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SOUTHERN COMPANY

JUN 0 6 2014

Docket Nos.: 50-348
50-364

NL-14-0586

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

Joseph M. Farley Nuclear Plant – Units 1 and 2
Response to Request for Information Pursuant to Title 10 CFR 50.54(f)
Regarding Recommendations 2.1, 2.3, and 9.3, of the NTTF Review of
Insights from the Fukushima Daiichi Accident, dated March 12, 2012

References:

1. NRC Letter, *Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Daiichi Accident*, dated March 12,2012. (ML12053A340).

2. Southern Nuclear Operating Company Letter, *60-Day Response to NRC Letter, Request for Information Pursuant to Title 10 CFR 50.54(f) Regarding Recommendations 2.1,.2.3, and 9.3 of the NTTF Review of Insights from the Fukushima Daiichi Accident, dated March 12, 2012*, dated May 9, 2012.

Ladies and Gentlemen:

On March 12, 2012, the NRC staff issued a letter entitled, *Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Daiichi Accident*. Enclosure 5 of the letter contains specific Requested Actions and Requested Information associated with Recommendation 9.3 for Emergency Preparedness (EP) programs.

In accordance with Reference 1, on May 9, 2012, Southern Nuclear Operating Company (SNC) submitted Reference 2, an alternative course of action for providing the requested information. The alternative course of action included revised information due dates and the basis for those dates. Enclosure 1 of this letter provides the SNC response as described in Reference 2 to provide a Phase 2 onsite staffing assessment.

The enclosed report documents the analysis performed for the Joseph M. Farley Nuclear Plant (FNP) to meet the commitments for conducting a Phase 2 staffing assessment considering functions related to NTFF Recommendation 4.2.

The FNP Phase 2 On-Shift Staffing Analysis was conducted using the guidance of NEI 10-05, NEI 12-01, and NEI 12-06. No conflicts or overlaps in functions or tasks required to be performed by on-shift operations and support personnel were identified during this analysis.

This letter contains no new NRC commitments. If you have any questions, please contact John Giddens at 205.992.7924.

Mr. C. R. Pierce states he is the Regulatory Affairs Director of Southern Nuclear Operating Company, is authorized to execute this oath on behalf of Southern Nuclear Operating Company and, to the best of his knowledge and belief, the facts set forth in this letter are true.

Respectfully submitted,

C. R. Pierce
Regulatory Affairs Director

CRP/JMG/RCW

*Sworn to and subscribed before me this* 6 *day of* June, *2014.*

*Notary Public*

*My commission expires:* 10/8/2017

Enclosure: FNP On-Shift Staffing Analysis Phase 2 Report

cc: Southern Nuclear Operating Company
Mr. S. E. Kuczynski, Chairman, President & CEO
Mr. D. G. Bost, Executive Vice President & Chief Nuclear Officer
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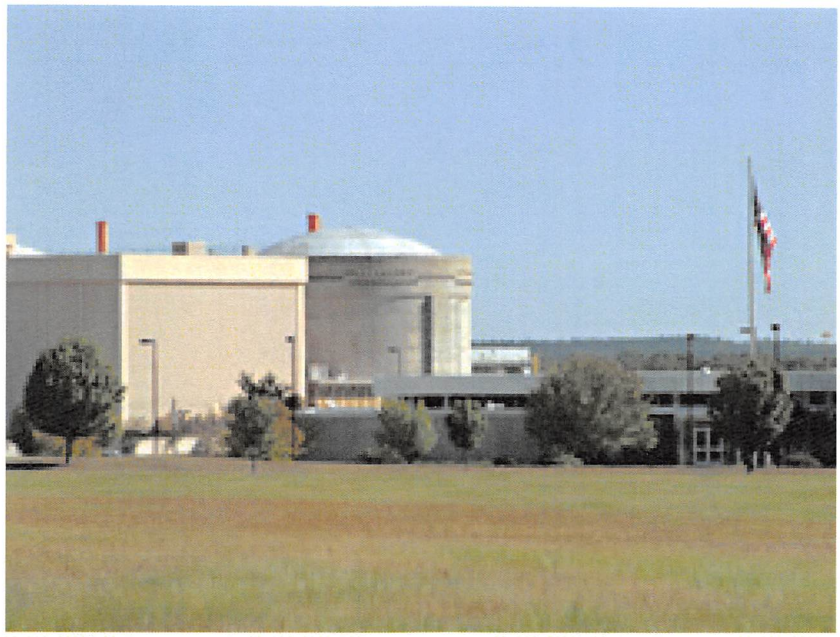
Enclosure to NL-14-0586

