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NLS2016042  
July 20, 2016

50.54(q)

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

Subject: On-Shift Staffing Analysis  
Cooper Nuclear Station, Docket No. 50-298, DPR-46

Reference: NPPD Letter to NRC, "Emergency Plan Revision 63," dated January 17, 2013  
(NLS2013003)

Dear Sir or Madam:

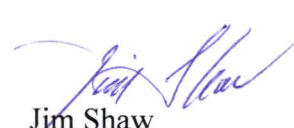
In April 2016, station personnel identified that Cooper Nuclear Station's (CNS) On-Shift Staffing Analysis (OSA), and subsequent revision, were not submitted to the Nuclear Regulatory Commission (NRC) within 30 days of the changes as required per 10 CFR 50.54(q)(5), "Conditions of licenses; Emergency plans." This issue was documented in CNS' Corrective Action Program. The purpose of this letter is to transmit the current revision (Revision 1) of CNS' OSA.

In December 2012, CNS' Emergency Plan was revised to reflect the OSA, Revision 0, results. The summary of the 10 CFR 50.54(q) analysis for this change was reported to the NRC per the Reference letter. The changes made to the OSA via Revision 1 were determined to be editorial or did not affect an emergency planning element/function. These changes did not require a full 10 CFR 50.54(q) evaluation and did not impact CNS' Emergency Plan.

This letter contains no regulatory commitments.

If you have any questions regarding this submittal, please contact me at (402) 825-2788.

Sincerely,

  
Jim Shaw  
Licensing Manager

/bk

Enclosure: Cooper Nuclear Station 10 CFR 50 Appendix E On-Shift Staffing Analysis, Revision 1

AXIS  
NPPD

cc: Regional Administrator, w/ enclosure (2)  
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Enclosure  
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**Enclosure**

**Cooper Nuclear Station  
10 CFR 50 Appendix E On-Shift Staffing Analysis,  
Revision 1**

# CNS ON-SHIFT STAFFING ANALYSIS REPORT

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## Nebraska Public Power District COOPER NUCLEAR STATION 10CFR50 APPENDIX E ON-SHIFT STAFFING ANALYSIS

Revision 1

July 1, 2015

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# COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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# COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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## I. INTRODUCTION

This document is a revision to the Cooper Nuclear Station On-shift Staffing Analysis (OSA) report dated December 20, 2012. This revision provides additional clarification to actions performed by on-shift staff, and incorporates changes implemented to reduce on-shift staff burden.

This revision continues to satisfy the requirements 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 5.2-1 of the Cooper 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 E-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 functions or tasks to be assigned to personnel already assigned other functions/tasks. These include Repair and Corrective Action, Rescue Operations and First Aid.



## COOPER 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 5.1.1, 5.1.2, Figure 5.2-1	Emergency Direction and Control	1
Control Room Supervisor (CRS)	50.54m E-plan 5.1.1, 5.1.2, Figure 5.2-1	SSD	1
Shift Technical Engineer (STE)	E-plan 5.1.1, 5.1.2, Figure 5.2-1	Technical Support	1
Reactor Operator #1	50.54m E-plan 5.1.1, 5.1.2, Figure 5.2-1	SSD	1
Reactor Operator #2	50.54m E-plan 5.1.1, 5.1.2, Figure 5.2-1	SSD	1
Reactor Operator #3	E-plan 5.1.1, 5.1.2, Figure 5.2-1	FBL	1
Station Operator #1	E-plan 5.1.1, 5.1.2, Figure 5.2-1	SSD	1
Station Operator #2	E-plan 5.1.1, 5.1.2, Figure 5.2-1	FB	1
Station Operator #3	E-plan 5.1.1, 5.1.2, Figure 5.2-1	FB	1
Communicator <sup>1</sup>	E-plan 5.1.1, 5.1.2, Figure 5.2-1	Notifications and Communications	1
Dose Assessor <sup>1</sup>	E-plan 5.1.1, 5.1.2, Figure 5.2-1	Dose Assessment	1
Chemistry/RP Technician	E-plan 5.1.1, 5.1.2, Figure 5.2-1	Chemistry/Radiation Protection	1
Utility Worker Fire Brigade #1	E-plan 5.1.1, 5.1.2, Figure 5.2-1	FB	1
Utility Worker Fire Brigade #2	E-plan 5.1.1, 5.1.2, Figure 5.2-1	FB	1
Security	Security Contingency Plan	Access Control and Accountability	Per Security Contingency Plan
<b>TOTAL</b>			<b>14</b>
<sup>1</sup> Filled by staff qualified per TPP-101, Training Program Procedure and the Emergency Plan			

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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### B. Other Commitments to Shift Staffing

None.

### C. Staffing Exceptions and Time Motion Studies (TMS)

1. The primary responsibility for the Chemistry Technician is chemistry/radiochemistry sampling; however no chemistry job tasks were noted as being time critical or required during the first 60 minutes of any of the analyzed events. 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 event notifications such as the Duty Plant Manager, and Operations Manager. These notifications by phone are considered communications that are approximately one minute in length and are tasks for the Shift Manager. No further analysis or TMS is required.
3. The analysis included a review of the implementation of the requirement 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 review of the Aircraft Threat Accident identified that there are sufficient personnel on-shift to perform this action during the event. Specifically, a licensed or non-licensed nuclear plant operator and a chemistry technician were all available to fill this function. No further analysis or TMS is required.
4. A Time Motion Study was completed to determine if the Shift Manager performance of ERO notification would impact the capability to maintain emergency direction and control as Emergency Director. The TMS demonstrated that the Shift Manager was able to maintain oversight for emergency direction and control during the approximate 90 seconds that it took to activate the ERO using Dialogics. ERO notification was evaluated as being an acceptable task for the Shift Manager. Details of the TMS are found in section VIII Appendix C



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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### D. Emergency Plan Tasks Not Analyzed

#### 1. Repair and Corrective Action -. 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 the 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 CNS, Station Operators on shift will primarily be available to the Shift Manager to perform actions to assist in controlling/mitigating the event. Initial corrective actions are contained in and controlled by plant operating procedures. The Station Operators have been trained to perform specific actions within the Abnormal and Emergency Operating Procedures and maintenance support is not required. Maintenance is not included in the on-shift staff. 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. Rescue operations and first aid may be performed by shift personnel assigned other functions. At CNS the Search and Rescue function is handled by trained emergency response personnel. If station personnel are unaccounted for in the initial or subsequent personnel accountability, an emergency team will be assigned to locate and if necessary, rescue them. Rescue operations and first aid response are acceptable collateral duties per the guidance of NEI 10-05 and was not analyzed.

### III. ANALYSIS PROCESS

The initial staffing analysis (Revision 0) was conducted by a joint team of corporate Emergency Preparedness (EP) personnel and station personnel from the Operations, Training, Security, Chemistry and Emergency Preparedness (EP) departments. The team members are identified in Section XII of this report.

The emergency response to each event scenario 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.

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 Section 5.1 and Figure 5.2.1, 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.

