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OCAN041303

April 30, 2013

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
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Rockville, MD 20852

**SUBJECT:** Entergy's Response to the March 12, 2012, Information Request, Enclosure 5, Recommendation 9.3, Emergency Preparedness – Staffing, Requested Information Items 1, 2, and 6 (Phase 1 Staffing Assessment) Arkansas Nuclear One – Units 1 and 2  
Docket Nos. 50-313 and 50-368  
License Nos. DPR-51 and NPF-6

- REFERENCES:**
1. NRC letter to Entergy, *Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3 of the Near-Term Task Force (NTTF) Review of Insights from the Fukushima Dai-ichi Accident*, dated March 12, 2012 (OCNA031208) (ML12053A340)
  2. Entergy letter to NRC, *Entergy's 60-Day Response to the March 12, 2012, Information Request, Action Plan for Completing Emergency Communication and Staffing Assessments*, dated May 11, 2012 (OCAN051202)
  3. Nuclear Energy Institute (NEI) 12-01, *Guideline for Assessing Beyond-Design-Basis Accident Response Staffing and Communications Capabilities*, Revision 0, dated May 2012
  4. NRC Order Number EA-12-049, *Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events*, dated March 12, 2012 (OCNA031206) (ML12054A735)
  5. NEI 10-05, *Assessment of On-Shift Emergency Response Organization Staffing and Capabilities*, Revision 0, dated June 2011

Dear Sir or Madam:

On March 12, 2012, the NRC staff issued Reference 1. Enclosure 5 of Reference 1 contains the specific Requested Actions, Requested Information, and Required Response associated with Recommendation 9.3 for Emergency Preparedness - Staffing. In accordance with

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Reference 1, Enclosure 5, Entergy Operations, Inc. (Entergy) submitted an alternative course of action for performing the requested actions and providing the requested information (Reference 2). Reference 2 described the alternative course of action and schedule for responding to the Emergency Preparedness – Staffing, Requested Information Items 1, 2, and 6.

Attachment 1 to this letter provides the Arkansas Nuclear One (ANO) Phase 1 Staffing Assessment Report. The ANO Phase 1 Staffing Assessment Report follows the assessment process described in References 3 and 5.

In accordance with Reference 2, this letter provides the response to Reference 1, Enclosure 5, Staffing, Requested Information Items 1, 2, and 6.

Response to Requested Information Item 1:

***It is requested that addressees provide an assessment of the onsite and augmented staff needed to respond to a large scale natural event meeting the conditions described in the Discussion section (Reference 1, Enclosure 5). This assessment should include a discussion of the onsite and augmented staff available to implement the strategies as discussed in the emergency plan and/or described in plant operating procedures. The following functions are requested to be assessed:***

- ***How onsite staff will move back-up equipment (e.g., pumps, generators) from alternate onsite storage facilities to repair locations at each reactor as described in the Order regarding the NRC NTTF Recommendation 4.2. It is requested that consideration be given to the major functional areas of NUREG-0654, Table B-1, such as plant operations and assessment of operational aspects, emergency direction and control, notification/communication, radiological accident assessment, and support of operational accident assessment, as appropriate.***
- ***New staff or functions identified as a result of the assessment.***
- ***Collateral duties (personnel not being prevented from timely performance of their assigned functions).***

Attachment 1 provides the ANO on-shift staffing assessment conducted pursuant to Reference 2. A detailed timeline based upon the existing loss of alternating-current (AC) power was performed based upon operations' review of the applicable station procedures. The focus of the timeline was to identify all resources, both operators and support organizations that would be required to execute each task. The data from the operations' timeline, as well as the review of radiation protection and chemistry resource requirements, was analyzed by applying the methodology specified in Reference 5 to evaluate the capability of the minimum on-shift staffing complement to execute the actions specified for operations, radiation protection, and chemistry and the required emergency plan responsibilities.

Based upon the minimum shift staffing, as specified in the ANO Emergency Plan, the required minimum shift staffing of 23 is sufficient to support the required plant actions, as well as the emergency plan functions, without the assignment of collateral duties that would adversely affect the ability to execute the emergency plan functions.

The tables describing the required minimum staffing, the operations' timeline, and the Reference 5 staffing analysis tables for ANO are included in Attachment 1.

As described in Attachment 1, development of the guidance to support the mitigation strategies required by Reference 4 must be completed in order to determine the applicable staffing requirements to address back-up equipment. Entergy will perform this assessment as part of the Phase 2 staffing assessment by June 5, 2014, as previously identified in Reference 2.

The staffing assessment provided in Attachment 1 determined that no new staff or functions have been identified as a result of the Phase 1 assessment.

The staffing assessment provided in Attachment 1 determined that the existing on-shift staff is sufficient to implement the existing loss of all AC power, multi-unit event response strategies, while supporting performance of the required emergency planning duties without unacceptable collateral duties.

Response to Requested Information Item 2:

***Provide an implementation schedule of the time needed to conduct the onsite and augmented staffing assessment. If any modifications are determined to be appropriate, please include in the schedule the time to implement the changes.***

Attachment 1 provides the ANO on-shift and augmented staffing assessment for the loss of all AC power, multi-unit event. Entergy will identify any appropriate modifications to the ANO Emergency Plan Drill and Exercise Program upon completion of the mitigation strategies and associated guidance being developed in response to Reference 4 (June 5, 2014).

Response to Requested Information Item 6:

***Identify changes that have been made or will be made to your emergency plan regarding the on-shift or augmented staffing changes necessary to respond to a loss of all ac power, multi-unit event, including any new or revised agreements with offsite resource providers (e.g., staffing, equipment, transportation, etc.).***

As described in Attachment 1, the existing on-shift staff is sufficient to implement the existing loss of all AC power strategies at both units. No changes to the emergency plan on-shift staffing have been identified.

Also as described in Attachment 1, the existing augmented emergency response organization (ERO) provides sufficient staffing to satisfy the expanded capability functions defined in Reference 3, Table 3.1. No changes to the emergency plan augmented ERO staffing have been identified.

As described in Attachment 1, the existing agreements with offsite resource providers were determined to be adequate and no new or revised agreements are required.

The Phase 1 Staffing Assessment results for ANO require the establishment of procedural controls to activate the expanded response capability. Entergy will incorporate instructions into applicable fleet or site guidance for ANO to activate the expanded response capability and to integrate this capability into the existing augmented ERO structure based upon the following conditions as described in Reference 3:

- Loss of all offsite and all on-site power sources to AC emergency busses at more than one unit, or
- Plant parameters or conditions require implementation of severe accident management strategies for more than one unit.

These changes will be implemented by March 5, 2014.

The new commitments contained in this submittal are summarized in Attachment 2. Should you have any questions concerning the content of this letter, please contact Stephenie Pyle at 479.858.4704.

I declare under penalty of perjury that the foregoing is true and correct. Executed on April 30, 2013.

Sincerely,



JGB /nbm

Attachments: 1. ANO NEI 12-01 Phase 1 Staffing Assessment  
2. List of Regulatory Commitments

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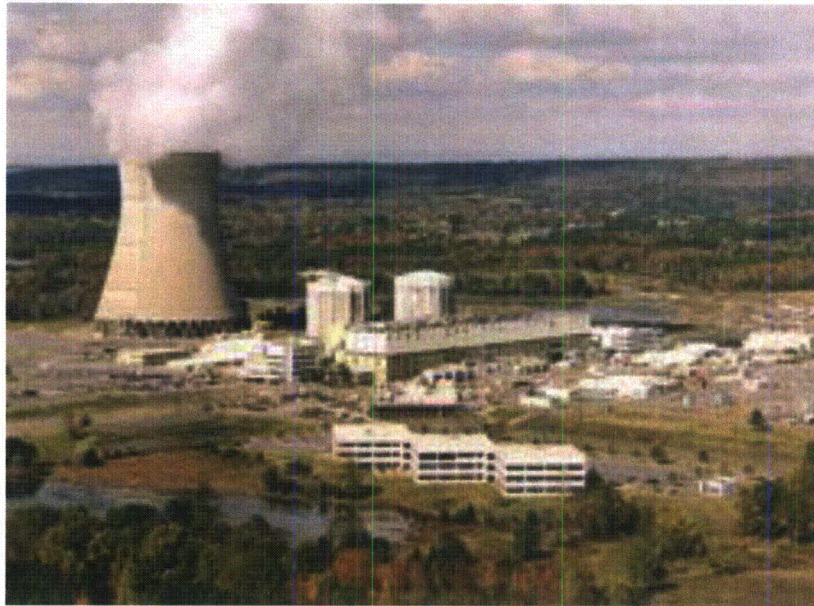
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**Attachment 1 to**

**OCAN041303**

**Arkansas Nuclear One Nuclear Energy Institute 12-01  
Phase 1 Staffing Assessment**



**ENERGY**

**ARKANSAS NUCLEAR ONE**

**NEI 12-01 Phase 1**

**Staffing Assessment**

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# Entergy Arkansas Nuclear One NEI 12-01 Phase 1 Staffing Assessment

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# Entergy Arkansas Nuclear One NEI 12-01 Phase 1 Staffing Assessment

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## 1.0 EXECUTIVE SUMMARY

This report provides responses to the March 12, 2012, *Nuclear Regulatory Commission (NRC) letter, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident,* as committed in the Entergy letter to NRC, *Entergy's 60-Day Response to the March 12, 2012, Information Request, Action Plan for completing Emergency Communication and Staffing Assessments,* dated May 11, 2012 (OCAN051202). The staffing assessment completion date of March 29, 2013 and submittal date of April 30, 2013 is in accordance with the Regulatory Commitment in the Entergy 60-day response letter. (ADAMS Accession No. ML12132A227).

This report provides responses to Enclosure 5, Recommendation 9.3 Staffing, Requested Information Items 1, 2, and 6. This response includes the results of the Phase 1 staffing assessment, as described in NEI 12-01, *Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities* and Emergency Plan implementation using the guidance of NEI-10-05, *Assessment of On-Shift Emergency Response Organization Staffing and Capabilities*. The report also includes a discussion of any changes planned in response to the Phase 1 assessment and the associated implementation schedule.

The Phase 1 staffing assessment concluded that the current minimum on-shift staffing as defined in the Arkansas Nuclear One Emergency Plan is sufficient to support the implementation of the current station blackout (SBO) strategies on both, Units 1 and 2, as well as the required Emergency Plan actions, with no unacceptable collateral duties. Additionally, the Phase 1 assessment identified adequate resources are available within the current ERO structure to staff the Expanded Response Functions as noted in NEI 12-01 Table 3.1.

The Phase 1 assessment did, however, identify the need to establish guidance to activate the Expanded Response Capability and to integrate this capability into the existing augmented ERO structure. The need to establish this guidance is noted in Attachment 2.

