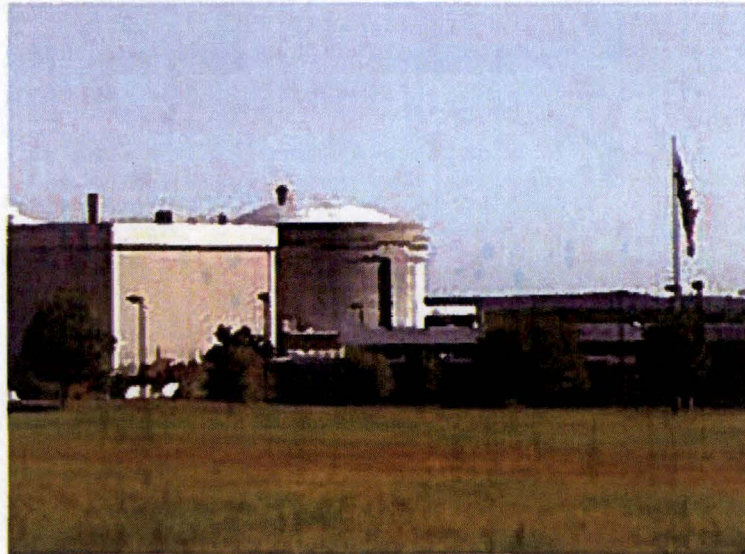
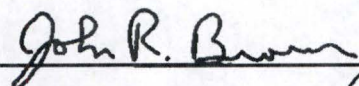
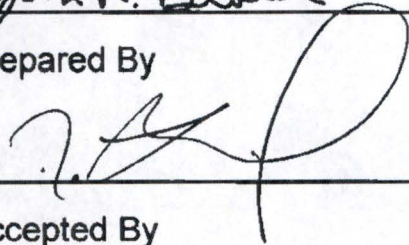


# Joseph M. Farley Nuclear Plant



## Standard Emergency Plan Proposed Version 4.0 On-Shift Staffing Analysis

	04/10/2018
Prepared By	Date
	4/20/18
Accepted By	Date



## FNP On-Shift Staffing Analysis

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## FNP On-Shift Staffing Analysis

### Introduction

10 CFR 50 Appendix E, effective on December 23, 2011 directed that a detailed study be performed by December 24, 2012, to ensure on-shift staffing was adequate to perform critical functions until relieved by the augmented Emergency Response Organization (ERO). The NRC in the published staff guidance (Reference 2) endorsed NEI 10-05 as an acceptable means of performing the required staffing analysis.

An on-shift staffing analysis was completed in November 2017, to support implementation of Technical Specifications Task Force (TSTF)-258 for the Farley Nuclear Plant (FNP). TSTF-258 allows for elimination of the title 'Shift Technical Advisor (STA)' from section 5.2.2.g of the FNP TS with the function being assumed by qualified personnel. The on-shift staffing analysis was performed with the STA position being removed as a required on-shift position in the SNC Standard Emergency Plan, Farley Annex Table 2.2.A. **Proposed Version 4.0** of the on-shift staffing analysis report documents the results of this evaluation.

### References

1. 10 CFR 50 Appendix E
2. NSIR/DPR-ISG-01, Interim Staff Guidance, Emergency Planning for Nuclear Power Plants
3. NEI 10-05, Revision 0, Assessment of On-Shift Emergency Response Organization Staffing and Capabilities
4. SNC Standard Emergency Plan Annex for FNP Units 1 and 2, Version **4.0**, Table 2.2.A
5. Farley Nuclear Plant FSAR Chapter 15, Section 15, and Attachment A

### Executive Summary

A detailed staffing analysis performed in accordance with NEI 10-05 was conducted to document the adequacy of shift staffing as required by 10 CFR 50 Appendix E.

Table 1 identifies the minimum staff as described in the SNC Standard Emergency Plan Annex for FNP Units 1 and 2, Version **4.0**, Table 2.2.A, and was used to perform the on-shift staffing analysis.

NRC staff guidance directs the scenarios that must be used to demonstrate the adequacy of on-shift staffing to perform required functions for event mitigation, radiation protection response, firefighting, chemistry and Emergency Plan functions. Those scenarios include specific design basis accidents as described in the FSAR as well as specific scenarios defined in the Staff Guidance document. Identification of these scenarios is the first phase of the NEI 10-05 process. Table 2 identifies the scenarios that were required to be considered for evaluation.

The next phase required of NEI 10-05 requires a dedicated team, using tabletop techniques, to evaluate the scenarios for conflicts between the functional areas that must be resolved by detailed procedural analysis. For those scenarios where no conflicts are identified in the specified areas no further action is required. The results of this analysis determined that conflicts do not exist; therefore, further action is not required.



## FNP On-Shift Staffing Analysis

### Conclusion

The minimum staff identified in the SNC Standard Emergency Plan Annex for FNP Units 1 and 2, Table 2.2.A is adequate to respond to the scenarios identified in the regulations until relieved by the augmented ERO. The analysis showed that the number of on-shift personnel are sufficient to respond to analyzed events until augmented by the ERO 75 minutes after event declaration and that no conflicts in responsibilities exist.

**Table 1**  
**FNP On-Shift Staffing**

Position Title	On-Shift
Shift Manager (SM)	1
Shift Supervisor (SRO)	2
Shift Support Supervisor (SRO/FBL) <sup>Note 1</sup>	1
Reactor Operator (RO)	4
System Operators (SO) <sup>Note 1</sup>	7
RP Technician (RP)	3
Chemistry Technician (CT)	2
Maintenance Supervisor (MS)	1
Electrical Maintenance (EM)	1
Mechanical Maintenance (MM)	1
I&C Maintenance (IC)	1
<b>Total On-Shift Personnel</b>	<b>24</b>
Fire Brigade <sup>Note 1</sup>	5
Rescue Operations/First Aid <sup>Note 2</sup>	2
Security	Sec plan

<sup>Note 1</sup> - Fire Brigade is a collateral duty of Operations requiring 5 personnel without safe shutdown responsibilities. The Fire Brigade consists of 1 Fire Brigade Leader (Shift Support Supervisor – SRO) and 4 Fire Brigade Members (System Operators). These individuals are not assigned safe shutdown responsibilities.

<sup>Note 2</sup> - Rescue/First Aid is a collateral duty of RP personnel



## FNP On-Shift Staffing Analysis

**Table 2**  
**NEI 10-05 Appendix A**  
**Analyzed Events and Accidents**

Event #	Event Type	Summary Description of Event	Plant Mode	Reference Document(s)	Event ECL	Analysis Required?
1	DBT	Land and/or waterborne HOSTILE ACTION directed against the Protected Area by a HOSTILE FORCE. Assume adversary characteristics defined by the Design Basis Threat (DBT)	Any	ISG IV.C	SAE	Yes
2	DBA	Major Reactor Coolant System Pipe Ruptures (LB LOCA)	1-4	FSAR 15.4.1	GE	Yes <b>Note 1</b>
3	DBA	Major Secondary System Pipe Rupture Main Steam Line Break	4	FSAR 15.4.2.1	UE	Yes
4	DBA	Major Secondary System Pipe Rupture Main Feedwater Line Break	1-4	FSAR 15.4.2.2	UE	No <b>Note 2</b>
5	DBA	Steam Generator Tube Rupture	1-4	FSAR 15.4.3	SAE	Yes
6	DBA	Single Reactor Coolant Pump Locked Rotor	1-5	FSAR 15.4.4	UE	Yes
7	DBA	Fuel Handling Accident	6	FSAR 15.4.5	ALERT	No <b>Note 3</b>
8	DBA	Rupture of a Control Rod Drive Mechanism Housing (Rod Control Cluster Assembly Ejection)	1-5	FSAR 15.4.6	ALERT	No <b>Note 4</b>
9	ISG	ATWS	1-5	ISG IV.C	UE	Yes
10	ISG	Response actions for an "aircraft probable threat" in accordance with 10CFR50.54 (hh)(1) and as discussed in RG 1.214, Guidance for Assessment of Beyond-Design-Basis Aircraft Impacts	Any	ISG IV.C	ALERT	Yes
11	ISG	Control room fire leading to evacuation and remote shutdown as referenced in IN 95-48 "Results of On-Shift Staffing Study"	1-4	ISG IV.C	ALERT	Yes
12	ISG	Station Blackout	1-2	ISG IV.C	SAE	Yes
13	ISG	NFPA-805 Fire Response	Any	ISG IV.C	ALERT	No <b>Note 5</b>
14	ISG	SAMG	N/A	ISG IV.C	N/A	No <b>Note 6</b>

**Note 1** – Event designated as proceeding non-mechanistically to GE with release exceeding Protective Action Guides (PAGs) and requiring Protective Action Recommendations (PARs).

**Note 2** - Event is bounded by the Main Steam Line Break. No further analysis is required.

**Note 3** – Refueling accident is not analyzed with the existing on-shift staff per FAQ 2013-008.

**Note 4** - Event is bounded the Large Break LOCA event. No further analysis is required.

**Note 5** – Event is bounded by the Control Room Fire with Evacuation and Remote Shutdown. No further analysis required.

**Note 6** – Per NEI 10-05, Section 2.11, no actions other than licensed and non-licensed operators are involved with SAMG implementation, therefore analysis is not required.



## **FNP On-Shift Staffing Analysis**

### **Appendix A Phase II Analysis Results**



## FNP On-Shift Staffing Analysis

A multi-disciplined team of subject matter experts from Farley Nuclear Plant was assembled to provide input into the shift staffing analysis of events identified by NSIR/DPR-ISG-01, Interim Staff Guidance, Emergency Planning for Nuclear Power Plants. This team consisted of: a Shift Manager (SRO); a Chemistry Nuclear Specialist; an RP Superintendent; and Emergency Planning staff (station and consultants). The team provided analysis support during the Phase II analysis as follows:

**Table 3**  
**On-Shift Staffing Analysis Team**

<b>Team Member</b>	<b>Subject Matter Expertise</b>
Shift Manager (SRO)	Emergency Operating Procedure (EOP) actions for SROs, ROs, and SOs
	Abnormal Operating Procedure (AOP) actions for SROs, ROs, and SOs
	Operating Procedure actions
	Emergency Director (E Plan) Actions
	Fire response actions
Chemistry Nuclear Specialist	Chemistry Technician response actions
RP Superintendent	RP Technician response actions
Emergency Preparedness Specialist/Coordinator	Abnormal Operating Procedure (AOP) and Emergency Operating Procedure (EOP) actions for maintenance.
	Security Response actions
	Accountability Response actions
	Emergency Plan response actions

The OSA was conducted in three steps: identification of events for analysis; minimum shift staffing complement determination; and, a table top analysis of the on-shift staffing resources required for response to the identified events. The results and recommendations of the OSA are documented in this report.



## **FNP On-Shift Staffing Analysis**

### **Appendix B Phase II Event Analysis Tables**



## FNP On-Shift Staffing Analysis

### On-Shift Personnel Assignments Used During OSA

#### On-Shift Operator Assignments

Position	Designation	Assignment
Shift Manager	SM	Shift Manager/Emergency Director
Unit Supervisor	SRO1	Unit 1 Shift Supervisor (SSD)
Unit Supervisor	SRO2	Unit 2 Shift Supervisor (SSD)
Shift Support Supervisor	SRO3/FBL	Shift Support / Fire Brigade Leader
Reactor Operator	RO1	Unit 1 Operator At Controls (SSD)
Reactor Operator	RO2/COM2	Unit 1 Licensed Operator (SSD)
Reactor Operator	RO3	Unit 2 Operator At Controls (SSD)
Reactor Operator	RO4/COM1	Unit 2 Licensed Operator
System Operator	SO1	Unit 1 Aux Building SO (SSD)
System Operator	SO2	Unit 2 Aux Building SO (SSD)
System Operator	SO3	Outside SO (SSD)
System Operator	SO4/FBM1	Unit 1 Turbine Building SO (FBM1)
System Operator	SO5/FBM2	Unit 2 Turbine Building SO (FBM2)
System Operator	SO6/FBM3	Rover SO (FBM3)
System Operator	SO7/FBM4	Diesel Building SO (FBM4)

#### Other On-Shift Personnel Assignments

Position	Designation	Assignment
RP Technician	RP1	RP Support
RP Technician	RP2	RP Support
RP Technician	RP3/FMT	RP Support/ Field Monitoring
Chemistry Technician	CT1	Chemistry Support
Chemistry Technician	CT2/DA	Chemistry Support/ Dose Assessment
Maintenance Supervisor	MM1	Maintenance Supervision
Electrical Maintenance	EM1	Electrical Maintenance Support
Mechanical Maintenance	MM2	Mechanical Maintenance Support
I&C Maintenance	IC1	I&C Maintenance Support
SAS Operator	SEC1	Accountability
CAS Operator	SEC2	Security Interface
Security Captain	SEC3	Security Interface
Security Officer	SEC4	Security Support



## **FNP On-Shift Staffing Analysis**

### **Event Timelines and Assumptions**

#### **Event #1      Design Basis Threat**

Initial Conditions:

Time: Sunday @0230

Unit 1&2 @ 100% Power

RCS @ normal operating temperature and pressure

Sequence of Events:

0235 Adversary force assaults FNP and attempts to breach the protected area fence

Security engages adversaries and notifies Shift Manager

0236 CR personnel initiate Security Event response AOP

Rx manually tripped

On-site protective actions initiated

0240 Security informs Shift Manager that PA has been breached

0245 Security informs Shift Manager that adversaries have been neutralized

No injuries to site personnel

No fires or collateral damage to plant equipment

No adverse consequences to plant safety



## FNP On-Shift Staffing Analysis

### Appendix B

**Event # 1: DBA/ISGE - Design Basis Threat**  
**TABLE 1 – On-shift Positions**

**ECL: Site Area Emergency**

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Action Required?
1.	Shift Manager	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L1 T5/L1 T5/L5 T5/L6 T5/L13	No	No
2.	Shift Supervisor (SRO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L2	No	No
3.	Shift Supervisor (SRO2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L3 T5/L10 T5/L11	No	No
4.	Shift Support Supervisor (SRO3/FBL)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L4 T5/L2 T5/L3 T5/L4	No	No
5.	Reactor Operator (RO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L5	No	No
6.	Reactor Operator (RO2/COM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L6	No	No
7.	Reactor Operator (RO3)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L7	No	No
8.	Reactor Operator (RO4/COM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L8 T5/L8 T5/L12	No	No
9.	CAS Operator (SEC2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L9	No	No



### FNP On-Shift Staffing Analysis

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Action Required?
10.	Security Captain (SEC3)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L10 T5/L13	No	No

**Notes:** Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, **OR** the functions are the same, **OR** the functions are performed sequentially without issue.