# JOSEPH M. FARLEY NUCLEAR PLANT



# FUKUSHIMA RESPONSE

# NEI 12-01 ON-SHIFT STAFFING ANALYSIS

# PHASE 2 REPORT

# MARCH 21, 2014

*Prepared for SNC by EP Consulting, LLC*

## Table of Contents

## Introduction

This report documents the analysis performed to meet the commitment to conduct a staffing assessment for a Beyond Design Basis External Event (BDBEE) for a multi-unit site affecting all units. This study was directed by NEI 12-01 and 12-06 to assess the current response to an Extended Loss of Power (ELAP) incident impacting the site. This report addresses Phase 2 of the study applicable to implementation of existing and FLEX strategies for prolonged loss of offsite power applicable to multi-unit sites during the initial and transition phases of the event. This analysis was performed to support the Joseph M. Farley Nuclear Plant (FNP) Units 1 and 2 response.

This analysis was conducted using draft FLEX Strategy Guidelines and EOP revisions. Use of these procedures is acceptable in accordance with NEI 12-01, page 4, Section 1.3.1.2:

> "In accordance with the Order, each licensee must develop new strategies for mitigating the effects of beyond-design-basis external events. To ensure accurate results, the staffing assessment for response functions related to NTTF Recommendation 4.2 must be based on actions delineated in the procedures and guidelines developed in response to the Order. Once the site-specific actions associated with the new response strategies are defined (e.g., down to the procedure or guideline step level), the staffing needed to perform these actions can be assessed with the necessary level of accuracy."

## Staffing Assessment Process Overview

The NEI 12-01 On-shift Staffing Analysis (OSA) Phase 2 was conducted by a multi-disciplined team using site procedures to determine if tasks have been sufficiently analyzed for performance by the minimum on-shift staff as designated in the Emergency Plan. Task areas analyzed include:

- Event Mitigation (Emergency Operating Procedures (EOP), Abnormal Operating Procedures (AOP), other site procedures specific to the extended loss of AC power)
- Health Physics (HP) and Chemistry Technician Functions (as specified in site response procedures)
- Emergency Preparedness Functions (NUREG-0654 Table B-1/ISG -01)

Existing strategies for responding to an extended loss of AC power affecting all on-site units and draft Flex Support Guidelines (FSGs) were evaluated in the On-shift Staffing Analysis. The staffing assessment also addressed the ability of the on-shift staff to perform any required emergency response functions that would be degraded or lost prior to the delayed arrival of the augmented Emergency Response Organization (ERO).

The NEI 12-01 Phase 2 analysis requires that the extended loss of AC power scenario be evaluated using the minimum staffing in the Emergency Plan along with the supplemental staff allowed by the minimum administrative staffing. FNP Emergency Plan Table 3, Rev 42, documents the approved minimum staff. The table below summarizes the available personnel, including shared resources for a two unit event, used for performance of the NEI 12-01 Phase 2 staffing assessment.

| FNP Units 1 and 2 Emergency Plan Table 3, Rev 42 | | Supplemental Administrative Staff (NEI 12-06 assumption) |
|---|---|---|
| Position | On-shift | |
| Shift Manager | 1 | |
| Shift Supervisor (SRO) | 2 | |
| Shift Support Supervisor (STA) | 1 | |
| Nuclear Plant Operator (RO) | 3 | |
| Shift Communicator (RO) | 1 | |
| System Operator (SO) | 3 | |
| Health Physics Technician | 3 | |
| Chemistry Technician | 3 | |
| Mechanical Journeyman | 1 | |
| Electrical Journeyman | 1 | |
| I&C Journeyman | 1 | |
| Emergency Vehicle Driver (Mech Maint) | 1 | |
| FMT Driver (Electrical Maint) | 1 | |
| Plant Survey Assistant (I&C) | 1 | |
| Total: | 23 | |
| Fire Brigade [Note 1] | 5 | |
| Security Personnel | Sec plan | |
| Maintenance Supervisor | | 1 |

Note 1 – Fire Brigade staffing consists of one (1) additional Shift Support Supervisor and four (4) additional System Operators.

## NEI 12-01 Phase 2 Assessment Results

No conflicts or overlaps in functions or tasks required to be performed by on-shift operations and support personnel were identified during this analysis. Transition Phase actions were required within the first six hours of the event.

Using NEI 12-01 guidance, the minimum on-shift Staff as defined in Table 3, Rev 42, of the FNP Emergency Plan, performed all actions required by operating and emergency plan procedures in the first hour period relying only on installed structures, systems and components remaining in the initial phase of the response. Once the General Emergency and the ELAP condition was declared, functional draft FLEX Strategies (FSG), including applicable Strategy Implementation Guidelines (SIG), were successfully implemented, using on-shift resources during the first six (6) hours and augmented responders from six (6) to twenty-four (24) hours.

