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March 1996

DOE HANDBOOK

ESTABLISHING NUCLEAR FACILITY DRILL PROGRAMS

U.S. Department of Energy **FSC 6910**
Washington, D.C. 20585

FOREWORD

This Department of Energy (DOE) Handbook, DOE-HDBK-1099-95, *Establishing Nuclear Facility Drill Programs*, is approved for use by all DOE Components and their contractors. This Handbook was developed to provide DOE contractors with information that can be used to develop or improve drill programs. Drills, when used in conjunction with other qualification processes, provide realism to learning experiences in controlling facility abnormal conditions.

Beneficial comments (recommendations, additions, deletions) and any pertinent data that may improve this document should be sent to:

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by letter or by using the self-addressed Document Improvement Proposal (DOE F 1300.3) appearing at the end of this document.

This Handbook has been prepared on the basis of drill programs used at various DOE nuclear facilities. DOE contractors are encouraged to selectively use the contents in improving or developing programs applicable to their facilities. All or part of the Handbook contents can be used, as furnished or modified, to meet the specific needs of the facility.

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1. SCOPE

1.1 Purpose

The purpose of DOE Handbook, *Establishing Nuclear Facility Drill Programs*, is to provide DOE contractor organizations with guidance for development or modification of drill programs that both train on and evaluate facility training and procedures dealing with a variety of abnormal and emergency operating situations likely to occur at a facility. The Handbook focuses on conducting drills as part of a training and qualification program (typically within a single facility), and is not intended to included responses of personnel beyond the site boundary, e.g. Local or State Emergency Management, Law Enforcement, etc. Each facility is expected to develop its own facility specific scenarios, and should not limit them to equipment failures but should include personnel injuries and other likely events.

A well-developed and consistently administered drill program can effectively provide training and evaluation of facility operating personnel in controlling abnormal and emergency operating situations. To ensure the drills are meeting their intended purpose they should have evaluation criteria for evaluating the knowledge and skills of the facility operating personnel. Training and evaluation of staff skills and knowledge such as component and system interrelationship, reasoning and judgment, team interactions, and communications can be accomplished with drills.

The appendices to this Handbook contain both models and additional guidance for establishing drill programs at the Department's nuclear facilities. Appendix A is a template that can be used to establish contents and format of a drill scenario. Appendix B provides scenarios typical of many facilities. Appendix C describes cues and props that can be used to represent various conditions. Appendix D contains information on methods and content of typical evaluation criteria.

1.2 Applicability

DOE 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*, requires a continuing training program for certified operators and certified supervisors that includes, at a minimum, the following as related to job performance: a) annual training and examination covering abnormal facility procedures and emergencies; and b) drills conducted in the facility or on a simulator to enable facility operating personnel and operating teams to

maintain their ability to respond to abnormal or accident situations. This Handbook has direct applicability for those facilities having certified operators and supervisors. It describes several methods of developing, conducting, critiquing, and evaluating drills. Where drill programs are not specifically required by DOE Directives (e.g., facilities not subject to 5480.20A), portions of this Handbook may be selectively implemented by a facility to improve the training and qualification of its operating personnel.

Numerous methods of conducting drills are available to a facility. There is no one set way to conduct drills, and the facility should develop drill scenarios that utilize the facility and facility operating personnel during all conditions of facility operation. DOE 5480.20A also encourages the use of alternative approaches to training. Alternative methods of conducting drills that are presently being used at DOE facilities are discussed in Section 11, Alternative Methods of Conducting Drills. The information presented in this Handbook can be applied to any method or setting chosen. Whatever the method or setting, the drill scenario should meet the needs of the facility operating personnel.

The processes described herein may also be used to develop drill scenarios that require assistance from other facilities or for site emergency drills. Specific recommendations concerning the development of these drills are not offered since the 5500 series of DOE Orders, especially DOE 5500.3A, *Planning and Preparedness for Operational Emergencies*, DOE-HDBK-5504-95, *Guidance for Evaluation of Operational Emergency Plans*, and the Emergency Management Guide produced by the DOE Office of Emergency Management contain requirements and guidance, and outline criteria for these types of drills.