## FNP On-Shift Staffing Analysis

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

Event # 1

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

Applicable to unit 1&2

Line	Generic Title/Role	On-Shift Position	Task Performance Validation
1.	Shift Manager	Shift Manager (SM)	Operator Training
2.	Shift Supervisor	Shift Supervisor (SRO1)	Operator Training
3.	Shift Supervisor	Shift Supervisor (SRO2)	Operator Training
4.	Shift Support Supervisor	Shift Support Supervisor (SRO3/FBL)	Operator Training
5.	Reactor Operator	Control Room Operator (RO1)	Operator Training
6.	Reactor Operator	Control Room Operator (RO2/COM2)	Operator Training
7.	Reactor Operator	Control Room Operator (RO3)	Operator Training
8.	Reactor Operator	Control Room Operator (RO4/COM4)	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
9.	CAS Operator	Security Officer (SEC2)	Security Training
10.	Security Supervisor	Security Captain (SEC3)	Security Training

**Notes:** Security supporting Control Room as needed per AOP



## FNP On-Shift Staffing Analysis

Table 2A – Procedure Timing Analysis

Event #1 Title: Design Basis Threat

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
FNP-0-AOP-49.0, Imminent Security Threat, Rev 25																				
Step 1	Determine event is a Ground/Water Attack	SRO1 SM	X																	
Steps 1&2	Align Service Water to turbine driven Aux Feed Pump	RO2/COM2	X																	
Steps 4.1 & 5.2	Contact NRC Operations Center	SRO3/FBL		X																
Steps 7.1-7.2	Trip U1 and U2 IAW EEP-0	SRO1 RO1 RO2/COM2 SRO2 RO3 SRO3/FBL	X																	
Step 7.4	Calculate Cold SD Boron Concentration	RO2/COM2 RO4/COM1			X															
Step 7.4	Borate Plant to Cold S/D	RO1 RO3				X (periodic)														
Step 7.5	Conduct Plant Cooldown to Cold SD	SRO1 RO1 SRO2 RO3							X (periodic)											
Step 8	Notify Site Personnel	SRO3/FBL	X																	
Step 9	Notify Security	SM			X															
Step 10	Secure TDAFWP	RO1 RO3			X															
Step 14	Verify Aux Building Doors Closed	SEC2			X															
Step 17	Place Control Room HVAC in Emergency Mode	RO2/COM2									X									
Step 18	Place TSC HVAC in Emergency Mode	RO2/COM2 SEC3											X							
FNP-1-ESP-0.1 Reactor Trip Response, Rev 36																				
	Reactor Trip Response	SRO1 RO1 SRO3/FBL		X (periodic)																




## FNP On-Shift Staffing Analysis

Table 2A – Procedure Timing Analysis

Event #1 Title: Design Basis Threat

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
FNP-2-ESP-0.1 Reactor Trip Response, Rev 34																				
	Reactor Trip Response	SRO2 RO3 SRO3/FBL		X (periodic)																

 Task completion time



## FNP On-Shift Staffing Analysis

**TABLE 3 – Firefighting**

**Event # 1**

<b>Line</b>	<b>Performed By</b>	<b>Task Analysis Controlling Method</b>
1.	N/A	N/A
2.	N/A	N/A
3.	N/A	N/A
4.	N/A	N/A
5.	N/A	N/A

**Notes:** No Fire Brigade response required for this event.

# FNP On-Shift Staffing Analysis

**TABLE 4 – Radiation Protection & Chemistry**

**Event # 1**

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0- 5	5- 10	10- 15	15- 20	20- 25	25- 30	30- 35	35- 40	40- 45	45- 50	50- 55	55- 60	60- 65	65- 70	70- 75	75- 80	80- 85	85- 90
1.	In-Plant Survey On-Shift Position:																		
2.	On-Site Survey On-Shift Position:																		
3.	Personnel Monitoring On-Shift Position:																		
4.	Job Coverage On-Shift Position:																		
5.	Offsite Radiological Assessment On-Shift Position:																		
6.	Other Site-Specific RP – Describe: On-Shift Position:																		
7.	Chemistry function/task #1 – Describe: On-Shift Position:																		
8.	Chemistry function/task #2 – Describe: On-Shift Position:																		

**Notes:** RP and Chemistry in Duck and Cover Mode



## FNP On-Shift Staffing Analysis

**TABLE 5 – Emergency Plan Implementation**

**Event # 1**

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1.	Declare the Emergency	SM	EP/Ops Training and EP Drill Program
2.	ERO notification	SRO3/FBL	EP/Ops Training and EP Drill Program
3.	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	SRO3/FBL	EP/Ops Training and EP Drill Program
4.	Abbreviated NRC notification for DBT event	SRO3/FBL	EP/Ops Training and EP Drill Program
5.	Complete State/local notification form	SM	EP/Ops Training and EP Drill Program
6.	Approve State/local notifications	SM	EP/Ops Training and EP Drill Program
7.	Approve Offsite PARs	N/A	EP/Ops Training and EP Drill Program
8.	Perform State/local notifications	RO4/COM1	EP Training and EP Drill Program
9.	Dose Assessment	N/A	EP/Ops Training and EP Drill Program
10.	Complete NRC event notification form	SRO2	EP/Ops Training and EP Drill Program
11.	Perform NRC notifications <span style="color: red;">Note 1</span>	SRO2	EP/Ops Training and EP Drill Program
12.	Activate ERDS	RO4/COM1	EP/Ops Training and EP Drill Program
13.	Perform other site-specific event notifications (DM) <span style="color: red;">Note 2, 3</span>	SM SEC3	EP/Ops and Security Training and EP Drill Program
14.	Personnel accountability	N/A	EP/Ops Training and EP Drill Program
15.	Approve extension to allowable dose limits	N/A	EP/Ops Training and EP Drill Program

**Notes:** EAL – HS1, Site Area Emergency  
NMP-EP-141-001, Farley Emergency Action Levels and Basis, Rev 2  
NMP-EP-142, Emergency Notification, Rev 1  
Note 1 – SRO2 utilizes a headset/speaker phone to maintain an open line with the NRC.  
Note 2 – SM notifies the Duty Manager (DM) IAW NMP-EP-142, Emergency Notification.  
This notification is completed within  $\approx$  1-2 minutes and does not affect performance of other functions.  
Note 3 – SEC3 notifies LLEC to position Offsite Fire Departments.




## FNP On-Shift Staffing Analysis

Table 5A - E-Plan Implementation Timeline/Event # 1

Function/Task	On-shift Position	Time from Event Initiation																	
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
Declare the Emergency	SM	HS1																	
ERO notification	SRO3/FBL				X														
Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	SRO3/FBL	X			X														
Abbreviated NRC notification for DBT event	SRO3/FBL		X																
Complete State/local notification form	SM				X												X		
Approve State/local notifications	SM					X												X	
Approve Offsite PARs	N/A																		
Perform State/local notifications	RO4/COM1						X												X
Dose Assessment	N/A																		
Complete NRC event notification form	SRO2								X										
Perform NRC notifications <span style="color: red;">Note 1</span>	SRO2														X				
Activate ERDS	RO4/COM1									X									
Perform other site-specific event notifications (DM) <span style="color: red;">Note 2, 3</span>	SM						X												
	SEC3										X								
Personnel accountability	N/A																		
Approve extension to allowable dose limits	N/A																		

**Notes:** Note 1 – SRO2 utilizes a headset/speaker phone to maintain open line with NRC.  
Note 2 – SM notifies Duty Manager (DM) IAW NMP-EP-142, Emergency Notification. This notification is completed within ≈ 1-2 minutes and does not affect performance of other functions.  
Note 3 – SEC3 notifies LLEC to position Offsite Fire Department.

 Task completion time



## FNP On-Shift Staffing Analysis

### Event Timelines and Assumptions

#### **Event #2 Major Reactor Coolant System Pipe Rupture (LB LOCA) with release and resulting PARs (Fast Breaker)**

Initial Conditions:

Time: Monday @ 2200

Unit 1 @100% Power

RCS @ normal operating temperature and pressure

Sequence of Events:

2200 LB LOCA (double ended cold leg guillotine break) initiated on 1B Cold Leg  
(RCS leak rate > charging pump capacity)

2200:05 Rx trip on low pressurizer pressure  
Turbine Generator Trip

2200:15 Avg CETC reading 700 °F  
Containment Pressure ≈ 7 psig

Operators enter EOP/AOPs  
LOSP occurs both EDGs start and load to respective emergency buses  
SI initiated – B Train components fail

2203 Containment high-range Rad Monitors exceed GE values  
Containment pressure rapidly decreases  
Faulted containment results in release occurring exceeding PAGs  
PARs required

## FNP On-Shift Staffing Analysis

### Appendix B

**Event # 2: DBA/ISG - Large Break LOCA with release > PAGs and PARs**

**ECL: General Emergency**

**TABLE 1 – On-shift Positions**

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Action Required?
1.	Shift Manager (SM)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T5/L1 T5/L6 T5/L7 T5/L13 T5/L15	No	No
2.	Shift Supervisor (SRO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L1	No	No
3.	Shift Supervisor (SRO2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T5/L5 T5/L10 T5/L11	No	No
4.	Shift Support Supervisor (SRO3/FBL)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L2	No	No
5.	Reactor Operator (RO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L3 T5/L3	No	No
6.	Reactor Operator (RO2/COM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L4	No	No
7.	Reactor Operator (RO4/COM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T5/L2 T5/L3 T5/L8 T5/L12	No	No
8.	System Operator (SO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L5	No	No
9.	System Operator (SO4/FBM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L6	No	No
10.	System Operator (SO5/FBM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L7	No	No
11.	System Operator (SO7/FBM4)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L8	No	No



### FNP On-Shift Staffing Analysis

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Action Required?
12.	RP Technician (RP1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L9 T4/L4	No	No
13.	RP Technician (RP2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L10 T4/L3	No	No
14.	RP Technician (RP3/FMT)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T4/L1	No	No
15.	Chemistry Technician (CT1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L11 T4/L6	No	No
16.	Chemistry Technician (CT2/DA)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T4/L5 T5/L9	No	No
17.	SAS Operator (SEC1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T5/L14	No	No

**Notes:** Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, **OR** the functions are the same, **OR** the functions are performed sequentially without issue.



## FNP On-Shift Staffing Analysis

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

Event # 2

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

Applicable to unit 1

Line	Generic Title/Role	On-Shift Position	Task Performance Validation
1.	Shift Supervisor	Unit Supervisor (SRO1)	Operator Training
2.	Shift Support Supervisor	Shift Support Supervisor (SRO3/FBL)	Operator Training
3.	Reactor Operator	Reactor Operator (RO1)	Operator Training
4.	Reactor Operator	Reactor Operator (RO2/COM2)	Operator Training
5.	System Operator	System Operator (SO1)	Operator Training
6.	System Operator	System Operator (SO4/FBM1)	Operator Training
7.	System Operator	System Operator (SO5/FBM2)	Operator Training
8.	System Operator	System Operator (SO7/FBM4)	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
9.	RP Technician	RP Technician (RP1)	RP Training
10.	RP Technician	RP Technician (RP2)	RP Training
11.	Chemistry Technician	Chemistry Technician (CT1)	Chemistry Training

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



## FNP On-Shift Staffing Analysis

Table 2A – Procedure Timing Analysis

Event: #2

Title: Fast Breaker GE with Release and PARs

Procedure Step/Actions			Performance Time (mins) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
FNP-1-EEP-0, Reactor Trip or Safety Injection, Rev 49																				
Steps 1 - 4	Reactor Trip/SI Immediate Actions	SRO1 RO1 RO2/COM2	X																	
Steps 1 - 4	Verify Immediate Actions	SRO1 RO1	X																	
Steps 5 & 8	Control Aux Feed water Flow & Verify SI Automatic Actions & Foldout Page Actions	RO2/COM2	X																	
Step 6	Verify Containment Conditions and Automatic Actuations	SRO1 RO1	X																	
Step 7	Plant Announcement of Rx Trip and SI	RO1	X																	
Steps 9-10	Check MSIV, Pressurizer PORVs and Spray	SRO1 RO1		X																
Steps 11-12	Check RCP and Minimum Flows	SRO1 RO1		X																
Steps 13-15	Diagnostics – Transition to FNP-1-EEP-1 Loss of Rx Coolant	SRO1 RO1 SRO3/FBL		X																
FNP-0-SOP-0.0, General Instructions for Operations Personnel, Rev 164.2																				
Appendix A	Turbine Building actions after Rx Trip	SO4/FBM1 SO5/FBM2			X															
FNP-1-EEP-1, Loss of Reactor or Secondary Coolant, Rev 32																				
Steps 1-5	Verify Proper Plant Response	SRO1 RO1 SRO3/FBL		X																
Step 6	Close Recirc Valve Disconnects IAW Attachment 1	SO1 RP2			X															



