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PNP 2013-060

August 7, 2013

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

SUBJECT: Response to Request for Additional Information for License
Amendment Request to Revise Emergency Response Organization
Staff Augmentation Response Times

Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

- REFERENCES:
1. Entergy Nuclear Operations, Inc. (ENO) letter to NRC, PNP 2013-044, *License Amendment Request to Revise Emergency Response Organization Staff Augmentation Response Times*, dated June 25, 2013 (ADAMS Accession No. ML13176A405).
 2. NRC email to ENO, *MF2321 PNP Request for Additional Information (RAI) for License Amendment Request to Revise ERO Staff Augmentation Response Times*, dated July 23, 2013.

Dear Sir or Madam:

In Reference 1, Entergy Nuclear Operations, Inc. (ENO) submitted a license amendment request to revise the Site Emergency Plan (SEP) at the Palisades Nuclear Plant (PNP). The proposed amendment would revise the PNP SEP to increase the staff augmentation response times for certain emergency response organization positions. In Reference 2, ENO received a request for information (RAI) concerning the license amendment request.

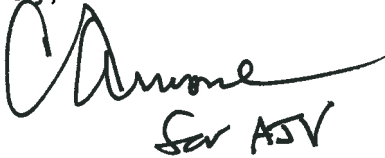
Attachment 1 provides the ENO response to the RAI in Reference 2.

A copy of this response has been provided to the designated representative of the State of Michigan.

This letter contains no new or revised commitments.

I declare under penalty of perjury that the foregoing is true and correct. Executed on August 7, 2013.

Sincerely,



ajv/jse

- Attachments:
1. Response to Request for Additional Information for License Amendment Request to Revise Emergency Response Organization Staff Augmentation Response Times
 2. Palisades Nuclear Station On-Shift Staffing Analysis Final Report, Revision 0, December 18, 2012

cc: Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC
State of Michigan

ATTACHMENT 1

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION FOR LICENSE AMENDMENT REQUEST TO REVISE EMERGENCY RESPONSE ORGANIZATION STAFF AUGMENTATION RESPONSE TIMES

An electronic follow-up request for additional information (RAI) was received, from the Nuclear Regulatory Commission (NRC), by electronic mail on July 23, 2013. The Entergy Nuclear Operations, Inc. (ENO) response to the RAI is provided below.

NRC Request (July 23, 2013)

- 1. The NRC staff needs to review the Palisades Nuclear Plant On-Shift Staffing Analysis (OSA) Report, Revision 0, dated December 18, 2012. The OSA results justify the changes to emergency staff augmentation response times in the proposed license amendment. The NRC needs to review the OSA to support the independent evaluation of the proposed changes to the PNP SEP.*

ENO Response

1. Palisades Nuclear Station On-Shift Staffing Analysis Final Report, Revision 0, dated December 18, 2012, is provided in Attachment 2.

ATTACHMENT 2

**PALISADES NUCLEAR STATION
ON-SHIFT STAFFING ANALYSIS FINAL REPORT,
REVISION 0, DECEMBER 18, 2012**

92 Pages Follow

PALISADES NUCLEAR STATION
ON-SHIFT STAFFING ANALYSIS
FINAL REPORT

Rev 0

December 18, 2012

Prepared by:

Myra Jones

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PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

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PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

I. INTRODUCTION

This document is the final report for the On-shift Staffing Analysis (OSA) that commenced at Palisades Nuclear Station during the week of June 11, 2012. This OSA satisfies the requirement of 10 CFR 50 Appendix E Section IV.A.9, which states that nuclear power licensees shall perform “a *detailed analysis demonstrating that on-shift personnel assigned emergency plan implementation functions are not assigned responsibilities that would prevent the timely performance of their assigned functions as specified in the emergency plan.*” A structured approach was utilized to perform this analysis using the guidance found in NEI 10-05, Rev. 0, *Assessment of On-Shift Emergency Response Organization Staffing and Capabilities*. This analysis examined the capability of the minimum staff listed in Figure 5-2 of the Palisades Emergency Plan (E-Plan) to perform the actions for the key functional areas of events described in NSIR/DPR-ISG-01, *Interim Staff Guidance – Emergency Planning for Nuclear Power Plants*, until augmenting Emergency Response Organization (ERO) staff arrives in accordance with the E-Plan.

II. ANALYSIS SUMMARY

The OSA team determined that an on-shift staff of fourteen (14) is required to respond to the most limiting accident scenario reviewed, main control room fire and shutdown at the remote shutdown panel. The on-shift staff consists of individuals necessary to support each of the emergency plan functional areas or tasks:

- Emergency Direction and Control
- Plant Operations and Safe Shutdown (SSD)
- Fire Fighting (FB)
- Accident Assessment
- Radiation Protection and Chemistry
- Notification/Communication
- Technical Support
- Access Control and Accountability

NEI 10-05 states it is acceptable for certain function to be assigned to personnel already assigned other functions/tasks. These include Repair and Corrective Action, Rescue Operations and First Aid.

The minimum on-shift staffing identified by this analysis is reflected in Table 1, “On-Shift Positions”, for each analyzed event. This is intended to identify the analyzed tasks performed by each on-shift ERO staff member based on the findings of the OSA. Any overlap of tasks or other conflicts identified during this OSA are captured in Section IX of this report and are based on the actual staffing at the time the analysis was considered complete.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

A. Emergency Plan Minimum Staffing

Per 10 CFR 50.54 (q)(1)(iii), *Emergency planning function* means a capability or resource necessary to prepare for and respond to a radiological emergency, as set forth in the elements of section IV of Appendix E and, for nuclear power reactor licensees, the planning standards of § 50.47(b).

The following table indicates the result of the NEI 10-05 staffing analysis of on-shift personnel to perform the required emergency planning functions and the licensing basis requirement for each on-shift position.

Position	Licensing Basis Requirement	E-Plan Functional Area	On-Shift Staffing Analysis Results
Shift Manager (SM)	50.54m E-Plan Figure 5-2	Emergency Direction and Control	1
Control Room Supervisor (CRS)	50.54m E-Plan Figure 5-2	SSD	1
Shift Technical Advisor (STA)	E-Plan Figure 5-2	Technical Support	1
Control Room Operator (RO #1)	50.54m E-Plan Figure 5-2	SSD	1
Control Room Operator (RO #2)	50.54m E-Plan Figure 5-2	SSD	1
Nuclear Plant Operator (NPO #1)	E-Plan Figure 5-2	SSD	1
Nuclear Plant Operator (NPO #2)	E-Plan Figure 5-2	FB	1
Nuclear Plant Operator (NPO #3)	E-Plan Figure 5-2	FB	1
Nuclear Plant Operator (NPO #4)	E-Plan Figure 5-2	FB	1
Nuclear Plant Operator (NPO #5)	E-Plan Figure 5-2	FB	1
Nuclear Plant Operator (NPO #6)	E-Plan Figure 5-2	FB	1
Communicator	E-Plan Figure 5-2	Communications Notifications	1
Chemistry Technician	E-Plan Figure 5-2	Accident Assessment/Chemistry	1
Radiation Protection (RP) #1	E-Plan Figure 5-2	Radiation Protection	1
Security	Security Contingency Plan/E-Plan Figure 5-2	Access Control and Accountability	Per Security Contingency Plan
TOTAL			14

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

B. Other Commitments to Shift Staffing

No additional stations commitments were identified conflicting with this staffing analysis.

C. Staffing Exceptions and Time Motion Studies (TMS)

1. The primary responsibility for the on-shift Chemistry Technician is chemistry/radiochemistry sampling; however no chemistry job tasks were noted as being required within the first 90 minutes of any of the analyzed events. As noted in the Site Emergency Plan, the on-shift Chemistry Technician may also be required to support the on-shift Radiation Protection Technician implement specific tasks to support the Major Functional Area of Protective Actions (In-plant). These specific tasks consist of access control, RP Coverage, Personnel monitoring, and dosimetry. While the capability to perform these tasks are specified in the Emergency Plan, this analysis did not identify the need to utilize the on-shift Chemistry Technician to perform any of these Radiation Protection related tasks. It is recognized, however, that the Shift Manager will prioritize and utilize the on-shift staff as needed. It is therefore acceptable to assign the Chemistry Technician the E-Plan function of dose assessment. No further analysis or TMS is required.
2. The Shift Manager is assigned the responsibility to make some site specific event notifications such as to the Duty Plant Manager, Operations Manager, and Resident Inspector. These notifications by phone are considered communications that are approximately one minute in length and are acceptable tasks for the Shift Manager. No further analysis or TMS is required.
3. Station staff are required to maintain continuous communications with the notification source during an aircraft threat in accordance with 10CFR50.54(hh) and Reg. Guide 1.214. There are no specific qualifications required to perform this task and the function is not required to be assigned in advance. The analysis of this event identified there are sufficient personnel on-shift to perform this task during the event. Specifically, a Nuclear Plant Operator, the radiation protection technician and/or chemistry technician can be made available to fill this function. No further analysis or TMS is required.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

4. The Shift Manager is assigned the task of notifying the off-shift ERO of the emergency. A Time Motion Study (TMS) was conducted to ensure the Shift Manager could perform the concurrent tasks of maintaining emergency direction and control while notifying the ERO of the event using Everbridge. The TMS demonstrated the Shift Manager was able to maintain Emergency Direction and Control during the approximate two minutes it took to notify the ERO using Everbridge.

D. Emergency Plan Tasks Not Analyzed

1. Repair and Corrective Action - Per the guidance of NUREG-0654, Table B-1, repair and corrective action tasks may be performed by shift personnel assigned other functions. Repair and corrective action is defined as:

- An action that can be performed promptly to restore a non-functional component to functional status (e.g., resetting a breaker), or to place a component in a desired configuration (e.g., open a valve), and which does not require work planning or implementation of lockout/tagout controls to complete.

In accordance with NEI 10-05 section 2.5, the analysis included a review of repair and corrective action tasks. For the purpose of this analysis, the tasks were considered to fall into two broad categories:

- Unplanned/unexpected actions that address equipment failures. These actions are contingent in nature and cannot be specified in advance.
- Planned/expected actions performed in support of operating procedure implementation, including severe accident management guidelines.

At Palisades, Nuclear Plant Operators are trained to perform the actions associated with this functional area. Actions (e.g., reset breakers, valve manipulation) directed by the Control Room Supervisor to mitigate the event per procedures were performed by the Nuclear Plant Operators in this analysis. Repair and Corrective Action is an acceptable collateral duty per the guidance of NEI 10-05 and was not analyzed

2. Rescue Operations and First Aid: In accordance with NEI 10-05 section 2.6, the analysis also included a review of rescue operations and first aid response although neither task was required during the evaluated scenarios. Per the guidance of NUREG-0654, Table B-1, rescue operations and first aid may be performed by shift personnel assigned other functions. The on-shift Radiation Protection staff member is trained and available to perform first aid and the station Fire Brigade staff are trained and available to perform search and rescue if needed. Rescue operations and first aid response are acceptable collateral duties per the guidance of NEI 10-05.

III. ANALYSIS PROCESS

This analysis was conducted by a joint team of corporate Emergency Preparedness (EP) personnel and station personnel from the Operations, Training, Radiation Protection, Chemistry and Emergency Preparedness (EP) departments. Additionally, personnel from Engineering and Security provided input to the analysis. The team members are identified in Section XII of this report.

The emergency response to each event was determined by conducting a tabletop of the event using the emergency plan and procedures and the applicable department procedures such as Operations emergency and abnormal operating procedures.

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Each scenario was reviewed by the cross disciplinary team to determine what plant actions and emergency plan implementation actions were required based on plant procedures prior to staff augmentation. These actions were then compared to the minimum staffing for Emergency Plan implementation as described in the Emergency Plan Figure 5-2, ensuring that no actions were assigned to staff members that conflicted with either their dedicated emergency plan role or their dedicated operational role as appropriate. In cases where multiple tasks were assigned to an individual in their role, the team evaluated timing of the tasks to ensure that they could be performed by the individual in series within any specified time requirements.