The analysis identified the two most personnel resource asset limiting FLEX strategies as:

- FSG-5, SIG-1 (600V Alternate Power)
- FSG-5, SIG-3 (S/G FLEX pump movement and staging for core cooling).

## Program Development Follow-up Actions

During the tabletop procedural analysis, follow-up actions related to existing procedures and processes were identified:

1. The following action items were identified for ECP 0.0:
   a. Include guidance in Step 5 concerning DC capacity vs. the number of DG start attempts
   b. Step 15 – determine if RVLIS and SG WR level need to be powered up to perform step. Revise step as needed.
   c. Step 16 – determine method to monitor CST level during ELAP conditions.
   d. Step 18 - add caution or procedure step to hold SG depressurization until Aux Building Batteries are being recharged and SG FLEX pump is available for usage.
   e. Step 18 - provide direction to give ARV control back to Control Room after the Emergency Air Compressor is started (during second loop of procedure step).
2. Determine/verify preset alarms on OSC DADs and add to procedure ECP 0.0 Step 8 if appropriate.
3. Ensure Operations personnel are adequately training to operate 12 kV manual disconnects (related to performance of Step 9 of ECP 0.0).
4. Resolve concern related to venting Main Generator Hydrogen ($H_2$) without purging with $CO_2$ (related to performance of Step 10 of ECP 0.0).
5. Resolve concern related to blocking SI during performance of ECP 0.0.
6. Perform DC Load Study to determine impact of restoring power to RVLIS and SG WR level and any additional instrumentation needed for plant monitoring.
7. The following action items were identified for FSG 5:
   a. Reassign Step 3C to the EOF.
   b. Reverse the order of Steps 4 and 5.
   c. Attachment 1 – reposition equipment checks so that equipment not immediately needed will be checked later.
   d. Add notes concerning Freeze Protection throughout procedure as appropriate.
8. Separate 600V and 480V actions in SIG 1 and SIG 2.
9. Determine basis for 8 hour UPS for communications equipment (RapidCom/RAPIDCASE) used at Vogtle (related to SIG 9).
10. Contact ENERCON for calculation to add hoses/monitors in storage area outside units SFP for future use if needed.
11. Provide guidance in SIG 7 to recharge the diesel fuel oil transfer pump battery.
12. Develop program document to show that actions for SFP make up are based on time to 200 °F.
13. Validate the Phase 2 staffing assessment results against the final approved procedures/guidelines. Include any identified discrepancies in the FNP corrective action program.

SNC will address these actions as part of the FLEX Project such that Staffing Study conclusions are not impacted.

## Phase 2 Staffing Assessment Details

The Phase 2 On-shift Staffing Analysis (OSA) for FNP was conducted on March 20 and 21, 2014, using the guidance of NEI 12-01, NEI 12-06 and NEI 10-05.

The following personnel were present to complete the assessment:

| Personnel (Position/Title) | Number | Organization/Department | Experience |
|---|---|---|---|
| Shift Manager (Senior Reactor Operator) | 1 | Operations | SRO/ERO |
| Nuclear Plant Operator (RO) | 1 | Operations | RO/ERO |
| System Operator (SO) | 1 | Operations | SO/ERO |
| Severe Accident Management, Manager | 1 | Severe Accident Management | SRO |
| HP Supervisor | 1 | Health Physics | HP/ERO |
| Maintenance Supervisor (OSC Manager) | 1 | Maintenance | Maintenance/ERO |
| Security Supervisor | 2 | Security | Security/ERO |
| EP Supervisor | 1 | Emergency Planning | EP |
| FLEX Training | 2 | Fukushima Response Team | SRO |
| FLEX Procedure Writer | 3 | Fukushima Response Team | SRO |
| FLEX Training/Procedure Oversight | 1 | Fukushima Response Team | SRO |
| EP Specialist | 2 | EP Consulting, LLC | EP |

## Assumptions

The extended loss of AC power event was evaluated using the following assumptions, consistent with NEI 12-01, NEI 12-06 and applicable assumptions from NEI 10-05.

NEI 12-01 - Assumptions for Staffing Assessment:

1. A large-scale external event occurs (earthquake) that results in:
   - all on-site units affected
   - extended loss of AC power
   - impeded access to the units
2. Initially, all on-site reactors are operating at full power and are successfully shut down.
3. A Hostile Action directed at the affected site does not occur during the period that the site is responding to the event.
4. The event impedes site access as follows:
   A. Post-event time: 6 hours – No site access. This duration reflects the time necessary to clear roadway obstructions, use different travel routes, mobilize alternate transportation capabilities (e.g., private resource providers or public sector support), etc.
   B. Post-event time: 6 to 24 hours – Limited site access. Individuals may access the site by walking, personal vehicle or via alternate transportation capabilities (e.g., private resource providers or public sector support).
   C. Post-event time: 24+ hours – Improved site access. Site access is restored to a near-normal status and/or augmented transportation resources are available to deliver equipment, supplies and large numbers of personnel.