## FNP On-Shift Staffing Analysis

Table 2A – Procedure Timing Analysis

Event: #2

Title: Fast Breaker GE with Release and PARs

Procedure Step/Actions			Performance Time (mins) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
Step 6	Place PAHA (2x) In Service IAW Attachment 2	SRO1 RO2/COM2				X														
Step 6	Plot Hydrogen Concentrations	SRO3/FBL				X (periodic)														
Step 6	Place Hydrogen Recombiners in Service IAW Attachment 3	RO2/COM2 SRO1									X									
Steps 7-9	Verify Proper Operation of SI Systems	SRO1 RO1 SRO3/FBL					X													
Step 11	Verify 4Kv Busses Energized IAW Attachment 4	SRO1 RO2/COM2											X							
Step 12	Monitor Diesel Operations	SO7/FBM4 RP1					X (periodic)													
Steps 13-14	Ensure Cold-Leg Recirc Capability & FNP-1-ESP-1.3 steps 1-6	RO1 RO2					X													
Steps 15	Transfer to Cold-Leg Recirc IAW FNP-1-ESP-1.3 (TCA)	SRO1						X												
FNP-1-ESP-1.3, Transfer to Cold Leg Recirculation, Rev 23																				
Step 7	CR Actions to Complete Cold-Leg Recirc Alignment	SRO1 RO2/COM2						X												
Steps 8-9	Check For Sump Blockage and Containment Spray Operations	SRO1 RO1						X												
Step 10	Align Containment Spray for Recirc (RWST ~4.5 Ft)	SRO1 RO1									X									




## FNP On-Shift Staffing Analysis

Table 2A – Procedure Timing Analysis

Event: #2

Title: Fast Breaker GE with Release and PARs

Procedure Step/Actions			Performance Time (mins) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
Step 12	Transition to FNP-1-EEP-1 Step 16	SRO1									X									
FNP-1-EEP-1, Loss of Reactor or Secondary Coolant, Rev 32 (continued)																				
Step 16	Isolate SI Accumulators	SRO1 RO1										X								
Step 17.2 & 17.3	Sample S/G for Activity IAW FNP-0-CCP-31 & FNP-0-CCP-645	CT1										X								
Step 17.5	Depressurize S/G via Atmosphere Relief Valves	SRO1 RO1															X			

 Task completion time

## FNP On-Shift Staffing Analysis

**TABLE 3 – Firefighting**

**Event # 2**

<b>Line</b>	<b>Performed By</b>	<b>Task Analysis Controlling Method</b>
1.	N/A	N/A
2.	N/A	N/A
3.	N/A	N/A
4.	N/A	N/A
5.	N/A	N/A

**Notes:** No Fire Brigade response required for this event.




# FNP On-Shift Staffing Analysis

**TABLE 4 – Radiation Protection & Chemistry**

**Event # 2**

Line	Position Performing Function/Task	Performance Time Period After Event Initiation (minutes)																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1.	Off-site Survey On-Shift Position: RP3/FMT				X														
2.	Personnel Monitoring On-Shift Position:																		
3.	Job Coverage – Close Recirc Valve Disconnects On-Shift Position: RP2			X															
4.	Job Coverage - Monitor Diesel Generator Bldg Rad Levels On-Shift Position: RP1				X (periodic)														
5.	Offsite Radiological Assessment On-Shift Position: CT2/DA				X														
6.	Chemistry function/task #1 – Describe: S/G sampling and analysis IAW FNP-0-CCP-31 and FNP-0-CCP-645 On-Shift Position: CT1										X								
7.	Chemistry function/task #2 – Describe: On-Shift Position:																		

**Notes:** NMP-EP-147, Offsite Dose Assessment, Rev 2  
FNP-0-CCP-31, Leak Rate Determinations, Rev 39  
FNP-0-CCP-645, Main Steam Abnormal Environmental Release, Rev 12

 Task completion time



## FNP On-Shift Staffing Analysis

**TABLE 5 – Emergency Plan Implementation**

Event # 2

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1.	Declare the Emergency	SM	EP/Ops Training and EP Drill Program
2.	ERO notification	RO4/COM1	EP/Ops Training and EP Drill Program
3.	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	RO1 RO4/COM1	EP/Ops Training and EP Drill Program
4.	Abbreviated NRC notification for DBT event	N/A	EP/Ops Training and EP Drill Program
5.	Complete State/local notification form	SRO2	EP/Ops Training and EP Drill Program
6.	Approve State/local notifications	SM	EP/Ops Training and EP Drill Program
7.	Approve Offsite PARs	SM	EP/Ops Training and EP Drill Program
8.	Perform State/local notifications	RO4/COM1	EP Training and EP Drill Program
9.	Dose Assessment	CT2/DA	EP/Chemistry Training/ EP Drill Program
10.	Complete NRC event notification form	SRO2	EP/Ops Training and EP Drill Program
11.	Perform NRC notifications <span style="color: red;">Note 1</span>	SRO2	EP/Ops Training and EP Drill Program
12.	Activate ERDS	RO4/COM1	EP/Ops Training and EP Drill Program
13.	Perform other site-specific event notifications (DM) <span style="color: red;">Note 2</span>	SM	EP/Ops Training and EP Drill Program
14.	Personnel accountability	SEC1	EP/Security Training and EP Drill Program
15.	Approve extension to allowable dose limits	SM	EP/Ops Training and EP Drill Program

**Notes:** EAL FG1, General Emergency  
 NMP-EP-141-001, Farley Emergency Action Levels and Basis, Rev 2  
 NMP-EP-142, Emergency Notification, Rev 1  
 NMP-EP-143, Protective Actions, Rev 2  
 NMP-EP-147, Offsite Dose Assessment, Rev 2  
Note 1 – SRO2 utilizes a headset/speaker phone to maintain an open line with the NRC.  
Note 2 – SM notifies the Duty Manager (DM) IAW NMP-EP-142, Emergency Notification. This notification is completed within  $\approx$  1-2 minutes and does not affect performance of other functions.



## FNP On-Shift Staffing Analysis

Table 5A - E-Plan Implementation Timeline/Event # 2

Function/Task	On-shift Position	Time from Event Initiation (minutes)																	
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
Declare the Emergency	SM	FG1																	
ERO notification	RO4/COM1				X														
Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	RO1	X																	
	RO4/COM1				X														
Abbreviated NRC notification for DBT event	N/A																		
Complete State/local notification form	SRO2				X												X		
Approve State/local notifications	SM					X												X	
Approve Offsite PARs	SM					X												X	
Perform State/local notifications	RO4/COM1					X													X
Dose Assessment	CT2/DA											X							
Complete NRC event notification form <span style="color: red;">Note 1</span>	SRO2						X												
Perform NRC notifications	SRO2												X						
Activate ERDS	RO4/COM1									X									
Perform other site-specific event notifications (DM) <span style="color: red;">Note 2</span>	SM							X											
Personnel accountability	SEC1						X												
Approve extension to allowable dose limits	SM																		(as necessary)

**Notes:** Note 1 – SRO 2 utilizes a headset/speaker phone to maintain an open line with the NRC.

Note 2 – SM notifies Duty Manager (DM) IAW NMP-EP-142, Emergency Notification. This notification is completed within ≈ 1-2 minutes and does not affect performance of other functions.

Task completion time

## **FNP On-Shift Staffing Analysis**

### **Event Timelines and Assumptions**

#### **Event #3 Major Secondary System Pipe Rupture Main Steam Line Break**

Initial Conditions:

Time: Saturday @ 0250

Unit 1 @ Mode 3 (Hot Standby); EOL

RCS @ Hot Standby operating temperature and pressure

Sequence of Events:

0250            1A Main Steam line fails upstream of the Isolation Valve, outside of containment.

                 Rx Trip initiated on low steamline pressure signal  
                 One RCCA stuck in full withdrawn position

                 Loss of offsite power occurs  
                 D/G's start and load within 60 seconds

                 Start of the reactor coolant pump coastdown is assumed to occur coincident with  
                 reactor trip.

                 SI initiated  
                 'B' Train of SI fails

                 Increase observed on IRE-15A (SJAE) readings (500 ccpm)



## FNP On-Shift Staffing Analysis

### Appendix B

**Event # 3: DBA/ISG - Main Steam Line Break**

**ECL: Unusual Event**

**TABLE 1 – On-shift Positions**

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Action Required?
1.	Shift Manager (SM)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L1 T5/L1 T5/L6 T5/L13	No	No
2.	Shift Supervisor (SRO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L2	No	No
3.	Shift Supervisor (SRO2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T5/L5 T5/L10 T5/L11	No	No
4.	Shift Support Supervisor (SRO3/FBL)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L3	No	No
5.	Reactor Operator (RO3)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L4	No	No
6.	Reactor Operator (RO2/COM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L5	No	No
7.	Reactor Operator (RO4/COM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T5/L2 T5/L3 T5/L8	No	No
8.	System Operator (SO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L6	No	No
9.	System Operator (SO4/FBM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L7	No	No
10.	System Operator (SO5/FBM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L8	No	No
11.	System Operator (SO6/FBM3)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L9	No	No
12.	System Operator (SO7/FBM4)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L10	No	No

### FNP On-Shift Staffing Analysis

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Action Required?
13.	RP Technician (RP1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T4/L3	No	No
14.	Chemistry Technician (CT1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L11 T4/L7 T4/L8 T4/L9	No	No
15.	Chemistry Technician (CT2/DA)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T4/L5 T5/L9	No	No

**Notes:** Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, **OR** the functions are the same, **OR** the functions are performed sequentially without issue.



## FNP On-Shift Staffing Analysis

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

Event # 3

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

Applicable to unit 1

Line	Generic Title/Role	On-Shift Position	Task Performance Validation
1.	Shift Manager	Shift Manager/Emergency Director (SM)	Operator Training
2.	Shift Supervisor	Shift Supervisor (SRO1)	Operator Training
3.	Shift Support Supervisor	Shift Support Supervisor (SRO3/FBL)	Operator Training
4.	Reactor Operator	Reactor Operator (RO1)	Operator Training
5.	Reactor Operator	Reactor Operator (RO2/COM2)	Operator Training
6.	System Operator	System Operator (SO1)	Operator Training
7.	System Operator	System Operator (SO4/FBM1)	Operator Training
8.	System Operator	System Operator (SO5/FBM2)	Operator Training
9.	System Operator	System Operator (SO6/FBM3)	Operator Training
10.	System Operator	System Operator (SO7/FBM4)	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
11.	Chemistry Technician	Chemistry Technician (CT1)	Chemistry Training

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



## FNP On-Shift Staffing Analysis

Table 2A - Procedure Timing Analysis

Event: #3 Title: Main Steam Line Break

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
FNP-1-EEP-0, Reactor Trip or Safety Injection, Rev 49																				
Steps 1-4	Trip Immediate Actions (Performed from Memory)	SRO1 RO1 RO2/COM2	X																	
Steps 1-4	Verify Reactor Trip	SRO1 RO1	X																	
Step 5 (Attach 2)	Verify Actuation Signal (SI) Automatic Actions	RO2/COM2	X																	
Step 5, (Attach 2 Step 17)	Transition to Attach 4 of EEP-0, Two Train ECCS Alignment Verification	RO2/COM2				X														
Step 5, (Attach 5 Step 1.9)	Check Spent Fuel Pool Cooling	SO1					X													
Step 7	Announce Reactor Trip and Safety Injection	RO2/COM2		X																
Various	Perform Required Actions in Response to Event (Not Listed Separately e.g. FW/Rx status)	SRO1 RO1	X																	
Step 9	Close MSIVs	RO1			X															
Step 9.1.9	Break Condenser Vacuum (Isolate Gland Steam)	SO4/FBM1		X																
Step 13	Check S/G Not Faulted (FNP-1-EEP-2)	SRO1 RO1			X															
FNP-0-SOP-0.0 General Instructions to Operations Personnel, Rev 164.2																				
Appendix B	Field Reactor Trip Response	SO4/FBM1 SO5/FBM2		X																
Actions per Operations Training																				
NA	STA Duties	SRO3/FBL	X (periodic)																	
NA	Offsite Power Restoration	SM				X														



## FNP On-Shift Staffing Analysis

Table 2A - Procedure Timing Analysis

Event: #3

Title: Main Steam Line Break

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
FNP-1-EEP-2.0, Faulted SG Isolation, Rev 16																				
Various	Perform Required Actions in Response to Event (Not Listed Separately e.g. FW/Rx status)	SRO1 RO1			X															
Step 3	Identify Faulted S/G	SRO1 RO1			X															
Step 4	Isolate Faulted S/G	SRO1 RO1			X															
Step 5.1	Isolate AFW to Faulted S/G	RO2/COM2				X														
Step 5.3	Locally Isolate AFW to Faulted S/G	SO6/FBM3				X														
Step 7.1	Direct Chemistry to perform FNP-0-CCP-31	SRO1					X													
Step 7.2	Check S/G Radiation Normal (Alternate Indications Demonstrate NO Tube Rupture)	SRO3/FBL					X													
Step 8.5	Transition to FNP-1-ESP-1.1 (SI Termination)	SRO1 RO1					X													
FNP-1-ESP-1.1, SI Termination, Rev 26																				
Steps 1-11	Perform Actions in Response to Event (Not Listed Separately e.g. FW/Rx status)	SRO1 RO1					X													
Step 12	Verify 4160V Busses Energized – Att 1	RO2/COM2							X											
Step 13.1.1	Perform CCP-645, Main Steam Abnormal Environmental Release	CT1							X											
Step 13.1.2	Maintain RCS Hot Leg Temperature Stable	RO1							X											




## FNP On-Shift Staffing Analysis

Table 2A - Procedure Timing Analysis

Event: #3

Title: Main Steam Line Break

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
Step 14	Establish Letdown	SRO1 RO1									X									
Step 14.1.1	Check Position of Letdown Line Penetration Room Isolation Valves	SO1									X									
Step 16	Align Reactor Water Makeup System	RO1										X								
Step 16.3	Sample and Analyze RCS for Boron Concentration using FNP-1-CCP-651 (Sampling the RCS)	CT1											X							
Step 20.2.2	Check RCDT Pressure Locally	SO1											X							
Step 22	Establish Auxiliary Spray	SRO1 RO1													X					
NA	Monitor DG Operations	SO7/FBM4				X (periodic)														
Step 28	Restore RCDT to Normal Alignment per FNP-1-SOP-50.0 (Liquid Waste Processing System)	SO1														X				

 Task completion time



## FNP On-Shift Staffing Analysis

**TABLE 3 – Firefighting**

**Event # 3**

<b>Line</b>	<b>Performed By</b>	<b>Task Analysis Controlling Method</b>
1.	N/A	N/A
2.	N/A	N/A
3.	N/A	N/A
4.	N/A	N/A
5.	N/A	N/A

**Notes:** No Fire Brigade response required for this event.

# FNP On-Shift Staffing Analysis

TABLE 4 – Radiation Protection & Chemistry

Event # 3

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1.	In-Plant Survey On-Shift Position:																		
2.	On-Site Survey/Field Monitoring Team On-Shift Position:																		
3.	Personnel Monitoring On-Shift Position: RP1			X															
4.	Job Coverage On-Shift Position:																		
5.	Offsite Radiological Assessment On-Shift Position: CT2/DA			X															
6.	Other Site-Specific RP – Describe: On-Shift Position:																		
7.	Chemistry function/task #1 – Describe: Perform CCP-31 On-Shift Position: CT1				X														
8.	Chemistry function/task #2 – Describe: Perform CCP-645 On-Shift Position: CT1						X												
9.	Chemistry function/task #3 – Describe: Sample and analyze RCS On-Shift Position: CT1											X							

**Notes:** Chemistry post-trip sampling after ERO augmentation.

NMP-EP-147, Offsite Dose Assessment, Rev 2

FNP-0-CCP-31, Leak Rate Determination, Rev 39

FNP-0-CCP-645, Main Steam Abnormal Environmental Release, Rev 12. Note – this task is related to completion of release permit paperwork and can be performed in parallel with CCP-31.