The results of the analysis for each of the scenarios are included in Section VIII, APPENDIX B – ON-SHIFT STAFFING ANALYSIS. Note that NSIR DPR-ISG-01 states that only DBA accidents “which would result in an emergency declaration” should be evaluated in the staffing assessment. Each of Palisades DBA’s were evaluated and classified according to its FSAR Chapter 14 description. If the accident description alone did not result in a classification, the projected accident Exclusion Area Boundary (EAB) dose was utilized to determine if an EAL threshold would be exceeded within the first 60 minutes using the Abnormal Radiation Level EAL thresholds. In cases where several projected doses were provided or release data was not detailed significantly to determine an EAL, the assessment used the radiological consequences associated with the realistic case in accordance with NEI 10-05.

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IV. ACCIDENT SCENARIOS

A. Accident Selection

1. The OSA scenarios were chosen using the guidance of NEI 10-05 and NSIR/DPR-ISG-01, "Interim Staff Guidance – Emergency Planning for Nuclear Power Plants." The evaluation considered the station Design Basis Accidents (DBA) described in the USAR along with additional scenarios specified by the guidance documents. The scenarios considered were:
 - Design Basis Threat (DBT) ground assault
 - Control Rod Ejection Accident
 - Main Steam Line Break Accident
 - Loss of Coolant Accident, (LOCA)
 - Fuel Handling Accident
 - Aircraft Probable Threat
 - Fire requiring evacuation of the Control Room and plant shutdown from remote location, (Appendix R Fire)
 - Station Blackout, (SBO)
 - LOCA/General Emergency with release and PAR
 - LOCA with entry into Severe Accident Management
 - Small Line Break Outside Containment
 - Waste Gas Accident
 - Steam Generator Tube Rupture (SGTR)
 - Dropped Cask
 - Appendix R Fire

B. Accident Scenarios included in the Analysis

1. Design Basis Threat (DBT) as described in NEI 10-05
 - The event evaluated for this analysis assumes a land based threat that is neutralized immediately when inside the protected area fence, no significant damage to equipment or systems that require corrective actions before the ERO is staffed, no radiological release, and no fire that requires firefighting response before the ERO is staffed.
2. Control Rod Ejection Accident as described in FSAR 14.16
 - This event assumes the reactivity insertion from the control rod ejection results in an overpower trip. The thermal-hydraulic analysis for this event is performed for only a few seconds. The remaining consequences of this event are covered by the small break LOCA analysis as noted in Chapter 14.17.2 of the FSAR.
3. Main Steam Line Break (MSLB) Inside Containment as described in FSAR 14.14
 - This event assumes a double-ended guillotine break of a Main Steam Line inside containment with a loss of offsite power. Release information was not available in the FSAR, however, to determine if a radiation based EAL condition would be met in the first 60 minutes of the event. Emergency declaration was based on the loss of offsite power.

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4. Loss of Coolant Accident as described in FSAR 14.17.
 - This event is defined by a large rupture of the PCS cold leg piping between the PCP and the reactor vessel for the PCS loop containing the pressurizer. This event also includes a loss of offsite power and failure of 1 diesel generator.
5. Fuel Handling Accident (FHA) as described in 14.19.
 - The FHA is assumed to occur in containment two days after shutdown. An Alert emergency declaration was assumed to be declared due to the event.
6. Aircraft Probable Threat (50.54hh)
 - Notification is received from the NRC that a probable aircraft threat exists (>5 minutes, <30 minutes).
7. Fire requiring evacuation of the Control Room and plant shutdown from remote location, (Appendix R Fire) as described in NEI 10-05.
 - A fire occurs in the main control room requiring the evacuation and the procedure implemented to shutdown from the remote shutdown panels.
8. Station Blackout as described in NEI 10-05.
 - A loss of all offsite AC power occurs and the failure of the emergency diesel generators to start. The SM determines power cannot be restored and declares a SAE on EAL SS1.1.
9. LOCA/General Emergency (GE) with release and PAR as described in NEI 10-05.
 - This event is based on the same initial conditions of the LOCA but assumes system failures meet the GE conditions of a loss of 2 fission product boundaries with the potential loss of the third.
10. Small Line Break Outside Containment as described in FSAR 14.23.
 - This analysis assumes a charging line break resulting in a 160 gpm primary coolant leak outside containment.
11. Waste Gas Accident as described in FSAR 14.21.
 - This event assumes the rupture of a waste gas decay tank. EAL AA1.1 conditions are assumed to be met based on expected stack high range monitor readings.
12. Steam Generator Tube Rupture as described in FSAR 14.15
 - This event analyzes the response of a failure of a steam generator U-tube combined with a loss of offsite power.

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C. Accident Scenarios not included in the Analysis

1. LOCA with entry into Severe Accident Management Guidelines (SAMG) as described in NEI 10-05.
 - NEI 10-05 Section 2.11 states that the analysis of the ability to implement SAMG focuses on the reasonably expected initial mitigation action that would be performed by on-shift personnel other than licensed and non-licensed operators. Palisades SAMGs are guided by the TSC. All on-shift actions prior to off-site augmentation are performed by Licensed and Non-licensed operators. No additional analysis is required.
2. Dropped Cask as described in FSAR 14.11.
 - Analyzed dropped cask events were identified as events that would only occur with the availability of additional station staff above and beyond those represented by station minimum staff and are outside the bounds of this analysis. Additionally, it was determined that no emergency declaration would be expected for this event.
3. Appendix R Fire
 - The team concluded the Control Room fire to be the most limiting for resources and therefore a staffing analysis for an additional fire scenario is not required. The emergency plan and fire brigade responsibilities are the same for both events.

V. GENERAL ASSUMPTIONS AND LIMITATIONS

A. Notes and Assumptions applicable to all accidents in Palisades Staffing Analysis:

1. The RP and Chemistry tasks reviewed were those directed by the Shift Manager to support actions in Off Normal Procedures (ONP), Emergency Operating Procedures (EOP), and Emergency Implementing Procedures (EI). Any additional tasks directed by the Technical Support Center (TSC), Operations Support Center (OSC), or Emergency Operations Facility (EOF) procedures were not reviewed.
2. Palisades has 30 minute and 60 minute emergency responders when augmented while the ERO is offsite. This analysis was conducted assuming a 90 minute response of the augmented ERO to allow the use of this analysis for a possible future extension in ERO augmentation times. No specific emergency response tasks requiring the augmented ERO were identified prior to the 90 minutes following the emergency declaration.
3. The OSA team determined there are no time critical RP and Chemistry tasks and that task performance is directed and prioritized by the Shift Manager. The time RP or Chemistry is directed to perform a task and the amount of time taken to complete tasks are estimated. No Chemistry samples are required by Tech Specs within the 90 minute period after a declaration. Since the Shift Manager directs when the tasks are performed, there are no overlapping RP or chemistry tasks.
4. All crews have one individual filling the SM and one individual filling the STA roles therefore the analysis did not consider using a dual-role individual.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

B. NEI 10-05 Rev 0 Assumptions

1. Response time used for this analysis was the maximum acceptable number of minutes elapsed between emergency declaration and the augmented ERO position holder at a location necessary to relieve an on-shift position of the emergency response task. As noted above, this analysis assumed a 90 minute augmentation time.
2. On-shift personnel complement was limited to the minimum required number and composition as described in the site emergency plan. If the plan commitments allow for different minimum staffing levels (e.g., a variance between a normal dayshift and a backshift), the staffing with the smallest total number of personnel was used for the analysis.
3. Although the temporary absence of a position may be allowed by Tech Specs, the analysis was performed assuming that all required on-shift positions are filled.
4. Event occurred during off-normal work hours where ERO was offsite and all required minimum on-shift positions were filled.
5. On-shift personnel reported to their assigned response locations within timeframes sufficient to allow for performance of assigned actions.
6. On-shift staff had necessary Radiation Worker qualification to obtain normal dosimetry and enter the radiological control area (RCA) (but not locked high or very high radiation areas) without the aid of a RP technician.
7. Personnel assigned plant operations and SSD met the requirements and guidance (analyzed through other programs such as operator training) and were not evaluated as part of this assessment unless a role/function/task from another major response area was assigned as a collateral duty.
8. In-plant (manual) safety related operator actions to manipulate components and equipment from locations outside the control room to achieve and maintain safe shutdown were done by a member of the on-shift staff as defined in the unit's Tech Specs.
9. Fire brigade (FB) staff performance is analyzed through other station programs (e.g., fire drills) and was not evaluated as part of this assessment unless a role/function/task from another major response area was assigned as a collateral duty.
10. Individuals holding the position of RP technician or Chemistry technician are qualified to perform the range of tasks expected of their position.
11. Security was not evaluated unless a role or function from another major response area was assigned as a collateral duty.
12. Communications, briefings, and peer checks are acceptable collateral duties.
13. All on-shift staff positions were evaluated, even if they had no known collateral duties, to ensure they can perform the tasks assigned to them. [Ref NSIR/DPR-ISG-01]
14. The Staffing Analysis specified the resources available to perform "Repair and Corrective Actions" and "Rescue Operations and First Aid" but these may be assigned as collateral duty to a designated on-shift responder.

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15. For assessment purposes, NRC notifications were treated as a continuous action per 10CFR50.72(c)(3) and 73.71(b)(1). This means once the initial NRC communications are established, the NRC will request an open line be maintained with the NRC Operations Center.
16. DBA (postulated accident, Condition IV event, or limiting fault) is considered as “Unanticipated occurrences that are postulated for accident analysis purposes but not expected to occur during the life of the plant. A postulated accident could result in sufficient damage to preclude resumption of plant operation. As a result, a greater number and variety of actions would need to be implemented by plant personnel.”
17. Unless otherwise specified in NSIR/DPR-ISG-01, Interim Staff Guidance – Emergency Planning for Nuclear Power Plants, or by the USAR initial conditions of a DBA analysis, it was assumed that the unit was in Mode 1, Power.
18. DBT assumed a hostile force breached the protected area fence but was neutralized with no adverse consequences to plant safety. Damage inflicted on plant systems, structures and components was not sufficient to prevent safe shutdown or cause a radiological release. There was no fire significant enough to warrant firefighting efforts prior to arrival of offsite resources and/or the augmented ERO.
19. The Staffing Analysis used DBA analysis assumptions, inputs, timing of events, plant protective response, and specified manual operator actions and their timing, as documented in the FSAR.
20. In cases where a DBA analysis included a radiological release, and the starting point of the release was not clearly defined, the staffing analysis assumed that the release began 15-minutes after the initiating event.
21. Severe Accident Management Guideline (SAMG) - this analysis assumed the accident progressed to conditions requiring a severe accident response; it did not include determining specific failures and the accident sequence.
22. SAMG - The actions analyzed included those that implement the initial site-specific actions assuming the core is not ex-vessel (i.e., no reactor vessel failure), and there is no actual or imminent challenge to containment integrity.

