

NEI 10-05 [Revision 0]

Assessment of On-Shift Emergency Response Organization Staffing and Capabilities

June 2011

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Nuclear Energy Institute

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Emergency Response
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This document was developed by the Nuclear Energy Institute (NEI) On-shift Emergency Response Organization (ERO) Staffing Analysis Task Force.

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EXECUTIVE SUMMARY

A nuclear power plant's on-shift Emergency Response Organization (ERO) staff must be capable of implementing the site emergency plan to address a spectrum initiating events and consequences. Key emergency response functions and tasks are described in NUREG-0654, and include:

- Shutdown the reactor and maintain safe shutdown
- Mitigate event consequences
- Notify augmented ERO staff and Offsite Response Organizations (OROs)
- Determine Protective Action Recommendations (PARs) for site personnel and the public
- Perform firefighting
- Provide medical assistance if needed

The on-shift ERO staff must not be assigned additional responsibilities that could detract from the performance of their primary emergency plan functions.

Section IV.A.9 of 10 CFR 50, Appendix E, states that nuclear power reactor licensees shall perform “*a detailed analysis demonstrating that on-shift personnel assigned emergency plan implementation functions are not assigned responsibilities that would prevent the timely performance of their assigned functions as specified in the emergency plan.*” The NEI On-shift ERO Staffing Task Force has developed this document to establish a standard methodology for performing analyses of the ability of on-shift staff to perform all required functions and tasks necessary to respond to a declared emergency. Licensees may use this methodology to meet the requirement of 10 CFR 50, Appendix E, Section IV.A.9 in a manner acceptable to the US Nuclear Regulatory Commission (NRC) staff.

A licensee may modify the methodology described in this document, or employ an alternate staffing analysis approach, if it is determined that the methodology is not the optimum for assessing their particular circumstances. For example, there are site-specific staffing, response commitments or technology factors that the methodology does not adequately consider. The modified methodology or alternate approach must be consistent with NRC requirements.

When completed, the staffing analyses performed in accordance with this document are to be incorporated into the site's emergency plan. Licensees will need to evaluate these emergency plan changes in accordance with 10 CFR 50.54(q) and follow the appropriate regulatory submittal requirements. In addition, the staffing analyses must be retained and available for subsequent regulatory inspection.

The analyses should be updated as needed to address changes in shift staffing, assignment of key responsibilities, introduction of new technologies, etc.

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ASSESSMENT OF ON-SHIFT EMERGENCY RESPONSE ORGANIZATION STAFFING AND CAPABILITIES

1 REGULATORY BACKGROUND DISCUSSION

The specific requirement for establishing a shift emergency organization to respond to emergency events appears in 10 CFR 50.47(b)(2) which states, in part, “*On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times...*” 10 CFR Part 50, Appendix E, Section IV.A, requires licensees to describe the organization for coping with radiological emergencies, including individuals assigned to the licensee’s ERO with a description of emergency assignments. More specifically, Section IV.A.9 states that nuclear power reactor licensees shall perform “*a detailed analysis demonstrating that on-shift personnel assigned emergency plan implementation functions are not assigned responsibilities that would prevent the timely performance of their assigned functions as specified in the emergency plan.*” This document, NEI 10-05, provides a structured approach for meeting this requirement.

NUREG-0654, Section II.B, “Onsite Emergency Organization,” presents guidance for meeting these requirements. The guidance describes the onsite emergency organization, including the staffing requirements found in Table B-1, “Minimum Staffing Requirements for NRC Licensees for Nuclear Power Plant Emergencies.” This table specifies a minimum of 10 on-shift responders in four functional areas. It also specifies 7 on-shift responders who perform response duties that may be performed by shift personnel who are assigned other functions. In other words, there are no dedicated responders to perform these functions. Finally, Table B-1 specifies two major functional areas, firefighting and site access control/personnel accountability, which must be staffed on a site-specific basis.

NUREG-0654, Section II.B, states that the emergency plan should unambiguously define on-shift responsibilities for emergency response. Evaluation Criterion B.1 states that each licensee shall specify the onsite emergency organization of plant staff for all shifts and its relation to the responsibilities and duties of the normal staff complement. To meet this criterion, all licensees have an emergency plan that specifies each emergency function and the emergency position assigned to perform it. Emergency response staffing should consider such contingencies as activation of the fire brigade, back-shift staffing when overall staffing levels are lowest, and the potential demand for radiation protection and chemistry technicians during events involving radiological hazards.

The on-shift staff must be able to cope with the spectrum of events described in NSIR/DPR-ISG-01, Interim Staff Guidance – Emergency Planning for Nuclear Power Plants, until augmenting Emergency Response Organization (ERO) staff arrives in accordance with the site’s emergency plan commitments. The augmented ERO responders assume many managerial, engineering, and administrative duties from the on-shift personnel, allowing them to focus more fully on plant operations. NUREG-0654 guidance recommends that there be 30-minute and 60-minute responders; however, many sites have different augmentation time commitments. This fact is recognized by the methodology described in NEI 10-05.

2 METHODOLOGY OVERVIEW

2.1 ANALYSIS PROCESS DESCRIPTION

Section IV.A.9 of 10 CFR 50, Appendix E, states that nuclear power reactor licensees shall perform “a detailed analysis demonstrating that on-shift personnel assigned emergency plan implementation functions are not assigned responsibilities that would prevent the timely performance of their assigned functions as specified in the emergency plan.” The methodology described in NEI 10-05 provides a structured approach for meeting this requirement. In order to make efficient use of licensee and regulatory resources, the methodology credits, where appropriate, results from existing Job Task Analysis (JTA) and performance-based assessment processes. In cases where such processes are not in place, NEI 10-05 will specify a method to assess the ability of on-shift personnel to perform their assigned emergency plan functions.

The expected performance of certain on-shift positions is already analyzed by existing programmatic JTA processes. Examples of such positions include those responsible for plant operations and safe shutdown, and firefighting activities. These detailed job task analyses verify that on-shift personnel such as operators, firefighters and others assigned a task necessary to achieve safe shutdown of the plant can perform their assigned emergency response duties. To meet the requirements of 10 CFR Part 50, Appendix E, Section IV.A for these positions, it is only necessary to identify the assignment of any collateral duty that may impact expected (i.e., the previously analyzed) performance. NEI 10-05 accomplishes this analysis in Appendix B, Tables 1, 2 and 3.

In some cases, there may be tasks which have been analyzed by an existing programmatic JTA, or similar process, but the potential for the performance of two or more of these tasks at the same time may not have been considered in the analysis (e.g., performance of duties under emergency conditions). Positions potentially having these types of tasks include Radiation Protection (RP) Technicians and Chemistry Technicians. The methodology of NEI 10-05 will verify that RP and Chemistry Technicians can perform all assigned emergency response duties; this analysis is accomplished in Appendix B, Tables 1 and 4.

The ability to perform initial emergency plan implementing duties, those done prior to the arrival of the augmented ERO, is routinely assessed during operations training, and emergency response drills and exercises. These assessments include an appraisal of performance against regulatory and fleet/site standards (e.g. accuracy, time durations, etc.), and use of a Corrective Action Program to address inadequate performance. Since these assessments are detailed analyses of function and task performance, they meet the requirements of 10 CFR Part 50, Appendix E, Section IV.A; however, it will be necessary to identify if a particular event or accident results in an emergency plan implementing duty being assigned to an individual whose other duties could adversely impact performance. NEI 10-05 accomplishes this analysis in Appendix B, Tables 1 and 5.

The above description is depicted in a Table 2-1.

The analysis methodology allows flexibility in the assignment of on-shift response functions and tasks, dependent upon the event or accident. For example, members of a fire brigade may be

assigned other response duties if the event or accident does not include a fire. Likewise, a security officer might be assigned to perform offsite notifications during a DBA but not the DBT.

2.2 ANALYSIS PROCESS STEPS

The NEI 10-05 methodology is composed of the following three steps.

1. Listing the events and accidents for which staffing analyses are required. These events and accidents are described in NSIR/DPR-ISG-01, Interim Staff Guidance – Emergency Planning for Nuclear Power Plants. An analysis will be performed for each specified event and accident.
2. For each event or accident, completion of an On-shift Staffing Analysis (OSA) that will identify on-shift ERO positions having:
 - a. No emergency response functions. These positions are not assigned responsibilities that would prevent the timely performance emergency plan functions; they require no further analysis.
 - b. Emergency response functions that fall within the scope of an existing JTA or performance-based assessment process. The response actions performed by these positions are within the bounds of an existing performance assessment process and require no further analysis.
 - c. An emergency response function(s) that has not been previously analyzed by an existing JTA or performance-based assessment process.
 - d. Emergency response functions, assessed by existing JTA or performance-based assessment processes, that may overlap such that the integrated performance of the functions has not been previously analyzed by an existing JTA or performance-based assessment process. This includes combinations of functions that may challenge effective performance due to the timing and duration of individual tasks.

The OSA process is described in greater detail in Section 3.0 of this document.

3. In cases c and d, above, a subsequent Time Motion Study (TMS) will be performed to verify the results of the OSA. The TMS is a performance-based assessment, essentially a drill, which will confirm or modify the results of the OSA.

The TMS Process is described in Section 4.0 of this document.

An overview of the methodology described above is presented in Figure 2.1.

It is expected that the results of each completed analysis will be verified and validated to ensure adequacy and accuracy – this includes the OSA and, if needed, the TMS. Once these actions are completed, licensees are expected to promptly enter any unsatisfactory results into their Corrective Action Program for resolution. After submitting a condition report, it will be necessary to determine what interim correction measures may be necessary to meet the requirements of 10 CFR 50.47(b)(2) and related regulatory guidance.

2.3 ON-SHIFT STAFF

Only personnel required to be on-shift can be credited in a staffing analysis. The associated staffing requirements (i.e., the number and composition of the on-shift staff) must be described in the site emergency plan.

2.4 AUGMENTED ERO RESPONSE TIME

Performance of a staffing analysis will require use of an assumed response (arrival) time for members of the augmented ERO. This time should be the maximum acceptable number of minutes elapsed between an emergency declaration¹ and the arrival of an ERO position-holder at a location necessary to relieve an on-shift ERO member. The times to be used are typically defined in, or can be derived from, the site emergency plan (e.g., in a description comparing augmented ERO staffing capability to NUREG 0654, Table B-1 guidance).

