Identify Modifications	• Connection points to the station 4.16 kV safeguards bus for a portable diesel generator (see Attachment 3 Figure 9). • The modification to harden existing diesel driven fire pump to meet seismic requirements and supply the TDAFW pump suction will also have a connection point for a PDDP (Pending Action 19).
Key Reactor Parameters	• A and B loop RCS Hot Leg Temperature • Core Exit Thermocouples • A and B Loop RCS Cold Leg Temperature • Wide Range RCS Pressure • A and B SG Wide Range Level • SI Accumulator Pressure • Pressurizer Level • Reactor Vessel Level • Steam Generator AFW Flow • A and B Steam Generator Pressure • CST Level • DC Bus Voltage • Neutron Flux • Credited portable equipment will be instrumented to provide Operators the required information to verify that it is functioning properly and meeting the requirements of the strategy being implemented.

Deployment Conceptual Design **(Attachment 3 contains Conceptual Sketches)**		
Strategy	**Modifications**	**Protection of connections**
Augmentation of RCS cooling capabilities via use of available RCC resources.	Electrical connections as described under the Safety Function Support Section.	Electrical connections are protected as described under the Safety Function Support Section.

Maintain Core Cooling & Heat Removal		
PWR Portable Equipment Phase 3		
Equipment from the RRC will initially be transported to an offsite receiving area like the Green Bay airport and an accessible route to the site will be identified based on the extent of damage. It is assumed that two diesel generators, of approximately 2 MW each, and two UHS pumps will arrive at the site staging area (one of the designated parking lots located to the South and North of the plant) from the RRC between 72 and 96 hours into the event. The equipment will be deployed from the staging area through the Protected Area vehicle trap under the control of Station Security. The equipment may be deployed through either the South or North Security fence gate. These generators will be connected to the B train 4.16 KV Emergency Bus (see Attachment 3, Figure 9). The UHS pumps will be staged near the pump house and connected to the SW system.	The modification to harden existing diesel driven fire pump to meet seismic requirements and supply the TDAFW pump suction will also have a connection point for a PDDP (Pending Action 19).	The connection point to SW is located within a Class I structure in the Pump House.

Maintain RCS Inventory Control
Determine Baseline coping capability with installed coping[2] modifications not including FLEX modifications, utilizing methods described in Table 3-2 of NEI 12-06: • **Low leakage RCP seals** • **RCS make-up and boration**
PWR Installed Equipment Phase 1:
MODES 1-5 Steam Generators available The Reactor Coolant Pump (RCP) seals will be upgraded with low leakage RCP seals qualified for the service conditions for 7 days. Since the low leakage seals will allow negligible RCS inventory losses through the RCP seals, RCS makeup is no longer required to achieve a stable steady state in Phase 1 with the reactor core being cooled. Cooldown of the RCS will commence approximately 12 hours after the BDBEE. Delaying the RCS cooldown allows time for: • Establishing the ability to isolate the accumulators. • Decay heat to lower to a level that can be removed by one SG ADV at reduced SG pressure. RCS cooldown to a SG temperature of 350°F would result in an SG pressure of 135psia and preliminary evaluation indicates that a single ADV would be capable of relieving enough steam to remove decay heat 6 hours after shutdown at this pressure (Reference 36). It is our intent to use the ADVs on both loops for RCS cooldown if available; however the worst case availability of a single loop ADV is acceptable. • Deployment of the Phase 2 low capacity, high pressure Portable Diesel Driven Charging Pump (PDDCP) and the establishment of RCS makeup/boric acid injection. A preliminary evaluation indicates that there would be sufficient volume available during a cooldown to inject water from the RWST and maintain the core sub-critical during cooldown without establishing letdown or venting the RCS to containment (References 37 and 38). Pending Action 29 will verify this initial evaluation. Delaying RCS cooldown also benefits the TDAFW pump in that it minimizes the operational time during periods of reduced steam pressure. Calculation 2005-0021, Revision 0, dated May 30, 2007 (Reference 39) demonstrates the acceptability of using the TDAFW pump during an Appendix R scenario in cooling down the RCS to 350°F within allowed time frame. Further evaluation will be required to address the need for extended operation at low Steam Generator pressures and low decay heat loads (Pending Action 14).

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

Maintain RCS Inventory Control	
MODES 5 and 6, Steam Generators Unavailable If SGs are not available and the refueling cavity is not flooded, the RCS will heat up. Makeup flow to the RCS will be established from the accumulator(s) via the fill line or gravity feed from the RWST if the RCS is adequately vented to atmosphere. A backup compressed gas supply will be installed to provide the motive force for the accumulator AOV (Pending Action 20). Administrative controls will be established to ensure the availability of accumulator inventory and the proper system alignment. Preliminary evaluations indicate that a single accumulator will supply water to compensate for boil off for over 2 hours based on a Technical Specification required volume between 1,100 and 1,136 cubic feet (Reference 32) and a decay heat load of 60 gpm per Attachment H to EDMG- 2 (Reference 33). If in MODE 6, with the cavity flooded, the time to boil is in excess of in excess of 7 hours (References 34 and 48). With the cavity at the required refueling height of greater than 23 feet above the reactor vessel flange (Reference 57) and a volume of 12,000 gallons per foot (Reference 58) it will take greater than 72 hours to boil the cavity dry. **All MODES** Formal MAAP or other comparable analysis and evaluations will be performed to demonstrate the adequacy of the mitigation strategy for RCS inventory in all plant operating modes (Pending Action 4).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	• ECA-0.0 Unit 1 and ECA-0.0 Unit 2, "Loss of All AC Power," provide directions to respond to a loss of all AC power. This is a direct entry procedure if both 4160 VAC safeguards buses, or both 480 VAC safeguards buses are de-energized. ECA-0.0 maintains RCS inventory by ensuring RCS inventory loss is minimize by ensuring the major RCS outflow lines that could contribute to rapid depletion of RCS inventory are isolated. ECA-0.0 actions combined with the installation of low leakage seals will maintain RCS inventory during Phase 1. • EOP-0 Unit 1 and EOP-0 Unit 2, "Reactor Trip or Safety Injection," provides directions to verify proper response of the automatic protection systems following manual or automatic actuation of a reactor trip or safety injection. This procedure could be entered directly with indications of a reactor trip. EOP-0 would direct a transition to ECA-0.0 at step 3 after trying to fast start the Emergency Diesel Generators.

Maintain RCS Inventory Control	
	• SEP-3.0 Unit 1 and SEP-3.0 Unit 2, "Loss of All AC Power to a Shutdown Unit," provide directions to respond to a loss of all 480 VAC power for a shutdown unit. This is a direct entry procedure if both 4160 VAC safeguards buses, or both 480 VAC safeguards buses are de-energized. SEP-3.0 maintains RCS inventory by ensuring RCS inventory loss is minimize by ensuring the major RCS outflow lines that could contribute to rapid depletion of RCS inventory are isolated. If the RCS is in reduced inventory (defined as reactor vessel level less than 55%) SEP-3.0 directs the performance of SEP-1.1 Unit 1 or SEP-1.1 Unit 2, "Alternate Core Cooling," in parallel with SEP-3.0. SEP-1.1 maintains RCS inventory by gravity draining the RWST to the RCS. The primary source of makeup cooling water for the Phase 1 FLEX strategy will be an accumulator. FLEX Support Guidelines will be developed to maintain RCS inventory. ECA-0.0, EOP-0 and SEP-3.0 will remain the entry points for ELAP Events with a LUHS. FLEX Support Guidelines will be developed and will be entered as directed by ECA-0.0, SEP-3.0 and if appropriate, other procedures. The FSGs will address initial assessment and FLEX equipment staging. Reactor Coolant System makeup flow with a borated water source while in MODES 5 and 6 (from the SI Accumulators or RWST) and DC load management. Emergency Operating Procedures, Shutdown Emergency Procedures, Emergency Contingency Actions, Abnormal Operating Procedures, and if appropriate other procedures will be updated as required to support the FSGs.
Identify Modifications	• Install low leakage RCP seals to decrease RCP seal leakage and increase the time to core uncovery so inventory control is not a concern during Phase 1 and a quick RCS cooldown and depressurization is not required (Pending Action 23). • For MODES 5 and 6 when the SGs are not available a backup compressed gas supply will be installed for the accumulator fill valves so the boric acid can be injected into the RCS in a controlled manner (Pending Action 20).

Maintain RCS Inventory Control	
Key Reactor Parameters	• A and B Loop RCS Hot Leg Temperature • Core Exit Thermocouples • A and B Loop RCS Cold Leg Temperature • SI Accumulator Pressure • Pressurizer Level • Reactor Vessel Level • Containment Pressure • DC Bus Voltage • Neutron Flux • Containment Temperature

Maintain RCS Inventory Control
PWR Portable Equipment Phase 2:

MODES 1-5 Steam Generators Available

Reactor Coolant System makeup and boron addition is accomplished via a PDDCP drawing water from the RWST or BAST and discharging to the RCS loop A or B via the normal or alternate charging lines. The PDDCP will be a low capacity, high pressure pump capable of delivering 15 gpm at approximately 2,500 psig (Reference 60). A separate PDDCP will be provided for each unit.

The RWST has been seismically qualified however the tank is not located within a Class I structure that would protect it from tornado wind loading and missiles. A condition evaluation (Reference 35) was performed to demonstrate that the lower portion of the RWST was protected from wind loading and missiles by surrounding structures. The conclusion was that the RWST remains functional following a tornado and tornado missile event with a contained volume of approximately 160,000 gallons. This volume is over eight times the makeup volume required to cooldown the plant to 70°F which was estimated to be 19,000 gallons (Reference 35). The RWST is the primary source of boric acid.

The BASTs are located within a Class I structure and thus protected from wind and missile hazards. The BASTs were originally designed and installed as seismic Class I but were administratively down graded to Class II when their safety related function was changed, however they are still considered as seismically robust. The boric acid concentration is maintained between 3.5 and 4.0 Wt% boric acid and the required volume per unit is 7,470 gallons and a minimum temperature of 70°F (Reference 59). The BASTs are considered backup source of boric acid if available.

MODES 5 and 6, Steam Generators Unavailable

For MODES 5 and 6 a PDDP, capable of at least 300 gpm to address boric acid precipitation concerns, will supply borated water from the RWST to the RCS using pre-established primary or secondary connection points on the RHR system piping. A flow rate of less than 60 gpm (Reference 33) will be sufficient to compensate for boil-off.

As noted above, the RWST remains functional following a tornado and tornado missile event with a contained volume of approximately 160,000 gallons. With a decay heat boil off rate of 60 gpm the remaining volume in the RWST would last for greater than 40 hours and allow high flow boric acid flushing to periodically occur.

As noted above the BASTs are considered as seismically robust and wind and missile protected. They contain a minimum volume of 7,470 gallons of between 3.5 and 4.0 Wt% boric acid (Reference 59). The BASTs are considered backup source of boric acid if available.

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If in MODE 6, with the cavity flooded, the time to boil is in excess of in excess of 7 hours (References 34 and 48). With the cavity at the required refueling height of greater than 23 feet

Maintain RCS Inventory Control	
PWR Portable Equipment Phase 2:	
above the reactor vessel flange (Reference 57) and a volume of 12,000 gallons per foot (Reference 58) it will take greater than 72 hours to boil the cavity dry. Because of the significant time available, a Phase 2 makeup strategy is not required for this condition. If makeup is required prior to receiving Phase 3 equipment raw water can be added to the cavity using a PDDP connected to containment spray (see Attachment 3, Figure 14) or connected to the RHR (see Attachment 3, Figure 12).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	• For MODES 1-4 with the SI Accumulators aligned for normal operation, ECA-0.0 Unit 1 and ECA-0.0 Unit 2, "Loss of All AC Power," will be the controlling procedure and provide directions to respond to a loss of all AC power. ECA-0.0 maintains RCS inventory by ensuring RCS inventory loss is minimized by ensuring the major RCS outflow lines that could contribute to rapid depletion of RCS inventory are isolated. FLEX Support Guidelines will be developed and will be entered as directed by ECA-0.0. FLEX Support Guidelines will be developed to provide guidance to maintain RCS inventory • For MODE 4 (SI Accumulator discharge MOV shut), 5 and 6, SEP-3.0 Unit 1 and SEP-3.0 Unit 2, "Loss of All AC Power to a Shutdown Unit," will be the controlling procedure and provide directions to respond to a loss of all 480 VAC safeguards power for a shutdown unit. When the RCS is not in reduced inventory (defined as reactor vessel level greater than 55%) SEP-3.0 maintains RCS inventory by ensuring RCS inventory loss is minimized by ensuring the major RCS outflow lines that could contribute to rapid depletion of RCS inventory are isolated. FLEX Support Guidelines will be developed and will be entered as directed by SEP-3.0. FLEX Support Guidelines will be developed to provide guidance to maintain RCS inventory. When the RCS is in reduced inventory (defined as reactor vessel level less than 55%) SEP-3.0 directs the performance of SEP-1.1 Unit 1 or SEP-1.1 Unit 2, "Alternate Core Cooling," in parallel with SEP-3.0. SEP-1.1 is used to evaluate and correct conditions that are causing, or could lead to an inadequate core cooling condition during residual heat removal system operation. SEP-1.1 utilizes gravity drain from the RWST to maintain the reactor vessel level greater than 22%. The primary

Maintain RCS Inventory Control	
PWR Portable Equipment Phase 2:	
	source of makeup cooling water for the Phase 1 FLEX strategy will be an accumulator. When the accumulator(s) is depleted, makeup cooling water will be delivered using a PDDP taking suction from the RWST. FLEX Support Guidelines will be developed to provide guidance to maintain RCS inventory. ECA-0.0 and SEP-3.0 will remain the controlling procedures for ELAP Events with a LUHS. FLEX Support Guidelines will be developed and will be entered as directed by ECA-0.0, SEP-3.0 and if appropriate, other procedures. The FSGs will address initial assessment and FLEX equipment staging, RCS inventory control, RCS makeup/cooling flow while in MODES 5 and 6, borating the RCS and DC load management. Emergency Operating Procedures, Shutdown Emergency Procedures, Emergency Contingency Actions, Abnormal Operating Procedures, and if appropriate other procedures will be updated as required to support the FSGs.
Identify Modifications	• The connection points to the charging lines already exist (see Attachment 3, Figures 13a and 13b). • For MODES 5 and 6 when SGs are not available, connection points for a portable diesel pump will be added to the RHR system for injecting into the RCS (see Attachment 3, Figure 12) (Pending Action 22). The connection points to the RWST and BAST already exist.
Key Reactor Parameters	• A and B Loop RCS Hot Leg Temperature • Core Exit Thermocouples • A and B Loop RCS Cold Leg Temperature • SI Accumulator Pressure • Pressurizer Level • Reactor Vessel Level • Containment Pressure • DC Bus Voltage • Neutron Flux • Containment Temperature • Credited portable equipment will be instrumented to provide Operators the required information to verify that it is functioning properly and meeting the requirements of the strategy being implemented.

Maintain RCS Inventory Control	
PWR Portable Equipment Phase 2:	
Storage / Protection of Equipment: **Describe storage / protection plan or schedule to determine storage requirements**	
Seismic	Storage of portable equipment will be within existing Class I structures, within existing structures qualified in accordance with the robust seismic requirements contained in NEI 12-06 or new structures designed and constructed in accordance with the robust requirements contained in NEI 12-06. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.
Flooding Note: if stored below current flood level, then ensure procedures exist to move equipment prior to exceeding flood level.	Storage of portable equipment will be in structures located above the design flood level or within existing Class I structures in areas protected from external flooding. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.
Severe Storms with High Winds	Storage of portable equipment will be within existing Class I structures designed to withstand severe winds and tornado missiles or within existing structures qualified in accordance with the robust requirements contained in NEI 12-06. If new structures are required, they will designed and constructed in accordance with the robust and diversity requirements contained in NEI 12-06. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.
Snow, Ice, and Extreme Cold	Storage of portable equipment will be within existing structures designed to withstand snow and ice conditions and provided with heating to maintain equipment functional. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.
High Temperatures	Storage of portable equipment will be within existing structures designed to withstand local high temperature conditions. Based on maximum temperature conditions expected and the equipment that will be stored no specific heat removal provisions are considered necessary to maintain equipment functional. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014

Deployment Conceptual Modification **(Attachment 3 contains Conceptual Sketches)**		
Strategy	**Modifications**	**Protection of connections**
A separate PDDCP will be deployed for each Unit. The pumps will be located on the 8' Elevation of the PAB in the general location of the installed charging pumps for the respective Unit (see Attachment 3, Figures 13a and 13b). An exhaust duct for each pump will be routed through personnel doors into the Turbine Building. Approximately 50 – 100 feet of high pressure, 1-inch hose will be used to connect the discharge of the PDDCP to the primary connection points at 1CV-D-18 and 2CV-D-18, which are located in the PAB pipeways. Approximately 100 – 150 feet of low pressure, 2-inch hose will be used to connect the suction of the PDDCP to the primary connection points at the flange near the 1SI-D-1 and 2SI-D-1 RWST drain valves located in the Unit 1 and Unit 2 facades respectively. If the secondary PDDCP discharge connection points are used, approximately 50-80 ft. of high pressure. 1-inch hose would be run from the PDDCP to the 1CV-V-3 and 2CV-V-4 vent valves located in each unit's "B" charging pump cubicle. If the secondary pump suction connection point is used, approximately 110 feet of low pressure 2-inch hose	Flanged hose adapters will be fabricated to facilitate connection to the primary and secondary connection points without modification of the permanent plant equipment (Pending Action 24). The hose adapters for each connection point will be pre-staged and stored with the skid pumps. Utilizing these existing lines would require operator action to remove the existing blind flange or screwed cap and attach the hose adapter.	Adapters will be stored with the skid pumps in existing Class 1 structure. The connection points to the charging system are located within a Class I structure. The suction connection from the RWST is located at the bottom of the tank and would be wind and missile protected like the lower section of the RWST (Reference 35). The secondary charging and suction connections are all located within a Class I structure.

would be run from the PDDCP to the 1SI-825C and 2SI-825C AOVs. The bonnet and operator will be removed from the AOV and replaced with a hose adapter. This connection point would allow water to be drawn from either the RWST or the BASTs depending on system valve alignment. The means for powering and operating the accumulator MOVs is discussed in the Core Cooling and Heat Removal Section.		

Maintain RCS Inventory Control	
PWR Portable Equipment Phase 3:	
The strategies implemented during Phase 2 are capable of maintaining RCS inventory control for an indefinite amount of time. Phase 3 strategies are focused on providing defense in depth and the recovery of normal RCS inventory control capabilities. During Phase 3 offsite resources will be available to replace or augment RCS inventory control capabilities implemented in Phase 2, if necessary. The primary strategy in Phase 3 is to restore power to the charging pumps and Chemical and Volume Control System (CVCS) components so that normal RCS inventory control can be established. The primary equipment required from the RRC would be 4.16 kV portable diesel generators.	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	• ECA-0.0 Unit 1 and ECA-0.0 Unit 2, "Loss of All AC Power," or SEP-3.0 Unit 1 and SEP-3.0 Unit 2, "Loss of All AC Power to a Shutdown Unit," would be the controlling procedure during ELAP Events with a LUHS. Reactor Coolant System inventory will be provided as it was in Phase 2. As in Phase 2 FSGs will be developed to maintain RCS inventory. ECA-0.0, EOP-0 and SEP-3.0 will remain the controlling procedures for ELAP Events with a LUHS. ECA-0.0 and SEP-3.0 contain actions to perform when power is restored. In addition to the FSGs that will be developed for Phase 2 RCS inventory control, FSGs will be developed to transition from flex equipment to installed plant equipment and long term RCS inventory control. The FSG will be entered as directed by ECA-0.0 or SEP-3.0 and if appropriate, other procedures. Emergency Operating Procedures, Shutdown Emergency Procedures, Emergency Contingency Actions, Abnormal Operating Procedures, and if appropriate other procedures will be updated as required to support the FSGs.
Identify Modifications	• 4.16 kV pre-designed connection points to connect to the station 4.16 kV safeguards bus
Key Reactor Parameters	• A and B loop RCS Hot Leg Temperature • Core Exit Thermocouples • A and B loop RCS Cold Leg Temperature • SI Accumulator Pressure • Pressurizer Level • Reactor Vessel Level • Containment Pressure • DC Bus Voltage

Maintain RCS Inventory Control	
PWR Portable Equipment Phase 3:	
Key Reactor Parameters (continued)	• Neutron Flux • Containment Temperature • Credited portable equipment will be instrumented to provide Operators the required information to verify that it is functioning properly and meeting the requirements of the strategy being implemented.

Deployment Conceptual Modification (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Augmentation of RCS inventory control capabilities via use of available RCC resources. Equipment from the RRC will initially be transported to an offsite receiving area such as the Green Bay airport and an accessible route to the site will be identified. It is assumed that two approximately 2 MW diesel generators will arrive at the site staging area (one of the designated parking lots located to the South and North of the plant) from the RRC between 72 and 96 hours into the event. The generators will be deployed from the staging area through the Protected Area vehicle trap under the control of Station Security. The equipment may be deployed through either the South or North Security fence gate. These generators will be connected to the B train 4.16 KV Emergency Bus (see Attachment 3, Figure 9).	Electrical connections for portable AC power supplies as described in the Safety Function Support Section.	The 4.16 kV connections will be to the B train safeguards bus. The Unit 1 and 2 B train 4.16 kV safeguards busses are located within the G-03 and G-04 emergency diesel generator building. This building is a Class I structure designed to withstand seismic, wind and missile loads. It is also located above the design flood level.