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VI. APPENDIX A - ANALYZED EVENTS AND ACCIDENTS

Event #	Event Type	Summary Description of Event	Plant Mode ¹	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).	1	NEI 10-05	Site Area Emergency	Yes
2	DBA	Control Rod Ejection	1	FSAR 14.16	Site Area Emergency	Yes
3	DBA	Small Line Break Outside Containment	1	FSAR 14.23	Site Area Emergency	Yes
4	DBA	Main Steam Line Break Inside Containment with LOOP (bounding for steam piping failures)	1	FSAR 14.14	Unusual Event (due to LOOP)	Yes
5	DBA	LOCA	1	FSAR 14.17	Site Area Emergency	Yes
6	DBA	Fuel Handling Accident	5	FSAR 14.19	Alert	Yes
7	DBA	Waste Tank Rupture	1	FSAR 14.21	Alert	Yes
8	Assumed for analysis purpose	Aircraft Probable Threat	1	10CFR50.54hh(1) RG 1.214	Alert	Yes
9	Assumed for Analysis Purpose	Control Room Evacuation and Remote Shutdown (fire in main control room)	1	10CFR50 Appendix R Procedure ONP-25.2	Alert	Yes
10	Assumed for analysis purpose	Station Blackout	1	10CFR50.63	Site Area Emergency	Yes
11	Assumed for Analysis Purpose	LOCA – General Emergency with radiological release and PAR	1	ISG IV.C	General Emergency	Yes
12	Assumed for Analysis Purpose	LOCA with entry into severe accident procedures.	1	ISG IV.C	General Emergency	No ²

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Event #	Event Type	Summary Description of Event	Plant Mode ¹	Reference Document(s)	Event ECL	Analysis Required?
13	Assumed for Analysis Purpose	Appendix R Fire	1	ISG IV.C	Alert	No ³
14	DBA	Dropped Cask	1	FSAR 14.11	None	No ⁴
15	DBA	Steam Generator Tube Rupture with concurrent LOOP	1	FSAR 14.15	Alert	Yes

¹ Plant mode per FSAR or assumed for analysis purpose

² SAMG is written to be implemented by the TSC. NEI 10-05 Section 2.11 states that the analysis of the ability to implement SAMG focuses on the reasonably expected initial mitigation action that would be performed by on-shift personnel other than licensed and non-licensed operators. Palisades does not include maintenance qualified to perform maintenance job tasks in minimum staffing and any response actions would be performed by operators.

³ Appendix R Fire is bound by the Control Room Fire and Remote Shutdown.

⁴ No emergency declaration is expected for this event.

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VII. APPENDIX B – ON-SHIFT STAFFING ANALYSIS

A. Accident Analysis #1 – Design Basis Threat (DBT)

1. Accident Summary
 - Land and/or waterborne HOSTILE ACTION directed against the Protected Area by a HOSTILE FORCE. Assume adversary characteristics defined by the Design Basis Threat.
2. Accident Specific Assumptions Made
 - The Palisades DBT for this analysis assumes a land based threat.
 - This event assumes the threat is neutralized immediately when inside the protected area fence, no significant damage to equipment or systems that require corrective actions before the ERO is staffed, no radiological release, and no fire that requires firefighting response before the ERO is staffed.
 - Assume at power in Mode 1
 - Security notifies the Shift Manager of condition of hostile action occurring within the protected area (Security code RED)
 - Assume all non-security staff is located inside the protected area at their normal work station when the event occurs.
 - Assume all systems function and the core remains covered. No fuel damage and no release.
3. Procedures for Accident Response
 - ONP-28.2 Rev.2, Response to Attack on Palisades
 - EOP-1.0 Rev. 13, Standard Post Trip Actions
 - EI-1 Rev 54, Emergency Classification and Actions
 - EI-3 Rev 31, Communications and Notifications
 - EI-2.2 Rev 15, Emergency Staff Augmentation
 - EI-12.1 Rev 18, Personnel Accountability and Assembly
 - ADMIN-4, Operations Organization, Responsibilities and Conduct

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

4. Tables

PALISADES TABLE 1 – ON-SHIFT POSITIONS Analysis # 1 DBT Security Threat						
Line #	On-shift Position	Basis Document	Augmentation Elapsed Time (min)*	Role in Table # / Line #	Unanalyzed Task?	TMS Required?
1	Shift Manager	Emergency Plan Figure 5-2	60	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L8 T5/L10 T5/L11 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5-2	N/A	T2/L2	No	No
3	Shift Technical Advisor	Emergency Plan Figure 5-2	60	T2/L3 T5/L7	No	No
4	Nuclear Control Operator #1	Emergency Plan Figure 5-2	N/A	T2/L4	No	No
5	Nuclear Control Operator #2	Emergency Plan Figure 5-2	N/A	T2/L5	No	No
6	Nuclear Plant Operator #1	Emergency Plan Figure 5-2	N/A	T2/L6	No	No
7	Nuclear Plant Operator #2	Emergency Plan Figure 5-2	N/A	N/A	No	No
8	Nuclear Plant Operator #3	Emergency Plan Figure 5-2	N/A	N/A	No	No
9	Nuclear Plant Operator #4	Emergency Plan Figure 5-2	N/A	N/A	No	No
10	Nuclear Plant Operator #5	Emergency Plan Figure 5-2	N/A	N/A	No	No
11	Nuclear Plant Operator #6	Emergency Plan Figure 5-2	N/A	N/A	No	No
12	Communicator	Emergency Plan Figure 5-2	30	T5/L9 T5/L13	No	No
13	Chem Tech	Emergency Plan Figure 5-2	60	N/A	No	No
14	RP#1	Emergency Plan Figure 5-2	30	N/A	No	No
15	Security	Security Contingency Plan / Emergency Plan Figure 5-2	N/A	N/A	No	No

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 2 – PLANT OPERATIONS & SAFE SHUTDOWN One Unit – One Control Room ANALYSIS # 1 <u>DBT Security Threat</u>			
Minimum Operations Crew Necessary to Implement ONPs and EOPs or SAMGs if Applicable			
Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Licensed Operator Training Program
2	Unit Supervisor	CRS	Licensed Operator Training Program
3	Shift Technical Advisor	STA	Licensed Operator Training Program
4	Reactor Operator #1	Nuclear Control Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Nuclear Control Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Nuclear Plant Operator #1	Non-Licensed Operator Training Program

Other (non-Operations) Personnel Necessary to Implement ONPs and EOPs or SAMGs if Applicable

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
7	Mechanic	N/A	N/A
8	Electrician	N/A	N/A
9	I&C Technician	N/A	N/A
10	Other	N/A	N/A
11	Other	N/A	N/A

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

Fire Brigade

PALISADES TABLE 3 – FIREFIGHTING		
ANALYSIS # 1 DBT Security Threat		
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

This accident does not include the need for firefighting, first aid or search & rescue.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis # 1 DBT Security Threat																					
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: <u>N/A</u>																				
2	On-site Survey: <u>N/A</u>																				
3	Personnel Monitoring: <u>N/A</u>																				
4	Job Coverage: <u>N/A</u>																				
5	Offsite Rad Assessment: <u>N/A</u>																				
6	Other site specific RP (describe): <u>N/A</u>																				
7	Chemistry Function task #1 (describe) <u>N/A</u>																				
8	Chemistry Function task #2 (describe) <u>N/A</u>																				

No chemistry or RP job function tasks for the conditions described in the DBT assumptions. RP and Chemistry take cover as directed.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis # 1 DBT Security Threat			
Line#	Function / Task	On-Shift Position	Task Analysis Controlling Method
1	Declare the emergency classification level (ECL)	Shift Manager	Emergency Planning Training Program / EP Drills
2	Approve Offsite Protective Action Recommendations	N/A	N/A
3	Approve content of State/local notifications	Shift Manager	Emergency Planning Training Program
4	Approve extension to allowable dose	N/A	N/A
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	Shift Manager	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	STA	Licensed Operator Training Program
8	Complete State/local notification form	Shift Manager	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	Shift Manager	Licensed Operator Training Program
11	Activate ERDS	Shift Manager	Emergency Planning Training Program
12	Offsite radiological assessment	N/A	N/A
13	Perform NRC notifications	Communicator	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

B. Design Basis Accident Analysis #2 – Control Rod Ejection

1. Accident Summary
 - This event assumes the reactivity insertion from the control rod ejection results in an overpower trip. The thermal-hydraulic analysis for this event is performed for only a few seconds. The remaining consequences of this event are covered by the small break LOCA analysis as noted in Chapter 14.17.2 of the FSAR.
2. Accident Specific Assumptions Made
 - Reactivity insertion – overpower trip.
 - The thermal-hydraulic analysis for this event is performed for only a few seconds. The remaining consequences of this event are covered by the small break LOCA analysis in Chapter 14.17.2
 - The analysis assumes 14.7% of the fuel fails due to DNB considerations.
 - 100% of the activity released from the damaged fuel is instantaneously released to the containment atmosphere, from which leakage to the environment occurs.
 - Radioactivity is transported to the secondary system through a 0.3 gpm primary to secondary leak in each steam generator.
 - EAB worst 2 hour dose containment release is within acceptable limits.
3. Procedures for Accident Response
 - EOP-4.0 R20 Loss of Coolant Accident Recovery
 - EOP-1.0 Rev 13, Standard Post Trip Actions
 - EI-1 Rev 54, Emergency Classification and Actions
 - EI-3 Rev 31, Communications and Notifications
 - EI-2.2 Rev 15, Emergency Staff Augmentation
 - EI-12.1 Rev 18, Personnel Accountability and Assembly
 - ADMIN-4, Operations Organization, Responsibilities and Conduct

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

4. Tables

PALISADES TABLE 1 – ON-SHIFT POSITIONS Analysis # 2 Control Rod Ejection Accident						
Line #	On-shift Position	Basis Document	Augmentation Elapsed Time (min)*	Role in Table # / Line #	Unanalyzed Task?	TMS Required?
1	Shift Manager	Emergency Plan Figure 5-2	60	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L8 T5/L10 T5/L11 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5-2	N/A	T2/L2	No	No
3	Shift Technical Advisor	Emergency Plan Figure 5-2	60	T2/L3	No	No
4	Nuclear Control Operator #1	Emergency Plan Figure 5-2	N/A	T2/L4	No	No
5	Nuclear Control Operator #2	Emergency Plan Figure 5-2	N/A	T2/L5	No	No
6	Nuclear Plant Operator #1	Emergency Plan Figure 5-2	N/A	T2/L6	No	No
7	Nuclear Plant Operator #2	Emergency Plan Figure 5-2	N/A	N/A	No	No
8	Nuclear Plant Operator #3	Emergency Plan Figure 5-2	N/A	N/A	No	No
9	Nuclear Plant Operator #4	Emergency Plan Figure 5-2	N/A	N/A	No	No
10	Nuclear Plant Operator #5	Emergency Plan Figure 5-2	N/A	N/A	No	No
11	Nuclear Plant Operator #6	Emergency Plan Figure 5-2	N/A	N/A	No	No
12	Communicator	Emergency Plan Figure 5-2	30	T5/L9 T5/L13	No	No
13	Chem Tech	Emergency Plan Figure 5-2	60	T5/L12	No	Yes
14	RP#1	Emergency Plan Figure 5-2	30	T4/L4	No	No
15	Security	Security Contingency Plan / Emergency Plan Figure 5-2	N/A	N/A	No	No

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 2 – PLANT OPERATIONS & SAFE SHUTDOWN One Unit – One Control Room ANALYSIS # 2 Control Rod Ejection Accident			
Minimum Operations Crew Necessary to Implement ONPs and EOPs or SAMGs if Applicable			
Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Licensed Operator Training Program
2	Unit Supervisor	CRS	Licensed Operator Training Program
3	Shift Technical Advisor	STA	Licensed Operator Training Program
4	Reactor Operator #1	Nuclear Control Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Nuclear Control Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Nuclear Plant Operator #1	Non-Licensed Operator Training Program

Other (non-Operations) Personnel Necessary to Implement ONPs and EOPs or SAMGs if Applicable

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
7	Mechanic	N/A	N/A
8	Electrician	N/A	N/A
9	I&C Technician	N/A	N/A
10	Other	N/A	N/A
11	Other	N/A	N/A

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

Fire Brigade

PALISADES TABLE 3 – FIREFIGHTING ANALYSIS # 2 Control Rod Ejection Accident		
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

This accident does not include the need for firefighting, first aid or search & rescue.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