## 2.0 SCOPE

In response to the Fukushima Dai-Ichi accident, the NRC issued a letter, *"Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force (NTTF) Review of Insights from the Fukushima Dai-Ichi Accident,"* dated March 12, 2012. The information

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requests related to Emergency Preparedness (EP) are contained in Enclosure 5, "Recommendation 9.3: Emergency Preparedness" of this §50.54(f) Letter. Within this enclosure are two Requested Actions (Communications and Staffing). Both Requested Actions involve performance of an assessment. The action for the staffing assessment is summarized below:

*It is requested that addressees assess their current staffing levels and determine the appropriate staff to fill all necessary positions for responding to a multi-unit event during a beyond design basis natural event and determine if any enhancements are appropriate given the considerations of NTTF Recommendation 9.3.*

Per the Entergy letter to NRC, *Entergy's 60-Day Response to the March 12, 2012, Information Request, Action Plan for completing Emergency Communication and Staffing Assessments*, dated May 11, 2012, the April 30, 2013 submittal is required to provide the requested information for Phase 1 (all functions except those related to NTTF Recommendation 4.2) of the Staffing Assessment (Enclosure 5, Recommendation 9.3 Staffing, Information Request Nos. 1, 2, and 6). Specifically, these items are:

- (1) Provide an assessment of the onsite and augmented staff needed to respond to a large scale natural event meeting the conditions described in the section 4.0. This assessment should include a discussion of the onsite and augmented staff available to implement the strategies as discussed in the emergency plan and/or described in plant operating procedures. The following functions are requested to be assessed:
  - a. How onsite staff will move back-up equipment (e.g., pumps, generators) from alternate onsite storage facilities to repair locations at each reactor as described in the order regarding the NRC NTTF Recommendation 4.2. It is requested that consideration be given to the major functional areas of NUREG-0654, Table B-1, such as plant operations and assessment of operational aspects, emergency direction and control, notification/communication, radiological accident assessment, and support of operational accident assessment, as appropriate.
  - b. New staff or functions identified as a result of the assessment.
  - c. Collateral duties (personnel not being prevented from timely performance of their assigned functions).
- (2) Provide an implementation schedule of the time needed to conduct the onsite and augmented staffing assessment. If any modifications are determined to be appropriate include in the schedule the time to implement the changes.

## Entergy Arkansas Nuclear One NEI 12-01 Phase 1 Staffing Assessment

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- (6) Identify changes that have been made or will be made to the emergency plan regarding the on-shift or augmented staffing changes necessary to respond to a loss of all AC power, multi-unit event, including any new or revised agreements with offsite resource providers (e.g., staffing, equipment, transportation, etc.).

While NSIR/DPR-ISG-01, *Interim Staff Guidance – Emergency Planning for Nuclear Power Plants* and NEI 10-05 address a SBO affecting a single-unit site, and one unit on a multi-unit site, they do not consider the scenario of an extended loss of AC power affecting all units on a multi-unit site. Licensees of multi-unit sites are to perform an assessment of this scenario using the assumptions listed in NEI 12-01 and the methodology provided in NEI 10-05. In particular, the assessment should determine the ability of the on-shift staff to implement Initial Phase coping actions and, consistent with the site access assumptions, any Transition Phase actions that must be performed prior to the end of the "no site access" time period.

Phase I of the staffing assessment includes the Initial and Transition Phases of the approach for mitigating a BDBEE. In this assessment, the BDBEE is an external event causing multi-unit extended loss of AC power (ELAP), or extended SBO, that results in:

- All on-site units affected
- Extended loss of AC power
- Impeded access to the units

The assessment of the on-shift staffing is to determine the ability of the on-shift staff to implement Initial Phase coping strategies needed to respond to a large-scale external event causing a multi-unit ELAP. The Initial Phase requires the minimum on-shift staff to use installed equipment and resources to maintain or restore the functions of core cooling, containment, and spent fuel pool cooling. The normal Emergency Response Organization (ERO) response time is 60 minutes for some functional support and 90 minutes for the remainder of the ERO. The assessment assumes no augmented ERO or support arrives for the first six (6) hours after the event occurred due to impediments preventing site access.

The Transition Phase will be accomplished using portable equipment stored on-site. The strategies for this phase must be capable of maintaining core cooling, containment, and spent fuel pool cooling capabilities (following their restoration, if applicable) from the time they are implemented until they can be supplemented by offsite resources in the Final Phase. The Final Phase is accomplished using the portable equipment stored on-site and augmented with additional equipment and consumables obtained from off-site.

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### 2.1 Methodology

A tabletop was used to determine what plant actions and emergency plan implementation actions were required based on plant procedures prior to staff augmentation during a six (6) hour SBO coping period and during the 6 to 24 hour period with limited augmented staff. 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. A team of Emergency Planning, Training, and Operations personnel completed the assessment of the on-shift staff's response to the SBO Initial Phase (6 hours). Security, Radiation Protection, and Chemistry also provided input for their expected response to a station blackout. The guidance of NEI 10-05 was used to determine if the number and composition of the on-shift staff is sufficient to implement the emergency plan and implement mitigation strategies and repair or corrective actions intended to maintain or restore the functions of core cooling, containment, and spent fuel pool cooling for both units.

ANO has a total of 23 staff members on shift for both units. The on-shift staff consists of individuals necessary to support each of the emergency plan functional areas or tasks per NUREG-0654 and the ANO Emergency Plan Table 5-1.

### 3.0 EMERGENCY PLAN MINIMUM STAFFING

The ANO Emergency Plan establishes the licensing basis for the on-shift staffing complement. Only personnel required to be on-shift are credited in the staffing analysis for the initial 6 hours of the event. The following table indicates the on-shift personnel necessary to perform the required emergency planning functions.

<b>Position</b>	<b>E-Plan Functional Area U1 staff</b>	<b>E-Plan Functional Area U2 staff</b>	<b>On-Shift Staffing Analysis Results U1</b>	<b>On-Shift Staffing Analysis Results U2</b>
Shift Manager (SM)	Safe Shutdown /Emergency Direction and Control	Emergency Direction and Control	1	1
Control Room Supervisor (CRS)	Plant Operations/Safe Shutdown	Plant Operations/Safe Shutdown	1	1
Shift Technical	Technical	Technical	1	1

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Advisor (STA)	Support	Support		
Reactor Operators	Plant Operations/Safe Shutdown	Plant Operations/Safe Shutdown	2	2
Auxiliary Operators	Plant Operations/Safe Shutdown/Fire Brigade	Plant Operations/Fire Brigade	3	3
Auxiliary Operator	Communicator / Notifications	Safe Shutdown/Communicator / Notifications	1	1
Chemistry	Chemistry/Offsite Dose Assessment	Chemistry/Offsite Dose Assessment	1	1
Radiation Protection	Radiation Protection	Radiation Protection	1	1
Security	Fire Brigade for both units		1	
Security	Access Control and Accountability		Per Security Contingency Plan	
			<b>12</b>	<b>11</b>

Emergency plan tasks of repair and corrective action, first aid and rescue operations are provided by personnel assigned other functions as allowed by NUREG-0654 Table B1 and NEI 10-05. The Shift Manager provides emergency direction and control and plant operations and assessment of operational aspects.

#### **4.0 BEYOND DESIGN BASIS EXTERNAL EVENT (BDBEE)**

##### 4.1 General Assumptions and Limitations

##### 4.1.1 NEI 12-01 Assumptions Common to Both Assessments (Staffing and Communications)

1. A large-scale external event occurs that results in:
  - a. all onsite units affected
  - b. extended loss of AC power
  - c. impeded access to the units
2. Initially, all on-site reactors are operating at full power and are successfully shut down.

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3. A Hostile Action directed at the affected site does not occur during the period that the site is responding to the event.
4. The event impedes site access as follows:
  - a. Post event time: 6 hours - No site access. This duration reflects the time necessary to clear road way obstructions, use different travel routes, mobilize alternate transportation capabilities, etc.
  - b. Post event time: 6 to 24 hours - Limited site access. Individuals may access the site by walking, personal vehicle or via alternate transportation capabilities.
  - c. Post event time: 24+ hours - Improved site access. Site access is restored to a near-normal status and/or augmented transportation resources are available to deliver equipment, supplies, and large numbers of personnel.

Each licensee should identify transportation and site access-enhancing methods in accordance with Section 3.9 of NEI 12-01, and include this information in the response to Staffing Information Request #4. The Information Request #4 response should also include an overview discussion of how the identified methods will be implemented following a beyond design basis external event.

A staffing assessment may utilize a “no site access” end time of less than 6 hours and greater than or equal to 4 hours, if supported by a documented basis. This basis should include a discussion of the site-specific transportation-related resources and capabilities, and related supporting arrangements, which provide assurance that augmented staff would be available on the site starting at the time used in the assessment. These resources and capabilities could be provided by Company-internal, private or public sources (including vehicles and aircraft, such as helicopters from military and National Guard organizations). All arrangements with the anticipated service providers should be documented (e.g., Letter of Agreement, contract, etc.).

A staffing assessment may not utilize a “no site access” end time of less than 4 hours.

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### 4.1.2 NEI 12-01 Assumptions for Staffing Assessment

1. On-shift personnel are limited to the minimum complement allowed by the site emergency plan (i.e., the minimum required number for each required position). This would typically be the on-shift complement present during a backshift, weekend, or holiday.
2. The NEI 12-01, Phase 1 staffing assessment considered the applicable actions from the SBO coping strategies in place at the time of the assessment.
  - a. Such actions may include the shedding of non-essential battery loads, use of portable generators or batteries, opening room and cabinet doors, water/coolant conservation or makeup using portable equipment, etc.
  - b. These actions do not include those associated with cross-tying AC power sources or electrical distribution busses between units since all on-site units are experiencing an extended loss of AC power.

Following the accident at Fukushima Dai-Ichi, the Institute of Nuclear Power Operations (INPO) issued three Event Reports (referred to as IERs) requiring the assessment and implementation of a range of actions intended to improve the capabilities for responding to a beyond design basis event and an extended loss of AC power, including events that impact the cooling of spent fuel. The staffing assessments performed in response to the NRC letter should include consideration of those IER improvement actions already implemented at the time of the assessment (e.g., incorporated into plant procedures).

Sites with existing strategies for responding to an extended loss of AC power affecting all on-site units should consider those actions in their NEI 12-01, Phase 1 staffing assessment.

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### 4.1.3 Other Assumptions for Staffing Assessment

1. For purposes of assessing augmented staffing, it is assumed that the on-shift staff successfully performs all Initial Phase, and any Transition Phase, coping actions.

***Initial Phase** – Implementation of strategies that generally rely upon installed plant equipment.*

***Transition Phase** – Implementation of strategies that involve the use of portable equipment and consumables to extend the coping period, and maintain or restore the functions of core cooling, containment, and spent fuel pool cooling.*

2. For purposes of this analysis, 6 hours will be used as the time period for the conduct of on-shift ERO Phase 1 initial response actions.