FNP-1-CCP-651, Sampling the RCS, Rev 35



Task completion time



## FNP On-Shift Staffing Analysis

**TABLE 5 – Emergency Plan Implementation**

**Event # 3**

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1.	Declare the Emergency	SM	EP/Ops Training and EP Drill Program
2.	ERO notification	RO4/COM1	EP/Ops Training and EP Drill Program
3.	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	RO4/COM1	EP/Ops Training and EP Drill Program
4.	Abbreviated NRC notification for DBT event	N/A	EP/Ops Training and EP Drill Program
5.	Complete State/local notification form	SRO2	EP/Ops Training and EP Drill Program
6.	Approve State/local notifications	SM	EP/Ops Training and EP Drill Program
7.	Approve Offsite PARs	N/A	EP/Ops Training and EP Drill Program
8.	Perform State/local notifications	RO4/COM1	EP Training and EP Drill Program
9.	Dose Assessment	CT2/DA	EP/Ops Training and EP Drill Program
10.	Complete NRC event notification form	SRO1	EP/Ops Training and EP Drill Program
11.	Perform NRC notifications	SRO1	EP/Ops Training and EP Drill Program
12.	Activate ERDS	N/A	EP/Ops Training and EP Drill Program
13.	Perform other site-specific event notifications (DM) <span style="color: red;">Note 1</span>	SM	EP/Ops Training and EP Drill Program
14.	Personnel accountability	N/A	EP/Ops Training and EP Drill Program
15.	Approve extension to allowable dose limits	N/A	EP/Ops Training and EP Drill Program

**Notes:** EAL RU1, Unusual Event  
 NMP-EP-141-001, Farley Emergency Action Levels and Basis, Rev 2  
 NMP-EP-142, Emergency Notification, Rev 1  
 NMP-EP-147, Offsite Dose Assessment, Rev 2  
Note 1 – SM notifies the Duty Manager (DM) IAW NMP-EP-142, Emergency Notification.  
 This notification is completed within  $\approx$  1-2 minutes and does not affect performance of other functions.




## FNP On-Shift Staffing Analysis

Table 5A - E-Plan Implementation Timeline/Event # 3

Function/Task	On-shift Position	Time from Event Initiation																		
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	
Declare the Emergency	SM	RU1																		
ERO notification	RO4/COM1				X															
Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	RO4/COM1	X																		
Abbreviated NRC notification for DBT event	N/A																			
Complete State/local notification form	SRO2				X												X			
Approve State/local notifications	SM					X												X		
Approve Offsite PARs	N/A																			
Perform State/local notifications	RO4/COM1						X												X	
Dose Assessment	CT2/DA				X															
Complete NRC event notification form	SRO1						X													
Perform NRC notifications	SRO1									X										
Activate ERDS	N/A																			
Perform other site-specific event notifications (DM) <small>Note 1</small>	SM							X												
Personnel accountability	N/A																			
Approve extension to allowable dose limits	N/A																			

**Notes:** Note 1 – SM notifies Duty Manager (DM) IAW NMP-EP-142, Emergency Notification. This notification is completed within ≈ 1-2 minutes and does not affect performance of other functions.

 Task completion time



## FNP On-Shift Staffing Analysis

### Event Timelines and Assumptions

#### Event #5 Steam Generator Tube Rupture

Initial Conditions:

Time: Wednesday @ 2100

Unit 1 @ 100% Power

RCS @ normal operating temperature and pressure

Primary coolant activity @ TS limit for operation

Sequence of Events:

- |      |  |
|------|--|
| 2105 | Condenser Vacuum Exhaust radiation monitor, 1-RE-15A & R70C begin to increase above background   |
| 2106 | Slight increase observed in 1C S/G level<br>MS Line radiation monitors increase above background<br>Pressurizer level observed to be decreasing  |
| 2107 | Control operators initiate actions to increasing pressurizer level and troubleshoot S/G tube leakage<br><br>SGTR occurs – double ended guillotine break of one SG tube in 1C S/G<br><br>Secondary rad monitors in Alarm  |
| 2110 | Rx trip on overtemperature $\Delta T$ or manual trip by RO due to inability to maintain PRZR Level<br><br>Highest worth control rod stuck in fully withdrawn position<br><br>SI initiated<br><br>Loss of station normal power occurs; EDG startup and provide power to necessary engineered safeguards equipment |
| 2140 | RCS Cooldown initiated   |

## FNP On-Shift Staffing Analysis

### Appendix B

**Event #5: DBA/ISG - Steam Generator Tube Rupture**

**ECL: Alert**

**TABLE 1 – On-shift Positions**

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Action Required?
1.	Shift Manager (SM)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L1 T5/L1 T5/L6 T5/L13	No	No
2.	Shift Supervisor (SRO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L2	No	No
3.	Shift Supervisor (SRO2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T5/L5 T5/L10 T5/L11	No	No
4.	Shift Support Supervisor (SRO3/FBL)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L3	No	No
5.	Reactor Operator (RO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L4	No	No
6.	Reactor Operator (RO2/COM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L5 T5/L3	No	No
7.	Reactor Operator (RO4/COM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T5/L2 T5/L3 T5/L8 T5/L12	No	No <sup>5</sup>
8.	System Operator (SO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L6	No	No
9.	System Operator (SO4/FBM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L7	No	No
10.	System Operator (SO5/FBM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L8	No	No
11.	System Operator (SO6/FBM3)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L9	No	No
12.	System Operator (SO7/FBM4)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L10	No	No



### FNP On-Shift Staffing Analysis

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Action Required?
13.	RP Technician (RP1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T4/L3	No	No
14.	RP Technician (RP3/FMT)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T4/L1	No	No
15.	Chemistry Technician (CT1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L11 T4/L6	No	No
16.	Chemistry Technician (CT2/DA)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T4/L4 T5/L9	No	No
17.	SAS Operator (SEC1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T5/L14	No	No

**Notes:** Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, **OR** the functions are the same, **OR** the functions are performed sequentially without issue.

## FNP On-Shift Staffing Analysis

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

Event # 5

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

Applicable to unit 1

Line	Generic Title/Role	On-Shift Position	Task Performance Validation
1.	Shift Manager	Shift Manager (SM)	Operator Training
2.	Shift Supervisor	Shift Supervisor (SRO1)	Operator Training
3.	Shift Support Supervisor	Shift Support Supervisor (SRO3/FBL)	Operator Training
4.	Reactor Operator	Reactor Operator (RO1)	Operator Training
5.	Reactor Operator	Reactor Operator (RO2/COM2)	Operator Training
6.	System Operator	System Operator (SO1)	Operator Training
7.	System Operator	System Operator (SO4/FBM1)	Operator Training
8.	System Operator	System Operator (SO5/FBM2)	Operator Training
9.	System Operator	System Operator (SO6/FBM3)	Operator Training
10.	System Operator	System Operator (SO7/FBM4)	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
11.	Chemistry Technician	Chemistry Technician (CT1)	Chemistry Training

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



## FNP On-Shift Staffing Analysis

Table 2A - Procedure Timing Analysis

Event: #5

Title: Steam Generator Tube Rupture

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
FNP-1-ARP-1.6, SG Tube Leak Above Setpoint, Rev 77.3																				
Step 1	Determine magnitude using R-70, A, B, & C	RO2/COM2	X																	
Step 6	Verify SGTR using R-70s	SRO3/FBL	X																	
Step 6.1	Place SJAE Filtration System in Service IAW FNP-1-SOP-28.5	SO4/FBM1	X																	
FNP-1-AOP-2.0, Faulted SG Isolation, Rev 37																				
Step 1	Maintain Pressurizer Level Stable (Unable to Maintain, Trip and Safety Injection, and transition to FNP-1-EEP-0.0	RO1	X																	
FNP-1-EEP-0, Rx Trip or Safety Injection, Rev 49																				
Steps 1-4	Trip Immediate Actions (Performed from Memory)	SRO1 RO1 RO2/COM2		X																
Steps 1-4	Verify Reactor Trip	SRO1 RO1		X																
Step 5 (Att 2)	Verify Actuation Signal (SI) Automatic Actions	RO2/COM2		X																
Step 5 (Att 2, Step 17)	Transition to Attach 4 of EEP-0, Two Train ECCS Alignment Verification	RO2/COM2					X													
Step 5 (Att 5, Step 1.9)	Check Spent Fuel Pool Cooling	SO1						X												
Step 7	Announce Reactor Trip and Safety Injection	RO2/COM2			X															
Various	Perform Required Actions in Response to Event (Not Listed Separately e.g. FW/Rx status)	SRO1 RO1		X																



## FNP On-Shift Staffing Analysis

Table 2A - Procedure Timing Analysis

Event: #5

Title: Steam Generator Tube Rupture

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
Step 14	Check S/G Not Ruptured FNP-1-EEP-3	SRO1 RO1						X												
FNP-0-SOP-0.0, General Instructions for Operations Personnel, Rev 164.2																				
Appendix B	Field Reactor Trip Response	SO4/FBM1 SO5/FBM2			X															
Actions per operations Training																				
NA	STA Duties	SRO3/FBL	X (periodic)																	
NA	Offsite Power Restoration	SM				X														
NA	Monitor DG Operations	SO7/FBM4				X (periodic)														
FNP-1-EEP-3, SG Tube Rupture, Rev 30																				
Various	Perform Required Actions in Response to Event (Not Listed Separately e.g. FW/Rx status)	SRO1 RO1				X (periodic)														
Step 2	Identify Ruptured S/G	SRO1 RO1				X														
Step 3	Isolate Ruptured S/G	SRO1 RO1				X														
Step 3.3.1	Check 1C S/G Ruptured	SRO1 RO1				X														
Step 3.3.2	FNP-0-CCP-645 (Main Steam Line Abnormal Environmental Release)	CT1					X													
Step 3.4	Isolate Steam Supply to TDAFW from 1C S/G @ Hot Shutdown Panel	SO6/FBM3				X														
Step 4	Check Ruptured S/G Level >31%	RO1						X												




## FNP On-Shift Staffing Analysis

Table 2A - Procedure Timing Analysis

Event: #5 Title: Steam Generator Tube Rupture

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
Step 4.1	Isolate AFW to Ruptured S/G	RO2/COM2						X												
Step 6	Perform RCS Cooldown	SR01 RO1 RO2/COM2 SRO3/FBL							X											
Step 17-18	Reduce RCS Pressure to Minimize Break Flow and Refill Pressurizer	SR01 RO1										X								
Step 20	Check SI Termination Criteria	SR01 RO2/COM2											X							
Step 21-22	Terminate SI Flow	SR01 RO2/COM2												X						
Step 23	Establish Normal Charging	SR01 RO2/COM2													X					
Steps 28 & 29	Establish Letdown and align Charging to VCT	SR01 RO2/COM2														X				
Step 31	Control RCS Parameters to Minimize Leakage	SR01 RO1															X			

 Task completion time



## FNP On-Shift Staffing Analysis

**TABLE 3 – Firefighting**

**Event # 5**

<b>Line</b>	<b>Performed By</b>	<b>Task Analysis Controlling Method</b>
1.	N/A	N/A
2.	N/A	N/A
3.	N/A	N/A
4.	N/A	N/A
5.	N/A	N/A

**Notes:** No Fire Brigade response required for this event.




## FNP On-Shift Staffing Analysis

**TABLE 4 – Radiation Protection & Chemistry**

Event # 5

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1.	Off-site Survey On-Shift Position: RP3/FMT					X													
2.	Personnel Monitoring On-Shift Position:																		
3.	Job Coverage (Turbine Bldg Tasks) On-Shift Position: RP1	X																	
4.	Offsite Radiological Assessment On-Shift Position: CT2/DA						X												
5.	Other Site-Specific RP – Describe: On-Shift Position:																		
6.	Chemistry function/task #1 – Describe: Initiate CCP-645 On-Shift Position: CT1					X													

**Notes:** NMP-EP-147, Offsite Dose Assessment, Rev 2  
FNP-0-CCP-645, Main Steam Abnormal Environmental Release, Rev 12

 Task completion time



## FNP On-Shift Staffing Analysis

**TABLE 5 – Emergency Plan Implementation**

Event # 5

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1.	Declare the Emergency	SM	EP/Ops Training and EP Drill Program
2.	ERO notification	RO4/COM1	EP/Ops Training and EP Drill Program
3.	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	RO2/COM2 RO4/COM1	EP/Ops Training and EP Drill Program
4.	Abbreviated NRC notification for DBT event	N/A	EP/Ops Training and EP Drill Program
5.	Complete State/local notification form	SRO2	EP/Ops Training and EP Drill Program
6.	Approve State/local notifications	SM	EP/Ops Training and EP Drill Program
7.	Approve Offsite PARs	N/A	EP/Ops Training and EP Drill Program
8.	Perform State/local notifications	RO4/COM1	EP Training and EP Drill Program
9.	Dose Assessment	CT2/DA	EP/Ops Training and EP Drill Program
10.	Complete NRC event notification form	SRO2	EP/Ops Training and EP Drill Program
11.	Perform NRC notifications <span style="color: red;">Note 1</span>	SRO2	EP/Ops Training and EP Drill Program
12.	Activate ERDS	RO4/COM1	EP/Ops Training and EP Drill Program
13.	Perform other site-specific event notifications (DM) <span style="color: red;">Note 2</span>	SM	EP/Ops Training and EP Drill Program
14.	Personnel accountability	SEC1	EP/Security Training and EP Drill Program
15.	Approve extension to allowable dose limits	N/A	EP/Ops Training and EP Drill Program

**Notes:** EAL FA1, Alert  
 NMP-EP-141-001, Farley Emergency Action Levels and Basis, Rev 2  
 NMP-EP-142, Emergency Notification, Rev 1  
 NMP-EP-147, Offsite Dose Assessment, Rev 2  
Note 1 – SRO2 utilizes a headset/speaker phone to maintain an open line with the NRC.  
Note 2 – SM notifies the Duty Manager (DM) IAW NMP-EP-142, Emergency Notification. This notification is completed within  $\approx$  1-2 minutes and does not affect performance of other functions.