5. On-shift personnel are limited to the minimum complement allowed by the site emergency plan. Additional administrative staff are designated as supplemental to the emergency plan minimum staff (see Assumption 28).

6. The staffing assessment uses the applicable actions from the Station Blackout (SBO) coping strategies in place at the time of the assessment.

7. The staffing assessment includes the INPO IER improvement actions already implemented at the time of the assessment.

8. All equipment credited in current coping strategies remains available for use.

NEI 10-05 - Applicable Assumptions:

9. On-shift personnel can report to their assigned response locations within timeframes sufficient to allow for performance of assigned actions.

10. The on-shift staff possesses the necessary Radiation Worker qualifications to obtain normal dosimetry and to enter Radiologically Controlled Areas (but not high, locked high or very high radiation areas) without the aid of a Radiation Protection Technician.

11. Personnel assigned to the major response area of Plant Operations & Safe Shutdown meet the requirements and guidance established by NRC regulations and are able to satisfactorily perform the functions and tasks necessary to achieve and maintain safe shutdown. Staff performance within this area is not evaluated as part of this assessment, unless a role/function/task from another major response area is assigned as a collateral duty.

12. On-site security organization: Performance of this function is regularly analyzed through other station programs and will not be evaluated here, unless a role or function from another major response area is assigned as a duty.

13. Individuals holding the position of Radiation Protection Technician or Chemistry Technician are qualified to perform the range of tasks expected of their position.

14. The task of making a simple and brief communication has minimal impact on the ability to perform other assigned functions/tasks, and is therefore an acceptable collateral duty for all positions. This assumption does not apply to emergency notification to an Offsite Response Organization (ORO) or the NRC.

15. The task of performing a peer check has minimal impact on the ability to perform other assigned functions/tasks, and is therefore an acceptable collateral duty for all positions.

16. The analyzed events occur during off-normal work hours at a time when augmented ERO responders are not at the site (e.g., during a backshift, weekend or holiday). For purposes of this analysis, and consistent with NEI 12-01 assumption #4, 360 minutes (6 hours) will be used as the time period for the conduct of on-shift ERO response actions.

NEI 12-06 Assumptions

17. Prior to the event the reactor has been operating at 100 percent rated thermal power for at least 100 days or has just been shut down from such a power history as required by plant procedures in advance of the impending event.

18. At the time of the postulated event, the reactor and supporting systems are within normal operating ranges for pressure, temperature, and water level for the appropriate plant condition. All plant equipment is either normally operating or available from the standby state as described in the plant design and licensing basis.

19. No specific initiating event is used. The initial condition is assumed to be a loss of off- site power (LOOP) at a plant site resulting from an external event that affects the off-site power system either throughout the grid or at the plant with no prospect for recovery of off-site power for an extended period. The LOOP is assumed to affect all units at a plant site.

20. All installed sources of emergency on-site ac power and SBO Alternate ac power sources are assumed to be not available and not imminently recoverable.

21. Cooling and makeup water inventories contained in systems or structures with designs that are robust with respect to seismic events, floods, and high winds, and associated missiles are available.

22. Normal access to the ultimate heat sink is lost, but the water inventory in the UHS remains available and robust piping connecting the UHS to plant systems remains intact. The motive force for UHS flow, i.e., pumps, is assumed to be lost with no prospect for recovery.

23. Fuel for FLEX equipment stored in structures with designs which are robust with respect to seismic events, floods and high winds and associated missiles, remains available.

24. Permanent plant equipment that is contained in structures with designs that are robust with respect to seismic events, floods, and high winds, and associated missiles, are available.

25. Other equipment, such as portable ac power sources, portable back up dc power supplies, spare batteries, and equipment for 50.54(hh)(2), may be used provided it is reasonably protected from the applicable external hazards per Sections 5 through 9 and Section 11.3 of this guidance and has predetermined hookup strategies with appropriate procedures/guidance and the equipment is stored in a relative close vicinity of the site

26. Installed electrical distribution system, including inverters and battery chargers, remain available provided they are protected consistent with current station design.

27. No additional events or failures are assumed to occur immediately prior to or during the event, including security events and fires.

28. On-site staff is at site administrative minimum shift staffing levels. All personnel on-site are available to support site response.

29. Reliance on the fire protection system ring header as a water source is acceptable only if the header meets the criteria to be considered robust with respect to seismic events, floods, and high winds, and associated missiles.