Maintain Containment	
Determine Baseline coping capability with installed coping[3] modifications not including FLEX modifications, utilizing methods described in Table 3-2 of NEI 12-06:	
PWR Installed Equipment Phase 1:	
PBNP will install low leakage RCP seals which will prevent significant leakage from the RCS seals into containment. During Phase 1 containment pressure is monitored, but there is no significant mass release to containment expected and the containment safety function is not challenged. An existing Appendix R scenario analysis projects the containment to reach approximately 28 psig and 205°F after 72 hours with no active containment heat removal systems available (Reference 39). This calculation assumed an RCP seal leakage of 21 gpm per pump and an RCS leak of 10 gpm for a total RCS leak rate of 52 gpm. The installation of the low leakage RCP seals is expected to result in a much lower containment pressure and temperature. The low leakage RCP seal leakage is assumed to be 1 gpm per pump and an RCS Technical Specification allowed leak rate of 1 gpm (typical RCS leakage is approximately 0.1 gpm) is assumed for a total RCS leak rate of 3 gpm. A new containment analysis will be performed based on the use of low leakage RCP seals and the FLEX mitigation strategy (Pending Action 5). In MODES 5 and 6, the plant Technical Specifications do not require containment operability other than the specific closure requirements of Technical Specification Limited Condition for Operation 3.9.3, "Containment Penetrations." While the containment may not initially be isolated in MODE 5 or 6, plant procedures require containment closure capability prior to bulk boiling when the RCS is not intact. Containment closure can be accomplished following a loss of power event. The consideration of the RCS being intact includes the ability to remove decay heat via natural circulation (i.e., SG available) (References 40, 41, and 54).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	ECA-0.0, "Loss of All AC Power" and SEP-3.0, "Loss of All AC Power To a Shutdown Unit," will remain the entry point and controlling procedures for ELAP Events with a LUHS. ECA-0.0 contains a step to check containment pressure has remained less than 25 psig and has a fold out page criteria of less than 5 psig for containment pressure to alert the control room to use adverse containment data. With the installation of low leakage RCP seals, containment pressure is not expected to increase significantly during Phase 1. FLEX Support Guidelines will be developed and will be entered as directed by ECA-0.0, SEP-3.0 and if appropriate, other procedures. Emergency Operating Procedures, Shutdown Emergency Procedure, Emergency Contingency Actions, Abnormal Operating Procedures, and if appropriate other procedures will be updated as required to support the FSGs.

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

Maintain Containment	
Identify Modifications	Low leakage reactor coolant pump seals will be installed (Pending Action 23).
Key Containment Parameters	• Containment Pressure • Containment Temperature

Maintain Containment	
PWR Portable Equipment Phase 2:	
During Phase 2, containment pressure and temperature are monitored to ensure the containment safety function is not challenged. If containment conditions warrant, a PDDP will supply water to the containment spray system via an adapter that will replace the cover of a spray pump discharge check valve (see Attachment 3, Figure 14).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	ECA-0.0, "Loss of All AC Power" and SEP-3.0, "Loss of All AC Power to a Shutdown Unit," will remain the controlling procedures for ELAP Events with a LUHS. ECA-0.0 has fold out page criteria of less than 5 psig containment pressure to alert the control room to use adverse containment data. FLEX Support Guidelines will be developed and will be entered as directed by ECA-0.0, SEP-3.0 and if appropriate, other procedures. The FSGs will address alternate containment cooling. Emergency Operating Procedures, Shutdown Emergency Procedures, Emergency Contingency Actions, Abnormal Operating Procedures, and if appropriate other procedures will be updated as required to support the FSGs.
Identify Modifications	No Phase 2 modifications are required. The connection point to Containment Spray already exists.
Key Containment Parameters	• Containment Pressure • Containment Temperature • Credited portable equipment will be instrumented to provide Operators the required information to verify that it is functioning properly and meeting the requirements of the strategy being implemented.
Storage / Protection of Equipment: **Describe storage / protection plan or schedule to determine storage requirements**	
Seismic	Storage of portable equipment will be within existing Class I structures, within existing structures qualified in accordance with the robust seismic requirements contained in NEI 12-06 or new structures designed and constructed in accordance with the robust requirements contained in NEI 12-06. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.
Flooding	Storage of portable equipment will be in structures located above the design flood level or within existing Class I structures in areas protected from external flooding. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.

Maintain Containment	
Severe Storms with High Winds	Storage of portable equipment will be within existing Class I structures designed to withstand severe winds and tornado missiles or within existing structures qualified in accordance with the robust requirements contained in NEI 12-06. If new structures are required, they will be designed and constructed in accordance with the robust and diversity requirements contained in NEI 12-06. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.
Snow, Ice, and Extreme Cold	Storage of portable equipment will be within existing structures designed to withstand snow and ice conditions and provided with heating to maintain equipment functional. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.
High Temperatures	Storage of portable equipment will be within existing structures designed to withstand local high temperature conditions. Based on maximum temperature conditions expected and the equipment that will be stored, no specific heat removal provisions are considered necessary to maintain equipment functional. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.

Deployment Conceptual Modification **(*Attachment 3 contains Conceptual Sketches*)**		
Strategy	**Modifications**	**Protection of connections**
If necessary, the capability exists to connect a PDDP to supply water to the containment spray system via an adapter which replaces the cover of a spray pump discharge check valve (see Attachment 3, Figure 14). Hose(s) from the PDDP will be routed through the 8' Elevation of the Turbine Building and PAB to this connection point. The PDDP will be positioned in the area near the pump house and suction hoses will be placed to draw water from the pump house fore bay or pump	None; the connection points already exist.	The connection points at the spray pump discharge check valves are located within the PAB, which is a seismic Class I, SR structure and provides protection from tornado missiles. All of the related installed piping that will provide the intended flow path is SR seismic Class I and is located within the PAB until it enters containment.

Maintain Containment		
bay. Alternative suction paths include the ability to draw water directly from Lake Michigan using a floating strainer (see Attachment 3, Figures 8a, 8b, and 14).		

Maintain Containment	
PWR Portable Equipment Phase 3:	
The strategies implemented during Phase 2 are capable of maintaining containment for an indefinite amount of time. Phase 3 strategies are focused on providing defense in depth and the recovery of normal containment heat removal capabilities. During Phase 3, offsite resources will be available to replace or augment containment cooling capabilities implemented in Phase 2, if necessary. The primary strategy in Phase 3 is to restore power to the containment cooling fans and restore cooling water flow through the containment cooling fan heat exchangers. The cooling water flow will be provided by either repowering the service water pumps using a PDG, or by a PDDP supplying water to the service water system via a new connection point in the pump house (Pending Action 19). The PDG and PDDP will be provided from the RRC.	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	ECA-0.0, "Loss of All AC Power" and SEP-3.0, "Loss of All AC Power To a Shutdown Unit," will remain the controlling procedures for ELAP Events with a LUHS. Containment pressure and temperature will be monitored and controlled as it was in Phase 2. The same FSGs that will be developed for Phase 2 will be applicable for Phase 3 and will be entered as directed by ECA-0.0, SEP-3.0, and if appropriate, other procedures. Additional FSGs will be developed to transition from FLEX equipment to plant equipment. Emergency Operating Procedures, Shutdown Emergency Procedures, Emergency Contingency Actions, Abnormal Operating Procedures, and if appropriate other procedures will be updated as required to support the FSGs.
Identify Modifications	Electrical connections for portable AC power supplies as described in the Safety Function Support Section (Pending Action 26).
Key Containment Parameters	• Containment Pressure • Containment Temperature • Credited portable equipment will be instrumented to provide Operators the required information to verify that it is functioning properly and meeting the requirements of the strategy being implemented.

Deployment Conceptual Modification (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
RCC PDG deployment. Equipment from the RRC will initially be transported to an offsite receiving area like the Green Bay airport and an accessible route to the site will be identified based on the extent of damage. It is assumed that two diesel generators, approximately 2 MW each, and two UHS pumps will arrive at the site staging area (one of the designated parking lots located to the South and North of the plant) from the RRC between 72 and 96 hours into the event. The equipment will be deployed from the staging area through the Protected Area vehicle trap under the control of Station Security. The equipment may be deployed through either the South or North Security fence gate. These generators will be connected to the B train 4.16 KV Emergency Bus (see Attachment 3, Figure 9). The UHS pumps will be staged near the pump house and connected to the SW system.	Electrical connections for portable AC power supplies as described in the Safety Function Support Section.	Electrical connections are protected as described in the Safety Function Support Section.

Maintain Spent Fuel Pool Cooling	
Determine Baseline coping capability with installed coping[4] modifications not including FLEX modifications, utilizing methods described in Table 3-2 of NEI 12-06:	
PWR Installed Equipment Phase 1:	
The SFP temperature is allowed to increase to the boiling point. Water will be added (Phase 2) well before fuel becomes uncovered. The PAB is vented by opening the PAB truck access doors and the 66' Elevation personnel doors as necessary based on PAB conditions. Assuming a loss of SFP cooling with the worst case design heat load (including a full core offload) the time-to-boil is approximately 10 hours (Reference 23). PBNP tracks the SFP heat load on a real time basis. Based on current SFP heat loading, and assuming a full core offload with an initial SFP temperature of 100°F, the projected time for the SFP to reach 200°F is 11 hours (References 24 and 25). After reaching the boiling point, it would take an additional 71 hours for the SFP to boil down to 6 inches above the fuel (Reference 26). As noted in the NextEra Energy Point Beach, LLC Overall Integrated Plan in Response to March 12, 2012 Commission Order to Modify Licenses with Regard to Reliable Spent Fuel Instrumentation (Reference 61) action will be initiated prior to the spent fuel pool lowering to a level of 2 feet 11 inches above the fuel. This level corresponds to the height of the east-west wall opening that separates the northern and southern areas of the pool. The level was chosen to ensure the SFP continues to function as a single pool for level monitoring reliability. After reaching the boiling point, the estimated time to a level of 2 feet 11 inches above the fuel would be an additional 64 hours.	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	ECA-0.0, "Loss of All AC Power" and SEP-3.0, "Loss of All AC Power To a Shutdown Unit," will remain the entry point and controlling procedures for ELAP Events with a LUHS. ECA-0.0 contains a step to periodically check the status of the SFP cooling by checking level greater than 62' 8" and SFP temperature less than 120°F. If either condition is not met AOP-8F, "Loss of Spent Fuel Pool Cooling," will be entered. AOP-8F will prompt for review of ROD 1.4, "Spent Fuel Pool Heatup Data Unit 1" and ROD 1.4 "Spent Fuel Pool Heatup Data Unit 2" to determine projected time to reach 200°F and the projected time to boil the water level down to 6" above the stored fuel. FLEX Support Guidelines will be developed and will be entered as directed by ECA-0.0, SEP-3.0 and if appropriate, other procedures. Emergency Operating Procedures, Shutdown Emergency Procedures, Emergency Contingency Actions, Abnormal Operating Procedures,

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

	and if appropriate other procedures will be updated as required to support the FSGs.
Identify Modifications	None are required to support Phase 1 actions.
Key SFP Parameter	Per NRC Order EA 12-051 SFP level indication will be modified to provide enhanced indication to support SFP cooling strategies.

Maintain Spent Fuel Pool Cooling	
PWR Portable Equipment Phase 2:	
Water is added to the SFP with a PDDP and hoses using either direct addition or spray. The PDDP will draw raw water from the pump house forebay, pump bay, or directly from Lake Michigan. A connection point on the suction of the P-9, Hold Up Tank (HUT) Recirculation Pump will allow the addition of approximately 250 gpm of raw water from the PDDP to the SFP without accessing the refueling deck (see Attachment 3, Figures 8a, 8b, and 15). A makeup water supply of 50 gpm is adequate to maintain SFP level (Reference 23). Spent fuel pool criticality analysis allows the use of non-borated water (Reference 42). If necessary based on PAB conditions, the PAB truck access doors and PAB personnel doors will be opened to vent steam from the PAB. PAB condensation removal will be addressed with a portable sump placed on the -19' Elevation of the PAB. An analysis will be performed to demonstrate the adequacy of the PAB environment for equipment and personnel access (Pending Action 6).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	ECA-0.0, "Loss of All AC Power" and SEP-3.0, "Loss of All AC Power To a Shutdown Unit," will remain the controlling procedures for ELAP Events with a LUHS. ECA-0.0 contains a step to periodically check the status of the spent fuel pool cooling by checking level greater than 62' 8" and SFP temperature less than 120°F. If either condition is not met AOP-8F, "Loss of Spent Fuel Pool Cooling," will be entered. FLEX Support Guidelines will be developed and will be entered as directed by ECA-0.0, SEP-3.0 and if appropriate, other procedures. FLEX Support Guidelines will install the portable FLEX equipment and guide the spent fuel pool makeup and cooling. Emergency Operating Procedures, Shutdown Emergency Procedures, Emergency Contingency Actions, Abnormal Operating Procedures, and if appropriate other procedures will be updated as required to support the FSGs.
Identify Modifications	A SFP makeup water connection point will be added to the suction of P-9 pump (Pending Action 7).
Key SFP Parameter	• Per EA 12-051, SFP level indication will be modified to provide enhanced indication to support SFP cooling strategies. Credited portable equipment will be instrumented to provide Operators the required information to verify that it is functioning properly and meeting the requirements of the strategy being implemented.

Maintain Spent Fuel Pool Cooling	
Storage / Protection of Equipment: **Describe storage / protection plan or schedule to determine storage requirements**	
Seismic	Storage of portable equipment will be within existing Class I structures, within existing structures qualified in accordance with the robust seismic requirements contained in NEI 12-06 or new structures designed and constructed in accordance with the robust requirements contained in NEI 12-06. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.
Flooding	Storage of portable equipment will be in structures located above the design flood level or within existing Class I structures in areas protected from external flooding. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.
Severe Storms with High Winds	Storage of portable equipment will be within existing Class I structures designed to withstand severe winds and tornado missiles or within existing structures qualified in accordance with the robust requirements contained in NEI 12-06. If new structures are required, they will be designed and constructed in accordance with the robust and diversity requirements contained in NEI 12-06. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.
Snow, Ice, and Extreme Cold	Storage of portable equipment will be within existing structures designed to withstand snow and ice conditions and provided with heating to maintain equipment functional. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.
High Temperatures	Storage of portable equipment will be within existing structures designed to withstand local high temperature conditions. Based on maximum temperature conditions expected and the equipment that will be stored, no specific heat removal provisions are considered necessary to maintain equipment functional. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.

Deployment Conceptual Design (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Water is added to the SFP with a PDDP and hoses using either direct addition or spray based on plant conditions. The PDDP will be positioned in the area near the pump house and suction hoses will be placed to draw water from the pump house fore bay or pump bay. Alternative suction paths include the ability to draw water directly from Lake Michigan using a floating strainer A 5" discharge hose is routed from the PDDP to the SFP truck bay area where a Gated Wye connection is installed from the Gated Wye; two 2 1/2" hoses are run up to each end of the SFP and tied off for direct discharge into the SFP or to spray nozzles (see Attachment 3, Figure 15). This will allow for a total flow rate of at least 500 gpm to the SFP. Ventilation of the central portion of the PAB will be achieved by opening the truck access doors and personnel doors on the 66' Elevation to the PAB fan rooms and facades. Any condensation in the PAB will accumulate in the -19' Elevation sump. A portable sump pump will be positioned in the -19' Elevation.	None.	No designated connection points.

Strategy	Modifications	Protection of connections
A sump and a hose will be routed to yard drains to remove any excessive accumulation of water. Power for the sump pump will be provided by a portable Diesel Generator (DG)		
A connection point on the suction of the P-9, HUT Recirculation Pump will be provided to allow raw water addition from a PDDP without accessing the refueling deck. Hose(s) from the PDDP will be routed through the 8' Elevation of the Unit 2 Turbine Building and PAB to this connection point. Alternate hose route(s) will access the PAB from the 8' Elevation of the Unit 1 Turbine Building (see Attachment 3, Figures 8a, and 8b).	A valve with threaded cap will replace the existing blank flange on the suction of the P-9, HUT Recirculation Pump. A hose adapter will be used to allow the connection of a 2 1/2" fire hose. The P-9 pump and associated piping which is currently not seismic Class I will be evaluated and upgraded if necessary to make it seismically robust (Pending Action 7).	This connection point is located within the PAB, which is a seismic Class I, SR structure. All of the related piping that will provide the intended flow path is/will be seismically robust. All of the piping from the P-9 pump to the SFP is protected from tornado missiles with the exception of the piping that extends above the 46' Elevation. An alternate flow path from the P-9 connection point is provided to the refueling transfer canal drain which can be used to add water to the SFP, overtopping the transfer canal doors if closed. This alternate flow path is tornado missile protected.

Maintain Spent Fuel Pool Cooling	
PWR Portable Equipment Phase 3:	
The strategies implemented during Phase 2 are capable of maintaining spent fuel pool cooling and heat removal for an indefinite amount of time. Phase 3 strategies are focused on providing defense in depth and the recovery of normal spent fuel pool cooling and heat removal capabilities. During Phase 3 offsite resources will be available to replace or augment SFP cooling capabilities implemented in Phase 2, if necessary. The primary strategy in Phase 3 is to restore power to the SFP cooling pumps and restore SFP heat exchanger cooling water flow. The cooling water flow will be provided by either repowering the service water pumps using a PDG or by PDDP supplying water to the service water system via a new connection point in the pump house (Pending Action 19). The PDG and PDDP will be provided from the RRC.	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	ECA-0.0, "Loss of All AC Power" and SEP-3.0, "Loss of All AC Power To a Shutdown Unit," will remain the controlling procedures for ELAP Events with a LUHS. Spent Fuel Pool level will be monitored and controlled as it was in phase 2. The same FSGs that will be developed for Phase 2 will be applicable for Phase 3 and will be entered as directed by ECA-0.0, SEP-3.0 and if appropriate, other procedures. Additional FSGs will be developed to transition from FLEX equipment to plant equipment. Emergency Operating Procedures, Shutdown Emergency Procedures, Emergency Contingency Actions, Abnormal Operating Procedures, and if appropriate other procedures will be updated as required to support the FSGs.
Identify Modifications	Electrical connections as described under the Safety Function Support Section.
Key SFP Parameter	• Per EA 12-051, SFP level indication will be modified to provide enhanced indication to support SFP cooling strategies. • Credited portable equipment will be instrumented to provide Operators the required information to verify that it is functioning properly and meeting the requirements of the strategy being implemented.

Deployment Conceptual Design **(Attachment 3 contains Conceptual Sketches)**		
Strategy	**Modifications**	**Protection of connections**
Augmentation of SFP cooling capabilities via use of portable generators and other available RCC resources.	Electrical connections as described in the Safety Function Support Section.	Electrical connections as described in the Safety Function Support Section.

Maintain Spent Fuel Pool Cooling		
Equipment from the RRC will initially be transported to an offsite receiving area like the Green Bay airport and an accessible route to the site will be identified based on the extent of damage. It is assumed that two diesel generators, approximately 2 MW each, and two UHS pumps will arrive at the site staging area (one of the designated parking lots located to the South and North of the plant) from the RRC between 72 and 96 hours into the event. The equipment will be deployed from the staging area through the Protected Area vehicle trap under the control of Station Security. The equipment may be deployed through either the South or North Security fence gate. These generators will be connected to the B train 4.16 KV Emergency Bus (see Attachment 3, Figure 9). The UHS pumps will be staged near the pump house and connected to the SW system.		

Safety Functions Support
Determine Baseline coping capability with installed coping[5] modifications not including FLEX modifications.
PWR Installed Equipment Phase 1
<u>Fuel Oil</u> The only equipment requiring fuel during Phase 1 will be the upgraded P-35B, DDFP. The upgraded P-35B fuel requirement is approximately 11.4 gallons per hour. The P-35B engine is gravity fed from T-30, Diesel Fire Pump Fuel Tank which has a capacity of 250 gallons and will be administratively controlled to ensure the availability of a quantity of fuel oil sufficient to supply P-35B for at least 13 hours. T-30 and all related piping are located within the Pump House which is a safety related, seismic Class I structure capable of handling tornado design wind and missile loads. T-30 and the related piping are not seismically qualified and will be evaluated and/or upgraded for the applicable seismic loading (Pending Action 8). The tank is protected from the expected Pump House flood level. <u>Lighting</u> Existing battery-operated emergency lighting units designed to provide adequate illumination for an 8-hour lighting duration are provided at local control panels and along the normal access routes traveled by operators to establish the Appendix R hot standby condition. In the exterior areas, emergency lighting is not provided for the access and egress routes (Reference 43). Appendix R emergency lighting is not seismically qualified. Many, but not all of the units are protected from tornado missiles. While not formally credited as FLEX equipment, surviving Appendix R emergency lighting may be available in some of the designated safe shutdown areas until the batteries are depleted. In addition to the fixed emergency lights, 8-hour, battery powered portable lights are provided in the Control Room for operator use when performing manual operator actions. These lights are designed for mounting on hard hats allowing hands free use. The helmet-mounted lights are provided for use in exterior areas and as a supplement to the fixed emergency lighting for traversing areas of low lighting and to compensate for out-of-service fixed emergency lights. Additional hand-held, battery powered, portable lights are provided in various plant locations for emergency use (Reference 43). The need for additional lighting will be evaluated as FSGs are developed (Pending Action 9).

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

Ventilation

Room temperatures in areas containing equipment required to mitigate a SBO event do not increase to values impacting operability following a loss of ventilation for at least one hour. Reasonable assurance of equipment operability is based on calculated maximum room temperature less than or equal to 120°F (Reference 15). Calculation 2005-0054 (Reference 16) verifies the times which control building rooms reach 120°F. The worst case room is the cable spreading room which will require an action to increase area cooling prior to 76 minutes.

Specific actions per AOP-30 "Temporary Ventilation for Vital Areas" (Reference 17) will be developed to account for the loss of all AC. Additional analysis will be performed to determine what additional time may be gained by opening cabinets and area doors (Pending Action 31).

DC Power

The safety-related 125V system consists of four main distribution buses: D-01, D-02, D-03, and D-04. The D-01 (train A) and D-02 (train B) main DC distribution buses supply power for control, emergency lighting, and the red and blue 120 VAC Vital Instrument bus (Y) inverters. The D-03 (train A) and D-04 (train B) main DC distribution buses supply power for control and the white and yellow 120 VAC Vital Instrument (Y) buses. In addition, there exists a swing SR battery D-305 which is connected to swing DC distribution bus D-301. This swing battery is capable of being aligned to any one of the four main distribution buses to take the place of the normal SR battery. There are also two non-SR 125V distribution buses (1/2D-201), and batteries installed. These buses and ancillary equipment are dedicated to a specific unit, and supply power to non-SR loads. A connection is provided from swing bus D-301 to both non-SR buses and batteries (Reference 21). All 5 of the SR batteries are located within SR seismic class I, tornado missile protected structures (see Attachment 3, Figure 7). If the non-safety related batteries are required to be credited as part of the battery load management strategy, they will be evaluated and upgraded as necessary to make them seismically robust and tornado missile protected (Pending Action 35).

A battery load management strategy will be developed to provide power to credited installed equipment (e.g., DC MOVs, SOVs, etc) and at least one channel of credited instrumentation during Phase 1 (Pending Action 1). The strategy will include initial load stripping to extend battery life. The DC load stripping will be initiated at 1 hour into the event and will be completed within the next hour. As the connected batteries become depleted, the batteries with remaining capacity will be switched in to replace them. A PDG will be used to restore power to the battery chargers before all batteries are depleted (Phase 2). Based on initial evaluation, the battery load management strategy is expected to provide greater than 18 hours of DC power before battery charger restoration will be required. A formal evaluation will be performed to verify available DC power time (Pending Action 1). A walkthrough of the initial load stripping actions will be performed to confirm that the strategy is viable within the assumed time frame (Pending Action 1).

