

ON-SHIFT AND AUGMENTATION STAFFING DURING A RADIOLOGICAL EMERGENCY AT NUCLEAR POWER PLANT SITES

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PROGRAM GOALS AND OBJECTIVES

- **Review Shift Staffing and Augmentation Levels in NUREG-0654, Table B-1 for a Spectrum of Events and Operating Modes**
- **Identify Industry Changes, Licensee Experience, and Changes in Technology and Analyze Their Impact on Shift Staffing and Augmentation**
- **Develop a Technical Basis for an Updated Table B-1 Shift Staffing and Augmentation Levels**

TASKS AND DELIVERABLES

- **Task 1a: Literature Search**
- **Task 1b: Emergency Functions and Tasks**
- **Task 1c: Emergency Sub-Tasks**
- **Task 1d: Emergency Task Time Requirements**
- **Task 1e: Site Visits and Data Collection**
- **Task 1f: Staffing Requirement Development**
- **Task 1g: Prepare NUREG/CR**

10 CFR 50.47, “EMERGENCY PLANS”

10 CFR 50.47(b)(2) Requires the following in the Emergency Plans:

“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, timely augmentation of response capabilities is available and the interfaces among various onsite response activities and offsite support and response activities are specified.”

EMERGENCY RESPONSE FUNCTIONS

- **Emergency Management**
- **Plant Operations and Control**
- **Emergency Declaration and Reclassification**
- **Emergency Response Organization and Facilities**
- **Emergency Notification and Communication**
- **Radiological Assessment and Dose Projections**
- **Onsite and Offsite Protective Action Recommendations**
- **Emergency Radiation Protection**
- **Emergency Team Support**

RADIOLOGICAL EMERGENCY RESPONSE MANAGEMENT

Emergency Response Management

- 1. Emergency Management Function**
- 3. Emergency Classifications Function**
- 7. Protective Action Recommendations Function**

Responsible ERO Staff: Emergency Director
CR Shift Manager ▶ TSC Manager ▶ EOF Manager
With Technical Support from ERF Supervisors

Facility Administration and Communication

- 4. Emergency Response Facilities Function**
- 5. Emergency Communications Function**

Responsible ERO Staff
Administrative, Liaison and Logistics Personnel
Communicators

Plant Operations and Control

- 2. Plant Operations and Control Function**
- 9. Emergency Team Support Function**

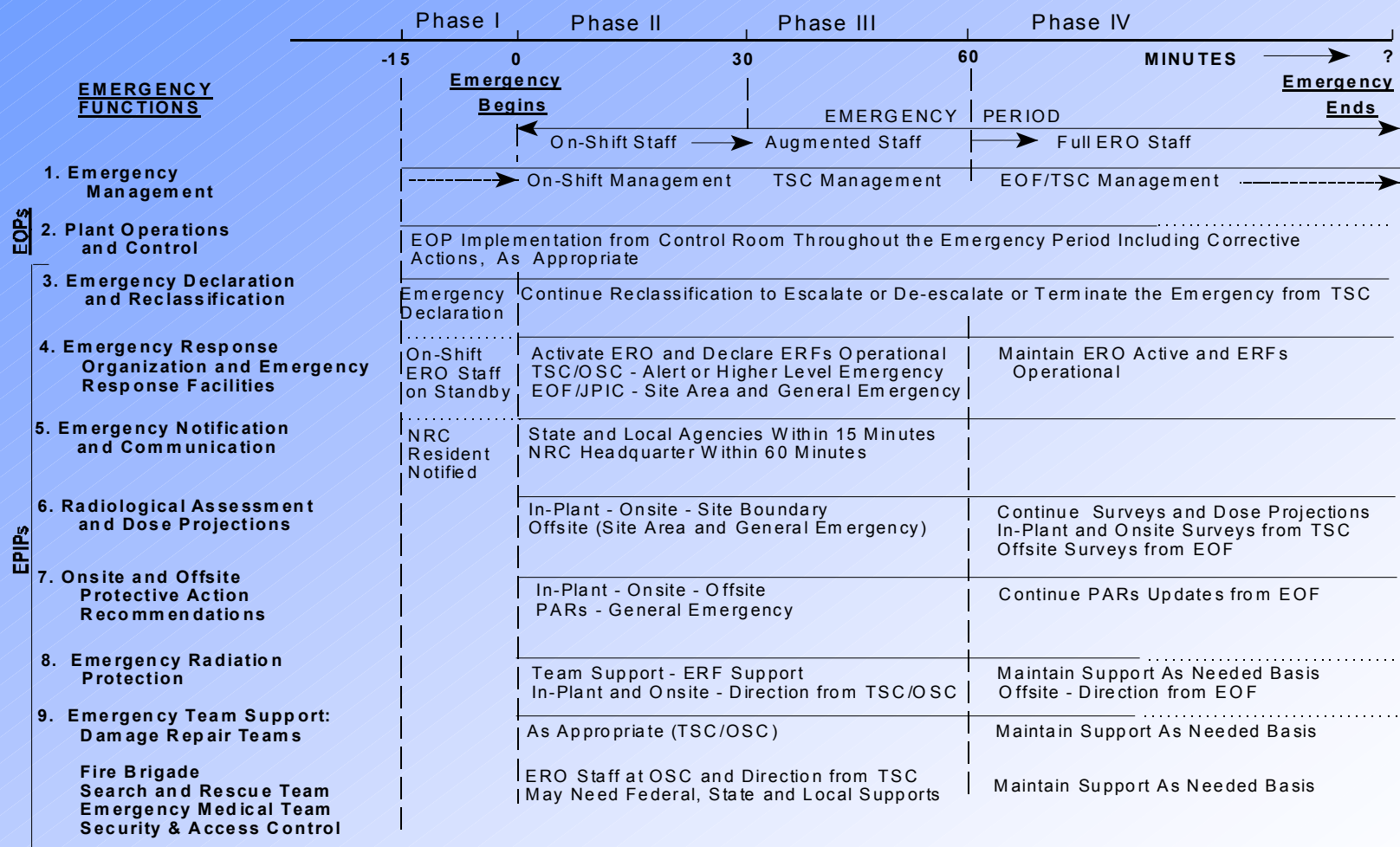
Responsible ERO Staff
Licensed and Non-Licensed Reactor Operators
Systems Engineering Personnel
Operations Technicians

