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0CAN042501

10 CFR 50.54(q)(5)
10 CFR 50, App. E
10 CFR 72.44(f)

April 2, 2025

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

Subject: Arkansas Nuclear One (ANO) Emergency Plan On-Shift Staffing Analysis Revision 4

Arkansas Nuclear One – Units 1 and 2
NRC Docket Nos. 50-313, 50-368, and 72-13
Renewed Facility Operating License Nos. DPR-51 and NPF-6

In accordance with 10 CFR 50.4(b)(5), 10 CFR 50.54(q)(5), 10 CFR 72.4, and 10 CFR 72.44(f), the Arkansas Nuclear One (ANO) Emergency Plan (EPlan) On-Shift Staffing Analysis (OSA) has been revised and is included in Enclosures 2, of this letter. Revision 4 of the OSA was implemented at the site on March 17, 2025. A summary of the changes to the OSA is included in Enclosure 1 of this letter.

10 CFR 50, Appendix E, Section IV.A.9, establishes the OSA as part of the EPlan. NRC Interim Staff Guidance NSIR/DPR-ISG-01, "Emergency Planning for Nuclear Power Plants," Section IV.C, also speaks of staffing analyses as part of the EPlan. Pursuant to 10 CFR 50.54(q), a screening and/or evaluation of the changes to the ANO OSA was performed. The screening and/or evaluation concluded that these changes to the OSA do not reduce the effectiveness of the EPlan, and the EPlan continues to meet the standards of 10 CFR 50.47(b) and 10 CFR 50, Appendix E.

There are no new commitments contained in this submittal.

If there are any questions or if additional information is needed, please contact Riley Keele, Manager, Regulatory Assurance, Arkansas Nuclear One, at 479-858-7826.

Sincerely,

Riley Keele, Jr.

RDK/ble

Enclosures: 1. Summary of Changes to the ANO On-Shift Staffing Analysis Report

2. ANO On-Shift Staffing Analysis Report

cc: NRC Region IV Regional Administrator
NRC Senior Resident Inspector – Arkansas Nuclear One
NRC Project Manager – Arkansas Nuclear One
NRC Director, Division of Fuel Management
NRC Region IV Senior Emergency Preparedness Inspector
Designated Arkansas State Official

Enclosure 1 to

0CAN042501

Summary of Changes to the ANO On-Shift Staffing Analysis Report

SUMMARY OF CHANGES TO THE ANO ON-SHIFT STAFFING ANALYSIS REPORT

The following tables provide a brief description or summary of changes made to the Arkansas Nuclear One (ANO) On-Shift Staffing Analysis (OSA) Report included in Enclosure 2 of this submittal. This summary includes changes completed in Revision 4 of the OSA Report.

Arkansas Nuclear One On-Shift Staffing Analysis Report, Revision 3	
Section Revised	**Description of Change**
Cover Page	**Added** Record of Change table. **Deleted**: "Staffing Analysis Rev.000 Prepared by: Myra Jones Fred Guynn Approved by: _____ Name/Title Date _____ Signature
Page 10, General Assumptions and Limitations: V.A.3	**Added**: "Dose Assessment is the only required function of the chemistry technicians within the first 90 minutes of an accident. If additional chemistry support is available, the tasks can be performed as requested."
Table 4 in following locations: • **Pg 18**, Analysis #2 – Unit 1 Steam Line Rupture, • **Pg 43**, Analysis # 7 – Unit 1 Waste Gas Tank Rupture, • **Pg 54**, Analysis #2 – Unit 2 Steam Line Rupture, • **Pg 59**, Analysis # 2 – Steam Line Rupture • **Pg 74**, Analysis #6 - Unit 2 LOCA, • **Pg 79**, Analysis # 7 – Unit 2 Waste Gas Tank Rupture.	**Added** asterisk to Chemistry function task #1 along with this note below each table: *** See Section V.A.3 General Assumptions and Limitations for clarification of chemistry task performance.*

Acronyms

ANO	Arkansas Nuclear One
OSA	On-Shift Staffing Analysis Report

The changes to the ANO OSA continue to meet the planning standards outlined in 10 CFR 50.47(b)(2) – Onsite Emergency Organization, 10 CFR 50.47(b)(6) – Emergency Communications, 10 CFR 50.47(b)(7) – Emergency Public Information, and 10 CFR 50.47(b)(8) - Emergency Facilities and Equipment. This revision to the On-Shift Staffing Analysis may be implemented without prior NRC Approval.

Enclosure 2 to

0CAN042501

ANO On-Shift Staffing Analysis Report

(124 Pages)

ENTERGY

ARKANSAS NUCLEAR ONE

ON-SHIFT STAFFING ANALYSIS

FINAL REPORT

Rev 004

Record of Changes

Location	Change
Cover Page	**Added** Record of Change table. **Deleted**: "Staffing Analysis Rev.000 Prepared by: Myra Jones Fred Guynn Approved by: _____ Name/Title Date _____ Signature
Page 10, General Assumptions and Limitations: V.A.3	**Added**: "Dose Assessment is the only required function of the chemistry technicians within the first 90 minutes of an accident. If additional chemistry support is available, the tasks can be performed as requested."
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TABLE OF CONTENTS

I. INTRODUCTION

This document is the final report for the On-shift Staffing Analysis (OSA) that commenced at Arkansas Nuclear One (ANO) the week of June 25, 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 Table B-1 of the ANO 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 twenty-two (22) for both ANO units is required to respond to the accidents reviewed. The most limiting accident scenario reviewed for both units was a main control room fire and alternate shutdown. 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
- 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.

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 function and the licensing basis requirement for each on-shift position. These positions are included in Table 1 of each accident analysis but any staff members added as 30-day compensatory measures are not shown as having a task responsibility.

Position U2	E-Plan Requirement	E-Plan Functional Area U1 staff	E-Plan Functional Area U2 staff	On-Shift Staffing Analysis Results U1	On-Shift Staffing Analysis Results U2
Shift Manager (SM)	E-Plan Table B-1	SSD/Emergency Direction and Control	Emergency Direction and Control	1	1
Control Room Supervisor (CRS)	E-Plan Table B-1	SSD	SSD	1	1
Shift Technical Advisor (STA)	E-Plan Table B-1	Technical Support	Technical Support	1	1
Reactor Operators	E-Plan Table B-1	SSD	SSD	2	2
Auxiliary Operators	E-Plan Table B-1	SSD[1]/FB[2]	FB[2]	3	3
Auxiliary Operator	E-Plan Table B-1	Communicator / Notifications	Communicator / Notifications	1[3]	1[3, 4]
Chemistry	E-Plan Table B-1	Chemistry	Chemistry	1[5]	1[5]
Radiation Protection	E-Plan Table B-1	Radiation Protection	Radiation Protection	1	1
Operator (FB)	E-Plan Table B-1	FB for both units[2]		1	
Security	Security Contingency Plan / E-Plan Table B-1	Access Control and Accountability		Per Security Contingency Plan	
TOTAL				**12**	**11**

[1]2 U1 AOs are qualified U1 safe shutdown operators.

[2]The affected unit supplies 1 Operations Fire Brigade Leader. The non-affected unit supplies 3 Operations Fire Brigade Members. An additional Operator provides the 5th member.

[3] An additional Operations staff member for each unit is assigned the Communicator/Notifications role for both units. Staff fulfilling the Communicator role is not required to be fully qualified in their job function but will be qualified for the Communicator position.

[4]Unit 2 Communicator will be qualified as a U2 Safe Shutdown Operator.

[5]The EPlan Table B-1 requires one Chemist on shift be qualified to perform Offsite Dose Projections with an additional qualified initial dose assessor to respond within 60 minutes. On Shift Chemists are qualified to perform sampling tasks on both units. Initial Dose Assessors are qualified to perform Offsite Dose Projections for both Units.

B. Other Commitments to Shift Staffing

None

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. Chemistry Technicians on-shift are qualified to work either unit. One Chemistry Technician is assigned to perform dose assessment. Any additional chemist on shift is responsible for chemistry tasks. A qualified Dose Assessor is required to be available within 90 minutes of an Alert ECL. A TMS for performing dose assessment was evaluated as not being required due to the Chemistry Technician not having any chemistry job tasks during the evaluated accident scenarios.

2. The Shift Manager makes plant specific notifications (ex. Duty Plant Manager, Operations Manager, and Resident Inspector) in response to a declared emergency. These phone notifications 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. The Unit 1 Shift Manager is assigned safe shutdown actions prior to going to the TSC to perform emergency director actions. A Time Motion Study was completed and found that the overlapping activities are acceptable. The TMS is documented in Section X, Appendix C.

4. Station staff is 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, reactor operators, nuclear plant operators, radiation protection technicians, or chemistry technicians were all available to fill this function. No further analysis or TMS is required

5. The ANO Emergency Response Data System (ERDS) link to the NRC is on 24-hour operation and does not require activation by the on-shift ERO. The task of ERDS activation is therefore not included as an on-shift task requiring evaluation as part of this staffing analysis.

6. The STA has a collateral task to notify the ERO as shown in each accident analysis. The task is reassigned to an Auxiliary Operator who will be qualified as a compensatory measure. Therefore a Time Motion Study is not required.

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 dedicated shift personnel or qualified shift personnel assigned other functions/tasks. 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 ANO, Nuclear Plant Operators are trained to perform the actions associated with this functional area. 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. Per the guidance of NUREG-0654, Table B-1, rescue operations and first aid may be performed by shift personnel assigned other functions. ANO Radiation Protection (RP) Technicians are trained to provide initial medical treatment and to perform basic rescue operations as defined in NEI 10-05 section 2.6. Rescue operations and first aid were not required in any of the accident scenarios reviewed. Rescue operations and first aid response are acceptable collateral duties per the guidance of NEI 10-05 and were not analyzed.

III. ANALYSIS PROCESS

This analysis was conducted by a joint team of corporate Emergency Preparedness (EP) personnel and station personnel from the Operations, Operations Training, Radiation Protection, Chemistry, and Emergency Preparedness (EP) departments. The team members are identified in Section XIII 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.

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 Table B-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.

The results of the analysis for each of the scenarios are included in Sections VII, VIII and IX, 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 ANO's DBAs were evaluated and classified according to its FSAR description, U1 FSAR Section 14 and U2 FSAR Section 15. 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.

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 for both U1 and U2 were:
    - Design Basis Threat (DBT)
    - DBA Steam Line Rupture
    - DBA Steam Generator Tube Failure
    - DBA Fuel Handling Accident
    - DBA Rod Ejection Accident
    - DBA Loss of Coolant Accident
    - Waste Gas Tank Rupture
    - DBA Aircraft Probable Threat
    - Fire / Control Room Evacuation and Alternate Shutdown (Appendix R Fire)
    - Station Blackout, (SBO)
    - LOCA/General Emergency with release and PAR
    - LOCA with entry into Severe Accident Management
    - Appendix R Fire (Fire that results in reactor trip)

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. Single event impacts both units.

2. Steam Line Rupture as described in U1 FSAR 14.2.2.1 / U2 FSAR 15.1.14

- A main steam line break with loss of offsite power. Release into the turbine building until Main steam stop valves isolates. EAL is based on the event.

3. Steam Generator Tube Failure as described in U1 FSAR 14.2.2.2 / U2 FSAR 15.1.18

- Failure of a single U-tube that resulted in exceeding charging pump capacity. No fuel failure is postulated. Operators are notified of the leak by radiation monitor alarm. The EAL is based on the event.

4. Fuel Handling Accident as described in U1 FSAR 14.2.2.3 / U2 FSAR 15.1.23

- The accident involves a dropped fuel bundle on top of the core. Initial EAL is based on the event.

5. Rod Ejection Accident as described in U1 FSAR 14.2.2.4 / U2 FSAR 15.1.20

- A complete circumferential rupture of the Control Element Drive Mechanism (CEDM) housing or CEDM nozzle and causes a rapid ejection of a CEA. The consequences of the loss of coolant resulting from the RCS rupture are similar to those for small breaks. All fuel rods that experience DNB are assumed to release their total gap activity to the reactor coolant.

6. Loss of Coolant Accident as described in U1 FSAR 14.2.2.5 / U2 FSAR 15.1.13

- A Break (Double Ended Guillotine Cold Leg break) between the reactor coolant pump and the reactor vessel results in core degradation with release to the containment and to the environment at the containment design leakage rate. EAL is based on the event

7. Waste Gas Tank Rupture as described in U1 FSAR 14.2.2.6 / U2 FSAR 15.1.16

- The most limiting waste gas accident is an unexpected and uncontrolled release to the atmosphere of the radioactive xenon and krypton fission gases that are stored in one waste gas decay tank. The tank is assumed to contain the gaseous activity evolved from degassing all of the reactor coolant following operation with 1% defective fuel.

8. Aircraft Probable Threat as described in 10 CFR 50.54 hh(1)

- Notification is received from the NRC that a probable aircraft threat exists (>5 minutes, <30 minutes). EAL is based on the event. The single event impacts both units.

9. Control Room Fire and Alternate Shutdown

- A fire occurs in the main control room requiring the evacuation and the procedure implemented to shutdown from the alternate shutdown panels. EAL is based on the event. Because of the control room design, the other unit will evacuate the control room after tripping the reactor and perform remote shutdown.