## FNP On-Shift Staffing Analysis

Table 5A - E-Plan Implementation Timeline/Event # 5

Function/Task	On-shift Position	Time from Event Initiation (minutes)																	
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
Declare the Emergency	SM	FA1																	
ERO notification	RO4/COM1				X														
Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	RO2/COM2			X															
	RO4/COM1				X														
Abbreviated NRC notification for DBT event	N/A																		
Complete State/local notification form	SRO2				X												X		
Approve State/local notifications	SM					X												X	
Approve Offsite PARs	N/A																		
Perform State/local notifications	RO4/COM1					X													X
Dose Assessment	CT2/DA											X							
Complete NRC event notification form	SRO2						X												
Perform NRC notifications <span style="color: red;">Note 1</span>	SRO2													X					
Activate ERDS	RO4/COM1									X									
Perform other site-specific event notifications (DM) <span style="color: red;">Note 2</span>	SM							X											
Personnel accountability	SEC1						X												
Approve extension to allowable dose limits	N/A																		

**Notes:** Note 1 – SRO2 utilizes a headset/speaker phone to maintain an open line with the NRC.

Note 2 – SM notifies the Duty Manager (DM) IAW NMP-EP-142, Emergency Notification. This notification is completed within ≈ 1-2 minutes and does not affect performance of other functions.

 Task completion time

## **FNP On-Shift Staffing Analysis**

### **Event Timelines and Assumptions**

#### **Event #6 Single Reactor Coolant Pump Locked Rotor**

Initial Conditions:

Time: Friday @1945

Unit 2 @ 100% Power

RCS @ maximum steady-state temperature and pressure

Sequence of Events:

1950:00	2B RCP rotor seizes
1950:01	Rx Trip initiated on low RCS flow signal One control rod remains fully withdrawn (highest worth rod)
1950:03	RCS pressure increases PRZR Spray fails to initiate  Loss of Offsite Power occurs; EDGs start
1951:03	EDGs load and provide power to essential buses



## FNP On-Shift Staffing Analysis

### Appendix B

**Event # 6: DBA/ISG - Locked RCP Rotor**  
**TABLE 1 – On-shift Positions**

**ECL: Unusual Event**

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Action Required?
1.	Shift Manager (SM)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L1 T5/L1 T5/L6 T5/L13	No	No
2.	Shift Supervisor (SRO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T5/L5 T5/L10 T5/L11	No	No
3.	Shift Supervisor (SRO2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L2	No	No
4.	Shift Support Supervisor (SRO3/FBL)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L3	No	No
5.	Reactor Operator (RO2/COM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T5/L2 T5/L3 T5/L8	No	No
6.	Reactor Operator (RO3)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L4 T5/L3	No	No
7.	Reactor Operator (RO4/COM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L5	No	No
8.	System Operator (SO2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L6	No	No
9.	System Operator (SO4/FBM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L7	No	No
10.	System Operator (SO5/FBM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L8	No	No
11.	System Operator (SO7/FBM4)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L9	No	No

### FNP On-Shift Staffing Analysis

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Action Required?
12.	Chemistry Technician (CT1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L10 T4/L6 T4/L7	No	No

**Notes:** Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, **OR** the functions are the same, **OR** the functions are performed sequentially without issue.



## FNP On-Shift Staffing Analysis

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

Event # 6

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

Applicable to unit 2

Line	Generic Title/Role	On-Shift Position	Task Performance Validation
1.	Shift Manager	Shift Manager (SM)	Operator Training
2.	Shift Supervisor	Shift Supervisor (SRO2)	Operator Training
3.	Shift Support Supervisor	Shift Support Supervisor (SRO3/FBL)	Operator Training
4.	Reactor Operator	Reactor Operator (RO3)	Operator Training
5.	Reactor Operator	Reactor Operator (RO4/COM1)	Operator Training
6.	System Operator	System Operator (SO2)	Operator Training
7.	System Operator	System Operator (SO4/FBM1)	Operator Training
8.	System Operator	System Operator (SO5/FBM2)	Operator Training
9.	System Operator	System Operator (SO7/FBM4)	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
10.	Chemistry Technician	Chemistry Technician (CT1)	Chemistry Training

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



## FNP On-Shift Staffing Analysis

Table 2A - Procedure Timing Analysis

Event: #6

Title: Locked Rotor

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
FNP-2-EEP-0, Rx Trip or Safety Injection, Rev 46																				
Steps 1-4	Trip Immediate Actions (Performed from Memory)	SRO2 RO3 RO4/COM1	X																	
Steps 1-4	Verify Reactor Trip	SRO2 RO3	X																	
FNP-0-SOP-0.0, General Instruction for Operations Personnel, Rev 164.2																				
Appendix B	Field Reactor Trip Response	SO4/FBM1 SO5/FBM2		X																
Actions per Operations Training																				
NA	STA Duties	SRO3/FBL	X (periodic)																	
FNP-2-ESP-0.1, Rx Trip Response, Rev 34																				
Step 5	Announce Reactor Trip	RO3		X																
Step 7 (Attach 2)	Verify 4160V Busses Energized	RO4/COM1		X																
Attach 2, Step 1.1	Coordinate/Restore Offsite Power	SM					X													
Attach 2, Step 1.14	Check SFPC in Service per SOP-54.0	SO2					X													
Step 10.2.2.3	Establish Auxiliary Spray	RO3			X															
Step 11.1.1	Perform CCP-645, Main Steam Abnormal Environmental Release	CT1				X														
Step 20.1	Check at least one RCP Started	SRO2 RO3							X (periodic)											
Step 20.1.1	Notify Chemistry Isolate ZAS	RO4/COM1							X											
SRO Direction	Monitor Diesel Generators	SO7/FBM4					X (periodic)													



## FNP On-Shift Staffing Analysis

Table 2A - Procedure Timing Analysis

Event: #6 Title: Locked Rotor

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																		
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	
Step 20.1.2	Shutdown Unit following Reactor trip IAW FNP-2-ESP-0.2	SRO2 RO3 RO4/COM1							X												

Task completion time

## FNP On-Shift Staffing Analysis

**TABLE 3 – Firefighting**

**Event # 6**

Line		Performed By	Task Analysis Controlling Method
1.		N/A	N/A
2.		N/A	N/A
3.		N/A	N/A
4.		N/A	N/A
5.		N/A	N/A

**Notes:** No Fire Brigade response required for this event.



# FNP On-Shift Staffing Analysis

**TABLE 4 – Radiation Protection & Chemistry**

**Event # 6**

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1.	Off-site Survey On-Shift Position:																		
2.	Personnel Monitoring On-Shift Position:																		
3.	Job Coverage On-Shift Position:																		
4.	Offsite Radiological Assessment On-Shift Position:																		
5.	Other Site-Specific RP – Describe: On-Shift Position:																		
6.	Chemistry function/task #1 – Describe: Perform CCP-645 On-Shift Position: CT1				X														
7.	Chemistry function/task #2 – Describe: Isolate Zinc Addition System (ZAS) On-Shift Position: CT1							X											

**Notes:** FNP-0-CCP-645, Main Steam Abnormal Environmental Release, Rev 12  
FNP-2-CCP-335, Zinc Addition System (ZAS), Rev 23.1



## FNP On-Shift Staffing Analysis

**TABLE 5 – Emergency Plan Implementation**

**Event # 6**

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1.	Declare the Emergency	SM	EP/Ops Training and EP Drill Program
2.	ERO notification	RO2/COM2	EP/Ops Training and EP Drill Program
3.	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	RO3 RO2/COM2	EP/Ops Training and EP Drill Program
4.	Abbreviated NRC notification for DBT event	N/A	EP/Ops Training and EP Drill Program
5.	Complete State/local notification form	SRO1	EP/Ops Training and EP Drill Program
6.	Approve State/local notifications	SM	EP/Ops Training and EP Drill Program
7.	Approve Offsite PARs	N/A	EP/Ops Training and EP Drill Program
8.	Perform State/local notifications	RO2/COM2	EP Training and EP Drill Program
9.	Dose Assessment	N/A	EP/Ops Training and EP Drill Program
10.	Complete NRC event notification form	SRO1	EP/Ops Training and EP Drill Program
11.	Perform NRC notifications <span style="color: red;">Note 1</span>	SRO1	EP/Ops Training and EP Drill Program
12.	Activate ERDS	N/A	EP/Ops Training and EP Drill Program
13.	Perform other site-specific event notifications (DM) <span style="color: red;">Note 2</span>	SM	EP/Ops Training and EP Drill Program
14.	Personnel accountability	N/A	EP/Ops Training and EP Drill Program
15.	Approve extension to allowable dose limits	N/A	N/A

**Notes:** EAL SU1, Unusual Event

NMP-EP-141-001, Farley Emergency Action Levels and Basis, Rev 2

NMP-EP-142, Emergency Notifications, Rev 1

Note 1 – SRO1 utilizes a headset/speaker phone to maintain an open line with the NRC.

Note 2 – SM notifies the Duty Manager (DM) IAW NMP-EP-142, Emergency Notification. This notification is completed within  $\approx$  1-2 minutes and does not affect performance of other functions.




## FNP On-Shift Staffing Analysis

Table 5A - E-Plan Implementation Timeline/Event # 6

Function/Task	On-shift Position	Time from Event Initiation																	
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
Declare the Emergency	SM	SU1																	
ERO notification	RO2/COM2				X														
Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	RO3	X																	
	RO2/COM2				X														
Abbreviated NRC notification for DBT event	N/A																		
Complete State/local notification form	SRO1				X												X		
Approve State/local notifications	SM					X												X	
Approve Offsite PARs	N/A																		
Perform State/local notifications	RO2/COM2					X													X
Dose Assessment	N/A																		
Complete NRC event notification form	SRO1						X												
Perform NRC notifications <span style="color: red;">Note 1</span>	SRO1								X										
Activate ERDS	N/A																		
Perform other site-specific event notifications (DM) <span style="color: red;">Note 2</span>	SM							X											
Personnel accountability	N/A																		
Approve extension to allowable dose limits	N/A																		

**Notes:** Note 1 – SRO1 utilizes a headset/speaker phone to maintain an open line with the NRC.

Note 2 – SM notifies the Duty Manager (DM) IAW NMP-EP-142, Emergency Notification. This notification is completed within ≈ 1-2 minutes and does not affect performance of other functions.

 Task completion time

## **FNP On-Shift Staffing Analysis**

### **Event Timelines and Assumptions**

#### **Event #9 ATWS**

Initial Conditions:

Time: Saturday @ 1400

Unit 2 @ 100% Power

RCS @ normal operating temperature and pressure

Sequence of Events:

1400 Turbine trip occurs due to loss of main condenser vacuum without RPS initiated Rx Trip signal

Manual Rx trip by OATC in control room is successful

1405 Unit 2 Shift Supervisor informs Shift Manager of initiating conditions and event



## FNP On-Shift Staffing Analysis

### Appendix B

**Event # 9: DBA/ISG - ATWS**  
**TABLE 1 – On-shift Positions**

**ECL: Unusual Event**

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Action Required?
1.	Shift Manager (SM)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T5/L1 T5/L6 T5/L13	No	No
2.	Shift Supervisor (SRO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T5/L5 T5/L10 T5/L11	No	No
3.	Shift Supervisor (SRO2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L1	No	No
4.	Shift Support Supervisor (SRO3/FBL)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L2	No	No
5.	Reactor Operator (RO2/COM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T5/L2 T5/L3 T5/L8	No	No
6.	Reactor Operator (RO3)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L3 T5/L3	No	No
7.	Reactor Operator (RO4/COM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L4	No	No
8.	System Operator (SO2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L5	No	No
9.	System Operator (SO4/FBM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L6	No	No
10.	System Operator (SO5/FBM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L7	No	No

**Notes:** Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, **OR** the functions are the same, **OR** the functions are performed sequentially without issue.