**PALISADES TABLE 4 – RADIATION PROTECTION AND CHEMISTRY
Analysis # 2 Control Rod Ejection Accident**

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: N/A																			
2	On-site Survey: N/A																			
3	Personnel Monitoring: N/A																			
4	Job Coverage: RP goes to CR for job support		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Offsite Rad Assessment: <i>(Included in Table 5)</i>																			
6	Other site specific RP (describe): N/A																			
7	Chemistry Function task #1 (describe) - N/A																			
8	Chemistry Function task #2 (describe) – N/A																			

RP will perform the above task as directed by the Shift Manager. Task are not time critical. The time* to perform the tasks and the time to complete the tasks are estimated.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis # 2 Control Rod Ejection Accident			
Line #	Function / Task	On-Shift Position	Task Analysis Controlling Method
1	Declare the emergency classification level (ECL)	Shift Manager	Emergency Planning Training Program / EP Drills
2	Approve Offsite Protective Action Recommendations	N/A	N/A
3	Approve content of State/local notifications	Shift Manager	Emergency Planning Training Program
4	Approve extension to allowable dose	N/A	N/A
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	Shift Manager	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A`	Licensed Operator Training Program
8	Complete State/local notification form	Shift Manager	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	Shift Manager	Licensed Operator Training Program
11	Activate ERDS	Shift Manager	Emergency Planning Training Program
12	Offsite radiological assessment	Chem Technician	Emergency Planning Training Program
13	Perform NRC notifications	Communicator	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

C. Design Basis Accident Analysis #3 – Small Line Break Outside Containment as described in FSAR 14.23

1. Accident Summary
 - This analysis assumes a charging line break resulting in a 160 gpm primary coolant leak outside containment.
2. Accident Specific Assumptions Made
 - PCS activity of 1 μ Ci/gm DEI released to the Auxiliary Building atmosphere.
 - No reactor depressurization or trip was assumed to occur. An iodine spike was not assumed.
 - Leak isolation time assumed to be 1 hour.
3. Procedures for Accident Response
 - ONP-23.1 R25, Primary Coolant Leak
 - EOP-4 R20, LOCA Recovery
 - EOP-1.0 Rev 13, Standard Post Trip Actions
 - EI-1 Rev 54, Emergency Classification and Actions
 - EI-3 Rev 31, Communications and Notifications
 - EI-2.2 Rev 15, Emergency Staff Augmentation
 - EI-12.1 Rev 18, Personnel Accountability and Assembly
 - ADMIN-4, Operations Organization, Responsibilities and Conduct

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

4. Tables

PALISADES TABLE 1 – ON-SHIFT POSITIONS Analysis # 3 Small Line Break Outside Containment						
Line #	On-shift Position	Basis Document	Augmentation Elapsed Time (min)*	Role in Table # / Line #	Unanalyzed Task?	TMS Required?
1	Shift Manager	Emergency Plan Figure 5-2	60	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L8 T5/L10 T5/L11 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5-2	N/A	T2/L2	No	No
3	Shift Technical Advisor	Emergency Plan Figure 5-2	60	T2/L3	No	No
4	Nuclear Control Operator #1	Emergency Plan Figure 5-2	N/A	T2/L4	No	No
5	Nuclear Control Operator #2	Emergency Plan Figure 5-2	N/A	T2/L5	No	No
6	Nuclear Plant Operator #1	Emergency Plan Figure 5-2	N/A	T2/L6	No	No
7	Nuclear Plant Operator #2	Emergency Plan Figure 5-2	N/A	N/A	No	No
8	Nuclear Plant Operator #3	Emergency Plan Figure 5-2	N/A	N/A	No	No
9	Nuclear Plant Operator #4	Emergency Plan Figure 5-2	N/A	N/A	No	No
10	Nuclear Plant Operator #5	Emergency Plan Figure 5-2	N/A	N/A	No	No
11	Nuclear Plant Operator #6	Emergency Plan Figure 5-2	N/A	N/A	No	No
12	Communicator	Emergency Plan Figure 5-2	30	T5/L9 T5/L13	No	No
13	Chem Tech	Emergency Plan Figure 5-2	60	T5/L12	No	Yes
14	RP#1	Emergency Plan Figure 5-2	30	T4/L4	No	No
15	Security	Security Contingency Plan / Emergency Plan Figure 5-2	N/A	T5/L15	No	No

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 2 – PLANT OPERATIONS & SAFE SHUTDOWN One Unit – One Control Room ANALYSIS # 3 Small Line Break Outside Containment			
Minimum Operations Crew Necessary to Implement ONPs and EOPs or SAMGs if Applicable			
Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Licensed Operator Training Program
2	Unit Supervisor	CRS	Licensed Operator Training Program
3	Shift Technical Advisor	STA	Licensed Operator Training Program
4	Reactor Operator #1	Nuclear Control Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Nuclear Control Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Nuclear Plant Operator #1	Non-Licensed Operator Training Program

Other (non-Operations) Personnel Necessary to Implement ONPs and EOPs or SAMGs if Applicable

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
7	Mechanic	N/A	N/A
8	Electrician	N/A	N/A
9	I&C Technician	N/A	N/A
10	Other	N/A	N/A
11	Other	N/A	N/A

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

Fire Brigade

PALISADES TABLE 3 – FIREFIGHTING ANALYSIS # 3 Small Line Break Outside Containment		
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

This accident does not include the need for firefighting, first aid or search & rescue.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

**PALISADES TABLE 4 – RADIATION PROTECTION AND CHEMISTRY
Analysis # 3 Small Line Break Outside Containment**

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: N/A																			
2	On-site Survey: N/A																			
3	Personnel Monitoring: N/A																			
4	Job Coverage: RP goes to CR for job support		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Offsite Rad Assessment: <i>(Included in Table 5)</i>																			
6	Other site specific RP (describe): N/A																			
7	Chemistry Function task #1 (describe) - N/A																			
8	Chemistry Function task #2 (describe) – N/A																			

RP will perform the above task as directed by the Shift Manager. Task are not time critical. The time* to perform the tasks and the time to complete the tasks are estimated.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis # 3 Small Line Break Outside Containment			
Line #	Function / Task	On-Shift Position	Task Analysis Controlling Method
1	Declare the emergency classification level (ECL)	Shift Manager	Emergency Planning Training Program / EP Drills
2	Approve Offsite Protective Action Recommendations	N/A	N/A
3	Approve content of State/local notifications	Shift Manager	Emergency Planning Training Program
4	Approve extension to allowable dose	N/A	N/A
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	Shift Manager	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	Licensed Operator Training Program
8	Complete State/local notification form	Shift Manager	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	Shift Manager	Licensed Operator Training Program
11	Activate ERDS	Shift Manager	Emergency Planning Training Program
12	Offsite radiological assessment	Chem Technician	Emergency Planning Training Program
13	Perform NRC notifications	Communicator	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

D. Design Basis Accident Analysis #4 – Main Steam Line Break Inside Containment.

1. Accident Summary

- This event assumes a double-ended guillotine break of a Main Steam Line inside containment with a loss of offsite power. Release information was not available in the FSAR to determine if a radiation based EAL condition would be met in the first 60 minutes of the event. Emergency declaration was based on the loss of offsite power.

2. Accident Specific Assumptions Made

- MSL break assumes 0.3 gpm primary to secondary leak for the affected SG that flashes to steam and is released through the break area.
- FSAR analysis assumes radionuclide releases from the primary coolant associated with 0.5% fuel failures.
- The EAB worst 2 hour dose was noted in the FSAR as being within acceptable criteria but specific release information was not available to determine if a radiation based EAL condition was met in the first 60 minutes of the event. The event declaration was therefore made based on the loss of off-site power.

3. Procedures for Accident Response

- EOP-1.0 Rev 13, Standard Post Trip Actions
- EI-1 Rev 54, Emergency Classification and Actions
- EI-3 Rev 31, Communications and Notifications
- ONP-9 R7 Excessive Load
- ADMIN-4, Operations Organization, Responsibilities and Conduct
- EOP-6.0 R17, Excess Steam Demand Event

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

4. Tables

PALISADES TABLE 1 – ON-SHIFT POSITIONS Analysis # 4 Main Steam Line Break						
Line #	On-shift Position	E-Plan Reference	Augmentation Elapsed Time (min)	Role in Table # / Line #	Unanalyzed Task?	TMS Required?
1	Shift Manager	Emergency Plan Figure 5-2	60	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L8 T5/L10 T5/L11 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5-2	N/A	T2/L2	No	No
3	Shift Technical Advisor	Emergency Plan Figure 5-2	60	T2/L3	No	No
4	Nuclear Control Operator #1	Emergency Plan Figure 5-2	N/A	T2/L4	No	No
5	Nuclear Control Operator #2	Emergency Plan Figure 5-2	N/A	T2/L5	No	No
6	Nuclear Plant Operator #1	Emergency Plan Figure 5-2	N/A	T2/L6	No	No
7	Nuclear Plant Operator #2	Emergency Plan Figure 5-2	N/A	N/A	No	No
8	Nuclear Plant Operator #3	Emergency Plan Figure 5-2	N/A	N/A	No	No
9	Nuclear Plant Operator #4	Emergency Plan Figure 5-2	N/A	N/A	No	No
10	Nuclear Plant Operator #5	Emergency Plan Figure 5-2	N/A	N/A	No	No
11	Nuclear Plant Operator #6	Emergency Plan Figure 5-2	N/A	N/A	No	No
12	Communicator	Emergency Plan Figure 5-2	30	T5/L9 T5/L13	No	No
13	Chem Tech	Emergency Plan Figure 5-2	60	T5/L12	No	Yes
14	RP#1	Emergency Plan Figure 5-2	30	T4/L4	No	No
15	Security	Security Contingency Plan / Emergency Plan Figure 5-2	N/A	T5/L15	No	No

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 2 – PLANT OPERATIONS & SAFE SHUTDOWN			
One Unit – One Control Room			
ANALYSIS # 4 Main Steam Line Break			
Minimum Operations Crew Necessary to Implement ONPs and EOPs or SAMGs if Applicable			
Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Licensed Operator Training Program
2	Unit Supervisor	CRS	Licensed Operator Training Program
3	Shift Technical Advisor	STA	Licensed Operator Training Program
4	Reactor Operator #1	Nuclear Control Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Nuclear Control Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Nuclear Plant Operator #1	Non-Licensed Operator Training Program

Other (non-Operations) Personnel Necessary to Implement ONPs and EOPs or SAMGs if Applicable

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
7	Mechanic	N/A	N/A
8	Electrician	N/A	N/A
9	I&C Technician	N/A	N/A
10	Other	N/A	N/A

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

Fire Brigade

PALISADES TABLE 3 – FIREFIGHTING ANALYSIS # 4 Main Steam Line Break		
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

This accident does not include the need for firefighting, first aid or search & rescue.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

**PALISADES TABLE 4 – RADIATION PROTECTION AND CHEMISTRY
Analysis # 4 Main Steam Line Break**

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: N/A																			
2	On-site Survey: N/A																			
3	Personnel Monitoring: N/A																			
4	Job Coverage: RP is available to support job coverage or surveys as required		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Offsite Rad Assessment: (Table 5)																			
6	Other site specific RP (describe): N/A																			
7	Chemistry Function task #1 (describe) N/A																			
8	Chemistry Function task #2 (describe) N/A																			

Although no specific radiological tasks were identified, the RP is available to provide support as directed by the Shift Manager. Tasks are not time critical. The time* to perform the tasks and the time to complete the tasks are estimated.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 5 – EMERGENCY PLAN IMPLEMENTATION			
Analysis # 4 Main Steam Line Break			
Line #	Function / Task	On-Shift Position	Task Analysis Controlling Method
1	Declare the emergency classification level (ECL)	Shift Manager	Emergency Planning Training Program / EP Drills
2	Approve Offsite Protective Action Recommendations	N/A	N/A
3	Approve content of State/local notifications	Shift Manager	Emergency Planning Training Program
4	Approve extension to allowable dose	N/A	N/A
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	Shift Manager	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	Shift Manager	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	Shift Manager	Licensed Operator Training Program
11	Activate ERDS	Shift Manager	Emergency Planning Training Program
12	Offsite radiological assessment	Chemistry Technician	Emergency Planning Training Program
13	Perform NRC notifications	Communicator	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security Officer	Security Training Program / EP Drills