### 4.1.4 NEI 10-05 Applicable Assumptions to Support Methodology

1. On-Shift personnel can report to their assigned response locations within timeframes sufficient to allow for performance of assigned actions.
2. The on-shift staff possesses the necessary Radiation Worker qualifications to obtain normal dosimetry and to enter Radiologically Controlled Areas (but not high, locked high or very high radiation areas) without the aid of a Radiation Protection Technician.
3. It is assumed that personnel assigned to the major response area of Plant Operations & Safe Shutdown meet the requirements and guidance established by NRC regulations. Staff performance within this area is not evaluated as part of this assessment, unless a role/function/task from another major response area is assigned as a collateral duty.
4. The on-site security organization is able to satisfactorily perform all tasks related to Site and Protected Area Access Controls, under all event or accident conditions. Performance of this function is regularly analyzed through other station programs and will not be evaluated here, unless a role or function from another major response area is assigned as a collateral duty.
5. Individuals holding the position of radiation protection or chemistry technician are qualified to perform the range of tasks expected of their position.
6. The task of making a simple and brief communication has minimal impact on the ability to perform other assigned functions/tasks, and is therefore an acceptable



collateral duty for all positions. Examples include making a plant page announcement or placing a call for assistance to an offsite resource such as local law enforcement. This assumption does not apply to emergency notification to an Offsite Response Organization (ORO) or the NRC.

7. The task of performing a peer check has minimal impact on the ability to perform other assigned functions/tasks, and is therefore an acceptable collateral duty for all positions. Examples include performing a peer check on a recommended emergency classification or notification form for transmittal to offsite authorities.

### 4.2 Sequence of Events

#### 4.2.1 Beyond Design Basis External Event (BDBEE): Station Blackout (SBO)

- A large-scale external event occurs that results in:
  - All on-site units affected
  - Extended loss of AC power
  - Impeded access to the units
- Initially, both on-site reactors are operating at full power and are successfully shut down.
- The event consists of a loss of offsite power and a failure of all emergency AC power sources resulting in a Station Blackout (Loss of all AC power). All of the emergency diesel generators (EDGs) experience a catastrophic failure, resulting in a complete loss of all AC power.
- Both units experience the extended loss of AC power, there is no “unaffected” unit.
- The BDBEE occurs such that restoration of any AC power source is not possible before the arrival of the augmented ERO personnel. (e.g., 6 hours)
- The event results in a Site Area Emergency based on EAL SS1.1
- On-shift personnel respond to the initiating events in accordance with Plant procedures. The initial response relies upon the turbine driven emergency feedwater pump taking suction from the QCST and feeding a steam generator for decay heat removal. The containment is isolated and RCP seal cooling is secured. The spent fuel pool is not challenged during the initial 6 hours.

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4.2.2 The following procedures were referenced during the event review:

- Common Control Room
  - 1903.010, Emergency Action Level Classification
  - 1903.011, Emergency Response Notifications
  - 1903.030, Evacuation
  - 1203.048 Security event (has B.5.b strategies)
  
- U1 Procedures
  - 1202.001, Reactor Trip
  - 1202.008, Blackout
  - 1202.008 Blackout Basis
  - 1203.036, Loss of 125 VDC
  - 1203.050, SFP Emergencies
  - 1905.001, Emergency Radiological Controls
  - SDS-008, U1 Extended Loss of AC Power
  
- U2 Procedures
  - 2202.001, Standard Post Trip Actions
  - 2202.002, Reactor Trip Recovery
  - 2202.008, Blackout
  - 2202.009, Functional Recovery
  - 2202.010, Standard Attachments
  - 2203.037, Loss of 125VDC DC Electrical Systems
  - 2203.002, SFP Emergencies (AOP)
  - SDS-007, U2 Extended Loss of AC Power

4.2.3 Severe Accident Management Guideline (SAMG)

The overall strategy at ANO is to maintain both units in hot standby and to remove decay heat by feeding the steam generators (SG) using turbine-driven Emergency Feedwater pumps (EFW) with condensate from a seismic qualified source (QCST). Both units use the QCST for decay heat removal. The QCST has inventory sufficient to remove decay heat from both units for 24.5 hours. On this success path, the core is cooled and the SAMG entry condition on the core exit temperature is never met for the 24 hour period prior to the full ERO arrival on site.

It is therefore concluded that the on shift ERO would not be called upon to perform SAMG activities based on loss of core cooling for the event analyzed for this report prior to the assistance of the greater ERO in the emergency facilities

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being available. SAMG developed strategies contained in SDS-008/007, Extended Station Blackout, are used, however, to direct contingency actions.

### 5.0 **EMERGENCY PLAN IMPLEMENTATION**

#### 5.1 On-shift Staff ERO Responsibilities

5.1.1 Each unit has an Operations staff of one Shift Manager (SM), one Control Room Supervisor (CRS), one Shift Technical Advisor (STA), two Reactor Operators (RO), three Auxiliary Operators (AO) and one EP Communicator. For this analysis, the U1 SM assumed the Emergency Director (ED) function and two Communicators were available to perform off-site notifications for this event. Two ROs and 3 AOs were available in each unit to perform plant operations as directed by the CRS using Emergency Operations Procedures (EOPs), Abnormal Operations Procedures (AOPs), and other procedures directed in the EOPs or AOPs. Two RP Technicians and two Chemistry Technicians were available to perform tasks as directed by the Shift Manager in either unit. One of the two Chemistry Technician was assigned the task of dose assessment should a release occur. The U2 Shift Manager was available to assist the ED with other communications such as contacting the CEC and coordinating request for resources.

#### 5.2 Classification

5.2.1 The ED declared a Site Area Emergency based on EAL SS1.1 and directed a protected area evacuation. The ED then directed all on-shift staff to card into an accountability card reader and Security to perform accountability. Card readers are assumed operable based on Security backup battery power. The Shift Manager is capable of performing the Emergency Director function with no collateral duties identified for this event.

5.2.2 After approximately 4 hours, the ED declared a General Emergency based on EAL SG1.1 and determined a shelter Protective Action Recommendation (PAR). The GE declaration may be expected to be made earlier if the ED receives information that on-site and off-site power restoration will not be possible within 4 hours.

#### 5.3 Notification

5.3.1 ANO communication/notification systems have battery backup on loss of power. A Communicator made the notification to the Arkansas Department of Health who notifies the counties. A Communicator notified the ERO using ENRON (Emergency Response Organization Notification). It is assumed ERO members in the 25-mile radius do not receive the notification due to a 25 mile radius power outage. ERO members outside the 25 mile radius are assumed to receive the notification because the equipment implementing the ERON process is located outside the

affected areas. All ERO members are trained to automatically respond to their assigned facilities or a designated staging area when made aware of an area-wide loss-of-grid (e.g., by direct observation, media reports, work-of-mouth, etc.). After completing notifications to the ERO, a Communicator notified the NRC. An additional notification is made to the Corporate Duty Manager. The Communicator(s) is capable of performing the notification function without concurrent collateral duties that could detract from the notification function.

Satellite phones are available in the Control Room and available for the Communicator to use to make notifications when the backup batteries are depleted. The Control Room has a minimum of three satellite phones available to make offsite notifications, NRC notification and other notifications.

#### 5.4 Communication

5.4.1 The telephone system has battery backup and may be used (if available) until the batteries are depleted. As noted in section 5.3.1, satellite phones are available as a backup to the telephone system. Power is lost to the plant paging system in a SBO. Hand-held radios with talk-around capability are available for in-plant communications. The ED will use radios to communicate with the on-shift staff outside of the control room and with security.

#### 5.5 Accident Assessment

5.5.1 A release is not expected since core cooling is maintained by decay heat removal using the turbine driven EFW pump to feed the steam generator and the atmospheric dump valve (ADV) to control pressure. One of the two Chemistry Technicians is assigned the role of dose assessor should a release occur. Sampling is not available due to the loss of power. RP technicians are available to perform on-site and site boundary surveys for detection of an unmonitored release. RP and Chemistry are capable of performing their function, except for sampling, with no collateral duties.

5.6 The station emergency lighting batteries are rated for 8 hours. Flashlights with spare batteries are available to allow portable lighting for the 24 hour duration. Food and water is available for 72 hours duration.

#### 6.0 **ON-SHIFT STAFFING INITIAL PHASE COPING STRATEGIES AND CAPABILITY** **[RFI#1, 1b, 1c]**

6.1 The assessment utilized a "no site access" period of 6 hours per the assumptions in NEI 12-01 Section 2.2. During this 6 hour period, the on-shift staff used installed plant equipment to respond to the event. Per the U1 FSAR, the emergency battery provides sufficient power for a minimum period of 2 hours with an expected period of 4 hours.

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Per the U2 FSAR, the emergency battery provides sufficient power for a minimum period of 8 hours. Per the INPO IER 11-4 Recommendation 2 response, load shed is expected to occur within 2 hours of the SBO. Per SDS-008/007, U1 load shed gives a maximum load time of 16 hours on battery D07 and U2 load shed gives battery 2D11 28 hours and battery 2D12 29 hours load time. The overall strategy at ANO is to maintain both units in hot standby and to remove decay heat by feeding the SGs using turbine-driven EFW pump with condensate from a seismic qualified source QCST. Both units use the QCST for decay heat removal. The CRS in each unit directs the actions of the EOPs and SDS (SAMG Developed Strategy) procedures to mitigate the event. Each unit has 2 ROs and 3 AOs to carry out the actions as directed by the CRS. Load shed and U2 containment isolation are the only actions required to be performed within a prescribed time period.

- 6.1.1 Core Cooling - Instrumentation indication for essential parameters of SG pressure and level, pressurizer pressure and level, and containment pressure remain available for the 6 hour period of no site access. The on-shift staff can maintain core cooling for the initial 6 hour period through natural heat removal from the RCS via the steam generators using manual operation of the turbine drive EFW pump and ADV.
- 6.1.2 Containment - The on-shift staff can maintain containment integrity for the first 6 hours of the SBO. U1 procedure SDS-008, Extended Loss of AC Power, and U2 procedure SDS-007, Extended Loss of AC Power, provides direction to manually close containment isolation valves. U1 and U2 containment pressure and temperature is not expected to exceed design limits for 24 hours after the SBO.
- 6.1.3 Spent Fuel Pool Cooling - The Spent Fuel Pool is not challenged in the initial 6 hour period. Per the note in SDS-007 and SDS-008 and the assumption made per ANO's response to IER 11-04, Unit 2 has just been refueled (20 days from start of refueling) and U1 has been operating for approximately 1 year. U2 SFP time to boil is 20 hours and will reach 10 ft. above the fuel in 78.4 hours. U1 SFP time to boil is in excess of 4 days.
- 6.2 The on-shift staff is capable of implementing all Initial Phase coping strategies. The available staffing is sufficient to implement the actions of the EOPs and SDS timely when directed by the CRS and without collateral duties. The AOs performed non-time critical tasks in series when necessary and were able to timely perform all their assigned functions. The staff performing EOP and SDS procedure plant operations is not assigned any other emergency plan function or task for the conditions of the SBO. Therefore, the performance of Initial Phase coping strategies does not impact the ability of the on-shift staff to perform any required emergency response function. Emergency response function would not be degraded or lost prior to the arrival of the augmented ERO.

### 7.0 TRANSITION PHASE STRATEGIES AND CAPABILITY

#### 7.1 On-shift Staff Transition Phase Coping Actions

- 7.1.1 The Transition Phase requires providing sufficient, portable, on-site equipment and consumables to maintain or restore functions until they can be accomplished with resources brought from off site.

This assessment did not identify any Transition Phase action that must be completed by the on-shift staff within the no-access 6 hour period. The response to SBO was assessed by first reviewing the response procedures, U1 1202.008/U2 2202.008, Blackout, and U1 SDS-008/U2 SDS-007, SAMG Developed Strategy for Extended Loss of AC Power.