10. Station Blackout

- A loss of all offsite AC power to both units occurs and the failure of the emergency diesel generators to start. EAL is based on the event.

11. General Emergency with release and PAR

- Assumed upgrade to a general emergency condition when dose projection indicates release exceeds PAG and will be considered in the PAR decision.

C. Accident Scenarios Not Included in the Analysis

1. Implement Severe Accident Management Guidelines (SAMG)

- 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.

2. 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. No analysis required.

V. GENERAL ASSUMPTIONS AND LIMITATIONS

A. Notes and Assumptions Applicable to All ANO OSA

1. The RP and Chemistry tasks reviewed were those directed by the Shift Manager to support actions in Off Normal Procedures, Emergency Operating Procedures, and Emergency Plan Implementing Procedures. Any additional tasks directed by the Technical Support Center (TSC), Operations Support Center (OSC), or Emergency Operations Facility (EOF) procedures were not reviewed.

2. ANO has 60 minute and 90 minute emergency responders when augmented while the ERO is offsite. This analysis was conducted assuming a 90 minute response of the augmented ERO. No credit was taken for 60 minute responders. 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.

4. No Chemistry samples are required by Tech Specs within the 90 minute period after a declaration. Dose Assessment is the only required function of the chemistry technicians within the first 90 minutes of an accident. If additional chemistry support is available, the tasks can be performed as requested. Since the Shift Manager directs when the tasks are performed, there are no overlapping RP or chemistry tasks.

5. 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.

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. (90 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), 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 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. At Least one chemist on shift is required to be qualified as Initial Dose Assessor.

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 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 USAR.

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 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.

VI. APPENDIX A - ANALYZED EVENTS AND ACCIDENTS

NOTE

Appendix A is applicable to both Unit 1 and Unit 2. Accidents are the same for both units.

Event #	Event Type	Summary Description of Event	Plant Mode[1]	Reference Document(s)	Event ECL[4] U1	Event ECL[4] U2	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	SAE	SAE	YES
2	DBA	Steam Line Rupture (SLR)	1	U1 FSAR 14.2.2.1 U2 FSAR 15.1.14	SAE	Alert	Yes
3	DBA	Steam Generator Tube Rupture (SGTR)	1	U1 FSAR 14.2.2.2 U2 FSAR 15.1.18	Alert	SAE	YES
4	DBA	Fuel Handling Accident (FHA)	1	U1 FSAR 14.2.2.3 U2 FSAR 15.1.23	SAE	SAE	YES
5	DBA	Rod Ejection	1	U1 FSAR 14.2.2.4 U2 FSAR 15.1.20	SAE	SAE	YES
6	DBA	Loss of Coolant Accident (LOCA)	1	U1 FSAR 14.2.2.5 U2 FSAR 15.1.13	GE (worst case)	GE	YES
7	DBA	Waste Gas Tank Rupture	1	U1 FSAR 14.2.2.6 U2 FSAR 15.1.16	GE (worst case)	SAE	Yes
8	Assumed for Analysis Purpose	Aircraft Probable Threat.	1	10CFR50.54hh(1) RG 1.214	Alert	Alert	YES
9	Assumed for Analysis Purpose	Control Room Evacuation and Alternate Shutdown (fire in main control room)	1	10CFR50 Appendix R ISG IV,C	Alert	SAE	YES

Event #	Event Type	Summary Description of Event	Plant Mode[1]	Reference Document(s)	Event ECL[4] U1	Event ECL[4] U2	Analysis Required?
10	Assumed for Analysis Purpose	Station Blackout	1	ISG IV.C	SAE	Alert	YES
11	Assumed for Analysis Purpose	LOCA – General Emergency with radiological release and PAR	1	ISG IV.C	GE	GE	YES
12	Assumed for Analysis Purpose	LOCA with entry into severe accident procedures.	1	ISG IV.C	GE	GE	NO[2]
13	Assumed for Analysis Purpose	Appendix R Fire with Reactor Trip	1	ISG IV.C	Alert	Alert	NO[3]

[1] Plant mode per USAR or assumed for analysis purpose

[2]ANO 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. SAMG is implemented by the TSC. All success paths' actions are performed by on-shift licensed and non-licensed operators.

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

[4]ECLs: UE (Unusual Event), Alert, SAE (Site Area Emergency), and GE (General Emergency). Classification level shown is based on ANO Emergency Plan Tables D-3 and D-4.

VII. APPENDIX B – U1 ON-SHIFT STAFFING ANALYSIS

A. Design Basis Accident Analysis #2 – Steam Line Rupture

1. Accident Summary

   - Double-ended rupture of the Steam pipe upstream of the main steam isolation valve on steam generator “B.” All expected isolations occur except for 1 main feedwater isolation valve to the affected steam generator. DNB will not occur.
   - Primary to secondary leakage to the affected steam generator.

2. Accident Specific Assumptions Made

   - EAL is based on FSAR EAB 2 hour dose

3. Procedures for Accident Response

   - 1202.001, Reactor Trip
   - 1202.003, Overcooling
   - 1202.006, Tube Rupture
   - 1015.037, Post Transient Review
   - 1601.307, Attachment 6 Primary to Secondary Leak
   - 1203.014, Control of Secondary System Contamination
   - 1903.010, Emergency Action Level Classification
   - 1903.011, Emergency Response Notifications
   - 1903.030, Evacuation
   - 1904.002, Offsite Dose Projection

4. Tables

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis # 2 – Steam Line Rupture						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U1 Shift Manager (SM)	E-Plan Table B-1	90	U1 T2/L1 T5/L1 T5/L3 T5/L5 T5/L14	No	No
2	U1 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U1 T2/L2	No	No
3	U1 Shift Technical Advisor (STA)	E-Plan Table B-1	90	U1 T2/L3 T5/L6	No	Yes
4	U1 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U1 T2/L4	No	No
5	U1 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U1 T2/L5	No	No
6	U1 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U1 T2/L6	No	No
7	U1 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	U1 T2/L7	No	No
8	U1 Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	N/A	No	No
9	U1 Auxiliary Operator (AO#4)	E-Plan Table B-1	N/A	N/A	No	No
10	U1 Chemistry	E-Plan Table B-1	90	T5/L12	No	Yes
11	U1 Radiation Protection (RP)	E-Plan Table B-1	90	T4/L1 T4/L2	No	No
12	U2 Shift Manager	E-Plan Table B-1	N/A	N/A	No	No
13	U2 CRS	E-Plan Table B-1	N/A	N/A	No	No
14	U2 STA	E-Plan Table B-1	N/A	T5/L8 T5/L9 T5/L10 T5/L13	No	Yes
15	U2 RO #1	E-Plan Table B-1	N/A	N/A	No	No
16	U2 RO #2	E-Plan Table B-1	N/A	N/A	No	No
17	U2 AO#1	E-Plan Table B-1	N/A	N/A	No	No
18	U2 AO#2	E-Plan Table B-1	N/A	N/A	No	No
19	U2 AO#3	E-Plan Table B-1	N/A	N/A	No	No
20	U2 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U2 Chemistry	E-Plan Table B-1	N/A	T4/L7	No	No
22	U2 RP	E-Plan Table B-1	N/A	T4/L3	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	T5/L15	No	No

ANO TABLE 2 – UNIT 1 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis # 2 – Steam Line Rupture 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	Auxiliary Operator #2	Non-Licensed Operator Training Program
8	Auxiliary Operator #3	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

Fire Brigade

ANO TABLE 3 – FIREFIGHTING Analysis # 2 – Steam Line 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

No firefighting activities included in this accident.

ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis # 2 – Steam Line 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: U1 RP (survey TB)			X	X	X	X	X	X	X									
2	On-site Survey: U1 RP (site boundary)													X	X	X	X	X	
3	Personnel Monitoring: U2 RP U2 RCA access/exit control			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
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) U2 Chemistry (samples) **						X	X	X	X	X	X	X	X	X	X	X	X	X
8	Chemistry Function task #2 (describe) N/A																		

*Times are estimated.

** See Section V.A.3 General Assumptions and Limitations for clarification of chemistry task performance.

ANO TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis # 2 – Steam Line Rupture			
Line#	**Function / Task**	**On-Shift Position**	**Task Analysis Controlling Method**
1	Declare the emergency classification level (ECL)	U1 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	U1 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.)	U1 Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U1 STA	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	U2 STA	Emergency Planning Training Program
9	Perform State/local notifications	U2 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U2 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	U1 Chemistry	Emergency Planning Training Program
13	Perform NRC notifications	U2 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U1 Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

B. Design Basis Accident Analysis #3 – Steam Generator Tube Failure

1. Accident Summary

   - Double ended rupture of one steam generator tube with loss of offsite power. HPI capacity is sufficient to maintain both volume and pressure control.
   - Primary to secondary leak. Operators are notified of the leak by radiation monitor alarm.

2. Accident Specific Assumptions

   - EAL is based on the event and resulting symptoms.
   - FSAR EAB dose not reached due to Operator actions per procedure success path.

3. Procedures for Accident Response

   - 1202.006, Tube Rupture
   - 1202.007, Degraded Power
   - 1903.010, Emergency Action Level Classification
   - 1903.011, Emergency Response Notifications
   - 1903.030, Evacuation
   - 1904.002, Offsite Dose Projection

4. Tables

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis # 3 – Steam Generator Tube Failure						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U1 Shift Manager (SM)	E-Plan Table B-1	90	U1 T2/L1 T5/L1 T5/L3 T5/L5 T5/L14	No	No
2	U1 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U1 T2/L2	No	No
3	U1 Shift Technical Advisor (STA)	E-Plan Table B-1	90	U1 T2/L3 T5/L6	No	Yes
4	U1 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U1 T2/L4	No	No
5	U1 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U1 T2/L5	No	No
6	U1 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U1 T2/L6	No	No
7	U1 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	U1 T2/L7	No	No
8	U1 Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	N/A	No	No
9	U1 Auxiliary Operator (AO#4)	E-Plan Table B-1	N/A	N/A	No	No
10	U1 Chemistry	E-Plan Table B-1	90	T5/L12	No	Yes
11	U1 Radiation Protection (RP)	E-Plan Table B-1	90	T4/L1	No	No
12	U2 Shift Manager	E-Plan Table B-1	N/A	N/A	No	No
13	U2 CRS	E-Plan Table B-1	N/A	N/A	No	No
14	U2 STA	E-Plan Table B-1	N/A	T5/L8 T5/L9 T5/L10 T5/L13	No	Yes
15	U2 RO #1	E-Plan Table B-1	N/A	N/A	No	No
16	U2 RO #2	E-Plan Table B-1	N/A	N/A	No	No
17	U2 AO#1	E-Plan Table B-1	N/A	N/A	No	No
18	U2 AO#2	E-Plan Table B-1	N/A	N/A	No	No
19	U2 AO#3	E-Plan Table B-1	N/A	N/A	No	No
20	U2 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U2 Chemistry	E-Plan Table B-1	N/A	N/A	No	No
22	U2 RP	E-Plan Table B-1	N/A	T4/L3	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	T5/L15	No	No

ANO TABLE 2 – UNIT 1 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis # 3 – Steam Generator Tube Failure 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	Auxiliary Operator #2	Non-Licensed Operator Training Program
8	Auxiliary Operator #3	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

Fire Brigade

ANO TABLE 3 – FIREFIGHTING Analysis # 3 – Steam Generator Tube Failure		
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

No firefighting activities included in this accident.

ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis # 3 – Steam Generator Tube Failure																		
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: ____U1 RP_ perform 1601.308												X	X	X	X	X	X	
2	On-site Survey: ____																		
3	Personnel Monitoring: _RP#2 Support PA Evacuation						X	X	X	X	X								
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_____																		

*Times are estimated.

ANO TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis # 3 – Steam Generator Tube Failure			
Line#	**Function / Task**	**On-Shift Position**	**Task Analysis Controlling Method**
1	Declare the emergency classification level (ECL)	U1 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	U1 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.)	U1 Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U1 STA	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	U2 STA	Emergency Planning Training Program
9	Perform State/local notifications	U2 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U2 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	U1 Chemistry	Emergency Planning Training Program
13	Perform NRC notifications	U2 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U1 Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

C. **Design Basis Accident Analysis #4 – Fuel Handling Accident**

1. Accident Summary

- Fuel handling accident in the spent fuel pool. Gap activity is released from six rows of fuel rods in one assembly while in spent fuel storage pool. The radionuclides released during the fuel handling accident are assumed to enter the atmosphere directly without filtration.

2. Accident Assumptions Made

- FSAR accident radiological analysis assumed FHA in spent fuel storage pool
- EAL is based on the event.
- Additional SROs, ROs, AOs, and RP Techs are on-shift as part of the refueling/outage support staffing. All are available to assist the Shift Manager to respond to the event.