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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 CNS DBA's were evaluated and classified according to its FSAR Chapter XIV description. If the accident description alone did not result in a classification, the projected accident exclusion area boundary (EAB) dose found in the FSAR was utilized to determine if an EAL threshold would be exceeded within the first 60 minutes using the Abnormal Rad Level EAL thresholds. In cases where several projected dose rates 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 FSAR along with additional scenarios specified by the guidance documents. The scenarios considered were:
  - Design Basis Threat (DBT) ground assault
  - DBA Control Rod Drop Accident
  - DBA Loss of Coolant Accident
  - Accidents That Result in Direct Release to Secondary Containment
  - DBA Fuel Handling Accident
  - DBA Main Steam Line Break Accident
  - Aircraft Probable Threat
  - Fire Requiring Evacuation of the Control Room and Plant Shutdown From Alternate Location
  - Station Blackout, (SBO)
  - LOCA/General Emergency with release and PAR
  - LOCA with entry into Severe Accident Management
  - Fire Resulting in Reactor Trip (NFPA 805 fire)

### B. Accident Scenarios included in the Analysis

1. Design Basis Threat (DBT) as described in NEI 10-05
  - Land and/or waterborne Hostile Action directed against the Protected Area by a Hostile Force. 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. EAL is based on the event.
2. Control Rod Drop Accident as described in FSAR XIV-6 Section 6.2
  - One control rod drops and reactor trips on APRM 120% flux scram. Credit is not taken for MSIV closure. Release pathway is through condenser, turbine building, then to environment. EAL is based on condenser release EAB dose information in FSAR.
3. Loss of Coolant Accident as described in FSAR XIV-6 Section 6.3
  - Double ended guillotine break of a recirculation line. All ECCS operate as designed. EAL is based on fission product barrier EALs.
4. Fuel Handling Accident as described in FSAR XIV-6 Section 6.4
  - The accident involves a dropped fuel bundle on top of the core. Initial EAL is based on event.

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5. Main Steam Line Break Accident as described in FSAR XIV-6 Section 6.5
    - Break of one main steam line and followed by MSIV closure. Release is to the atmosphere through the top of the turbine building (puff release). Reactor coolant activity at TS limit. No EAL on the accident but on the USAR EAB 2-hr dose.
  6. Aircraft Probable Threat (50.54hh)
    - Notification is received from the NRC that a probable aircraft threat exists (>5 minutes, <30 minutes). EAL is based on the event.
  7. Control Room Fire and Remote Shutdown.
    - A fire occurs in the main control room requiring the evacuation and the procedure implemented to perform shutdown from the alternate shutdown panels. EAL is based on the event.
  8. Station Blackout.
    - A loss of all offsite AC power occurs and the failure of the emergency diesel generators. EAL is based on the event.
  9. General Emergency with release and PAR
    - Assume GE condition with dose projection indication of a release greater than the protective action guideline (PAG).
- C. Accident Scenarios not included in the Analysis
1. Accidents That Result in Direct Release to Secondary Containment
    - FSAR includes 2 varieties of accidents: (1) Failures of the reactor coolant pressure boundary inside Secondary Containment and (2) failure involving fuel that is located outside the Primary Containment but inside the Secondary Containment. These accidents are not described since they are less severe than similar accidents in other categories. No Analysis is required.
  2. Implement SAMG
    - 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. A review of the SAMGs associated with the initial site-specific Candidate High Level Actions concluded that no actions would require on-shift personnel other than licensed and non-licensed operators. No analysis required.
  3. NFPA 805 Fire
    - Fire leading to reactor trip with complications. The control room fire and alternate shutdown requires more resources and actions outside the control room than this fire. The team concluded the control room fire bounds the fire analysis. No additional analysis required.



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### V. GENERAL ASSUMPTIONS AND LIMITATIONS

#### A. Notes and Assumptions applicable to Cooper OSA:

1. The RP and Chemistry tasks reviewed were those directed by the Shift Manager to support actions in Abnormal Operating Procedures (AOP), Emergency Operating Procedures (EOP), and Emergency Plan Implementing Procedures (EPIP). Any additional tasks directed by the Technical Support Center (TSC), Operations Support Center (OSC), or Emergency Operations Facility (EOF) procedures were not reviewed.
2. The OSA team determined RP/Chem Tech tasks performance is directed and prioritized by the Shift Manager. The time the RP/Chem Tech 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 60 minute period after the declaration. Since the Shift Manager directs when the tasks are performed, there are no overlapping RP or chemistry tasks.
3. All crews have one individual filling the SM and one individual filling the STE roles therefore the analysis did not consider using a dual-role individual
4. While the augmentation time used for this analysis was based on the time identified in the station's emergency plan (60 minutes), no additional tasks requiring the augmented ERO were noted as being required of the on-shift ERO for the first 90 minutes following the emergency declaration.

#### 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. (60 min.).
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), use the staffing with the smallest number of personnel.
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.

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7. Personnel assigned plant operations and safe shutdown meet the requirements and guidance (analyzed through other programs such as operator training) and was 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 was 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.
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 FSAR 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.



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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) - It is sufficient to simply assume that the accident progressed to conditions requiring a severe accident response; it is not necessary to determine 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.

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

### VI. APPENDIX A - ANALYZED EVENTS AND ACCIDENTS

Event #	Event Type	Summary Description of Event	Plant Mode <sup>1</sup>	Reference Document(s)	Event ECL	Analysis Required?
1	DBT	Land and/or waterborne HOSTILE ACTION directed against the Protected Area by a HOSTILE FORCE.	1	NEI 10-05  ISG IV.C	Site Area Emergency	Yes
2	DBA	Control Rod Drop Accident	1	FSAR XIV-6 Section 6.2	Site Area Emergency	Yes
3	DBA	Loss of Coolant Accident	1	FSAR XIV-6 Section 6.3	Site Area Emergency	Yes
4	DBA	Accidents that result in radioactive material release directly to the Secondary Containment	1	Not described in FSAR	N/A	No <sup>2</sup>
5	DBA	Fuel Handling Accident	5	FSAR XIV-6 Section 6.4	Alert	Yes
6	DBA	Main Steam Line Break	1	FSAR XIV-6 Section 6.5	Unusual Event	Yes
7	Assumed for analysis purpose	Aircraft Probable Threat	1	10CFR50.54hh (1)  RG 1.214	Alert	Yes
8	Assumed for Analysis Purpose	Control Room Evacuation and Alternate Shutdown (fire in main control room)	1	FSAR 14.6.1  10CFR50 NFPA 805 Fire Hazard Analysis	Alert	Yes
9	Assumed for analysis purpose	Station Blackout	1	ISG IV.C	Site Area Emergency	Yes
10	Assumed for Analysis Purpose	LOCA- General Emergency with radiological release and PAR	1	ISG IV.C	General Emergency	Yes
11	Assumed for Analysis Purpose	LOCA with entry into severe accident procedures.	1	ISG IV.C	General Emergency	No <sup>3</sup>
12	Assumed for Analysis Purpose	NFPA 805 Fire with Reactor Trip	1	ISG IV.C	Site Area Emergency	No <sup>4</sup>

<sup>1</sup> Plant mode per FSAR or assumed for analysis purpose

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<sup>2</sup> Includes 2 varieties of accidents: (1) Failures of the reactor coolant pressure boundary inside **Secondary** Containment and (2) failure involving fuel that is located outside the Primary Containment but inside **the** Secondary Containment. These accidents are not described in the FSAR since they are less severe **than** similar accidents in other categories. Analysis is not **required**.