Two transition tasks were identified in SDS-008 /SDS-007 that required additional augmented ERO resources but the tasks were not time critical and could be performed after the arrival of the augmented ERO. The two tasks are:

- a. Add inventory to the SFP using Attachment J of 1204.048, Security Event. (Operators, Mechanical Maintenance)
- b. Install Jumper between spare (D02-21B) and Spare (D01-21B) per SDS-008, Extended Loss of AC Power. (Electrical)

Makeup to the SFP is necessary in approximately 20 hours and the jumper should be installed before 16 hours.

#### 7.2 Augmented ERO Transition Phase Coping Actions

- 7.2.1 **Transition Phase** – *Implementation of strategies that involve the use of portable equipment and consumables to extend the coping period, and maintain or restore the functions of core cooling, containment, and spent fuel pool cooling.*

- 7.2.2 The following Transition Phase tasks are assumed to be performed by the augmented staff within the 6-24 hour period after limited ERO members arrive:

1. **[U1]** Install Jumper between spare (D02-21B) and Spare (D01-21B) per SDS-008, Extended Loss of AC Power. (Electrical)
  - Electrical maintenance is not on shift and operators are not trained to install the jumper. This task must be performed after Attachment 1 load shed is complete and between 6 hours and 16 hours by the augmented ERO. Installing the jumper and performing Attachment 3 before the end of the 16 hour battery load will add an anticipated 18 hours of critical parameter indication. Failure to install the jumper and cross-tie the bus

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will result in the loss of these indications. The jumper, reserved for this task and stored in the breaker shop [CR-ANO-C-2011-01950 CA 00031], would be installed using a team of 2 electrical/I&C technicians with an estimated performance time of 2 hours. The assumption is made that the 2 electrical / I&C technicians would be able to augment the on-shift staff following the 6 hour no site access period and prior to the loss of the DC battery bus.

2. **[Both units]** Makeup to the SFP (both units) using procedure 1203.048, Security Event, Attachment J within approximately 20 hours of blackout. (Operators, Mechanical Maintenance)
  - Procedures SDS-008/SDS-007 directs the makeup of the SFP using applicable portions of 1203.048, Security Event, Attachment J within 20 hours of the blackout. Attachment J utilizes the B.5.b pump to makeup inventory to the SFP. This task requires 2 people (1 must be operator) and approximately 2 - 2½ hours to align the makeup water source. The task would be performed by the limited access augmented ERO operators and Mechanical Maintenance personnel assumed to arrive on site after 6 hours. The lineup would be required to be completed prior to the SBO 20 hour period.
  - Involves aligning the portable B.5.b pump which is stored on site and involves retrieving and installing the pump and hoses. The 2 individuals needed for this task will stay with the equipment until makeup is secured. Time to fill the pool is dependent on level when started. Operators are trained to perform this task.

- 7.3 To perform the Transition Phase actions, the expanded ERO requires 2 electrical/I&C technicians for U1 and a team of 1 fire brigade qualified AO and 1 Mechanical Maintenance or AO from either unit. These augmented ERO members are capable of performing the Transition Phase coping strategies.

Entergy response to IER 11-01 for B.5.b/SAMG (CR-ANO C-2011-727 CA4) documents the review of SAMG/B.5.b training procedures and training records. The IER review documents that ANO has an adequate level of qualified Operators and site support staff available to implement the strategies included in the SAMG/B.5.b document for both units.

### 8.0 **AUGMENTED ERO**

- 8.1 ERO Response

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Emergency Response Organization members are instructed to respond to their assigned Emergency Response Facility (ERF) or, if that facility is inaccessible, to the alternate facility. In support of this requirement, training material FCBT-EP-RESP, Entergy ERO Responsibilities, and FCBT-EP-ERO ROLES, ERO Roles and Responsibilities provides information to direct the actions individuals should take if they become aware of a grid disturbance or significant natural disaster (e.g., earthquake, tornado, flood).

### 8.2 ERO Notification

8.2.1 ANO has four (4) qualified ERO teams, with a team on call 24/7, to respond to any Alert or higher emergency declared by the Shift Manager. EN-EP-801, Emergency Response Organization, lists the expectations and responsibilities of ERO members. To facilitate a timely and effective response, the following procedure section applies:

#### Section 5.2.2

- Respond promptly to actual emergencies, pager tests and off-hours/unannounced drills when available, regardless of whether on-call or not. ERO members not on-call are expected to respond unless they are unavailable.

Additionally, if a wide-area loss of grid occurred that degraded the capability to notify the ERO to respond, ANO has communicated the expectation to the ERO to ensure that "ERO members are trained to automatically respond to their assigned facilities or a designated staffing area when made aware of an area wide loss-of-grid (e.g., by direct observation, media reports, word-of-mouth, etc.)."

8.2.2 If a loss of telephone or internet services were to occur, satellite phones in the control room may be used to activate the ERO.

### 8.3 ERO Notification with Degraded Communications Capabilities (RFI#3)

8.3.1 Requested Information#3: *Identify how the augmented staff would be notified given degraded communications capabilities.*

- Entergy provided a response to RFI #3 in *Entergy's 90-Day Response to the March 12, 2012, Information Request, Action Plan for Completing Emergency Communication and Staffing Assessments* dated June 8, 2012 (OCAN061201).
- This section provides additional information to the response.

8.3.2 NEI 12-01 Section 4.4 offers two potential options to promote timely staff augmentation by the ERO:



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- ERO members can be notified of the emergency using a method that would be operable under the assumed event conditions (e.g., satellite pagers), AND/OR
- ERO members are trained to automatically respond to their assigned facilities or a designated staging area when made aware of an area wide loss-of-grid (e.g., by direct observation, media reports, word-of-mouth, etc.).

This requested information is addressed in *Entergy Response to NRC Technical Issues for Resolution Regarding Licensee Communication Submittals Associated with Near-Term Task Force Recommendation 9.3* dated February 20, 2013.

ANO will ensure that “*ERO members are trained to automatically respond to their assigned facilities or a designated staffing area when made aware of an area wide loss-of-grid (e.g., by direct observation, media reports, work-of-mouth, etc.)*.” This expectation has been communicated to the ERO and included in initial and annual ERO requalification training.

ERO members were made aware of the expectation by a notice sent to all ERO members and shop craft members by the EP Manager on 5/30/12. This action is documented in the corrective action program LO-HQNLO-2011-00138 CA-18.

The expectation was also included in the following training material:

- ASCBT-EP-EROEXP, ANO ERO Expectations, which is included in all ERO members’ training plan
- FCBT-EC-RESP, Entergy Nuclear Emergency Response Organization Responsibilities
- FCBT-EP-ERORoles, ERO Roles and Responsibilities

### 8.4 Augmented ERO Site Access (RFI#4)

8.4.1 Requested Information#4: *Identify the methods of access (e.g., roadways, navigable bodies of water and dockage, airlift, etc.) to the site that are expected to be available after a widespread large scale natural event.* Entergy provided a response to RAI #4 in *Entergy’s 90-Day Response to the March 12, 2012, Information Request, Action Plan for Completing Emergency Communication and Staffing Assessments* dated June 8, 2012 (OCAN061201)

- This section provides additional information to the response. Per the assumptions of NEI 12-01, the event impedes site access as follows:
- *Post event time: 6 hours – No site access. This duration reflects the time necessary to clear roadway obstructions. Use of different travel routes,*

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*mobilize alternate transportation capabilities (e.g., private resource providers or public sector support) etc*

- 8.4.2 ANO assumes that limited augmented ERO resources will be available at six hours post-event time to full ERO staffing at 24 hours. In the event that the site cannot be accessed via the roadways, personnel will report to the alternate EOF in Russellville or county Emergency Operations Centers (EOC).
- 8.4.3 A Phase 1 Staffing Assessment Team member reviewed the Emergency Plan and Letters of Agreement and interviewed State and County officials to confirm the assistance provided to ANO.

### A. Alternate Transportation – Primary Method

In the event that the site cannot be accessed via the roadways, ERO personnel will report to the alternate EOF or the EOC in Yell, Logan or Johnson counties where the statewide AWINS radio system or satellite phones can be used to coordinate the pickup and transport of ANO personnel to the site. ANO has a verbal agreement with the Arkansas State Police (ASP) that, in the event of restricted site access following a BDBEE, they will provide a helicopter and transport ERO personnel to the ANO site. ASP has one helicopter (Bell 407) capable of transporting two pilots and 4 passengers. Per ASP this unit would already be assigned to this area (if ANO was in the epicenter of the disaster) in order to insert additional ASP resources for enhanced security purposes. ASP would make it available until such time that they are relieved by National Guard air resources and private contractors. Helicopters are able to land at the alternate EOF and county EOCs and will use the ANO Helicopter Pad (LZ) in the SW corner of the site to land at the site. The Arkansas National Guard has an agreement with Arkansas Department of Emergency Management (ADEM) to transport personnel and equipment via helicopter in a variety of disasters. Any county can declare a state of emergency and request support from the National Guard through ADEM. Mobilization times for National Guard helicopters can range from an estimated three to four hours following approvals from the chain of command. Therefore, the ASP is the preferred option for initial response and the National Guard will replace the ASP as soon as possible.

It is reasonable to assume that the ASP will be notified within one hour of the event. ASP estimates 60 minutes from time of notification until arrival at the alternate EOF or county EOCs as directed. However, bad weather will cause a delay for additional preflight checks. If the aircraft is committed on another mission south of Little Rock this could delay response time to redirect the flight. Given these considerations, it is reasonable to assume that within three hours post-event time, a helicopter will arrive at the ANO alternate EOF and begin

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transporting ERO staff to the site. The helicopter can transport four persons per trip and ASP estimates 20 minutes for a round trip (alternate EOF to the ANO site and back). This time would be approximately 35 minutes for round trips to the county EOCs. Once the National Guard takes over transport duties, the Blackhawk helicopter is capable of transporting from 12-14 personnel at a time.

Based on this strategy, it is assumed sufficient ERO personnel will be available at six hours post-event time to support the on-shift staff in completing the required coping and Transition Phase strategies.

### B. Additional Methods of Site Access

The following methods of access are available to the ANO site. One or more of these methods are expected to be available after a widespread large scale natural event:

#### 1. Types of Transport

##### a) Airlift

- ANO Helicopter Landing Pad in SW portion of site is primary Landing Zone (Primary)
- ANO site Parking lots - ANO Security has portable landing pad equipment to mark landing sites (special lights, wind tape and poles). (Alternate)
- Several large, level, open fields at the ANO site such as the one adjacent to the Met Tower on east side of the site and near the Emergency Core Cooling Pond on the NW side. (Second Alternates)

##### b) Water

- ANO use of plant boats leaving from ANO barge dock, traveling across Lake Dardanelle to the Lake Dardanelle State Park boat launch.
- Pope County Office of Emergency Services-Search and Rescue division will also move personnel from the various boat launch ramps across Lake Dardanelle and from locations along the Arkansas River to the site for ERO members residing in the Yell, Logan or Johnson County Area.
- The Little Rock District Corps of Engineers also has boats based at Dardanelle Dam that could be requested through the Arkansas Department of Emergency Management to support movement of personnel.