2.5 ANALYSIS OF REPAIR AND CORRECTIVE ACTION RESPONSES

Table B-1 of NUREG-0654 lists one Major Task for which a need may not be specified during a staffing analysis - "Repair and Corrective Actions". Following the guidance contained in NUREG-0654, Table B-1, repair and corrective action tasks may be performed by dedicated shift personnel or qualified shift personnel assigned other functions/tasks. The assignment for the performance of repair and corrective action tasks must be indicated within the site emergency plan and consistent with Table B-1.

To promote consistency across the industry in the assignment of this task, the following definition should be used unless a site-specific definition is already in place.

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

For purposes of this document, in-plant repair and corrective actions are considered to fall into 2 broad categories:

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

To complete a staffing analysis, licensees will need to identify any site-specific planned/expected actions performed in-plant prior to the arrival of the augmented ERO. The actions of interest here are those that support implementation of abnormal or emergency operating procedures, and severe accident management guidelines, and that are not performed by Operations personnel (since actions performed by Operations personnel are assessed elsewhere). An example would be a procedure step that directs dispatch of an electrician to close a breaker that supports proper Emergency Core Cooling System (ECCS) operation.

¹ An alternate start time may be used in specified in the site emergency plan.

2.6 ANALYSIS OF RESCUE OPERATIONS AND FIRST AID RESPONSES

Table B-1 of NUREG-0654 lists one Major Functional Area for which a need may not be specified during an analysis - "Rescue Operations and First Aid". Following the guidance contained in NUREG-0654, Table B-1, this contingent function may be performed by dedicated shift personnel or qualified shift personnel assigned other functions/tasks. The assignment for the performance of the rescue operations and first aid function must be indicated within the site emergency plan and consistent with Table B-1.

To promote consistency across the industry in the assignment of this function, the following definition should be used unless a site-specific definition is already in place.

Rescue Operations and First Aid: The tasks of locating missing personnel, removing them from hazardous areas, if needed, and providing necessary initial medical treatment. Personnel performing initial medical treatment should be trained to the level of Red Cross Basic First Aid, or otherwise meet minimum State and/or local standards for providing such assistance.

2.7 ANALYSIS OF RADIATION PROTECTION AND CHEMISTRY TECHNICIANS

All nuclear power plants require that an individual holding the position of radiation protection technician or chemistry technician be qualified to perform the range of tasks expected of the position. Qualification is performed and documented in accordance with the appropriate fleet/site training program(s). Examples include taking a radiation level reading using a particular instrument, or obtaining and analyzing certain types of samples.

Although training and qualification processes will ensure that a radiation protection technician or chemistry technician can perform individual tasks, they typically do not assess for impacts from potential multiple overlapping tasks that may be necessary during an emergency. In contrast, a simulator exam will assess not only each task performed by a Reactor Operator but also the overall performance of the Reactor Operator during that particular emergency response (i.e., the ability to perform all tasks in an effective and timely manner during the accident sequence). It should be recognized that, contra the implementation of an operating procedure, there is some variability in how and when a radiation protection or chemistry technician may perform a task.

The analysis approach used by NEI 10-05 will identify all tasks assigned to on-shift radiation protection and chemistry technicians, plot the task start and duration times on a timeline, and then determine if any task performance timeframes overlap. Should the performance of two or more tasks overlap, a TMS will be required to validate acceptable performance.

2.8 DESIGN BASIS ACCIDENT CASE SELECTION AND ATTRIBUTES

Some Design Basis Accidents may be analyzed in several cases, each case reflecting different initial assumptions affecting radiological consequences (e.g., RCS activity, leak rates, etc.). For example, an analysis may contain a conservative case (e.g., a bounding case with parameters at Technical Specification allowable limits) and a realistic case (e.g., using typically expected parameters reflecting sound operational decision-making). The staffing analysis for that particular Design Basis Accident may use the radiological consequences associated with the realistic case.

If the site's Updated Final Safety Analysis Report (UFSAR) presents multiple analyses of a postulated accident type reflecting different initiating event severities (e.g., a LOCA analyzed in both a small-break and a large break case), the one resulting in the highest emergency classification should be used for the staffing analysis. If the conditions of similar postulated accidents would result in the same emergency classification, select the case that causes the most severe radiological consequences. Should neither criterion differentiate between the available cases, the licensee may choose the case to be used for a staffing analysis.

In cases where a Design Basis Accident analysis includes a radiological release, and the starting point of the release is not clearly defined, the staffing analysis may assume that the release begins 15-minutes after the initiating event. Licensees are free to use a starting point of less than 15-minutes if desired. Elapsed times of greater than 15-minutes may also be used; however, a documented basis for the selected time should be developed and appended to the staffing analysis.

2.9 ANALYSIS OF A FIRE RESPONSE

In accordance with NSIR/DPR-ISG-01, Interim Staff Guidance – Emergency Planning for Nuclear Power Plants, a staffing analysis must be performed for a control room fire leading to evacuation and remote shutdown. Within the spectrum of analyzed fire events, it is expected that a control room fire and evacuation will be the limiting scenario, i.e., it will require the greatest number of response actions on the part of the control room staff. This assumption should be qualitatively validated with appropriate operations and fire protection personnel. Should another fire analysis scenario be identified as more limiting, then that fire event will also require a staffing analysis. The validation and associated results must be documented and included in the staffing analysis.

2.10 ANALYSIS OF A GENERAL EMERGENCY RESPONSE

In accordance with NSIR/DPR-ISG-01, Interim Staff Guidance – Emergency Planning for Nuclear Power Plants, the staffing analysis for at least one Design Basis Accident must include an assessment of the actions performed in response to a General Emergency. This same event must also include a radiological release that results in a dose that exceeds the Environmental Protection Agency's (EPA) Protective Action Guides (PAGs) beyond the site boundary, and thus necessitates promulgation of a Protective Action Recommendation (PAR). Should no Design Basis Accident result in the declaration of a General Emergency, the licensee will need to select one and assume that it causes a General Emergency declaration.

For staffing analysis purposes, it is sufficient to simply assume that 1) a General Emergency was declared, and 2) a significant radiological release, necessitating a PAR, is in progress at the time of declaration. The determination of specific failures and accident progression is not necessary.

2.11 ANALYSIS OF A SEVERE ACCIDENT MANAGEMENT RESPONSE

NSIR/DPR-ISG-01, Interim Staff Guidance – Emergency Planning for Nuclear Power Plants, requires that licensees consider the ability of the on-shift staff to implement actions associated with initial implementation of severe accident management guidelines (i.e., those actions expected to occur prior to the arrival of the augmented ERO). It is recommended that a DBA that results in a General Emergency, or the one selected as such per step 2.9 above, be used for

this assessment. As stated above, it is sufficient to simply assume that the accident progressed to conditions requiring a severe accident response; it is not necessary to determine specific failures and the accident sequence.

The NEI 10-05 analysis of the ability to implement severe accident management guidelines focuses on the reasonably expected initial mitigation actions that would be performed by on-shift personnel other than licensed and non-licensed operators. This approach reflects the fact that severe accident management tasks performed by licensed and non-licensed operators - parameter monitoring, and direction and execution of manipulations at the main control boards/consoles and in-plant locations – are extensions of the operator tasks already evaluated by the Plant Operations and Safe Shutdown portion of the staffing assessment. The actions assessed by NEI 10-05 are those which implement the initial site-specific Candidate High Level Action² assuming the core is not ex-vessel (i.e., no reactor vessel failure), and there is no actual or imminent challenge to containment integrity.

2.12 ANALYSIS OF A STATION BLACKOUT EVENT

NSIR/DPR-ISG-01, Interim Staff Guidance – Emergency Planning for Nuclear Power Plants, provides guidance associated with the staffing analysis for a station blackout. Unless there is a compelling basis to do otherwise, licensees are strongly encouraged to perform a staffing analysis for a station blackout event.

2.13 ANALYSIS OF A 10 CFR 50.54(hh)(1) EVENT

NSIR/DPR-ISG-01, Interim Staff Guidance – Emergency Planning for Nuclear Power Plants, requires that licensees perform “a detailed analysis to determine if the current on-shift staff can adequately perform all emergency response actions required by site-specific procedures for an ‘aircraft probable threat.’ This analysis should include all emergency response actions taken prior to an aircraft impact in accordance with RG 1.214 for an aircraft threat that is greater than 5 minutes, but less than 30 minutes, from the site, and should consider the dispersal of the site fire brigade away from target areas for firefighting.” Regulatory Guide 1.214 is entitled, “Response Strategies for Potential Aircraft Threats.” Following a review of the regulation and guidance, and related implementation across the industry, the NEI On-Shift ERO Staffing Analysis Task Force made the following observations.

- The variability in how sites implemented 10 CFR 50.54(hh)(1), and Regulatory Guide 1.214, is sufficient to preclude development of a standard assessment template.
- Sites validated different aspects of their 10 CFR 50.54(hh)(1) response strategies and the level of validation also varied.

Based on these observations, the task force has the following recommendations for performing this staffing analysis.

² A generic term used in Electric Power Research Institute (EPRI), 1992, “Severe Accident Management Guidance Technical Basis Report,” EPRI Proprietary Report TR-101869, Vols. 1 and 2, and in subsequent vendor guidance.

- Develop a site-specific list of response task for this event. These actions should generally reflect those listed in 10 CFR 50.54(hh)(1), as expanded upon in Regulatory Guide 1.214, and others required by the emergency plan.
- Determine which of these tasks were previously analyzed through an approved station process (e.g., Operation Training Program, a procedure validation in involving assessed performance, etc.).
- For tasks that were previously analyzed, perform a collateral duty analysis to verify that personnel do not have assigned responsibilities that would prevent the timely performance of their assigned functions as specified in the emergency plan. The guidance in Section 3 of this document can be used to inform this assessment.
- For tasks that were not previously analyzed, perform a TMS to verify timely and effective implementation of appropriate procedures. The guidance in Section 4 of this document can be used to inform this assessment.