<sup>3</sup> CNS does not meet the NEI 10-05 intent for the analysis of implementing SAMG. 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. The actions assessed by NEI 10-05 are those which implement the initial site-specific Candidate High Level Action assuming the core is not ex-vessel (i.e., no reactor vessel failure), and there is no actual or imminent challenge to containment integrity. CNS does not include maintenance qualified to perform maintenance job tasks in minimum staffing and any response actions would be performed by operators.

<sup>4</sup> NFPA 805 Fire is bound by the Control Room Fire and Alternate Shutdown. Analysis is not **required**.



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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. Security Code Red condition.

#### 2. Accident Specific Assumptions Made

- 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 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

- 5.5SECURITY
- 5.7.1, Emergency Classification
- 5.7.2, Emergency Director EPIP
- 5.7.6, Notification

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

### 4. Tables

Note: Table 1 contains the staffing identified in Section II.A, OSA Minimum Staffing.

CNS 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 5.2-1	60	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L7 T5/L11 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5.2-1	N/A	T2/L2	No	No
3	Shift Technical Engineer (STE)	Emergency Plan Figure 5.2-1	60	T2/L3 T5/L10	No	No
4	Reactor Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L4	No	No
5	Reactor Operator #2	Emergency Plan Figure 5.2-1	N/A	T2/L5	No	No
6	Reactor Operator #3	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
	Station Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L6	No	No
8	Station Operator #2	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
9	Station Operator #3	Emergency Plan Figure 5.2-1	60	N/A	No	No
10	Communicator	Emergency Plan Figure 5.2-1	60	T5/L8 T5/L9 T5/L13	No	No
11	RP/Chem Tech #1	Emergency Plan Figure 5.2-1	60	N/A	No	No
12	Dose Assessor	Emergency Plan Figure 5.2-1	60	N/A	No	No
13	Utility Fire Brigade Member #1	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
14	Utility Fire Brigade Member #2	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
15	Security	Security Contingency Plan	60	T5/L15	No	No



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

<b>CNS TABLE 2 – PLANT OPERATIONS &amp; SAFE SHUTDOWN</b> <b>One Unit – One Control Room</b> <b>ANALYSIS # 1 DBT Security Threat</b> <b>Minimum Operations Crew Necessary to Implement AOPs and EOPs or SAMGs if Applicable</b>			
Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
1	Shift Manager	Shift Manager	Licensed Operator Training Program
2	Unit Supervisor	Control Room Supervisor	Licensed Operator Training Program
3	Shift Technical Advisor	Shift Technical Engineer (STE)	Licensed Operator Training Program
4	Reactor Operator #1	Reactor Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Reactor Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Station Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Other needed for Safe Shutdown	N/A	N/A
9	Other needed for Safe Shutdown	N/A	N/A
10	Other needed for Safe Shutdown	N/A	N/A

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

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
11	Mechanic	N/A	N/A
12	Electrician	N/A	N/A
13	I&C Technician	N/A	N/A
14	Other	N/A	N/A
15	Other	N/A	N/A

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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CNS TABLE 3 – FIREFIGHTING		
ANALYSIS # 1 <u>DBT Security Threat</u>		
Line #	Performed by	Task Analysis Controlling Method
1	N/A	Fire Protection Program
2	N/A	Fire Protection Program
3	N/A	Fire Protection Program
4	N/A	Fire Protection Program
5	N/A	Fire Protection Program

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



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

CNS 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>																		

Note: No chemistry or RP job function tasks for the conditions described in the DBT assumptions. The RP/Chem Tech takes cover as directed.

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

CNS TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis # 1 <u>DBT Security Threat</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	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	Shift Manager	Licensed Operator Training Program
8	Complete State/local notification form	Communicator	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	STE	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 Officer	Security Training Program / EP Drills



# COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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

### 1. Accident Summary

- The control rod drop accident (CRDA) results from an assumed failure of the control rod-to-drive mechanism coupling after the control rod (very reactive rod) becomes stuck in its fully inserted position. It is assumed that the control rod drive is then fully withdrawn before the stuck rod falls out of the core. The control rod velocity limiter, an engineered safeguard, limits the control rod drop velocity. The resultant radioactive material release is maintained far below the guideline values of 10CFR50.67.
- Loss of offsite power coincidental with CRDA.
- Radionuclides are released from damaged fuel rods to the main condenser. Single release path is modeled from the leakage of main condenser at 1% volume per day to the turbine building. Activity is distributed throughout the turbine building and passes directly to the environment (with no mixing or holdup in the TB volume) as a diffuse ground level release

### 2. Accident Specific Assumptions Made

- EAL is based on FSAR EAB dose information.

### 3. Procedures for Accident Response

- 5.1RAD, Building Radiation Trouble
- 2.4OG, Offgas Abnormal
- 5.2Fuel, Fuel Failure
- 5.3EMPWR, Emergency Power During Modes 1, 2, and 3
- 2.1.5, Reactor Scram
- 5.7.16, Release Rate Determination
- 5.7.17, Dose Assessment
- 5.7.19, On-site Radiological Monitoring
- 5.7.1, Emergency Classification
- 5.7.2, Emergency Director EPIP
- 5.7.6, Notification
- 5.7.10, Personnel Assembly and Accountability
- 9.EN-RP-142, Failed Fuel Response



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

### 4. Tables

Note: Table 1 contains the staffing identified in Section II.A, OSA Minimum Staffing.

CNS TABLE 1 – ON-SHIFT POSITIONS Analysis # 2 <u>Control Rod Drop Accident</u>						
Line #	On-shift Position	Basis Document	Augmentation Elapsed Time (min)*	Role in Table # / Line #	Unanalyzed Task?	TMS Required?
1	Shift Manager	Emergency Plan Figure 5.2-1	60	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5.2-1	N/A	T2/L2	No	No
3	Shift Technical Engineer (STE)	Emergency Plan Figure 5.2-1	60	T2/L3 T5/L10 T5/L11	No	No
4	Reactor Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L4	No	No
5	Reactor Operator #2	Emergency Plan Figure 5.2-1	N/A	T2/L5	No	No
6	Reactor Operator #3	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
7	Station Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L6	No	No
8	Station Operator #2	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
9	Station Operator #3	Emergency Plan Figure 5.2-1	60	N/A	No	No
10	Communicator	Emergency Plan Figure 5.2-1	60	T5/L8 T5/L9 T5/L13	No	No
11	RP/Chem Tech #1	Emergency Plan Figure 5.2-1	60	T4/L1 T4/L7	No	No
12	Dose Assessor	Emergency Plan Figure 5.2-1	60	T5/L12	No	No
13	Utility Fire Brigade Member #1	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
14	Utility Fire Brigade Member #2	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
15	Security	Security Contingency Plan	60	T5/L15	No	No