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

E. Design Basis Accident Analysis #5 – Loss of Coolant Accident.

1. Accident Summary
 - This event is defined by a large rupture of the PCS cold leg piping between the PCP and the reactor vessel for the PCS loop containing the pressurizer. This event also includes a loss of offsite power and failure of 1 diesel generator.
2. Accident Specific Assumptions Made
 - Large rupture of the PCS cold leg piping between the PCP and the reactor vessel for the PCS loop containing the pressurizer.
 - Rapid depressurization of the PCS, reactor trip signal but credit is taken for shut down by coolant voiding in the core. Experience DNB.
 - SIAS signal initiated
 - Loss of offsite power and failure of 1 D/G
 - Assumes loss of one ECCS train, one HPSI, one LPSI, all containment spray pumps and all containment fan coolers are operational.
3. Procedures for Accident Response
 - EOP-4.0 R20 Loss of Coolant Accident Recovery
 - EOP-1.0 Rev 13, Standard Post Trip Actions
 - EI-1 Rev 54, Emergency Classification and Actions
 - EI-3 Rev 31, Communications and Notifications
 - EI-2.2 Rev 15, Emergency Staff Augmentation
 - EI-12.1 Rev 18, Personnel Accountability and Assembly
 - ADMIN-4, Operations Organization, Responsibilities and Conduct
 - ONP-23.1, Rev 25 Primary Coolant Leak

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

4. Tables

PALISADES TABLE 1 – ON-SHIFT POSITIONS Analysis # 5 Loss of Coolant Accident						
Line #	On-shift Position	E-Plan Reference	Augmentation Elapsed Time (min)	Role in Table # / Line #	Unanalyzed Task?	TMS Required?
1	Shift Manager	Emergency Plan Figure 5-2	60	T2/L1 T5/L1 T5/L2 T5/L3 T5/L5 T5/L6 T5/L8 T5/L10 T5/L11 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5-2	N/A	T2/L2	No	No
3	Shift Technical Advisor	Emergency Plan Figure 5-2	60	T2/L3	No	No
4	Nuclear Control Operator #1	Emergency Plan Figure 5-2	N/A	T2/L4	No	No
5	Nuclear Control Operator #2	Emergency Plan Figure 5-2	N/A	T2/L5	No	No
6	Nuclear Plant Operator #1	Emergency Plan Figure 5-2	N/A	T2/L6	No	No
7	Nuclear Plant Operator #2	Emergency Plan Figure 5-2	N/A	N/A	No	No
8	Nuclear Plant Operator #3	Emergency Plan Figure 5-2	N/A	N/A	No	No
9	Nuclear Plant Operator #4	Emergency Plan Figure 5-2	N/A	N/A	No	No
10	Nuclear Plant Operator #5	Emergency Plan Figure 5-2	N/A	N/A	No	No
11	Nuclear Plant Operator #6	Emergency Plan Figure 5-2	N/A	N/A	No	No
12	Communicator	Emergency Plan Figure 5-2	30	T5/L9 T5/L13	No	No
13	Chem Tech	Emergency Plan Figure 5-2	60	T5/L12	No	Yes
14	RP	Emergency Plan Figure 5-2	30	T4/L4	No	No
15	Security	Security Contingency Plan / Emergency Plan Figure 5-2	N/A	T5/L15	No	No

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 2 – PLANT OPERATIONS & SAFE SHUTDOWN			
One Unit – One Control Room			
ANALYSIS # 5 <u>Loss of Coolant Accident</u>			
Minimum Operations Crew Necessary to Implement ONPs and EOPs or SAMGs if Applicable			
Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Licensed Operator Training Program
2	Unit Supervisor	CRS	Licensed Operator Training Program
3	Shift Technical Advisor	STA	Licensed Operator Training Program
4	Reactor Operator #1	Nuclear Control Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Nuclear Control Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Nuclear Plant Operator #1	Non-Licensed Operator Training Program

Other (non-Operations) Personnel Necessary to Implement ONPs and EOPs or SAMGs if Applicable

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
7	Mechanic	N/A	N/A
8	Electrician	N/A	N/A
9	I&C Technician	N/A	N/A
10	Other	N/A	N/A

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

Fire Brigade

PALISADES TABLE 3 – FIREFIGHTING ANALYSIS # 5 Loss of Coolant Accident		
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

This accident does not include the need for firefighting, first aid or search & rescue.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

**PALISADES TABLE 4 – RADIATION PROTECTION AND CHEMISTRY
Analysis # 5 Loss of Coolant Accident**

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: N/A																			
2	On-site Survey: N/A																			
3	Personnel Monitoring: N/A																			
4	Job Coverage: RP reports to the CR to provide RP support (including in plant and out of plant surveys) as directed by the SM.		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Offsite Rad Assessment: <i>(Included in Table 5)</i>																			
6	Other site specific RP (describe): N/A																			
7	Chemistry Function task #1 (describe) N/A																			
8	Chemistry Function task #2 (describe) N/A																			

RP will perform the above task as directed by the Shift Manager. Tasks are not time critical. The time* to perform the tasks and the time to complete the tasks are estimated.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis # 5 <u>Loss of Coolant Accident</u>			
Line #	Function / Task	On-Shift Position	Task Analysis Controlling Method
1	Declare the emergency classification level (ECL)	Shift Manager	Emergency Planning Training Program / EP Drills
2	Approve Offsite Protective Action Recommendations	N/A	Emergency Planning Training Program
3	Approve content of State/local notifications	Shift Manager	Emergency Planning Training Program
4	Approve extension to allowable dose	N/A	Emergency Planning Training Program
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	Shift Manager	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	Shift Manager	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	Shift Manager	Licensed Operator Training Program
11	Activate ERDS	Shift Manager	Emergency Planning Training Program
12	Offsite radiological assessment	Chemistry Technician	Emergency Planning Training Program
13	Perform NRC notifications	Communicator	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security Officer	Security Training Program

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

F. Design Basis Accident Analysis #6 – Fuel Handling Accident

1. Accident Summary
 - The fuel handling accident is assumed to occur as a consequence of a failure of the fuel assembly lifting mechanism, resulting in the dropping of a raised fuel assembly onto stored fuel bundles. The FHA is assumed to occur in containment two days after shutdown. An Alert emergency declaration was assumed to be declared due to the event.
2. Accident Specific Assumptions Made
 - An Alert is declared on the fuel handling event. Radiological release rates are not available to classify on the release.
 - Additional station personnel, including Operations and Health Physics Technicians, would normally be on-site during fuel movement activities. Additional station personnel were not required, however, to support initial response actions.
3. Procedures for Accident Response
 - ONP-11.2 R7, Fuel Handling Accident
 - EI-1 Rev 54, Emergency Classification and Actions
 - EI-3 Rev 31, Communications and Notifications
 - EI-2.2 Rev 15, Emergency Staff Augmentation
 - EI-12.1 Rev 18, Personnel Accountability and Assembly
 - ADMIN-4, Operations Organization, Responsibilities and Conduct

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

4. Tables

PALISADES TABLE 1 – ON-SHIFT POSITIONS Analysis #6 – <u>Fuel Handling Accident</u>						
Line #	On-shift Position	E-Plan Reference	Augmentation Elapsed Time (min)	Role in Table # / Line #	Unanalyzed Task?	TMS Required?
1	Shift Manager	Emergency Plan Figure 5-2	60	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L8 T5/L10 T5/L11 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5-2	N/A	T2/L2	No	No
3	Shift Technical Advisor	Emergency Plan Figure 5-2	60	T2/L3	No	No
4	Nuclear Control Operator #1	Emergency Plan Figure 5-2	N/A	T2/L4	No	No
5	Nuclear Control Operator #2	Emergency Plan Figure 5-2	N/A	T2/L5	No	No
6	Nuclear Plant Operator #1	Emergency Plan Figure 5-2	N/A	T2/L6	No	No
7	Nuclear Plant Operator #2	Emergency Plan Figure 5-2	N/A	N/A	No	No
8	Nuclear Plant Operator #3	Emergency Plan Figure 5-2	N/A	N/A	No	No
9	Nuclear Plant Operator #4	Emergency Plan Figure 5-2	N/A	N/A	No	No
10	Nuclear Plant Operator #5	Emergency Plan Figure 5-2	N/A	N/A	No	No
11	Nuclear Plant Operator #6	Emergency Plan Figure 5-2	N/A	N/A	No	No
12	Communicator	Emergency Plan Figure 5-2	30	T5/L9 T5/L13	No	No
13	Chem Tech	Emergency Plan Figure 5-2	60	T5/L12	No	Yes
14	RP#1	Emergency Plan Figure 5-2	30	T4/L4	No	No
15	Security	Security Contingency Plan / Emergency Plan Figure 5-2	N/A	T5/L15	No	No

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 2 – PLANT OPERATIONS & SAFE SHUTDOWN			
One Unit – One Control Room			
ANALYSIS # 6 – Fuel Handling Accident			
Minimum Operations Crew Necessary to Implement ONPs and EOPs or SAMGs if Applicable			
Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Licensed Operator Training Program
2	Unit Supervisor	CRS	Licensed Operator Training Program
3	Shift Technical Advisor	STA	Licensed Operator Training Program
4	Reactor Operator #1	Nuclear Control Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Nuclear Control Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Nuclear Plant Operator #1	Non-Licensed Operator Training Program

Other (non-Operations) Personnel Necessary to Implement ONPs and EOPs or SAMGs if Applicable

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
7	Mechanic	N/A	N/A
8	Electrician	N/A	N/A
9	I&C Technician	N/A	N/A
10	Other	N/A	N/A
11	Other	N/A	N/A

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

Fire Brigade

PALISADES TABLE 3 – FIREFIGHTING ANALYSIS # 6 – Fuel Handling Accident		
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

This accident does not include the need for firefighting, first aid or search & rescue.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

**PALISADES TABLE 4 – RADIATION PROTECTION AND CHEMISTRY
Analysis #6 – Fuel Handling Accident**

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: <u>RP#2</u>																			
2	On-site Survey: N/A																			
3	Personnel Monitoring: N/A																			
4	Job Coverage: RP reports to the CR to provide RP support (including in plant and out of plant surveys) as directed by the SM.		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Offsite Rad Assessment: <i>(Included in Table 5)</i>																			
6	Other site specific RP (describe): N/A																			
7	Chemistry Function task #1 (describe) N/A																			
8	Chemistry Function task #2 (describe) N/A																			

RP will perform the above task as directed by the Shift Manager. Tasks are not time critical. The time* to perform the tasks and the time to complete the tasks are estimated.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 5 – EMERGENCY PLAN IMPLEMENTATION			
Analysis #6 – Fuel Handling Accident			
Line #	Function / Task	On-Shift Position	Task Analysis Controlling Method
1	Declare the emergency classification level (ECL)	Shift Manager	Emergency Planning Training Program / EP Drills
2	Approve Offsite Protective Action Recommendations	N/A	N/A
3	Approve content of State/local notifications	Shift Manager	Emergency Planning Training Program
4	Approve extension to allowable dose	N/A	N/A
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	Shift Manager	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	Shift Manager	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	Shift Manager	Licensed Operator Training Program
11	Activate ERDS	Shift Manager	Emergency Planning Training Program
12	Offsite radiological assessment	Chemistry Technician	Emergency Planning Training Program
13	Perform NRC notifications	Communicator	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security Officer	Security Training Program