Plant Specific Assumptions

30. Plant Instrument Air is assumed to be unavailable.

31. RCS Inventory:

    a. Pump seal leakage assumed to be four (4) gpm (1 gpm/Reactor Coolant Pump – 3gpm and 1 gpm unidentified). FNP RCPs are equipped with seals which are designed to provide seal integrity in station blackout conditions.

    b. Time to uncover core is seven (7) days.

32. Station 125V DC batteries

    a. The DC busses have an expected capacity of eight (8) hours prior to power restoration.

33. The PBX system for the site is assumed to be unavailable.

34. Radio repeater is unavailable, hand-held radios are only able to operate line-of-sight.

35. Sound Powered phones are available for on-site communications.

36. Condensate Storage Tank (CST) for both units is 150,000 gallons and will not be depleted for twelve (12) hours.

37. FNP-1/2-ECP-0.0 directs periodic monitoring of Spent Fuel Pool (SFP) level. Additional SFP actions were not required. Time to reach 200 °F is > 30 hours using Assumption #17.

38. Fire Protection System is assumed to be unavailable.

39. Five (5) battery-operated satellite phones, including extra batteries and chargers, have been purchased and received, for use by emergency response personnel for onsite and offsite communications. These units are also utilized to contact the Emergency Operations Facility (EOF). Two (2) additional satellite phones,

including extra batteries and chargers have been purchased and deployed for emergency response in the EOF.

40. All equipment credited in current coping strategies remains available for use.

41. The Joint Information Center (JIC) is located approximately 20 miles from the site and is available as a staging location.

42. The EOF is located in Birmingham, Alabama, which is > 200 miles from the site and is available to provide required support.

## Methodology

The on-shift staffing assessment was performed using NEI 12-01, NEI 12-06 and NEI 10-05. Subject matter experts and consultants were assembled to provide analysis support. The assessment was conducted via a tabletop procedural analysis using FNP procedures to determine if tasks have been sufficiently analyzed for performance by the minimum on-shift staff as designated in the Emergency Plan and supplemental administrative staff. The following provides a summary of the process that was used.

Each on-shift position from Emergency Plan, Table 3, Rev 42 and any additional administrative on-shift position was entered in Attachment 1, Table 1. For position titles with more than one position holder, a unique sequential number was assigned to each position. The site emergency plan reference that describes the requirement for the position to be on-shift was then entered into column 3 of Appendix 1, Table 1. Using only the on-shift positions entered in the table, the following Appendix 1 tables were completed by entering the shift position that fills a described role, or performs a specific function or tasks:

- Table 2 - Minimum Operations Crew Necessary to Implement AOPs and EOPs, FSGs or SAMGs if applicable
- Table 2A – Procedural Implementation Timeline of activities corresponding to Table 2
- Table 3 – Firefighting (not applicable for this event analysis)
- Table 4 – Radiation Protection & Chemistry Time Line of Activities
- Table 5 - Emergency Plan Implementation
- Table 5A – E-Plan Implementation Timeline

Following completion of each of the above tables, each on-shift position assigned to the associated table was located on Appendix 1, Table 1. For each position, the table number and associated line number was then entered in column 4, "Role in Table#/Line#". If the associated task required additional actions, a Yes was placed in the last column and the additional action recorded in the results section of this report.

The OSA was conducted using the following process:

1. Selection of the multi-disciplined work group
2. Scheduling the tabletop for FNP to allow free access to required procedures and administrative documents
3. Conduct of a pre-job briefing outlining the requirements of NEI 12-01, NEI 12-06 and NEI 10-05
4. Review of the event initial conditions and assumptions
5. Performance of the tabletop procedural analysis
6. Documentation of the results of the tabletop by EP Consulting using the NEI 10-05 forms modified to extend to 24 hours.

This review provided the team with a basic understanding of the event and resulting emergency classifications. The SRO reviewed EOP, AOP and FSG actions and identified them to the team. Specific site procedures referenced during assessment of this postulated event are provided in Table2A. Resources needed to perform initial and transition phase response actions were identified from the EOP, AOP, or FSG procedures and documented. The team determined when other on-shift resources, such as the RP or Chemistry Technician, would be required and identified the time required to perform expected emergency plan functions. This information was documented on the applicable tables in Appendix 1 of this report. Finally, the on-shift resources and their actions were summarized in the tables using the NEI 10-05 documentation process in Appendix 1, Table 1.

## Security Considerations

Existing coping strategies do not anticipate the use of Security Officers to perform duties unrelated to their assigned roles. Tasks assigned for FLEX response are consistent with their normal duties and assigned as non-routine duties. Security Officers will perform functions within their current roles such as monitoring and controlling site/protected area access and providing compensating measures for any vital area doors that may need to remain open to facilitate room environmental conditions.