2. SOURCE DOCUMENTS

1. DOE Order 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*, November 1994.
2. DOE Order 5500.3A, *Planning and Preparedness for Operational Emergencies*, April 1991
3. DOE-STD-1070-94, *Guidelines for Evaluation of Nuclear Facility Training Programs*, June 1994.
4. DOE-HDBK-5504-95, *Guidance for Evaluation of Operational Emergency Plans*, March 1995
5. *Advanced Test Reactor (ATR) In-Plant Drill Program*, Lockheed Idaho Technologies Co., May 1994.
6. *Facility Drills and Monitored Evolutions*, Westinghouse Savannah River Co., January 1994.
7. *Fast Flux Test Facility (FFTF) In-Plant Drill Program*, Westinghouse Hanford Co., December 1994.
8. *High Flux Beam Reactor (HFBR) Drill Manual*, Brookhaven National Laboratory, January 1995.
9. *Research Reactors Division Drill Manual*, Lockheed Martin Energy Systems, December 1992.
10. *Utilities Operations Administrative Procedure*, Westinghouse Hanford Co., February 1994.
11. *Westinghouse GOCO Conduct of Casualty Drills*, Westinghouse Hanford Co., June 1994.

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3. DEFINITIONS

Cues and Props - Information used to control the progress of the drill.

Drill Conduct - The control and evaluation of a drill in a fashion that will safely, fairly, and accurately allow facility operating personnel to demonstrate the adequacy of their response capabilities.

Drill Coordinator - A knowledgeable, experienced person who ensures that drills are conducted safely and that all participants follow approved, established procedures. This person has the overall responsibility for safe conduct, coordination, continuity, evaluation, and critique of the drill.

Drill Evaluator - A person assigned to a specific drill for the purpose of evaluating, recording, and reporting the strengths and weaknesses of facility operating personnel activities and functions.

Drill Initiation - The event(s) that signals the beginning of a particular drill scenario.

Drill Safety Monitor - The person(s) whose sole responsibility is to ensure the facility is not placed in an unsafe condition. The drill safety monitor has the authority to stop the drill at any time and direct that the facility be placed in a safe condition.

Drill Scenario - A narrative of a hypothetical or real situation which serves as a theme or basis upon which the action of a drill is based to meet the established goals, scope, and objectives. A scenario contains adequate information (technical data) on facility operations and other conditions to allow facility operating personnel to respond as realistically as possible.

Drill Team - A group of people conducting, monitoring, and evaluating the drill (drill coordinator, evaluators, safety monitor, observers).

Evaluation Criteria - The standards the drill coordinator uses to determine when an objective has been adequately demonstrated. Evaluation criteria are developed for each drill objective.

Initial Conditions - Those conditions set forth in the drill scenario that must be met before the drill can be initiated.

Objective - Specific measurable performance objectives that are used for drills. These objectives are designed to demonstrate or test specific portions of participants' knowledge of facility operations.

Observer - One who is responsible for observing a drill, but who is not authorized to interact with facility operating personnel.

Restoration - The return of facility equipment to a desired and specified condition to permit continued operation. Identification of final facility condition following the normal completion of a drill scenario.

Simulation - An enactment representing a real situation. Specific events of the scenario may be simulated for practical reasons during a drill (operations of critical facility equipment, entrance into high radiation areas, etc.).

Termination Conditions - (1) Those conditions as described in the drill scenario that when met terminate the drill and restore the facility to a safe condition. (2) Those limits, established in the drill scenario, that if exceeded during the conduct of the drill require an immediate halt to the drill and a return to a safe and stable condition.

4. INTRODUCTION

Proper response to abnormal conditions is vital for ensuring personnel safety and protecting facility equipment and the environment. Personnel must be able to take the immediate actions necessary to safely mitigate the consequences of an unexpected or abnormal and potentially dangerous condition. Drills focus on the actions that are necessary to respond to abnormal conditions that present a hazard to personnel, equipment, or the environment.

The primary objective of a drill program is to train and qualify personnel. Drills are an integral component for safe and efficient facility operation. To successfully achieve this goal, drill participation should be integrated into initial and continuing training. An effective drill program is one of the best means available to management for assuring that the operating staff can safely deal with unplanned, potentially hazardous situations.

The rigor and detail of a drill program will vary with facility complexity and hazard potential. For example, a drill conducted at a reactor facility may involve several people and require a high level of detail, whereas a drill conducted at a site support facility may involve only a few people and require less detail. Drills conducted on safety related systems or components at high hazard facilities may require a large drill team using a detailed drill scenario, while drills conducted on safety systems at a low hazard facility may require a drill team of only a few persons.