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

G. Design Basis Accident Analysis #7 – Waste Tank Rupture

1. Accident Summary
 - This event assumes the rupture of a waste gas decay tank. EAL AA1.1 conditions are assumed to be met based on expected stack high range monitor readings.
2. Accident Specific Assumptions Made
 - A rupture in the Waste Gas System or a rupture of the volume control tank would result in offsite doses well below the 10 CFR 100 limits, and would not present any undue risk to the health and safety of the public.
 - The release for this accident is similar to the small break LOCA outside containment. Details are not provided to determine an EAL, therefore an assumption is made that EAL AA1.1 conditions are met based on the stack high range monitor.
3. Procedures for Accident Response
 - HP-2.8 R25, Response to Unusual Radiological Occurrences
 - EI-1 Rev 54, Emergency Classification and Actions
 - EI-3 Rev 31, Communications and Notifications
 - EI-2.2 Rev 15, Emergency Staff Augmentation
 - EI-12.1 Rev 18, Personnel Accountability and Assembly
 - ADMIN-4, Operations Organization, Responsibilities and Conduct

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

4. Tables

PALISADES TABLE 1 – ON-SHIFT POSITIONS Analysis #7 – <u>Waste Tank Rupture</u>						
Line #	On-shift Position	E-Plan Reference	Augmentation Elapsed Time (min)	Role in Table # / Line #	Unanalyzed Task?	TMS Required?
1	Shift Manager	Emergency Plan Figure 5-2	60	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L8 T5/L10 T5/L11 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5-2	N/A	T2/L2	No	No
3	Shift Technical Advisor	Emergency Plan Figure 5-2	60	T2/L3	No	No
4	Nuclear Control Operator #1	Emergency Plan Figure 5-2	N/A	T2/L4	No	No
5	Nuclear Control Operator #2	Emergency Plan Figure 5-2	N/A	T2/L5	No	No
6	Nuclear Plant Operator #1	Emergency Plan Figure 5-2	N/A	T2/L6	No	No
7	Nuclear Plant Operator #2	Emergency Plan Figure 5-2	N/A	N/A	No	No
8	Nuclear Plant Operator #3	Emergency Plan Figure 5-2	N/A	N/A	No	No
9	Nuclear Plant Operator #4	Emergency Plan Figure 5-2	N/A	N/A	No	No
10	Nuclear Plant Operator #5	Emergency Plan Figure 5-2	N/A	N/A	No	No
11	Nuclear Plant Operator #6	Emergency Plan Figure 5-2	N/A	N/A	No	No
12	Communicator	Emergency Plan Figure 5-2	30	T5/L9 T5/L13	No	No
13	Chem Tech	Emergency Plan Figure 5-2	60	T5/L12	No	Yes
14	RP#1	Emergency Plan Figure 5-2	30	T4/L4	No	No
15	Security	Security Contingency Plan / Emergency Plan Figure 5-2	N/A	T5/L15	No	No

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 2 – PLANT OPERATIONS & SAFE SHUTDOWN			
One Unit – One Control Room			
ANALYSIS # 7 – Waste Tank Rupture			
Minimum Operations Crew Necessary to Implement ONPs and EOPs or SAMGs if Applicable			
Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Licensed Operator Training Program
2	Unit Supervisor	CRS	Licensed Operator Training Program
3	Shift Technical Advisor	STA	Licensed Operator Training Program
4	Reactor Operator #1	Nuclear Control Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Nuclear Control Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Nuclear Plant Operator #1	Non-Licensed Operator Training Program

Other (non-Operations) Personnel Necessary to Implement ONPs and EOPs or SAMGs if Applicable

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
7	Mechanic	N/A	N/A
8	Electrician	N/A	N/A
9	I&C Technician	N/A	N/A
10	Other	N/A	N/A
11	Other	N/A	N/A

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

Fire Brigade

PALISADES TABLE 3 – FIREFIGHTING ANALYSIS # 7 – Waste Tank Rupture		
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

This accident does not include the need for firefighting, first aid or search & rescue.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

**PALISADES TABLE 4 – RADIATION PROTECTION AND CHEMISTRY
Analysis #7 –Waste Tank Rupture**

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: <u>RP#2</u>																			
2	On-site Survey: N/A																			
3	Personnel Monitoring: N/A																			
4	Job Coverage: RP reports to the CR to provide RP support (including in plant and out of plant surveys) as directed by the SM.		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Offsite Rad Assessment: <i>(Included in Table 5)</i>																			
6	Other site specific RP (describe): N/A																			
7	Chemistry Function task #1 (describe) N/A																			
8	Chemistry Function task #2 (describe) N/A																			

RP will perform the above task as directed by the Shift Manager. Tasks are not time critical. The time* to perform the tasks and the time to complete the tasks are estimated.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 5 – EMERGENCY PLAN IMPLEMENTATION			
Analysis #7 – Waste Tank Rupture			
Line #	Function / Task	On-Shift Position	Task Analysis Controlling Method
1	Declare the emergency classification level (ECL)	Shift Manager	Emergency Planning Training Program / EP Drills
2	Approve Offsite Protective Action Recommendations	N/A	N/A
3	Approve content of State/local notifications	Shift Manager	Emergency Planning Training Program
4	Approve extension to allowable dose	N/A	N/A
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	Shift Manager	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	Shift Manager	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	Shift Manager	Licensed Operator Training Program
11	Activate ERDS	Shift Manager	Emergency Planning Training Program
12	Offsite radiological assessment	Chemistry Technician	Emergency Planning Training Program
13	Perform NRC notifications	Communicator	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security Officer	Security Training Program

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

H. Accident Analysis #8 – Aircraft Probable Threat

1. Accident Summary

- The analysis includes all emergency response actions taken prior to an aircraft impact in accordance with RG 1.214 for an aircraft threat that is greater than 5 minutes, but less than 30 minutes from the site, and considers the dispersal of the site fire brigade away from target areas for firefighting.
- The analysis does not include a scenario or response actions taken during or after a crash.

2. Accident Specific Assumptions Made

- The Shift Manager receives the call from the NRC of probable aircraft threat.
- All non-security on-shift personnel are inside the protected area fence at their normal workstation.

3. Procedures for Accident Response

- ONP-28.1 Rev 1, Response to Security Threats
- EOP-1.0 Rev 13, Standard Post Trip Actions
- EI-1 Rev 54, Emergency Classification and Actions
- EI-3 Rev 31, Communications and Notifications
- EI-2.2 Rev 15, Emergency Staff Augmentation
- EI-12.1 Rev 18, Personnel Accountability and Assembly
- ADMIN-4, Operations Organization, Responsibilities and Conduct

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

4. Tables

PALISADES TABLE 1 – ON-SHIFT POSITIONS Analysis #8 – Aircraft Probable Threat						
Line #	On-shift Position	Basis Document	Augmentation Elapsed Time (min)	Role in Table 5 / Line #	Unanalyzed Task?	TMS Required?
1	Shift Manager	Emergency Plan Figure 5-2	60	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L8 T5/L10 T5/L11 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5-2	N/A	T2/L2	No	No
3	Shift Technical Advisor	Emergency Plan Figure 5-2	60	T2/L3	No	No
4	Nuclear Control Operator #1	Emergency Plan Figure 5-2	N/A	T2/L4	No	No
5	Nuclear Control Operator #2	Emergency Plan Figure 5-2	N/A	T2/L5	No	No
6	Nuclear Plant Operator #1	Emergency Plan Figure 5-2	N/A	T2/L6	No	No
7	Nuclear Plant Operator #2	Emergency Plan Figure 5-2	N/A	N/A	No	No
8	Nuclear Plant Operator #3	Emergency Plan Figure 5-2	N/A	N/A	No	No
9	Nuclear Plant Operator #4	Emergency Plan Figure 5-2	N/A	N/A	No	No
10	Nuclear Plant Operator #5	Emergency Plan Figure 5-2	N/A	N/A	No	No
11	Nuclear Plant Operator #6	Emergency Plan Figure 5-2	N/A	N/A	No	No
12	Communicator	Emergency Plan Figure 5-2	30	T5/L9 T5/L13	No	No
13	Chem Tech	Emergency Plan Figure 5-2	60	T4/L7	No	No
14	RP#1	Emergency Plan Figure 5-2	30	T4/L6	No	No
15	Security	Security Contingency Plan / Emergency Plan Figure 5-2	N/A	T5/L15	No	No

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 2 – PLANT OPERATIONS & SAFE SHUTDOWN			
One Unit – One Control Room			
Analysis #8 – Aircraft Probable Threat			
Minimum Operations Crew Necessary to Implement ONPs and EOPs or SAMGs if Applicable			
Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Licensed Operator Training Program
2	Unit Supervisor	CRS	Licensed Operator Training Program
3	Shift Technical Advisor	STA	Licensed Operator Training Program
4	Reactor Operator #1	Nuclear Control Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Nuclear Control Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Nuclear Plant Operator #1	Non-Licensed Operator Training Program

Other (non-Operations) Personnel Necessary to Implement ONPs and EOPs or SAMGs if Applicable

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
7	Mechanic	N/A	N/A
8	Electrician	N/A	N/A
9	I&C Technician	N/A	N/A
10	Other	N/A	N/A
11	Other	N/A	N/A

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

Fire Brigade

PALISADES TABLE 3 – FIREFIGHTING Analysis #8 – Aircraft Probable Threat		
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

This accident does not include the need for firefighting, first aid or search & rescue. The fire brigade relocates to the Training Center.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

**PALISADES TABLE 4 – RADIATION PROTECTION AND CHEMISTRY
Analysis #8 – Aircraft Probable Threat**

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: N/A																			
2	On-site Survey: N/A																			
3	Personnel Monitoring: N/A																			
4	Job Coverage: N/A																			
5	Offsite Rad Assessment: <i>(Included in Table 5 – N/A)</i>																			
6	Other site specific RP (describe):																			
7	Chemistry Function task #1 (describe)																			
8	Chemistry Function task #2 (describe) – N/A																			

*Times are estimated

No specific RP or Chemistry tasks are performed for this event. At the on-set of this event, RP relocates to the survey vehicle outside the protected area and the Chemistry Technician relocates to the Training Center.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 5 – EMERGENCY PLAN IMPLEMENTATION			
Analysis #8 – Aircraft Probable Threat			
Line #	Function / Task*	On-Shift Position	Task Analysis Controlling Method
1	Declare the emergency classification level (ECL)	Shift Manager	Emergency Planning Training Program / EP Drills
2	Approve Offsite Protective Action Recommendations	N/A	N/A
3	Approve content of State/local notifications	Shift Manager	Emergency Planning Training Program
4	Approve extension to allowable dose	N/A	N/A
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	Shift Manager	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	Shift Manager	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	Shift Manager	Licensed Operator Training Program
11	Activate ERDS	Shift Manager	Emergency Planning Training Program
12	Offsite radiological assessment	N/A	N/A
13	Perform NRC notifications	Communicator	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

I. Accident Analysis #9 – Control Room Fire Requiring Evacuation and Remote Shutdown

1. Accident Summary

- This event involves a large transient fire requiring evacuation of the Control Room. The event has the potential to include shorts and/or spurious signals producing potential LOCA pathways and/or incorrect system lineup for shutdown.

2. Accident Specific Assumptions Made

- The Nuclear Control Operator will initiate a manual reactor trip prior to evacuating the control room.
- The Shift Manager will make the plant announcement prior to evacuating the control room.