2.14 CHANGES TO ERO RESPONSE TIMES

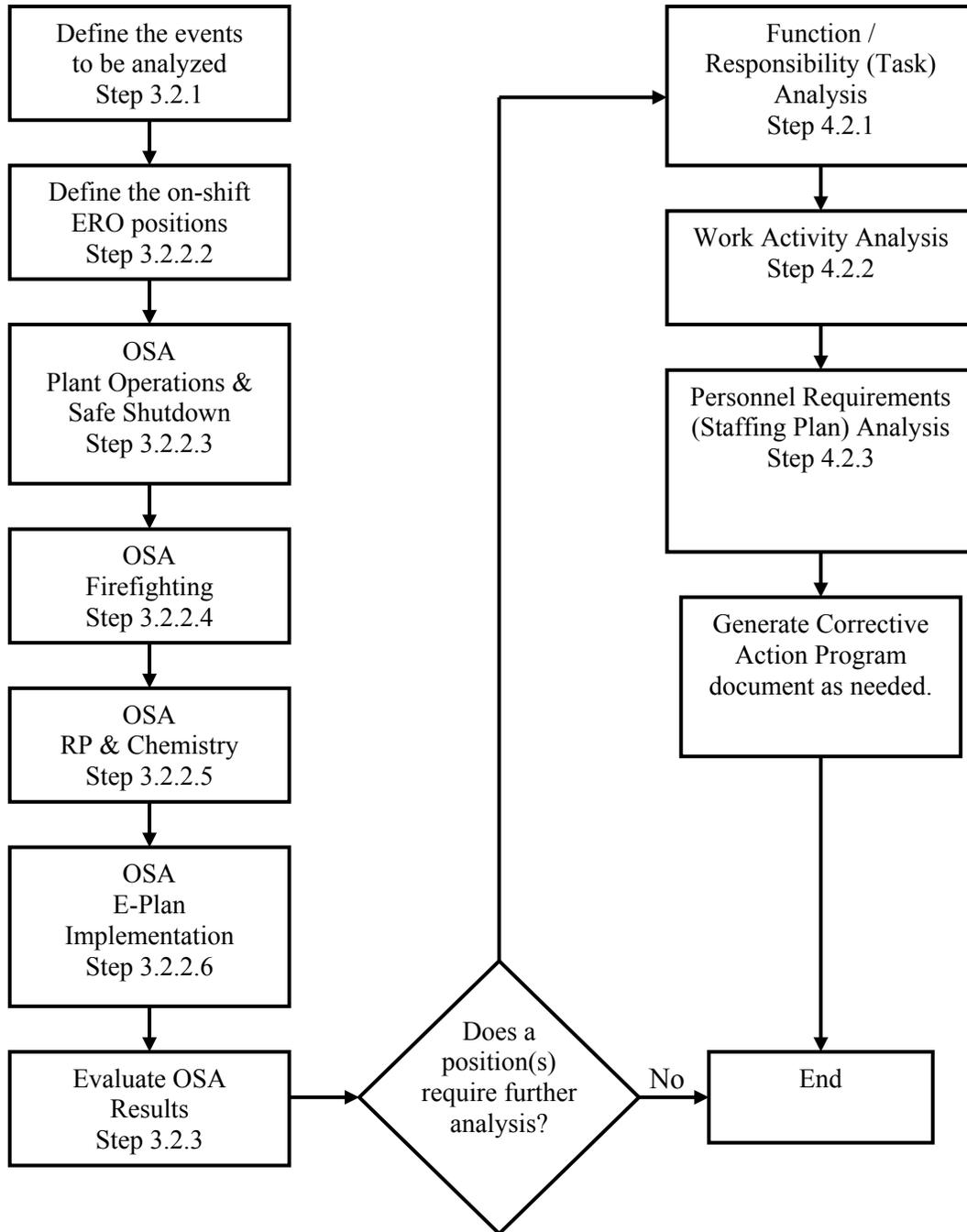
Although developed to meet the requirements of 10 CFR 50, Appendix E, Section IV.A.9, the staffing assessment methodology may be used to evaluate proposed changes to on-shift staffing levels or augmented ERO response times. For example, an analysis could be performed with a desired response time for the augmenting ERO (e.g., 90 minutes), and the results then used to support the basis for changing a staffing or augmentation time commitment. Licensees are strongly cautioned that any changes to the staffing of the on-shift ERO, or the staffing or timing of the augmented ERO, are subject to the requirements of 10 CFR 50.54(q) and related guidance.

Table 2.1
Staffing Analysis Methodology for DBAs and DBT

| Major Functional Area | Major Tasks | Position Title or Expertise | Detailed Analysis of Task Performance | Collateral Duty Analysis |
|---|--|--|--|---------------------------------|
| Plant Operations and Assessment of Operational Aspects | N/A | Shift Supervisor (SRO) | Operations Training Program | NEI 10-05 per Appendix B |
| | N/A | Shift Forman (SRO) | Operations Training Program | NEI 10-05 per Appendix B |
| | N/A | Control Room Operators | Operations Training Program | NEI 10-05 per Appendix B |
| | N/A | Auxiliary Operators | Operations Training Program | NEI 10-05 per Appendix B |
| Emergency Direction and Control (Emergency Coordinator) | Notify licensee, State, local and Federal personnel and maintain communication | Shift Technical Advisor, Shift Supervisor or designated facility manager | Operations Training Program <u>And</u> EP Drill and Exercise Program | NEI 10-05 per Appendix B |
| Radiological Accident Assessment and Support of Operational Accident Assessment | In-plant surveys Chemistry/ Radiochemistry | HP Technicians Rad/Chem Technicians | Per site-specific training program(s) | NEI 10-05 per Appendix B |
| Plant System Engineering, Repair and Corrective Actions | Technical Support | Shift Technical Advisor | Per site-specific training program(s) | NEI 10-05 per Appendix B |
| | Repair and Corrective Action | Mechanical Maintenance Electrical Maintenance | Per site-specific training program(s) | NEI 10-05 per Appendix B |
| Protective Actions (In-Plant) | Radiation Protection: a. Access Control b. HP Coverage for repair, corrective actions, search and rescue first-aid & firefighting c. Personnel monitoring d. Dosimetry | HP Technicians | Per site-specific training program(s) | NEI 10-05 per Appendix B |
| Firefighting | N/A | N/A | Firefighting Training | NEI 10-05 per |

| Major Functional Area | Major Tasks | Position Title or Expertise | Detailed Analysis of Task Performance | Collateral Duty Analysis |
|--|---|------------------------------------|---|--|
| Rescue Operations and First-Aid | N/A | N/A | Program Medical response training program <u>And</u> EP Drill and Exercise Program | Appendix B NEI 10-05 per Appendix B |
| Site Access Control and Personnel Accountability | Security, firefighting communications, personnel accountability | Security Personnel | Security Training Program <u>And</u> Security and EP Drills and Exercises | NEI 10-05 per Appendix B |

Figure 2.1
Overview of On-Shift Staffing Analysis Process



3 ON-SHIFT STAFFING ANALYSIS

The on-shift assignments assessed by the On-Shift Staffing Analysis (OSA) include both the Major Functional Areas and Major Tasks listed in NUREG-0654, Table B-1, as well as additional actions identified by a review of related operating experience and regulatory documents. To facilitate the development of a standard and readily usable staffing assessment methodology, and as discussed in Section 2, these functions and tasks were grouped into four major response areas.

- Plant Operations & Safe Shutdown
- Firefighting
- Radiation Protection & Chemistry
- Emergency Plan Implementation

The OSA is meant to identify on-shift positions that have emergency response assignments outside the bounds of an existing JTA or performance-based assessment process, or overlapping assignments that could potentially challenge performance of an emergency response function/task. These positions will require a Time Motion Study (TMS) analysis to determine if the duty assignments are acceptable, i.e., all actions can be performed in an effective and timely manner, consistent with applicable regulatory requirements and station commitments, until relieved by the augmenting ERO staff.

As discussed in Section 2.0, the OSA is structured to credit task analyses performed in accordance with other program or process requirements. If a task is identified for which an analysis has not been performed, then a TMS of that task will be required per Section 4.0.

Additional process design considerations are discussed below.

3.1 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations are applicable to all OSA.

1. Unless otherwise specified in NSIR/DPR-ISG-01, Interim Staff Guidance – Emergency Planning for Nuclear Power Plants, or by the initial conditions of a DBA analysis, it is assumed that all site units are in Mode 1, Power Operations, and operating at 100% reactor power.
2. The event being assessed occurs during off-normal work hours at a time when most ERO responders are not at the site (e.g., during a backshift, weekend or holiday). The augmented ERO responders will need to be notified and report to their assigned locations.
3. The on-shift personnel complement is limited to the minimum required number and composition as described in the site emergency plan. If the plan commitments allow for different minimum staffing levels (e.g., a variance between a normal dayshift and a backshift), use the staffing with the smallest total number of personnel.
4. Although the temporary absence of a position may be allowed by Technical Specifications, the analyses should be performed assuming that all required on-shift positions are filled.

5. With respect to the DBT staffing analyses, it may be assumed that a HOSTILE FORCE breached the Protected Area fence but was neutralized with no adverse consequences to plant safety. Damage inflicted on plant systems, structures and components is not sufficient to prevent safe shutdown or cause a radiological release. There is no fire significant enough to warrant firefighting efforts prior to the arrival of offsite resources and/or the augmented ERO. The analysis should confirm that sufficient staff is available to simultaneously implement both the emergency plan and the security plan.
6. On-shift personnel can report to their assigned response locations within timeframes sufficient to allow for performance of assigned actions. Licensees should verify that the administrative controls necessary to promote a timely response by on-shift ERO personnel are in place.
7. Notwithstanding the guidance in step 3.1.6 above, the analysis of the DBT event must account for the expected constraints on the movement of personnel (e.g., movement not allowed, limited movement using the 2-person rule, etc.). Specifically, individuals must usually be in, or readily able to respond to, assigned response locations before being credited with performing a function/task that implements the emergency plan. The inability of an individual to reach their assigned response location may introduce a collateral duty assignment to another individual.
8. 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 (RP) Technician. Licensees should verify that the on-shift staff possesses the necessary qualifications.
9. Staffing requirements for operations personnel are established by NRC regulations and related guidance³. It is assumed that personnel assigned to the major response area of Plant Operations & Safe Shutdown meet these requirements and guidance, and are able to satisfactorily perform the functions and tasks necessary to achieve and maintain safe shutdown. As discussed in Section 2, staff performance within this area is regularly analyzed through other station programs (e.g., licensed operator training) and will not be evaluated as part of this assessment, unless a role/function/task from another major response area is assigned as a collateral duty.