To ensure proper implementation of a drill program, the duties, roles, and responsibilities of personnel involved and the mechanics for conducting the drill should be delineated. This ensures consistency of development, conduct, evaluations, critiques, and feedback into the training and drill programs. Alternative methods of conducting drills should be included as an integral part of the drill program to ensure the program is meeting its intended mission of training facility operating personnel. Facility management should determine the appropriate level of effort and resources to implement each element of the drill program, consistent with the risk and complexity of the facility.

Regardless of the size, complexity, and risk of a facility, an effective drill program includes the following essential elements:

- Developed drill scenarios

- Trained drill team personnel
- Process for drill conduct
- Criteria for drill evaluation
- Drill critiques
- Incorporated feedback from drills
- Alternative methods of conducting drills

The remainder of this Handbook addresses each of these elements.

5. DEVELOPING DRILL SCENARIOS

All drills should be conducted in accordance with a drill scenario approved by facility management or a group or individual(s) specifically identified by facility management to approve drills. While anyone may prepare a drill scenario, only qualified personnel should validate the scenario to determine its credibility, technical accuracy, and safety implications. When preparing a scenario, remember that a simple drill may often accomplish training objectives more effectively than a complicated one. However, the more detailed the scenario is in terms of cues and props and specific duties of evaluators and safety monitors, the lesser the chances are for a problem occurring during the drill. In any case, drills developed to be conducted in the facility should not lead to or have the potential for safety concerns.

Components that should be included in the scenario are Scope, Purpose, and Terminal Objective(s), Initial Conditions, Precautions and Limitations, Drill Team Duties, Drill Initiation, Expected Response and Evaluation Criteria, and Termination and Restoration. These are discussed below and shown in a template in Appendix A, and in example scenarios in Appendix B. Different formats are shown as examples in Appendix B.

Scope, Purpose, and Terminal Objective - Defines the boundaries (scope) of the drill, the reason (purpose) for running the drill (i.e., verify operators can startup the machinery with failed...), and the guidelines for evaluation of the outcome of the drill terminal objective. Generally these should be stated on the cover sheet.

Initial Conditions - Identifies initial conditions for the drill, i.e., the facility configuration needed to meet the objective. All organizations that could be affected by the conduct of the drill should be listed here and notified prior to drill initiation. Examples of these organizations include the fire department, safeguards and security, and facility emergency response organizations.

Precautions and Limitations - Lists any special safety or hazard considerations here as well as Technical Safety Requirements (TSR) for the affected systems or components. Hazards are generally identified in facility procedures, Safety Analysis Reports, special test operational requirements, etc.

Drill Team Duties - Includes specific instructions for each person performing drill team duties, i.e., the initiator, evaluator, safety monitor, cue and prop handler, etc. Each drill team

member should be listed by name so there is no confusion as to who has what drill function. The drill safety monitor should not allow facility operating personnel to take any actions that would adversely affect safety or cause equipment damage. No other responsibilities should be assigned to this person. Directions should emphasize that anyone knowing of an unsafe condition should terminate the drill. Details for any special actions or activities if required, such as intervention points (i.e., if an action is to be simulated rather than performed). Intervention points should be adequately described so the evaluator, safety monitor, or other individual monitoring can adequately control the situation.

Drill Initiation - Describes how to initiate the drill (e.g., the event being performed to cause the facility operating personnel to suspect a problem). The drill initiation event should be very specific.

Expected Response/Evaluation Criteria - Describes the expected response and the evaluation criteria for all personnel actions. Typically, the expected response is already identified in a procedure. But, it is generally insufficient to just list the procedure. Include the details in this section so they may be properly evaluated. Details will also ensure that the safety monitor has a better chance of acting on a problem before damage occurs. Communications that are expected should also be listed so they may be evaluated. If any action or communication needs more evaluation criteria than the procedure describes, it should be included here. If there are a number of ways to accomplish a given task, the expected response should be the normally accepted method. If any other safe response is allowed, it should be stated here. Criteria for evaluating personnel actions should be listed in this section of the drill scenario. More information on the methods of listing the evaluation criteria is contained in Section 8, Criteria for Drill Evaluation and Appendix D, Evaluation Criteria.