Radiological Assessment and Protection

- 6. Radiological Assessment Function**
- 8. Radiation Protection Function**

Responsible ERO Personnel
Health Physicists
Radiation Protection Technicians
Chemistry and Rad-Chem Technicians

EMERGENCY FUNCTIONS TIME-LINE



METHOD OF ANALYSIS

- **Define Emergency Period in Phases**
- **Identify Emergency Response Functions**
- **Identify Emergency Response Tasks and Subtasks**
- **Determine ERO Personnel**
- **Determine Time Required for Each Task**
- **Determine ERO Staffing Categories/Positions**
- **Identify ERO Personnel to Cover All Emergency Response Subtasks**
- **Use SME, Table Top Model or Computer Program to Identify Minimum Staffing Level Required in Each Category**
- **Reconcile All Issues Identified Earlier**

SITE DATA COLLECTION

- **9 Emergency Response Functions Consist of About 54 Tasks and About 207 Sub-Tasks**
- **Time Dependence of Sub-Task Execution**
- **Time Dependence of ERO/ERF Activation**
- **Time Dependence of ERF Operational**
- **Task May be Continuous, Periodic or Discrete Occurrences**
- **Consistent ERO Position, Sub-Task Start Time, Time Requirement Estimates**
- **Variations in Time Estimates**
- **Workload Assessment Based on ERO Position**

SUGGESTED IMPROVEMENTS IN SURVEY PACKAGE

- **A 'Stand Alone' Survey Package**
- **Clear Explanation of All Data Form Columns**
- **Discussion of Scenarios for Ops, But EP Must Cover a Broad Spectrum of CD Events**
- **Identification of Continuous and Periodic Tasks**
- **Clarification of Time Variations (e.g., between the as-planned case and a reasonably complicated case)**
- **Sub-Task Prioritization Effect by Providing Time Span for the Start Time**

SITE DATA COLLECTION (SEABROOK)

- **Start Time: Phase I – Event Recognized; Phase II – Emergency Declared; Phase III – TSC/OSC Operational; Phase IV – EOF/JPIC Operational**
- **ERO Personnel: Must Be Available At Start Time**
- **Time Estimate: Procedures Referenced**
- **Time Variation: Certain Cases Equal to Time Estimate**
- **Workload: Based on ERO Position's Skill, Knowledge and Ability**
- **No Source Term and Dose Projection Until TSC/OSC Declared Operational**
- **Minimum On-Shift Staffing Level Excludes Seven Collateral Positions Identified in Table B-1**