Any "safety-related operator action"⁴ will be done by a member of the on-shift staff as defined in the unit's Technical Specifications. This includes in-plant (manual) actions performed to manipulate components and equipment from locations outside the main control room. These actions are typically performed by auxiliary (non-licensed) operators but may be performed by licensed operators or other on-shift staff members (e.g., an electrician) under some conditions.

³ Refer to 10 CFR 50.54(m) and references listed in NUREG-0800, Section 13.2.1.

⁴ The American National Standards Institute/American Nuclear Society defines "safety-related operator action" in ANSI/ANS-58.8-1994, as follows: A manual action required by plant emergency procedures that is necessary to cause a safety-related system to perform its safety-related function during the course of any DBE (design-basis event). The successful performance of a safety-related operator action might require that discrete manipulations be performed in a specific order.

10. Fire Brigade staffing requirements are established by NRC regulations and related guidance.⁵ It is assumed that personnel assigned to the major response area of Firefighting meet these requirements and guidance, and are able to satisfactorily perform all functions and tasks necessary to fight a fire. As discussed in Section 2, staff performance within this area is regularly analyzed through other station programs (e.g., fire drills) and will not be evaluated as part of this assessment, unless a role/function/task from another major response area is assigned as a collateral duty.
11. Individuals holding the position of radiation protection technician or chemistry technician are qualified to perform the range of tasks expected of their position.⁶
12. 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 (e.g., Force-on-Force drills, emergency response drills, etc.) and will not be evaluated here, unless a role or function from another major response area is assigned as a collateral duty.
13. 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 notification actions specifically called out in the assessment methodology (e.g., initial emergency notification to an ORO or the NRC); these actions must be assessed.
14. 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.

3.2 INSTRUCTIONS

3.2.1 Complete Appendix A, Analyzed Events and Accidents.

1. Enter each event and accident for which an analysis will be performed; these are described in NSIR/DPR-ISG-01, Interim Staff Guidance – Emergency Planning for Nuclear Power Plants. For each entry, provide:
 - a. A summary description of the event or accident in column 2 (e.g., “Loss of Coolant Accident”).
 1. The Design Basis Threat (DBT) is already entered in the table and does not require a separate entry.
 - b. The plant mode specified in the ISG or, for a DBA, the initial conditions of the analysis, in column 3. If no mode is stipulated, assume that all site units are in Mode 1, Power Operations.

⁵ Refer to Regulatory Guide 1.189, “Fire Protection for Nuclear Power Plants.”

⁶ Refer to Regulatory Guide 1.8, “Qualification and Training of Personnel for Nuclear Power Plants.”

- c. The associated reference document(s) describing the event or accident conditions and, for a DBA, the associated analysis in column 4 (e.g., “UFSAR section 15.2.2”).
- d. The Emergency Classification Level (ECL) that would be declared in accordance with the site emergency classification procedure in column 5. If no emergency would be declared, enter “None”.

NOTE

As discussed in Section 2.10, should no Design Basis Accident result in the declaration of a General Emergency, the licensee must select one and assume that it causes a General Emergency declaration for analysis purposes. This analysis will also include an assumed radiological release that results in a dose that exceeds the EPA PAGs beyond the site boundary, and thus necessitates promulgation of a PAR. It is recommended that this entry be annotated as such (e.g., “General Emergency with release and PAR – assumed for analysis purposes”).

- e. Determination if a staffing analysis is required. [Column 6]
 - 1) Enter “Yes” if the event requires an emergency declaration per the site emergency classification procedure. Otherwise, enter “No”.
 - 2. Attach additional pages as necessary and maintain the “Analysis #” sequential numbering.
- 3.2.2 For each event or accident identified in Appendix A, complete an analysis of on-shift staffing adequacy using Appendix B, On-Shift Staffing Analysis, by performing the following steps.
- 1. Enter the applicable “Analysis #” from Appendix A for which the OSA is being performed. This number will be entered on each page of Appendix B.
 - 2. Complete Table 1, On-Shift Positions, by performing the following steps.
 - a. Enter each On-shift Position in column 2, On-shift Position.

NOTE

For security personnel, list only those security positions relied upon to perform an emergency plan/response function. For example, if one Security Officer is assigned as a shift communicator and another Security Officer performs accountability, then list only those two individuals in Table 1.

NOTE

If some crews have two individuals filling the Shift Manager and Shift Technical Advisor roles, and other crews have a dual-role individual, the analysis should be performed using the dual-role individual.

For position titles with more than one position holder, assign a unique sequential number to each position. For example, a site with two units and two Reactor Operators per unit would enter Reactor Operator #1, Reactor Operator #2, Reactor Operator #3 and Reactor Operator #4.

- b. Enter the site emergency plan reference that describes the requirement for the position to be on-shift in column 3, Emergency Plan Reference. If more than one, enter all references that apply to this position.
 - c. For the on-shift positions listed below, enter the elapsed time, in minutes, from the emergency declaration until the position is relieved of the function/task or supplemented by additional staff from the augmented ERO in column 4, Augmentation Elapsed Time. This should be the time(s) described in, or derived from, the site emergency plan (e.g., 30 minutes, 60 minutes, 90 minutes, etc.).
 - Radiation Protection Technician
 - Chemistry Technician
 - d. Attach additional pages as necessary. Maintain the sequential line numbering for each position.
 - e. Using only the On-shift Positions listed in Table 1, complete Tables 2 through 5 by entering the on-shift position that fills a described role, or performs a specific function or task. Follow the instructions presented below for each Table.
3. Complete Table 2, Plant Operations & Safe Shutdown, by performing the following steps.
- a. Identify the operations staffing matrix which aligns with the site unit and control room configuration (i.e., number of units and control rooms), and enter the applicable site unit(s) number next to the selected staffing matrix.

NOTE

Sites with 3 or more units should use the combination of existing tables, or create a table, that best reflects their site configuration.

- b. For each generic title/role listed in the table entitled, “Minimum Operations Crew Necessary to Implement AOPs and EOPs, or SAMGs if applicable”, enter the corresponding On-shift Position from Table 1. Position definition is provided

below.

- 1) The Unit Supervisor is the Senior Reactor Operator (SRO) that provides direction to Reactor Operators during implementation of Abnormal Operating Procedures (AOPs) and Emergency Operating Procedures (EOPs).
 - 2) For On-shift Positions with multiple members, include the unique sequential number in each block. For example, a single unit site with three on-shift reactor operators would list Reactor Operator #1 and Reactor Operator #2 in the respective blocks of Table 2. This leaves Reactor Operator #3 available for assignment to another role/function.
 - 3) List the Auxiliary Operators (AOs) who are required to perform the in-plant (manual) operator actions necessary to achieve safe shutdown of the unit⁷. In other words, these are the AOs who must be available (dedicated) to perform safe shutdown actions, and thus can have no other assigned functions. [This role is typically filled by a non-licensed operator but may be filled by a licensed operator in some scenarios.] Similar to the above bullet, if a single unit site has 5 AOs on-shift, list AO #1 and AO #2 in the respective blocks of Table 2. This leaves three (3) AOs available for assignment to another role/function.
- c. Enter any additional personnel if they are required to support implementation of the operating procedures necessary to respond to the event prior to the arrival the augmented ERO.
1. On-shift personnel that are not part of the operating crew (i.e., not a licensed or non-licensed operator) must be listed in the table entitled, "Other (non-Operations) Personnel Necessary to Implement AOPs and EOPs, or SAMGs if applicable". For example, an electrician from the Maintenance Department who is required to implement a planned/expected action necessary to complete an EOP step would be entered in this portion of the table.
- d. If this staffing analysis includes an assessment of the ability to implement Severe Accident Management (SAM) guidelines, as discussed in Section 2.11, then perform the following steps.
1. Identify the SAM guideline tasks that meet all 3 of the following attributes:
 - a. The task implements the first expected Candidate High Level Action described in the site's SAM guidelines assuming:
 1. The core is not ex-vessel (i.e., no reactor vessel failure).
 2. There is no actual or imminent challenge to containment integrity.

⁷ This is typically the minimum Auxiliary Operator complement required by the unit's Technical Specifications.

- b. The task is not performed by a licensed or non-licensed operator.
 - c. It is expected that the task would be performed without the support of the augmented ERO (i.e., implemented by on-shift personnel without the assistance of the TSC and OSC).
 2. Enter the position(s) that would perform the task(s) in the table entitled, "Other (non-Operations) Personnel Necessary to Implement AOPs and EOPs, or SAMGs if applicable."
 - e. In column 4, enter the controlling method (i.e., a program or process) by which the collective tasks assigned to each position have been analyzed. For example, the capability of Reactor Operator #1 to implement assigned Plant Operations & Safe Shutdown tasks for a large-break LOCA is assessed and validated by the Operations Training Program. Enter "N/V" for a position if an assigned Plant Operations & Safe Shutdown task has not analyzed.
 - f. In Table 1, locate each On-Shift Position assigned to Table 2. For each position, enter "Table 2" and the associated line number in column 5 of Table 1 (Role in Table#/Line#).
 1. For each position, enter "Yes" in column 6 of Table 1 (Unanalyzed Task?) if the position has a task that has not analyzed (i.e., an "N/V" was entered). Otherwise, enter "No".
4. Complete Table 3, Firefighting, by performing the following steps.
 - a. If the event or accident being assessed does not include a fire, enter "N/A" in all blocks; continue to step 4.2.2.5.
 - b. Enter the five (5) On-Shift Positions (from Table 1) that comprise the Fire Brigade.
 - c. In column 3, enter the controlling method (i.e., a program or process) by which the collective tasks assigned to each position have been analyzed. For example, the capability of Auxiliary Operator #3 to implement assigned Firefighting tasks is assessed and validated by the Fire Protection Program. Enter "N/V" for a position if an assigned Firefighting task has not analyzed.
 - d. In Table 1, locate each On-Shift Position assigned to Table 3. For each position, enter "Table 3" and the associated line number in column 5 of Table 1 (Role in Table#/Line#).
 1. For each position, enter "Yes" in column 6 of Table 1 (Unanalyzed Task?) if the position has a task that has not analyzed (i.e., an "N/V" was entered). Otherwise, enter "No".
5. Complete Table 4, Radiation Protection & Chemistry, by performing the following steps.