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

**CNS TABLE 2 – PLANT OPERATIONS & SAFE SHUTDOWN**  
**One Unit – One Control Room**  
**ANALYSIS # 2 Control Rod Drop Accident**

Minimum Operations Crew Necessary to Implement AOPs 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	Control Room Supervisor	Licensed Operator Training Program
3	Shift Technical Advisor	Shift Technical Engineer (STE)	Licensed Operator Training Program
4	Reactor Operator #1	Reactor Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Reactor Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Station Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Other needed for Safe Shutdown	N/A	N/A
9	Other needed for Safe Shutdown	N/A	N/A
10	Other needed for Safe Shutdown	N/A	N/A

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

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
11	Mechanic	N/A	N/A
12	Electrician	N/A	N/A
13	I&C Technician	N/A	N/A
14	Other	N/A	N/A
15	Other	N/A	N/A



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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Fire Brigade

CNS TABLE 3 – FIREFIGHTING ANALYSIS # 2 Control Rod Drop 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

The CRDA does not include the need for firefighting.

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

CNS TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis # 2 Control Rod Drop 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: Applicable steps of EN-RP-142, Failed Fuel Response				X	X	X	X	X	X	X	X	X						
2	On-site Survey: N/A																		
3	Personnel Monitoring: N/A																		
4	Job Coverage: N/A																		
5	Offsite Rad Assessment: (Included in 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																		

\*Performance Times are estimated

Rx coolant sample as directed by the SM is not required until 2-6 hours after shutdown.

Procedure directs Offgas sample (not time critical) but it isolates. Sample not required during the 60 minutes.



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

CNS TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis # 2 Control Rod Drop 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	Communicator	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	STE	Non-Licensed Operator Training Program
11	Activate ERDS	STE	Emergency Planning Training Program
12	Offsite radiological assessment	Dose Assessor	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

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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### C. Design Basis Accident Analysis #3 – Loss of Coolant Accident

#### 1. Accident Summary

- This event involves the postulation of a spectrum of piping breaks inside containment varying in size, type, and location. Break of a large recirculation pipe represents the limiting pipe break inside the containment. Reactor scram, MSIVs isolate, ECCS initiates and injects.
- Worst case 2-hour period for exclusion area boundary dose occurs from 1.3 to 3.3 hours of 1.002 rem TEDE.

#### 2. Accident Specific Assumptions Made

- Loss of offsite power at the initiating event and is not restored during event.
- No operator action for the first 10 minutes. Post-LOCA manual valve manipulations are after the initiating alarm is received.
- Classification is made on fission product barrier EAL.

#### 3. Procedures for Accident Response

- 5.2FUEL, Fuel Failure
- 5.1RAD, Building Radiation Trouble
- 2.1.5, Reactor Scram
- 5.7.1, Emergency Classification
- 5.7.2, Emergency Director EPIP
- 5.7.6, Notification
- 5.7.10, Personnel Assembly and Accountability
- 5.7.14, Stable Iodine Thyroid Blocking (KI)
- 5.7.16, Release Rate Determination
- 5.7.17, Dose Assessment
- 5.7.19, On-site Radiological Monitoring



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

### 4. Tables

Note: Table 1 contains staffing identified in Section II.A, OSA Minimum Staffing

CNS TABLE 1 – ON-SHIFT POSITIONS Analysis # 3 Loss of Coolant 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 5.2-1	60	T2/L1 T3/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L14 T5/L11	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5.2-1	N/A	T2/L2	No	No
3	Shift Technical Engineer (STE)	Emergency Plan Figure 5.2-1	60	T2/L3 T5/L10	No	No
4	Reactor Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L4	No	No
5	Reactor Operator #2	Emergency Plan Figure 5.2-1	N/A	T2/L5	No	No
6	Reactor Operator #3	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
7	Station Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L6	No	No
8	Station Operator #2	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
9	Station Operator #3	Emergency Plan Figure 5.2-1	60	N/A	No	No
10	Communicator	Emergency Plan Figure 5.2-1	60	T5/L8 T5/L9 T5/L13	No	No
11	RP/Chem Tech #1	Emergency Plan Figure 5.2-1	60	T4/L1 T4/L4 T4/L6	No	No
12	Dose Assessor	Emergency Plan Figure 5.2-1	60	T5/L12	No	No
13	Utility Fire Brigade Member #1	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
14	Utility Fire Brigade Member #2	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
15	Security	Security Contingency Plan	60	T5/L15	No	No



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

**CNS TABLE 2 – PLANT OPERATIONS & SAFE SHUTDOWN**  
**One Unit – One Control Room**  
**ANALYSIS # 3 Loss of Coolant Accident**

Minimum Operations Crew Necessary to Implement AOPs 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	Control Room Supervisor	Licensed Operator Training Program
3	Shift Technical Advisor	Shift Technical Engineer (STE)	Licensed Operator Training Program
4	Reactor Operator #1	Reactor Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Reactor Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Station Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Other needed for Safe Shutdown	N/A	N/A
9	Other needed for Safe Shutdown	N/A	N/A
10	Other needed for Safe Shutdown	N/A	N/A

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

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
11	Mechanic	N/A	N/A
12	Electrician	N/A	N/A
13	I&C Technician	N/A	N/A
14	Other	N/A	N/A
15	Other	N/A	N/A

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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Fire Brigade

CNS TABLE 3 – FIREFIGHTING ANALYSIS # 3 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

The LOCA does not include a fire.

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

CNS TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis # 3 Loss Of Coolant Accident																			
L I N E	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: Set up portable sampler for CR monitoring				X	X	X												
2	On-site Survey: N/A																		
3	Personnel Monitoring: N/A																		
4	Job Coverage: Proc. 5.2 Att 1 (Operator valve manipulations w/in 100 min of SD)													X	X	X	X	X	X
5	Offsite Rad Assessment: <i>(Included in Table 5)</i>																		
6	Other site specific RP (describe): RP Briefing / Issue KI							X	X	X	X	X							
7	Chemistry Function task #1 (describe) - N/A																		
8	Chemistry Function task #2 (describe) – N/A																		

\*Performance Times are estimated

Note: Tasks are as directed by the SM. The only time critical task is job coverage for operators to manipulate valves within 100 minutes of shutdown. TSC and OSC are operational within 60 minutes to provide RP support.