3. Procedures for Accident Response

- 1203.042 R007, Refueling Abnormal Operation
- 1903.010, Emergency Action Level Classification
- 1903.011, Emergency Response Notifications
- 1903.030, Evacuation
- 1904.002, Offsite Dose Projection

4. Tables

U1 in Refueling

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis # 4 – Fuel Handling Accident						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U1 Shift Manager (SM)	E-Plan Table B-1	90	U1 T2/L1 T5/L1 T5/L3 T5/L5 T5/L14	No	No
2	U1 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U1 T2/L2	No	No
3	U1 Shift Technical Advisor (STA)	E-Plan Table B-1	N/A	N/A	N/A	N/A
4	U1 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U1 T2/L4	No	No
5	U1 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U1 T2/L5	No	No
6	U1 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U1 T2/L6	No	No
7	U1 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	U1 T2/L7	No	No
8	U1 Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	N/A	No	No
9	U1 Auxiliary Operator (AO#4)	E-Plan Table B-1	N/A	N/A	No	No
10	U1 Chemistry	E-Plan Table B-1	90	T5/L12	No	Yes
11	U1 Radiation Protection (RP)	E-Plan Table B-1	90	T4/L2	No	No
12	U2 Shift Manager	E-Plan Table B-1	N/A	N/A	No	No
13	U2 CRS	E-Plan Table B-1	N/A	N/A	No	No
14	U2 STA	E-Plan Table B-1	N/A	T5/L6 T5/L9 T5/L8 T5/L10 T5/L13	No	Yes
15	U2 RO #1	E-Plan Table B-1	N/A	N/A	No	No
16	U2 RO #2	E-Plan Table B-1	N/A	N/A	No	No
17	U2 AO#1	E-Plan Table B-1	N/A	N/A	No	No
18	U2 AO#2	E-Plan Table B-1	N/A	N/A	No	No
19	U2 AO#3	E-Plan Table B-1	N/A	N/A	No	No
20	U2 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U2 Chemistry	E-Plan Table B-1	N/A	N/A	No	No
22	U2 RP	E-Plan Table B-1	N/A	T4/L6	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	T5/L15	No	No

ANO TABLE 2 – UNIT 1 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis # 4 – Fuel Handling 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	N/A	N/A
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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	Auxiliary Operator #2	Non-Licensed Operator Training Program
8	Auxiliary Operator #3	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

Fire Brigade

ANO TABLE 3 – FIREFIGHTING Analysis # 4 – 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

No firefighting activities included in this accident.

ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis # 4 – 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: U1 RP			X	X	X	X	X	X	X	X	X							
3	Personnel Monitoring: N/A																		
4	Job Coverage: N/A																		
5	Offsite Rad Assessment: *(Included in Table 5*																		
6	Other site specific RP (describe): U2 RP support PA evacuation				X	X	X	X	X	X									
7	Chemistry Function task #1 (describe) N/A																		
8	Chemistry Function task #2 (describe) N/A																		

*Times are estimated.

ANO TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis # 4 – Fuel Handling Accident			
Line#	**Function / Task**	**On-Shift Position**	**Task Analysis Controlling Method**
1	Declare the emergency classification level (ECL)	U1 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	U1 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.)	U1 Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U2 STA	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	U2 STA	Emergency Planning Training Program
9	Perform State/local notifications	U2 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U2 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	U1 Chemistry	Emergency Planning Training Program
13	Perform NRC notifications	U2 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U1 Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

D. Design Basis Accident Analysis #5 – Rod Ejection

1. Accident Summary

- Physical failure of a pressure barrier component in the control rod drive assembly caused a rapid ejection of the assembly from the core region.
- All fuel rods that experience DNB are assumed to release their total gap activity to the reactor coolant. Some cladding failure occurred.

2. Accident Assumptions Made

- The gap activity is released to the reactor building or the steam generators via primary to secondary leakage. EAL is based on the leakage event.
- Release to the environment is from the reactor building (RB) at the RB design basis leakage rate. It is assumed the EAL upgrade is not required before the emergency response facilities are operational.

3. Procedures for Accident Response

- 1202.001, Loss of Coolant Accident
- 1601.307, Unit 1 Off-Normal Operations
- 1903.010, Emergency Action Level Classification
- 1903.011, Emergency Response Notifications
- 1903.030, Evacuation
- 1904.002, Offsite Dose Projection

4. Tables

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis #5 – Rod Ejection						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U1 Shift Manager (SM)	E-Plan Table B-1	90	U1 T2/L1 T5/L1 T5/L3 T5/L5 T5/L14	No	No
2	U1 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U1 T2/L2	No	No
3	U1 Shift Technical Advisor/FSS (STA)	E-Plan Table B-1	90	U1 T2/L3 T5/L6	No	Yes
4	U1 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U1 T2/L4	No	No
5	U1 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U1 T2/L5	No	No
6	U1 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U1 T2/L6	No	No
7	U1 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	U1 T2/L7	No	No
8	U1 Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	N/A	No	No
9	U1 Chemistry	E-Plan Table B-1	90	T5/L12	No	Yes
10	U1 Radiation Protection (RP)	E-Plan Table B-1	90	T4/L1	No	No
11	(Common) Auxiliary Operator	E-Plan Table B-1	N/A	N/A	No	No
12	U2 Shift Manager	E-Plan Table B-1	N/A	N/A	No	No
13	U2 CRS	E-Plan Table B-1	N/A	N/A	No	No
14	U2 STA	E-Plan Table B-1	N/A	T5/L8 T5/L9 T5/L10 T5/L13	No	Yes
15	U2 RO #1	E-Plan Table B-1	N/A	N/A	No	No
16	U2 RO #2	E-Plan Table B-1	N/A	N/A	No	No
17	U2 AO#1	E-Plan Table B-1	N/A	N/A	No	No
18	U2 AO#2	E-Plan Table B-1	N/A	N/A	No	No
19	U2 AO#3	E-Plan Table B-1	N/A	N/A	No	No
20	U2 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U2 Chemistry	E-Plan Table B-1	N/A	N/A	No	No
22	U2 RP	E-Plan Table B-1	N/A	T4/L3	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	T5/L15	No	No

ANO TABLE 2 – UNIT 1 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis #5 – Rod Ejection 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	Auxiliary Operator #2	Non-Licensed Operator Training Program
8	Auxiliary Operator #3	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

Fire Brigade

ANO TABLE 3 – FIREFIGHTING Analysis #5 – Rod Ejection		
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

No firefighting activities included in this accident.

ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis #5 – Rod Ejection																			
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: ___U1 RP_ (perform 1601.307))			X	X	X	X	X	X	X	X	x							
2	On-site Survey: ___N/A																		
3	Personnel Monitoring: U2 RP U1 / 2 RCA access/exit control_____			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
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) ___U2 Chemistry (samples)																		
8	Chemistry Function task #2 (describe) ___N/A_____																		

*Times are estimated.

ANO TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis #5 – Rod Ejection			
Line#	**Function / Task**	**On-Shift Position**	**Task Analysis Controlling Method**
1	Declare the emergency classification level (ECL)	U1 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	U1 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.)	U1 Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U1 STA	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	U2 STA	Emergency Planning Training Program
9	Perform State/local notifications	U2 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U2 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	U1 Chemistry	Emergency Planning Training Program
13	Perform NRC notifications	U2 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U1 Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

E. Design Basis Accident Analysis #6 – Loss of Coolant Accident with Loss of Offsite Power

1. Accident Summary

   - A full double-area, guillotine break in the cold leg pump discharge piping at the elevation of the reactor vessel inlet nozzle. A loss of offsite power is assumed at the time of the break opening, so the reactor coolant pumps and main feedwater pumps are not powered.
   - Releases to the atmosphere are monitored by radiation monitors in the Penetration Room Ventilation System and by stack radiation monitoring equipment.

2. Accident Assumptions Made

   - EAL is based on the event

3. Procedures for Accident Response

   - 1201.001, Loss of Coolant Accident
   - 1601.307, Off-Normal Operations
   - 1903.010, Emergency Action Level Classification
   - 1903.011, Emergency Response Notifications
   - 1903.030, Evacuation
   - 1904.002, Offsite Dose Projection

4. Tables

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis #6 – LOCA						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U1 Shift Manager (SM)	E-Plan Table B-1	90	U1 T2/L1 T5/L1 T5/L2 T5/L3 T5/L4 T5/L5 T5/L14	No	No
2	U1 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U1 T2/L2	No	No
3	U1 Shift Technical Advisor/FSS (STA)	E-Plan Table B-1	90	U1 T2/L3 T5/L6	No	Yes
4	U1 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U1 T2/L4	No	No
5	U1 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U1 T2/L5	No	No
6	U1 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U1 T2/L6	No	No
7	U1 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	U1 T2/L7	No	No
8	U1 Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	N/A	No	No
9	U1 Auxiliary Operator (AO#4)	E-Plan Table B-1	N/A	N/A	No	No
10	U1 Chemistry	E-Plan Table B-1	90	T5/L12	No	Yes
11	U1 Radiation Protection (RP)	E-Plan Table B-1	90	T4/L1 T4/L3	No	No
12	U2 Shift Manager	E-Plan Table B-1	N/A	N/A	No	No
13	U2 CRS	E-Plan Table B-1	N/A	N/A	No	No
14	U2 STA	E-Plan Table B-1	N/A	T5/L8 T5/L9 T5/L10 T5/L13	No	Yes
15	U2 RO #1	E-Plan Table B-1	N/A	N/A	No	No
16	U2 RO #2	E-Plan Table B-1	N/A	N/A	No	No
17	U2 AO#1	E-Plan Table B-1	N/A	N/A	No	No
18	U2 AO#2	E-Plan Table B-1	N/A	N/A	No	No
19	U2 AO#3	E-Plan Table B-1	N/A	N/A	No	No
20	U2 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U2 Chemistry	E-Plan Table B-1	N/A	N/A	No	No
22	U2 RP	E-Plan Table B-1	N/A	T4/L6	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	T5/L15	No	No

ANO TABLE 2 – UNIT 1 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis #6 – LOCA 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	Auxiliary Operator #2	Non-Licensed Operator Training Program
8	Auxiliary Operator #3	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

Fire Brigade

ANO TABLE 3 – FIREFIGHTING Analysis #6 – LOCA		
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

No firefighting activities included in this accident.

ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis #6 – LOCA																		
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: U1 RP (perform 1601.307))									X	X	X	X	X	X	X	X		
2	On-site Survey: N/A																		
3	Personnel Monitoring: U1 RP support PA evacuation at PAP			X	X	X	X	X											
4	Job Coverage: N/A																		
5	Offsite Rad Assessment: *(Included in Table 5*																		
6	Other site specific RP (describe): U2 RP – RCA exit monitoring			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7	Chemistry Function task #1 (describe) N/A																		
8	Chemistry Function task #2 (describe) N/A																		

*Times are estimated.

ANO TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis #6 – LOCA			
Line#	**Function / Task**	**On-Shift Position**	**Task Analysis Controlling Method**
1	Declare the emergency classification level (ECL)	U1 Shift Manager	Emergency Planning Training Program / EP Drills
2	Approve Offsite Protective Action Recommendations	U1 Shift Manager	Emergency Planning Training Program / EP Drills
3	Approve content of State/local notifications	U1 Shift Manager	Emergency Planning Training Program
4	Approve extension to allowable dose	U1 Shift Manager	Emergency Planning Training Program / EP Drills
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	U1 Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U1 STA	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	U2 STA	Emergency Planning Training Program
9	Perform State/local notifications	U2 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U2 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	U1 Chemistry	Emergency Planning Training Program
13	Perform NRC notifications	U2 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U1 Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

F. Design Basis Accident Analysis #7 – Waste Gas Tank Rupture

1. Accident Summary

- A tank is assumed to contain the gaseous activity evolved from degassing all of the reactor coolant following operation with 1% defective fuel.
- The waste gas tank ruptured releasing the gas into the auxiliary building and to the atmosphere via the Auxiliary Building Ventilation System.
- The quantity of radioactivity contained in a single tank has been limited to a curie value which will prevent a member of the public at the exclusion area boundary from receiving a total body exposure exceeding a 0.5 Rem in a 2-hour period.

2. Accident Assumptions Made

- EAL is declared on radiological release.
- GE shown in Appendix A not reached.

3. Procedures for Accident Response

- 1203.012, Annunciator Corrective Action
- 1903.010, Emergency Action Level Classification
- 1903.011, Emergency Response Notifications
- 1903.030, Evacuation
- 1904.002, Offsite Dose Projection

4. Tables

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis #7 – Waste Gas Tank Rupture						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U1 Shift Manager (SM)	E-Plan Table B-1	90	U1 T2/L1 T5/L1 T5/L3 T5/L5 T5/L14	No	No
2	U1 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U1 T2/L2	No	No
3	U1 Shift Technical Advisor/FSS (STA)	E-Plan Table B-1	90	U1 T2/L3 T5/L6	No	Yes
4	U1 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U1 T2/L4	No	No
5	U1 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U1 T2/L5	No	No
6	U1 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U1 T2/L6	No	No
7	U1 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	U1 T2/L7	No	No
8	U1 Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	N/A	No	No
9	U1 Auxiliary Operator (AO#4)	E-Plan Table B-1	N/A	N/A	No	No
10	U1 Chemistry	E-Plan Table B-1	90	T5/L12	No	Yes
11	U1 Radiation Protection (RP)	E-Plan Table B-1	90	T4/L1	No	No
12	U2 Shift Manager	E-Plan Table B-1	N/A	N/A	No	No
13	U2 CRS	E-Plan Table B-1	N/A	N/A	No	No
14	U2 STA	E-Plan Table B-1	N/A	T5/L8 T5/L9 T5/L10 T5/L13	No	Yes
15	U2 RO #1	E-Plan Table B-1	N/A	N/A	No	No
16	U2 RO #2	E-Plan Table B-1	N/A	N/A	No	No
17	U2 AO#1	E-Plan Table B-1	N/A	N/A	No	No
18	U2 AO#2	E-Plan Table B-1	N/A	N/A	No	No
19	U2 AO#3	E-Plan Table B-1	N/A	N/A	No	No
20	U2 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U2 Chemistry	E-Plan Table B-1	N/A	T4/L7	No	No
22	U2 RP	E-Plan Table B-1	N/A	T4/L6	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	T5/L15	No	No

ANO TABLE 2 – UNIT 1 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis #7 – Waste Gas Tank Rupture 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	Auxiliary Operator #2	Non-Licensed Operator Training Program
8	Auxiliary Operator #3	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

Fire Brigade

ANO TABLE 3 – FIREFIGHTING Analysis #7 – Waste Gas 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

No firefighting activities included in this accident.

ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis #7 – Waste Gas 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: U1 RP			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): U2 RP – RCA exit monitoring			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7	Chemistry Function task #1 (describe) U2 Chemistry sample SPING inline ductwork **			X	X	X	X	X	X	X	X								
8	Chemistry Function task #2 (describe) N/A																		

*Times are estimated.

** See Section V.A.3 General Assumptions and Limitations for clarification of chemistry task performance.

ANO TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis #7 – Waste Gas Tank Rupture			
Line#	**Function / Task**	**On-Shift Position**	**Task Analysis Controlling Method**
1	Declare the emergency classification level (ECL)	U1 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	U1 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.)	U1 Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U1 STA	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	U2 STA	Emergency Planning Training Program
9	Perform State/local notifications	U2 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U2 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	U1 Chemistry	Emergency Planning Training Program
13	Perform NRC notifications	U2 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U1 Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

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

1. Accident Summary (Assumed for Staffing Analysis Purpose)

   - The unit upgrades to a general emergency based on loss of 2 barriers and potential loss of the 3rd. A release is ongoing.
   - A dose projection shows PAG is exceeded and information is used to determine the PAR.

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

   - 1201.001, Loss of Coolant Accident
   - 1601.307, Off-Normal Operations
   - 1903.010, Emergency Action Level Classification
   - 1903.011, Emergency Response Notifications
   - 1903.030, Evacuation
   - 1904.002, Offsite Dose Projection
   - 1903.035, KI

4. Tables

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis #11 – LOCA/General Emergency with Release and PAR						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U1 Shift Manager (SM)	E-Plan Table B-1	90	U1 T2/L1 T5/L1 T5/L2 T5/L3 T5/L4 T5/L5	No	No
2	U1 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U1 T2/L2	No	No
3	U1 Shift Technical Advisor/FSS (STA)	E-Plan Table B-1	90	U1 T2/L3	No	No
4	U1 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U1 T2/L4	No	No
5	U1 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U1 T2/L5	No	No
6	U1 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U1 T2/L6	No	No
7	U1 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	U1 T2/L7	No	No
8	U1 Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	N/A	No	No
9	U1 Auxiliary Operator (AO#4)	E-Plan Table B-1	N/A	N/A	No	No
10	U1 Chemistry	E-Plan Table B-1	90	T5/L12	No	Yes
11	U1 Radiation Protection (RP)	E-Plan Table B-1	90	T4/L6	No	No
12	U2 Shift Manager	E-Plan Table B-1	N/A	N/A	No	No
13	U2 CRS	E-Plan Table B-1	N/A	N/A	No	No
14	U2 STA	E-Plan Table B-1	N/A	T5/L8 T5/L9 T5/L10 T5/L13	No	Yes
15	U2 RO #1	E-Plan Table B-1	N/A	N/A	No	No
16	U2 RO #2	E-Plan Table B-1	N/A	N/A	No	No
17	U2 AO#1	E-Plan Table B-1	N/A	N/A	No	No
18	U2 AO#2	E-Plan Table B-1	N/A	N/A	No	No
19	U2 AO#3	E-Plan Table B-1	N/A	N/A	No	No
20	U2 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U2 Chemistry	E-Plan Table B-1	N/A	N/A	No	No
22	U2 RP	E-Plan Table B-1	N/A	T4/L1 T4/L3	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	N/A	No	No

ANO TABLE 2 – UNIT 1 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis #11 – LOCA/General Emergency with Release and PAR 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	Auxiliary Operator #2	Non-Licensed Operator Training Program
8	Auxiliary Operator #3	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

Fire Brigade

ANO TABLE 3 – FIREFIGHTING Analysis #11 – LOCA/General Emergency with Release and 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

No firefighting activities included in this accident.

ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis #11 – LOCA/General Emergency with Release and 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: U2 RP (perform 1601.307))									X	X	X	X	X	X	X	X		
2	On-site Survey: N/A																		
3	Personnel Monitoring: U2 RP support PA evacuation at PAP			X	X	X	X	X											
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: *(Included in Table 5*																		
6	Other site specific RP (describe): U1 RP – Issue KI			X	X	X	X	X											
7	Chemistry Function task #1 (describe) N/A																		

8	Chemistry Function task #2 (describe) N/A																		

*Times are estimated.

ANO TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis #11 – LOCA/General Emergency with Release and PAR			
Line#	**Function / Task**	**On-Shift Position**	**Task Analysis Controlling Method**
1	Declare the emergency classification level (ECL)	U1 Shift Manager	Emergency Planning Training Program / EP Drills
2	Approve Offsite Protective Action Recommendations	U1 Shift Manager	Emergency Planning Training Program / EP Drills
3	Approve content of State/local notifications	U1 Shift Manager	Emergency Planning Training Program
4	Approve extension to allowable dose	U1 Shift Manager	Emergency Planning Training Program / EP Drills
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	U1 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	U2 STA	Emergency Planning Training Program
9	Perform State/local notifications	U2 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U2 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	U1 Chemistry	Emergency Planning Training Program
13	Perform NRC notifications	U2 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	N/A	N/A
15	Personnel Accountability	N/A	NA

VIII. APPENDIX B - UNIT 2 SHIFT STAFFING ANALYSIS

A. Design Basis Accident Analysis #2 – Steam Line Rupture with Loss of Offsite Power

1. Accident Summary

   - Double-ended rupture of the Steam pipe rupture upstream of the main steam isolation valve caused a non-isolable condition in the affected steam generator. No fuel damage occurs. All necessary ESF systems to maintain safe shutdown operate as designed. Manual actions to operate the atmospheric steam dump and isolation valves are taken about 30 minutes after the event.
   - Loss of offsite power

2. Accident Specific Assumptions Made

   - EAL is based on FSAR EAB dose for the pre-existing iodine spike (PIS).
   - For the purpose of the analysis, assume the release EAL is met immediately after the break.

3. Procedures for Accident Response

   - 2202.001, Standard Post Trip Actions
   - 2201.006, Loss of Feedwater
   - 2202.009, Functional Recovery
   - 2202.010, H_2O_2 Concentration High
   - 1601.307, Attachment 5 Primary to Secondary Leak
   - 1903.010, Emergency Action Level Classification
   - 1903.011, Emergency Response Notifications
   - 1903.030, Evacuation
   - 1904.002, Offsite Dose Projection

4. Tables

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis # 2 – Steam Line Rupture						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U2 Shift Manager (SM)	E-Plan Table B-1	90	U2 T2/L1 T5/L1 T5/L3 T5/L5 T5/L14	No	No
2	U2 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U2 T2/L2	No	No
3	U2 Shift Technical Advisor (STA)	E-Plan Table B-1	90	U2 T2/L3 T5/L6	No	Yes
4	U2 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U2 T2/L4	No	No
5	U2 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U2 T2/L5	No	No
6	U2 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U2 T2/L6	No	No
7	U2 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	N/A	No	No
8	U2 Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	N/A	No	No
9	U2 Auxiliary Operator (AO #4)	E-Plan Table B-1	N/A	N/A	No	No
10	U2 Chemistry	E-Plan Table B-1	90	T5/L12	No	Yes
11	U2 Radiation Protection (RP)	E-Plan Table B-1	90	T4/L1	No	No
12	U1 Shift Manager	E-Plan Table B-1	N/A	N/A	No	No
13	U1 CRS	E-Plan Table B-1	N/A	N/A	No	No
14	U1 STA	E-Plan Table B-1	N/A	T5/L8 T5/L9 T5/L10 T5/L13	No	Yes
15	U1 RO #1	E-Plan Table B-1	N/A	N/A	No	No
16	U1 RO #2	E-Plan Table B-1	N/A	N/A	No	No
17	U1 AO#1	E-Plan Table B-1	N/A	N/A	No	No
18	U1 AO#2	E-Plan Table B-1	N/A	N/A	No	No
19	U1 AO#3	E-Plan Table B-1	N/A	N/A	No	No
20	U1 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U1 Chemistry	E-Plan Table B-1	N/A	T4/L7	No	No
22	U1 RP	E-Plan Table B-1	N/A	T4/L3	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	T5/L15	No	No

ANO TABLE 2 – UNIT 2 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis # 2 – Steam Line Rupture 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Auxiliary Operator #3	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

Fire Brigade

ANO TABLE 3 – FIREFIGHTING Analysis # 2 – Steam Line 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

No firefighting activities included in this accident.

ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis # 2 – Steam Line 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: U2 RP_ per 1203.14 & 1601.308			X	X	X	X	X	X	X	X	X	X	X	X				
2	On-site Survey: N/A																		
3	Personnel Monitoring: U1 RP U1 RCA access/exit control			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
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) U1 Chemistry (sample steam generator) **						X	X	X	X	X	X	X	X	X	X	X	X	
8	Chemistry Function task #2 (describe) N/A																		

*Times are estimated.

** See Section V.A.3 General Assumptions and Limitations for clarification of chemistry task performance.

ANO TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis # 2 – Steam Line Rupture			
Line#	**Function / Task**	**On-Shift Position**	**Task Analysis Controlling Method**
1	Declare the emergency classification level (ECL)	U2 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	U2 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.)	U2 Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U2 STA	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	U1 STA	Emergency Planning Training Program
9	Perform State/local notifications	U1 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U1 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	U2 Chemistry	Emergency Planning Training Program
13	Perform NRC notifications	U1 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U2 Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

B. Design Basis Accident Analysis #3 – Steam Generator Tube Failure

1. Accident Summary

- Double ended rupture of one steam generator tube with loss of offsite power. HPI capacity is sufficient to maintain both volume and pressure control. Sixty minutes after the tube rupture, operators determine which SG contains the rupture and isolates it by closing the MSIV. No fuel failure occurs.
- Primary to secondary leak. Operators are notified of the leak by radiation monitor alarm.
- Release is through the secondary safety valves or atmospheric dump valves.

2. Accident Specific Assumptions

- EAL is based on the event.

3. Procedures for Accident Response

- 2202.004, Steam Generator Tube Rupture
- 2202.001, Standard Post Trip Actions
- 2202.007, Degraded Power
- 2202.010, Power Restoration
- 1903.010, Emergency Action Level Classification
- 1903.011, Emergency Response Notifications
- 1903.030, Evacuation
- 1904.002, Offsite Dose Projection

4. Tables

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis # 3 – Steam Generator Tube Rupture						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U2 Shift Manager (SM)	E-Plan Table B-1	90	U2 T2/L1 T5/L1 T5/L3 T5/L5 T5/L14	No	No
2	U2 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U2 T2/L2	No	No
3	U2 Shift Technical Advisor (STA)	E-Plan Table B-1	90	U2 T2/L3 T5/L6	Yes	Yes
4	U2 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U2 T2/L4	No	No
5	U2 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U2 T2/L5	No	No
6	U2 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U2 T2/L6	No	No
7	U2 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	N/A	No	No
8	U2 Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	N/A	No	No
9	U2 Auxiliary Operator (AO #4)	E-Plan Table B-1	N/A	N/A	No	No
10	U2 Chemistry	E-Plan Table B-1	90	T5/L12	No	Yes
11	U2 Radiation Protection (RP)	E-Plan Table B-1	90	T4/L1 T4/L3	No	No
12	U1 Shift Manager	E-Plan Table B-1	N/A	N/A	No	No
13	U1 CRS	E-Plan Table B-1	N/A	N/A	No	No
14	U1 STA	E-Plan Table B-1	N/A	T5/L8 T5/L9 T5/L10 T5/L13	No	Yes
15	U1 RO #1	E-Plan Table B-1	N/A	N/A	No	No
16	U1 RO #2	E-Plan Table B-1	N/A	N/A	No	No
17	U1 AO#1	E-Plan Table B-1	N/A	N/A	No	No
18	U1 AO#2	E-Plan Table B-1	N/A	N/A	No	No
19	U1 AO#3	E-Plan Table B-1	N/A	N/A	No	No
20	U1 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U1 Chemistry	E-Plan Table B-1	N/A	T4/L7	No	No
22	U1 RP	E-Plan Table B-1	N/A	T4/L6	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	T5/L15	No	No

ANO TABLE 2 – UNIT 2 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis # 2 – Steam Line Rupture 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Auxiliary Operator #3	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

Fire Brigade

ANO TABLE 3 – FIREFIGHTING Analysis # 2 – Steam Line 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

No firefighting activities included in this accident.

ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis # 2 – Steam Line 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: ____U2 RP_ per 1203.14 & 1601.308										X	X	X	X	X	X	X	X	X
2	On-site Survey: ____N/A																		
3	Personnel Monitoring: U2 RP _Support PA evacuation			X	X	X	X	X	X										
4	Job Coverage: ____N/A_____																		
5	Offsite Rad Assessment: _*(Included in Table 5*____																		
6	Other site specific U1 RP (describe): U2 RCA access/exit control			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7	Chemistry Function task #1 (describe) ____U1 Chemistry (sample for boron then TB sump sample **						X	X	X	X	X	X	X	X	X	X	X	X	
8	Chemistry Function task #2 (describe) ____N/A_____																		

*Times are estimated.

** See Section V.A.3 General Assumptions and Limitations for clarification of chemistry task performance.

ANO TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis # 2 – Steam Line Rupture			
Line#	**Function / Task**	**On-Shift Position**	**Task Analysis Controlling Method**
1	Declare the emergency classification level (ECL)	U2 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	U2 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.)	U2 Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U2 STA	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	U1 STA	Emergency Planning Training Program
9	Perform State/local notifications	U1 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U1 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	U2 Chemistry	Emergency Planning Training Program
13	Perform NRC notifications	U1 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U2 Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

C. **Design Basis Accident Analysis #4 – Fuel Handling Accident**

1. Accident Summary

- Fuel handling accident is analyzed for both containment and auxiliary building spent fuel pool. The radiological analysis results are the same for both auxiliary building with no ventilation and containment with open personnel airlock. The radionuclides released during the fuel handling accident are assumed to enter the atmosphere directly without filtration.
- Release from the failed fuel rods is modeled as a puff release

2. Accident Assumptions Made

- EAL is based on the event.
- Additional SROs, ROs, AOs, and RP Techs are on-shift as part of the refueling/outage support staffing. All are available to assist the Shift Manager to respond to the event.

3. Procedures for Accident Response

- 2502.001, Refueling Abnormal Operation
- 1903.010, Emergency Action Level Classification
- 1903.011, Emergency Response Notifications
- 1903.030, Evacuation
- 1904.002, Offsite Dose Projection

4. Tables

U2 in Refueling

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis # 4 – Fuel Handling Accident						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U2 Shift Manager (SM)	E-Plan Table B-1	90	U2 T2/L1 T5/L1 T5/L3 T5/L5 T5/L14	No	No
2	U2 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U2 T2/L2	No	No
3	U2 Shift Technical Advisor (STA)	E-Plan Table B-1	N/A	N/A	N/A	N/A
4	U2 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U2 T2/L4	No	No
5	U2 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U2 T2/L5	No	No
6	U2 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U2 T2/L6	No	No
7	U2 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	N/A	No	No
8	U2Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	N/A	No	No
9	U2Auxiliary Operator (AO #4	E-Plan Table B-1	N/A	N/A	No	No
10	U2 Chemistry	E-Plan Table B-1	90	T5/L12	No	Yes
11	U2 Radiation Protection	E-Plan Table B-1	90	T4/L3	No	No
12	U1 Shift Manager	E-Plan Table B-1	N/A	N/A	No	No
13	U1 CRS	E-Plan Table B-1	N/A	N/A	No	No
14	U1 STA	E-Plan Table B-1	N/A	T5/L6 T5/L9 T5/L8 T5/L10 T5/L13	No	Yes
15	U1 RO #1	E-Plan Table B-1	N/A	N/A	No	No
16	U1 RO #2	E-Plan Table B-1	N/A	N/A	No	No
17	U1 AO#1	E-Plan Table B-1	N/A	N/A	No	No
18	U1 AO#2	E-Plan Table B-1	N/A	N/A	No	No
19	U1 AO#3	E-Plan Table B-1	N/A	N/A	No	No
20	U1 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U1 Chemistry	E-Plan Table B-1	N/A	N/A	No	No
22	U1 RP	E-Plan Table B-1	N/A	T4/L2	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	T5/L15	No	No

ANO TABLE 2 – UNIT 2 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis # 4 – Fuel Handling 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	N/A	N/A
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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Auxiliary Operator #3	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

Fire Brigade

ANO TABLE 3 – FIREFIGHTING Analysis # 4 – 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

No firefighting activities included in this accident.

ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis # 4 – 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: U1 RP			X	X	X	X	X	X	X	X	X							
3	Personnel Monitoring: U2 RP Support Cont. / AB evacuation		X	X	X	X	X	X	X	X	X	X							
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																		

*Times are estimated.

ANO TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis # 4 – Fuel Handling Accident			
Line#	**Function / Task**	**On-Shift Position**	**Task Analysis Controlling Method**
1	Declare the emergency classification level (ECL)	U2 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	U2 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.)	U2 Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U1 STA	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	U1 STA	Emergency Planning Training Program
9	Perform State/local notifications	U1 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U1 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	U2 Chemistry	Emergency Planning Training Program
13	Perform NRC notifications	U1 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U2 Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

D. Design Basis Accident Analysis #5 – Rod Ejection

1. Accident Summary

- A complete circumferential rupture of the CEDM housing or the CEDM nozzle and rapid ejection of a CEA.
- 14% failed fuel; primary to secondary release

2. Accident Assumptions Made

- The gap activity is released to the reactor building or the steam generators via primary to secondary leakage. EAL is based on the leakage event.

3. Procedures for Accident Response

- 2202.001, Standard Post Trip Actions
- 2202.003, Loss of Coolant Accident
- 1903.010, Emergency Action Level Classification
- 1903.011, Emergency Response Notifications
- 1903.030, Evacuation
- 1904.002, Offsite Dose Projection

4. Tables

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis #5 – Rod Ejection						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U2 Shift Manager (SM)	E-Plan Table B-1	90	U2 T2/L1 T5/L1 T5/L3 T5/L5 T5/L14	No	No
2	U2 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U2 T2/L2	No	No
3	U2 Shift Technical Advisor (STA)	E-Plan Table B-1	90	U2 T2/L3 T5/L6	No	Yes
4	U2 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U2 T2/L4	No	No
5	U2 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U2 T2/L5	No	No
6	U2 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U2 T2/L6	No	No
7	U2 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	U2 T2/L7	No	No
8	U2Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	N/A	No	No
9	U2Auxiliary Operator (AO #4)	E-Plan Table B-1	N/A	N/A	No	No
10	U2 Chemistry	E-Plan Table B-1	90	T5/L12	No	Yes
11	U2 Radiation Protection	E-Plan Table B-1	90	T4/L1	No	No
12	U1 Shift Manager	E-Plan Table B-1	N/A	N/A	No	No
13	U1 CRS	E-Plan Table B-1	N/A	N/A	No	No
14	U1 STA	E-Plan Table B-1	N/A	T5/L8 T5/L9 T5/L10 T5/L13	No	Yes
15	U1 RO #1	E-Plan Table B-1	N/A	N/A	No	No
16	U1 RO #2	E-Plan Table B-1	N/A	N/A	No	No
17	U1 AO#1	E-Plan Table B-1	N/A	N/A	No	No
18	U1 AO#2	E-Plan Table B-1	N/A	N/A	No	No
19	U1 AO#3	E-Plan Table B-1	N/A	N/A	No	No
20	U1 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U1 Chemistry	E-Plan Table B-1	N/A	N/A	No	No
22	U1 RP	E-Plan Table B-1	N/A	T4/L3 T4/L6	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	T5/L15	No	No

ANO TABLE 2 – UNIT 2 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis #5 – Rod Ejection 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Auxiliary Operator #3	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

Fire Brigade

ANO TABLE 3 – FIREFIGHTING Analysis #5 – Rod Ejection		
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

No firefighting activities included in this accident.

ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis #5 – Rod Ejection																		
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: ____U2 RP_ (perform 1601.308))				X	X	X	X	X	X	X	X	X	X					
2	On-site Survey: ____N/A																		
3	Personnel Monitoring: U1 RP U1 / 2 RCA access/exit control_____								X	X	X	X	X	X	X	X	X	X	X
4	Job Coverage: ____N/A_____																		
5	Offsite Rad Assessment: _*(Included in Table 5*___																		
6	Other site specific RP (describe): U1 RP U2 CR Habitability_			X	X	X	X												
7	Chemistry Function task #1 (describe) ____N/A																		
8	Chemistry Function task #2 (describe) ____N/A_____																		

*Times are estimated.

ANO TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis #5 – Rod Ejection			
Line#	**Function / Task**	**On-Shift Position**	**Task Analysis Controlling Method**
1	Declare the emergency classification level (ECL)	U2 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	U2 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.)	U2 Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U2 STA	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	U1 STA	Emergency Planning Training Program
9	Perform State/local notifications	U1 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U1 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	U2 Chemistry	Emergency Planning Training Program
13	Perform NRC notifications	U1 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U2 Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

E. Design Basis Accident Analysis #6 – Loss of Coolant Accident with Loss of Offsite Power

1. Accident Summary

- A full double-area, guillotine break in the cold leg pump discharge piping at the elevation of the reactor vessel inlet nozzle. A loss of offsite power is assumed at the time of the break opening, so the reactor coolant pumps and main feedwater pumps are not powered.
- Releases to the atmosphere are monitored by radiation monitors in the Penetration Room Ventilation System and by stack radiation monitoring equipment.

2. Accident Assumptions Made

- EAL is based on the event

3. Procedures for Accident Response

- 2202.003, Loss of Coolant Accident
- 2202.001, Reactor Trip
- 2201.010, Power Restoration
- 1601.307, Off-Normal Operations
- 1903.010, Emergency Action Level Classification
- 1903.011, Emergency Response Notifications
- 1903.030, Evacuation
- 1904.002, Offsite Dose Projection

4. Tables

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis #6 – LOCA						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U2 Shift Manager (SM)	E-Plan Table B-1	90	U2 T2/L1 T5/L1 T5/L2 T5/L3 T5/L4 T5/L5 T5/L14	No	No
2	U2 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U2 T2/L2	No	No
3	U2 Shift Technical Advisor (STA)	E-Plan Table B-1	90	U2 T2/L3 T5/L6	No	Yes
4	U2 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U2 T2/L4	No	No
5	U2 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U2 T2/L5	No	No
6	U2 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U2 T2/L6	No	No
7	U2 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	U2 T2/L7	No	No
8	U2Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	N/A	No	No
9	U2Auxiliary Operator (AO #4)	E-Plan Table B-1	N/A	N/A	No	No
10	U2 Chemistry	E-Plan Table B-1	90	T5/L12	No	Yes
11	U2 Radiation Protection	E-Plan Table B-1	90	T4/L1 T4/L3	No	No
12	U1 Shift Manager	E-Plan Table B-1	N/A	N/A	No	No
13	U1 CRS	E-Plan Table B-1	N/A	N/A	No	No
14	U1 STA	E-Plan Table B-1	N/A	T5/L8 T5/L9 T5/L10 T5/L13	No	Yes
15	U1 RO #1	E-Plan Table B-1	N/A	N/A	No	No
16	U1 RO #2	E-Plan Table B-1	N/A	N/A	No	No
17	U1 AO#1	E-Plan Table B-1	N/A	N/A	No	No
18	U1 AO#2	E-Plan Table B-1	N/A	N/A	No	No
19	U1 AO#3	E-Plan Table B-1	N/A	N/A	No	No
20	U1 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U1 Chemistry	E-Plan Table B-1	N/A	T4/L7	No	No
22	U1 RP	E-Plan Table B-1	N/A	T4/L6	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	T5/L15	No	No

ANO TABLE 2 – UNIT 2 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis #6 – LOCA 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Auxiliary Operator #3	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

Fire Brigade

ANO TABLE 3 – FIREFIGHTING Analysis #6 – LOCA		
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

No firefighting activities included in this accident.

ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis #6 – LOCA																		
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: U2 RP (perform 1601.308))									X	X	X	X	X	X	X	X		
2	On-site Survey: N/A																		
3	Personnel Monitoring: U2 RP support PA evacuation at PAP			X	X	X	X	X											
4	Job Coverage: N/A																		
5	Offsite Rad Assessment: *(Included in Table 5*																		
6	Other site specific RP (describe): U1 RP – RCA exit monitoring			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7	Chemistry Function task #1 (describe) U1 Chemistry (sample SG) **							X	X	X	X	X	X	X	X	X	X	X	X
8	Chemistry Function task #2 (describe) N/A																		

*Times are estimated.

** See Section V.A.3 General Assumptions and Limitations for clarification of chemistry task performance.

ANO TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis #6 – LOCA			
Line#	**Function / Task**	**On-Shift Position**	**Task Analysis Controlling Method**
1	Declare the emergency classification level (ECL)	U2 Shift Manager	Emergency Planning Training Program / EP Drills
2	Approve Offsite Protective Action Recommendations	U2 Shift Manager	Emergency Planning Training Program / EP Drills
3	Approve content of State/local notifications	U2 Shift Manager	Emergency Planning Training Program
4	Approve extension to allowable dose	U2 Shift Manager	Emergency Planning Training Program / EP Drills
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	U2 Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U2 STA	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	U1 STA	Emergency Planning Training Program
9	Perform State/local notifications	U1 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U1 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	U2 Chemistry	Emergency Planning Training Program
13	Perform NRC notifications	U1 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U2 Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

F. Design Basis Accident Analysis #7 – Waste Gas Tank Rupture

5. Accident Summary

- A tank is assumed to contain the gaseous activity evolved from degassing all of the reactor coolant following operation with 1% defective fuel.
- The waste gas tank ruptured releasing the gas into the auxiliary building and to the atmosphere via the Auxiliary Building Ventilation System.