Termination and Restoration -

Termination 1) States the event(s) that indicate when the drill should be concluded. The facility condition(s) that ensures all required and expected actions have been completed and the facility can continue to operate or be shutdown safely should be identified. 2) States the event(s) that would cause an immediate termination of the drill due to a safety problem, TSR violation, or other problem, and would require immediate actions to place the facility in a safe condition.

Restoration Identifies any systems, components, or equipment that must be reset to normal operating status at the conclusion of the drill. This section could also be used as a verification section to ensure the reset of these items. It should include a mechanism to ensure restoration of the cues and props used in the drill.

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6. TRAINING AND SELECTION OF DRILL TEAM

Prior to conducting a drill, the drill team members should be assembled and trained in the duties, responsibilities, and activities of their respective positions in the conduct of the drill. Drill team training does not necessarily mean formal training. The training may be accomplished during the pre-drill briefing. Each drill team member's duties should be individually addressed during the pre-drill briefing.

Evaluators and safety monitors should have a level of knowledge of the facility that is sufficient for their drill team duties. Persons providing cues and props should be trained in their application and interpretation as they apply to specific drill scenarios. They should also be knowledgeable of facility equipment locations, operating characteristics, other facility requirements, and consequences of improperly interpreted cues and props.

The drill coordinator should be designated by facility management. The drill coordinator should be qualified on the facility, system, or equipment specified in the drill scenario, and may be a member of the operating staff or the training organization. The drill coordinator is responsible for the briefing, conduct, and critique of the drill. The duties and responsibilities of the drill coordinator include:

- Developing and preparing the exercise package
- Obtaining necessary approvals for conducting the drill prior to conduct
- Ensuring completion of pre-drill notifications
- Verifying the qualifications of drill team personnel and that assignments match their qualifications
- Ensuring that drill team members are properly identified (e.g., arm bands, name tags)
- Verifying facility status and initial conditions prior to conducting the drill
- Supervising coordination and conduct of the drill
- Terminating scenario at the completion of the drill
- Terminating the drill if limits specified in the drill scenario are exceeded, or if actions taken by facility operating personnel affect safety of personnel or cause damage to equipment or the environment
- Ensuring the post-drill restoration and removal of simulations
- Ensuring that any post-drill notifications have been made
- Conducting a critique (verbal and written) with all personnel involved
- Completing drill documentation and filing appropriately

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7. CONDUCTING DRILLS

When conducting drills the process should always be the same. The reason a set process should be followed is to minimize risking injury to personnel, or damage to equipment or the environment. A part of the drill process is contacting outside organizations such as the fire department, safeguards and security, and emergency response units. They should be notified when drills are to commence, and to respond or not to respond as required by the drill scenario. Included in the notification of these organizations should be how they will be notified in the event of an actual facility abnormal condition. Conduct of drills includes the pre-drill briefing, drill initiation, and drill performance.

7.1 Pre-drill Briefing

The drill coordinator should hold a pre-drill briefing with the selected drill evaluators, safety monitors, observers, and visitors to discuss each person's role, past problems encountered, and any safety considerations. The drill coordinator should discuss each section of the scenario, including specific instructions concerning intervention points, and answer any questions team members may have. The drill coordinator should also discuss how drill termination will be identified for both normal and abnormal conditions and how the facility will be restored.

7.2 Drill Initiation

The drill should be initiated by either the drill coordinator or by a drill team member in accordance with the drill scenario. Drill initiation can be coordinated by either time or event. The exact actions for the drill initiation should be identified. An example of an exact action is "Open breaker DC-34-BAC located in electrical panel DC-03-4. An alarm will immediately sound on the auxiliary pump control board indicating the loss of #3 pump control circuit." If an announcement is to be made that initiates the drill, the wording should be stated in the drill initiation section of the drill scenario and include the words "This is a drill."

7.3 Drill Performance

After the drill initiation is performed, facility operating personnel actions should be as described in appropriate facility procedures. Every activity and response action should be carried out exactly, to the maximum extent possible, as it would be if the event were real. If alternative actions are allowed, they should be listed here.