## Strategy Resource Loading

An evaluation of each FSG was conducted to determine the resources needed to accomplish the tasks associated with the strategy and the estimated duration of the task.

| FSG | Description | Resources | Duration | Notes |
|---|---|---|---|---|
| FSG-1 | RCS Long Term RCS Inventory Control | | | Not required during initial or transition phase |
| FSG-2 | Alternate Feedwater Suction | N/A | N/A | N/A |
| FSG-3 | Alternate Low Pressure Feedwater | | | |
| FSG-4 | ELAP DC Bus Load Shed | SSS (1)<br>NPO (2)<br>SO (2) | 20 minutes | Time sensitive – extend battery capacity (both units) |
| FSG-5 | Damage Assessment and Equipment Staging | | | |
| Attachment 1 | CR | NPO (2) | 10 minutes | |
| | Field Actions | SO (2) | 20 minutes | |
| | Security (Haul Path) | SEC (1) | 10 minutes | |
| Step 1 | Install lights in CR | NPO (2) | 10 minutes | |
| | Lower Bollards at Sally port (NMP-OS-019-003) | SEC (1) | 30 minutes | |
| | Debris Removal | MM (2) | 4 hours | |
| | Open Aux Building and SFP doors | SEC (1) | 1 hours | |
| SIG-1 (performed in series) | 600V Alternate Power – Retrieve and stage 600V DG; Bus Prep, Connect, start, and load 600V DG (Establish 125 VDC Battery Chargers) | EM (1)<br>HP (1)<br>SO (2) | 2 hours | Time sensitive – DC bus restoration **(resource limiting)** |
| SIG-2 | 480V Alternate Power – Retrieve and stage 480V DG (Boron Injection or RC Makeup pumps); Connect, start, and load 480V DG | EM (1)<br>HP (1) | 2 hours | Time sensitive dependent on end of cooldown |
| SIG-3 | Stage S/G FLEX Pumps | MM (2)<br>SO (2) | 2 hours | Time sensitive @ T=12 hours – CST level **(resource limiting)** |
| SIG-4 | Boron Injection and RCS Makeup – move and connect pumps | SO (1)<br>ERO (1) | 1 hour | |
| SIG-5 | Tank Makeup – local actions (Move and connect equipment/hoses) | | | Implemented in parallel with SIG-3 |
| SIG-6 | Containment Integrity | N/A | N/A | |
| SIG-7 | Diesel Fuel Oil Transfer | ERO (5) | Continuous | |
| SIG-8 | Spent Fuel Pool Makeup – stage equipment (move and connect hose; set fill and monitor nozzle in SFP) | SO (1)<br>HP (1) | 1 hours | SFP makeup is not required during initial or transition phase |
| FSG-6 | Alternate CST Makeup | SO (1) | 10 minutes | Implemented with |

| FSG | Description | Resources | Duration | Notes |
|---|---|---|---|---|
| | | | | SIG-3 and SIG-5 |
| FSG-7 | Loss of Vital Instrumentation or Control Power | IC (2)<br>CT (1) | Continuous until DC power restored | Not required during staffing analysis |
| FSG-8 | Alternate RCS Boration - monitor equipment operation | SO (1) | 4 hours | Implemented with SIG-4 |
| FSG-9 | Low Decay Heat Temperature Control | N/A | N/A | Not required during initial or transition phase |
| FSG-10 | Passive RCS Injection | NPO (2)<br>SO (1) | 10 minutes | |
| FSG-11 | Alternate SFP Makeup | N/A | N/A | Not required during initial or transition phase |
| FSG-12 | Alternate Containment Cooling | N/A | N/A | Not required during initial or transition phase |
| FSG-13 | Transition from FLEX | N/A | N/A | Not required during initial or transition phase |

Time Sensitive Task
Resource Limiting

# Appendix 1 - Staffing Tables

**FNP On-Shift Personnel Assignments Used During Phase 2 Staffing Analysis**

**Operations Assignments**

| Position | Designation | Assignment |
|---|---|---|
| Shift Manager | Shift Manager | Shift Manager/Emergency Director |
| Shift Supervisor | SRO1 | Unit 1 Shift Supervisor |
| Shift Supervisor | SRO2 | Unit 2 Shift Supervisor |
| Shift Support Supervisor/STA | SSS1 | Shift Technical Advisor |
| Shift Support Supervisor/FBC | SSS2 | Fire Brigade Chief |
| Control Room Operator | NPO1 | Unit 1 Operator At Controls (OATC) |
| Control Room Operator | NPO2 | Unit 1 Unit Operator (Shift Communicator) |
| Control Room Operator | NPO3 | Unit 2 Operator At The Controls (OATC) |
| Control Room Operator | NPO4 | Unit 2 Unit Operator (Shift Communicator) |
| System Operator | SO1 | Unit 1 Auxiliary Building SO |
| System Operator | SO2 | Unit 2 Auxiliary Building SO |
| System Operator | SO3 | Outside SO |
| System Operator | SO4 | Unit 1 Turbine Building/FB Member |
| System Operator | SO5 | Unit 2 Turbine Building/FB Member |
| System Operator | SO6 | Rover/FB Member |
| System Operator | SO7 | Diesel Building/FB Member |