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

<b>CNS TABLE 5 – EMERGENCY PLAN IMPLEMENTATION</b> <b>Analysis # 3 Loss of Coolant Accident</b>			
<b>Line #</b>	<b>Function / Task</b>	<b>On-Shift Position</b>	<b>Task Analysis Controlling Method</b>
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	Communicator	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	STE	Non-Licensed Operator Training Program
11	Activate ERDS	Shift Manager	Emergency Planning Training Program
12	Offsite radiological assessment	Dose Assessor	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

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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### D. Design Basis Accident Analysis #5 – 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 the core. The drop causes mechanical damage to the bundle being dropped.
- The drywell and reactor building are open with ventilation running. All releases to the environment are through the reactor building ventilation.
- The drop of a fuel bundle in containment over the reactor pressure vessel bounds a drop of a fuel bundle in the reactor building due to the greater drop height.
- Since Secondary Containment is not assumed to be functioning, the discharge is a ground level, unfiltered release from the ventilation exhaust plenum to the discharge point on the Reactor Building roof. This release point was determined to provide the most limiting dose consequences over other Reactor Building hatches, doors, and airlocks

#### 2. Accident Specific Assumptions Made

- Onsite personnel will be in accordance with the refuel outage staffing plan that includes additional SROs, ROs, NPOs, RP Techs, and Maintenance.

#### 3. Procedures for Accident Response

- EOP-5A, EOP Flowchart, Radioactive Release Control
- 5.1RAD, Building Radiation Trouble
- 5.7.1, Emergency Classification
- 5.7.2, Emergency Director EPIP
- 5.7.6, Notification
- 5.7.16, Release Rate Determination
- 5.7.17, Dose Assessment
- 5.7.19, On-site Radiological Monitoring



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

### 4. Tables

Note: Table 1 contains the staffing identified in Section II.A, OSA Minimum Staffing

CNS TABLE 1 – ON-SHIFT POSITIONS Analysis # 5 Fuel Handling 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 5.2-1	60	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L11 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5.2-1	N/A	T2/L2	No	No
3	Shift Technical Engineer (STE)	Emergency Plan Figure 5.2-1	N/A	T5/L10	No	No
4	Reactor Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L4	No	No
5	Reactor Operator #2	Emergency Plan Figure 5.2-1	N/A	T2/L5	No	No
6	Reactor Operator #3	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
7	Station Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L6	No	No
8	Station Operator #2	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
9	Station Operator #3	Emergency Plan Figure 5.2-1	60	N/A	No	No
10	Communicator	Emergency Plan Figure 5.2-1	60	T5/L8 T5/L9 T5/L13	No	No
11	RP/Chem Tech #1	Emergency Plan Figure 5.2-1	60	T4/L3	No	No
12	Dose Assessor	Emergency Plan Figure 5.2-1	60	T5/L12	No	No
13	Utility Fire Brigade Member #1	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
14	Utility Fire Brigade Member #2	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
15	Security	Security Contingency Plan	60	T5/L15	No	No



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

<b>CNS TABLE 2 – PLANT OPERATIONS &amp; SAFE SHUTDOWN</b> <b>One Unit – One Control Room</b> <b>ANALYSIS # 5 Fuel Handling Accident</b>			
Minimum Operations Crew Necessary to Implement AOPs 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	Control Room Supervisor	Licensed Operator Training Program
3	Shift Technical Advisor	Shift Technical Engineer (STE)	Licensed Operator Training Program
4	Reactor Operator #1	Reactor Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Reactor Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Station Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Other needed for Safe Shutdown	N/A	N/A
9	Other needed for Safe Shutdown	N/A	N/A
10	Other needed for Safe Shutdown	N/A	N/A

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

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
11	Mechanic	N/A	N/A
12	Electrician	N/A	N/A
13	I&C Technician	N/A	N/A
14	Other	N/A	N/A
15	Other	N/A	N/A

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

Fire Brigade

CNS TABLE 3 – FIREFIGHTING ANALYSIS # 5 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

FHA does not include a fire.

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

CNS TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis # 5 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: N/A																		
2	On-site Survey: N/A																		
3	Personnel Monitoring: RP/CHEM#1					X	X	X	X	X									
4	Job Coverage: N/A																		
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																		

\* Times are estimated.

Note: RP/Chem#1 assists in monitoring and decon of building evacuees. Additional RP on shift for refueling/outage



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

CNS TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis # 5 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	Communicator	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	STE	Non-Licensed Operator Training Program
11	Activate ERDS	Shift Manager	Emergency Planning Training Program
12	Offsite radiological assessment	Dose Assessor	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

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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### E. Design Basis Accident Analysis #6 – Main Steam Line Break.

1. Accident Summary
  - This event involves the postulation of a large steam line pipe break outside containment downstream of the outermost isolation valve with a simultaneous loss of offsite power. No fuel damage is calculated to result but the EAB dose assumes coolant I-131 TS limit of  $\leq 4 \mu\text{Ci/gm}$ . MSIVs isolate resulting in a steam cloud (puff) to environment within seconds.
2. Accident Specific Assumptions Made
  - Emergency Classification is not required based on the break of the main steam line. This analysis is based on the FSAR MSLB accident dose. Assume the turbine building vent reaches the Alert level for  $\geq 15$  minutes (EAL AA1.1)
3. Procedures for Accident Response
  - 5.3BREAK, Pipe Break Outside Primary Containment
  - 5.1RAD, Building Radiation Trouble
  - 5.7.1, Emergency Classification
  - 5.7.2, Emergency Director EPIP
  - 5.7.6, Notifications
  - 5.7.16, Release Rate Determination
  - 5.7.17, Dose Assessment
  - 5.7.19, On-site Radiological Monitoring



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

### 4. Tables

Note: Table 1 contains the staffing identified in Section II.A, OSA Minimum Staffing.

CNS TABLE 1 – ON-SHIFT POSITIONS Analysis # 6 Main Steam Line Break (MSLB)						
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 5.2-1	60	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L14 T5/L11	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5.2-1	N/A	T2/L2	No	No
3	Shift Technical Engineer (STE)	Emergency Plan Figure 5.2-1	60	T2/L3 T5/L10	No	No
4	Reactor Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L4	No	No
5	Reactor Operator #2	Emergency Plan Figure 5.2-1	N/A	T2/L5	No	No
6	Reactor Operator #3	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
7	Station Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L6	No	No
8	Station Operator #2	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
9	Station Operator #3	Emergency Plan Figure 5.2-1	60	N/A	No	No
10	Communicator	Emergency Plan Figure 5.2-1	60	T5/L8 T5/L9 T5/L13	No	No
11	RP/Chem Tech #1	Emergency Plan Figure 5.2-1	60	T4/L1	No	No
12	Dose Assessor	Emergency Plan Figure 5.2-1	60	T5/L12	No	No
13	Utility Fire Brigade Member #1	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
14	Utility Fire Brigade Member #2	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
15	Security	Security Contingency Plan	60	T5/L15	No	No



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

<b>CNS TABLE 2 – PLANT OPERATIONS &amp; SAFE SHUTDOWN</b> <b>One Unit – One Control Room</b> <b>ANALYSIS # 6 Main Steam Line Break (MSLB)</b>			
Minimum Operations Crew Necessary to Implement AOPs 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	Control Room Supervisor	Licensed Operator Training Program
3	Shift Technical Advisor	Shift Technical Engineer (STE)	Licensed Operator Training Program
4	Reactor Operator #1	Reactor Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Reactor Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Station Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Other needed for Safe Shutdown	N/A	N/A
9	Other needed for Safe Shutdown	N/A	N/A
10	Other needed for Safe Shutdown	N/A	N/A

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

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
11	Mechanic	N/A	N/A
12	Electrician	N/A	N/A
13	I&C Technician	N/A	N/A
14	Other	N/A	N/A
15	Other	N/A	N/A

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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Fire Brigade

CNS TABLE 3 – FIREFIGHTING ANALYSIS # 6 Main Steam Line Break (SLB)		
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

Note: The MSLB analysis does not include a fire.