Cues and props are used by the drill team to improve realism. They are used to simulate the circumstances of an actual abnormal facility condition. Examples of such may include simulated gauge readings, alarms, announcements, a fire, leaking water, breaker positions, etc. Simulations may be in the forms of placards, stick-ons, made-up gauge faces, verbal commands, etc. Appendix C, Example Drill Cues and Props, contains examples of methods used to improve the realism and conduct of the drill. Drill team members should not lead facility operating personnel to the correct response action. This is especially true when facility operating personnel ask for clarification of a cue, prop, or action.

During the drill, evaluators document all activities on evaluation forms that are based on criteria found in the drill scenario. Each drill scenario should specify the areas of evaluation so that all actions required by facility operating personnel can be observed and evaluated. The evaluation forms are used to identify both individual and team performance strengths and weaknesses of facility operating personnel. They provide documentation of performance as part of training, identify problems with the conduct of the drill scenario, and aid in conducting the drill critique.

The drill scenario should be allowed to run to completion if possible. A normal termination would end the drill due to completion of the stated objective, or as determined by the drill coordinator. An abnormal termination would end the drill when a limit specified in the drill scenario, facility procedures, or TSRs is exceeded, or when actions taken by facility operating personnel would adversely affect the safety of personnel or cause damage to equipment or the environment. For abnormal terminations, facility operating personnel should immediately take all appropriate actions to place the facility in a safe condition. The facility should be restored to the condition specified in the drill scenario in accordance with approved facility procedures. Cues and props that were used in the conduct of the scenario should be removed from their location immediately. A checklist in the restoration section of the scenario is helpful in ensuring none of the cues or props are forgotten.

8. CRITERIA FOR DRILL EVALUATION

Evaluation is as important to the drill as planning or conducting it. The more thorough the evaluation process, the greater its benefit in the form of useful lessons learned. Evaluation serves two functions. It provides for evaluation of the personnel actions and for overall evaluation of the drill with respect to meeting the needs identified in the scope, purpose, and objective(s).

Evaluation criteria should be part of the required response/evaluation criteria section of the drill scenario. Regardless of whether the drill is conducted by the typical method of in-plant perform or by use of an alternative method (e.g., table-top), the evaluation criteria should take into account the setting. If the criteria is already developed for the in-plant setting and the scenario will be run in the table-top setting, the existing evaluation criteria should be verified satisfactory or the evaluation criteria should be revised to fit the setting.

As indicated in the Purpose section of this Handbook, performance factors for which evaluation criteria should be developed are as follows:

- Component and system interrelationships - understanding the operating characteristics of each system and its major components, the relationships between systems, and how events in one system affect interfacing systems
- Reasoning and judgement - ability to apply knowledge of facility systems, components, procedures, and requirements to normal, abnormal, and accident situations
- Team interactions - ability of individual crew/team members to work effectively in controlling plant/facility operations and events
- Communications - ability to convey information accurately and effectively

Evaluation forms/documentation should be as straightforward as possible. A simple form with brief instructions and space to list identified strength and weaknesses works well, as does criteria listed alongside the action being observed. A checklist can be used for the evaluator to rate various activities. The forms should contain space for listing the criteria, the time the event occurred, the person or job position being observed, and the grade assigned to the action performance. Regardless of the format or method chosen, the evaluation should match the objective descriptions. This ensures the actions being observed and the drill are being evaluated consistently to the same criteria. When the objective descriptions have been developed they

should be used consistently throughout the drill program. Appendix D contains several example formats of evaluation criteria.

9. CRITIQUING DRILLS

Immediately following the drill, the drill coordinator should hold a critique to formally conclude the drill. The critique should be documented on facility forms specifically designed for this purpose. In cases where the drill is a requirement for qualification, the critique should be filed as part of the participant's training record.

A drill critique is not necessarily a chronology of the events of a drill. It is an analysis of what went right and any shortcomings with facility operating personnel actions, the drill scenario, facility equipment, cues and props, drill evaluators, safety monitors, etc. The critique should include an analysis of expected versus actual facility operating personnel actions, a review of scenario events, and identification of shortcomings in the scenario or drill conduct. The drill team should meet, discuss their evaluation notes, discuss the actions taken by facility operating personnel, and discuss the drill performance. A good practice is to have the participants evaluate themselves first, then have the drill team add in anything missed. The drill coordinator should make a determination of whether the drill objective was met or not, and also list the personnel and the positions on which they were evaluated or trained on the critique form.