**Other On-Shift Assignments Used During Analysis**

| Position | Designation | Assignment |
|---|---|---|
| HP Technician | HP1 | Offsite/On-Site Surveys (FMT #1) |
| HP Technician | HP2 | In Plant Surveys |
| HP Technician | HP3 | HP Support/First Aid |
| Chemistry Technician | CT1 | Dose Assessment |
| Chemistry Technician | CT2 | Chemistry Sampling |
| Chemistry Technician | CT3 | HP Support/FMT Communicator |
| Mechanical Journeyman | MM1 | Mechanical Maintenance |
| Electrical Journeyman | EM1 | Electrical Maintenance |
| I&C Journeyman | IC1 | I&C Maintenance |
| Emergency Vehicle Driver | MM2 | Mech Mnt/FB Tanker Truck Driver |
| FMT #1 Driver | EM2 | Elec Mnt/FMT Support |
| Plant Survey Assistant | IC2 | I&C Mnt/Plant Surveys Assistant |
| CAS Operator | CAS Operator | CAS Operator - Accountability |
| Maintenance Supervisor | MS | Maintenance Shift Supervisor |

Administrative on-shift staffing supplemental to the Emergency Plan minimum staff

## Loss of all AC Power

**TABLE 1 – On-shift Positions**

| Line | On-shift Position | Emergency Plan Reference | Role in Table#/Line# | Action Required? |
|---|---|---|---|---|
| 1. | Shift Manager/ED | FNP Emergency Plan Table 3, Rev 42 | T2/L1<br>T5/L1<br>T5/L2<br>T5/L3<br>T5/L5 | No |
| 2. | Unit Supervisor – U1 (SRO1) | FNP Emergency Plan Table 3, Rev 42 | T2/L2 | No |
| 3. | Unit Supervisor - U2 (SRO2) | FNP Emergency Plan Table 3, Rev 42 | T2/L3 | No |
| 4. | Shift Support Supervisor/STA (SSS1) | FNP Emergency Plan Table 3, Rev 42 | T2/L4<br>T5/L10 | No |
| 5. | Shift Support Supervisor/FBC (SSS2) | FNP Emergency Plan Table 3, Rev 42 | T2/L5<br>T5/L8 | No |
| 6. | Control Room Operator – U1 OATC (NPO1) | FNP Emergency Plan Table 3, Rev 42 | T2/L6 | No |
| 7. | Control Room Operator – U1 Unit Operator (NPO2) | FNP Emergency Plan Table 3, Rev 42 | T2/L7 | No |
| 8. | Control Room Operator – U2 OATC (NPO3) | FNP Emergency Plan Table 3, Rev 42 | T2/L8 | No |
| 9. | Control Room Operator – U2 Unit Operator (NPO4) | FNP Emergency Plan Table 3, Rev 42 | T2/L9<br>T5/L6<br>T5/L9<br>T5/L13<br>T5/L14 | No [Note 1] |
| 10. | System Operator (SO1) | FNP Emergency Plan Table 3, Rev 42 | T2/L10 | No |
| 11. | System Operator (SO2) | FNP Emergency Plan Table 3, Rev 42 | T2/L11 | No |
| 12. | System Operator (SO3) | FNP Emergency Plan Table 3, Rev 42 | T2/L12 | No |
| 13. | System Operator (SO4) | FNP Emergency Plan Table 3, Rev 42 | T2/L13 | No |
| 14. | System Operator (SO5) | FNP Emergency Plan Table 3, Rev 42 | T2/L14 | No |
| 15. | System Operator (SO6) | FNP Emergency Plan Table 3, Rev 42 | T2/L15 | No |
| 16. | System Operator (SO7) | FNP Emergency Plan Table 3, Rev 42 | T2/L16 | No |
| 17. | HP Technician/FMT (HP1) | FNP Emergency Plan Table 3, Rev 42 | T2/L22 | No |
| 18. | Chemistry Technician/ODA (CT1) | FNP Emergency Plan Table 3, Rev 42 | T2/L23 | No |