<table>
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<u>Communication</u>

PBNP has a diverse set of communications systems, designed to ensure reliable communications during normal plant operations and during emergency situations, including loss of offsite power. The communications systems are not Safety Related. Reliability is established by providing primary and backup systems that are sufficiently independent of one another and by back up power capable to protect against loss of offsite power events. Enhancements to our communications system was documented by "NextEra Energy Point Beach, LLC Response to 10 CFR 50.54(f) Request for Information Regarding Near-Term Task Force Recommendation 9.3, Emergency Preparedness," letter to the NRC, dated October 30, 2012 (Reference 44). Future enhancements included providing portable generators to power battery chargers for portable Frequency Modulation (FM) radios, providing additional FM radio repeaters or back up power for existing repeaters, and providing portable generators to supply the existing FM radio system. The Phase II staffing study for FLEX will include an assessment of communications for FLEX activities (Pending Action 34).

Telephone system, plant paging system (Gai-Tronics), and FM two-way radio system have battery back ups. There will be additional spare batteries staged for the portable satellite phones and plant FM radios to provide continuous use for at least 12 hours. Charging stations powered by portable diesel generators will provide a continuous supply of charged batteries.

</td></tr>
<tr><td colspan="2">Details:</td></tr>
<tr><td>Provide a brief description of Procedures / Strategies / Guidelines</td><td>ECA-0.0 and SEP-3.0 will remain the entry point and controlling procedures for ELAP Events with a LUHS. FLEX Support Guidelines will be developed and will be entered as directed by ECA-0.0, SEP-3.0 and if appropriate, other procedures. FLEX Support Guidelines or other procedures if appropriate will perform DC load management and describe those actions required to implement the support mitigation strategies described above. Emergency Operating Procedures, Shutdown Emergency Procedures, Emergency Contingency Actions, Abnormal Operating Procedures, and if appropriate other procedures will be updated as required to support the FSGs.</td></tr>
<tr><td>Identify Modifications</td><td>T-30, Diesel Fire Pump Fuel Tank and related piping will be evaluated for seismic loading and upgraded as necessary (Pending Action 7).</td></tr>
<tr><td>Key Parameters</td><td>• DC Bus Voltage</td></tr>
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Safety Functions Support
PWR Portable Equipment Phase 2

During Phase 2 onsite portable equipment is used to restore battery chargers, replenish fuel oil tanks, and augment plant lighting, ventilation, freeze protection, and communication systems as necessary.

Portable AC Power Supplies

A 480 VAC PDG will be used to power credited installed equipment via the safety related 480 VAC distribution system. The primary connection points will be at 1B-03 and 2B-04 which are located in the Cable Spreading Room (CSR). (See Attachment 3, Figures 16a, 16b, 17a and 17b)

Fuel Oil

At full capacity, the PDDP uses 13.5 GPH. The PDDP has a fuel tank which will provide a minimum of 12 hours of operation at full capacity (Reference 33). The PDG connected to 1B-03 and 2B-04, and the other small diesel powered equipment (e.g., 5.5 kW PDGs and diesel driven charging pumps) will also require periodic refueling. The refueling frequency of this equipment will be based on fuel oil consumption (Pending Action 13).

Technical Specification requirements ensure greater than 64,000 gallons of fuel oil is maintained on site in SR seismic Class I underground tanks (Reference 46). This fuel would be available to supply permanently installed and/or portable diesel powered equipment credited for a FLEX mitigation strategy. The capability will exist to refuel required permanently installed and portable FLEX equipment within 12 hours following an event. This will be accomplished with the use of an approximately 500 gallon fuel tank trailer capable of being towed by a Ford F-350 or equivalent truck. The trailer/truck combination will have the capability to draw fuel oil from on site fuel oil tanks.

DC Power

Station batteries will be charged using the installed chargers and a PDG connected to 1B-03 and 2B-04. The B-03 and B-04 busses in each unit will be cross tied and the normal electrical distribution system will be used to supply power to the individual battery chargers (See Attachment 3, Figures 16a and 16b).

Lighting

Appendix R emergency lighting is not seismically qualified. Many, but not all of the units are protected from tornado missiles. While not formally credited as FLEX equipment, surviving Appendix R emergency lighting may be available in some of the designated safe shutdown areas, until the batteries are depleted (approximately 8 hours) (Reference 43). Portable lighting powered by PDGs will be available for installation in those areas of the plant requiring occupation for

Safety Functions Support
PWR Portable Equipment Phase 2

significant periods of time. Emergency lanterns will be used as necessary in other plant areas.

Ventilation

Temperatures in vital areas will continue to be monitored. Temporary ventilation may be set up per AOP 30 "Temporary Ventilation for Vital Areas" (Reference 17).

Communications

Communications systems and battery usage for satellite phones and FM radios will continue to be monitored including in-plant telephone system and communication system back up batteries. Portable diesel generators may need to be connected to battery chargers to increase battery life.

Freeze Protection

The installed electrical freeze protection heat tracing and building heating system are not seismically qualified and much of the distribution network and freeze protection circuitry is not protected from tornado missiles. However, the installed freeze protection equipment and building heating system is presumed to be available in the case of an extreme low temperature event (i.e., not coincident with a seismic or tornado event). In this circumstance PDGs connected to 1B-03 and 2-B04 would be used to power those portions of the Freeze Protection System that would be necessary to maintain the functionality of the installed equipment credited for a FLEX strategy that is not located within a heated building.

In the case of a seismic or tornado missile event occurring during normal winter conditions, the installed Freeze Protection electrical distribution system may not survive. The capability will exist to locally connect PDGs to the Freeze Protection heating elements within a time frame that will prevent the FLEX credited equipment from becoming non-functional or a means (portable heaters, torches, etc) will be provided to restore the equipment function in time to support the FLEX strategy.

Insulation blankets, portable torpedo heaters and temporary enclosures will be used as necessary to maintain the functionality of various pieces of portable equipment (PDGs, PDDP, etc) while not in use after deployment. PDDPs deployment in extremely cold temperatures will include a recirculation flow path to maintain sufficient flow through the deployed hoses to keep them from freezing. Alternatively the pumps and hoses will be drained.

Safety Functions Support	
PWR Portable Equipment Phase 2	
Field Instrument Readings Where practical, the capability will exist to take field readings of important plant parameters using non-electrical gauges/indicators or with the installed transmitters through the use of hand held meters (e.g. FLUKE 705, FLUKE 114). A reference source of field reading locations and instructions will be compiled. Some of the field reading locations may be at the containment penetrations. The handheld meters will be available in the general location of the field readings (i.e., PAB and Control Building). FLEX Equipment Storage The storage of FLEX equipment will be in existing Class 1 structures or in a new structure designed and constructed in accordance with the requirements of NEI 12-06. The Steam Generator Storage Building (SGSB) is a concrete structure located just north of PBNP and directly outside of the security fence. The SGSB will be analyzed for seismic and tornado loading to qualify it for FLEX purposes. There is high confidence that most of the SGSB (except the southern half of the west wall) can be qualified, without modification, for the seismic and tornado loads required to satisfy the FLEX requirements. The west wall of the SGSB will require additional evaluation and modification to ensure that it satisfies the FLEX requirements and is appropriately robust and functional after a BDB event. The SGSB will provide adequate space and protection to be used as the primary storage location for essential FLEX equipment (see Attachment 3, Figure 10). The deployment of credited FLEX equipment to the designated primary and secondary connection points within the required time frame will be resource and time validated (Pending Action 10).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	ECA-0.0 and SEP-3.0 will remain the entry point and controlling procedures for ELAP Events with a LUHS. FLEX Support Guidelines will be developed and will be entered as directed by ECA-0.0, SEP-3.0 and if appropriate, other procedures. FLEX Support Guidelines, will perform FLEX equipment staging, restore battery chargers, and describe those actions required to implement the support mitigation strategies described above. Additional guidance will be developed to perform electrical connections, refueling of portable equipment, ventilation, lighting and freeze protection. Emergency Operating Procedures, Shutdown Emergency Procedures, Emergency Contingency Actions, Abnormal Operating Procedures, and if appropriate other procedures will be updated as required to support the FSGs and any additional procedures.

Safety Functions Support	
PWR Portable Equipment Phase 2	
Identify Modifications	• Portable Diesel Generator connection points at 1B03 and 2B04 (Pending Action 25). • The SGSB will be analyzed for seismic and tornado loading to qualify it for FLEX purposes. The west wall of the SGSB will require additional evaluation and modification to ensure that it satisfies the FLEX requirements (Pending Action 27).
Key Parameters	• DC Bus Voltage • 480 V Safeguard Bus Voltage • Credited portable equipment will be instrumented to provide Operators the required information to verify that it is functioning properly and meeting the requirements of the strategy being implemented.
Storage / Protection of Equipment : **Describe storage / protection plan or schedule to determine storage requirements**	
Seismic	Storage of portable equipment will be within existing Class I structures, within existing structures qualified in accordance with the robust seismic requirements contained in NEI 12-06 or new structures designed and constructed in accordance with the robust requirements contained in NEI 12-06. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.
Flooding Note: if stored below current flood level, then ensure procedures exist to move equipment prior to exceeding flood level.	Storage of portable equipment will be in structures located above the design flood level or within existing Class I structures in areas protected from external flooding. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.
Severe Storms with High Winds	Storage of portable equipment will be within existing Class I structures designed to withstand severe winds and tornado missiles or within existing structures qualified in accordance with the robust requirements contained in NEI 12-06. If new structures are required, they will be designed and constructed in accordance with the robust and diversity requirements contained in NEI 12-06. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.
Snow, Ice, and Extreme Cold	Storage of portable equipment will be within existing structures designed to withstand snow and ice conditions and provided with heating to maintain equipment functional.

Safety Functions Support		
PWR Portable Equipment Phase 2		
	The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.	
High Temperatures	Storage of portable equipment will be within existing structures designed to withstand local high temperature conditions. Based on maximum temperature conditions expected and the equipment that will be stored, no specific heat removal provisions are considered necessary to maintain equipment functional. The necessary upgrade of existing structures or construction of new storage facilities will be completed by October, 2014.	
Deployment Conceptual Design **(Attachment 3 contains Conceptual Sketches)**		
Strategy	**Modifications**	**Protection of connections**
Strategies are as described above. Attachment 3, Figure 11 shows the preferred and alternate deployment paths from the FLEX equipment storage area. Specific deployment details are provided below.	See specific detail discussion that follows	All connections for the FLEX equipment will be designed to withstand and be protected from the applicable hazards. See specific detail discussion that follows.
<u>Portable AC Power Supplies</u> The 480VAC PDG will be positioned east of the turbine building. Cable routes will be through either of the turbine building truck access area doors, up through the non-vital 4.16 kV switchgear area, and into the CSR. An alternate PDG location will be west of the turbine building near the boiler room. The cable route from this location will be through the boiler room, B-08/B-09 switchgear area, turbine building, and then into the CSR (See Attachment 3, Figures 16a, 16b, 17a and 17b).	Connection points will be installed on 1B-03 and 2B-04 to facilitate the timely connection of a PDG (Pending Action 25).	1B-03 and 2B-04 are 480 VAC SR switchgear located within the CSR which is part of the control building. The control building is a seismically qualified, SR structure (Reference 45).

Safety Functions Support		
PWR Portable Equipment Phase 2		
Strategy	**Modifications**	**Protection of connections**
If the primary connection points are not available, the capability will exist to make connections local to the required equipment. These connections will require some disassembly of existing equipment. The secondary connection points will be designated (Pending Action 11).	No modifications are anticipated for secondary connections points.	Secondary connection points will be located in SR structures.
Fuel Oil The capability will exist to draw fuel oil from on site fuel oil tanks into the fuel tank trailer that will be used to refuel operating diesel driven equipment.	None	The existing underground SR fuel oil tanks seismic are Class I and protected from tornado missiles (Reference 47). The connection point for the credited fuel oil supply is inside the DG building which is a SR seismic Class I structure located well above the maximum projected flood level (Reference 45).
DC Power Batteries will be charged using the installed chargers and a PDG connected to 1B-03 and 2B-04. The deployment of the PDG was previously described.	None other than the 1B-03 and 2B-04 connection points previously discussed.	The B-03 and B-04 busses and the battery chargers are located within a SR seismic Class I structure protected from flooding (References 6 and 45).
Secondary connection points will exist at the 480 VAC contactor panels' 1B-39, 1B-49, 2B-39, and 2B-49. Use of these connection points will require some disassembly of the existing connections.	None required	The secondary connection points are located in the control building which is a SR seismic Class I structure and is protected from flooding (References 6 and 45).

Safety Functions Support
PWR Portable Equipment Phase 2
Notes: Credited portable equipment will be instrumented to provide Operators the required information to verify that it is functioning properly and meeting the requirements of the strategy being implemented.

Safety Functions Support	
PWR Portable Equipment Phase 3	
The strategies implemented during Phase 2 are capable of maintaining the safety functions for an indefinite amount of time. Phase 3 strategies are focused on providing defense in depth and the recovery of available plant equipment. During Phase 3 offsite resources will be available to replace or augment the capabilities implemented in Phase 2, if necessary. Phase 3 strategies involve the use of large 4.16 kV diesel generator(s) from the RRC. This strategy would restore power to most of the electrical distribution system, lighting, and communications loads which are not damaged from the ELAP and LUHS event via the installed electrical distribution systems or through manually routed cables to the individual loads. Major loads which may be repowered with this DG are the SW pumps, motor driven AFW pumps (or Standby Steam Generator (SSG) pumps), CCW pumps, RHR pumps, SFP cooling pumps, and containment cooling fans. The RRC DG will also have the capability of restoring power to other 480V AC loads that were repowered off the FLEX DG in Phase 2, if needed, and any available non-safety related loads, if required.	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	ECA-0.0 and SEP-3.0 will remain the entry point and controlling procedures for ELAP Events with a LUHS. Safety function support will be maintained as it was in Phase 2. The same FSGs that will be developed for Phase 2 will be applicable for Phase 3 and will be entered as directed by ECA-0.0, SEP-3.0 and if appropriate, other procedures. Additional FSGs will be developed to transition from FLEX equipment to plant equipment. Emergency Operating Procedures, Shutdown Emergency Procedures, Emergency Contingency Actions, Abnormal Operating Procedures, and if appropriate other procedures will be updated as required to support the FSGs and any additional procedures.
Identify Modifications	Modifications to facilitate the connection of a PDG to the 1-A06 and 2-A06 4.16 kV switchgear will be performed (see Attachment 3, Figure 9) (Pending Action 26).
Key Parameters	• DC Bus Voltage • 4160V and 480V Safeguard Bus Voltage • Credited portable equipment will be instrumented to provide Operators the required information to verify that it is functioning properly and meeting the requirements of the strategy being implemented.

Safety Functions Support		
PWR Portable Equipment Phase 3		
Deployment Conceptual Design **(Attachment 3 contains Conceptual Sketches)**		
Strategy	**Modifications**	**Protection of connections**
Strategies are as described above. Specific deployment details are provided below.	See specific detail discussion that follows.	All connections for the FLEX equipment will be designed to withstand and be protected from the applicable hazards. See specific detail discussion that follows.
<u>Portable AC Power Supplies</u> The primary connection points for the 4.16 kV PDG(s) will be at 1A-06 and 2A-06. The PDG(s) will be positioned near the DG building. Cable routes will be through the west DG building vestibule to the Unit 1 and Unit 2 4.16 kV switchgear rooms. An alternate cable route path would be through the G-03 and G-04 Emergency Diesel Generator (EDG) rooms via the north and south doors of the DG building (See Attachment 3, Figure 9). If the primary connection points are not available, local connections will be required. These connections will require some disassembly of existing equipment. These connection points would require the use of power supplies and transformers provided by the RRCs.	Possible modifications required to facilitate the connection of a PDG to the 1-A06 and 2-A06 4.16kV switchgear (Pending Action 26). None	1-A06 and 2-A-06 are located in the DG building which is a SR related seismic Class I structure (Reference 49). Secondary connection points will be located in safety related structures.

Safety Functions Support		
PWR Portable Equipment Phase 3		
Strategy	**Modifications**	**Protection of connections**
<u>Fuel Oil</u> Onsite fuel oil stores and/or equipment will be replenished from offsite suppliers. Local suppliers within 35 miles of PBNP have substantial bulk storage capacity and the capability to provide emergency delivery at any time (Reference 50).	None	No specific connection point.

PWR Portable Equipment Phase 2 Note: The amount of FLEX equipment will meet the N+1 criteria of NEI 12-06							
Use and (potential / flexibility) diverse uses						*Performance Criteria*	*Maintenance*
List portable equipment	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / PM requirements
HL130M self prime pump	**X**	**X**	**X**			Performance criteria will be specified when designs and analyses are complete (Pending Action 33).	Will follow EPRI template requirements (Pending Action 36).
Hose and fittings for HL130M pumps	**X**	**X**	**X**			All support equipment to be rated for application (Pending Action 33).	Will follow EPRI template requirements (Pending Action 36).
Portable Diesel Driven Charging pump	**X**					15 gpm at 2500 psig.	Will follow EPRI template requirements (Pending Action 36).
480 VAC Generator	**X**			**X**	**X**	Performance criteria will be specified when designs and analyses are complete (Pending Action 33).	Will follow EPRI template requirements (Pending Action 36).
Cables for connection of PDG to B-03/B-04	**X**			**X**	**X**	All support equipment to be rated for application (Pending Action 33).	Will follow EPRI template requirements (Pending Action 36).

PWR Portable Equipment Phase 2 **Note: The amount of FLEX equipment will meet the N+1 criteria of NEI 12-06**							
Use and (potential / flexibility) diverse uses						*Performance Criteria*	*Maintenance*
List portable equipment	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / PM requirements
Sump Pump			**X**			50 gpm	Will follow EPRI template requirements (Pending Action 36).
120/240 VAC Generator			**X**		**X**	5.5 kW	Will follow EPRI template requirements (Pending Action 36).
Cord sets for 120/240 VAC DGs			**X**		**X**	All support equipment to be rated for application (Pending Action 33).	Will follow EPRI template requirements (Pending Action 36).
FLUKE 114 Multimeter				**X**		**NA**	Will follow EPRI template requirements (Pending Action 36).
FLUKE 705 Loop Calibrator				**X**		**NA**	Will follow EPRI template requirements (Pending Action 36).
Portable Vent Fans and ducting					**X**	All support equipment to be rated for application (Pending Action 33).	Will follow EPRI template requirements (Pending Action 36).
Portable light stands					**X**	All support equipment to be rated for application (Pending Action 33).	Will follow EPRI template requirements (Pending Action 36).
Portable "torpedo" heaters	**X**	**X**	**X**	**X**	**X**	All support equipment to be rated for application (Pending Action 33).	Will follow EPRI template requirements (Pending Action 36).

PWR Portable Equipment Phase 2 **Note: The amount of FLEX equipment will meet the N+1 criteria of NEI 12-06**							
Use and (potential / flexibility) diverse uses						*Performance Criteria*	*Maintenance*
List portable equipment	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / PM requirements
Insulation blankets	**X**	**X**	**X**	**X**	**X**	All support equipment to be rated for application (Pending Action 33).	Will follow EPRI template requirements (Pending Action 36).
Battery powered portable lights					**X**	Performance criteria will be specified when designs and analyses are complete (Pending Action 33).	Will follow EPRI template requirements (Pending Action 36).
F-350 Tow vehicle	**X**	**X**	**X**	**X**	**X**	All support equipment to be rated for application (Pending Action 33).	Will follow EPRI template requirements (Pending Action 36).
Fuel oil tanker trailer	**X**	**X**	**X**	**X**	**X**	500 gallons	Will follow EPRI template requirements (Pending Action 36).

PWR Portable Equipment Phase 3							
Use and (potential / flexibility) diverse uses						*Performance Criteria*	*Notes*
List portable equipment	Core	Containment	SFP	Instrumentation	Accessibility		
Two (2) 4160 VAC Diesel Generators	**X**	**X**	**X**	**X**	**X**	~ 2 MW	Portable 4160 VAC generators will power one installed SDC train on each Unit.
4.16 KV/480 V Transformers	**X**	**X**	**X**	**X**	**X**	All support equipment to be rated for application (Pending Action 33).	Required to power individual 480 V loads.
Two (2) Ultimate Heat Sink Pumps	**X**	**X**	**X**	**X**	**X**	~ 7,000 gpm	UHS pumps will take suction from Lake Michigan and supply the SW system.