6. Accident Assumptions Made

- EAL is declared on radiological release.

7. Procedures for Accident Response

- 2203.012k, Process Gas Radiation Hi/Low
- 1903.010, Emergency Action Level Classification
- 1903.011, Emergency Response Notifications
- 1903.030, Evacuation
- 1904.002, Offsite Dose Projection

8. Tables

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis #7 – Waste Gas Tank Rupture						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U2 Shift Manager (SM)	E-Plan Table B-1	90	U2 T2/L1 T5/L1 T5/L3 T5/L5 T5/L14	No	No
2	U2 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U2 T2/L2	No	No
3	U2 Shift Technical Advisor (STA)	E-Plan Table B-1	90	U2 T2/L3 T5/L6	No	Yes
4	U2 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U2 T2/L4	No	No
5	U2 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U2 T2/L5	No	No
6	U2 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U2 T2/L6	No	No
7	U2 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	N/A	No	No
8	U2Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	N/A	No	No
9	U2Auxiliary Operator (AO #4)	E-Plan Table B-1	N/A	N/A	No	No
10	U2 Chemistry	E-Plan Table B-1	90	T5/L12	No	Yes
11	U2 Radiation Protection	E-Plan Table B-1	90	T4/L1	No	No
12	U1 Shift Manager	E-Plan Table B-1	N/A	N/A	No	No
13	U1 CRS	E-Plan Table B-1	N/A	N/A	No	No
14	U1 STA	E-Plan Table B-1	N/A	T5/L8 T5/L9 T5/L10 T5/L13	No	Yes
15	U1 RO #1	E-Plan Table B-1	N/A	N/A	No	No
16	U1 RO #2	E-Plan Table B-1	N/A	N/A	No	No
17	U1 AO#1	E-Plan Table B-1	N/A	N/A	No	No
18	U1 AO#2	E-Plan Table B-1	N/A	N/A	No	No
19	U1 AO#3	E-Plan Table B-1	N/A	N/A	No	No
20	U1 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U1 Chemistry	E-Plan Table B-1	N/A	T4/L7	No	No
22	U1 RP	E-Plan Table B-1	N/A	T4/L6	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	T5/L15	No	No

ANO TABLE 2 – UNIT 2 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis #7 – Waste Gas Tank Rupture 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Auxiliary Operator #3	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

Fire Brigade

ANO TABLE 3 – FIREFIGHTING Analysis #7 – Waste Gas 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

No firefighting activities included in this accident.

ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis #7 – Waste Gas 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: ____U2 RP_ AB survey and post			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): U1 RP – RCA exit monitoring			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7	Chemistry Function task #1 (describe) ____U1 Chemistry sample SPING inline ductwork **			X	X	X	X	X	X	X	X								
8	Chemistry Function task #2 (describe) ____N/A_____																		

*Times are estimated.

** See Section V.A.3 General Assumptions and Limitations for clarification of chemistry task performance.

ANO TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis #7 – Waste Gas Tank Rupture			
Line#	**Function / Task**	**On-Shift Position**	**Task Analysis Controlling Method**
1	Declare the emergency classification level (ECL)	U2 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	U2 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.)	U2 Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U2 STA	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	U1 STA	Emergency Planning Training Program
9	Perform State/local notifications	U1 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U1 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	U2 Chemistry	Emergency Planning Training Program
13	Perform NRC notifications	U1 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U2 Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

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

1. Accident Summary (Assumed for Staffing Analysis Purpose)

   - The unit upgrades to a general emergency based on loss of 2 barriers and potential loss of the 3rd. A release is ongoing.
   - A dose projection shows PAG is exceeded and information is used to determine the PAR.

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

   - 2203.003, Loss of Coolant
   - 1201.001, Loss of Coolant Accident
   - 1903.010, Emergency Action Level Classification
   - 1903.011, Emergency Response Notifications
   - 1904.002, Offsite Dose Projection
   - 1903.035, KI

4. Tables

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis #11 – LOCA/General Emergency with Release and PAR						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U2 Shift Manager (SM)	E-Plan Table B-1	90	U2 T2/L1 T5/L1 T5/L2 T5/L3 T5/L4 T5/L5	No	No
2	U2 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U2 T2/L2	No	No
3	U2 Shift Technical Advisor (STA)	E-Plan Table B-1	90	U2 T2/L3	No	No
4	U2 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U2 T2/L4	No	No
5	U2 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U2 T2/L5	No	No
6	U2 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U2 T2/L6	No	No
7	U2 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	N/A	No	No
8	U2Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	N/A	No	No
9	U2Auxiliary Operator (AO #4)	E-Plan Table B-1	N/A	N/A	No	No
10	U2 Chemistry	E-Plan Table B-1	90	T5/L12	No	Yes
11	U2 Radiation Protection	E-Plan Table B-1	90	T4/L6	No	No
12	U1 Shift Manager	E-Plan Table B-1	N/A	N/A	No	No
13	U1 CRS	E-Plan Table B-1	N/A	N/A	No	No
14	U1 STA	E-Plan Table B-1	N/A	T5/L8 T5/L9 T5/L10 T5/L13	No	Yes
15	U1 RO #1	E-Plan Table B-1	N/A	N/A	No	No
16	U1 RO #2	E-Plan Table B-1	N/A	N/A	No	No
17	U1 AO#1	E-Plan Table B-1	N/A	N/A	No	No
18	U1 AO#2	E-Plan Table B-1	N/A	N/A	No	No
19	U1 AO#3	E-Plan Table B-1	N/A	N/A	No	No
20	U1 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U1 Chemistry	E-Plan Table B-1	N/A	N/A	No	No
22	U1 RP	E-Plan Table B-1	N/A	N/A	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	N/A	No	No

ANO TABLE 2 – UNIT 1 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis #11 – LOCA/General Emergency with Release and PAR 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Auxiliary Operator #3	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

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ANO TABLE 3 – FIREFIGHTING Analysis #11 – LOCA/General Emergency with Release and 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

No firefighting activities included in this accident.

ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis #11 – LOCA/General Emergency with Release and 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: *(Included in Table 5*																		
6	Other site specific RP (describe): U2 RP – Issue KI			X	X	X	X	X											
7	Chemistry Function task #1 (describe) N/A																		
8	Chemistry Function task #2 (describe) N/A																		

*Times are estimated.

ANO TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis #11 – LOCA/General Emergency with Release and PAR			
Line#	**Function / Task**	**On-Shift Position**	**Task Analysis Controlling Method**
1	Declare the emergency classification level (ECL)	U2 Shift Manager	Emergency Planning Training Program / EP Drills
2	Approve Offsite Protective Action Recommendations	U2 Shift Manager	Emergency Planning Training Program / EP Drills
3	Approve content of State/local notifications	U2 Shift Manager	Emergency Planning Training Program
4	Approve extension to allowable dose	U2 Shift Manager	Emergency Planning Training Program / EP Drills
5	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	U2 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	U1 STA	Emergency Planning Training Program
9	Perform State/local notifications	U1 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U1 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	U2 Chemistry	Emergency Planning Training Program
13	Perform NRC notifications	U1 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	N/A	N/A
15	Personnel Accountability	N/A	N/A

IX. APPENDIX B – ACCIDENTS AFFECTING BOTH UNITS SHIFT STAFFING ANALYSIS

A. Accident Analysis #1 - Design Basis Threat (DBT) as described in NEI 10-05

NOTE
Threat based event is single procedure and both units affected. Unit 1 takes lead on EP actions.

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
   - Assume 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

   - 1203.048, Security Event
   - 1903.010, Classification
   - 1903.011, Notifications

4. Tables

ANO TABLE 1 – ON-SHIFT POSITIONS Accident Analysis #1 – DBT						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U1 Shift Manager (SM)	E-Plan Table B-1	90	U1 T2/L1 T5/L1 T5/L3 T5/L5 T5/L14	No	No
2	U1 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U1 T2/L2	No	No
3	U1 Shift Technical Advisor (STA)	E-Plan Table B-1	90	U1 T2/L3 T5/L9 T5/L13	No	Yes
4	U1 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U1 T2/L4	No	No
5	U1 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U1 T2/L5	No	No
6	U1 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U1 T2/L6	No	No
7	U1 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	U1 T2/L7	No	No
8	U1Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	N/A	No	No
9	U1Auxiliary Operator (AO #4)	E-Plan Table B-1	N/A	N/A	No	No
10	U1Chemistry	E-Plan Table B-1	90	N/A	No	No
11	U1 Radiation Protection	E-Plan Table B-1	90	N/A	No	No
12	U2 Shift Manager	E-Plan Table B-1	N/A	U2 T2/L1	No	No
13	U2 CRS	E-Plan Table B-1	N/A	U2 T2/L2	No	No
14	U2 STA	E-Plan Table B-1	N/A	U2 T2/L3 T5/L6 T5/L7 T5/L8 T5/L10	No	Yes
15	U2 RO #1	E-Plan Table B-1	N/A	U2 T2/L4	No	No
16	U2 RO #2	E-Plan Table B-1	N/A	U2 T2/L5	No	No
17	U2 AO#1	E-Plan Table B-1	N/A	U2 T2/L6	No	No
18	U2 AO#2	E-Plan Table B-1	N/A	N/A	No	No
19	U2 AO#3	E-Plan Table B-1	N/A	N/A	No	No
20	U2 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U2 Chemistry	E-Plan Table B-1	N/A	N/A	No	No
22	U2 RP	E-Plan Table B-1	N/A	N/A	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	T5/L15	No	No

ANO TABLE 2 – UNIT 1 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Accident Analysis #1 – DBT 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	Auxiliary Operator #2	Non-Licensed Operator Training Program
8	Auxiliary Operator #3	N/A	N/A
9	Other needed for Safe Shutdown	N/A	N/A
10	Other needed for Safe Shutdown	N/A	N/A

ANO TABLE 2 – UNIT 2 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Accident Analysis #1 – DBT 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Auxiliary Operator #3	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

Fire Brigade

ANO TABLE 3 – FIREFIGHTING Accident Analysis #1 – DBT		
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

No firefighting activities included in this accident.

ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Accident Analysis #1 – DBT																		
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: *(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																		

*Times are estimated.

RP and Chemistry shelter during the DBT

ANO TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis #1 – DBT			
Line#	**Function / Task**	**On-Shift Position**	**Task Analysis Controlling Method**
1	Declare the emergency classification level (ECL)	U1 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	U1 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.)	U1 Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U2 STA	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	U2 STA	Licensed Operator Training Program
8	Complete State/local notification form	U2 STA	Emergency Planning Training Program
9	Perform State/local notifications	U1 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U2 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	N/A	N/A
13	Perform NRC notifications	U1 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U1 Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

B. Accident Analysis #8 – Aircraft Probable Threat

Note
Threat based event is single procedure and both units affected. Threat based event is single procedure and both units affected. Unit 2 takes lead on EP actions

.

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 U1 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

   - 1203.048, Security Event
   - 1903.010, Classification
   - 1903.011, Notifications

4. Tables

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis #8 – Aircraft Probable Threat						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U1 Shift Manager (SM)	E-Plan Table B-1	90	U1 T2/L1 T5/L1 T5/L3 T5/L5 T5/L14	No	No
2	U1 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U1 T2/L2	No	No
3	U1 Shift Technical Advisor (STA)	E-Plan Table B-1	90	U1 T2/L3	No	No
4	U1 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U1 T2/L4	No	No
5	U1 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U1 T2/L5	No	No
6	U1 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U1 T2/L6	No	No
7	U1 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	U1 T2/L7	No	No
8	U1Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	N/A	No	No
9	U1Auxiliary Operator (AO #4)	E-Plan Table B-1	N/A	N/A	No	No
10	U1Chemistry	E-Plan Table B-1	90	N/A	No	No
11	U1 Radiation Protection	E-Plan Table B-1	90	N/A	No	No
12	U2 Shift Manager	E-Plan Table B-1	N/A	U2 T2/L1	No	No
13	U2 CRS	E-Plan Table B-1	N/A	U2 T2/L2	No	No
14	U2 STA	E-Plan Table B-1	N/A	U2 T2/L3 T5/L6 T5/L7 T5/L8 T5/L10 T5/L13	No	Yes
15	U2 RO #1	E-Plan Table B-1	N/A	U2 T2/L4	No	No
16	U2 RO #2	E-Plan Table B-1	N/A	U2 T2/L5	No	No
17	U2 AO#1	E-Plan Table B-1	N/A	U2 T2/L6	No	No
18	U2 AO#2	E-Plan Table B-1	N/A	N/A	No	No
19	U2 AO#3	E-Plan Table B-1	N/A	N/A	No	No
20	U2 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U2 Chemistry	E-Plan Table B-1	N/A	N/A	No	No
22	U2 RP	E-Plan Table B-1	N/A	N/A	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	T5/L15	No	No

ANO TABLE 2 – UNIT 1 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis #8 – Aircraft Probable Threat 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	Auxiliary Operator #2	Non-Licensed Operator Training Program
8	Auxiliary Operator #3	N/A	N/A
9	Other needed for Safe Shutdown	N/A	N/A
10	Other needed for Safe Shutdown	N/A	N/A

ANO TABLE 2 – UNIT 2 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis #8 – Aircraft Probable Threat 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Auxiliary Operator #3	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

Fire Brigade

ANO 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

No firefighting activities included in this accident.