| Line | On-shift Position | Emergency Plan Reference | Role in Table#/Line# | Action Required? |
|---|---|---|---|---|
| 19. | Chemistry Technician (CT2) | FNP Emergency Plan Table 3, Rev 42 | T2/L24 | No |
| 20. | Mechanical Maintenance (MM1) | FNP Emergency Plan Table 3, Rev 42 | T2/L17 | No |
| 21. | Mechanical Maintenance/EVD (MM2) | FNP Emergency Plan Table 3, Rev 42 | T2/L18 | No |
| 22. | Electrical Maintenance (EM1) | FNP Emergency Plan Table 3, Rev 42 | T2/L19 | No |
| 23. | Electrical Maintenance/FMT (EM2) | FNP Emergency Plan Table 3, Rev 42 | T2/L20 | No |
| 24. | I&C Maintenance (IC1) | FNP Emergency Plan Table 3, Rev 42 | T2/L21 | No |
| 25. | Security Officer (SEC1) | FNP Emergency Plan Table 3, Rev 42 | T2/L25 | No |
| 26. | Security Officer (SEC2) | FNP Emergency Plan Table 3, Rev 42 | T2/L26 | No |
| 27. | Security Officer (SEC3) | FNP Emergency Plan Table 3, Rev 42 | T2/L27 | No |
| 28. | CAS Operator (CAS) | FNP Emergency Plan Table 3, Rev 42 | T2/L28<br>T5/L15 | No [Note 1] |

**Notes:**
STA – Shift Technical Advisor
FBC – Fire Brigade Chief
NPO – Nuclear Plant Operator (licensed operator)
FMT – Field Monitoring Team
ODA – Offsite Dose Assessment
EVD – Emergency Vehicle Driver (FB Tanker Truck)
PSA – Plant Survey Assistant

Note 1 – No conflict; Table 2 and Table 5 functions are the same

**TABLE 2 - Plant Operations & Safe Shutdown**

**Two Units - One Control Room**
**Minimum Operations Crew Necessary to Implement**
**AOPs and EOPs, or SAMGs if applicable**

| Line | Generic Title/Role | On-Shift Position | Task Performance Validation |
|---|---|---|---|
| 1. | Shift Manager | Shift Manager | Operator Training |
| 2. | Shift Supervisor | Unit Supervisor – U1 (SRO1) | Operator Training |
| 3. | Shift Supervisor | Unit Supervisor – U2 (SRO2) | Operator Training |
| 4. | Shift Support Supervisor | Shift Support Supervisor/STA (SSS1) | Operator Training |
| 5. | Shift Support Supervisor | Shift Support Supervisor/FBC (SSS2) | Operator Training |
| 6. | Reactor Operator (OATC) | Control Room Operator – U1 (NPO1) | Operator Training |
| 7. | Reactor Operator (BOP) | Control Room Operator – U1 (NPO2) | Operator Training |
| 8. | Reactor Operator (OATC) | Control Room Operator – U2 (NPO3) | Operator Training |
| 9. | Reactor Operator (BOP) | Control Room Operator – U2 (NPO4) | Operator Training |
| 10. | Auxiliary Operator | System Operator (SO1) | Operator Training |
| 11. | Auxiliary Operator | System Operator (SO2) | Operator Training |
| 12. | Auxiliary Operator | System Operator (SO3) | Operator Training |
| 13. | Auxiliary Operator | System Operator (SO4) | Operator Training |
| 14. | Auxiliary Operator | System Operator (SO5) | Operator Training |
| 15. | Auxiliary Operator | System Operator (SO6) | Operator Training |
| 16. | Auxiliary Operator | System Operator (SO7) | Operator Training |

**Notes:** See Table 2A for AOP/EOP actions

**Other (non-Operations) Personnel Necessary to Implement**
**AOPs and EOPs, or SAMGs if applicable**

| Line | Generic Title/Role | On-Shift Position | Task Performance Validation |
|---|---|---|---|
| 17. | Maintenance Technician | Mechanical Maintenance (MM1) | Maintenance Training |
| 18. | Maintenance Technician | Mechanical Maintenance/EVD (MM2) | Maintenance/EP Trng |
| 19. | Electrician | Electrical Maintenance (EM1) | Electrical Mnt Training |
| 20. | Electrician | Electrical Maintenance/FMT (EM2) | Electrical Mnt/EP Trng |
| 21. | I&C Technician | I&C Maintenance (IC1) | I&C Training |
| 22. | HP Technician | HP Technician/FMT (HP1) | HP/EP Training |
| 23. | Chemistry Technician | Chemistry Technician/ODA (CT1) | Chemistry/EP Training |

| | | | |
|---|---|---|---|
| 24. | Chemistry Technician | Chemistry Technician (CT2) | Chemistry/EP Training |
| 25. | Security Officer | Security Officer (SEC1) | Security Training |
| 26. | Security Officer | Security Officer (SEC1) | Security Training |
| 27. | Security Officer | Security Officer (SEC1) | Security Training |
| 28. | CAS Operator | CAS Operator (CAS) | Security Training |

**Notes:** See Table 2A for AOP/EOP actions