##### c) Roadways

- U.S. Highway 64 East and West to Arkansas State Highway 333 to site access roads

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- (1) primary (ANO Main Access Road)
  - (2) alternate access roads (Evacuation Access Road 2 to Flatwood Drive to Hwy 333; and May Road to Hwy 333).
  - Interstate 40 near ANO parallels U.S. Hwy 64 about 75 yards away with multiple exit ramps onto Hwy 64.
2. Transport providers for the above types of transport available to ANO include:
- a) Airlift
- Arkansas State Police
  - Arkansas National Guard Camp Robinson
  - Entergy has contracts with multiple private helicopter providers throughout the system
- b) Water
- ANO plant boats
  - Pope County OEM-Search and Rescue
  - U.S Army Corp of Engineers
  - Lake Dardanelle State Park Marina
- c) Roadways
- Personal vehicles
3. Provisions for restoring site access at ANO include:
- a) Pope, Johnson, Logan and Yell Counties will coordinate with the Arkansas State Highway Administration District 8 Headquarters in Russellville to remove traffic impediments restore traffic flow for evacuation and/or return of ANO employees. The activities involved may include: debris clearance; emergency repairs to roads and bridges; maintaining essential plant services; and assistance, when needed, with the removal of road impediments. The evacuation route includes Arkansas State Highway Route 333. Verbal agreement exists from the Pope County Judge to assist the State Highway Department with debris removal on Hwy 333 if the state cannot perform this task in a timely manner.
4. The following agreements with ANO are in place:
- a) Arkansas Department of Emergency Management agrees to activate the state emergency plan which includes ESF actions to the National Guard, Arkansas State Highway Department and multiple other state and federal

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agencies such as the US Army Corp of Engineers to deal with this emergency and support ANO as described above.

- b) The Pope, Yell, Logan and Johnson County Radiological Emergency Planning (REP) Plans call for counties and municipal entities to use their road department resources to clear and maintain evacuation routes as necessary. This would include State Hwy 333 if the state highway department is not able to provide service to this key evacuation route due to other priority work.
- c) Note: Arkansas has Initiated Act 175-110 et al, "Emergency Management Act " that provides a state overall mutual aid agreement for all 75 counties that provides means of full integration and support between state, county and local emergency services that is coordinated through the Arkansas Department of Emergency Management.

### C. Corporate Resources

Additional logistics support is available from the Entergy Corporate Emergency Center (CEC) located at the headquarters in Jackson, MS. Once notified that a station is in a declared emergency and station blackout, the CEC should be activated using EN-EP-601, Corporate Emergency Center Operations. The purpose of the CEC is to provide site support to an Entergy station(s) during declared emergencies, recovery operations, severe weather events, or off-normal events. The CEC serves as the central command area for coordinating fleet resources. The CEC coordinates requests for additional equipment and materials, and support services/resources from Entergy sites or corporate headquarters, contractors, vendors, or other outside agencies. The CEC has resources to contract helicopter services, tree trimming services for site access, etc. as necessary to provide ERO site access. The CEC may also coordinate with the Entergy Transmission and Distribution system for prioritization for restoring power and request for tree trimming assistance to clear roads.

The CEC is located in Jackson, MS and is outside the 25 mile radius of any Entergy station. It is assumed the CEC would be fully functional to support ANO in an extended SBO. ANO control room and the CEC have satellite communication capability.

### 8.5 Expanded ERO

- 8.5.1 The current ANO augmented ERO would be challenged to effectively respond to a BDBEE that resulted in an extended loss of AC power affecting both units. In an event of this magnitude, it would be necessary to "expand" the capability of the

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augmented ERO in order to facilitate timely and effective performance of critical emergency response functions. The focus of this “expanded response capability” at ANO should be to enable the performance of unit-specific accident assessment and mitigation functions.

NEI 12-01 Table 3.1 lists the emergency response functions identified by the NEI Beyond Design Basis Event Response Staffing Study Task Force as meeting expanded response requirements. NEI 12-01 Table 3.1 further provides key roles and staffing considerations for each expanded response function and specifies the staffing necessary to support the simultaneous deployment of emergency repair and corrective action teams to each affected unit.

The personnel required for implementation of strategies for a BDBEE may vary depending upon several factors. However, the process should facilitate a flexible response strategy that can be applied in a graded approach by the ERO personnel on a unit/priority specific basis (i.e., the extent/type of BDBEE and associated event challenges would correspond to the expansion/contraction of the expanded ERO and the assignment of unit specific expanded ERO response functions and unit specific resources).

NEI 12-01 Table 3.1 was compared to the recommended ERO staffing listed in EN-EP-801, Emergency Response Organization and the ANO ERO roster at the time of the assessment data collection. This method identified expanded ERO candidates from the existing ERO to perform the functions identified in Table 3.1 regardless of the BDBEE event.

### 8.5.2 Table 8-1 Expanded Response Functions for ANO Phase 1 Staffing

<b>TABLE 8-1</b>				
<b>Expanded Response Function from NEI 12-01, Table 3.1</b>	<b>Key Roles and Staffing Considerations</b>	<b>ANO ERO Position Performing this Function and Available Staff Resources</b>	<b>ERO Available to Implement Coping Strategies for 2 units</b>	<b>ANO ERF Reporting Location</b>
Unit Response Coordination	<ul style="list-style-type: none"> <li>• Overall cognizance of the activities related to implementation of repair and corrective actions, and implementation of Transition Phase coping and Severe Accident</li> </ul>	Emergency Plant Manager (EPM) / TSC Manager  <ul style="list-style-type: none"> <li>• ANO maintains 4 qualified Emergency Plant Managers and 4</li> </ul>	This requires a <b>new position</b> for a multi-unit event to allow the EPM to maintain the TSC oversight and TSC Manager to manage TSC	TSC

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**TABLE 8-1**

<b>Expanded Response Function from NEI 12-01, Table 3.1</b>	<b>Key Roles and Staffing Considerations</b>	<b>ANO ERO Position Performing this Function and Available Staff Resources</b>	<b>ERO Available to Implement Coping Strategies for 2 units</b>	<b>ANO ERF Reporting Location</b>
	Management (SAM) strategies for an assigned unit <ul style="list-style-type: none"> <li>• One individual per unit; individuals should not be assigned other functions</li> </ul>	TSC Managers <ul style="list-style-type: none"> <li>• May be filled by EPM or TSC Manager</li> </ul>	operation. N+2 (new position) Filled by existing EPMs or TSC Managers	
Operations Coordination	<ul style="list-style-type: none"> <li>• Provides coordination of Operations staff and support for an assigned unit</li> <li>• One individual per unit; individuals should not be assigned other functions</li> </ul>	Operations Coordinator <ul style="list-style-type: none"> <li>• ANO maintains an Operations Coordinator (U1) and Operations Coordinator (U2) on each ERO team.</li> </ul>	Operations Coordinators N+1	TSC
Maintenance Coordination	<ul style="list-style-type: none"> <li>• Provides coordination of Maintenance staff and support for an assigned unit</li> <li>• One individual per unit; individuals should not be assigned other functions</li> </ul>	Maintenance Coordinator <ul style="list-style-type: none"> <li>• ANO maintains a minimum of 4 qualified Maintenance Coordinators</li> </ul>	Maintenance Coordinators. N+1	TSC
Engineering Coordination	<ul style="list-style-type: none"> <li>• Provides coordination of Engineering staff and support for an assigned unit.</li> <li>• One individual per unit; individuals should not be assigned other functions.</li> </ul>	Engineering Coordinator <ul style="list-style-type: none"> <li>• ANO maintains a minimum of 4 qualified Engineering Coordinators</li> </ul>	Engineering Coordinators N+1	TSC
Engineering Assessments	<ul style="list-style-type: none"> <li>• One team for each unit to perform engineering assessments in support repair and corrective</li> </ul>	Engineers <ul style="list-style-type: none"> <li>• The ERO requires a minimum of 1</li> </ul>	Mech. Engineer N+1 Elec/I&C Engineer N+1	TSC

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**TABLE 8-1**

<b>Expanded Response Function from NEI 12-01, Table 3.1</b>	<b>Key Roles and Staffing Considerations</b>	<b>ANO ERO Position Performing this Function and Available Staff Resources</b>	<b>ERO Available to Implement Coping Strategies for 2 units</b>	<b>ANO ERF Reporting Location</b>
	<p>actions.</p> <ul style="list-style-type: none"> <li>• Team composition (i.e., number and represented disciplines) as described in the emergency plan.</li> <li>• Team may include personnel responsible for performing other functions for the same assigned unit.</li> </ul>	<p>Mechanical Engineer, 1 Electrical/I&amp;C Engineer and 1 Reactor Engineer on each ERO team.</p>	<p>Reactor Engineer N+1</p> <p>Duty concurrent with Engineering Assessments</p>	
<p>Evaluation of Severe Accident Management (SAM) Strategies</p>	<ul style="list-style-type: none"> <li>• One team for each unit to evaluate selection of SAM strategies; team performs evaluations not done by Control Room personnel.</li> <li>• Team composition (i.e., number and represented disciplines) as described in governing site programs, procedures and guidelines.</li> <li>• Team may include personnel responsible for performing other functions for the same assigned unit.</li> </ul>	<p>Operations Coordinator / Engineering Coordinator / Engineers</p>	<p>Ops Coordinator N+1</p> <p>Eng. Coordinator N+1</p> <p>Engineers (ME, EE, RE) N+3</p> <p>Duty concurrent with ERO position responsibilities</p>	<p>TSC</p>
<p>Unit In-Plant Team Coordination</p>	<ul style="list-style-type: none"> <li>• Overall cognizance of on-site and in-plant teams performing or supporting repair and corrective actions for an assigned unit.</li> <li>• One individual per unit;</li> </ul>	<p>Work Control Coordinator</p> <p>ANO maintains a minimum of 4 qualified Work Control Coordinators,</p>	<p>Work Control Coordinators N+1</p>	<p>OSC</p>



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<b>TABLE 8-1</b>				
<b>Expanded Response Function from NEI 12-01, Table 3.1</b>	<b>Key Roles and Staffing Considerations</b>	<b>ANO ERO Position Performing this Function and Available Staff Resources</b>	<b>ERO Available to Implement Coping Strategies for 2 units</b>	<b>ANO ERF Reporting Location</b>
	individuals should not be assigned other functions.	1/team.		
Non-Licensed Operators (NLO)	<ul style="list-style-type: none"> <li>• Two individuals per unit to assist with implementation of repair and corrective actions.</li> <li>• Should not include members of the on-shift staff.</li> </ul>	Non-Licensed Operators	4	OSC
Mechanical Maintenance Repair and Corrective Action	<ul style="list-style-type: none"> <li>• Two individuals per unit to implement repair and corrective actions.</li> <li>• Staffing may include an on-shift individual (i.e., 2 individuals for a unit composed of 1 on-shift and 1 augmented)</li> </ul>	No maintenance positions on shift.	4	OSC
Electrical Maintenance Repair and Corrective Action	<ul style="list-style-type: none"> <li>• Two individuals per unit to implement repair and corrective actions.</li> <li>• Staffing may include an on-shift individual (i.e., 2 individuals for a unit composed of 1 on-shift and 1 augmented)</li> </ul>	No maintenance positions on shift.	4	OSC
I&C Repair and Corrective Action	<ul style="list-style-type: none"> <li>• Two individuals per unit to implement repair and corrective actions.</li> <li>• Staffing may include an on-shift individual (i.e., 2 individuals for a unit composed of 1 on-shift and 1 augmented)</li> </ul>	No maintenance positions on shift.	4	OSC