NOTE

The Radiation Protection (RP) functions/tasks presented in this table are those performed by RP technicians. Do not include non-RP Technician personnel who are qualified to perform one of these functions or tasks. For example, an Auxiliary Operator qualified to perform self-job coverage should not be included.

- a. Review applicable response procedures to identify RP or Chemistry-related functions or tasks that must be performed during the period prior to the arrival of the augmenting ERO (i.e., during the time period denoted in Table 1, column 4). Procedures to be reviewed include AOPs, EOPs, radiation protection, chemistry and those implementing the emergency plan.
 - b. In column 2, enter the On-shift Position (from Table 1) which performs the listed Function/Task required by a procedure.
 - “Offsite Radiological Assessment” refers to the task of performing offsite dose projections in response to a radiological release to the environment⁸. If the event or accident does not result in a radiological release, or this function is not performed by a Radiation Protection or Chemistry Technician, then enter “N/A” in this block.
 - Attach additional sheets as necessary.
 - c. Based on operating experience (e.g., drills, real events, etc.), timed performance and/or informed judgment⁹, enter an “X” in each column representing the five (5) minute time increments following the emergency declaration during which the function or task would be performed. Attach supporting information to explain the basis for the selected timeframes.
 - d. In Table 1, locate each On-Shift Position assigned to Table 4. For each position, enter “Table 4” and the associated line number in column 5 of Table 1 (Role in Table#/Line#).
 - e. For each position, enter “Yes” in column 6 of Table 1 (Unanalyzed Task?) if the position has a task that has not analyzed. Otherwise, enter “No”.
6. Complete Table 5, Emergency Plan Implementation, by performing the following steps.
- a. In column 3, enter the On-shift Position (from Table 1) which performs the listed Function/Task required by an emergency plan implementing procedure.

⁸ The analysis should use the definition of a release specified in the site emergency plan or implementing procedures.

⁹ Informed judgment is the least preferred option. Its use should be limited to functions or tasks for which directly applicable operating experience is not available, and timed performance is not practical, or may not provide consistent or meaningful results.

NOTE

In some cases, licensee procedures may allow for more than one individual to perform a given function/task (e.g., a primary and a backup). For analysis purposes, assume that the “primary” individual performs the function/task.

- 1) Line 1 - “Declare the Emergency Classification Level (ECL)” refers to the task of declaring the emergency.
- 2) Line 2 - “Approve Offsite Protective Action Recommendations” refers to the task of approving PARs for transmittal to offsite authorities.
- 3) Line 3 - “Approve content of State/local notifications” refers to the task of approving emergency-related information for transmittal to offsite authorities.
- 4) Line 4 - “Approve extension to allowable dose limits” refers to the task of approving increases to emergency worker dose limits.
- 5) Line 5 - “Notification and direction to on-shift staff” refers to the task of determining appropriate instructions to provide to plant personnel (e.g., assemble, evacuate, etc.).
- 6) Line 6 - “ERO notification” refers to the task of initiating/performing the callout of the ERO during a backshift, weekend or holiday. Examples include activating pagers, activating a callout system or service, etc.
- 7) Line 7 - “Abbreviated NRC notification for DBT event” refers to the task of placing a brief telephone call to the NRC which provides initial notification of a Hostile Action. For all analyses except the DBT, enter “N/A”.
- 8) Line 8 - “Complete State/local notification form”; self-explanatory. This should be the position which would receive NRC Drill/Exercise Performance (DEP) indicator credit for completing the offsite notification form.
- 9) Line 9 - “Perform State/local notifications” refers to the task of placing a telephone call, fax, web form transmittal, etc. which provides initial event notification to offsite authorities.
- 10) Line 10 - “Complete NRC event notification form”; self-explanatory.
- 11) Line 11 - “Activate ERDS”; self-explanatory.
- 12) Line 12 - “Offsite radiological assessment” refers to the task of performing offsite dose projections in response to a radiological release to

the environment.¹⁰ If the event or accident under analysis does not result in a radiological release, or if the assessment is performed by a Radiation Protection or Chemistry Technician (as indicated in Table 4), then enter “N/A” in this block.

- 13) Line 13 - “Perform NRC notifications” refers to the task of placing a telephone call which provides initial event notification to the NRC. This should be treated as a continuous action per 10 CFR 50.72(c)(3) and 73.71(b)(1) which requires licensees reporting events to “maintain an open and continuous communication channel with the NRC Operations Center upon request by the NRC.”
 - 14) Line 14 - “Perform other site-specific event notifications (e.g., INPO, ANI, etc.)”; self-explanatory. Enter “N/A” if no additional, procedurally driven notification is required, if the notification can be completed within approximately 1 minute, or if it can be deferred until the arrival of the augmenting ERO.
 - 15) Line 15 - “Personnel accountability” refers to the function of generating the initial accountability report. For all events and accidents except the DBT, this is required within 30 minutes of a Site Area Emergency or General Emergency although some sites may have this requirement at the Alert level. If the emergency classification level for the event or accident does not result in the initiation of the personnel accountability function, then enter “N/A” in this block.
 - 16) Line 16 – “Other: Specify”. Include any additional site-specific roles, functions or tasks necessary to implement the emergency plan if performance duration exceeds approximately 1 minute.
- b. In column 4, enter the controlling method (i.e., a program or process) by which the capability to perform each task has been analyzed. For example, the capability of a Work Control Supervisor to perform State/local notifications is assessed and validated by the Operations Training Program and the EP Drill Program. Enter “N/V” for a position if an assigned Emergency Plan Implementation task has not analyzed.
 - c. In Table 1, locate each On-Shift Position assigned to Table 5. For each position, enter “Table 5” and the associated line number in column 5 of Table 1 (Role in Table#/Line#).
 1. For each position, enter “Yes” in column 6 of Table 1 (Unanalyzed Task?) if the position has a task that has not analyzed (i.e., an “N/V” was entered). Otherwise, enter “No”.

¹⁰ The analysis should use the definition of a release specified in the site emergency plan or implementing procedures.

3.2.3 Perform an assessment of the analysis results

1. Review Table 1, column 6, to identify the On-Shift Positions that have an unanalyzed task(s) (i.e., a “Yes” has been entered).
 - a. For each of these positions, enter “Yes” in column 7 (TMS Required?).
2. Review Table 1 to identify the On-shift Positions which have no or one assigned role, function or task, as denoted in column 5.
 - a. Enter “No” in column 7 (TMS Required?) for each position unless a “Yes” has already been entered.
3. The Shift Manager may be assigned the role of Shift Technical Advisor (STA)¹¹. This collateral duty assignment does not require a TMS.
4. Review Table 4 to identify time periods requiring the concurrent performance of two or more functions or tasks by the same on-shift position.
 - a. For the on-shift positions not required to perform two or more functions or tasks concurrently, enter “No” in column 7 of Table 1 (TMS Required?) unless a “Yes” has already been entered.
 - b. For the on-shift positions that are required to perform two or more functions or tasks concurrently, enter “Yes” in column 7 of Table 1 (TMS Required?).
5. Review Table 1 to identify the On-Shift Positions which are assigned an emergency plan implementing function or task (from Table 5).
 - a. Using the guidance in Table 3.1, below, enter “Yes” or “No” in column 7 (TMS Required?) for each position. [A “No” is entered only if a “Yes” has not already been entered for that position.]

Table 3.1

| Table 5 Line # | Assigned E-Plan Role, Function or Task (from Table 5) | On-Shift Position | | | |
|-------------------|--|--------------------------|---|---|---|
| | | Shift Manager (SM) | For any position <u>not</u> listed in Table 2, 3 or 4 ¹² | For any position listed in Table 2 (except SM) | For any position listed in Table 3 or 4 |
| 1 | Declare the | No | No | Yes | Yes |

¹¹ This is an acceptable collateral duty assignment per Generic Letter 86-04, Policy Statement on Engineering Expertise On-Shift.

¹² Based on industry experience/practice, the listed emergency plan implementing tasks, with the exception of Offsite Radiological Assessment, are typically performed in a sequential fashion. Performance of the listed tasks is routinely reviewed and evaluated in emergency response drills and exercises.

| Table 5 Line # | Assigned E-Plan Role, Function or Task (from Table 5) | On-Shift Position | | | |
|-------------------|---|--------------------------|---|---|---|
| | | Shift Manager (SM) | For any position <u>not</u> listed in Table 2, 3 or 4 ¹² | For any position listed in Table 2 (except SM) | For any position listed in Table 3 or 4 |
| | Emergency Classification Level (ECL) | | | | |
| 2 | Approve Offsite Protective Action Recommendations | No | No | Yes | Yes |
| 3 | Approve content of State/local notifications | No | No | Yes | Yes |
| 4 | Approve extension to allowable dose limits | No | No | Yes | Yes |
| 5 | Notification and direction to on- shift staff (e.g., to assemble, evacuate, etc.) | No | No | No | Yes |
| 6 | ERO Notification | Yes | No | Yes | Yes |
| 7 | Abbreviated NRC notification for DBT event | No | No | No | Yes |
| 8 | Complete State/local notification form | No | No | Yes | Yes |
| 9 | Perform State/local notifications | Yes | No | Yes | Yes |
| 10 | Complete NRC event notification form | No | No | Yes | Yes |
| 11 | Activate ERDS | No | No | No | Yes |
| 12 | Offsite radiological assessment | Yes | Yes ¹³ | Yes | Yes |

¹³ If this function is performed by an individual with no other assigned functions/tasks, then enter "No".

| Table 5 Line # | Assigned E-Plan Role, Function or Task (from Table 5) | On-Shift Position | | | |
|-------------------|---|--------------------------|---|---|---|
| | | Shift Manager (SM) | For any position <u>not</u> listed in Table 2, 3 or 4 ¹² | For any position listed in Table 2 (except SM) | For any position listed in Table 3 or 4 |
| 13 | Perform NRC notifications ¹⁴ | Yes | No | Yes | Yes |
| 14 | Perform other site- specific event notifications (e.g., INPO, ANI, etc.) | Yes | No | Yes | Yes |
| 15 | Personnel Accountability | Yes | No | Yes | Yes |
| 16 | Other | Yes | No | Yes | Yes |

6. Enter “Yes” in column 7 of Table 1 (TMS Required?) for all other positions.
7. Perform the required TMS for each position per Section 4.0.
8. If there are no “Yes” entries in Table 1, column 7, the on-shift staffing is adequate to respond to this event and no further action is required.