Phase 3 Response Equipment/Commodities	
Item	**Notes**
Radiation Protection Equipment • Survey instruments • Dosimetry • Off-site monitoring/sampling	
Commodities • Food • Potable water	
Fuel Requirements	Annual contract is in place for fuel oil supplier (Reference 51).
Heavy Equipment • Transportation equipment • Debris clearing equipment	

Modification List:

Modification description	Attachment 3 Figure	Pending Action
A SFP makeup water connection point will be added to the suction of P-9 pump. The P-9 pump and associated piping which is currently not seismic class I will be evaluated and upgraded as necessary to make it seismically robust.	15	7
T-30, Diesel Fire Pump Fuel Tank and related piping will be evaluated for seismic loading and upgraded as necessary.	6	8
Seismically harden the CSTs and missile protect the bottom 6 feet.	4	18
Harden existing diesel driven fire pump to meet seismic requirements. Install a cross connect between fire water and the SW system to supply the TDAFW pump suction. The cross connect to SW will also have a connection point for a PDDP.	5a and 5b	19
A compressed gas backup will be installed for the accumulator fill valves.	18	20
Cross connect piping will be installed between the Unit 1 and Unit 2 TDAFW pumps steam exhaust lines, steam supply lines and pump discharge lines.	1a, 1b, 2 and 3	21
Connection points for a portable diesel pump will be added to the RHR system for injecting into the RCS.	12	22
Install low leakage RCP seals.		23
Install PDG connection points at 1B03 and 2B04.	16a and 16b	25
Potential modifications to facilitate the connection of a PDG to the 1-A06 and 2-A06 4.16 kV switchgear.	9	26
The SGSB will be analyzed for seismic and tornado loading to qualify it for FLEX purposes. The west wall of the SGSB will require additional evaluation and modification to ensure that it satisfies the FLEX requirements.	10	27

Attachment 1A
Sequence of Events Timeline

Action Item	Elapsed Time	Action	Time Constraint Y/N [6]	Remarks / Applicability
	0	**Event Starts**	**NA**	Plant at 100% power.
1	0+	Automatic Reactor/Turbine Trip for both units.	**N**	Loss of all AC will result in an automatic trip.
2	0+	Turbine Driven Auxiliary Feed Water Pump Starts automatically and feeds the Steam Generators.	**N**	Automatic Start is generated by an under voltage on A01 and A02.
3	<.1	Operators perform immediate actions of EOP-0 (Verify Reactor Trip, Verify Turbine Trip and Checking at least 1 Safeguards Bus energized) and then transition to ECA 0.0, Loss of all AC. ECA-0.0 may be entered directly based on indication. ECA-0.0 contains immediate action steps to Verify Reactor Trip and Verify turbine trip.	**N**	EOP-0 contains immediate action steps to fast start and load the DGs from the control room. ECA-0.0 does not attempt a fast start of the DGs until Step 8.
4	<.1	RCS inventory loss is minimized by ensuring the major RCS outflow lines that could contribute to rapid depletion of RCS inventory are isolated.	**N**	This is performed in ECA -0.0 Step 4.
5	<.1	The TDAFW pump is checked at Step 5 of ECA-0.0. Flow is verified at greater than 230 gpm and SG levels are maintained between 29% and 65%.	**N**	The response not obtained column of ECA-0.0 will need to be changed to reflect the modifications for unit crossties on the TDAFW pump.
6	.3	Based on Foldout page criteria in ECA-0.0, when CST level decreases to 4 feet (Low-Low Level alarm received in the control room).	**N**	Foldout page criteria are applicable after immediate actions

[6] Instructions: Provide justification if No or NA is selected in the remark column
If yes include technical basis discussion as requires by NEI 12-06 section 3.2.1.7

Action Item	Elapsed Time	Action	Time Constraint Y/N [7]	Remarks / Applicability
		Operators are directed to shift to alternate AFW suction source per AOP-23, Establishing Alternate AFW Suction Supply.		are complete. (Steps 1 and 2) AOP-23 will require a revision to add steps to ensure the DDFP is operating, (Automatic starts from a loss of all AC) aligned to the SW system and SW aligned as required to provide adequate suction pressure to the TDAFW pump.
7	<.5	Operators determine they are not able to restore AC power from the control room.	N	This would be at the current ECA-0.0 Step 31 where equipment control switches are place in pull to lock position.
8	.5	Shift Manager determines that an ELAP condition exists.	Y	Time Constraint to start DC load management. (Pending Action 1). This would be a spot where the SM implements a FSG (Initial Flex Assessment and equipment staging guide) as directed by ECA-0.0.
9	1	Start reducing DC loads per procedure.	N	This will be guided by the FSG.

[7] Instructions: Provide justification if No or NA is selected in the remark column
If yes include technical basis discussion as requires by NEI 12-06 section 3.2.1.7

Action Item	Elapsed Time	Action	Time Constraint Y/N [8]	Remarks / Applicability
10	1	Vent hydrogen from the main generators.	**N**	This will be guided by the FSG. Allows stripping of DC Seal Oil Pump
11	1.25	Monitor vital area room temperatures- Computer Room, Cable Spreading Room, Vital Switchgear Room, Control Room, AFW room, and PAB White and Yellow inverter rooms, and open doors as necessary.	**Y**	Time Constraint, Cable spreading room will reach 120°F at approximately 1hour 16minutes (Reference 17) (Pending Action 12).
12	1.3	Establishment of Service Water flow to the Turbine Driven Auxiliary Feedwater pump via the Diesel Driven Fire pump.	**Y**	Time Constraint, needs to be completed prior to SGs drying out (Pending Action 15).
13	1.5	Initiate deployment of debris removal equipment.	**N**	This will be guided by the FSG and will be needed to move FLEX equipment into position.
14	2	Complete load stripping to conserve battery life.	**Y**	Time Constraint to maintain battery supply (Pending Action 1).
15	3	Initiate deployment of 480v diesel generator.	**N**	This will be guided by the FSG.
16	3	Initiate deployment of portable Charging pumps for RCS makeup and Boration.	**N**	This will be guided by the FSG.

[8] Instructions: Provide justification if No or NA is selected in the remark column
If yes include technical basis discussion as requires by NEI 12-06 section 3.2.1.7

Action Item	Elapsed Time	Action	Time Constraint Y/N [9]	Remarks / Applicability
17	4	Deploy PDDP and Route 5 inch hose for backup Steam Generator makeup, Containment Spray, and SFP makeup at P-9.	**N**	This will be guided by the FSG.
18	6	Initiate deployment of fuel oil refueling trailer.	**N**	This will be guided by the FSG.
19	9	Complete deployment of PDDP and Route 5 inch hose for SFP makeup at P-9.	**Y**	Time Constraint to have completed prior to SFP level reaching 2 feet 8 inches above the fuel (Reference 61). It is desired to have completed prior to SFP reaching 200°F.
20	9	Energize 480 Volt safeguards buses.	**Y**	Time Constraint to allow energizing battery chargers to supply DC loads (Pending Action 1).
21	9	Complete deployment of portable Charging pumps.	**N**	Portable Charging pumps are required to support cool down for RCS inventory makeup. The reactor will not require boration to maintain shutdown margin until after xenon decays to less than full power equilibrium values.

[9] Instructions: Provide justification if No or NA is selected in the remark column
If yes include technical basis discussion as requires by NEI 12-06 section 3.2.1.7

Action Item	Elapsed Time	Action	Time Constraint Y/N [10]	Remarks / Applicability
22	10	Open PAB doors to vent SFP area.	**N**	Doors will be opened based on PAB conditions and habitability (Pending Action 6).
23	10	Energize the required station battery chargers and align to the batteries.	**Y**	Time Constraint to have battery chargers energized and aligned prior to battery depletion (Pending Action 1).
24	10	Spent Fuel Pool Boils Assuming full core off load (Reference 53).	**N**	Spent Fuel Pool temperature is monitored per ECA-0.0.
25	11	Refuel Diesel Driven Fire Pump and commence refueling schedule for all portable equipment.	**Y**	Time Constraint based on Fuel Oil Consumption of Diesel Driven Fire pump (Pending Action 13).
26	12	Commence RCS Cool down to desired temperature and Pressure.	**N**	Not a Time Constraint based on installation of low leakage Reactor Coolant Pump seals.
27	12	Commence Boric acid / inventory additions to the RCS.	**N**	Not a Time Constraint but needed to support cool down.
28	13	Isolate SI Accumulators.	**N**	Complete prior to SG pressure of 200 psig. (Refs 19 and 30).

[10] Instructions: Provide justification if No or NA is selected in the remark column
If yes include technical basis discussion as requires by NEI 12-06 section 3.2.1.7

Action Item	Elapsed Time	Action	Time Constraint Y/N [11]	Remarks / Applicability
29	72	Receive RRC 4160V portable Diesel Generators and initiate plant system(S) recovery.	**N**	
30	75	Spent Fuel Pool Level Reaches 2 feet 8 inches above the fuel.	**N**	

[11] Instructions: Provide justification if No or NA is selected in the remark column
If yes include technical basis discussion as requires by NEI 12-06 section 3.2.1.7

Attachment 1B
NSSS Significant Reference Analysis Deviation Table

Item	Parameter of interest	WCAP value (WCAP-17601-P August 2012 Revision 0)	WCAP page	Plant applied value	Gap and discussion
RCS/RCP Leakage Deviation					
3.1 Objective 5 Conclusions	RCS Make Up Flow	20 gpm	3-3	3 gpm	Installation of low leakage RCP Shut Down Seals (SDS) limits seal leakage to 1 gpm per seal and an additional 1 gpm for balance of RCS leakage to utilize a total of 3 gpm.
3.1 Objective 5 Recommendations	RCS Make Up pump	40 gpm at 1500 psia	3-7	15 gpm at 2500 psia	Installation of low leakage RCP seals will allow a longer time before cooldown is required. Make up will be to support reactivity control as Xenon decays away. Because of low leakage seals there is less RCS inventory loss. Pump can be smaller, lighter and more portable therefore easier to hook up and align. Similar statement in Objective 6 Page 3-7.
Table 4.1.1.1-1	Leak Rate at 2250 psia and 550°F	43 gpm	4-2	3 gpm maximum or bounding value	Installation of low leakage RCP SDS limits seal leakage to 1 gpm per seal and an additional 1 gpm for balance of RCS leakage to utilize a total of 3 gpm.

4.2.2.1	RCP seal leakage	3 gpm/RCP to 21 gpm/RCP at 2250 psia after 13 minutes	4-14	5 gpm/RCP to 1 gpm/RCP at 19 minutes	Installation of low leakage RCP SDS limits seal leakage to 1 gpm per seal and an additional 1 gpm for balance of RCS leakage to utilize a total of 3 gpm.
4.4.1 and 4.4.1.1	RCP Seal Leakage	21 gpm/RCP at 2250 psia and a cold leg temperature of 550 °F	4-32 4-33	1 gpm/RCP at 2250 psia	Installation of low leakage RCP seals will allow a longer time before cool down is required. RCS T_{hot} temperature will be procedurally maintained below 550°F in cases of asymmetric cooling to protect the seal O-Rings
Table 5.2.2-1	780 seconds RCP Seal Leakage	Increases to 21 gpm/RCP	5-6	1 gpm/RCP at 2250 psia at 19 minutes (1140 seconds)	Installation of low leakage RCP SDS limits seal leakage to 1 gpm per seal and an additional 1 gpm for balance of RCS leakage to utilize a total of 3 gpm.
5.3.1	RCP Seal Leakage	21 gpm/RCP	5-33	1 gpm/RCP	Installation of low leakage RCP SDS limits seal leakage to 1 gpm per seal and an additional 1 gpm for balance of RCS leakage to utilize a total of 3 gpm. Model 93 pumps don't have a shaft sleeve and sleeve o-ring so the leakage is much lower.
Table 5.3.1.7	2-Loop 12 ft Core Model 93A	56.0 hours to uncover	5-35	>7 days (expected)	PBNP has Model 93 RCP. The ratio of time to uncover to for Model 93 vs. Model 93A is greater than 4.
<u>Portable Feedwater Deviation</u>					
3.1 Objective 8 Recommendations	Portable feedwater system injection	300 gpm at 300 psig	3-8	Scaled to decay heat requirement	WCAP is based off a 4 loop plant. PBNP is a 2 loop plant and has lower decay heat loads. (Reference 33 and 62)

RCS Cooldown Deviation					
4.2.1.6	Assume cool down to occur per EOP	Approximately 2 hours	4-13	Currently assumed start 12 hours post trip.	Installation of low leakage RCP seals will allow a longer time before cool down is required. Make up will be to support reactivity control as Xenon decays away. Because of low leakage seals there is less RCS inventory loss. Pump can be smaller, lighter and more portable therefore easier to hook up and align. Similar statement in Objective 6 Page 3-7.
4.2.1.19	Time to start cool down and cool down rate	2 hours at 75°F per hour	4-14	Currently assumed start 12 hours post trip at a rate of 25°F per hour.	Installation of low leakage RCP seals will allow a longer time before cool down is required. Make up will be to support reactivity control as Xenon decays away. Because of low leakage seals there is less RCS inventory loss. Pump can be smaller, lighter and more portable therefore easier to hook up and align. Similar statement in Objective 6 Page 3-7. This also allows a longer time at higher SG pressure to drive the TDAFW pump at full speed and minimize TDAFW damage at low speed operation. A 25°F cooldown rate is assumed in the PBNP SBO calculation with cooldown starting at 4 hours and reaching RHR cut in conditions at 44 hours (Reference 55).
4.2.2.3	SG atmospheric dump capacity	Can meet 75°F per hour cool down at 2 hours	4-14	25°F per hour	Installation of low leakage RCP seals will allow a longer time before cool down is required. By the time cool down will proceed the SG ADV has enough capacity to meet the cool down rate.

					A 25°F cooldown rate was used in the PBNP SBO calculation with cooldown starting at 4 hours and reaching RHR cumin conditions at 44 hours (Reference 55).
4.2.2.4	ECA 0.0	Cool down start at 2 hours	4-15	Assumed start 12 hours post trip.	Installation of low leakage RCP seals will allow a longer time before cool down is required.
Table 5.2.2-1	7200 seconds (2.0 hours) Operators start cool down	~70°F per hour to SG pressure of 300 psia	5-6	Assumed start 12 hours post trip at a rate of 25°F per hour.	Installation of low leakage RCP seals will allow a longer time before cool down is required. A 25°F cooldown rate was used in the PBNP SBO calculation with cooldown starting at 4 hours and reaching RHR cut in conditions at 44 hours (Reference 55).
Accumulator Injection Deviation					
Table 4.1.1.1-1	Accumulator Water Volume	8,000 gallons	4-2	0 gallons	Because of installation of RCP SDS, PBNP will isolate accumulators prior to cooling past the point of accumulator injection. Minimum required accumulator volume is 8,228 gallons per each of the two accumulators (Ref. 32).
5.6.1	Acc Injection for RCS Boration and Makeup Isolation/venting to prevent gas injection	Assume accumulator injection during cool down	5-163	No accumulator injection will occur.	Because of installation of RCP SDS PBNP will isolate accumulators prior to cooling past the point of Accumulator injection. Makeup will be via a diesel driven pump utilizing the RWST as a suction source.

Attachment 2
Point Beach Unit 1 and Unit 2 Milestone Schedule

The following milestone schedule is provided. The dates are planning dates subject to change as design and implementation details are developed. Any changes to the following target dates will be reflected in the subsequent 6 month status reports.

Original Target Date	Activity	Status
Feb 2013	Submit Integrated Plan	Complete
Mar 2013	Initiate Engineering Changes for Modification Development	
Aug 2013	Complete Analyses Supporting FLEX Strategies	
Aug 2013	Submit Six Month Status Update Initiate Procurement of Remaining FLEX Equipment	
Dec 2013	Complete FLEX Support Guidelines	
Feb 2014	Submit Six Month Status Update	
Mar 2014	Complete Revisions to Site Emergency Response Procedures Receive Remaining FLEX Equipment	
Apr 2014	Complete Final Time Constraint Validations	
May 2014	Complete the Staffing Assessment	
Jun 2014	Complete Training Development	
Aug 2014	Submit Six Month Status Update	
Aug 2014	Complete RRC Offsite Delivery Arrangements Complete Construction of the FLEX Storage Facility Complete Maintenance and Operations Procedures related to FLEX Equipment Storage, Maintenance, and Testing	
Sep 2014	Complete Unit 1 & Common Non-Outage Modifications Complete Applicable Training for Unit 1 and Common FLEX Strategy Implementation Complete FLEX Administrative Program Implementation	
Oct 2014	Unit 1 Implementation Outage & Unit 1 Implementation Completion	
Feb 2015	Submit Six Month Status Update	
Aug 2015	Submit Six Month Status Update	
Sep 2015	Complete Unit 2 Non-outage Modifications Complete Applicable Training for Unit 2 FLEX Strategy Implementation Revise FLEX Administrative Program for Unit 2	
Oct 2015	Unit 2 Implementation Outage & Unit 2 Implementation Completion	