3. Procedures for Accident Response

- ONP-25.1 R21, Fire Which Threatens Safety Related Equipment
- ONP-25.2 R28 Alternate Safe Shutdown Procedure
- EI-1 Rev 54, Emergency Classification and Actions
- EI-3 Rev 31, Communications and Notifications
- EI-2.2 Rev 15, Emergency Staff Augmentation
- EI-12.1 Rev 18, Personnel Accountability and Assembly
- ADMIN-4.0 R47, Operations Organization, Responsibilities and Conduct

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

4. Tables

PALISADES TABLE 1 – ON-SHIFT POSITIONS Analysis #9 – CR Evacuation & Remote SD						
Line #	On-shift Position	Basis Document	Augmentation Elapsed Time (min)	Role in Table 5 / Line #	Unanalyzed Task?	TMS Required?
1	Shift Manager	Emergency Plan Figure 5-2	60	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L8 T5/L10 T5/L11 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5-2	N/A	T2/L2	No	No
3	Shift Technical Advisor	Emergency Plan Figure 5-2	60	T2/L3	No	No
4	Nuclear Control Operator #1	Emergency Plan Figure 5-2	N/A	T2/L4	No	No
5	Nuclear Control Operator #2	Emergency Plan Figure 5-2	N/A	T2/L5	No	No
6	Nuclear Plant Operator #1	Emergency Plan Figure 5-2	N/A	T2/L6	No	No
7	Nuclear Plant Operator #2	Emergency Plan Figure 5-2	N/A	T3/L1	No	No
8	Nuclear Plant Operator #3	Emergency Plan Figure 5-2	N/A	T3/L2	No	No
9	Nuclear Plant Operator #4	Emergency Plan Figure 5-2	N/A	T3/L3	No	No
10	Nuclear Plant Operator #5	Emergency Plan Figure 5-2	N/A	T3/L4	No	No
11	Nuclear Plant Operator #6	Emergency Plan Figure 5-2	N/A	T3/L5	No	No
12	Communicator	Emergency Plan Figure 5-2	30	T5/L9 T5/L13	No	No
13	Chem Tech	Emergency Plan Figure 5-2	60	N/A	No	No
14	RP#1	Emergency Plan Figure 5-2	30	T4/L4	No	No
15	Security	Security Contingency Plan / Emergency Plan Figure 5-2	N/A	N/A	No	No

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 2 – PLANT OPERATIONS & SAFE SHUTDOWN			
One Unit – One Control Room			
Analysis #9 – CR Evacuation & Remote SD			
Minimum Operations Crew Necessary to Implement ONPs and EOPs or SAMGs if Applicable			
Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Licensed Operator Training Program
2	Unit Supervisor	CRS	Licensed Operator Training Program
3	Shift Technical Advisor	STA	Licensed Operator Training Program
4	Reactor Operator #1	Nuclear Control Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Nuclear Control Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Nuclear Plant Operator #1	Non-Licensed Operator Training Program

Other (non-Operations) Personnel Necessary to Implement ONPs and EOPs or SAMGs if Applicable

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
7	Mechanic	N/A	N/A
8	Electrician	N/A	N/A
9	I&C Technician	N/A	N/A
10	Other	N/A	N/A
11	Other	N/A	N/A

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

Fire Brigade

PALISADES TABLE 3 – FIREFIGHTING Analysis #9 – CR Evacuation & Remote SD		
Line #	Performed by	Task Analysis Controlling Method
1	Nuclear Plant Operator #2	Fire Brigade Training
2	Nuclear Plant Operator #3	Fire Brigade Training
3	Nuclear Plant Operator #4	Fire Brigade Training
4	Nuclear Plant Operator #5	Fire Brigade Training
5	Nuclear Plant Operator #6	Fire Brigade Training

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis #9 – CR Evacuation & Remote SD																				
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: N/A																			
2	On-site Survey: N/A																			
3	Personnel Monitoring: N/A																			
4	Job Coverage: RP#1 Support FB			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
5	Offsite Rad Assessment: <i>(Included in Table 5)</i>																			
6	Other site specific RP (describe): N/A																			
7	Chemistry Function task #1 (describe) – N/A																			
8	Chemistry Function task #2 (describe) – N/A																			

*Times are estimated

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 5 – EMERGENCY PLAN IMPLEMENTATION			
Analysis #9 – CR Evacuation & Remote SD			
Line #	Function / Task*	On-Shift Position	Task Analysis Controlling Method
1	Declare the emergency classification level (ECL)	Shift Manager	Emergency Planning Training Program / EP Drills
2	Approve Offsite Protective Action Recommendations	N/A	N/A
3	Approve content of State/local notifications	Shift Manager	Emergency Planning Training Program
4	Approve extension to allowable dose	N/A	N/A
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	Shift Manager	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	Shift Manager	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	Shift Manager	Licensed Operator Training Program
11	Activate ERDS	Shift Manager	Emergency Planning Training Program
12	Offsite radiological assessment	N/A	N/A
13	Perform NRC notifications	Communicator	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	N/A	N/A

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

J. Accident Analysis #10 – Station Blackout

1. Accident Summary
 - A loss of all offsite AC power occurs and the failure of the emergency diesel generators to start. The SM determines power cannot be restored and declares a SAE on EAL SS1.1.
2. Accident Specific Assumptions Made
 - At time T-0 a loss of all AC power occurs
 - No release occurs
3. Procedures for Accident Response
 - EOP-3 R14, Station Blackout Recovery
 - ONP-23.4 R3, Loss of Spent Fuel Pool cooling
 - SOP-34
 - EMG Emergency Management guideline

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

4. Tables

PALISADES TABLE 1 – ON-SHIFT POSITIONS Analysis #10 – Station Blackout						
Line #	On-shift Position	Basis Document	Augmentation Elapsed Time (min)	Role in Table 5 / Line #	Unanalyzed Task?	TMS Required?
1	Shift Manager	Emergency Plan Figure 5-2	60	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L8 T5/L10 T5/L11 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5-2	N/A	T2/L2	No	No
3	Shift Technical Advisor	Emergency Plan Figure 5-2	60	T2/L3	No	No
4	Nuclear Control Operator #1	Emergency Plan Figure 5-2	N/A	T2/L4	No	No
5	Nuclear Control Operator #2	Emergency Plan Figure 5-2	N/A	T2/L5	No	No
6	Nuclear Plant Operator #1	Emergency Plan Figure 5-2	N/A	T2/L6	No	No
7	Nuclear Plant Operator #2	Emergency Plan Figure 5-2	N/A	N/A	No	No
8	Nuclear Plant Operator #3	Emergency Plan Figure 5-2	N/A	N/A	No	No
9	Nuclear Plant Operator #4	Emergency Plan Figure 5-2	N/A	N/A	No	No
10	Nuclear Plant Operator #5	Emergency Plan Figure 5-2	N/A	N/A	No	No
11	Nuclear Plant Operator #6	Emergency Plan Figure 5-2	N/A	N/A	No	No
12	Communicator	Emergency Plan Figure 5-2	30	T5/L9 T5/L13	No	No
13	Chem Tech	Emergency Plan Figure 5-2	60	N/A	No	No
14	RP#1	Emergency Plan Figure 5-2	30	N/A	No	No
15	Security	Security Contingency Plan / Emergency Plan Figure 5-2	N/A	T5/L15	No	No

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 2 – PLANT OPERATIONS & SAFE SHUTDOWN			
One Unit – One Control Room			
Analysis #10 – Station Blackout			
Minimum Operations Crew Necessary to Implement ONPs and EOPs or SAMGs if Applicable			
Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Licensed Operator Training Program
2	Unit Supervisor	CRS	Licensed Operator Training Program
3	Shift Technical Advisor	STA	Licensed Operator Training Program
4	Reactor Operator #1	Nuclear Control Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Nuclear Control Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Nuclear Plant Operator #1	Non-Licensed Operator Training Program

Other (non-Operations) Personnel Necessary to Implement ONPs and EOPs or SAMGs if Applicable

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
7	Mechanic	N/A	N/A
8	Electrician	N/A	N/A
9	I&C Technician	N/A	N/A
10	Other	N/A	N/A
11	Other	N/A	N/A

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

Fire Brigade

PALISADES TABLE 3 – FIREFIGHTING Analysis #10 – Station Blackout		
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

This accident does not include the need for firefighting, first aid or search & rescue.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis #10 – Station Blackout																			
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: N/A																		
2	On-site Survey: N/A																		
3	Personnel Monitoring: N/A																		
4	Job Coverage: RP#1 CR for job coverage and CR habitability			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
5	Offsite Rad Assessment: <i>(Included in Table 5)</i>																		
6	Other site specific RP (describe): N/A																		
7	Chemistry Function task #1 (describe) – N/A																		
8	Chemistry Function task #2 (describe) – N/A																		

*Times are estimated

Chemistry does not have an assigned chemistry task for SBO. Chemistry is available for dose assessment if a release occurs.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 5 – EMERGENCY PLAN IMPLEMENTATION			
Analysis #10 – Station Blackout			
Line #	Function / Task*	On-Shift Position	Task Analysis Controlling Method
1	Declare the emergency classification level (ECL)	Shift Manager	Emergency Planning Training Program / EP Drills
2	Approve Offsite Protective Action Recommendations	N/A	N/A
3	Approve content of State/local notifications	Shift Manager	Emergency Planning Training Program
4	Approve extension to allowable dose	N/A	N/A
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	Shift Manager	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	Shift Manager	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	Shift Manager	Licensed Operator Training Program
11	Activate ERDS	Shift Manager	Emergency Planning Training Program
12	Offsite radiological assessment	N/A	N/A
13	Perform NRC notifications	Communicator	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

K. Accident Analysis #11 – LOCA/General Emergency with Release and PAR

1. Accident Summary (Assumed for Staffing Analysis Purpose)
 - The unit is in a Site Area Emergency when the Shift Manager is given a dose assessment update that projects >1 Rem TEDE dose at the site boundary.
2. Accident Specific Assumptions Made
 - All actions for SAE are complete.
 - No transients other than LOCA are considered.
 - The ERO would be activated at an Alert or SAE. For Staffing Analysis purpose, the T=0 clock is used for the emergency plan actions to evaluate the capability to implement the GE classification, PAR and notification functions before the ERO arrives.
3. Procedures for Accident Response
 - EOP-4.0 R20 Loss of Coolant Accident Recovery
 - EOP-1.0 Rev 13, Standard Post Trip Actions
 - EI-1 Rev 54, Emergency Classification and Actions
 - EI-3 Rev 31, Communications and Notifications
 - EI-2.2 Rev 15, Emergency Staff Augmentation
 - EI-12.1 Rev 18, Personnel Accountability and Assembly
 - ADMIN-4, Operations Organization, Responsibilities and Conduct
 - EI-6.13, R21 Protective Action Recommendations for Offsite Populations

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

4. Tables

PALISADES TABLE 1 – ON-SHIFT POSITIONS Analysis #11 – LOCA/GE with PAR						
Line #	On-shift Position	Basis Document	Augmentation Elapsed Time (min)	Role in Table 5 / Line #	Unanalyzed Task?	TMS Required?
1	Shift Manager	Emergency Plan Figure 5-2	60	T2/L1 T5/L1 T5/L2 T5/L3 T5/L4 T5/L5 T5/L6 T5/L8 T5/L10 T5/L11 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5-2	N/A	T2/L2	No	No
3	Shift Technical Advisor	Emergency Plan Figure 5-2	60	T2/L3	No	No
4	Nuclear Control Operator #1	Emergency Plan Figure 5-2	N/A	T2/L4	No	No
5	Nuclear Control Operator #2	Emergency Plan Figure 5-2	N/A	T2/L5	No	No
6	Nuclear Plant Operator #1	Emergency Plan Figure 5-2	N/A	T2/L6	No	No
7	Nuclear Plant Operator #2	Emergency Plan Figure 5-2	N/A	N/A	No	No
8	Nuclear Plant Operator #3	Emergency Plan Figure 5-2	N/A	N/A	No	No
9	Nuclear Plant Operator #4	Emergency Plan Figure 5-2	N/A	N/A	No	No
10	Nuclear Plant Operator #5	Emergency Plan Figure 5-2	N/A	N/A	No	No
11	Nuclear Plant Operator #6	Emergency Plan Figure 5-2	N/A	N/A	No	No
12	Communicator	Emergency Plan Figure 5-2	30	T5/L9 T5/L13	No	No
13	Chem Tech	Emergency Plan Figure 5-2	60	T5/L12	No	Yes
14	RP#1	Emergency Plan Figure 5-2	30	N/A	No	No
15	Security	Security Contingency Plan / Emergency Plan Figure 5-2	N/A	T5/L15	No	No