¹⁴ For assessment purposes, this task should be treated as a continuous action per 10 CFR 50.72(c)(3) and 73.71(b)(1) which requires licensees reporting events to “maintain an open and continuous communication channel with the NRC Operations Center upon request by the NRC.”

4 TIME MOTION STUDY PROCESS

For the purposes of this guideline, an ERO job is defined as a group of EP related functions that are assigned to a single position. Functions can be associated with and grouped by planning standard. See Appendix C for a table of ERO performance functions and example descriptions for onsite personnel.

Responsibilities, or tasks, are elements that compose the process to accomplish a particular function. An ERO position may be assigned one or more responsibilities to accomplish a function, or multiple responsibilities may be assigned to several ERO positions to accomplish a particular function. The below outline illustrates the hierarchy:

A. Planning Standard – any of the §50.47(b) EP planning standards.

1. Function – the component that defines the program element used to accomplish the planning standard.

1.1. Responsibility (task) – the activity that describes the action or work performed to accomplish (or support the accomplishment of) a function.

1.1.1. Action step – the detailed actions performed to accomplish the task.

An ERO job that consists of interrelated functions and responsibilities that do not conflict would be coherent. An example of conflicting functions and responsibilities would be a RP Technician who is assigned to perform state and local event notification and in-plant radiation surveys. In this case, the RP Tech assigned to notifications and surveys, on Appendix B Table 1 On-Shift Position RP #1 in column 5 would be assigned two roles Table 4 Line 2 and Table 5 Line 8. Because these are not collateral duties allowed by the Table in Step 3.2.3.2.a, “TMS Required” was checked in column 6 of Appendix B, Table 1. Because “TMS Required” was checked yes the evaluator is now referred to Section 4 for further evaluation.

A task analysis is the identification of requirements for accomplishing a particular responsibility and is typically used to determine initial and continuing training. Within the context of this guideline, the task analysis results are used to identify issues of timing, workload, etc. to determine resource conflicts that would affect the ability to accomplish a function and thus impact staffing assignments.

For certain responsibilities, it is possible for an ERO position to perform some overlapping tasks without experiencing overload. This is frequently the case for personnel within an operating center such as the Control Room, Technical Support Center and Emergency Operations Facility. For other positions, task overlap cannot be accommodated. This occurs when tasks must be performed in isolated areas or outside of the plant.

4.1 PROCESS ASSUMPTIONS

4.1.1 Concept of operations (Ops on-shift organization) for minimum shift RO and SRO requirements specified in §50.54(m)(2)(I) will not be altered. Functions and responsibilities assigned to licensed operators listed in Appendix B, Collateral Duty

Identification Analysis, Table 2, Plant Operations & Safe Shutdown, other than for the Shift Manager position, will be limited to current plant status and corrective action bounded by EOP/AOP instruction.

- 4.1.2 The functions and responsibilities will be organized by planning standard as described in NUREG-0654 and will be used as the standard for defining the emergency performance requirements of the on-shift organization.
- 4.1.3 On-shift work activities analysis is performed up to the time where ERO responders are expected to arrive and relieve the on-shift position of the function as specified in the approved Emergency Plan. No credit is taken for earlier response and relief.

4.2 PROCESS OUTLINE

4.2.1 Function/Responsibility (Task) Analysis

Using the event analysis results developed in Section 3 that identified positions with collateral / multiple responsibilities assigned to their position that may overlap (tasks that resulted in Column 6 of Appendix B Table 1 being checked yes for TMS Required), perform a function / responsibility (task) analysis to document the steps required to perform each of the functions.

- A. For each position assigned multiple responsibilities in a particular event scenario, record the following on Appendix D, Function/Responsibility (Task) Analysis Template table:
 - Event type from Appendix A.
 - On-shift position and line # from Appendix B, Table 1.
 - Applicable overlapping functions and their associated responsibilities (tasks).
- B. Determine and list all of the action steps needed to perform the responsibilities (tasks) from implementing procedures or other instructional sources. Add additional rows for task's action steps as needed.
- C. Document the time it takes to perform the step. Step time (or duration) can be determined through direct performance observation such as in a drill or exercise that simulates the conditions under which the task is performed.

4.2.2 Work Activities Analysis

Appendix E or a similar chronological timeline is used to record the work activities analysis information.

- A. Develop an event scenario timeline and narrative out to the time the position would be relieved of the responsibilities for the task.

This scenario should be documented in a manner similar to a drill/exercise package and include a description of the methods used to perform and observe the accomplishment of the task actions.

Level of detail should include defining whether the simulation starts in another location, travel time to the location where the activity is accomplished, delay time to acquire a procedure or get clearance to enter an area, environmental conditions likely to be present when the activity is performed (low visibility due to smoke, heat, lower levels of lighting for LOPs, etc.)

Documentation of the scenario should be similar to an extent-of-play description typically included in exercise scenario manuals. The level of documentation for the scenario is determined by station processes.

NOTE: It may be useful to include a reference to a procedure or instruction in the column used to record the task / action step description.

- B. Run the scenario in an appropriate setting (walkthrough, simulator session, drill, etc.) and record the time, event condition and action performed for each task being analyzed.
- C. Determine whether there is an overlap of task steps that would preclude or impact the ability or timeliness to perform the actions.

4.2.3 Personnel Requirements (Staffing Plan) Analysis

- A. Evaluate the results of the work activities analysis for overlap of concurrent task activity steps performed by single on-shift positions.
- B. If an overlap or other conflict is identified, the issue must be documented within the station corrective action process, evaluated and addressed¹⁵.

Dispositioning of an overlap or other conflict may include the following:

- Performing additional formal task analysis (for example, Systems Approach to Training - SAT analysis) to determine whether the overlap can be resolved and justified as currently implemented, such as by prioritization of activities based on importance and difficulty. Refer to Appendix F for difficulty and importance definitions specific to EP tasks SAT analyses that may be used to assist in the dispositioning of overlapping responsibilities.
- Reassigning one or more tasks or steps that caused the overlap to another on-shift position. Reassignment of tasks or steps would require re-analysis of the affected positions to ensure no new overlap was created by the reassignment.

¹⁵ It is expected that analysis results will be verified and validated prior to submitting a condition report. Once a condition report is submitted, it will be necessary to determine whether interim corrective actions are necessary.

- Implementing technology solutions that alter the steps or timing of activities related to the overlapping tasks (for example, replacing a manual call process with an automated system).
- Adding additional personnel to the on-shift ERO. If an overlap of responsibilities cannot be justified, eliminated by reassignment to an existing on-shift ERO position (that would not create a new overlap) or removed by alteration, then actions to eliminate the overlap with additional permanent on-shift ERO personnel, and potentially immediate compensatory actions, would be required to address the overlap.

5 REFERENCES

- 5.1 10 CFR § 50.47 Emergency plans – Section (b)
- 5.2 10 CFR § 50.54 Conditions of licenses – Section (m)
- 5.3 10 CFR § 50.54 Conditions of licenses – Section (hh)
- 5.4 10 CFR § 50.72 Immediate notification requirements for operating nuclear power reactors – Section (c)
- 5.5 10 CFR § 73.71 Reporting of safeguards events – Section (b)
- 5.6 10 CFR § 50, Appendix E – Emergency Planning and Preparedness for Production and Utilization Facilities
- 5.7 ANSI/ANS-58.8-1994, Time Response Design Criteria for Safety-Related Operator Actions
- 5.8 Electric Power Research Institute (EPRI) Proprietary Report TR-101869, Severe Accident Management Guidance Technical Basis Report, Vols. 1 and 2, 1992
- 5.9 NRC Generic Letter 86-04, Policy Statement on Engineering Expertise On-Shift
- 5.10 NRC Information Notice 91-77, Shift Staffing at Nuclear Power Plants
- 5.11 NRC Information Notice 93-81, Implementation of Engineering Expertise On-Shift
- 5.12 NRC Information Notice 95-48, Results of Shift Staffing Study
- 5.13 NSIR/DPR-ISG-01, Interim Staff Guidance – Emergency Planning for Nuclear Power Plants
- 5.14 NUREG-0654, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants
- 5.15 NUREG-0800, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants
- 5.16 NUREG-1852, Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire
- 5.17 NUREG/CR-3903, Analysis of Emergency Staffing for Nuclear Power Plants
- 5.18 Regulatory Guide 1.189, Fire Protection for Nuclear Power Plants
- 5.19 Regulatory Guide 1.8, Qualification and Training of Personnel for Nuclear Power Plants
- 5.20 Regulatory Guide 1.214, Response Strategies for Potential Aircraft Threats

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APPENDIX A

Analyzed Events and Accidents

| Analysis # | Summary Description of Event or Accident | Plant Mode | Reference Document(s) | ECL | Analysis Required? |
|------------|--|------------|-----------------------|---------------------|--------------------|
| 1 | Land and/or waterborne HOSTILE ACTION directed against the Protected Area by a HOSTILE FORCE. Assume adversary characteristics defined by the Design Basis Threat (DBT). | 1 | | Site Area Emergency | Yes |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |

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APPENDIX B
On-Shift Staffing Analysis

Complete this appendix by following the instructions in section 3.2.2.

This OSA is applicable to Analysis # _____ as identified in Appendix A.