## FNP On-Shift Staffing Analysis

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

Event # 9

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

Applicable to unit 2

Line	Generic Title/Role	On-Shift Position	Task Performance Validation
1.	Shift Supervisor	Shift Supervisor (SRO2)	Operator Training
2.	Shift Technical Advisor	Shift Support Supervisor (SRO3/FBL)	Operator Training
3.	Reactor Operator	Reactor Operator (RO3)	Operator Training
4.	Reactor Operator	Reactor Operator (RO4/COM1)	Operator Training
5.	System Operator	System Operator (SO2)	Operator Training
6.	System Operator	System Operator (SO4/FBM1)	Operator Training
7.	System Operator	System Operator (SO5/FBM2)	Operator Training

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




## FNP On-Shift Staffing Analysis

Table 2A - Procedure Timing Analysis

Event: #9

Title: ATWS

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
FNP-2-EOP-0, Rx Trip or Safety Injection, Rev 46																				
Steps 1-4	Trip Immediate Actions (Performed from Memory)	SRO2 RO3 RO4/COM1	X																	
Steps 1-4	Verify/Initiate Reactor Trip	SRO2 RO4/COM1	X																	
FNP-0-SOP-0.0, General Instruction for Operations Personnel, Rev 164.2																				
Appendix A	Field Reactor Trip Response	SO4/FBM1 SO5/FBM2		X																
Actions per Operations Training																				
NA	STA Duties	SRO3/FBL	X (periodic)																	
FNP-2-ESP-0.1, Rx Trip Response, Rev 34																				
Step 5	Announce Reactor Trip	RO3		X																
Step 7	Verify 4160V Busses Energized IAW Attach 2	RO4/COM1		X																
Attach 2, Step 1.14	Check SFPC in Service per SOP-54.0	SO2			X															
Step 20	Check at least one RCP Started	SRO2 RO3							X											
Step 20.2	Shutdown Unit following Reactor Trip IAW FNP-2-UOP-2.3	SRO2 RO3 RO4/COM1							X											

 Task completion time

## FNP On-Shift Staffing Analysis

**TABLE 3 – Firefighting**

**Event #9**

<b>Line</b>	<b>Performed By</b>	<b>Task Analysis Controlling Method</b>
1.	N/A	N/A
2.	N/A	N/A
3.	N/A	N/A
4.	N/A	N/A
5.	N/A	N/A

**Notes:** No Fire Brigade response required for this event.




# FNP On-Shift Staffing Analysis

**TABLE 4 – Radiation Protection & Chemistry**

**Event #9**

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0- 5	5- 10	10- 15	15- 20	20- 25	25- 30	30- 35	35- 40	40- 45	45- 50	50- 55	55- 60	60- 65	65- 70	70- 75	75- 80	80- 85	85- 90
1.	Off Site Survey On-Shift Position:																		
2.	Personnel Monitoring On-Shift Position:																		
3.	Job Coverage On-Shift Position:																		
4.	Offsite Radiological Assessment On-Shift Position:																		
5.	Other Site-Specific RP – Describe: On-Shift Position:																		
6.	Chemistry function/task #1 – Describe: On-Shift Position: Chemistry Tech																		

 Task completion time

## FNP On-Shift Staffing Analysis

**TABLE 5 – Emergency Plan Implementation**

**Event #9**

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1.	Declare the Emergency	SM	EP/Ops Training and EP Drill Program
2.	ERO notification	RO2/COM2	EP/Ops Training and EP Drill Program
3.	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	RO3 RO2/COM2	EP/Ops Training and EP Drill Program
4.	Abbreviated NRC notification for DBT event	N/A	EP/Ops Training and EP Drill Program
5.	Complete State/local notification form	SRO1	EP/Ops Training and EP Drill Program
6.	Approve State/local notifications	SM	EP/Ops Training and EP Drill Program
7.	Approve Offsite PARs	N/A	EP/Ops Training and EP Drill Program
8.	Perform State/local notifications	RO2/COM2	EP Training and EP Drill Program
9.	Dose Assessment	N/A	EP/Ops Training and EP Drill Program
10.	Complete NRC event notification form	SRO1	EP/Ops Training and EP Drill Program
11.	Perform NRC notifications <span style="color: red;">Note 1</span>	SRO1	EP/Ops Training and EP Drill Program
12.	Activate ERDS	N/A	EP/Ops Training and EP Drill Program
13.	Perform other site-specific event notifications (DM) <span style="color: red;">Note 2</span>	SM	EP/Ops Training and EP Drill Program
14.	Personnel accountability	N/A	EP/Security Training and EP Drill Program
15.	Approve extension to allowable dose limits	N/A	EP/Ops Training and EP Drill Program

**Notes:** EAL SU5, Unusual Event

NMP-EP-141-001, Farley Emergency Action Levels and Basis, Rev 2

NMP-EP-142, Emergency Notification, Rev 1

Note 1 – SRO1 utilizes a headset/speaker phone to maintain an open line with the NRC.

Note 2 – SM notifies the Duty Manager (DM) IAW NMP-EP-142, Emergency Notification. This notification is completed within  $\approx$  1-2 minutes and does not affect performance of other functions.



## FNP On-Shift Staffing Analysis

Table 5A - E-Plan Implementation Timeline/Event # 9

Function/Task	On-shift Position	Time from Event Initiation																	
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
Declare the Emergency	SM	SU5																	
ERO notification	RO2/COM2				X														
Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	RO3	X																	
	RO2/COM2				X														
Abbreviated NRC notification for DBT event	N/A																		
Complete State/local notification form	SRO1				X												X		
Approve State/local notifications	SM					X												X	
Approve Offsite PARs	N/A																		
Perform State/local notifications	RO2/COM2					X													X
Dose Assessment	N/A																		
Complete NRC event notification form	SRO1						X												
Perform NRC notifications <span style="color: red;">Note 1</span>	SRO1																		
Activate ERDS	N/A									X									
Perform other site-specific event notifications (DM) <span style="color: red;">Note 2</span>	SM							X											
Personnel accountability	N/A																		
Approve extension to allowable dose limits	N/A																		

**Notes:** Note 1 – SRO1 utilizes a headset/speaker phone to maintain an open line with the NRC.

Note 2 – SM notifies the Duty Manager (DM) IAW NMP-EP-142, Emergency Notification. This notification is completed within ≈ 1-2 minutes and does not affect performance of other functions.

 Task completion time

## **FNP On-Shift Staffing Analysis**

### **Event Timelines and Assumptions**

#### **Event #10 Aircraft Probable Threat**

Initial Conditions:

Time: Wednesday @ 0300

Unit 1&2 @ 100% Power

RCS @ normal operating temperature and pressure

Sequence of Events:

0300 NRC notifies FNP control room of confirmed aircraft threat

Probable threat - > 5 minutes < 30 minutes

0301 CR personnel initiate Security Event response AOP

On-site actions initiated



## FNP On-Shift Staffing Analysis

### Appendix B

**Event # 10: DBA/ISG - Aircraft Threat**  
**TABLE 1 – On-shift Positions**

**ECL: Alert**

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Action Required?
1.	Shift Manager (SM)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L10 T5/L13	No	No
2.	Shift Supervisor (SRO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L2	No	No
3.	Shift Supervisor (SRO2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L3	No	No
4.	Shift Support Supervisor (SRO3/FBL)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L4 T3/L1	No	No
5.	Reactor Operator (RO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L5	No	No
6.	Reactor Operator (RO2/COM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L6	No	No
7.	Reactor Operator (RO3)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L7	No	No
8.	Reactor Operator (RO4/COM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L8 T5/L2 T5/L3 T5/L8 T5/L11 T5/L12	No	No
9.	System Operator (SO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L9	No	No
10.	System Operator (SO2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L10	No	No

### FNP On-Shift Staffing Analysis

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Action Required?
11.	System Operator (SO3)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L11	No	No
12.	System Operator (SO4/FBM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L12 T3/L2	No	No
13.	System Operator (SO5/FBM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L13 T3/L3	No	No
14.	System Operator (SO6/FBM3)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L14 T3/L4	No	No
15.	System Operator (SO7/FBM4)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L15 T3/L5	No	No
16.	RP Technician (RP1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L16 T4/L6	No	No
17.	CAS Operator (SEC2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L17	No	No
18.	Security Captain (SEC3)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L18	No	No
19.	Security Officer (SEC4)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L19	No	No

**Notes:** Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, **OR** the functions are the same, **OR** the functions are performed sequentially without issue.



## FNP On-Shift Staffing Analysis

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

Event # 10

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

Applicable to unit 1 & 2

Line	Generic Title/Role	On-Shift Position	Task Performance Validation
1.	Shift Manager	Shift Manager (SM)	Operator Training
2.	Shift Supervisor	Shift Supervisor (SRO1)	Operator Training
3.	Shift Supervisor	Shift Supervisor (SRO2)	Operator Training
4.	Shift Support Supervisor	Shift Support Supervisor (SRO3/FBL)	Operator Training
5.	Reactor Operator	Reactor Operator (RO1)	Operator Training
6.	Reactor Operator	Reactor Operator (RO2/COM2)	Operator Training
7.	Reactor Operator	Reactor Operator (RO3)	Operator Training
8.	Reactor Operator	Reactor Operator (RO4/COM1)	Operator Training
9.	System Operator	System Operator (SO1)	Operator Training
10.	System Operator	System Operator (SO2)	Operator Training
11.	System Operator	System Operator (SO3)	Operator Training
12.	System Operator	System Operator (SO4/FBM1)	Operator Training
13.	System Operator	System Operator (SO5/FBM2)	Operator Training
14.	System Operator	System Operator (SO6/FBM3)	Operator Training
15.	System Operator	System Operator (SO7/FBM4)	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
16.	RP Technician	RP Technician (RP1)	RP Training
17.	CAS Operator	CAS Operator (SEC2)	Security Training
18.	Security Captain	Security Captain (SEC3)	Security Training
19.	Security Officer	Security Officer (SEC4)	Security Training

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



## FNP On-Shift Staffing Analysis

Table 2A - Procedure Timing Analysis

Event: #10

Title: Aircraft Threat

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
FNP-0-AOP-49.1, Airborne Security Threat, Rev 12																				
Step 1	Validate Origin of Threat	SM SRO2	X																	
	Continuous Communication with NRC	RO4/COM1	X (periodic)																	
Step 1.1	Security Notified	SM	X																	
Step 2	Check if Airborne Threat is Imminent	SRO2	X																	
Step 9	Check if Airborne Threat is Probable	SRO2	X																	
Step 11	Rapid Power Reduction IAW FNP-1-AOP-17.1	SRO1 RO1 RO2/COM2		X																
Step 11	Rapid Power Reduction IAW FNP-2-AOP-17.1	SRO2 RO3		X																
Step 11.1.2.1	Trip Unit 1, Enter EEP-0	RO1							X											
Step 11.1.2.1	Trip Unit 2, Enter EEP-0	RO3							X											
Step 11.1.3	Notify PCC	SRO3/FBL		X																
Step 11.1.4	Borate Plant to Cold S/D	RO1 RO3								X										
Step 11.1.5	Conduct Plant Cooldown to Cold SD	RO1 RO3															X			
Step 12.2	Notify Onsite Personnel / Stage Fire Brigade	SM		X																
Step 12.2	Fire Brigade Dispersal	SRO3/FBL SO4/FBM1 SO5/FBM2 SO6/FBM3 SO7/FBM4 RP1		X																
Step 12.6	Verify Security Procedures Implemented	SM		X																




## FNP On-Shift Staffing Analysis

Table 2A - Procedure Timing Analysis

Event: #10

Title: Aircraft Threat

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
Step 12.6.3	Contact City Fire Department	RO4/COM1			X															
Step 13.1	Secure Hi Mast Plant Lighting	SO3				X														
Step 13.1	Secure Roadway Lighting	SEC4 SO3				X														
Step 20	Place CR HVAC in Emergency Mode	RO2/COM2								X										
Step 21	Place TSC HVAC in Emergency Mode	RO2/COM2 SEC3										X								
Step 26	Verify Aux Bldg Doors Closed	SEC2						X												
Step 27	De-energize Plant Lighting	SO3								X										
Step 30	Call Out Additional Resources	RO4/COM1									X									
FNP-1-ESP-0.1, Rx Trip Response, Rev 36; FNP-2-ESP-0.1, Rx Trip Response, Rev 34																				
Steps 1-4	Reactor Trip Response	SRO1 RO1 RO2/COM2 SO1							X											
Steps 1-4	Reactor Trip Response	SRO2 RO3 SO2							X											
Actions per Operations Training																				
NA	Perform STA Functions	SM SRO1 SRO2		X (periodic)																

 Task completion time

## FNP On-Shift Staffing Analysis

**TABLE 3 – Firefighting**

**Event # 10**

<b>Line</b>	<b>Performed By</b>	<b>Task Analysis Controlling Method</b>
1.	Shift Support Supervisor (SRO3/FBL)	Fire Brigade Training
2.	System Operator (SO4/FBM1)	Fire Brigade Training
3.	System Operator (SO5/FBM2)	Fire Brigade Training
4.	System Operator (SO6/FBM3)	Fire Brigade Training
5.	System Operator (SO7/FBM4)	Fire Brigade Training

**Notes:** Fire Brigade dispersed IAW AOP-49.1




# FNP On-Shift Staffing Analysis

TABLE 4 – Radiation Protection & Chemistry

Event #10

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1.	In-Plant Survey On-Shift Position:																		
2.	Off-Site Survey On-Shift Position:																		
3.	Personnel Monitoring On-Shift Position:																		
4.	Job Coverage On-Shift Position:																		
5.	Offsite Radiological Assessment On-Shift Position:																		
6.	Other Site-Specific RP – Describe: Disperse with Fire Brigade On-Shift Position: RP1			X															
7.	Chemistry function/task #1 – Describe: On-Shift Position:																		
8.	Chemistry function/task #2 – Describe: On-Shift Position:																		

**Notes:** RP Technician relocates with Fire Brigade.

 Task completion time



## FNP On-Shift Staffing Analysis

**TABLE 5 – Emergency Plan Implementation**

**Event #10**

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1.	Declare the Emergency	SM	EP/Ops Training and EP Drill Program
2.	ERO notification	RO4/COM1	EP/Ops Training and EP Drill Program
3.	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	SM RO4/COM1	EP/Ops Training and EP Drill Program
4.	Abbreviated NRC notification for DBT event	N/A	EP/Ops Training and EP Drill Program
5.	Complete State/local notification form	SM	EP/Ops Training and EP Drill Program
6.	Approve State/local notifications	SM	EP/Ops Training and EP Drill Program
7.	Approve Offsite PARs	N/A	EP/Ops Training and EP Drill Program
8.	Perform State/local notifications	RO4/COM1	EP Training and EP Drill Program
9.	Dose Assessment	N/A	EP/Ops Training and EP Drill Program
10.	Complete NRC event notification form	SM	EP/Ops Training and EP Drill Program
11.	Perform NRC notifications <span style="color: red;">Note 1</span>	RO4/COM1	EP/Ops Training and EP Drill Program
12.	Activate ERDS	RO4/COM1	EP/Ops Training and EP Drill Program
13.	Perform other site-specific event notifications (DM) <span style="color: red;">Note 2</span>	SM	EP/Ops Training and EP Drill Program
14.	Personnel accountability	N/A	EP/Security Training and EP Drill Program
15.	Approve extension to allowable dose limits	N/A	EP/Ops Training and EP Drill Program

**Notes:** EAL HA1, Alert  
 NMP-EP-141-001, Farley Emergency Action Levels and Basis, Rev 2  
 NMP-EP-142, Emergency Notification, Rev 1  
Note 1 – RO4/COM1 utilizes a headset/speaker phone to maintain an open line with the NRC.  
Note 2 – SM notifies the Duty Manager (DM) IAW NMP-EP-142, Emergency Notification. This notification is completed within  $\approx$  1-2 minutes and does not affect performance of other functions.