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 2 – PLANT OPERATIONS & SAFE SHUTDOWN One Unit – One Control Room Analysis #11 – LOCA/GE with PAR			
Minimum Operations Crew Necessary to Implement ONPs and EOPs or SAMGs if Applicable			
Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Licensed Operator Training Program
2	Unit Supervisor	CRS	Licensed Operator Training Program
3	Shift Technical Advisor	STA	Licensed Operator Training Program
4	Reactor Operator #1	Nuclear Control Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Nuclear Control Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Nuclear Plant Operator #1	Non-Licensed Operator Training Program

Other (non-Operations) Personnel Necessary to Implement ONPs and EOPs or SAMGs if Applicable

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
7	Mechanic	N/A	N/A
8	Electrician	N/A	N/A
9	I&C Technician	N/A	N/A
10	Other	N/A	N/A
11	Other	N/A	N/A

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

Fire Brigade

PALISADES TABLE 3 – FIREFIGHTING Analysis #11 – LOCA/GE with PAR		
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

This accident does not include the need for firefighting, first aid or search & rescue.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

**PALISADES TABLE 4 – RADIATION PROTECTION AND CHEMISTRY
Analysis #11 – LOCA/GE with PAR**

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: RP#1																			
2	On-site Survey: RP#2																			
3	Personnel Monitoring:																			
4	Job Coverage: RP reports to the CR to provide RP support (including in plant and out of plant surveys) as directed by the SM.		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Offsite Rad Assessment: <u>See Table 5</u>																			
6	Other site specific RP (describe): N/A																			
7	Chemistry Function task #1 (describe) N/A																			
8	Chemistry Function task #2 (describe) N/A																			

RP will perform the above task as directed by the Shift Manager. Tasks are not time critical. The time* to perform the tasks and the time to complete the tasks are estimated.

Chemistry does not have an assigned chemistry task for LOCA. Chemistry is available for dose assessment.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 5 – EMERGENCY PLAN IMPLEMENTATION			
Analysis #11 – LOCA/GE with PAR			
Line #	Function / Task*	On-Shift Position	Task Analysis Controlling Method
1	Declare the emergency classification level (ECL)	Shift Manager	Emergency Planning Training Program / EP Drills
2	Approve Offsite Protective Action Recommendations	Shift Manager	Emergency Planning Training Program
3	Approve content of State/local notifications	Shift Manager	Emergency Planning Training Program
4	Approve extension to allowable dose	Shift Manager	Emergency Planning Training Program
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	N/A	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	Licensed Operator Training Program
8	Complete State/local notification form	Shift Manager	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	Shift Manager	Licensed Operator Training Program
11	Activate ERDS	N/A	Emergency Planning Training Program
12	Offsite radiological assessment	Chemistry Technician	Emergency Planning Training Program
13	Perform NRC notifications	Communicator	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

L. Accident Analysis #15 – Steam Generator Tube Rupture with Concurrent Loss of Off-site Power

1. Accident Summary

- This event analyzes the response of a failure of a steam generator U-tube combined with a loss of offsite power.

2. Accident Specific Assumptions Made

- Radiation monitor alarms on the MSLs, condenser air ejector discharge, SG blowdown line, fan room and plant stack before the reactor trip/turbine trip.
- Following a reactor trip and turbine trip, the radioactive fluid is released through the steam generator safety or atmospheric dump valves as a result of the loss of normal AC power.
- Doses are calculated for an event generated iodine spike, initial activity of 1 $\mu\text{Ci/gm}$ and a spiking factor of 335 (GIS) and a pre-accident iodine spike 40 $\mu\text{Ci/gm}$ (PIS).
- Primary to secondary leakage rate of 432 gallons per day is assumed in the unaffected steam generator for the duration of the transient.

3. Procedures for Accident Response

- EOP-5.0 R15, Steam Generator Tube Rupture Recovery
- EOP-1.0 Rev 13, Standard Post Trip Actions
- EI-1 Rev 54, Emergency Classification and Actions
- EI-3 Rev 31, Communications and Notifications
- EI-2.2 Rev 15, Emergency Staff Augmentation
- EI-12.1 Rev 18, Personnel Accountability and Assembly
- ADMIN-4, Operations Organization, Responsibilities and Conduct
- ONP-23.2 R14, SGT leak

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

4. Tables

PALISADES TABLE 1 – ON-SHIFT POSITIONS Analysis #15 – Steam Generator Tube Rupture						
Line #	On-shift Position	Basis Document	Augmentation Elapsed Time (min)	Role in Table 5 / Line #	Unanalyzed Task?	TMS Required?
1	Shift Manager	Emergency Plan Figure 5-2	60	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L8 T5/L10 T5/L11 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5-2	N/A	T2/L2	No	No
3	Shift Technical Advisor	Emergency Plan Figure 5-2	60	T2/L3	No	No
4	Nuclear Control Operator #1	Emergency Plan Figure 5-2	N/A	T2/L4	No	No
5	Nuclear Control Operator #2	Emergency Plan Figure 5-2	N/A	T2/L5	No	No
6	Nuclear Plant Operator #1	Emergency Plan Figure 5-2	N/A	T2/L6	No	No
7	Nuclear Plant Operator #2	Emergency Plan Figure 5-2	N/A	N/A	No	No
8	Nuclear Plant Operator #3	Emergency Plan Figure 5-2	N/A	N/A	No	No
9	Nuclear Plant Operator #4	Emergency Plan Figure 5-2	N/A	N/A	No	No
10	Nuclear Plant Operator #5	Emergency Plan Figure 5-2	N/A	N/A	No	No
11	Nuclear Plant Operator #6	Emergency Plan Figure 5-2	N/A	N/A	No	No
12	Communicator	Emergency Plan Figure 5-2	30	T5/L9 T5/L13	No	No
13	Chem Tech	Emergency Plan Figure 5-2	60	T5/L12	No	Yes
14	RP#1	Emergency Plan Figure 5-2	30	T4/L4	No	No
15	Security	Security Contingency Plan / Emergency Plan Figure 5-2	N/A	T5/L15	No	No

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 2 – PLANT OPERATIONS & SAFE SHUTDOWN			
One Unit – One Control Room			
Analysis #15 – Steam Generator Tube Rupture			
Minimum Operations Crew Necessary to Implement ONPs and EOPs or SAMGs if Applicable			
Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Licensed Operator Training Program
2	Unit Supervisor	CRS	Licensed Operator Training Program
3	Shift Technical Advisor	STA	Licensed Operator Training Program
4	Reactor Operator #1	Nuclear Control Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Nuclear Control Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Nuclear Plant Operator #1	Non-Licensed Operator Training Program

Other (non-Operations) Personnel Necessary to Implement ONPs and EOPs or SAMGs if Applicable

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
7	Mechanic	N/A	N/A
8	Electrician	N/A	N/A
9	I&C Technician	N/A	N/A
10	Other	N/A	N/A
11	Other	N/A	N/A

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Fire Brigade

PALISADES TABLE 3 – FIREFIGHTING		
Analysis #15 – Steam Generator Tube Rupture		
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

This accident does not include the need for firefighting, first aid or search & rescue.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PALISADES TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis #15 – Steam Generator Tube Rupture																				
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: N/A																			
2	On-site Survey: N/A																			
3	Personnel Monitoring:																			
4	Job Coverage: RP performs surveys and job coverage as needed and directed by the SM.		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Offsite Rad Assessment: See Table 5																			
6	Other site specific RP (describe): N/A																			
7	Chemistry Function task #1 (describe) N/A																			
8	Chemistry Function task #2 (describe) N/A																			

*Times are estimated

Chemistry does not have an assigned chemistry task and is available for dose assessment.

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PALISADES TABLE 5 – EMERGENCY PLAN IMPLEMENTATION			
Analysis #15 – Steam Generator Tube Rupture			
Line #	Function / Task*	On-Shift Position	Task Analysis Controlling Method
1	Declare the emergency classification level (ECL)	Shift Manager	Emergency Planning Training Program / EP Drills
2	Approve Offsite Protective Action Recommendations	N/A	Emergency Planning Training Program
3	Approve content of State/local notifications	Shift Manager	Emergency Planning Training Program
4	Approve extension to allowable dose	N/A	Emergency Planning Training Program
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	Shift Manager	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	Licensed Operator Training Program
8	Complete State/local notification form	Shift Manager	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	Shift Manager	Licensed Operator Training Program
11	Activate ERDS	Shift Manager	Emergency Planning Training Program
12	Offsite radiological assessment	Chemistry Technician	Emergency Planning Training Program
13	Perform NRC notifications	Communicator	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

VIII. APPENDIX C – TIME MOTION STUDIES SUPPORTING THE STAFFING ANALYSIS

A. Dose Assessment

1. See Section II.C.1 for the exception taken for the Chemistry Technician to perform dose assessment. No time motion study or corrective actions is required.

B. ERO notification (Everbridge activation)

PALISADES

TIME MOTION STUDY OF OVERLAPPING TASKS

TASK 1: ACTIVATE THE ERO USING EVERBRIDGE

JOB: SHIFT MANAGER

TASK 2: EMERGENCY DIRECTION AND CONTROL

JOB: SHIFT MANAGER

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

PURPOSE:

Perform a Time Motion Study to evaluate whether assigning the performance of ERO notification using Everbridge to the Shift Manager or STA can be justified as an acceptable overlap to the Shift Manager's primary emergency plan function of direction and control.

NOTE

The Time Motion Study may be completed during simulator training/evaluation or during EP drills

LOCATION:

Simulator (to use the "TRAINING" event code to avoid inadvertent ERO activation for an EMERGENCY event.) Codes are site specific.

REQUIRED TOOLS/EQUIPMENT:

- A. Individual performing the procedure actions must be logged on to the computer being used.
- B. PC with Internet 7.0 and internet access.
- C. Instructions/codes for activating Everbridge in the TRAINING mode. [Staged Instruction sheet for activating Everbridge may be used in lieu of EN-EP-310, *Emergency Response Organization Notification System*]

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

IX. OVERLAP OF TASKS ACTIVITIES OR OTHER CONFLICTS IDENTIFIED

A. Overlap Requiring Compensatory Measures

1. The SM and STA perform off-site notifications for some analyzed events resulting in tasks that are concurrent and conflict with the SM and STAs primary Emergency Plan tasks.
2. The SM is assigned the task of performing radiological assessment. The assignment of radiological assessment to the SM results in concurrent and conflicting tasks with SM Emergency Direction and Control.

X. CORRECTIVE ACTIONS

A. Corrective Actions and Compensatory Measures

1. Assign an additional on-shift ERO staff member to relieve the SM and/or STA from the concurrent tasks of off-site communication tasks. The additional on-shift ERO staff member will be responsible to perform state/local and NRC off-site notifications.
2. Assign the task of radiological assessment to the on-shift Chemist to relieve the SM and/or STA of concurrent tasks.

PALISADES ON-SHIFT STAFFING ANALYSIS REPORT

XI. REFERENCES

- NEI 10-05, Rev 0, *Assessment of On-Shift Emergency Response Organization Staffing and Capabilities*
- NSIR DPR-ISG-01, *Interim Staff Guidance – Emergency Planning for Nuclear Power Plants*
- NUREG-0654, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.*
- Palisades Emergency Plan, Rev 22

XII. STAFFING ANALYSIS TEAM

- Fred Guynn, Entergy ECH Project Manager, EP
- Myra Jones, Contractor CMCG
- Todd Mulford, Assistant Operations Manager
- Kevin Schneider, Training
- Don Karnes, Senior Operations Training Instructor
- Steve Andrews, Chemistry Specialist
- Steve Mims, Radiation Control Supervisor
- Dan Malone, Emergency Preparedness Manager