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

CNS TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis # 6 Main Steam Line Break (MSLB)																			
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/Chem#1 Turb. Bldg			x	x	x	x	x	x	x	x	x							
2	On-site Survey: N/A																		
3	Personnel Monitoring: N/A																		
4	Job Coverage: N/A																		
5	Offsite Rad Assessment: (Included in 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																		

\*Performance times are estimated.



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

<b>CNS TABLE 5 – EMERGENCY PLAN IMPLEMENTATION</b> <b>Analysis # 6 <u>Main Steam Line Break (MSLB)</u></b>			
<b>Line #</b>	<b>Function / Task</b>	<b>On-Shift Position</b>	<b>Task Analysis Controlling Method</b>
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	Communicator	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	STE	Licensed Operator Training Program
11	Activate ERDS	Shift Manager	Emergency Planning Training Program
12	Offsite radiological assessment	Dose Assessor	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	N/A	N/A

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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### F. Design Basis Accident Analysis #7 – 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
  - 5.5AIRCRAFT, Aircraft Threat



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

### 4. Tables

Note: Table 1 contains the staffing identified in Section II.A, OSA Minimum Staffing.

CNS TABLE 1 – ON-SHIFT POSITIONS Analysis #7 – Aircraft Probable Threat						
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 5.2-1	60	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5.2-1	N/A	T2/L2 T5/L11	No	No
3	Shift Technical Engineer (STE)	Emergency Plan Figure 5.2-1	60	T2/L3 T5/L10	No	No
4	Reactor Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L4	No	No
5	Reactor Operator #2	Emergency Plan Figure 5.2-1	N/A	T2/L5	No	No
6	Reactor Operator #3	Emergency Plan Figure 5.2-1	N/A	T3/L1	No	No
7	Station Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L6	No	No
8	Station Operator #2	Emergency Plan Figure 5.2-1	N/A	T3/L2	No	No
9	Station Operator #3	Emergency Plan Figure 5.2-1	60	T3/L3	No	No
10	Communicator	Emergency Plan Figure 5.2-1	60	T5/L8 T5/L9 T5/L13	No	No
11	RP/Chem Tech #1	Emergency Plan Figure 5.2-1	60	N/A	No	No
12	Dose Assessor	Emergency Plan Figure 5.2-1	60	N/A	No	No
13	Utility Fire Brigade Member #1	Emergency Plan Figure 5.2-1	N/A	T3/L4	No	No
14	Utility Fire Brigade Member #2	Emergency Plan Figure 5.2-1	N/A	T3/L5	No	No
15	Security	Security Contingency Plan	60	N/A	No	No



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

<b>CNS TABLE 2 – PLANT OPERATIONS &amp; SAFE SHUTDOWN</b> <b>One Unit – One Control Room</b> <b>ANALYSIS # 7 – Aircraft Probable Threat</b>			
Minimum Operations Crew Necessary to Implement AOPs 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	Control Room Supervisor	Licensed Operator Training Program
3	Shift Technical Advisor	Shift Technical Engineer (STE)	Licensed Operator training Program
4	Reactor Operator #1	Reactor Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Reactor Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Station Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Other needed for Safe Shutdown	N/A	N/A
9	Other needed for Safe Shutdown	N/A	N/A
10	Other needed for Safe Shutdown	N/A	N/A

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

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
11	Mechanic	N/A	N/A
12	Electrician	N/A	N/A
13	I&C Technician	N/A	N/A
14	Other	N/A	N/A
15	Other	N/A	N/A

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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Fire Brigade

CNS TABLE 3 – FIREFIGHTING ANALYSIS #7 Aircraft Probable Threat		
Line #	Performed by	Task Analysis Controlling Method
1	Reactor Operator #3	Fire Brigade Training
2	Station Operator #2	Fire Brigade Training
3	Station Operator #3	Fire Brigade Training
4	Utility Worker #1	Fire Brigade Training
5	Utility Worker #2	Fire Brigade Training

FB relocates to outside the footprint.

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

CNS TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis #7 – 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: <u>N/A</u>																		
2	On-site Survey: N/A																		
3	Personnel Monitoring: N/A																		
4	Job Coverage: N/A																		
5	Offsite Rad Assessment: <u>(Included in 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 / Chemistry Tech goes with FB to location outside the footprint as directed by the SM.



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

CNS TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis #7 – 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	Communicator	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	STE	Non-Licensed Operator Training Program
11	Activate ERDS	CRS	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

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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### G. Design Basis Accident Analysis #8 – Control Room Evacuation and Shutdown

1. Accident Summary
  - Fire in the Main Control that requires control room evacuation.
  - If the nuclear system becomes isolated from the main condenser, decay heat is transferred from the reactor to the suppression pool via the relief valves. The incident detection circuitry initiates operation of the RCIC and HPCI systems on low water level which maintains reactor vessel water level, and the RHR suppression pool cooling mode is used to remove the decay heat from the suppression pool if required. When reactor pressure falls below 100 psig level, the RHR shutdown cooling mode is started.
2. Accident Specific Assumptions Made
  - The ATC operator will perform the immediate actions of the procedure to initiate a manual scram and verify all rods in before evacuating the control room.
  - Subsequent actions are performed from outside the control room.
3. Procedures for Accident Response
  - 5.1 INCIDENT, Site Emergency Incident
  - 5.4 FIRE-S/D, Fire Induced Shutdown from Outside Control Room
  - 5.7.1, Emergency Classification
  - 5.7.2, Emergency Director EPIP
  - 5.7.6, Notification
  - 5.4 POST-FIRE-CONTROL



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

### 4. Tables

Note: Table 1 contains the staffing identified in Section II.A, OSA Minimum Staffing

CNS TABLE 1 – ON-SHIFT POSITIONS Analysis #8 – CR Evacuation & Alternate SD						
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 5.2-1	60	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L11 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5.2-1	N/A	T2/L2	No	No
3	Shift Technical Engineer (STE)	Emergency Plan Figure 5.2-1	60	T2/L3 T5/L10	No	Yes
4	Reactor Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L4	No	No
5	Reactor Operator #2	Emergency Plan Figure 5.2-1	N/A	T2/L5	No	No
6	Reactor Operator #3	Emergency Plan Figure 5.2-1	N/A	T3/L1	No	No
7	Station Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L6	No	No
8	Station Operator #2	Emergency Plan Figure 5.2-1	N/A	T3/L2	No	No
9	Station Operator #3	Emergency Plan Figure 5.2-1	60	T3/L3	No	No
10	Communicator	Emergency Plan Figure 5.2-1	60	T5/L8 T5/L9 T5/L13	No	No
11	RP/Chem Tech #1	Emergency Plan Figure 5.2-1	60	T4/L4	No	No
12	Dose Assessor	Emergency Plan Figure 5.2-1	60	N/A	No	No
13	Utility Fire Brigade Member #1	Emergency Plan Figure 5.2-1	N/A	T3/L4	No	No
14	Utility Fire Brigade Member #2	Emergency Plan Figure 5.2-1	N/A	T3/L5	No	No
15	Security	Security Contingency Plan	60	T5/L15	No	No