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<b>TABLE 8-1</b>				
<b>Expanded Response Function from NEI 12-01, Table 3.1</b>	<b>Key Roles and Staffing Considerations</b>	<b>ANO ERO Position Performing this Function and Available Staff Resources</b>	<b>ERO Available to Implement Coping Strategies for 2 units</b>	<b>ANO ERF Reporting Location</b>
Implementation of SAMG Strategies	<ul style="list-style-type: none"> <li>Number and composition of personnel capable of simultaneous implementation of any 2 SAM strategies at each unit.</li> </ul>	The TSC/OSC implements the SAMG. <b>Unit 1</b> 1 – BWST refill from external source  2 – Install external source water to MFW piping <b>Unit 2</b> 1. Spray down outside of Containment  2. Depressurize the RCS	3 Operators 2 Mechanical Maint.  4 Operators 2 Mechanical Maint.  2 Operators 2 Craft  1 RO & 1 AO	OSC
RP Techs	<ul style="list-style-type: none"> <li>Number needed to support implementation of any 2 extended loss of AC power coping strategies per unit. Determine this number by reviewing strategies for each unit.</li> <li>Number needed for repair and corrective action.</li> <li>Number of on-site RP Technicians performing other emergency plan functions that would preclude them from performing job coverage for extended loss of AC power coping, repair or</li> </ul>	RP Techs	8	OSC

## Entergy Arkansas Nuclear One NEI 12-01 Phase 1 Staffing Assessment

TABLE 8-1				
Expanded Response Function from NEI 12-01, Table 3.1	Key Roles and Staffing Considerations	ANO ERO Position Performing this Function and Available Staff Resources	ERO Available to Implement Coping Strategies for 2 units	ANO ERF Reporting Location
	corrective action teams			

### 8.5.3 On Site Radiation Protection Technicians

The ANO process for providing an expanded response capability will include provisions for a minimum number of available Radiation Protection (RP) Technicians following a BDBEE to support performance of emergency plan functions and expanded response capability.

Per NEI 12-01, the equation is used to determine the required number of on-site RP Technicians (RPTs):

$$RPTT = RPTCOP + RPTRCA + RPTNC$$

Where:

RPTT = Total required number of on-site RP Technicians

RPTCOP = Number needed to support implementation of any 2 extended loss of AC power coping strategies per unit. Determine this number by reviewing strategies for each unit.

RPTRCA = Number needed for repair and corrective action

= 2 x the number of units

RPTNC = Number of on-site RP Technicians performing other emergency plan functions that would preclude them from performing job coverage for extended loss of AC power coping, repair or corrective action teams.

#### **For ANO U1 & U2:**

RPTCOP = 2 RP Technicians (Assume no core damage, no leakage, no release, 1 to make containment entry and 1 to monitor and support filling SFP)

RPTRCA = 4 RP Technicians (2 per Unit)

RPTNC = 2 RP Technician (Off-site Surveys)

RPTT = 8 RP Technicians

RPTCOP – FLEX equipment and procedures are not in place at this time to evaluate coping strategy implementation. Using the existing EOP and SDS procedures, the only RP job coverage required is containment entry and a survey of the spent fuel pool area while makeup components are being installed or if boiling occurs. Other than the SDS procedure, entry into SAMG was not required. The 2 identified tasks would require 2 RP technicians.

### Provisions to obtain additional RP Techs

For ANO, the complement of RP Technicians specified in the augmented ERO per the Emergency Plan is six 60 minute responders and six additional 90 minute responders. Therefore, sufficient RP Technicians are anticipated to be available from site resources to support the initial staffing of the Expanded Capability. Additional RP Technician resources are available from other Entergy sites.

Should additional RP Technicians be required, the Corporate Duty Manager, if the CEC is not activated, or the Corporate Emergency Center (CEC) will contact the other Entergy sites to obtain additional RP staff (Entergy or Contract personnel) to support ANO. Procedure EN-EP-601, Corporate Emergency Center Operations, describes the conduct of the CEC. The CEC may also contact INPO to coordinate request for assistance from other utilities or vendors per the Nuclear Power Plant Emergency Response Voluntary Assistance Agreement.

#### 8.5.4 Administrative Support Personnel

ANO has implemented the Entergy Fleet Standard ERO which includes a Log Keeper position in the CR, OSC, EOF, and JIC. The Log Keeper will fill the needs of administrative support. Additional administrative staff members respond to the ERO call-out and are available for the expanded ERO if needed.

#### 8.5.5 Work Areas for Personnel Performing Expanding Response Functions

- The EOF is located in the Training Building. Walkdowns of these areas identified sufficient space is available in adjacent offices, conference rooms, and classrooms to support the role of the expanded response functions.
- The TSC is located in the Administration Building. Walkdowns of these areas identified sufficient space is available in adjacent offices and conference rooms to support the role of the expanded response functions.

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- The OSC is located in the Maintenance Facility. Walkdowns of these areas identified sufficient space is available in adjacent offices and administrative work areas to support the role of the expanded response functions.
- A Secondary TSC and Secondary OSC are located at the EOF. The Alternate EOF is located in Russellville. Alternate facilities may be used if needed.

### 8.5.6 Expanded ERO for SAMG Actions

SAMG was reviewed for U1 and U2 to determine the strategies requiring the greatest number of staff.

**Unit 1**, all but 2 strategies require energized pumps or equipment. The 2 strategies not requiring energized pumps or equivalent utilize the B.5.b pump. In a situation where the expanded ERO would perform the SAMG strategies in an extended loss of offsite power, the 2 strategies would have to be performed in series since only (1) B.5.b pump is available.

- Unit 1 Strategies if not in a SBO:  
If the expanded ERO is utilized because both units are in SAMGs, the U1 non-blackout SAMG strategies each require 2 operators. An example of 2 strategies are to inject water into the RCS, requiring 2 AOs and approximately 2½ hours to accomplish, and to spray RB atmosphere which requires 2 AOs and approximately 2 hours to complete. A total of 4 AOs are needed to implement both strategies.
- Unit 1 SAMG Strategies if in SBO:  
SAM Strategy #1 BWST refill, installing external source to obtain water
  - 5 people (3 Ops/craftsman, 2 mechanics) takes approximately 1.5 hours if tasks to move and connect the B.5.b pump, route hoses, and remove man-way from BWST are performed concurrently.OR
  - 2 people (1 Ops, 1 craftsman) take 4.5 hours if tasks are performed in series.SAM Strategy #2 - Other feedwater option, installing external water source to Main FW piping
  - 6 people (4 operators, 2 mechanics) take 3 hours if tasks to move and connect the B.5.b pump, route hoses, make the connections, and perform valve alignment are performed in parallel concurrently.

OR

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- 2 people (1 Ops, 1 mechanic) take 6.5 hours if tasks are performed in series

**Unit 2**, most strategies require energized pumps or equipment.

- Unit 2 Strategies if not in SBO:  
SAM Strategy #1 Inject into the SG requires 1 RO and 2 AOs for approximately 1 hour.  
SAM Strategy #2 Spray down outside containment requires 2 operators and 2 craft approximately 2.5 hours.
- Unit 2 Strategies if in SBO:  
SAM Strategy #1 Spray down outside containment requires 2 operators and 2 craft approximately 2.5 hours. Uses fire protection water or fire pumper truck.  
SAM Strategy #2 Depressurize the SG requires 1 AO approximately 1 hour.

### 8.6 Staffing the Expanded Response Functions

8.6.1 NEI 12-01 states: A licensee should ensure the availability of a sufficient number of personnel to perform expanded response functions. This may be done in several ways, including:

- Assign responsibilities to existing ERO positions. Per NRC Letter Staffing Information Request #1, the potential impacts from the assignment of new collateral duties should be assessed.
- Establish provisions for calling out additional individuals from the existing augmented ERO staff (e.g., calling out 2 engineering teams at a 2-unit site).
- Select and qualify additional personnel. Sources of additional staffing include site, corporate or contracted personnel. Site Security Department resources may also be considered.
- Consider the application of remote data access, meeting and other communications technologies to support the availability of required staffing

8.6.2 Entergy will establish guidance to fill the expanded ERO positions from the call-out of the existing augmented ERO. **[Enhancement]** The ERO consist of 4 qualified teams. Two teams will be utilized to fill the ERO positions for 12 hour rotation duty. The other 2 teams will be used to fill the expanded ERO positions

for 12 hour rotations. The expanded response position will be filled with ERO members qualified for the position but training drills have not included an expanded ERO or simultaneous mitigation strategies on both units.

### 9.0 **ON-SITE STAFF'S ABILITY TO MOVE BACK-UP EQUIPMENT [RFI#1a]**

- 9.1 US Nuclear Regulatory Commission (NRC) letter, Request for Information Pursuant to Title 10 of Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated March 12, 2012 REQUESTED INFORMATION states in part

*The following functions are requested to be assessed:*

*How onsite staff will move back-up equipment (e.g., pumps, generators) from alternate onsite storage facilities to repair locations at each reactor as described in the Order regarding the NTTF Recommendation 4.2. It is requested that consideration be given to the major functional areas or NUREG 0654 Table B-1, such as plant operations and assessment of operational aspects, emergency direction and control, notification/communication, radiological accident assessment, and support of operational accident assessment, as appropriate.*

- 9.1.1 Back-up equipment was not installed and associated procedures were not developed at the time of this assessment. The response to this request requires that the procedures to support the mitigating strategies, as described in the Order regarding the NTTF Recommendation 4.2, be developed to determine the applicable staffing. The schedule for the response to the order does not support the timing requirements of the Phase 1 staffing assessment.

This information will be provided in the Phase 2 Staffing Assessment. Refer to Entergy Letter (OCAN051202) to NRC *Entergy's 60-Day Response to the March 12, 2012, Information Request, Action Plan for Completing Emergency Communication and Staffing Assessments* dated May 11, 2012 which contains the following commitments:

1. Conduct the onsite and augmented staffing assessment considering functions related to NTTF Recommendation 4.2. Scheduled completion date May 5, 2014.
2. Provide onsite and augmented staffing assessment considering functions related to NTTF Recommendation 4.2. Scheduled completion date June 5, 2014.

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### 10.0 STAFFING ASSESSMENT COMPLETION OF NEI 10-05 STYLE TABLES

- 10.1 Refer to Attachment 1, NEI 10-05 Style Staffing Table for ANO, for documentation of the on-shift staffing analysis results.
- 10.2 There were no potential overlaps of tasks identified. The most limiting positions were determined to be the Auxiliary Operators (AO). The AO tasks were assigned as shown in Table 10.1 below.