Notes should be kept for referral the next time the same drill is conducted. Lessons learned should be generated, distributed to all appropriate facility operating personnel to ensure that maximum training value is gained, and filed for future reference. Deficiencies in training, equipment, procedures, etc., identified in the critique should be documented and corrected.

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10. INCORPORATING FEEDBACK FROM DRILLS

A mechanism should be in place to upgrade the drill program, and individual weaknesses identified during the conduct of drills. A new feedback program is not needed if an existing facility feedback processes is already in place.

If the critique results indicate that the facility operating personnel could not control the situation presented in the drill scenario, a determination should be made of whether the problem was is due to a lack of training, inadequate procedures, drill scenario problems, etc. If training is the problem, the facility training program should be upgraded. Immediate training needs should be identified and included in to the continuing training program. The initial training program should also be modified to include the information identified on training deficiencies. Good practices should be identified and factored into initial and continuing training programs. As appropriate, personnel deficiencies should be corrected by remediation and/or retraining. All completed remediation or retraining should be documented and filed in the person's training record.

Problems encountered with any portion of the drill scenario should be identified in the drill critique. These problems should be corrected before the drill scenario is conducted again. For example, items that may be considered include:

- Improving identification of initial conditions or initiation methods for the drill
- Using more or fewer personnel to run the drill
- Dealing with unexpected problems encountered during the conduct of the drill (i.e., the drill scenario or facility conditions)
- Correcting communications problems
- Replacing inaccurate or inappropriate cues or props
- Equipment malfunctions

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11. CONDUCTING DRILLS BY ALTERNATIVE METHODS

A facility is not limited in the method used to conduct drills. The preferred method of conducting drills is to perform them during normal facility operations and with actual facility equipment. However, if facility conditions will not allow performance of a drill, alternative methods may be necessary. Alternative methods include table-top discussions, facility walkthroughs, simulator exercises (if available), and/or use of mock-ups.

Realism is more difficult to create during facility simulations or table-top discussions than during in-plant drills. Therefore, during simulations or table-top discussions personnel being evaluated should describe their activities and actions. Their descriptions will provide the prompts for the drill team members to supply cues and props. Careful coordination of cues and props by drill team members, with the descriptions of activities supplied by the facility operating personnel, can ensure that facility operating personnel receive valuable training without direct interaction with the facility. During conduct types of drills using alternative techniques, the drill team members should be careful not to lead the facility operating personnel to the correct response action.

During in-plant simulations or table-top discussions, the initiation will have to be stated or supplied by a cue or prop. Since cues or props cannot be heard, the drill team will have to ensure that cues and props are seen by the facility operating personnel. All materials that facility operating personnel would normally have available to them in the facility should also be available to them when conducting a table-top discussion if practical.

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APPENDIX A - TEMPLATE FOR DRILL SCENARIO

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APPENDIX A - TEMPLATE FOR DRILL SCENARIO

Title: Drill Number: Revision Number: Drill Scope, Purpose, and Objective:
Submitted By: _____ Date: _____ Reviewed By: _____ Date: _____ Reviewed By: _____ Date: _____ Approved By: _____ Date: _____

APPENDIX A - TEMPLATE FOR DRILL SCENARIO

Title:

Drill Number: Revision Number:

Initial Conditions:

Briefly describe facility status and system or equipment setup that is needed for the drill.

Pre-drill Notifications:

Mark space as notifications are made.

Yes

Identify group(s) to be notified

Precautions and Limitations:

State the affected system limits and precautions. Usually indicated in the system/facility operating procedures.

Operational limits:

List any limits imposed by the facility operating condition.

Technical Safety Requirements:

List any TSR limitations specified.

Drill Team Duties:

Describe the duties of the evaluators, safety monitors, observers, visitors, etc. Include where they should be stationed to observe personnel actions properly. Indicate when cues and props are to be used and answers to likely questions the facility operating personnel would normally ask. Be as specific as possible for each position, but especially for the evaluators and safety monitors.

Evaluator: *Any specific intervention points the evaluator is to perform should be placed here, with the name of the evaluator and the specific intervention point.*

Safety Monitor: *Any specific intervention points the safety monitor is to perform should be placed here, with the name of the safety monitor and the specific intervention point.*

APPENDIX A - TEMPLATE FOR DRILL SCENARIO

Title:

Drill Number: Revision Number:

Drill Initiation:

Describe the method used to initiate the drill. If an announcement is to be made indicating drills are to commence, write out the announcement. The announcement should include the words, "This is a drill."