Attachment 3
Conceptual Sketches

List of Figures

CROSS CONNECTION OF MAIN STEAM LINE SUPPLY TO TDAFW TURBINE- UNIT 1

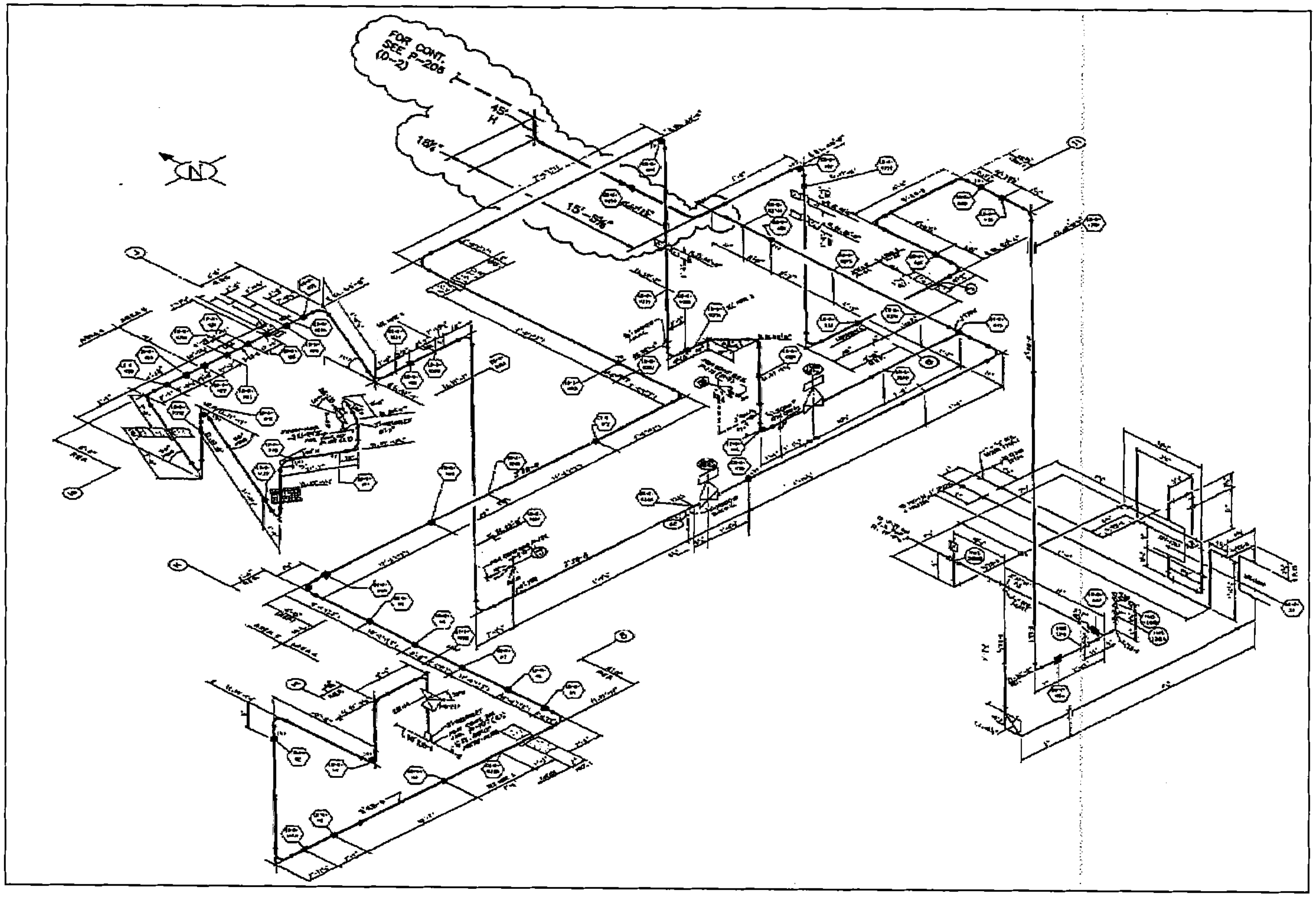

Figure 1a

CROSS CONNECTION OF MAIN STEAM LINE SUPPLY TO TDAFW TURBINE – UNIT 2

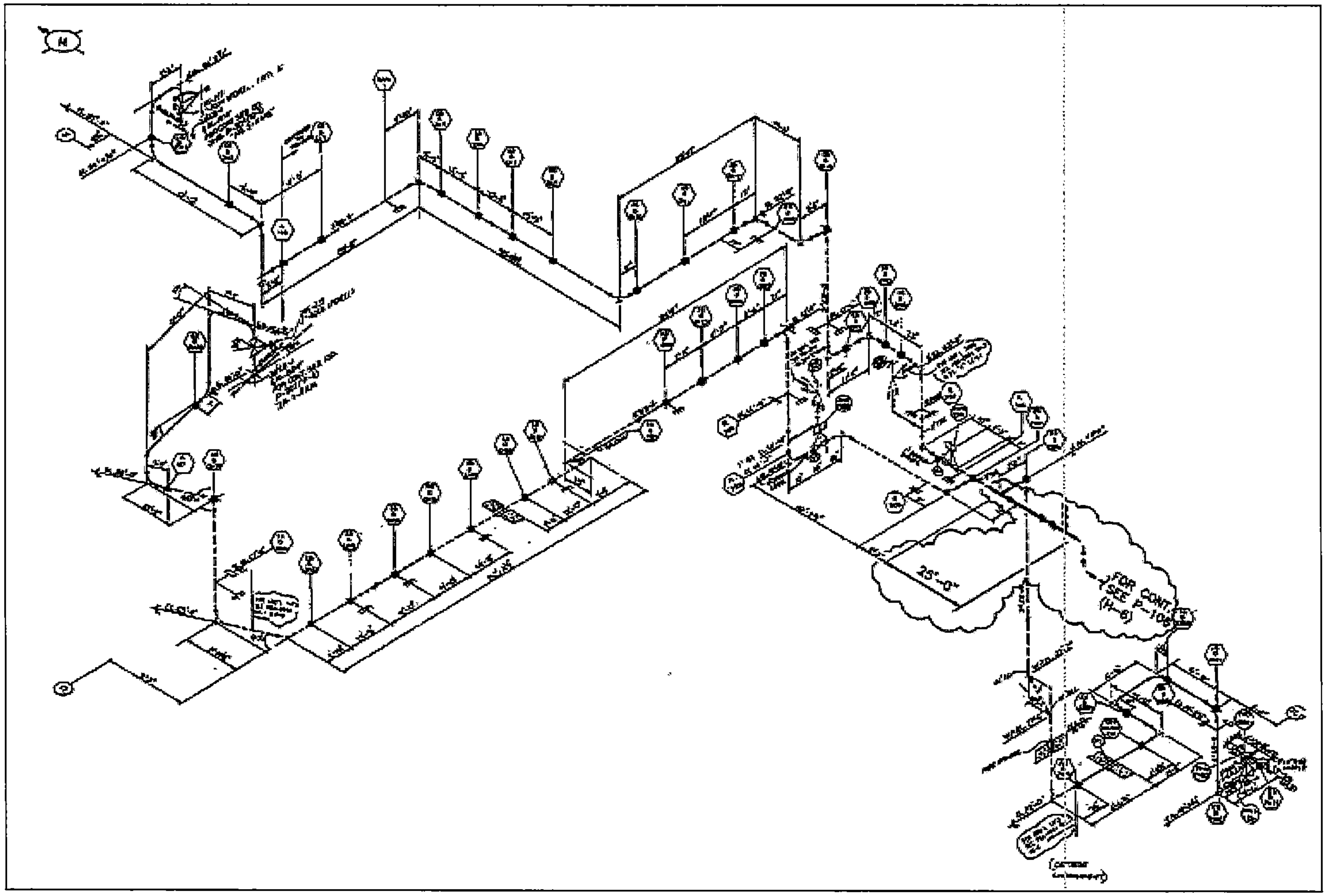

Figure 1b

TDAFW STEAM EXHAUST CROSS CONNECTION

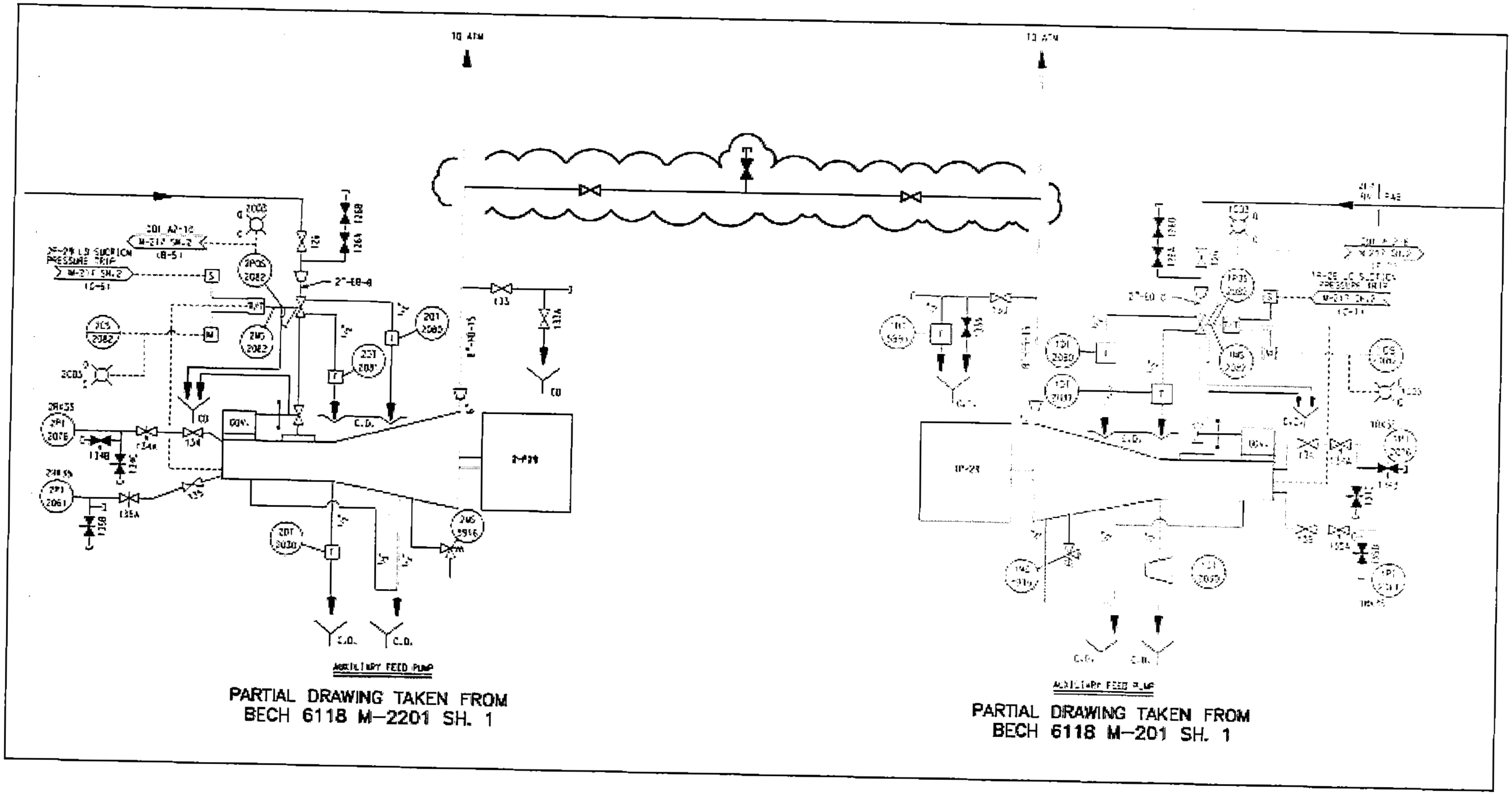

Figure 2

CROSS CONNECTION OF TDAFW PUMP DISCHARGE

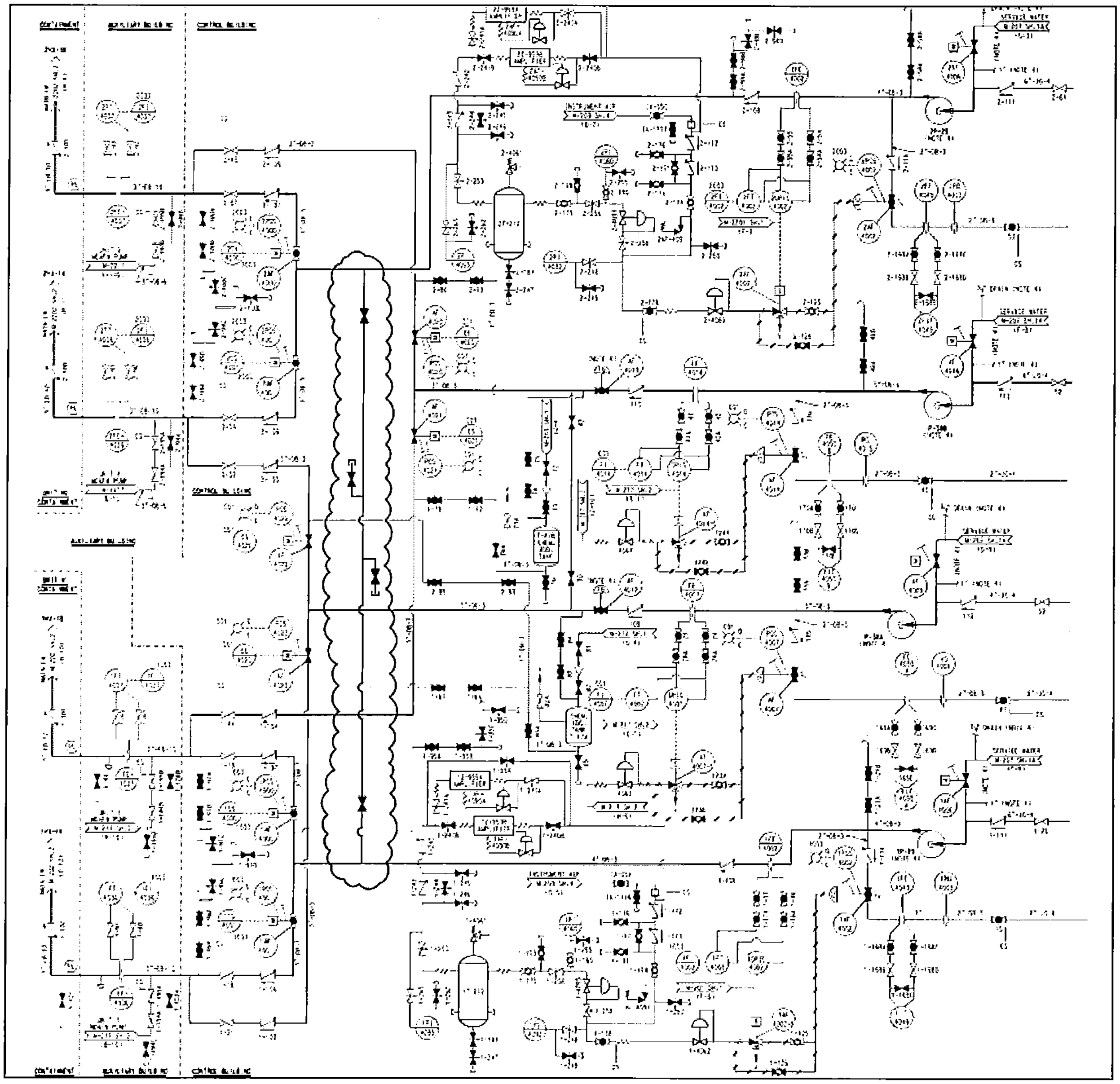

Figure 3

MISSILE PROTECTION FOR CSTs: PLAN VIEW

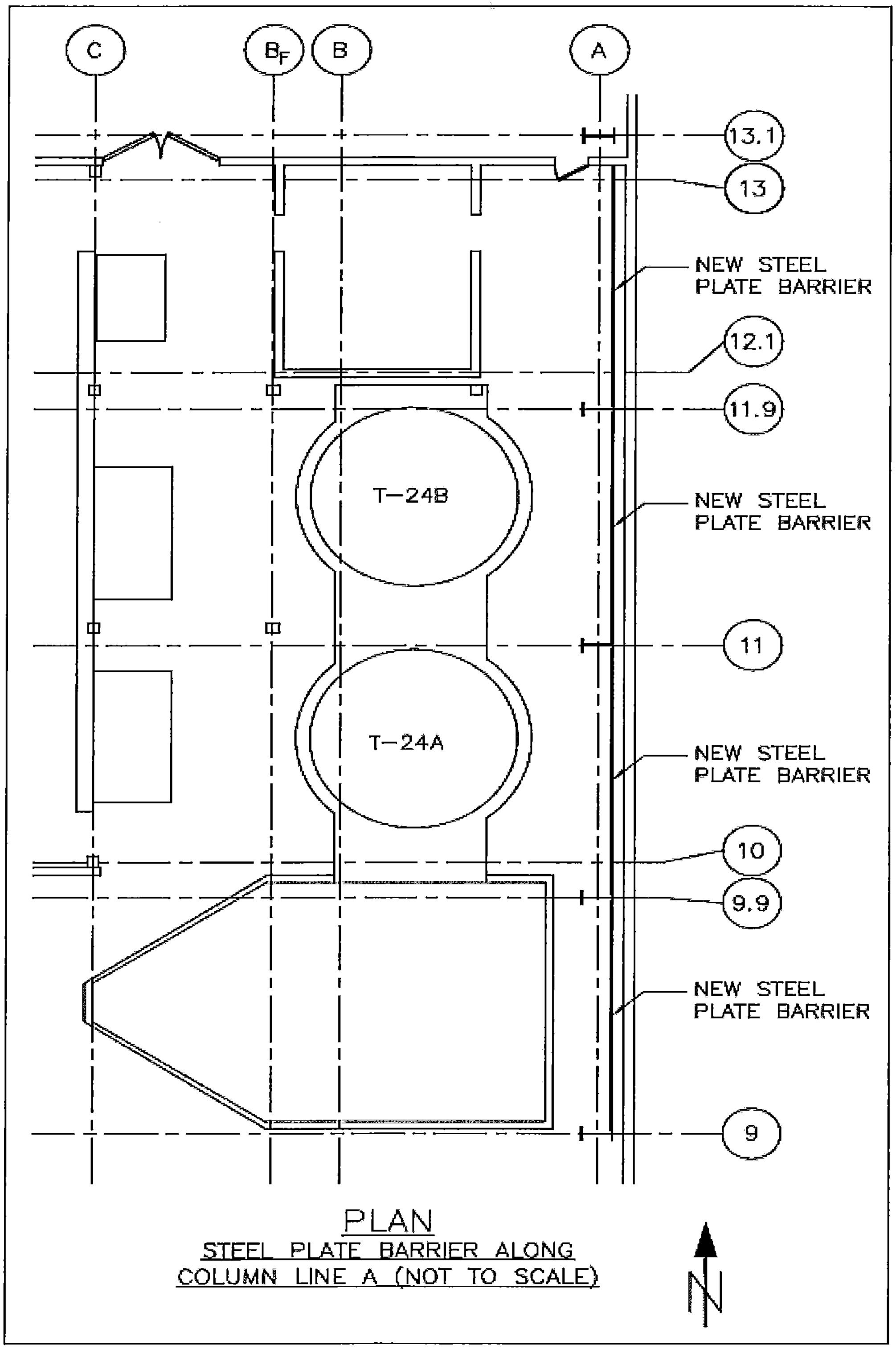

Figure 4

FIRE WATER CROSS CONNECT TO THE SW SYSTEM

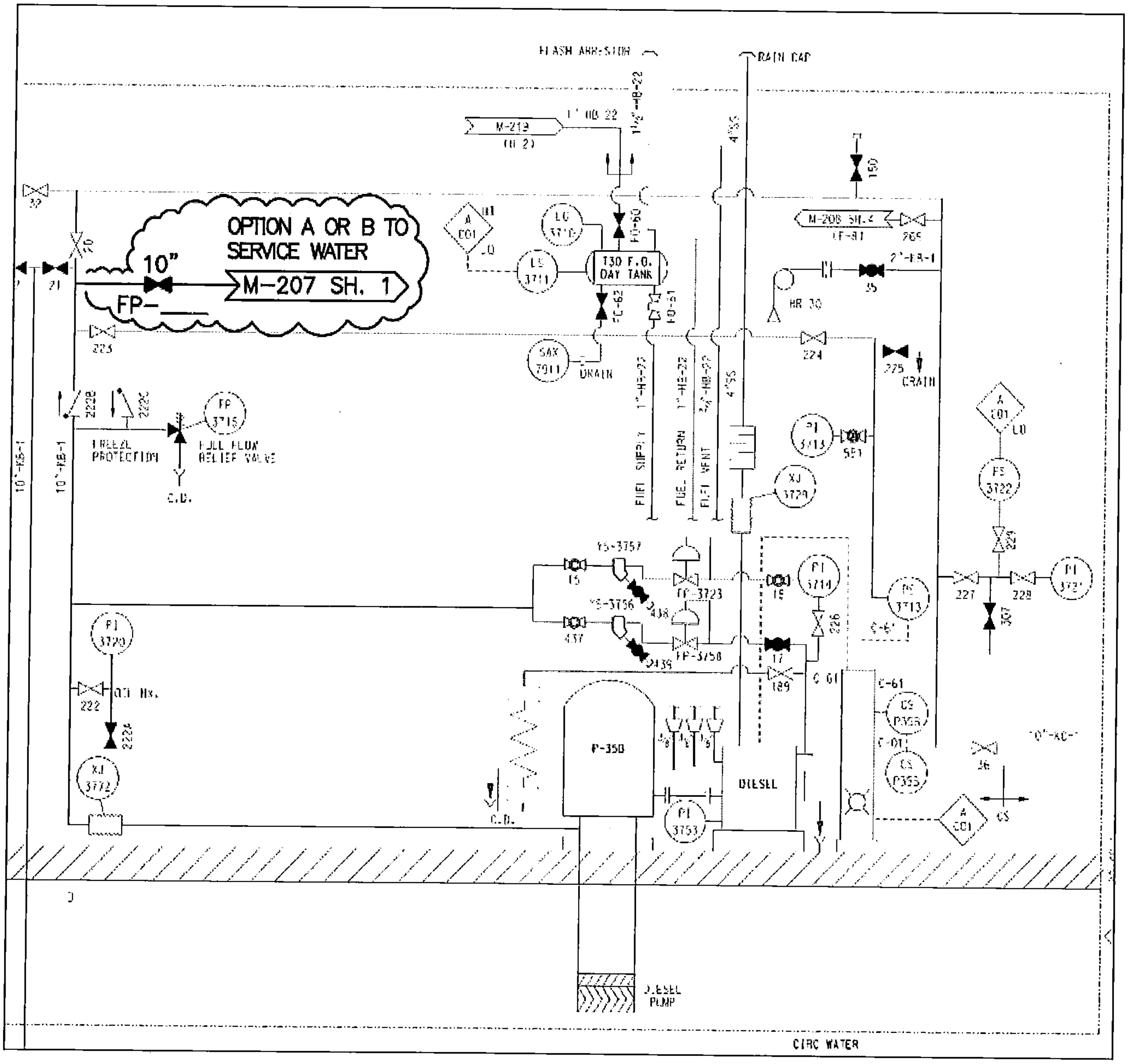

Figure 5a

FIRE WATER CROSS CONNECT TO THE SW SYSTEM

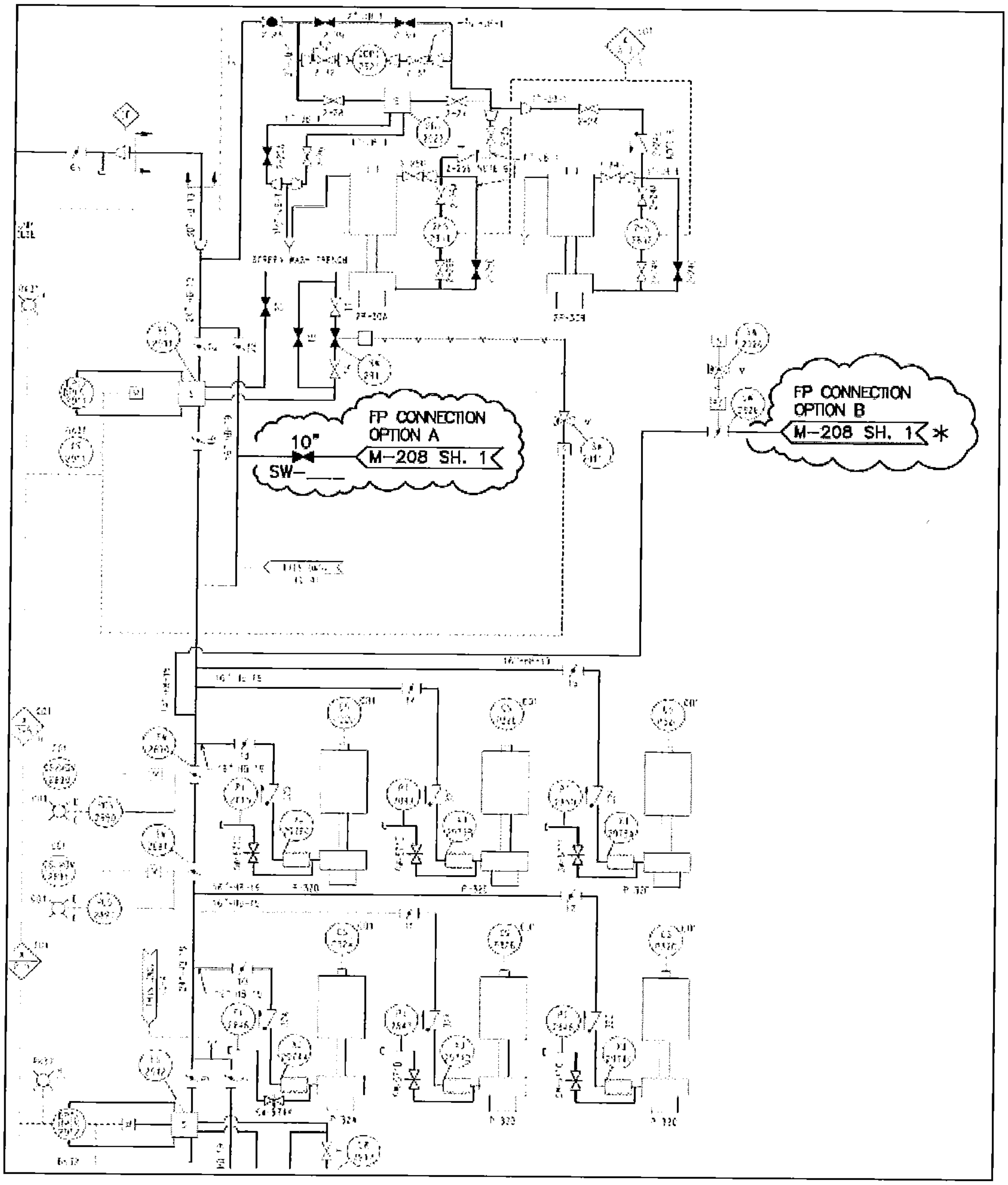

Figure 5b

CIRCULATION WATER PUMP HOUSE

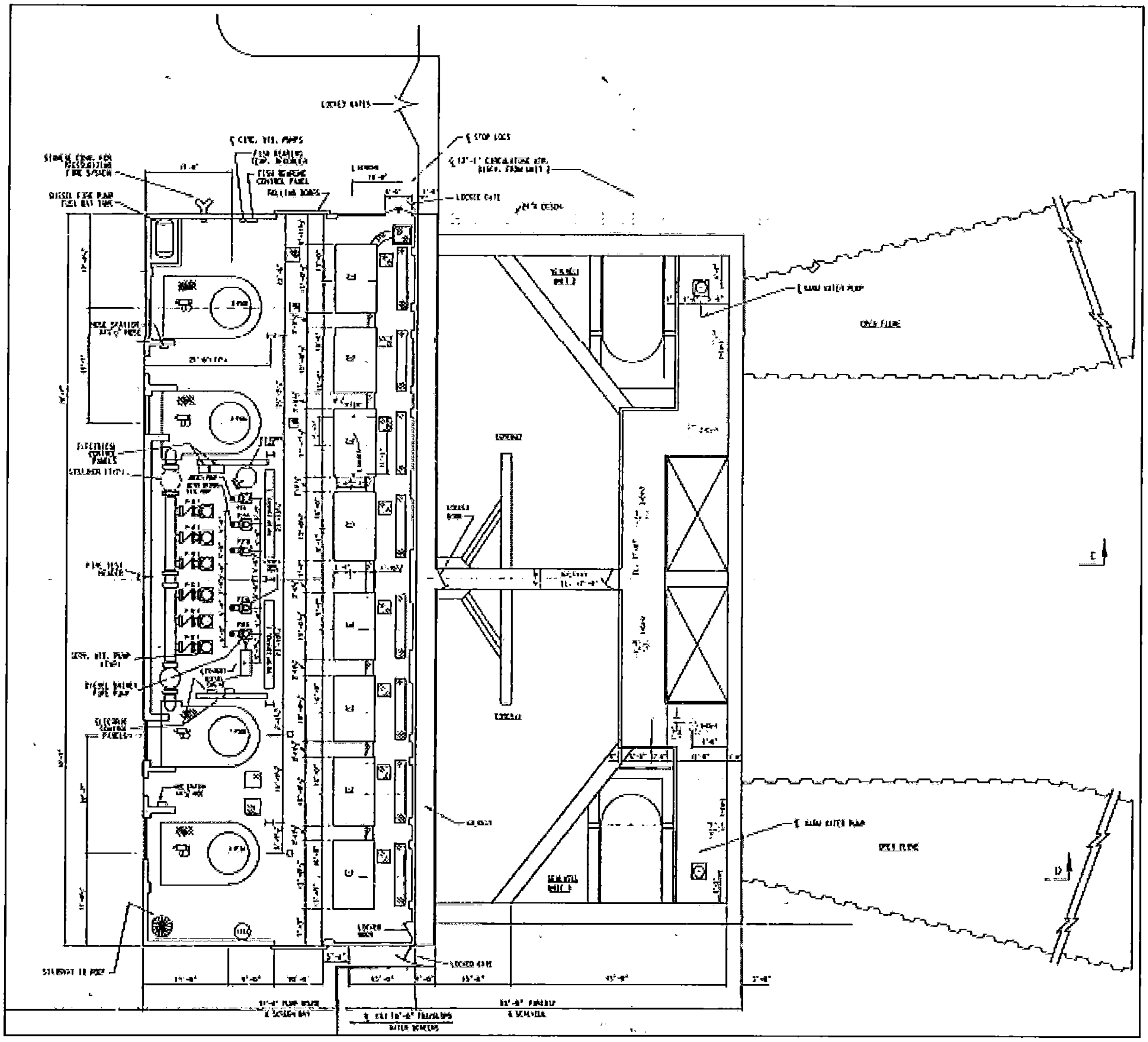

Figure 6

125 VDC SYSTEM CONFIGURATION

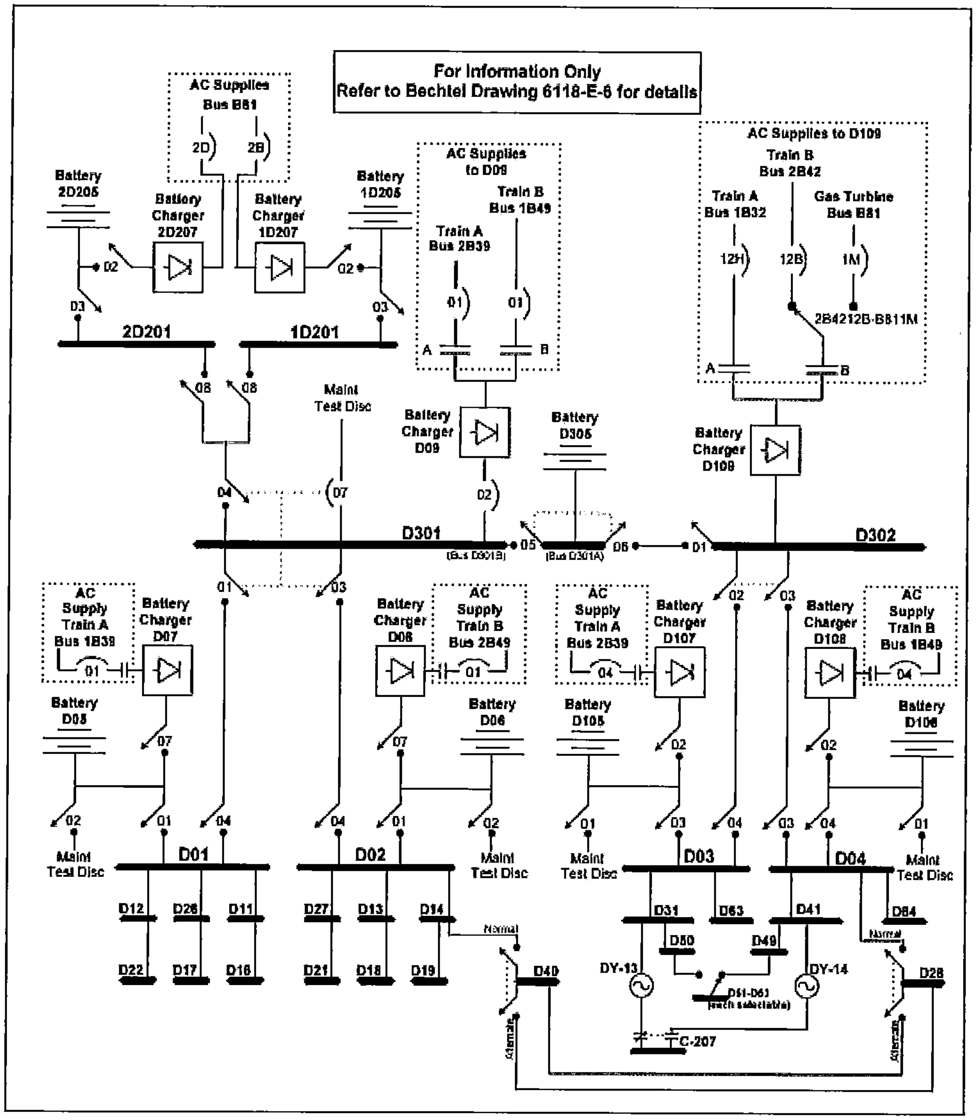

Figure 7

PDDP PHASE 2 DEPLOYMENT

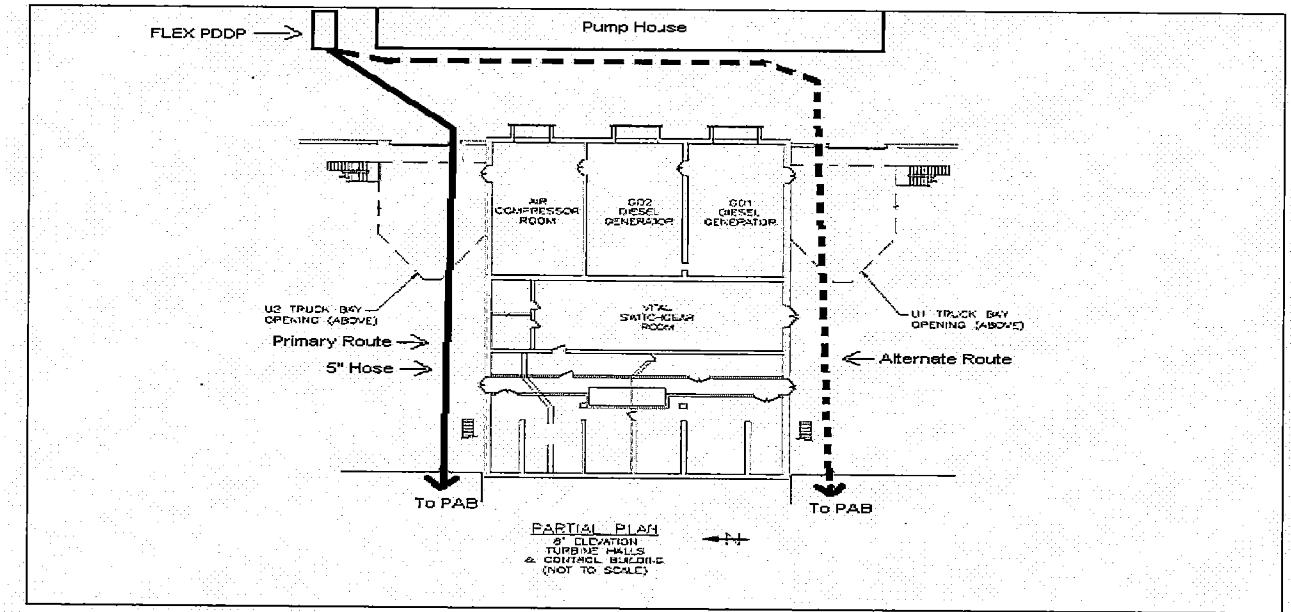

Figure 8a

PDDP PHASE 2 DEPLOYMENT

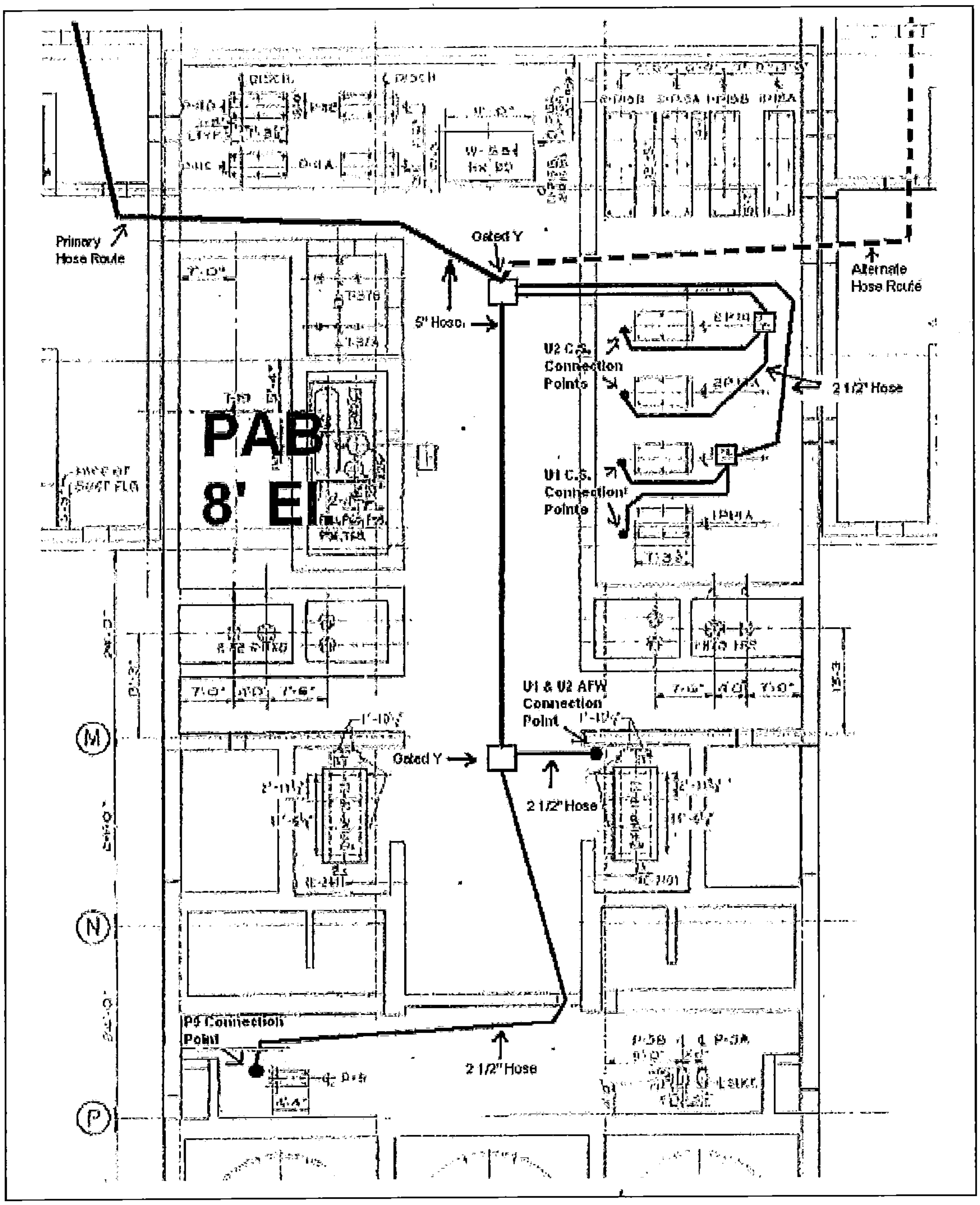

Figure 8b

4.16 KV PDG PHASE 3 DEPLOYMENT

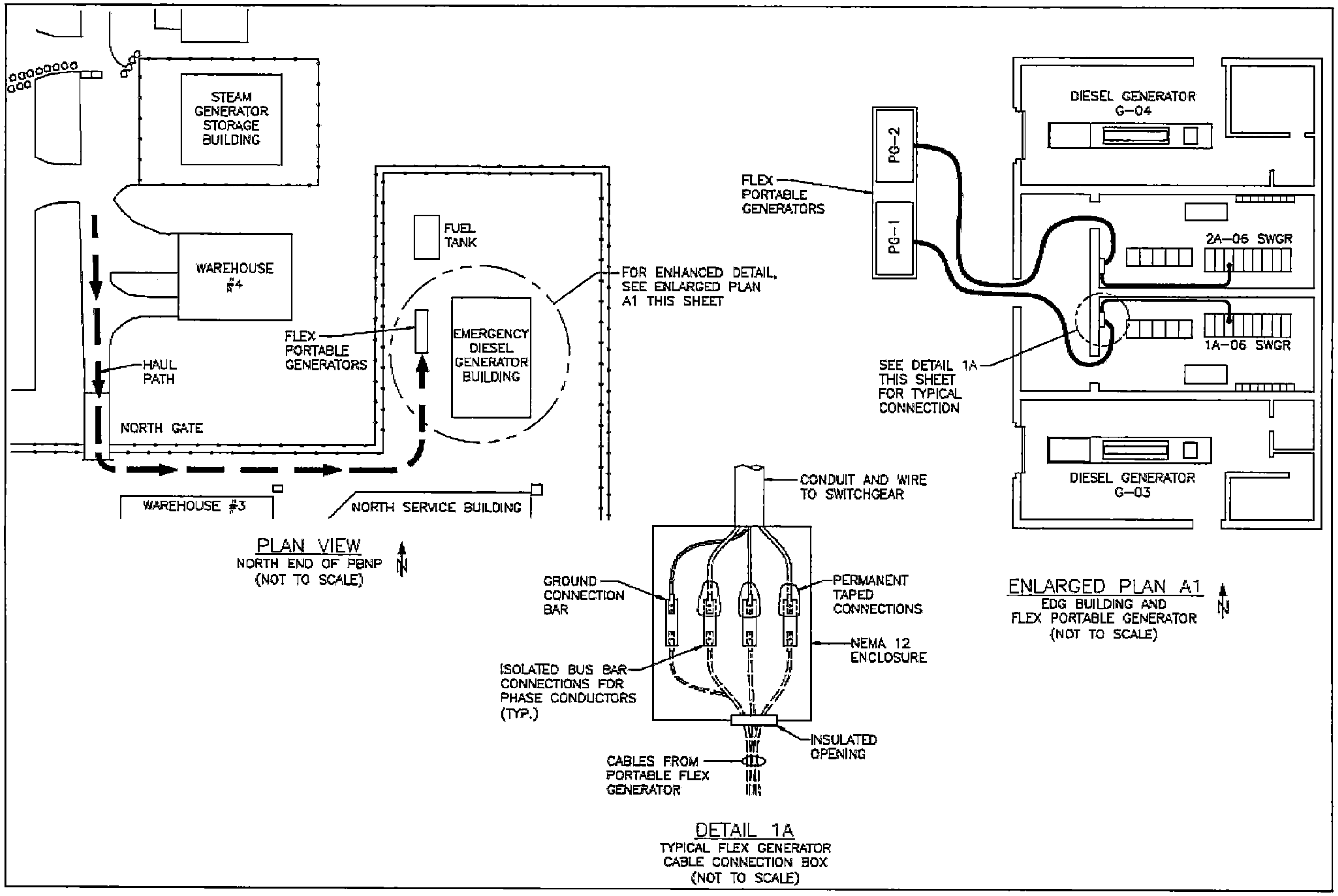

Figure 9

PRELIMINARY SKETCH OF SGSB USE AND MODIFICATION

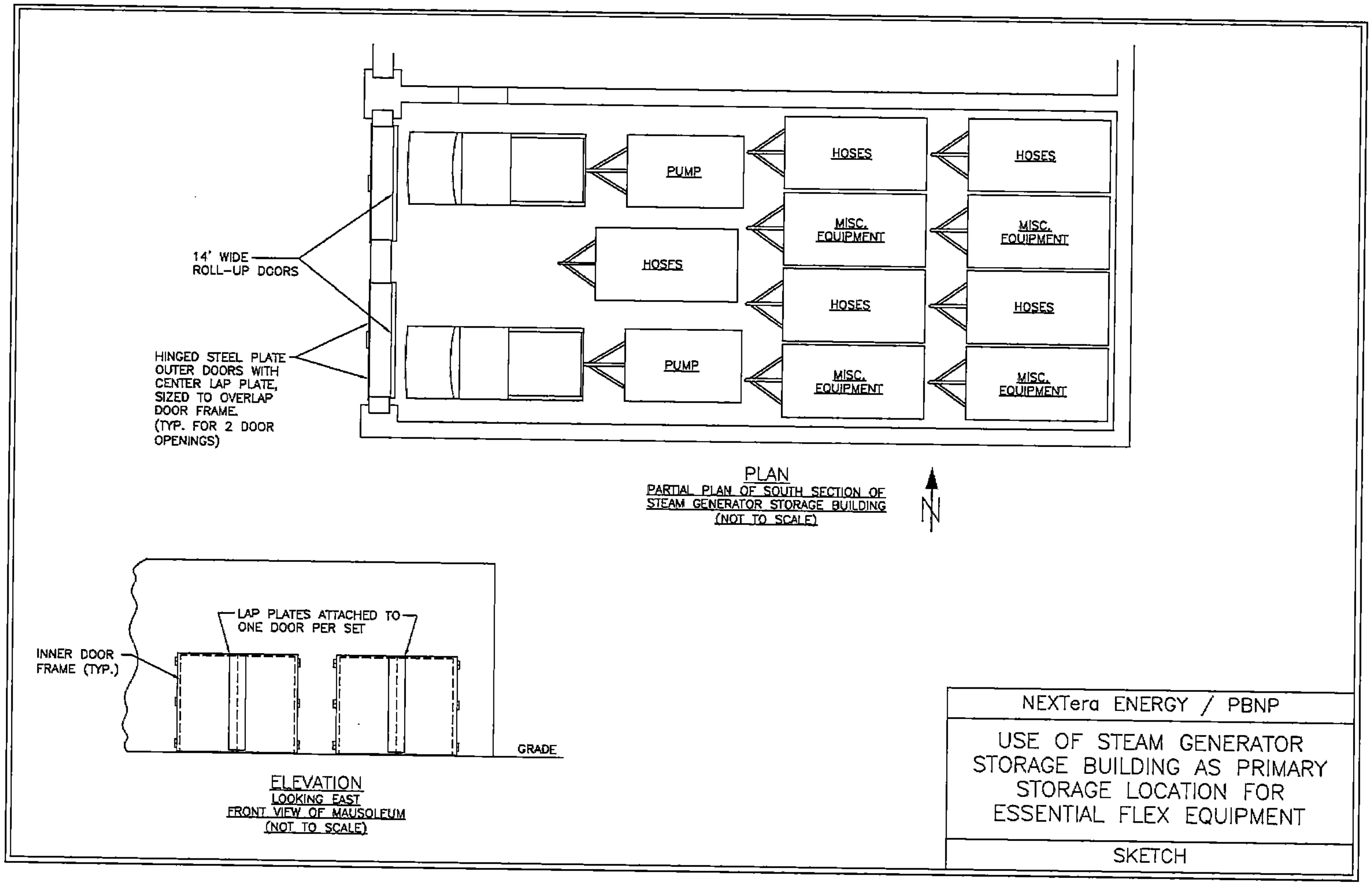

Figure 10

FLEX EQUIPMENT DEPLOYMENT ROUTE – PHASE 2

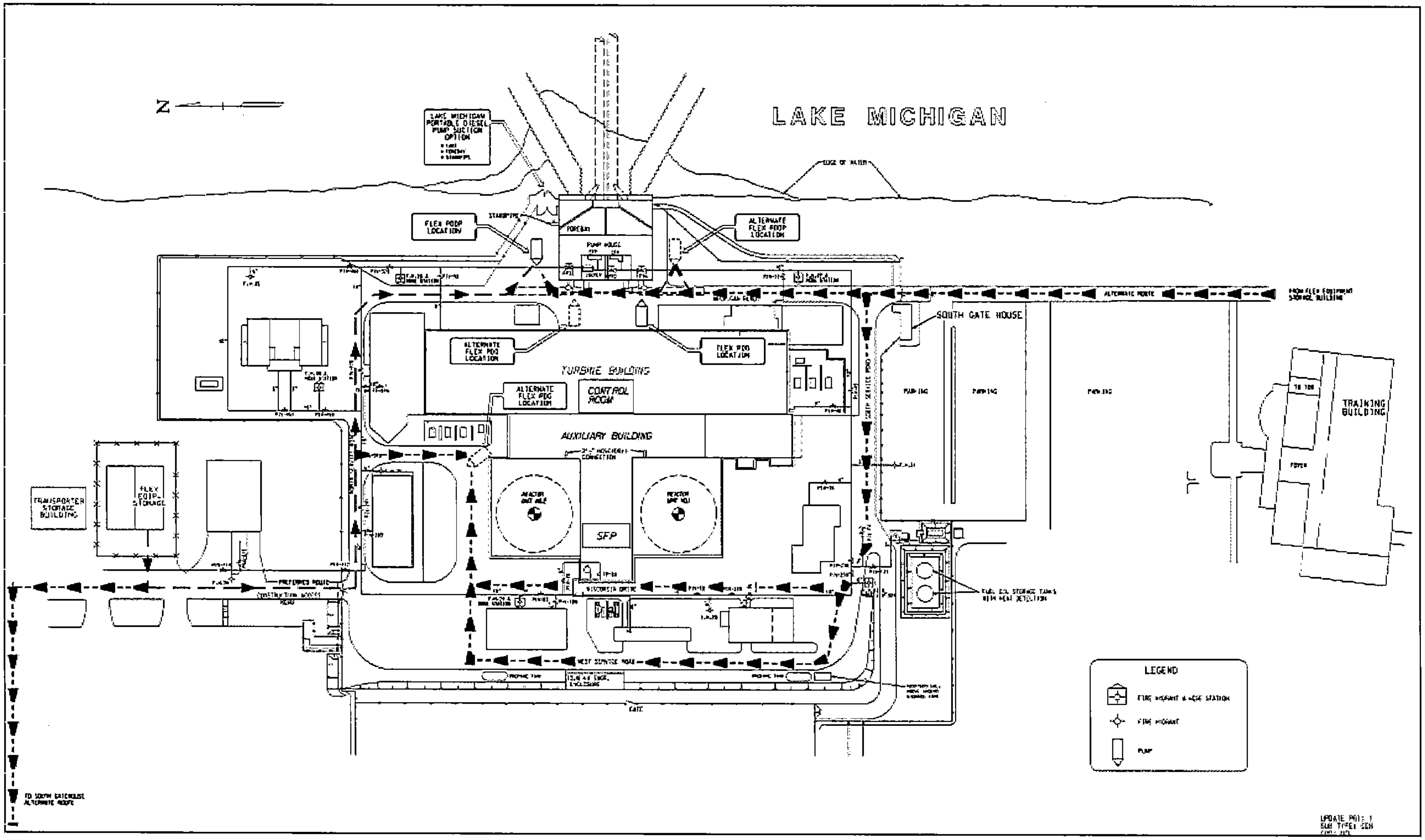

Figure 11

MODE 5 & 6 RCS MAKE UP FROM RWST – PHASE 2

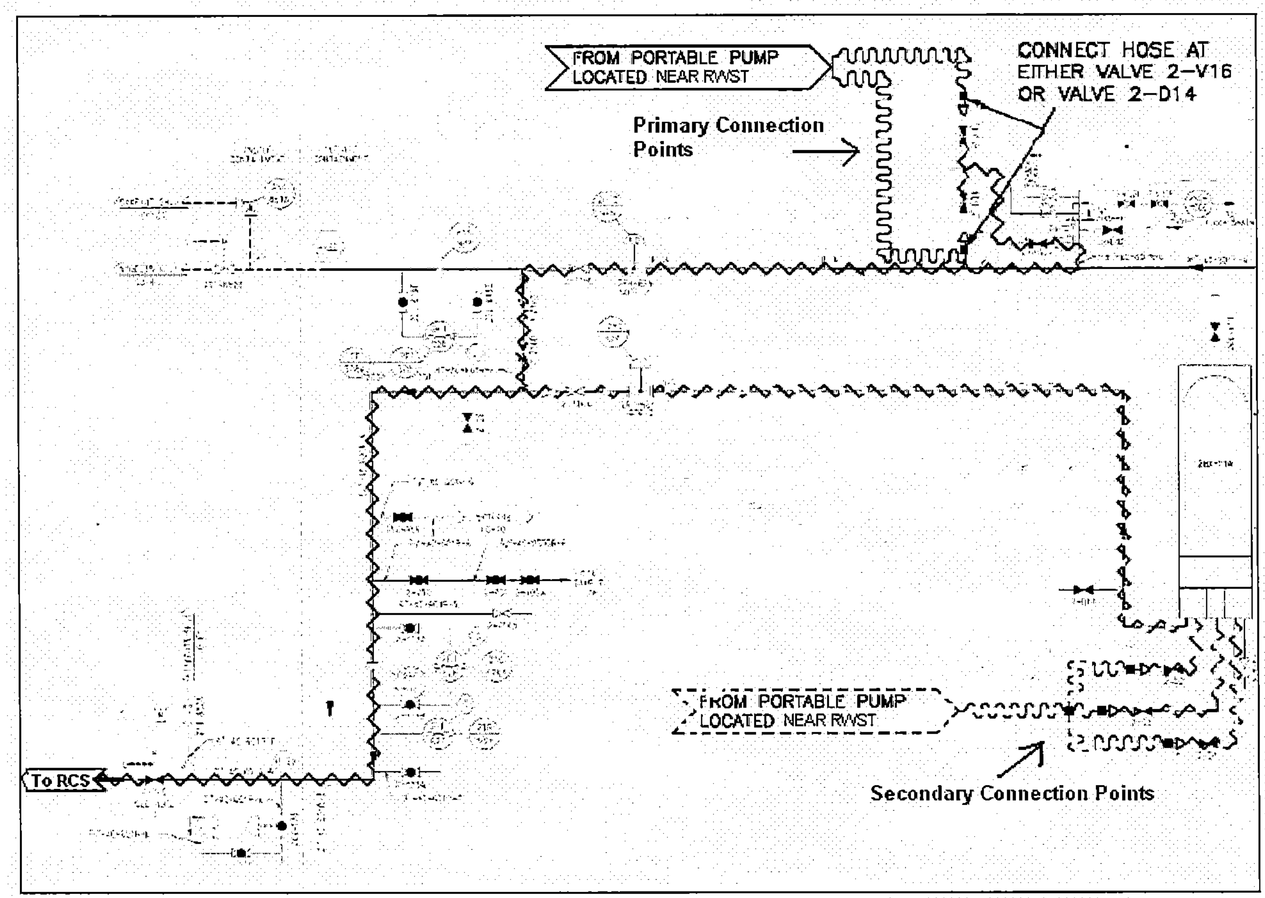

Figure 12

LAYOUT OF PRIMARY CONNECTIONS FOR RCS MAKEUP FOR U1 AND U2 VIA SKID PUMP

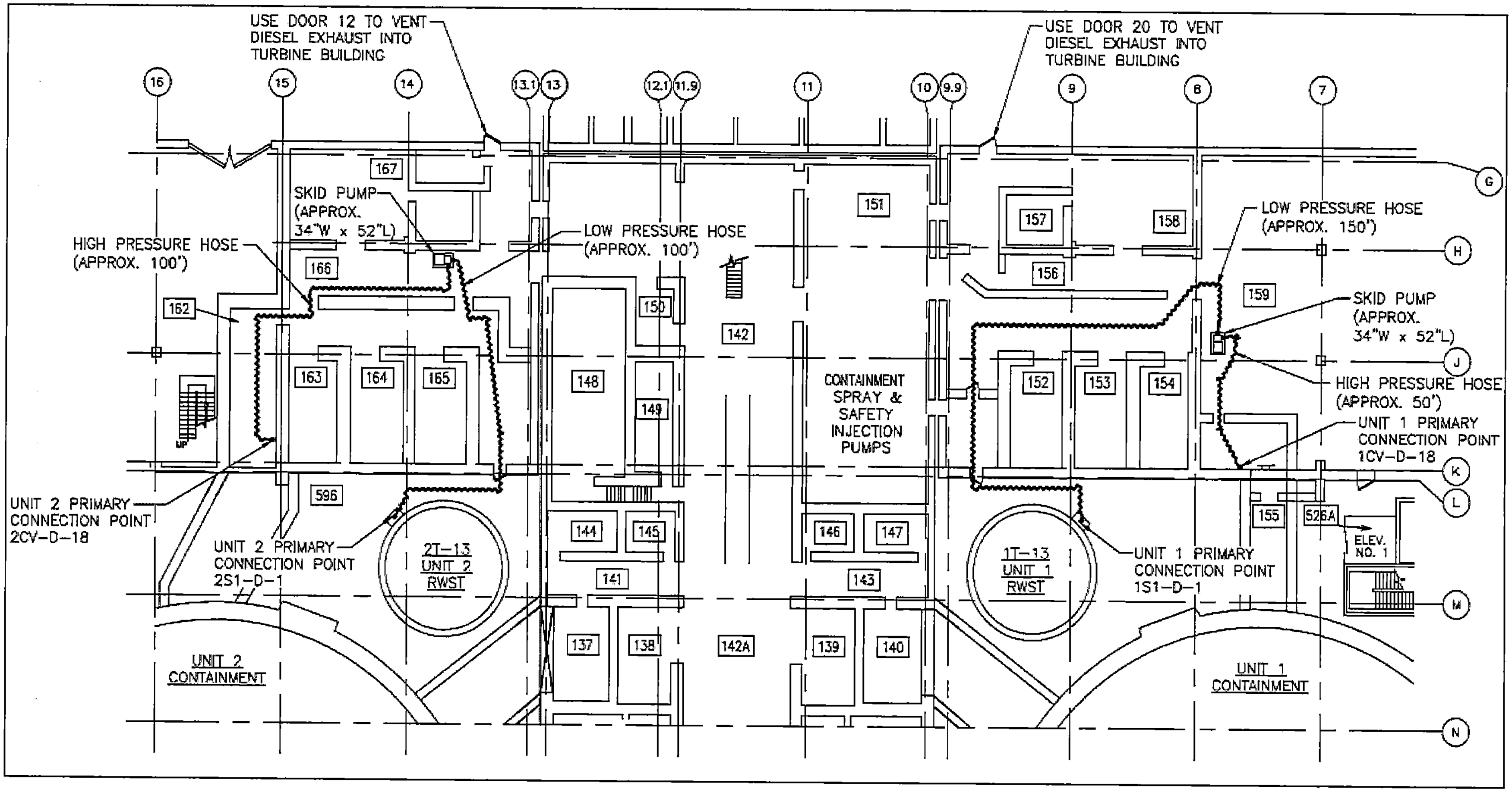

Figure 13a

LAYOUT OF SECONDARY CONNECTIONS FOR RCS MAKEUP FOR U1 AND U2 VIA SKID PUMP

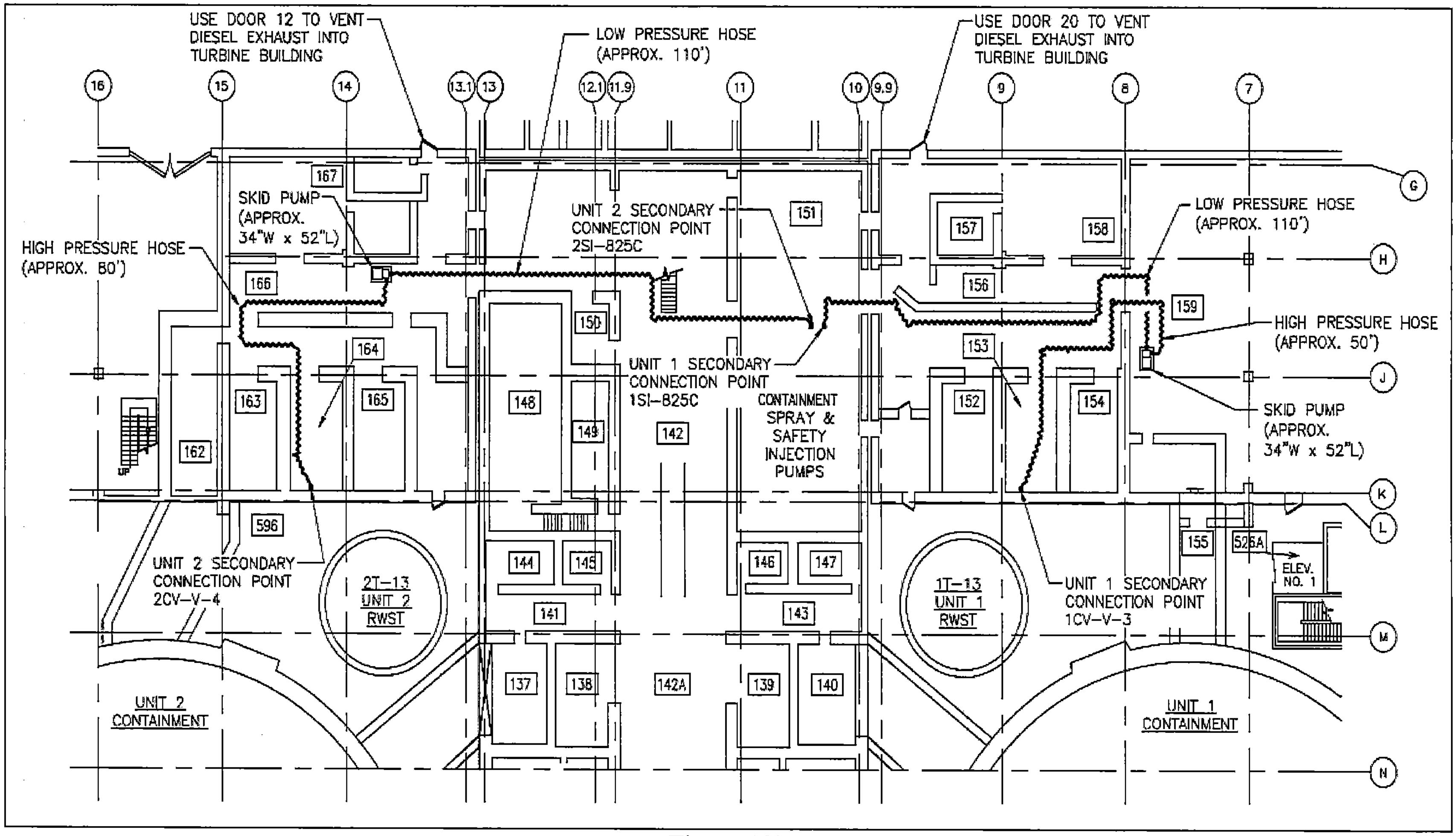

Figure 13b

CONTAINMENT SPRAY LINE CONNECTION POINTS

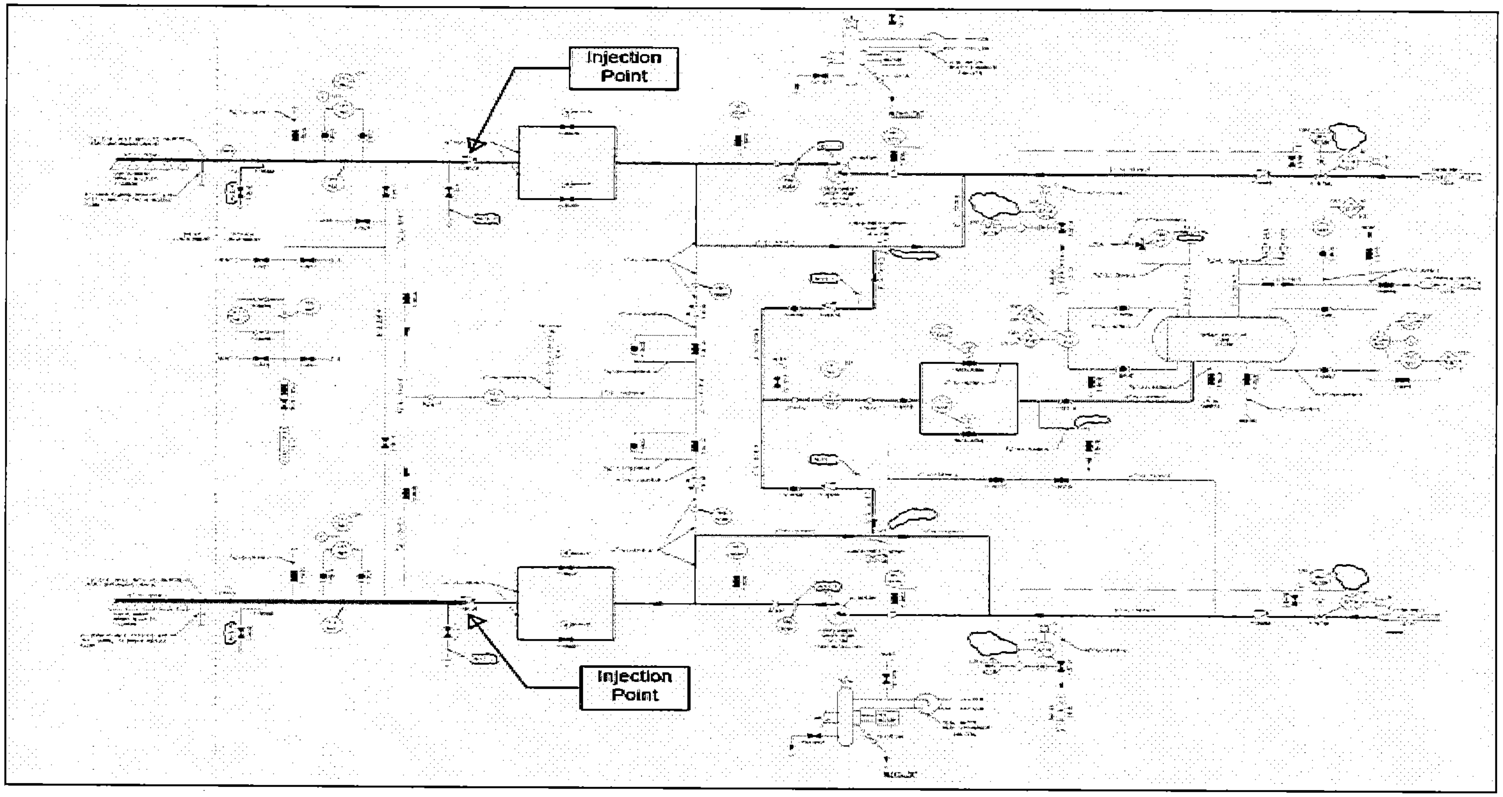

Figure 14

HOSE DEPLOYMENT AT SFP – PHASE 2

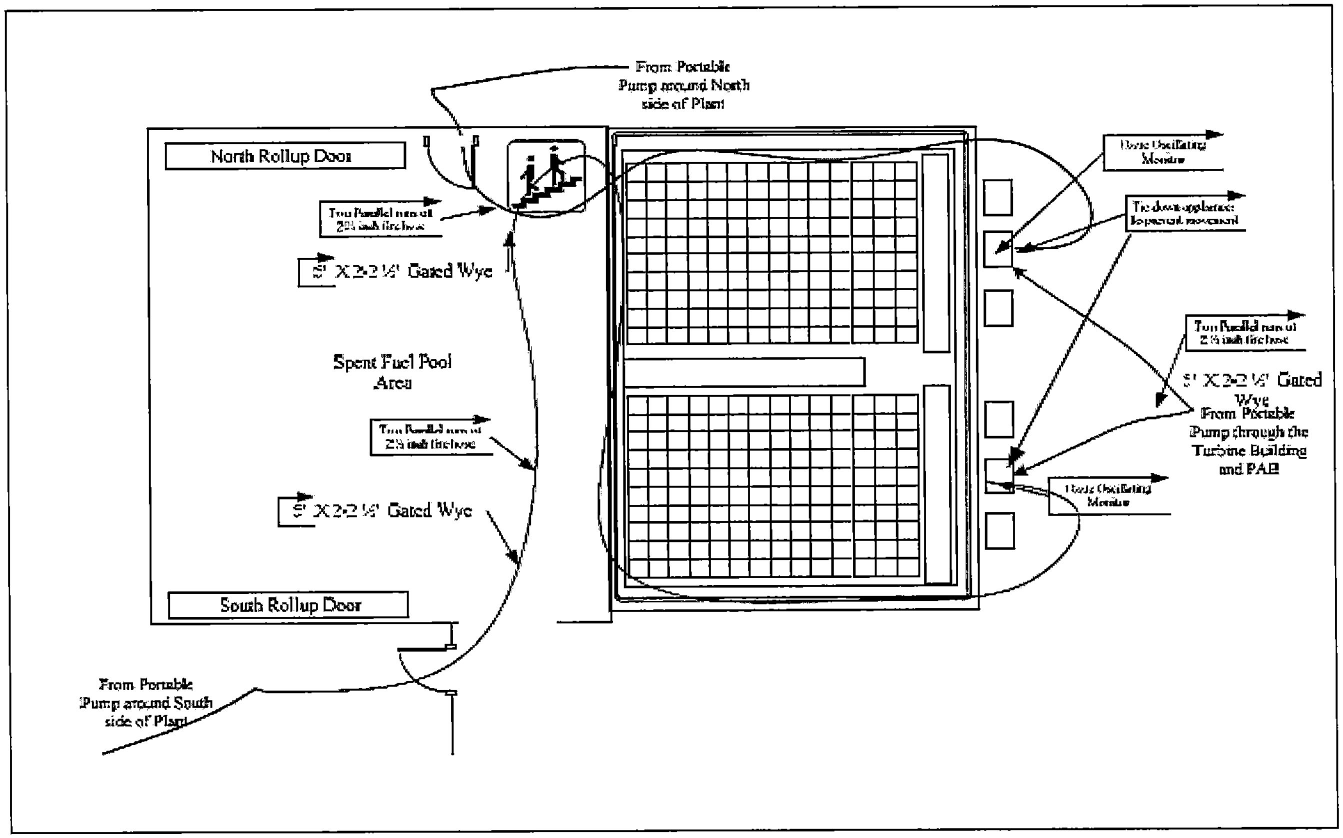

Figure 15

PORTABLE GENERATOR CONNECTION AT 2B–04

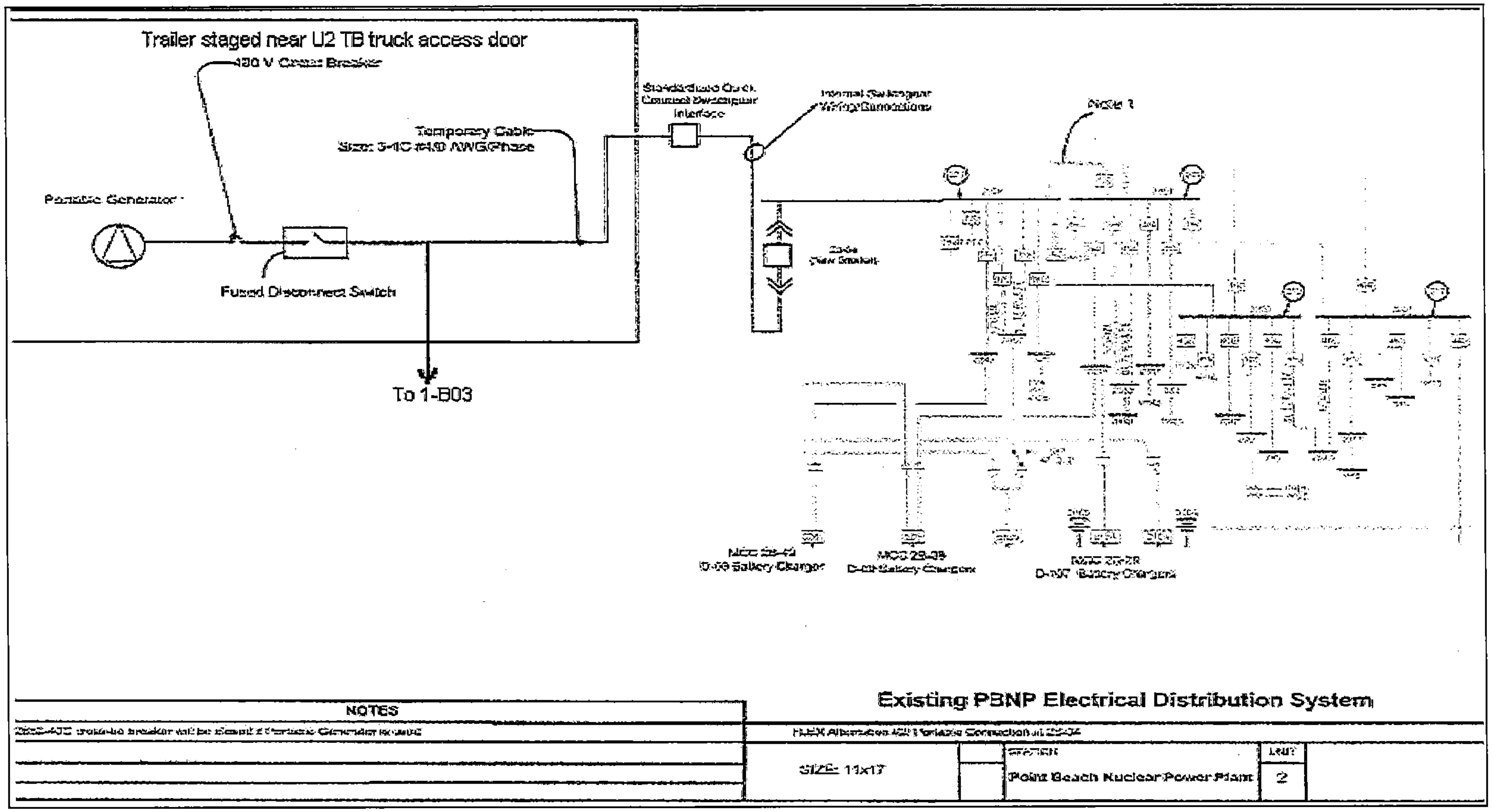

Figure 16a

PORTABLE GENERATOR CONNECTION AT 1B-03

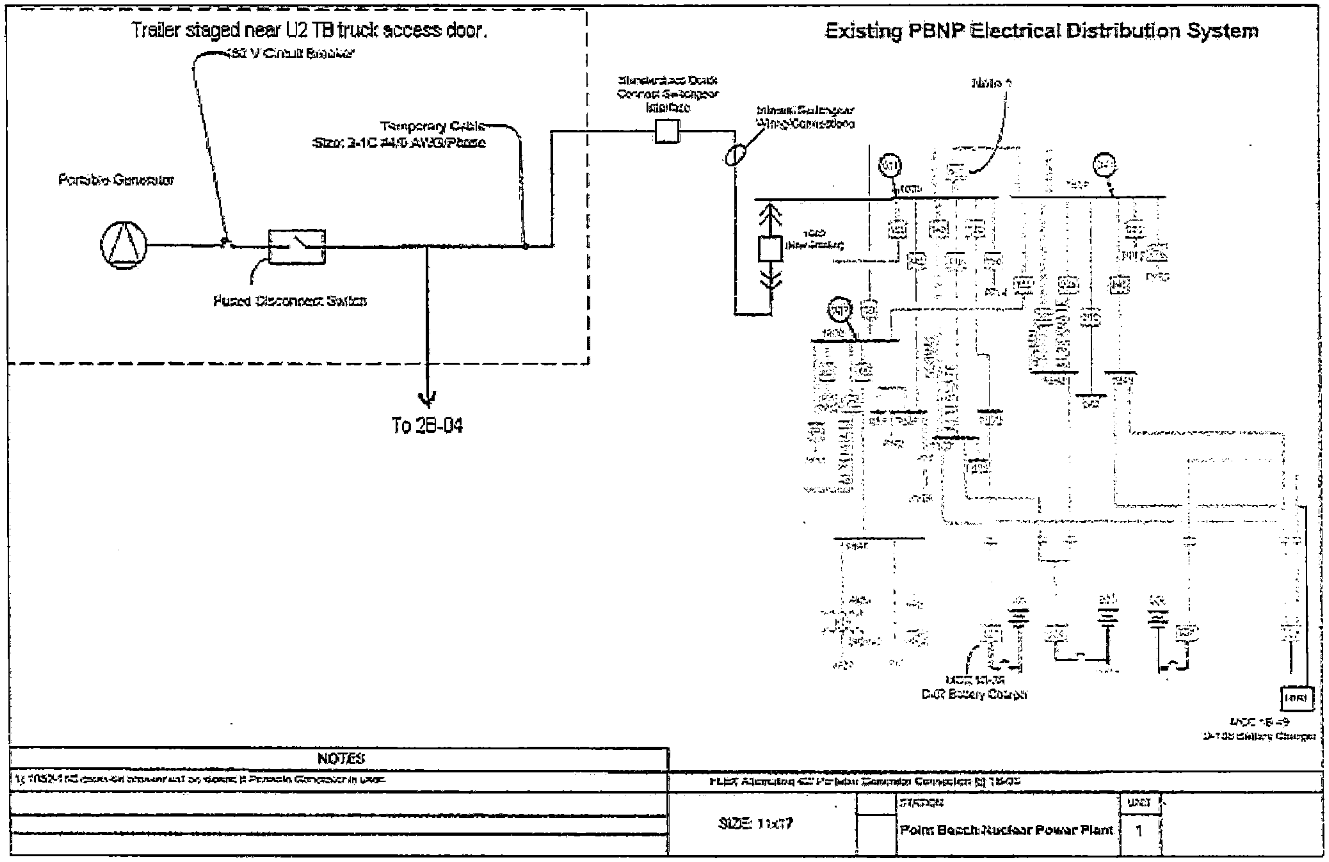

Figure 16b

PORTABLE GENERATOR CONNECTIONS AT 1B-03 AND 2B-04

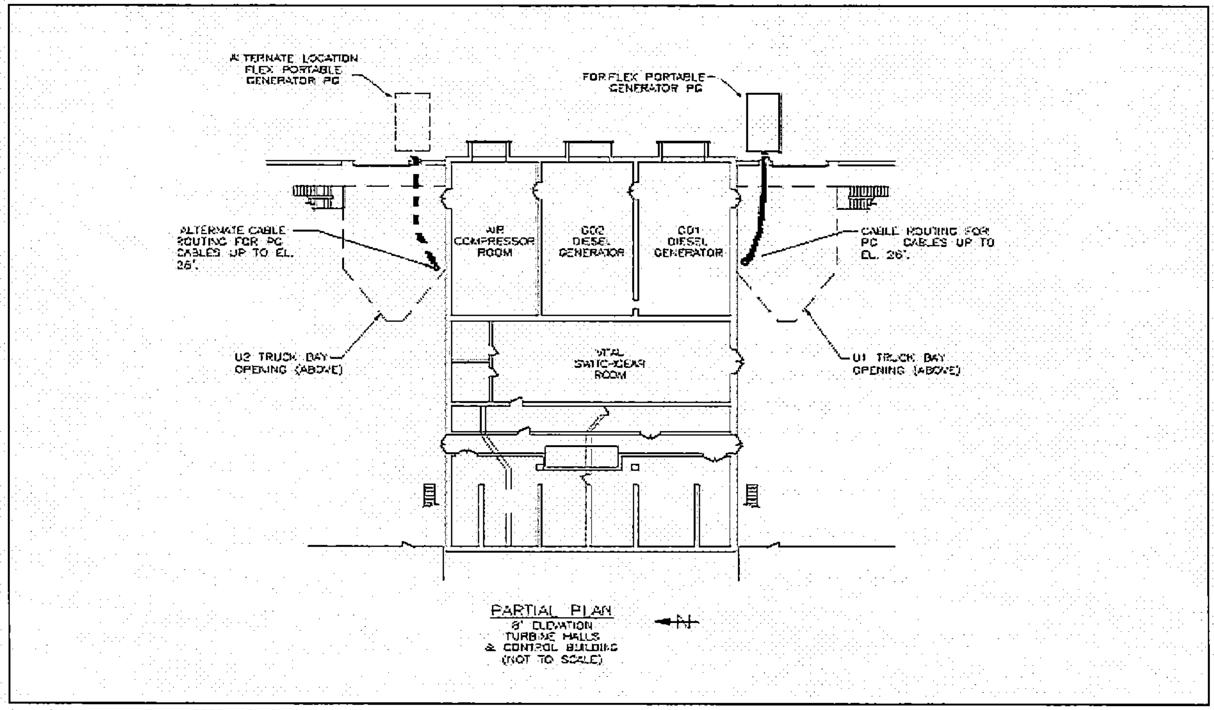

Figure 17a

PORTABLE GENERATOR CONNECTIONS AT 1B-03 AND 2B-04

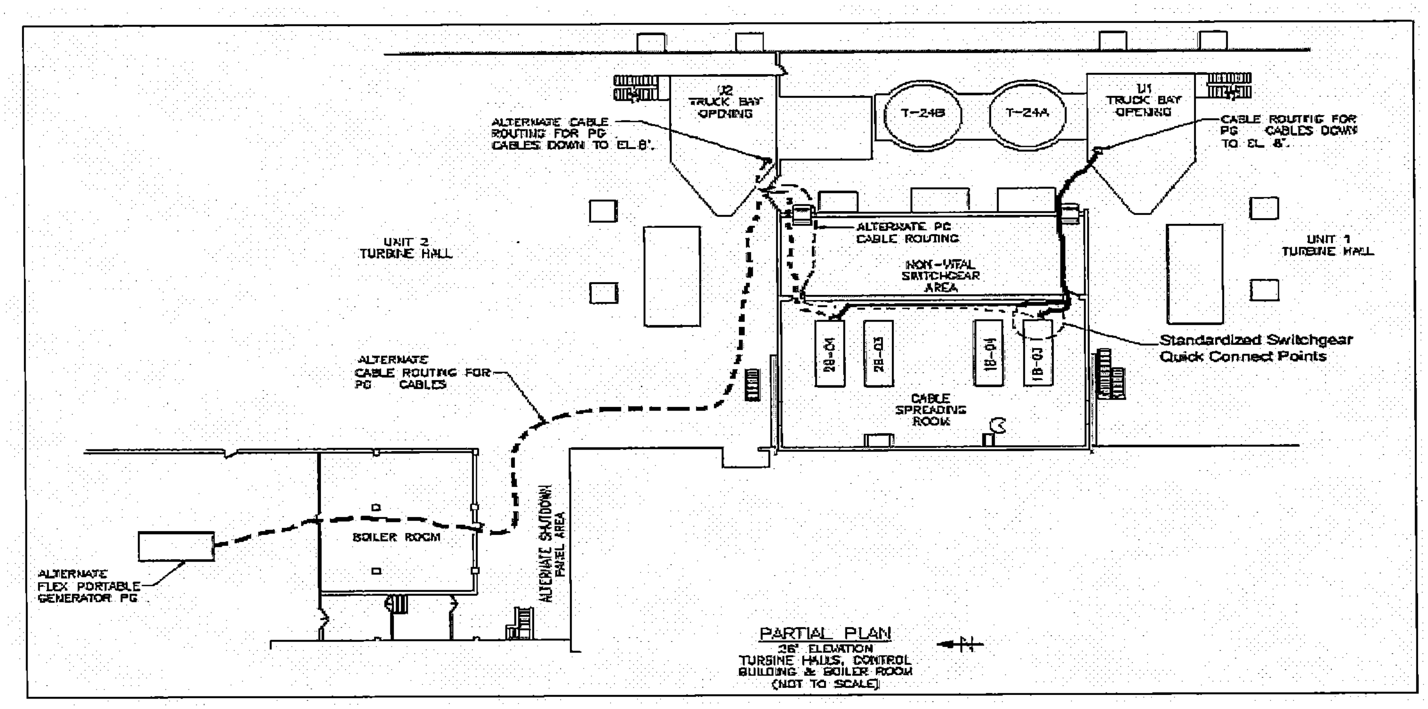

Figure 17b

ACCUMULATOR MAKE-UP TO RCS – PHASE 1

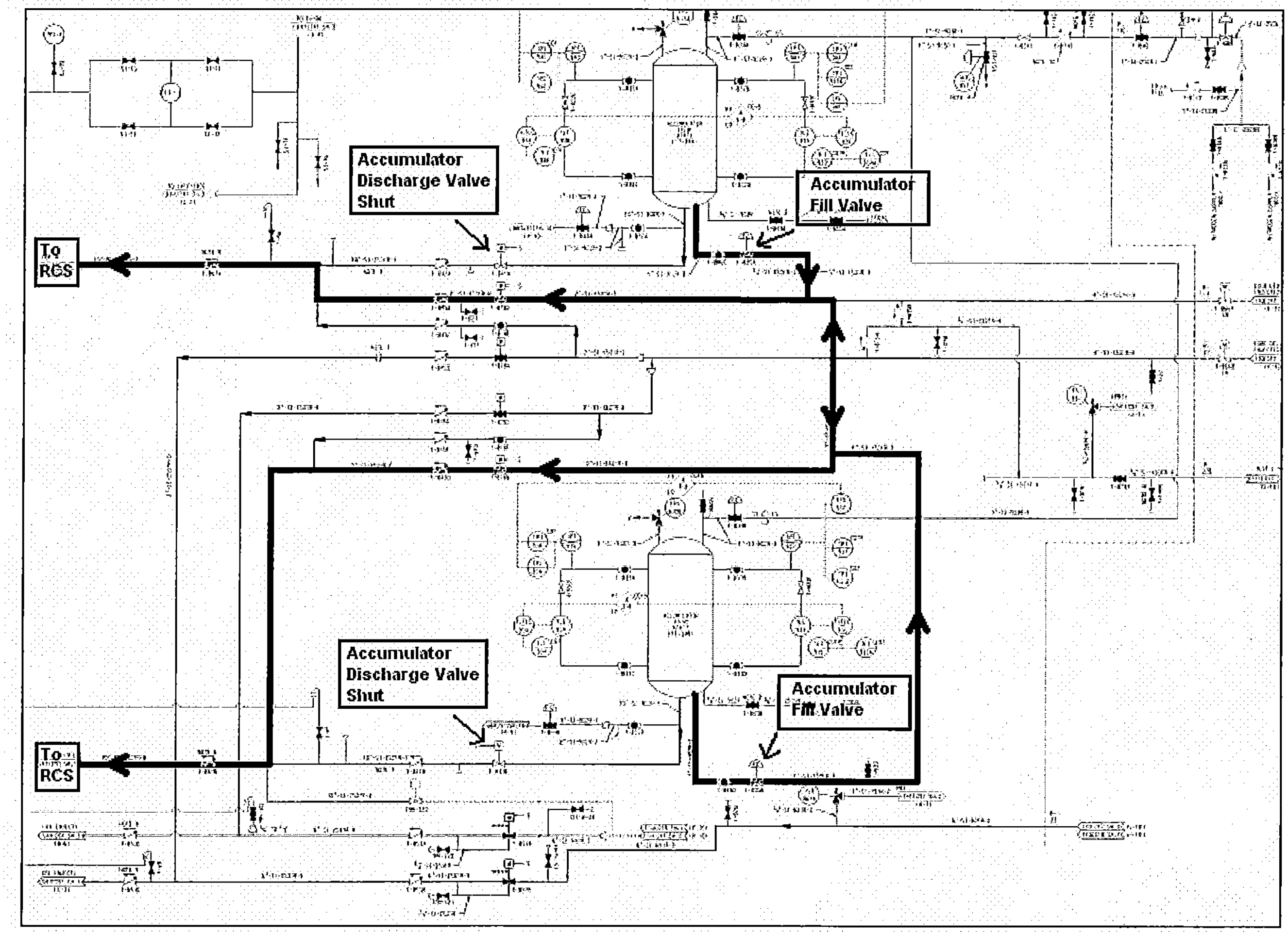

Figure 18

Pending Actions

(1) A DC load management strategy will be developed. It will include a formal evaluation to verify available DC power time and validate the Time Constraints to initiate and complete load stripping activities. The battery load management strategy will include power to credited installed equipment (e.g., DC MOVs, SOVs, etc) and at least one channel of credited instrumentation during Phase 1. The Time Constraint to have battery chargers energized and aligned prior to battery depletion will be validated.