TABLE 1 – On-shift Positions

| Line | On-shift Position | Emergency Plan Reference | Augmentation Elapsed Time (min) | Role in Table#/Line# | Unanalyzed Task? | TMS Required? |
|-------------|--------------------------|---------------------------------|--|-----------------------------|-------------------------|----------------------|
| 1. | | | | | | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |
| 6. | | | | | | |
| 7. | | | | | | |
| 8. | | | | | | |
| 9. | | | | | | |
| 10. | | | | | | |
| 11. | | | | | | |
| 12. | | | | | | |
| 13. | | | | | | |
| 14. | | | | | | |

On-Shift Staffing Analysis

TABLE 1 – On-shift Positions (continued)

Analysis # _____

| Line | On-shift Position | Emergency Plan Reference | Augmentation Elapsed Time (min) | Role in Table#/Line# | Unanalyzed Task? | TMS Required? |
|-------------|--------------------------|---------------------------------|--|-----------------------------|-------------------------|----------------------|
| 15. | | | | | | |
| 16. | | | | | | |
| 17. | | | | | | |
| 18. | | | | | | |
| 19. | | | | | | |
| 20. | | | | | | |
| 21. | | | | | | |
| 22. | | | | | | |
| 23. | | | | | | |
| 24. | | | | | | |
| 25. | | | | | | |
| 26. | | | | | | |
| 27. | | | | | | |
| 28. | | | | | | |

On-Shift Staffing Analysis

TABLE 2 – Plant Operations & Safe Shutdown

Analysis # _____

One Unit - One Control Room

Applicable to site unit(s) # _____

**Minimum Operations Crew Necessary to Implement
AOPs and EOPs, or SAMGs if applicable**

| Line | Generic Title/Role | On-Shift Position | Task Analysis Controlling Method |
|-------------|---------------------------|--------------------------|---|
| 1 | Shift Manager | | |
| 2 | Unit Supervisor | | |
| 3 | Shift Technical Advisor | | |
| 4 | Reactor Operator #1 | | |
| 5 | Reactor Operator #2 | | |
| 6 | Auxiliary Operator #1 | | |
| 7 | Auxiliary Operator #2 | | |
| 8 | Other | | |
| 9 | Other | | |
| 10 | Other | | |

**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 | | |
| 12 | Electrician | | |
| 13 | I&C Technician | | |
| 14 | Other | | |

On-Shift Staffing Analysis

TABLE 2 – Plant Operations & Safe Shutdown

Analysis # _____

Two Units - One Control Room

Applicable to site unit(s) # _____

**Minimum Operations Crew Necessary to Implement
AOPs and EOPs, or SAMGs if applicable**

| Line | Generic Title/Role | On-Shift Position | Task Analysis Controlling Method |
|-------------|---------------------------|--------------------------|---|
| 1 | Shift Manager | | |
| 2 | Unit Supervisor | | |
| 3 | Shift Technical Advisor | | |
| 4 | Reactor Operator #1 | | |
| 5 | Reactor Operator #2 | | |
| 6 | Reactor Operator #3 | | |
| 7 | Auxiliary Operator #1 | | |
| 8 | Auxiliary Operator #2 | | |
| 9 | Auxiliary Operator #3 | | |
| 10 | Other | | |
| 11 | Other | | |
| 12 | Other | | |

**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 |
|-------------|---------------------------|--------------------------|---|
| 13 | Mechanic | | |
| 14 | Electrician | | |
| 15 | I&C Technician | | |
| 16 | Other | | |

On-Shift Staffing Analysis

TABLE 2 – Plant Operations & Safe Shutdown (continued) Analysis # _____

Two Units - Two Control Rooms Applicable to site unit(s) # _____

**Minimum Operations Crew Necessary to Implement
AOPs and EOPs, or SAMGs if applicable**

| Line | Generic Title/Role | On-Shift Position | Task Analysis Controlling Method |
|-------------|---------------------------|--------------------------|---|
| 1 | Shift Manager | | |
| 2 | Unit Supervisor #1 | | |
| 3 | Unit Supervisor #2 | | |
| 4 | Shift Technical Advisor | | |
| 5 | Reactor Operator #1 | | |
| 6 | Reactor Operator #2 | | |
| 7 | Reactor Operator #3 | | |
| 8 | Reactor Operator #4 | | |
| 9 | Auxiliary Operator #1 | | |
| 10 | Auxiliary Operator #2 | | |
| 11 | Auxiliary Operator #3 | | |
| 12 | Auxiliary Operator #4 | | |
| 13 | Other | | |
| 14 | Other | | |
| 15 | Other | | |
| 16 | Other | | |

**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 |
|-------------|---------------------------|--------------------------|---|
| 17 | Mechanic | | |
| 18 | Electrician | | |
| 19 | I&C Technician | | |
| 20 | Other | | |

On-Shift Staffing Analysis

TABLE 3 – Firefighting

Analysis # _____

| Line | Performed By | Task Analysis Controlling Method |
|-------------|---------------------|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |

On-Shift Staffing Analysis

TABLE 4 – Radiation Protection & Chemistry

Analysis # _____

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

On-Shift Staffing Analysis

TABLE 5 – Emergency Plan Implementation

Analysis # _____

| Line | Function/Task | On-Shift Position | Task Analysis Controlling Method |
|-------------|--|--------------------------|---|
| 1 | Declare the Emergency Classification Level (ECL) | | |
| 2 | Approve Offsite Protective Action Recommendations | | |
| 3 | Approve content of State/local notifications | | |
| 4 | Approve extension to allowable dose limits | | |
| 5 | Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.) | | |
| 6 | ERO notification | | |
| 7 | Abbreviated NRC notification for DBT event | | |
| 8 | Complete State/local notification form | | |
| 9 | Perform State/local notifications | | |
| 10 | Complete NRC event notification form | | |
| 11 | Activate ERDS | | |
| 12 | Offsite radiological assessment | | |
| 13 | Perform NRC notifications | | |
| 14 | Perform other site-specific event notifications (e.g., INPO, ANI, etc.) | | |
| 15 | Personnel accountability | | |
| 16 | Other: Specify | | |

APPENDIX C

ERO Function List (by Planning Standard)

- A) Assignment of Responsibility (Organization Control): §50.47(b)(1)**
 - 1) Coordination with Offsite Response Agencies (EM, ICP, Field Mon, etc.)
 - 2) Continuous Staffing and Shift Relief
- B) Onsite Emergency Organization: §50.47(b)(2)**
 - 1) Plant Operations (status monitoring and EOP actions)
 - 2) Command and Control
 - 3) Facility/Group Management and Supervision
 - 4) ERO Mobilization and Response (persons receiving the notification)
 - 5) Use of Medical, Fire and Law Enforcement Support
- C) Emergency Response Support and Resources: §50.47(b)(3)**
 - 1) Request, Integration and Use of Offsite Personnel within the ERFs
 - 2) Dispatch and Control of Offsite EOC Liaisons
 - 3) Contact and Use of External Support Services (technical, material, etc.)
- D) Emergency Classification System: §50.47(b)(4)**
 - 1) Event Classification
- E) Notification Methods and Procedures: §50.47(b)(5)**
 - 1) ERO Notification
 - 2) Local/State Event Notification (ECL and PAR)
 - 3) NRC Event Notification
 - 4) Siren Activation/EAS Message Development
- F) Emergency Communications: §50.47(b)(6)**
 - 1) Inter-Facility Communications
 - 2) NRC Emergency Telecommunications System
 - 3) Inter-Agency/Organization Communications
 - 4) Industry Event Communications (INPO, ANI, etc.)
- G) Public Education and Information: §50.47(b)(7)**
 - 1) Media Statements
 - 2) Media Briefings
 - 3) Accommodation of News Media Personnel
 - 4) Media Monitoring
 - 5) Rumor Control
- H) Emergency Facility and Equipment: §50.47(b)(8)**
 - 1) Facility/Work Area Setup
 - 2) Facility Activation
 - 3) Facility Operation
 - 4) Facility Relocation
 - 5) Facility Information Display Systems
- I) Accident Assessment: §50.47(b)(9)**
 - 1) Accident Detection and Assessment
 - a) Engineering analysis
 - b) Plant system prognosis
 - c) Priorities of mitigating actions
 - 2) Dose Assessment
 - a) Meteorological assessment
 - b) Release determination/projection
 - 3) Core Damage Assessment
 - 4) Radiological Monitoring (in plant, onsite and offsite)
 - 5) Response Team Activities (damage assessment, repair, firefighting)
 - a) Task development and prioritization
 - b) Team briefing, dispatch and control
 - 6) Extreme Measures
- J) Protective Response: §50.47(b)(10)**
 - 1) Assembly and Accountability (onsite and/or offsite)
 - a) Search and rescue
 - 2) Evacuation (local area, protected area and OCA)
 - a) Precautionary dismissal
 - b) Site access controls
 - 3) Authorization and use of KI
 - 4) Offsite Protective Action Recommendations
 - 5) Personnel Protective Equipment
- K) Radiological Exposure Control: §50.47(b)(11)**
 - 1) Authorization and use of Emergency Exposure Limits
 - 2) Monitoring and Decontamination (personnel, material, etc)
 - 3) Contamination and Habitability Controls (site and personnel)
- L) Medical and Public Health Support: §50.47(b)(12)**
 - 1) First Aid
 - 2) Transportation of Contaminated Injured Personnel
 - 3) Medical Treatment Assistance
- M) Recovery Planning and Post-accident Operations: §50.47(b)(13)**
 - 1) Event Termination
 - 2) Initiation and Operation of the Recovery Organization
 - 3) Environmental Sampling (ingestion pathway activities)
- Z) ERO Fundamentals**
 - 1) Briefings and Updates
 - 2) Log and Record Keeping
 - 3) Post Event Facility/Work Area Restoration Activities
 - 4) Human Performance Error Reduction Techniques

NUREG/CR-3903 On-shift Functions

Plant Operations – activities performed or directed by licensed operators to stabilize the event and bring the reactor to a safe shutdown condition.

Current plant status: activities related to monitoring the status of the major reactor systems: the reactor core, the primary coolant boundary, the emergency core cooling system and the integrity of the containment building.

Corrective actions: all activities related to the execution of emergency operating procedures.

Damage assessment and repair: tasks necessary to identify damaged systems or components, put them back into operating condition, and verify the proper performance of corrective maintenance.