## FNP On-Shift Staffing Analysis

Table 5A - E-Plan Implementation Timeline/Event # 10

Function/Task	On-shift Position	Time from Event Initiation																	
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
Declare the Emergency	SM	HA1																	
ERO notification	RO4/COM1				X														
Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	SM		X																
	RO4/COM1				X														
Abbreviated NRC notification for DBT event	N/A																		
Complete State/local notification form	SM				X													X	
Approve State/local notifications	SM					X												X	
Approve Offsite PARs	N/A																		
Perform State/local notifications	RO4/COM1					X													X
Dose Assessment	N/A																		
Complete NRC event notification form	SM						X												
Perform NRC notifications <span style="color: red;">Note 1</span>	RO4/COM1												X						
Activate ERDS	RO4/COM1									X									
Perform other site-specific event notifications (DM) <span style="color: red;">Note 2</span>	SM							X											
Personnel accountability	N/A																		
Approve extension to allowable dose limits	N/A																		

**Notes:** Note 1 – RO4/COM1 utilizes a headset/speaker phone to maintain an open line with the NRC.

Note 2 – SM notifies the Duty Manager (DM) IAW NMP-EP-142, Emergency Notification. This notification is completed within ≈ 1-2 minutes and does not affect performance of other functions.

 Task completion time

## **FNP On-Shift Staffing Analysis**

### **Event Timelines and Assumptions**

#### **Event #11 Control Room Fire with evacuation and remote shutdown**

Initial Conditions:

Time: Friday @ 2100

Unit 1&2 @ 100% Power

RCS @ normal operating temperature and pressure

Sequence of Events:

2105 Operators observe smoke coming from behind control board

2106 Smoke in CR becomes thicker/flames observed

FB activated

2107 Operators attempt to extinguish flames without success

Decision is made to evacuate control room

Loss of Control Room does not assume loss of critical control functions, i.e. charging and letdown



## FNP On-Shift Staffing Analysis

### Appendix B

**Event # 11: DBA/ISG - Control Room Fire with Evacuation and Remote Shutdown**

**ECL: Alert**

**TABLE 1 – On-shift Positions**

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Action Required?
1.	Shift Manager (SM)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L1 T5/L1 T5/L5 T5/L6 T5/L10 T5/L13	No	No
2.	Shift Supervisor (SRO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L2	No	No
3.	Shift Supervisor (SRO2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L3	No	No
4.	Shift Support Supervisor (SRO3/FBL)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T3/L1	No	No
5.	Reactor Operator (RO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L4	No	No
6.	Reactor Operator (RO2/COM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L5 T5/L3	No	No
7.	Reactor Operator (RO3)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L6	No	No
8.	Reactor Operator (RO4/COM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L7 T5/L2 T5/L3 T5/L8 T5/L11 T5/L12	No	No
9.	System Operator (SO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L8	No	No
10.	System Operator (SO2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L9	No	No
11.	System Operator (SO3)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L10	No	No



### FNP On-Shift Staffing Analysis

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Action Required?
12.	System Operator (SO4/FBM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T3/L2	No	No
13.	System Operator (SO5/FBM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T3/L3	No	No
14.	System Operator (SO6/FBM3)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T3/L4	No	No
15.	System Operator (SO7/FBM4)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T3/L5	No	No
16.	RP Technician (RP1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T3/L6 T4/L5	No	No
17.	RP Technician (RP3/FMT)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T4/L1	No	No
18.	Chemistry Technician (CT1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L11 T4/L6 T4/L7	No	No
19.	Chemistry Technician (CT2/DA)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T4/L4 T5/L9	No	No
20.	Security Captain (SEC3)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T3/L7	No	No
21.	Security Officer (SEC4)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T3/L8	No	No

**Notes:** Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, **OR** the functions are the same, **OR** the functions are performed sequentially without issue.



## FNP On-Shift Staffing Analysis

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

Event # 11

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

Applicable to unit 1 & 2

Line	Generic Title/Role	On-Shift Position	Task Performance Validation
1.	Shift Manager	Shift Manager (SM)	Operator Training
2.	Shift Supervisor	Shift Supervisor (SRO1)	Operator Training
3.	Shift Supervisor	Shift Supervisor (SRO2)	Operator Training
4.	Reactor Operator	Reactor Operator (RO1)	Operator Training
5.	Reactor Operator	Reactor Operator (RO2/COM2)	Operator Training
6.	Reactor Operator	Reactor Operator (RO3)	Operator Training
7.	Reactor Operator	Reactor Operator (RO4/COM1)	Operator Training
8.	System Operator	System Operator (SO1)	Operator Training
9.	System Operator	System Operator (SO2)	Operator Training
10.	System Operator	System Operator (SO3)	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
11.	Chemistry Technician	Chemistry Technician (CT1)	Chemistry Training

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



## FNP On-Shift Staffing Analysis

Table 2A - Procedure Timing Analysis

Event: #11 Title: Control Room Fire

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
FNP-0-AOP-29.0, Plant Fire, Rev 50.1																				
Step 1	Implement Plant Fire Procedure	SRO1	X																	
Step 3	Plant Announcement Muster Fire Brigade	RO2/COM2	X																	
Step 3.4	Pager to Ops On-shift Personnel	RO4/COM1	X																	
Step 4	Implement FNP-0-EIP-13.0	SM	X																	
Step 6	Implement FNP-1/2-AOP-28.2, Fire In The Control Room	SRO1 SRO2	X																	
Actions per Operations Training																				
NA	STA Duties	SM	X (periodic)																	
FNP-1-AOP-28.2, Fire in the Control Room, Rev 31; FNP-2-AOP-28.2, Fire in the Control Room, Rev 32																				
Steps 1 & 1.4	Trip Rx, Turbine, and RCPs	SRO1 RO1 SRO2 RO3	X																	
Steps 1.5 & 1.6	Locally verify all RCP supply breakers open.	SO1 SO2		X																
Step 1.7	Isolate RCP seals and thermal barriers IAW Attach 5	SO1 SO2			X															
Step 3	Establish manning the hot shutdown panels	SRO1 SRO2 RO1 RO3		X																
Step 4.1	Announce Fire in Control Room	RO2/COM2		X																
Step 4.4	Locally Verify Rx 1/2 Trip and Bypass Breakers Open	RO1 RO3		X																
Step 5.1	Place all DGs in Local Control IAW Att 12	SO3		X																



## FNP On-Shift Staffing Analysis

Table 2A - Procedure Timing Analysis

Event: #11

Title: Control Room Fire

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
Step 5.1	Remove power from EDG SW valves IAW Attach 7	SO3		X																
Step 5.2	Perform actions to obtain Local Equipment Control Non-Rad Aux Building IAW Attach 8	SO1 SO2					X													
Steps 6-9	Align Hot Shutdown Panels	RO1 RO3			X															
Steps 11, 23-24	Verify Charging Alignment / Maintain Pressurizer Level and pressure	RO1 RO3					X (periodic)													
Step 12	Maintain Seal Injection flow until isolated IAW Attach 5	RO1 RO3					X (periodic)													
Steps 13 & 14	Maintain S/G Level/Pressure	RO1 RO3					X (periodic)													
Steps 17-22	Align Various Components at Hot Shutdown Panel	SRO1 RO1 SRO2 RO3						X												
Step 25	Complete Natural Circ logs and Verify Adequate Natural Circulation	RO2/COM2					X (periodic – every 30 min each unit)													
Step 27.1 -.3	Verify Local Operation of Inside Equipment	SO1 SO2						X												
Steps 27.4-.5, 30	Verify local operation of RW and SW; Check SW Wet Pit Level	SO3					X													
Step 27.7	Notify Chemistry to Secure ZAS	SRO1 SRO2					X													




## FNP On-Shift Staffing Analysis

Table 2A - Procedure Timing Analysis

Event: #11 Title: Control Room Fire

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
Steps 28 & 29	Monitor CST/RWST Level - local	SO1									X									
Step 36	Verify Aux Bldg Battery exhaust fans running	SO2									X									
Step 37.1	Direct Chemistry to sample RCS	RO1							X											
	Sample and analyze RCS for Boron	CT1							X											

**Notes:** Reference step numbers are for Unit 1, procedure actions for unit 2 are similar/consistent with Unit 1.

 Task completion time



## FNP On-Shift Staffing Analysis

**TABLE 3 – Firefighting**

**Event # 11**

<b>Line</b>	<b>Performed By</b>	<b>Task Analysis Controlling Method</b>
1.	Shift Support Supervisor (SRO3/FBL)	Fire Brigade Training
2.	System Operator (SO4/FBM1)	Fire Brigade Training
3.	System Operator (SO5/FBM2)	Fire Brigade Training
4.	System Operator (SO6/FBM3)	Fire Brigade Training
5.	System Operator (SO7/FBM4)	Fire Brigade Training
6.	RP Technician (RP1)	RP Training
7.	Security Captain (SEC3)	Security Training
8.	Security Officer (SEC4)	Security Training

**Notes:** FBL performs actions IAW AOP-29.0


# FNP On-Shift Staffing Analysis

TABLE 4 – Radiation Protection & Chemistry

Event # 11

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1.	Off-Site Survey On-Shift Position: RP3/FMT				X														
2.	Personnel Monitoring On-Shift Position:																		
3.	Job Coverage On-Shift Position:																		
4.	Offsite Radiological Assessment On-Shift Position: CT2/DA				X														
5.	Other Site-Specific RP – Describe: Provide First Aid Support as needed to Fire Brigade On-Shift Position: RP1		X																
6.	Chemistry function/task #2 – Describe: Isolate Zinc Addition System (ZAS) for both units On-Shift Position: CT1					X													
7.	Chemistry function/task #3 – Describe: Sample and analyze RCS for boron On-Shift Position: CT1									X									

**Notes:** NMP-EP-147, Offsite Dose Assessment, Rev 2  
 FNP-1-CCP-651, Sampling the RCS, Rev 35  
 FNP-2-CCP-651, Sampling the RCS, Rev 41  
 FNP-1-CCP-335, Zinc Addition System (ZAS), Rev 14.1  
 FNP-2-CCP-335, Zinc Addition System (ZAS), Rev 23.1

 Task completion time



## FNP On-Shift Staffing Analysis

**TABLE 5 – Emergency Plan Implementation**

**Event #11**

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1.	Declare the Emergency	SM	EP/Ops Training and EP Drill Program
2.	ERO notification	RO4/COM1	EP/Ops Training and EP Drill Program
3.	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	RO2/COM2 RO4/COM1	EP/Ops Training and EP Drill Program
4.	Abbreviated NRC notification for DBT event	N/A	EP/Ops Training and EP Drill Program
5.	Complete State/local notification form	SM	EP/Ops Training and EP Drill Program
6.	Approve State/local notifications	SM	EP/Ops Training and EP Drill Program
7.	Approve Offsite PARs	N/A	EP/Ops Training and EP Drill Program
8.	Perform State/local notifications	RO4/COM1	EP Training and EP Drill Program
9.	Dose Assessment	CT2/DA	EP/Ops Training and EP Drill Program
10.	Complete NRC event notification form	SM	EP/Ops Training and EP Drill Program
11.	Perform NRC notifications <span style="color: red;">Note 1</span>	RO4/COM1	EP/Ops Training and EP Drill Program
12.	Activate ERDS	RO4/COM1	EP/Ops Training and EP Drill Program
13.	Perform other site-specific event notifications (DM) <span style="color: red;">Note 2</span>	SM	EP/Ops Training and EP Drill Program
14.	Personnel accountability	N/A	EP/Security Training and EP Drill Program
15.	Approve extension to allowable dose limits	N/A	EP/Ops Training and EP Drill Program

**Notes:** EAL HA6, Alert  
NMP-EP-141-001, Farley Emergency Action Levels and Basis, Rev 2  
NMP-EP-142, Emergency Notification, Rev 1  
NMP-EP-147, Offsite Dose Assessment, Rev 2  
Note 1 – RO4/COM1 utilizes a headset/speaker phone to maintain an open line with the NRC.  
Note 2 – SM notifies the Duty Manager (DM) IAW NMP-EP-142, Emergency Notification. This notification is completed within  $\approx$  1-2 minutes and does not affect performance of other functions.