**Table 10.1: ANO AO Utilization**  
(Time in Minutes)

	0-15	15-30	30-45	45-60	60-75	75-90	90-105	105-120
U1 AO #1		F	I					
U1 AO #2		D	H				E	
U1 AO #3		G						
U1 AO #4	A							
U2 AO #1		I						
U2 AO #2		D	O	E	E	E	E	
U2 AO #3			K		G			
U2 AO #4	B, C							

	120-135	135-150	150-165	165-180	180-195	195-210	210-225	225-240
U1 AO #1	I							
U1 AO #2	J	K	L	M				
U1 AO #3	G							
U1 AO #4	A							
U2 AO #1	I							
U2 AO #2	P		P				Q	H
U2 AO #3	G							



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U2 AO #4	B, C							
	240-255	255-270	270-285	285-300	300-315	315-330	330-345	345-360
U1 AO #1	I							
U1 AO #2							N	
U1 AO #3	G							
U1 AO #4	A							
U2 AO #1	I							
U2 AO #2	H			E	E	E		
U2 AO #3	G							
U2 AO #4	B, C							

- A. Communicator/notifications
- B. Assist Communicator NRC open line (NRC open line between getting SFP level & Temp)
- C. Maintain log SFP level & temperature (log every 30 min. to determine rate of change then hourly)
- D. Attempt to start D/G
- E. DC load shed
- F. Isolate Letdown & RCP seal
- G. Monitor/Control TDEFW locally
- H. Generator hydrogen purge
- I. Manual operation of ADV
- J. Close Block valve & ICW isolation valve locally
- K. Close doors SFP area / hatch/elevator
- L. Monitor Battery Room temperature
- M. Monitor QCST level
- N. Line up makeup to SFP/B.5.b pump
- O. Secure Inverter
- P. Close containment isolation valves/containment entry
- Q. Secure pumps locally

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10.3 The analysis did not identify any new or non-validated tasks or potential overlap tasks that would require a Time Motion Study to be performed

### 11.0 **CHANGES / INTERIM ACTIONS TO SUPPORT PHASE 1 STAFFING ASSESSMENT** **(RFI#5)**

11.1 Requested Information#5: *Identify any interim actions that have been taken or are planned prior to the completion of the staffing assessment.*

- Entergy provided a response to RFI #5 in *Entergy's 90-Day Response to the March 12, 2012, Information Request, Action Plan for Completing Emergency Communication and Staffing Assessments* dated June 8, 2012 (OCAN061201).
- This section provides additional information to the response.

### 11.2 Staffing Changes

The existing on-shift staff is sufficient to implement the existing SBO strategies on both units, simultaneously, while supporting performance of the required Emergency Planning duties without unacceptable collateral duties. No staffing changes are required. The emergency plan will not be changed as a result of the on-shift or augmented staffing necessary to respond to a loss of all ac power.

### 11.2 Expanded Capability Staffing

The existing augmented ERO provides sufficient staffing to satisfy the Expanded Capability functions as defined in NEI 12-01, Table 3.1. Additional staffing support is available from Entergy fleet resources (Grand Gulf, River Bend, Waterford, Palisades, Fitzpatrick, Indian Point, Vermont Yankee, and Pilgrim) as well as the Corporate organization at Jackson, Ms. Resources, including Operations, Maintenance, Instrumentation and Controls, Radiation Protection, and Engineering, are routinely shared during refueling outages. This experience, along with the common structure of Entergy's processes enables personnel shared between sites to support site-specific activities. Should the event require long-term staffing, additional resources are available from the remaining Entergy Nuclear sites, as well as the Corporate office at Echelon in Jackson.

### 11.3 Emergency Plan and Procedure Changes

Per NEI 21-01, Section 3.10, the capability for responding to a beyond design basis external event does not need to be described in the emergency plan. A licensee may, however, choose to incorporate implementing instructions for expanded response functions into emergency plan implementing procedures, and/or extended loss of AC power, SAM or other program documents.

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Entergy will incorporate instructions into applicable fleet/site guidance to activate the Expanded Response Capability based upon the following conditions, as described in NEI 12-01, Section 3.8:

- Loss of ALL offsite and ALL on-site power sources to AC emergency busses at more than 1 unit, OR
- Plant parameters or conditions require implementation of SAM strategies for more than 1 unit.

NEI 12-01 further states that a licensee should determine if any changes are necessary to documents describing the emergency response drill and exercise program. In particular, standard objectives and extent-of-play may need to be revised to clarify the expected demonstration of functions that are dependent upon the type of scenario event or accident (i.e., within or beyond design basis, and number of affected units). For example, functions associated with an expanded response capability would not be demonstrated during a drill or exercise that involved a design basis accident affecting only one unit.

Given that mitigating strategies, associated procedures, and modifications have not been implemented at this time, Entergy will not revise the drill and exercise program in response to the Phase 1 assessment. Entergy will identify any appropriate modifications to the Arkansas Nuclear One (ANO) Emergency Plan Drill and Exercise Program upon completion of the mitigation strategies and associated guidance being developed in response to NRC order EA 12-049 recommendation 4.2. **[Enhancement]**

### **12.0 IMPLEMENTATION SCHEDULE TO CONDUCT ONSITE AND AUGMENTED STAFFING ASSESSMENT (RFI #2)**

- 12.1 Requested Information #2 *Provide an implementation schedule of the time needed to conduct the onsite and augmented staffing assessment. If any modifications are determined to be appropriate include in the schedule the time to implement the changes.*
- 12.2 Attachment 1 provides the ANO on-shift and augmented staffing assessment Phase 1 for the loss of all AC power, multi-unit event. No modifications were identified in the Phase 1 assessment.
- 12.3 Per the commitment made in Entergy's 60 day response to the March 12, 2012, (OCAN051202) dated May, 11, 2012, the Phase 1 staffing assessment submittal date is April 30, 2013 and the Phase 2 staffing assessment will be completed by May 5, 2014 and submitted by June 5, 2014.

### 13.0 NEI 12-01 PHASE 1 STAFFING ASSESSMENT SUMMARY [RFI#1, #6]

This assessment concluded that the current minimum on-shift staffing as defined in EP-Emergency Plan for Arkansas Nuclear One, is sufficient to support the implementation of the current station blackout (SBO) strategies on Units 1 and 2, as well as the required Emergency Plan actions, with no unacceptable collateral duties. The staffing assessment did not identify the need for any new staff or identify any new functions that have not been analyzed.

The Phase 1 assessment also identified the staffing necessary to support the Expanded Response Capability for the beyond design basis external event (BDBEE) as defined for the Phase 1 assessment. This staffing will be provided by the current site resources, and can be supplemented by fleet resources, as necessary.

The existing on-shift staff and augmented ERO is sufficient to implement the existing SBO strategies on both units, simultaneously, while supporting performance of the required Emergency Planning duties without unacceptable collateral duties. No staffing changes are required. The emergency plan will not be changed as a result of the on-shift or augmented staffing necessary to respond to a loss of all ac power. No interim actions have been taken or are planned prior to the completion of the staffing assessment.

The Letters of Agreement in the Emergency Plan along with State and County Emergency Plans and Mutual Aid Agreements are sufficient to describe the support available to assist the sites should a BDBEE occur.

The assessment concluded enhancements are needed to address the activation and control of the Expanded Response Capability. These enhancements are identified in Attachment 2.

## Entergy Arkansas Nuclear One NEI 12-01 Phase 1 Staffing Assessment

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### 14.0 REFERENCES

- 14.1 NEI 12-01, Rev 0, *Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities*
- 14.2 NEI 10-05, Rev 0, *Assessment of On-Shift Emergency Response Organization Staffing and Capabilities*
- 14.3 NSIR DPR-ISG-01, *Interim Staff Guidance – Emergency Planning for Nuclear Power Plants*
- 14.4 NRC Letter to All Power Reactor Licensees and Holders of Construction Permits in Active or Deferred Status, dated March 12, 2012, *Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendation 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident.*
- 14.5 Entergy letter (OCAN051202) to the NRC dated May 11, 2012, *Entergy's 60-Day Response to the March 12, 2012, Information Request, Action Plan for Completing Emergency Communication and Staffing Assessments*
- 14.6 Entergy Letter (OCAN061201) dated June 8, 2012, *Entergy's 90-Day Response to the March 12, 2012, Information Request, Action Plan for Completing Emergency Communication and Staffing Assessments*
- 14.7 Entergy Letter (OCAN021304) dated February 20, 2013, *Entergy Response to NRC Technical Issues for Resolution Regarding Licensee Communication Submittals Associated with Near-Term Task Force Recommendation 9.3*
- 14.8 NRC Letter (OCNA061202) dated June 11, 2012, *Arkansas Nuclear One, Units 1 and 2 – Review of 60 Day Response to Request for Information Regarding Recommendation 9.3 of the Near-Term Task Force Related to the Fukushima Dai-Ichi Nuclear Power Plant Accident*
- 14.9 Entergy Response to NRC Technical Issues for Resolution Regarding Licensee Communication Submittals Associated with Near-Term Task Force Recommendation 9.3 dated February 20, 2013
- 14.10 Corrective Action Program Learning Organization LO-HQNLO-00138, Notifying Augmented Staff
- 14.11 Corrective Action Program CR-ANO C-2011-01950, ANO Station Response to IER 11-04
- 14.12 ANO Emergency Plan Revision 36

## Entergy Arkansas Nuclear One NEI 12-01 Phase 1 Staffing Assessment

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### 15.0 ATTACHMENTS

15.1 Attachment 1, NEI 10-05 Style Staffing Tables for Arkansas Nuclear One

15.2 Attachment 2 Enhancements

**Entergy Arkansas Nuclear One NEI 12-01 Phase 1 Staffing Assessment  
Attachment 1**

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**NEI 10-05 Staffing Tables**

**For**

**Entergy Arkansas Nuclear One**

**NEI 12-01 Phase 1**

# Entergy Arkansas Nuclear One NEI 12-01 Phase 1 Staffing Assessment Attachment 1

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## ATTACHMENT 1 – NEI 10-05 STYLE STAFFING TABLES FOR ANO

### NEI 12-01 Phase 1 OSA

#### Multi- Unit Extended Station Blackout (SBO)

**1. Accident Summary:**

- A loss of all offsite AC power occurs coincident with the trip of the unit. All emergency diesel generators fail to start.