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

<b>CNS TABLE 2 – PLANT OPERATIONS &amp; SAFE SHUTDOWN</b> <b>One Unit – One Control Room</b> <b>ANALYSIS # 8 – CR Evacuation &amp; Alternate SD</b>			
Minimum Operations Crew Necessary to Implement AOPs 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	Control Room Supervisor	Licensed Operator Training Program
3	Shift Technical Advisor	Shift Technical Engineer (STE)	Licensed Operator Training Program
4	Reactor Operator #1	Reactor Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Reactor Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Station Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Other needed for Safe Shutdown	N/A	N/A
9	Other needed for Safe Shutdown	N/A	N/A
10	Other needed for Safe Shutdown	N/A	N/A

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

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
11	Mechanic	N/A	N/A
12	Electrician	N/A	N/A
13	I&C Technician	N/A	N/A
14	Other	N/A	N/A
15	Other	N/A	N/A

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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Fire Brigade

CNS TABLE 3 – FIREFIGHTING ANALYSIS # 8 – CR Evacuation & Alternate SD		
Line #	Performed by	Task Analysis Controlling Method
1	Reactor Operator #3	Fire Brigade Training
2	Station Operator #2	Fire Brigade Training
3	Station Operator #3	Fire Brigade Training
4	Utility Worker #1	Fire Brigade Training
5	Utility Worker #2	Fire Brigade Training

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

CNS TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis #8 – CR Evacuation & Alternate 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: RP#2																		
2	On-site Survey: N/A																		
3	Personnel Monitoring: N/A																		
4	Job Coverage: RP/Chem#1 Support FB		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	Offsite Rad Assessment: (Included in 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																		



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

CNS TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis #8 – CR Evacuation & Alternate 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	Communicator	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	Communicator	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

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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### H. Accident Analysis #9 – Station Blackout

1. Accident Summary
  - At power, normal lineups and no additional events
  - HPCI and RCIC start to restore level
2. Accident Specific Assumptions Made
  - Assume the Shift Manager recognizes power cannot be restored within 15 minutes after the loss before the 15 minute SBO EAL period has expired.
3. Procedures for Accident Response
  - 5.3SBO, Station Blackout
  - 2.4FPC, Fuel Pool Cooling Trouble
  - 5.3ALT-STRATEGY, Alternate Core Cooling Mitigating Strategies
  - 2.2.99, Supplemental Diesel Generator System
  - 2.2.100, SAMG Diesel Generator System
  - 0.39.1, Fire Watches and Fire Impairments
  - 5.7.1, Emergency Classification
  - 5.7.2, Emergency Director EPIP
  - 5.7.6, Notification
  - 5.7.10, Personnel Assembly and Accountability

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

### 4. Tables

Note: Table 1 contains the staffing identified in Section II.A, OSA Minimum Staffing.

CNS TABLE 1 – ON-SHIFT POSITIONS Analysis #9 – 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 5.2-1	60	T2/L1 T5/L1 T5/L3 T5/L5 T5/L6 T5/L11 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5.2-1	N/A	T2/L2	No	No
3	Shift Technical Engineer (STE)	Emergency Plan Figure 5.2-1	60	T2/L3 T5/L10	No	No
4	Reactor Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L4	No	No
5	Reactor Operator #2	Emergency Plan Figure 5.2-1	N/A	T2/L5	No	No
6	Reactor Operator #3	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
7	Station Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L6	No	No
8	Station Operator #2	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
9	Station Operator #3	Emergency Plan Figure 5.2-1	60	N/A	No	No
10	Communicator	Emergency Plan Figure 5.2-1	60	T5/L8 T5/L9 T5/L13	No	No
11	RP/Chem Tech #1	Emergency Plan Figure 5.2-1	60	N/A	No	No
12	Dose Assessor	Emergency Plan Figure 5.2-1	60	N/A	No	No
13	Utility Fire Brigade Member #1	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
14	Utility Fire Brigade Member #2	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
15	Security	Security Contingency Plan	60	T5/L15	No	No



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

<b>CNS TABLE 2 – PLANT OPERATIONS &amp; SAFE SHUTDOWN</b> <b>One Unit – One Control Room</b> <b>Analysis #9 – Station Blackout</b>			
Minimum Operations Crew Necessary to Implement AOPs 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	Control Room Supervisor	Licensed Operator Training Program
3	Shift Technical Advisor	Shift Technical Engineer (STE)	Licensed Operator Training Program
4	Reactor Operator #1	Reactor Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Reactor Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Station Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Other needed for Safe Shutdown	N/A	N/A
9	Other needed for Safe Shutdown	N/A	N/A
10	Other needed for Safe Shutdown	N/A	N/A

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

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
11	Mechanic	N/A	N/A
12	Electrician	N/A	N/A
13	I&C Technician	N/A	N/A
14	Other	N/A	N/A
15	Other	N/A	N/A

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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Fire Brigade

CNS TABLE 3 – FIREFIGHTING Analysis #9 – 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

The Station Blackout Analysis does not include the need for firefighting

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

CNS TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis #9 – 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: N/A																		
5	Offsite Rad Assessment: <i>(Included in Table 5 – N/A)</i>																		
6	Other site specific RP : N/A																		
7	Chemistry Function task #1: N/A																		
8	Chemistry Function task #2 (describe) – N/A																		

RP/Chemistry Tech does not have an assigned task for SBO.



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

CNS TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis #9 – <u>Station Blackout</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	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	Communicator	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	STE	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

# COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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## I. Accident Analysis #10 – LOCA/General Emergency with Release and PAR

1. Accident Summary (Assumed for Staffing Analysis Purpose)
  - The unit is in a Site Area Emergency AS1 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
  - 5.7.1, Emergency Classification
  - 5.7.2, Emergency Director EPIP
  - 5.7.6, Notification
  - 5.7.16, Release Rate Determination
  - 5.7.17, Dose Assessment
  - 5.7.20, Protective Action Recommendation

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

### 4. Tables

Note: Table 1 contains the staffing identified in Section II.A, OSA Minimum Staffing.