ANO 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: *(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																		

*Times are estimated.

ANO 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)	U1 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	U1 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.)	U1 Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U2 STA	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	U2 STA	Emergency Planning Training Program
9	Perform State/local notifications	U2 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U2 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	N/A	N/A
13	Perform NRC notifications	U2 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U1 Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

C. Accident U1 Analysis #9 – U1 Control Room Fire with U1 Alternate Shutdown and U2 Remote Shutdown

1. Accident Summary

   - Fire in U1 control room renders both units' control room uninhabitable. U1 evacuates the U1 control room and performs alternate shutdown. U2 evacuates the U2 control room and performs remote shutdown.

2. Accident Assumptions

   - U2 Shift Manager Shift Manager will assume the Emergency Director and go to the TSC. The U1 STA goes to the TSC to perform notifications.

3. Procedures for Accident Response

   - 1903.010, Classification
   - 1203.002, Alternate Shutdown
   - 2203.030, Remote Shutdown

4. Tables

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis #9 – U1 Control Room Fire and Alternate Shutdown / U2 Remote Shutdown						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U1 Shift Manager (SM)	E-Plan Table B-1	90	U1 T2/L1 T5/L1 T5/L3 T5/L5 T5/L14	No	Yes (SSD)
2	U1 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U1 T2/L2	No	No
3	U1 Shift Technical Advisor (STA)	E-Plan Table B-1	90	U1 T2/L3 T5/L6 T5/L7 T5/L8 T5/L9 T5/L10 T5/L13	No	Yes
4	U1 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U1 T2/L4	No	No
5	U1 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U1 T2/L5	No	No
6	U1 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U1 T2/L6	No	No
7	U1 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	U1 T2/L7	No	No
8	U1Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	T3/L1	No	No
9	U1 Auxiliary Operator (AO#4)	E-Plan Table B-1	N/A	N/A	No	No
10	U1Chemistry #1	E-Plan Table B-1	90	N/A	No	No
11	U1 Radiation Protection #1	E-Plan Table B-1	90	N/A	No	No
12	U2 Shift Manager	E-Plan Table B-1	N/A	U2 T2/L1	No	Yes (SSD)
13	U2 CRS	E-Plan Table B-1	N/A	U2 T2/L2	No	No
14	U2 STA	E-Plan Table B-1	N/A	U2 T2/L3	No	Yes (SSD)
15	U2 RO #1	E-Plan Table B-1	N/A	U2 T2/L4	No	No
16	U2 RO #2	E-Plan Table B-1	N/A	U2 T2/L5	No	No
17	U2 AO#1	E-Plan Table B-1	N/A	U2 T2/L6	No	No
18	U2 AO#2	E-Plan Table B-1	N/A	T3/L2	No	No
19	U2 AO#3	E-Plan Table B-1	N/A	T3/L3	No	No
20	U2 AO#4	E-Plan Table B-1	N/A	T3/L4	No	No
21	U2 Chemistry	E-Plan Table B-1	N/A	N/A	No	No
22	U2 RP	E-Plan Table B-1	N/A	N/A	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	T3/L5	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	T5/L15	No	No

ANO TABLE 2 – UNIT 1 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis #9 – U1 Control Room Fire and Alternate Shutdown / U2 Remote Shutdown 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	Auxiliary Operator #2	Non-Licensed Operator Training Program
8	Auxiliary Operator #3	N/A	N/A
9	Other needed for Safe Shutdown	N/A	N/A
10	Other needed for Safe Shutdown	N/A	N/A

ANO TABLE 2 – UNIT 2 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis #9 – U1 Control Room Fire and Alternate Shutdown / U2 Remote Shutdown 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A
8	Auxiliary Operator #3	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

Fire Brigade

ANO TABLE 3 – FIREFIGHTING Analysis #9 – U1 Control Room Fire and Alternate Shutdown / U2 Remote Shutdown		
Line #	**Performed by**	**Task Analysis Controlling Method**
1	U1 AO#3 (WCO)	Fire Protection Program Training
2	U2 AO#2	Fire Protection Program Training
3	U2 AO#3	Fire Protection Program Training
4	U2 AO#4	Fire Protection Program Training
5	Operator (FB)	Fire Protection Program Training

No firefighting activities included in this accident.

ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis #9 – U1 Control Room Fire and Alternate Shutdown / U2 Remote Shutdown																		
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: *(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																		

*Times are estimated.

ANO TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis #9 – U1 Control Room Fire and Alternate Shutdown / U2 Remote Shutdown			
Line#	**Function / Task**	**On-Shift Position**	**Task Analysis Controlling Method**
1	Declare the emergency classification level (ECL)	U1 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	U1 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.)	U1 Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U1 STA	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	U1 STA	Emergency Planning Training Program
9	Perform State/local notifications	U1 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U1 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	N/A	N/A
13	Perform NRC notifications	U1 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U1 Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

D. Accident U2 Analysis #9 – U2 Control Room Fire with U2 Alternate Shutdown and U1 Remote Shutdown

1. Accident Summary

   - Fire in U2 control room renders both units' control room uninhabitable. U2 evacuates the U2 control room and performs alternate shutdown. U1 evacuates the U1 control room and performs remote shutdown.

2. Accident Assumptions

   - U2 Shift Manager Shift Manager will assume the Emergency Director and go to the TSC. The U1 STA goes to the TSC to perform notifications.

3. Procedures for Accident Response

   - 2203.014, Alternate Shutdown
   - 1203.002, Remote Shutdown
   - 1903.010, Classifications

4. Tables

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis #9 – U2 Control Room Fire and Alternate Shutdown / U1 Remote Shutdown						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U1 Shift Manager (SM)	E-Plan Table B-1	90	U1 T2/L1	No	Yes (SSD)
2	U1 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U1 T2/L2	No	No
3	U1 Shift Technical Advisor (STA)	E-Plan Table B-1	90	U1 T2/L3	No	Yes (SSD)
4	U1 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U1 T2/L4	No	No
5	U1 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U1 T2/L5	No	No
6	U1 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U1 T2/L6	No	No
7	U1 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	U1 T2/L7	No	No
8	U1Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	U1 T3/L2	No	No
9	U1Auxiliary Operator (AO #4)	E-Plan Table B-1	N/A	U1 T3/L3	No	No
10	U1Chemistry	E-Plan Table B-1	90	N/A	No	No
11	U1 Radiation Protection	E-Plan Table B-1	90	N/A	No	No
12	U2 Shift Manager	E-Plan Table B-1	N/A	U2 T2/L1 T5/L1 T5/L3 T5/L5 T5/L14	No	No
13	U2 CRS	E-Plan Table B-1	N/A	U2 T2/L2	No	No
14	U2 STA	E-Plan Table B-1	N/A	U2 T2/L3 T5/L6 T5/L7 T5/L8 T5/L9 T5/L10 T5/L13	No	Yes
15	U2 RO #1	E-Plan Table B-1	N/A	U2 T2/L4	No	No
16	U2 RO #2	E-Plan Table B-1	N/A	U2 T2/L5	No	No
17	U2 AO#1	E-Plan Table B-1	N/A	U2 T2/L6	No	No
18	U2 AO#2	E-Plan Table B-1	N/A	T3/L4	No	No
19	U2 AO#3	E-Plan Table B-1	N/A	T3/L1	No	No
20	U2 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U2 Chemistry	E-Plan Table B-1	N/A	N/A	No	No
22	U2 RP	E-Plan Table B-1	N/A	N/A	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	T3/L5	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	T5/L15	No	No

ANO TABLE 2 – UNIT 1 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis #9 – U2 Control Room Fire and Alternate Shutdown / U1 Remote Shutdown 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	Auxiliary Operator #2	Non-Licensed Operator Training Program
8	Auxiliary Operator #3	N/A	N/A
9	Other needed for Safe Shutdown	N/A	N/A
10	Other needed for Safe Shutdown	N/A	N/A

ANO TABLE 2 – UNIT 2 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis #9 – U2 Control Room Fire and Alternate Shutdown / U1 Remote Shutdown 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A

8	Auxiliary Operator #3	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

Fire Brigade

ANO TABLE 3 – FIREFIGHTING Analysis #9 – U2 Control Room Fire and Alternate Shutdown / U1 Remote Shutdown		
Line #	**Performed by**	**Task Analysis Controlling Method**
1	U2 AO#3 (WCO)	Fire Protection Program Training
2	U1 AO#3	Fire Protection Program Training
3	U1 AO#4	Fire Protection Program Training
4	U2 AO#2	Fire Protection Program Training
5	Operator (FB)	Fire Protection Program Training

No firefighting activities included in this accident.

ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Analysis #9 – U2 Control Room Fire and Alternate Shutdown / U1 Remote Shutdown																		
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: *(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																		

*Times are estimated.

ANO TABLE 5 – EMERGENCY PLAN IMPLEMENTATION Analysis #9 – U2 Control Room Fire and Alternate Shutdown / U1 Remote Shutdown			
Line#	**Function / Task**	**On-Shift Position**	**Task Analysis Controlling Method**
1	Declare the emergency classification level (ECL)	U2 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	U2 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.)	U2 Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U2 STA	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	U2 STA	Emergency Planning Training Program
9	Perform State/local notifications	U2 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U2 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	N/A	N/A
13	Perform NRC notifications	U2 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U2 Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

E. Accident Analysis #10 - Station Blackout (Both Units)

1. Accident Summary

- A loss of offsite power occurs concurrently on both units.
- All emergency generators fail to start

2. Accident Specific Assumptions Made

- Both units are in station blackout
- U1 Shift Manager coordinates with U2 Shift Manager and assumes the Emergency Director role.
- Both Shift Managers concur power cannot be restored within 15 minutes and U1 Shift Manager declares the emergency prior to the 15 minute EAL condition.
- EAL is based on the event.

3. Procedures for Accident Response

- 1202.008, Blackout
- 2202.008, Station Blackout
- 1903.010, Emergency Action Level Classification
- 1903.011, Emergency Response Notifications
- 1903.030, Evacuation

4. Tables

ANO TABLE 1 – ON-SHIFT POSITIONS Analysis #10 – Station Blackout						
Line #	**On-shift Position**	**Basis Document**	**Augmentation Elapsed Time (min)***	**Role in Table # / Line #**	**Unanalyzed Task?**	**TMS Required?**
1	U1 Shift Manager (SM)	E-Plan Table B-1	90	U1 T2/L1	No	Yes (SSD)
2	U1 Control Room Supervisor (CRS)	E-Plan Table B-1	N/A	U1 T2/L2	No	No
3	U1 Shift Technical Advisor (STA)	E-Plan Table B-1	90	U1 T2/L3	No	No
4	U1 Reactor Operator (RO #1)	E-Plan Table B-1	N/A	U1 T2/L4	No	No
5	U1 Reactor Operator (RO #2)	E-Plan Table B-1	N/A	U1 T2/L5	No	No
6	U1 Auxiliary Operator (AO #1)	E-Plan Table B-1	N/A	U1 T2/L6	No	No
7	U1 Auxiliary Operator (AO #2))	E-Plan Table B-1	N/A	U1 T2/L7	No	No
8	U1Auxiliary Operator (AO #3)	E-Plan Table B-1	N/A	N/A	No	No
9	U1Auxiliary Operator (AO #4)	E-Plan Table B-1	N/A	N/A	No	No
10	U1Chemistry	E-Plan Table B-1	90	N/A	No	No
11	U1 Radiation Protection	E-Plan Table B-1	90	N/A	No	No
12	U2 Shift Manager	E-Plan Table B-1	N/A	U2 T2/L1 T5/L1 T5/L3 T5/L5 T5/L14	No	No
13	U2 CRS	E-Plan Table B-1	N/A	U2 T2/L2	No	No
14	U2 STA	E-Plan Table B-1	N/A	U2 T2/L3 T5/L6 T5/L7 T5/L8 T5/L9 T5/L10 T5/L13	No	Yes
15	U2 RO #1	E-Plan Table B-1	N/A	U2 T2/L4	No	No
16	U2 RO #2	E-Plan Table B-1	N/A	U2 T2/L5	No	No
17	U2 AO#1	E-Plan Table B-1	N/A	U2 T2/L6	No	No
18	U2 AO#2	E-Plan Table B-1	N/A	N/A	No	No
19	U2 AO#3	E-Plan Table B-1	N/A	N/A	No	No
20	U2 AO#4	E-Plan Table B-1	N/A	N/A	No	No
21	U2 Chemistry	E-Plan Table B-1	N/A	N/A	No	No
22	U2 RP	E-Plan Table B-1	N/A	N/A	No	No
23	Operator (FB)	E-Plan Table B-1	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	90	T5/L15	No	No

ANO TABLE 2 – UNIT 1 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis #10 – Station Blackout 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	Auxiliary Operator #2	Non-Licensed Operator Training Program
8	Auxiliary Operator #3	N/A	N/A
9	Other needed for Safe Shutdown	N/A	N/A
10	Other needed for Safe Shutdown	N/A	N/A

ANO TABLE 2 – UNIT 2 PLANT OPERATIONS & SAFE SHUTDOWN Two Unit – Two Control Room Analysis #10 – Station Blackout 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 Advisor	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	Auxiliary Operator #1	Non-Licensed Operator Training Program
7	Auxiliary Operator #2	N/A	N/A

8	Auxiliary Operator #3	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

Fire Brigade

ANO TABLE 3 – FIREFIGHTING Analysis #10 – Station Blackout		
Line #	**Performed by**	**Task Analysis Controlling Method**
1	U2 AO#3 (WCO)	Fire Protection Program Training
2	U1 AO#2	Fire Protection Program Training
3	U1 AO#3	Fire Protection Program Training
4	U2 AO#4	Fire Protection Program Training
5	Operator (FB)	Fire Protection Program Training

No firefighting activities included in this accident.