## FNP On-Shift Staffing Analysis

Table 5A - E-Plan Implementation Timeline/Event # 11

Function/Task	On-shift Position	Time from Event Initiation (minutes)																	
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
Declare the Emergency	SM	HA6																	
ERO notification	RO4/COM1				X														
Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	RO2/COM2	X																	
	RO4/COM1				X														
Abbreviated NRC notification for DBT event	N/A																		
Complete State/local notification form	SM				X												X		
Approve State/local notifications	SM					X												X	
Approve Offsite PARs	N/A																		
Perform State/local notifications	RO4/COM1					X													X
Dose Assessment	N/A																		
Complete NRC event notification form	SM						X												
Perform NRC notifications <i>Note 1</i>	RO4/COM1								X										
Activate ERDS	RO4/COM1									X									
Perform other site-specific event notifications (DM) <i>Note 2</i>	SM						X												
Personnel accountability	N/A																		
Approve extension to allowable dose limits	N/A																		

**Notes:** *Note 1* – RO4/COM1 utilizes a headset/speaker phone to maintain an open line with the NRC.

*Note 2* – SM notifies the Duty Manager (DM) IAW NMP-EP-142, Emergency Notification. This notification is completed within ≈ 1-2 minutes and does not affect performance of other functions.

 Task completion time



## **FNP On-Shift Staffing Analysis**

### **Event Timelines and Assumptions**

#### **Event #12 Station Blackout**

Initial Conditions:

Time: Sunday @ 0100

Weather: Thunderstorms with heavy rain; .5" recorded in last 15 minutes

Unit 1&2 @ 100% Power; EOC

RCS @ normal operating temperature and pressure

Sequence of Events:

0110 Lightning strike affects offsite power grid resulting in loss of Off-site power

Main Turbine trips resulting in Rx Trip of both Units

0110:10 U2 EDGs start and load to essential buses – AC power is available to unit 2 4160 kV buses

U1 EDGs fail to start and load to essential buses – no AC power is available

Instrument Air pressure does not sufficiently degrade to cause letdown isolation.

Operators initiate EOPs/AOPs in response

## FNP On-Shift Staffing Analysis

### Appendix B

**Event # 12: DBA/ISG - Station Blackout**  
**TABLE 1 – On-shift Positions**

**ECL: Alert**

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Action Required?
1.	Shift Manager (SM)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T5/L1 T5/L5 T5/L6 T5/L13	No	No
2.	Shift Supervisor (SRO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L1	No	No
3.	Shift Supervisor (SRO2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L2	No	No
4.	Shift Support Supervisor (SRO3/FBL)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L3 T5/L10 T5/L11	No	No
5.	Reactor Operator (RO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L4	No	No
6.	Reactor Operator (RO2/COM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L5	No	No
7.	Reactor Operator (RO3)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L6	No	No
8.	Reactor Operator (RO4/COM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L7 T5/L2 T5/L3 T5/L8 T5/L12	No	No
9.	System Operator (SO1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L8	No	No
10.	System Operator (SO2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L9	No	No
11.	System Operator (SO4/FBM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L10	No	No



### FNP On-Shift Staffing Analysis

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Action Required?
12.	System Operator (SO5/FBM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L11	No	No
13.	System Operator (SO7/FBM4)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L12	No	No
14.	RP Technician (RP3/FMT)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T4/L1	No	No
15.	Chemistry Technician (CT1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T4/L6	No	No
16.	Chemistry Technician (CT2/DA)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T4/L4 T5/L9	No	No
17.	Electrical Maintenance (EM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L13	No	No
18.	Maintenance Supervisor (MM1)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	75	T2/L14	No	No
19.	Mechanical Maintenance (MM2)	SNC Standard E Plan Annex for FNP Unit 1&2, Table 2.2.A	N/A	T2/L15	No	No

**Notes:** Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, **OR** the functions are the same, **OR** the functions are performed sequentially without issue.



## FNP On-Shift Staffing Analysis

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

Event # 12

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

Applicable to unit 1 & 2

Line	Generic Title/Role	On-Shift Position	Task Performance Validation
1.	Shift Supervisor	Shift Supervisor (SRO1)	Operator Training
2.	Shift Supervisor	Shift Supervisor (SRO2)	Operator Training
3.	Shift Support Supervisor	Shift Support Supervisor (SRO3/FBL)	Operator Training
4.	Reactor Operator	Reactor Operator (RO1)	Operator Training
5.	Reactor Operator	Reactor Operator (RO2/COM2)	Operator Training
6.	Reactor Operator	Reactor Operator (RO3)	Operator Training
7.	Reactor Operator	Reactor Operator (RO4/COM1)	Operator Training
8.	System Operator	System Operator (SO1)	Operator Training
9.	System Operator	System Operator (SO2)	Operator Training
10.	System Operator	System Operator (SO4/FBM1)	Operator Training
11.	System Operator	System Operator (SO5/FBM2)	Operator Training
12.	System Operator	System Operator (SO7/FBM4)	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
13.	Electrical Maintenance	Electrical Maintenance (EM1)	Elec Maintenance Training
14.	Maintenance Supervisor	Maintenance Supervisor (MM1)	Mech Maintenance Training
15.	Mechanical Maintenance	Mechanical Maintenance (MM2)	Mech Maintenance Training

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



## FNP On-Shift Staffing Analysis

Table 2A - Procedure Timing Analysis

Event: #12

Title: Station Blackout

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																		
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	
FNP-1-EEP-0, Rx Trip or Safety Injection, Rev 49; FNP-2-EEP-0, Rx Trip or Safety Injection, Rev 46																					
Steps 1-4	Trip Immediate Actions (Performed from Memory)	SRO1 RO1 RO2/COM2	X																		
Steps 1-4	Trip Immediate Actions (Performed from Memory)	SRO2 RO3 RO4/COM1	X																		
FNP-0-SOP-0.0, General Instructions for Operations Personnel, Rev 164.2																					
Appendix A	Field Reactor Trip Response	SO4/FBM1 SO5/FBM2		X																	
FNP-1-ECP-0.0, Loss of All AC Power, Rev 30																					
Steps 1-2	Implement Immediate Actions	SRO1 RO1 RO2/COM2	X																		
Steps 1-2	Verify Reactor and Turbine Trip	SRO1 RO1	X																		
Step 3	Verify RCS Isolated	SRO1 RO1	X																		
Step 5.1-5.3	Verify Load Shed and secure secondary components	RO1		X																	
Step 5.4	Restore Power from Diesel Generator 1-2A (Fails to start)	SRO1 RO2/COM2		X																	
Step 5.4.e	Start 2C DG (Swing Diesel Generator)	SRO1 RO2/COM2			X																
Steps 5.4.h	Close 2C DG Output Breaker, Energize 1G Bus	SRO1 RO2/COM2			X																
Step 5.9	Verify Adequate Cooling to 2C DG	RO2/COM2			X																
Step 5.9.4	Check Lube Oil temperature annunciator	SO7/FBM4			X																
SRO Direction	Monitor Diesel Generators	SO7/FBM4				X (periodic)															



## FNP On-Shift Staffing Analysis

Table 2A - Procedure Timing Analysis

Event: #12 Title: Station Blackout

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																	
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
Step 5.10	Check ESF Bus Energized, Transition to FNP-1-EEP-0	SRO1 RO2/COM2				X														
FNP-1-EEP-0, Rx Trip or Safety Injection, Rev 49																				
Steps 1-4	Verify Reactor Trip	SRO1 RO1				X														
Step 4	Implement Reactor Trip Response per FNP-1-ESP-0.1 (See Detail Below)	SRO1 RO1 RO2/COM2					X													
Actions per Operations Training																				
NA	STA Duties	SRO3/FBL	X (periodic)																	
FNP-1-ESP-0.1, Rx Trip Response, Rev 36; FNP-2-ESP-0.1, Rx Trip Response, Rev 34																				
Step 5	Announce Reactor Trip	RO4/COM1		X																
Step 7	Verify 4160V Busses Energized IAW Attach 2	RO2/COM2					X													
Attach 2, Step 1.11	Align 2A air compressor for service	RO3			X															
Attach 2, Step 1.12.1	Align 2C air compressor to Unit 1	SO5/FBM2			X															
Attach 2, Step 1.14 (Unit 2)	Check SFPC in Service per SOP-54.0	SO2			X															
Step 16 .3	Check at least one RCP Started	SRO1 RO1 SRO2 RO3							X											
Attach 2, Step 1.14 (Unit 1)	Check SFPC in Service per SOP-54.0	SO1							X											
Step 20.1.1	Direct Chemistry to isolate ZAS	RO2/COM2							X											
Step 20.1.2	Shutdown Unit following Reactor Trip IAW FNP-1-ESP-0.2	SRO1 RO1 RO2/COM2											X (periodic)							




## FNP On-Shift Staffing Analysis

Table 2A - Procedure Timing Analysis

Event: #12                      Title: Station Blackout

Procedure Step/Actions			Performance Time (Minutes) After Procedure Implementation																		
Proc/Step	Task	Assigned Resource	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	
Step 20.1.2	Shutdown Unit following Reactor Trip IAW FNP-2-ESP-0.2	SRO2 RO3 RO4/COM1											X (periodic)								
SM Direction	Troubleshoot Loss of DG 1-2A and 1B	MM1 EM1 MM2				X															

 Task completion time

## FNP On-Shift Staffing Analysis

**TABLE 3 – Firefighting**

**Event # 12**

<b>Line</b>	<b>Performed By</b>	<b>Task Analysis Controlling Method</b>
1.	N/A	N/A
2.	N/A	N/A
3.	N/A	N/A
4.	N/A	N/A
5.	N/A	N/A

**Notes:** No Fire Brigade response required for this event.




# FNP On-Shift Staffing Analysis

**TABLE 4 – Radiation Protection & Chemistry**

**Event # 12**

Line	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1.	Off-Site Survey On-Shift Position: RP3/FMT					X													
2.	Personnel Monitoring On-Shift Position:																		
3.	Job Coverage On-Shift Position:																		
4.	Offsite Radiological Assessment On-Shift Position: CT2/DA					X													
5.	Other Site-Specific RP – Describe: On-Shift Position:																		
6.	Chemistry function/task #2 – Describe: Isolate Zinc Addition System (ZAS) for both units On-Shift Position: CT1							X											

**Notes:** NMP-EP-147, Offsite Dose Assessment, Rev 2 (Dose Assessment initiated, no radioactive release in progress)  
FNP-1-CCP-335, Zinc Addition System (ZAS), Rev 14.1  
FNP-2-CCP-335, Zinc Addition System (ZAS), Rev 23.1

 Task completion time



## FNP On-Shift Staffing Analysis

**TABLE 5 – Emergency Plan Implementation**

**Event # 12**

Line	Function/Task	On-Shift Position	Task Analysis Controlling Method
1.	Declare the Emergency	SM	EP/Ops Training and EP Drill Program
2.	ERO notification	RO4/COM1	EP/Ops Training and EP Drill Program
3.	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	RO4/COM1	EP/Ops Training and EP Drill Program
4.	Abbreviated NRC notification for DBT event	N/A	EP/Ops Training and EP Drill Program
5.	Complete State/local notification form	SM	EP/Ops Training and EP Drill Program
6.	Approve State/local notifications	SM	EP/Ops Training and EP Drill Program
7.	Approve Offsite PARs	N/A	EP/Ops Training and EP Drill Program
8.	Perform State/local notifications	RO4/COM1	EP Training and EP Drill Program
9.	Dose Assessment	CT2/DA	EP/Ops Training and EP Drill Program
10.	Complete NRC event notification form	SRO3/FBL	EP/Ops Training and EP Drill Program
11.	Perform NRC notifications <span style="color: red;">Note 1</span>	SRO3/FBL	EP/Ops Training and EP Drill Program
12.	Activate ERDS	RO4/COM1	EP/Ops Training and EP Drill Program
13.	Perform other site-specific event notifications (DM) <span style="color: red;">Note 2</span>	SM	EP/Ops Training and EP Drill Program
14.	Personnel accountability	N/A	EP/Security Training and EP Drill Program
15.	Approve extension to allowable dose limits	N/A	EP/Ops Training and EP Drill Program

**Notes:** EAL SA5, Alert  
 NMP-EP-141-001, Farley Emergency Action Levels and Basis, Rev 2  
 NMP-EP-142, Emergency Notification, Rev 1  
 NMP-EP-147, Offsite Dose Assessment, Rev 2  
Note 1 – SRO2 utilizes a headset/speaker phone to maintain an open line with the NRC.  
Note 2 – SM notifies the Duty Manager (DM) IAW NMP-EP-142, Emergency Notification. This notification is completed within  $\approx$  1-2 minutes and does not affect performance of other functions.



## FNP On-Shift Staffing Analysis

Table 5A - E-Plan Implementation Timeline/Event # 12

Function/Task	On-shift Position	Time from Event Initiation (minutes)																	
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
Declare the Emergency	SM	SA1																	
ERO notification	RO4/COM1				X														
Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	RO4/COM1	X			X														
Abbreviated NRC notification for DBT event	N/A																		
Complete State/local notification form	SM				X												X		
Approve State/local notifications	SM					X												X	
Approve Offsite PARs	N/A																		
Perform State/local notifications	RO4/COM1					X													X
Dose Assessment	CT2/DA						X												
Complete NRC event notification form	SRO3/FBL							X											
Perform NRC notifications <span style="color: red;">Note 1</span>	SRO3/FBL													X					
Activate ERDS	RO4/COM1									X									
Perform other site-specific event notifications (DM) <span style="color: red;">Note 2</span>	SM							X											
Personnel accountability	N/A																		
Approve extension to allowable dose limits	N/A																		

**Notes:** Note 1 – SRO2 utilizes a headset/speaker phone to maintain an open line with the NRC.  
Note 2 – SM notifies the Duty Manager (DM) IAW NMP-EP-142, Emergency Notification. This notification is completed within ≈ 1-2 minutes and does not affect performance of other functions.

 Task completion time