**2. Accident Specific Assumptions:**

- The start and load manual actions for the SBO Diesel Generators are unsuccessful.
- NEI 10-05 Assumptions identified in Section 4.0.
- NEI 12-01 Assumptions identified in Section 4.0

**3. Procedures Reviewed for Accident Response Include:**

- Procedures identified in Section 4.2



**Entergy Arkansas Nuclear One NEI 12-01 Phase 1 Staffing Assessment  
Attachment 1**

<b>ANO TABLE 1 - ON-SHIFT POSITIONS Multi-Unit Extended Station Blackout</b>						
<b>Line #</b>	<b>On-shift Position</b>	<b>Basis Document</b>		<b>Role in Table # / Line #</b>	<b>Unanalyzed Task?</b>	<b>TMS Required?</b>
1	U1 SM	E-Plan Table B-1	N/A	U1 T2/L1 T5/L1 T5/L2 T5/L3 T5/L5 T5/L8 T5/L10	No	No
2	U1 CRS	E-Plan Table B-1	N/A	U1 T2/L2	No	No
3	U1STA	E-Plan Table B-1	N/A	U1 T2/L3	No	No
4	U1 RO #1	E-Plan Table B-1	N/A	U1 T2/L4	No	No
5	U1 RO #2	E-Plan Table B-1	N/A	U2 T2/L5	No	No
6	U1 AO #1	E-Plan Table B-1	N/A	U1 T2/L6	No	No
7	U1 AO #2	E-Plan Table B-1	N/A	U1 T2/L7	No	No
8	U1 AO #3	E-Plan Table B-1	N/A	N/A	No	No
9	U1 AO #4 Communicator	E-Plan Table B-1	N/A	T5/L6 T5/L9 T5/L13	No	No
10	U1 Chemistry	E-Plan Table B-1	N/A	T5/L12	No	No
11	U1RP	E-Plan Table B-1	N/A	T4/L2	No	No
12	U2 SM	E-Plan Table B-1	N/A	U2 T2/L1 T5/L14	No	No
13	U2 CRS	E-Plan Table B-1	N/A	U2T2/L2	No	No
14	U2 STA	E-Plan Table B-1	N/A	U2 T2/L3	No	No
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	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 Communicator Qualified	E-Plan Table B-1	N/A	U2 T2/L6	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/L4	No	No
23	Security	E-Plan Table B-1 (FB)	N/A	N/A	No	No
24	Security	Security Contingency Plan / E-Plan Table B-1	N/A	T5/L15	No	No

**Entergy Arkansas Nuclear One NEI 12-01 Phase 1 Staffing Assessment  
Attachment 1**

<b>ANOTABLE 2 - UNIT 1 PLANT OPERATIONS &amp; SAFE SHUTDOWN</b>			
<b>Two Unit - Two Control Room</b>			
<b>Multi-Unit Extended Station Blackout</b>			
Minimum Operations Crew Necessary to Implement AOPs and EOPs or SAMGs if Applicable			
<b>Line #</b>	<b>Generic Title/Role</b>	<b>On-Shift Position</b>	<b>Task Analysis Controlling Method</b>
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

<b>ANO TABLE 2- UNIT 2 PLANT OPERATIONS &amp; SAFE SHUTDOWN</b>			
<b>Two Unit - Two Control Room</b>			
<b>Multi-Unit Extended Station Blackout</b>			
Minimum Operations Crew Necessary to Implement AOPs and EOPs or SAMGs if Applicable			
<b>Line #</b>	<b>Generic Title/Role</b>	<b>On-Shift Position</b>	<b>Task Analysis Controlling Method</b>
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 #4	Non-Licensed Operator Training Program

**Entergy Arkansas Nuclear One NEI 12-01 Phase 1 Staffing Assessment  
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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 (No firefighting activities included in this accident.)

<b>ANO TABLE 3 - FIREFIGHTING Multi-Unit Extended Station Blackout</b>		
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

**Entergy Arkansas Nuclear One NEI 12-01 Phase 1 Staffing Assessment  
Attachment 1**

ANO TABLE 4 - RADIATION PROTECTION AND CHEMISTRY Multi-Unit Extended Station Blackout																			
L I N E	Position Performing Function / Task <b>6 + hours</b>	Performance Time Period After Emergency Declaration (minutes)*																	
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90
1	In-Plant Survey: <u>U1/U2 RP</u>	As directed by SM																	
2	On-site Survey: ___																		
3	Personnel Monitoring: ___																		
4	Job Coverage: <u>U1/U2 RP</u>	As directed by SM																	
5	Offsite Rad Assessment: <i>(Included in Table 5)</i>																		
6	Other site specific RP (describe):																		
7	Chemistry Function task #1 (describe) <u>U2 Chem</u>	As directed by SM																	
8	Chemistry Function task #2 (describe)																		

ANO TABLE 4 - RADIATION PROTECTION AND CHEMISTRY Multi-Unit Extended Station Blackout																			
L I N E	Position Performing Function / Task <b>6 + hours</b>	Performance Time Period After Emergency Declaration (minutes)*																	
		90-95	95-100	100-105	105-110	110-115	115-120	120-125	125-130	130-135	135-140	140-145	145-150	150-155	155-160	160-165	165-170	170-175	175-180
1	In-Plant Survey: <u>U1/U2 RP</u>	As directed by SM																	
2	On-site Survey:																		
3	Personnel Monitoring:																		
4	Job Coverage: <u>U2 RP</u>	As directed by SM												X	X	X	X	X	X
5	Offsite Rad Assessment:																		

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	<i>(Included in Table 5)</i>																			
6	Other site specific RP (describe):																			
7	Chemistry Function task #1 (describe) <u>U2 Chem</u>	As directed by SM																		
8	Chemistry Function task #2 (describe)																			

ANO TABLE 4 - RADIATION PROTECTION AND CHEMISTRY Multi-Unit Extended Station Blackout																				
L I N E	Position Performing Function / Task <b>6 + hours</b>	Performance Time Period After Emergency Declaration (minutes)*																		
		180-185	185-190	190-195	195-200	200-205	205-210	210-215	215-220	220-225	225-230	230-235	235-240	240-245	245-250	250-255	255-260	260-265	265-270	
1	In-Plant Survey: <u>U1/U2 RP</u>	As directed by SM																		
2	On-site Survey: <u>U1 RP</u>													X						
3	Personnel Monitoring:																			
4	Job Coverage: <u>U1/U2 RP</u>	As directed by SM																		
5	Offsite Rad Assessment: <i>(Included in Table 5)</i>																			
6	Other site specific RP (describe):																			
7	Chemistry Function task #1 (describe) <u>U2 Chem</u>	As directed by SM																		

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8	Chemistry Function task #2 (describe)																			
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ANO TABLE 4 – RADIATION PROTECTION AND CHEMISTRY Multi-Unit Extended Station Blackout																			
L I N E	Position Performing Function / Task <b>6 + hours</b>	Performance Time Period After Emergency Declaration (minutes)*																	
		270- 275	275- 280	280- 285	285- 290	290- 295	295- 300	300- 305	305- 310	310- 315	315- 320	320- 325	325- 330	330- 335	335- 340	340- 345	345- 350	350- 355	355- 360
1	In-Plant Survey: U1/U2 RP	As directed by SM																	
2	On-site Survey: U1/U2 RP	As directed by SM																	
3	Personnel Monitoring: _____																		
4	Job Coverage: U1/U2 RP	As directed by SM																	
5	Offsite Rad Assessment: <i>(Included in Table 5)</i>																		
6	Other site specific RP (describe): _____																		
7	Chemistry Function task #1 (describe) U2 Chem	As directed by SM																	
8	Chemistry Function task #2 (describe) _____																		

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<b>ANO TABLE 5 - EMERGENCY PLAN IMPLEMENTATION Multi-Unit Extended Station Blackout</b>			
<b>Line#</b>	<b>Function / Task</b>	<b>On-Shift Position</b>	<b>Task Analysis Controlling Method</b>
1	Declare the emergency classification level (ECL)	U1 SM	Emergency Planning Training Program / EP Drills
2	Approve Offsite Protective Action Recommendations	U1 SM	Emergency Planning Training Program / EP Drills
3	Approve content of State/local notifications	U1 SM	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 SM	Licensed Operator Training Program / Emergency Planning Training Program
6	ERO notification	U1 Communicator (Note 3)	Emergency Planning Training Program
7	Abbreviated NRC notification for DBT event	N/A	N/A
8	Complete State/local notification form	U1 SM	Emergency Planning Training Program
9	Perform State/local notifications	U1 Communicator (Note 3)	Emergency Planning Training Program
10	Complete NRC event notification form	U1 SM	Licensed Operator Training Program
11	Activate ERDS	(Note 1)	N/A
12	Offsite radiological assessment	(Note 2)	Emergency Planning Training Program
13	Perform NRC notifications	U1 Communicator (Note 3)	Emergency Planning Training Program
14	Perform other site-specific event notifications (e.g., Duty Plant Manager, INPO, ANI, etc.)	U2 SM	Licensed Operator Training Program
15	Personnel Accountability	Security	Security Training Program / EP Drills

Note 1: ERDS at both units normally operates 24/7 and therefore does not require specific actions to activate the system. It is recognized, however, that the BDBEE may result in the loss of normal communication paths for ERDS. If ERDS capability is lost, critical information would be communicated directly to the NRC over other communication paths, such as satellite phones.

Note 2: U1 Chemistry will report to the U1 Control Room to assist the SM/ED as directed and be available if an unmonitored release is detected by onsite surveys. A release is not anticipated since core cooling, spent fuel pool cooling and containment are maintained during the 24 hour period.

Note 3: The U2 Communicator was available to assist in notifications.

## Entergy Arkansas Nuclear One NEI 12-01 Phase 1 Staffing Assessment Attachment 2

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### ATTACHMENT 2 - ENHANCEMENTS

#### **A. Activating the ANO Expanded Response Capability**

Entergy will develop and implement a process to activate, and integrate the expanded response capability into existing augmented ERO (i.e., put in place the ability to transition to unit-specific performance) in the event of a BDBEE. The expanded response capability process will be formalized using fleet or station specific guidance. The process will include implementing strategy and decision-making criteria for initiating the actions necessary to ensure timely performance of expanded response functions. **[Enhancement]**

#### **B. Drill and Exercise Program**

Given that the mitigating strategies, associated procedures, and modifications have not been implemented at this time, Entergy will not be revising the drill and exercise program in response to the Phase 1 assessment. Entergy will identify any appropriate modifications to the Arkansas Nuclear One (ANO) Emergency Plan Drill and Exercise Program upon completion of the mitigation strategies and associated guidance being developed in response to NRC order EA 12-049 recommendation 4.2. **[Enhancement]**



**Attachment 2 to**

**OCAN041303**

**List of Regulatory Commitments**

List of Regulatory Commitments

The following table identifies those actions committed to by Entergy in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments.

COMMITMENT	TYPE (Check One)		SCHEDULED COMPLETION DATE  (If Required)
	ONE- TIME ACTION	CONTINUING COMPLIANCE	
Entergy will perform this assessment (determine the applicable staffing requirements to address back-up equipment to support the mitigation strategies required by NRC Order Number EA-12-049) as part of the Phase 2 staffing assessment.	X		June 5, 2014
Entergy will identify any appropriate modifications to the Arkansas Nuclear One (ANO) Emergency Plan Drill and Exercise Program upon completion of the mitigation strategies and associated guidance being developed in response to NRC Order Number EA-12-049.	X		June 5, 2014
Entergy will incorporate instructions into applicable fleet/site guidance for ANO to activate the expanded response capability and to integrate this capability into the existing augmented emergency response organization structure based upon the following conditions as described in Nuclear Energy Institute 12-01, Revision 0, dated May 2012: <ul style="list-style-type: none"> <li>• Loss of all offsite and all on-site power sources to alternating-current emergency busses at more than one unit, or</li> <li>• Plant parameters or conditions require implementation of severe accident management strategies for more than one unit.</li> </ul>	X		March 5, 2014