Firefighting: all activities needed to locate, contain and extinguish fires.

Emergency Assessment – diagnoses of past and present plant conditions and prognoses of future plant conditions that guide emergency personnel in their efforts to mitigate damage to the plant and prevent exposure to radiation.

Emergency classification: the comparison of key plant parameters or conditions to emergency action levels.

Engineering analysis: primarily the development of solutions to mechanical, electrical, instrumentation and control, and core physics/thermohydraulic problems. However, it also includes the diagnosis of the accident causes and the development of plans and procedures for corrective actions.

Plant systems prognosis: projection of the future status of the reactor core, primary coolant boundary, emergency core cooling system and containment integrity.

Source term projection/assessment: evaluation of the likely release fractions of various isotopes from the fuel and primary coolant system, as well as the time sequence of the releases. The source term assessment is based upon plant systems prognosis, radiochemical analysis and direct measurements of inplant radiation levels.

Radiochemical analysis: preparation and analysis of samples of reactor coolant, contaminant atmosphere, and stack or liquid effluents.

Protective Response – actions taken to prevent or minimize exposure of individuals to unnecessary hazards.

Radiological monitoring: dispatching of teams to any of three principal areas - inplant, onsite or offsite - and involves the measurement, recording and transmission of radiation survey data.

Meteorological assessment: collection of primary meteorological data, calculation of dispersion parameters, and the forecasting of future meteorological conditions.

Dose projection/assessment: calculation of dose rates from source term derived from one of three bases: (1) plant systems data (either current plant status or plant system prognosis), (2) inplant radiological information and effluent measurements, or (3) environmental samples. It also includes the projection of total (integral) dose over specified time frames.

Protective action recommendation: determination of the appropriate protective action for selected individuals onsite or offsite and the communication of the recommendation to the responsible authorities. The primary inplant protective actions involve use of respirators, radioprotective drugs, protective clothing, shielding, access control and evacuation. Offsite protective actions are primarily sheltering and evacuation.

Radiological exposure control: activities such as briefing of teams (e.g., exposure limits, routes of travel and stay times in radiation hazard areas), issuance of dosimetry and recording of exposures.

Search and rescue: locating missing or injured plant personnel, diagnosing any injuries, administering first aid, and transporting the victim to treatment facilities.

Decontamination: all activities required to remove surface contamination from exposed plant personnel.

Environmental sampling: dispatch of survey teams, collection of air, water or soil samples, the recording and transmission of environmental data and the analysis of samples collected. Analysis of environmental samples may be used to confirm dose assessments or to form the basis for offsite protective responses.

Emergency Management – activities by which the physical and human resources used to respond to the emergency are maintained and controlled to accomplish the goals of the emergency response effort.

Activation of emergency organizations: notification of required plant personnel onsite and off-duty as well as members of offsite emergency organizations.

Offsite coordination: communication of emergency conditions, analyses and actions to offsite organizations. These include the State and local operations centers and support facilities, corporate headquarters, industry support groups (e.g., NSSS vendor, A/E, INPO, ANI), and the NRC.

Onsite management: establishment and maintenance of communication and coordinated action among response teams performing plant operations, emergency assessment and protective response functions.

Accountability: establishment and maintenance of records of the location of all onsite personnel and establishment of the identity and probable location of missing persons.

Security: restriction of access to the site or controlled areas within the site and control of the evacuation of nonessential personnel.

Documentation: recording of plant status and prognosis, corrective actions implemented, and protective actions recommended and implemented.

Administrative and logistic support: activities required to provide additional onsite personnel, material or equipment, or to request offsite firefighting, medical or security support.

Public information: periodic press releases and press conferences in coordination with local, state and federal response agencies.

Several NUREG/CR-3903 function descriptions involve multiple planning standards, and actually consist of several functions. A table correlating the NUREG/CR-3903 generalized on-shift functions with the NUREG-0654 planning standard categorized functions is provided below:

| NUREG/CR-3903 function | PS function | Comments |
|---------------------------------------|---------------------|---------------------------------------|
| Plant Operations | | |
| Current plant status | B.1 | |
| Corrective actions | B.1 | |
| Damage assessment and repair | J.6 | |
| Firefighting | J.6 | |
| Emergency Assessment | | |
| Emergency classification | D.1 | |
| Engineering analysis | I.1 | |
| Plant systems prognosis | I.1 | |
| Source term projection/assessment | I.4 | |
| Radiochemical analysis | I.4 | part of core damage assessment |
| Protective Response | | |
| Radiological monitoring | I.3 | |
| Meteorological assessment | I.2 | part of dose assessment |
| Dose projection/assessment | I.2 | |
| Protective action recommendation | E.2, J.3, K.3 / J.4 | |
| Radiological exposure control | J.6 | title not consistent with description |
| Search and rescue | J.1 | |
| Decontamination | K.2 | |
| Environmental sampling | M.3 | |
| Emergency Management | | |
| Activation of emergency organizations | E.1, E.2, E.3 | |
| Offsite coordination | C.1, E.4 | |
| Onsite management | J.6 | title not consistent with description |
| Accountability | J.1 | |
| Security | J.2 | |
| Documentation | Z.2 | not a planning standard |
| Administrative and logistic support | B.2, C.4 | |
| Public information | G.1, G.2 | |

APPENDIX D

Function / Responsibility (Task) Analysis Template

Event: _____

Position: _____

Line #: _____

| Function | Responsibility (Task) | Action Step | Duration |
|-----------------|------------------------------|--------------------|-----------------|
| 1. | 1.1 | 1.1.1 | |
| | | 1.1.2 | |
| | | 1.1.3 | |
| | 1.2. | 1.2.1 | |
| | | 1.2.2 | |
| | | 1.2.3 | |
| | 1.3. | 1.3.1 | |
| | | 1.3.2 | |
| | | 1.3.3 | |
| 2. | 2.1 | 2.1.1 | |
| | | 2.1.2 | |
| | | 2.1.3 | |
| | 2.2. | 2.2.1 | |
| | | 2.2.2 | |
| | | 2.2.3 | |
| | 2.3. | 2.3.1 | |
| | | 2.3.2 | |
| | | 2.3.3 | |

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APPENDIX F

EP Based Responsibility (task) ‘Difficulty’ and ‘Importance’ Rating Criteria

One potential method to disposition an overlap in tasks would be to evaluate the importance and difficulty attributes of those tasks in order to provide the ability to prioritize actions formally within the implementing procedure instructions.

Typically, ERO procedures are written broadly to allow actions to be taken as they apply to the circumstances of a particular event. While EP procedures often allow steps to be performed in any order or omitted as applicable, they do not always distinguish a priority or hierarchy other than for key risk significant activities such as classification, notification and PARs.

If an overlap of task occurs it may be possible to justify why the overlap of actions is not a concern or an impact on the ability of the ERO member to perform the functions of those tasks in a timely manner. For example; if the action steps to notify state and local agencies of an event overlapped with the action steps to develop a broadcast message for non-ERO utility personnel, the actions of the non-critical responsibility could be delayed to a later point in the procedure to eliminate the timing overlap. The way this would be done would be to perform a formal task analysis to define the attributes applicable to the tasks and then determined whether the overlapping tasks could be effectively prioritized and still perform their function.

Each training department has procedures governing the process of formal task analysis (i.e., SAT process). The EP based criteria for difficulty and importance is provided below to aid in a task analysis where overlapping actions would be evaluated within a formal process to determine whether a priority or hierarchy exists. If it can be shown that overlapping tasks do not need to be performed at the same time or otherwise be in conflict, the corrective action could be to enhance procedure instruction rather than to reassign the task entirely.

Difficulty ‘D’

The difficulty of a responsibility (task) is based on an average of the difficulty attribute values associated with the responsibility (task). Numeric ratings are established from the assumption that experience/proficiency levels are those of an individual newly qualified to the ERO. Difficulty attributes and their values are as follows:

| | 5 points | 3 points | 1 point |
|--------------------------------|-----------------|-----------------|----------------|
| Complexity (# of steps) | High | Medium | Low |
| Speed | Fast | Medium | Slow |
| Duration | Long | Medium | Short |
| Distractions | Many | Some | Few |
| Locations | Many | Some | Single |
| Overlap | Likely | Possible | Unlikely |

Complexity – Complexity is established by assessing the intricacy or number of steps involved with the task.

Speed – Speed is established by assessing the pace at which the task must be performed, particularly in the case of time dependent activities, such as classification and notification.

Duration – Duration is established by assessing the time it takes to complete the task and whether it is repeated frequently.

Distractions – Distractions is established by assessing the environment where the task is performed in consideration of light, noise, nearby activity, interruption, etc.

Locations – Locations is established by assessing the number of locations it would take an individual to fully perform the task (not how many places the task could be performed from).

Overlap – Overlap is established by assessing the potential for the task to be performed at the same time that another task is being done. For example, Notification steps for a General Emergency typically overlap with steps to determine an initial PAR.

Importance 'I'

Note: The term Risk Significant Planning Standards refers to Planning Standards described in 10 CFR 50.47(b)(4), (5), (9) and (10), and related material in Appendix E.

The importance of a responsibility (task) relative to its emergency response functions or to the safety of the public / plant staff is based on a 1 through 5 point scale.

Considerations for determining the level of importance are based primarily on their relationship to a Planning Standard (PS) or Risk Significant Planning Standard (RSPS) and include the following:

High (5 points) – The responsibility (task) involves the accomplishment of a RSPS function and failure to perform the task would result in the failure of the RSPS function.

-OR-

Failure to accomplish the responsibility (task) correctly results in the immediate risk of death to anyone involved in the activity.

Medium High (4 points) – The task involves the accomplishment of a RSPS function, but failure to perform the task would not result in the failure of the RSPS function.

-OR-

Failure to accomplish the responsibility (task) correctly creates a personnel safety hazard capable of serious injury or risk to health.

Medium (3 points) – The responsibility (task) involves the accomplishment of a PS function and failure to perform the task would result in the failure of the PS function.

Medium Low (2 points) – The responsibility (task) involves the accomplishment of a PS function, but failure to perform the task would not result in the failure of the PS function.

Low (1 point) – The responsibility (task) does not involve the accomplishment of a RSPS or PS function.