CNS TABLE 1 – ON-SHIFT POSITIONS Analysis #10 –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 5.2-1	60	T2/L1 T5/L1 T5/L2 T5/L3 T5/L4 T5/L5 T5/L14	No	Yes
2	Control Room Supervisor	Emergency Plan Figure 5.2-1	N/A	T2/L2	No	No
3	Shift Technical Engineer (STE)	Emergency Plan Figure 5.2-1	60	T2/L3 T5/L10	No	No
4	Reactor Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L4	No	No
5	Reactor Operator #2	Emergency Plan Figure 5.2-1	N/A	T2/L5	No	No
6	Reactor Operator #3	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
7	Station Operator #1	Emergency Plan Figure 5.2-1	N/A	T2/L6	No	No
8	Station Operator #2	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
9	Station Operator #3	Emergency Plan Figure 5.2-1	60	N/A	No	No
10	Communicator	Emergency Plan Figure 5.2-1	60	T5/L8 T5/L9 T5/L13	No	No
11	RP/Chem Tech #1	Emergency Plan Figure 5.2-1	60	N/A	No	No
12	Dose Assessor	Emergency Plan Figure 5.2-1	60	T5/L12	No	No
13	Utility Fire Brigade Member #1	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
14	Utility Fire Brigade Member #2	Emergency Plan Figure 5.2-1	N/A	N/A	No	No
15	Security	Security Contingency Plan	60	T5/L15	No	No



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

<b>CNS TABLE 2 – PLANT OPERATIONS &amp; SAFE SHUTDOWN</b> <b>One Unit – One Control Room</b> <b>Analysis #10 – LOCA/GE with PAR</b>			
Minimum Operations Crew Necessary to Implement AOPs 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	Control Room Supervisor	Licensed Operator Training Program
3	Shift Technical Advisor	Shift Technical Engineer (STE)	Licensed Operator Training Program
4	Reactor Operator #1	Reactor Operator #1	Licensed Operator Training Program
5	Reactor Operator #2	Reactor Operator #2	Licensed Operator Training Program
6	Auxiliary Operator #1	Station Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Other needed for Safe Shutdown	N/A	N/A
9	Other needed for Safe Shutdown	N/A	N/A
10	Other needed for Safe Shutdown	N/A	N/A

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

Line #	Generic Title/Role	On-Shift Position	Task Analysis Controlling Method
11	Mechanic	N/A	N/A
12	Electrician	N/A	N/A
13	I&C Technician	N/A	N/A
14	Other	N/A	N/A
15	Other	N/A	N/A

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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Fire Brigade

CNS TABLE 3 – FIREFIGHTING Analysis #10 – 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

Note: The LOCA/GE with PAR Analysis does not include the need for firefighting.

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

CNS TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis #10 – 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: 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): N/A																		
7	Chemistry Function task #1 (describe) – N/A																		
8	Chemistry Function task #2 (describe) – N/A																		

\*Times are estimated. Note: The Dose Assessor is available for dose assessment



## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

CNS TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis #10 – 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	N/A
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	Communicator	Emergency Planning Training Program
9	Perform State/local notifications	Communicator	Emergency Planning Training Program
10	Complete NRC event notification form	STE	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	Dose Assessor	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	N/A	N/A

## **COOPER ON-SHIFT STAFFING ANALYSIS REPORT**

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

#### **A. TMS Shift Manager Activate Dialogics**

### **COOPER**

### **TIME MOTION STUDY OF OVERLAPPING TASKS**

#### **TASK 1: ACTIVATE THE ERO USING DIALOGICS**

**JOB: SHIFT MANAGER**

#### **TASK 2: PERFORM EMERGENCY DIRECTION AND CONTROL**

**JOB: SHIFT MANAGER**

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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### PURPOSE:

Perform a Time Motion Study to evaluate whether assigning the performance of ERO notification using DIALOGICS to the Shift Manager is an acceptable task overlap to the Shift Manager's primary emergency plan function of emergency direction and control.

### NOTE

The Time Motion Study may be completed during simulator training/evaluation or during an EP drill while the Shift Manager is performing the Emergency Director function.

### LOCATION:

Simulator

### REQUIRED TOOLS/EQUIPMENT:

- A. Telephone with ANS Activation Module
- B. Procedure 5.7.2 Attachment 1 Activation of ANS-Hardcard
- C. Simulator Dialogics Communication Cross-Tie is in OFF or not cross-tied.



# COOPER ON-SHIFT STAFFING ANALYSIS REPORT

## APPENDIX D (NEI 10-05)

### Function / Responsibility (Task) Analysis Template

Event: \_\_\_\_\_ Site: CNS Position: Shift Manager Line #: 1

Function	Responsibility (Task)	Action Step	Duration  Clock/Step Time In
1.Notification	1.1 Initiate notification to the ERO via the Dialogics Program	<b>CAUTION:</b> <b>The Simulator Communication Cross- tie for Dialogics must be OFF to prevent inadvertent activation of the ERO.</b>	+5/5 sec
		1.1.1 Retrieve the Dialogics Hardcard instruction.	
		1.1.2 At the ANS ACTIVATION MODULE, pick up handset and verify dial tone.	+10/5 sec
		1.1.3 Depress "ACTIVATE DIALOGICS" pushbutton.	+20 /10 sec
		1.1.4 When asked for Scenario, depress desired "Yellow" scenario pushbutton.	+36/16 sec
		1.1.5 Wait until system says "Goodbye" then hang up.	+48/12 sec
		1.1.6 When pagers activate within 3 minutes, then STOP	1:29 / 41 sec
		<b>END OF ERO NOTIFICATION TASK TOTAL TASK DURATION:</b>	<b>1 min 29 sec</b>
Function	Responsibility (Task)	Action Step	Duration
2.Emergency Direction and Control	2.1 Maintain emergency direction and control of the event response.	1. Oversight of the emergency response.	41 sec
		2. Initiate any emergency actions.	48 sec
		NOTE: The TMS is for overlap period. The total time considered for this task should be concurrent with Task 1.	
		<b>END OF EMERGENCY DIRECTION AND CONTROL TASK TOTAL TASK DURATION</b>	<b>1 min 29 sec</b>

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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### RESULT:

**Explain why it is acceptable or not acceptable for the Shift Manager to perform the task of notifying the ERO:**

The process of activating the ERO takes 48 seconds to perform the actions required followed by 41 seconds of carrying the pager to verify that it activated. Activating the ERO is covered by 2.1-2 to initiate any emergency actions. Per the Shift Manager, more time would be expended directing someone to activate the ERO with code 222 than it would to just do it. This task is very short in duration and the shift manager is able to stay apprised of plant conditions while doing it.

The Shift Manager used proper place-keeping techniques while performing this task.

	NAME	POSITION	DATE
Task Performer	Ron Shaw	Assistant Operations Manager	Nov. 3, 2012
Evaluator	Tim Rients	Emergency Preparedness Coordinator	Nov. 3, 2012

## COOPER ON-SHIFT STAFFING ANALYSIS REPORT

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### IX. OVERLAP OF TASKS ACTIVITIES OR OTHER CONFLICTS IDENTIFIED

#### A. Overlap Requiring Compensatory Measures

None

### X. 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.*
- CNS Emergency Plan, Rev 39

### XI. ORIGINAL STAFFING ANALYSIS TEAM

- Fred Guynn, Entergy ECH Sr Project Manager, EP
- Myra Jones, CMCG Contractor
- Dave Werner, CNS Training
- John Teten, CNS Chemistry
- Kip Reeves, CNS Emergency Planning
- Ron Shaw, CNS Operations
- Tim Rients, CNS Emergency Planning
- Mark Uhri, CNS Chemistry
- Greg Brewer, CNS Training