(2) An evaluation will be performed to determine whether SW system return and non-seismic/missile protected portions of the SW system isolation will be required to ensure adequate flow to the suction of the TDAFW pump.

(3) Based on the results of the evaluation (Pending Action 2) required Operator actions to isolate SW will be time validated.

(4) Formal MAAP or other comparable analysis and evaluations will be performed to demonstrate the adequacy of the mitigation strategies for core cooling in all plant operating MODES.

(5) A containment environmental analysis will be performed based on the use of low leakage RCP seals and the FLEX mitigation strategy.

(6) An analysis will be performed to demonstrate the adequacy of the PAB environment for equipment and personnel access during SFP boiling. The requirements for opening doors to establish a vent path will be determined. Administrative guidance will be created based on this analysis.

(7) A SFP makeup water connection point will be added to the suction of P-9 pump (Attachment 3, Figure 15). The P-9 pump and associated piping which is currently not seismic Class I will be evaluated and upgraded as necessary to make it seismically robust.

(8) T-30, Diesel Fire Pump Fuel Tank and related piping will be evaluated for seismic loading and upgraded as necessary.

(9) The need for additional lighting will be evaluated as FSGs are developed.

(10) The deployment of credited FLEX equipment to the designated primary and secondary connection points within the required time frame will be resource and time validated.

(11) The portable AC generator secondary connection points will be designated.

(12) Cable spreading room will reach 120°F at approximately 1 hour and 16 minutes (Reference #17). The ability to meet the Time Constraint will be validated.

(13) An overall diesel refueling plan will be developed based on final FLEX diesel driven component fuel consumption requirements that specifies refueling frequency and time requirements. Time Constraint based on Fuel Oil Consumption of DDFP will be validated.

(14) Further evaluation will be required to address the need for extended operation at low SG pressures and low decay heat loads.

(15) Time validation studies will be conducted to justify the Time Constraints and resources necessary for implementing the PBNP FLEX strategies. These will be performed in accordance with PBNP Operations Manual OM 4.3.8, "Control of Time Critical Operator Actions."

(16) PBNP will develop strategy implementing procedures and FLEX support guidelines including the following:

a. Provide guidance for manual actions to implement AFW steam and discharge line alignment,
b. Provide guidance for operators to provide steam or AFW flow from opposite unit when required, and
c. Procedurally control maintaining one accumulator available in modes 5 and 6 with S/Gs unavailable.

(17) SAT will be used to evaluate training requirements for station personnel based upon changes to plant equipment, implementation of FLEX portable equipment, and new or revised procedures that result from implementation of the FLEX strategies.