ANO 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: 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																		

*Times are estimated.

ANO 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)	U2 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	U2 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.)	U2 Shift Manager	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U2 STA	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	U2 STA	Emergency Planning Training Program
9	Perform State/local notifications	U2 STA	Emergency Planning Training Program
10	Complete NRC event notification form	U2 STA	Licensed Operator Training Program
11	Activate ERDS	N/A	N/A
12	Offsite radiological assessment	N/A	N/A
13	Perform NRC notifications	U2 STA	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U2 Shift Manager	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

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

A. Chemistry performance of 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 action required

B. Shift Manager Overlapping Task of Safe Shutdown and Emergency Direction and Control

NEI 10-05 (Revision 0)
June 2011

TIME MOTION STUDY OF OVERLAPPING TASKS

TASK 1: PERFORM PROCEDURE 1203.002 SECTION 1A

JOB: SHIFT MANAGER

TASK 2: MAINTAIN SHIFT MANAGER OVERSIGHT

JOB: SHIFT MANAGER

1

ANO Unit 1 Shift Manager Safe Shutdown Duties Time and Motion Study
November 5, 2012, Scheduled 1100-1200

Condition: This activity was conducted as a part of the Shift Staffing Analysis under Rulemaking to determine if the concurrent duties for Safe Shutdown actions held by the Unit 1 Shift Manager could be carried out without impacting the ability of the SM to monitor the plant and arrive at the TSC in a timely manner to carry out Emergency Direction and Control duties under the ANO Emergency Plan. This study used the task criteria in OP 1203.002 Section 1A to identify the tasks to be performed. It assumes a worst case condition in which a fire in the control room forces the crew to immediately leave the control room and procedure with Alternate Shutdown Activities. A safety brief and walk down were conducted prior to the start of the study. The subject SM also briefed the on-duty SM where we would be going and the simulated actions to be taken.

Method: An off-shift Unit 1 Shift Manager was chosen to perform the task and was monitored and recorded by the Emergency Planning Manger who utilized a stop watch to record times for each individual task performed in the above named attachment Section 1A and by an EP intern who ran a continuous clock on the overall evolution. It is noted that the times recorded would have been faster if it had not been necessary to allow two additional timing personnel to enter through and exit security door 56 which slowed down the movement of the SM by more than one full minute. Timing of transit between locations of tasks was too difficult to monitor and time accurately and is therefore indicated as total time minus time spent in task performance.

Results: The total time to perform the actual tasks (Steps 3/1-3/11) was 67.78 Seconds or roughly one minute and 8 seconds. The total time to finish all tasks through step 3/15 and the end of Safe Shutdown Actions was 8 minutes and 37 seconds. This includes the transit time of 2:16 to move from the main turbine trip lever location on the turbine deck to the TSC and 77.5 seconds to make two announcements to the site upon reaching the TSC. Transit time between shutdown tasks is calculated at (8 minutes 37 seconds minus 2:16 minus 77.5 minus 67.78 = 235.72 Seconds or almost 4 minutes. Keep in mind this would have been at least a full minute less if not for the time keepers slowing down the transit through the security doors.

Once in the TSC, the SM took 1 minute 55 seconds to pull up the appropriate screens on PDS and obtain his 1903.011M form for the Alert Declaration at 10minutes and 32 seconds total elapsed time. At 10 minutes and 34 Seconds elapsed time he declared the Alert based on EAL 6.8 Control Room Evacuation (1149 clock time) and ordered the Unit 1 STA (played by the EP Mgr.) to make notifications. The notifications form was completed and simulated to be transmitted at 14 minutes and 15 seconds total elapsed time (less than 4 minutes from the declaration of the Alert).

The SM spent 3 minutes and 46 seconds, during the notifications message preparation period performing oversight tasks including: Simulating radio calls to the ROs and NLOs, Paging the Duty Manager for Support, ensuring the ERO was paged out, Performing ATTH 1 Alternate SD display SG Level and RCS Pressurizer Level plots and

setting level bands for monitoring of overcooling. The study was terminated at 18 minutes elapsed time.

Conclusions: The Unit 1 Shift Manager was able to easily perform the Alternate Safe Shutdown Tasks associated with a worst case control room fire and relocate to the TSC to continue to provide command and control oversight. He diagnosed, classified and declared the emergency event in less than 15 minutes and was able to meet the 15 minute requirement for making notifications to offsite agencies. He was able to stay in contact with his crew via radio (simulated). It is therefore our belief the Unit 1 SM can perform concurrent duties involving safe shutdown activities and still provide effective oversight and execute his emergency planning duties as the Emergency Director in a timely manner. Robert Holeyfield

TIME MOTION STUDY

APPENDIX D

Function / Responsibility (Task) Analysis Template

Event: #8 CR Fire U1 ASD_ _____ Site: ANO U1 Position: __Shift Manager_____ Line #: __1____

Function	Responsibility (Task)	Action Step	Duration
1. Safe Shutdown	1.1 Perform the actions of 1203.002 Section 1A 3.0, Shift Manager Follow-Up Actions. Start at step 3.0 Assumes worse case Rx trip. verify SW EDG opn Close MSIV.	3.1 Verify possession of master key ring. **[simulate]**	1.4 sec
		3.2 At Alternate Shutdown Locker, obtain the following: • Copy of procedure [provided by Evaluator] • Copy of Section 1A [provided by Evaluator] • Flashlight • Radio w/headset	8.14 sec.
		3.3 Perform a radio check **[simulate]**	2.2 sec
		3.4 At D21, open the following breakers: **[simulate]** • 6900 Volt Switchgear H2 (breaker #1) • 4160 Volt Switchgear A2 (breaker #3) • 480 Volt Switchgear B6 (breaker #9) • 6900 Volt Switchgear H2 (breaker #1) • Rx Vessel and T-Hot High Point Vents (c-486-2 (breaker #29) • RCP Seal Bleedoff Alternate Path to Quench Tank solenoid Valves (breaker #32) 3.4.1 Notify CRS that H2 & B6 Bus DC Control Power have been de-energized.	4.12 Time Radio Call 2.1 secs.
		3.5 At D02, perform the following: **[simulate]** 3.5.1 Open Supply to MCC D25 breaker (D02-21A). 3.5.2 Place Panel D21 transfer control in the REMOTE	8.4

TIME MOTION STUDY

		DISCONNECTED position	
		3.6 WHEN CV-1000 verified closed by either one of the following: • By control room indication prior to de-energizing A4, **[CR indicated closed]** • RO #1 reports CV-1000 is in LOCAL and closed, **THEN** at A4, perform the following: **[simulate]** 3.6.1 Verify A4 feed to B6 breaker (A-401) open. 3.6.2 Open A-401 DC control power breaker (inside cubicle).	9.8
		3.7 At D11, open the following breakers: **[simulate]** • 6900 Volt Switchgear H1 (breaker #1) • 4160 Volt Switchgear A1 (breaker #3) • 480 Volt Switchgear B5 (breaker #9) • Rx Vessel, PZR, and T-Hot High Point Vents on C-486-1 (breaker #11) • SV-1000 PZR Relief Vlv C30 (breaker #24) 3.7.1 Notify CRS that K1 & B5 Bus DC Control Power have been de-energized.	4.6 Sim Radio Check.
		3.8 At D01, perform the following: : **[simulate]** 3.8.1 Open Supply to MCC D15 breaker (D01-21A) 3.8.2 Place Panel D11 transfer control in the REMOTE DISCONNECTED position.	7.3
		3.9 At A3, perform the following: : **[simulate]** 3.9.1 Verify A3 feed to B5 breaker (A-301) open 3.9.2 Open A-301 DC control power breaker (inside cubicle)	12.1
		3.10 Manually trip both Main Feedwater Pumps locally. : **[simulate]**	6.4
		3.11 Manually trip Main Turbine with TRIP lever at front standard. : **[simulate]**	1.2
		3.12 GO TO Technical support Center (3rd floor admin building)	2:15.5

Radio Call to Crew

TIME MOTION STUDY

		3.13 IF NOT already performed, THEN dispatch Fire Brigade as follows using one of the following methods: 3.13.1 Press "Fire Brigade" on base radio. 3.13.2 Perform both of the following: • Notify Fire Brigade on BOTH units using radio channels 4 and 5 • Notify Security at CAS (ext 3109/3388) to dispatch the Fire Brigade officers 3.13.3 Make the follow plant announcement: A. Momentarily depress Fire and Medical tone pushbbutton B. Make the following announcement **TWICE**: **"Attention all personnel! Attention all personnel! There is a fire in the: Unit 1 Control Room zone 129F (or Unit 1 Cable Spread Room, zone 97R)** **The Fire Brigade is responding. All other personnel stay clear of the affected area. Plant control will be established from the TSC."**	Performed by Unit 2 1:17-34 Timed separately in case U1 has to do it.
	Pulled up JADS. 1:55 Reviewing EAL's 1:55pm 1149 Declared EAL Alert 6.8 notified.	3.14 As time allows, commence calling out at least one additional operator per classification.	N/A
		3.15 On Attachment 1, mark Item 1.E (de-energizing D-15 and D-25) as complete.	Elapsed time to here at end 8:37
		Elapsed time	Includes transitional time between tasks.
	-14:15 Total	**END OF PERFORM SAFE SHUTDOWN ACTIONS**	
2.Shift Manager Oversight	2.1 Maintain oversight of the event response.	1 Oversight of the Safe Shutdown response. Page Duty mgr for support.	3:46.50
		2 AH.1 Alt. SP. Display SG Level RCS Prz. level.	
		setting level bands monitoring for over cooling.	
		END OF EMERGENCY DIRECTION AND CONTROL TASK	

TIME MOTION STUDY

PURPOSE:

Perform a Time Motion Study to evaluate whether assigning the performance of safe shutdown actions per procedure 1203.002 Section 1A to the Shift Manager can be justified as an acceptable overlap to the Shift Manager's oversight of the U1 event response.

LOCATION:

Start in the Control Room, go to safe shutdown equipment locations and then to the TSC.

REQUIRED TOOLS/EQUIPMENT:

A. Copy of procedure. [Provide a copy of the procedure to the performer. Do not remove the copy in the Alternate Shutdown Locker.]

B. **Simulate** the use of a radio and equipment manipulations.

C. Coordinate with EP to have the TSC unlocked to perform the TMS.

INSTRUCTIONS TO PROCEDURE PERFORMER – SHIFT MANAGER:

1. Perform Section 1A, Shift Manager Follow-Up Actions by walkthrough of the procedure and simulation of expected actions/manipulations. **Do not manipulate plant equipment**. Simulate procedure actions. Simulate the necessary communications by "talking" to the evaluator.
2. The performance will be timed with the clock to start when leaving the control room and will stop when get to step 3.15.
3. Demonstrate the Shift Manager can maintain oversight of the event response while performing the section of 1203.002.

COMPLETION:

Shift Manager: Richard Loveland / _____ Date: 11-19-12
Name (print) (Signature)

Evaluator: Robert Haleyfield / _____ Date: 11/18/12
Name (print) (Signature)

XI. OVERLAP OF TASKS ACTIVITIES OR OTHER CONFLICTS IDENTIFIED

A. Overlap Requiring Compensatory Measures

1. The U2 Shift Technical Advisor is assigned a collateral task to perform safe shutdown (SSD) manipulations during the control room fire and alternate shutdown per 2203.014, Alternate Shutdown.

2. The U2 Shift Manager is assigned a collateral task to perform SSD manipulations during the control room fire and alternate shutdown per 2203.014, Alternate Shutdown.

3. One of the two on-shift STAs is assigned responsibility for off-site notifications and communication for all events. The assignment of the notification/communication functional area to the STA results in a collateral duty for the STA that may challenge the ability of the STA to perform the STA function during events impacting both units.

XII. 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.*
- ANO Emergency Plan, Rev 35

XIII. STAFFING ANALYIS TEAM

- Fred Guynn, Entergy ECH Sr. Project Manager, EP
- Myra Jones, Contractor CMCG
- Jeff Horton, ANO Assistant Operations Manager U1
- Mark Gohman, Operations Shift Manager U1
- Marcus Schacht, Control Room Supervisor U2
- Joe Tatman, Sr. Ops Instructor - Training
- Subrena Morris, Chemistry Supervisor
- Travis Hogrefe, Radiation Protection Supervisor
- Robert Holeyfield, Emergency Preparedness Manager