(18) Seismically harden the CSTs and missile protect the bottom 6 feet to provide additional coping time for aligning the DDFP to the SW System and the suction of the TDAFW pump.

(19) Harden existing diesel driven fire pump to meet seismic requirements. Install a cross connect between fire water and the SW system to supply the TDAFW pump suction. The cross connect to SW will also have a connection point for a PDDP.

(20) A compressed gas backup will be installed for the accumulator fill valves to allow the boric acid to be injected into the RCS in a controlled manner.

(21) Cross connect piping will be installed between the Unit 1 and Unit 2 TDAFW pumps steam exhaust lines, steam supply lines and pump discharge lines.

(22) Connection points for a portable diesel pump will be added to the RHR system for injecting into the RCS.

(23) Install low leakage RCP seals to decrease RCP seal leakage and increase the time to core uncovery.

(24) Flanged hose adapters will be fabricated to facilitate connection of the PDDCP to the primary and secondary connection points without modification of the permanent plant equipment. The hose adapters for each connection point will be pre-staged and stored with the skid pumps.

(25) Install PDG connection points at 1B03 and 2B04 (see Attachment 3, Figures 16a, and 16b).

(26) Modifications to facilitate the connection of a PDG to the 1A-06 and 2A-06 4.16 kV switchgear will be preformed (see Attachment 3, Figure 9).

(27) The SGSB will be analyzed for seismic and tornado loading to qualify it for FLEX purposes. The west wall of the SGSB will require additional evaluation and modification to ensure that it satisfies the FLEX requirements.

(28) Evaluate the TSC 18.5 foot level for adequacy of storing miscellaneous FLEX strategy equipment.

(29) Formalize an evaluation that demonstrates adequate shutdown margin can be maintained during cooldown without establishing letdown and injecting water from the RWST.

(30) Required operator actions to cross connect the TDAFW discharge and steam supply lines will be time validated.

(31) Specific actions per AOP-30 "Temporary Ventilation for Vital Areas" (Reference 17) will be developed to account for the loss of all AC. Additional analysis will be performed to determine what additional time may be gained by opening cabinets and area doors.

(32) Validate the adequacy of the existing B.5.b pumps for use during Phase 2 Core Cooling and Heat Removal.

(33) Develop performance requirements for Phase 2 and 3 portable equipment following completion of required analyses and modification design efforts.

(34) The Phase II staffing study for FLEX will include an assessment of communications for FLEX activities.

(35) If the non-safety related batteries are required to be credited as part of the battery load management strategy, they will be evaluated and upgraded as necessary to make them seismically robust and tornado missile protected.

(36) PBNP will implement a FLEX program stipulating the required administrative controls to be implemented. The program will include:

a. FLEX equipment procurement requirements,
b. Plant configuration control procedures to assure plant physical changes will not adversely impact the approved FLEX strategies,
c. Complete Maintenance and Operations Procedures related to FLEX Equipment Storage, Maintenance, and Testing, and
d. Deployment strategy administrative requirements that address all MODES of operation and requirements to keep routes and staging areas clear or invoke contingency actions.

ACRONYM LIST

AC	Alternating Current
ADV	Atmospheric Dump Valve
AFW	Auxiliary Feedwater
AOV	Air Operated Valve
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
BAST	Boric Acid Storage Tank
BDBEE	Beyond Design Basis External Event
CAP	Corrective Action Program
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CLB	Current Licensing Basis
CSR	Cable Spreading Room
CST	Condensate Storage Tank
CVCS	Chemical and Volume Control System
CWPH	Circulating Water Pump House
DBA	Design Basis Accident
DBD	Design Basis Document
DC	Direct Current
DDFP	Diesel Driven Fire pump
DG	Diesel Generator
ECA	Emergency Contingency Actions
EDG	Emergency Diesel Generator
EDMG	Extreme Damage Mitigation Guideline
ELAP	Extended Loss of Alternating Current Power
EOP	Emergency Operating Procedure
EPRI	Electric Power Research Institute
ERO	Emergency Response Organization
FM	Frequency Modulation
FLEX	For our Diverse and Flexible Coping Strategies
FP	Fire Protection
FSAR	Final Safety Analysis Report
FSG	Flex Support Guideline
GPH	Gallons Per Hour
HUT	Hold Up Tank
IPEEE	Individual Plant Examination of External Events
ISFSI	Independent Spent Fuel Storage Installation
ISG	Interim Staff Guidance
JLD	Japan Lessons-Learned Project Directorate
LUHS	Loss of Ultimate Heat Sink
MAAP	Modular Accident Analysis Program
MCC	Motor Control Center
MOV	Motor Operated Valve

ACRONYM LIST

MSSV	Main Steam Safety Valve
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OBE	Operating Basis Earthquake
PAB	Primary Auxiliary Building
PBNP	Point Beach Nuclear Plant
PDDCP	Portable Diesel Driven Charging Pump
PDDP	Portable Diesel Driven pump
PDG	Portable Diesel Generator
PM	Preventative Maintenance
psig	Pounds per square inch gauge
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RRC	Regional Response Center
RWST	Refueling Water Storage Tank
SAFER	Strategic Alliance for FLEX Emergency Response
SAT	Systematic Approach to Training
SBO	Station Black Out
SDS	Shut Down Seals
SEP	Shutdown Emergency Procedure
SER	Safety Evaluation Report
SFP	Spent Fuel Pool
SG	Steam Generator
SGSB	Steam Generator Storage Building
SI	Safety Injection
SOV	Solenoid Operated Valves
SR	Safety Related
SSE	Safe Shutdown Earthquake
SSG	Standby Steam Generator
SW	Service Water
TDAFW	Turbine Driven Auxiliary Feedwater
TSC	Technical Support Center
UHS	Ultimate Heat Sink
VAC	Voltage Alternating Current
WCAP	Westinghouse Commercial Atomic Power
Wt	Weight

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