Expected Response/Evaluation Criteria:

Describe the response expected from all personnel. Give details for any special actions or activities if required. Describe the general sequence of events for the facility and the final conditions. If a specific order of response is required, ensure that the order of response is stated. If the drill scenario is to test reasoning or deductive powers, then give guidelines for the events that should occur (e.g., in checklist form) so that evaluators can accurately assess the abilities of the facility operating personnel.

Example Evaluation Criteria

(See Section 8 and Appendix D for More Details)

IMPLEMENT appropriate operating procedures, abiding by cautions and limitation.

1	***2***	***3***	***4***
Referred to incorrect procedure and failed to correct the error.	*Problems and failures in referring to procedures in important instances.*	*Minor difficulties and oversights in referring to appropriate procedures.*	*Timely, accurate enactment of procedure.*

1	***2***	***3***	***4***

IDENTIFY plant conditions requiring entry into abnormal procedures.

Serious omissions, delays in recognizing events.	*Some delays in recognizing off-normal conditions.*	*Minor delays in recognizing off-normal conditions.*	*Quick and accurate recognition.*

Title:

Drill Number: Revision Number:

Termination and Restoration:

Termination criteria are twofold:

The first criterion should describe the indications that the drill has reached completion. This may be the completion of a specific step in a procedure, the completion of a specific action such as replacing a fuse, or some other indication.

The second criterion should describe conditions indicating that the facility is not within prescribed limits, a facility limit or TSR limit has been exceeded, or other problem. Anyone recognizing an unsafe condition can and must call for the termination of the drill.

Restoration:

Describe the necessary actions to restore the facility to a desired condition for continued facility operation. This might include referencing a facility procedure or configuration document. May include a restoration checklist or listing in this section to ensure all restoration is complete. An example could be: HVAC #3 returned to service yes/no (circle one), ACC pump #1 running yes/no (circle one). Also, include restoration of the cues and props used in the drill. They are not to be left after the conclusion of the drill.

APPENDIX B - EXAMPLE DRILL SCENARIOS

The drill scenarios found in Appendix B have been compiled from the drill manuals listed in the Source Document section of this Handbook. The scenarios are in use or have been used at their respective facilities. The only exception to this is example scenario B 5-1 which was developed especially for this Handbook to compliment the guidelines of Appendix A.

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Title: Containment Argon Leak From R-36

Drill Number: 007-02 Revision Number: 0

Drill Scope, Purpose, and Objective:

Submitted By: _____ Date: _____

Reviewed By: _____ Date: _____

Reviewed By: _____ Date: _____

Approved By: _____ Date: _____

Title: Containment Argon Leak From R-36

Drill Number: 007-02 Revision Number: 0

SECTION I. INITIAL CONDITIONS

PLANT MODE/DECAY HEAT: Any

SYSTEM/EQUIPMENT: 82, 25\CTMT H&V E68/69, R3/4

WATCHSTATIONS: ERT, RPT, CT, Control Room, SS

SPECIAL EQUIPMENT: R-36 on line

PRE-DRILL NOTIFICATIONS: IEM Cell Shift Supervisor

IEM CELL IMPACT: Inerted with R-36 on line.

SPECIAL CONDITIONS AND INSTRUCTIONS: None

SECTION II. PRECAUTIONS and LIMITATIONS

ABORT LIMITS: If containment pressure approaches + 1 psig.

OPERATIONAL LIMITS: None

TECH SPEC LIMITS OR PRECAUTIONS: IEM Cell 17.3.7.2.3

DRILL TEAM DUTIES: Monitor RPT, ERT and Control Room responses.

REFERENCES: Operation of IEM Cell Purification Unit, R-36, SN-82.1-11, H-4-11125, IEM Cell Argon Purification System. CTMT H&V, H-4-11502, 11547

SECTION III. DRILL INITIATION

The drill is initiated by a drill team member reporting as an RPT to the Control Room that a smear of 20,000 CPM (Beta, Gamma) was found in Cell 572 near R-36.

Title: Containment Argon Leak From R-36

Drill Number: 007-02 Revision Number: 0

SECTION IV. EXPECTED RESPONSE/EVALUATION CRITERIA

Control Room has ERT and RPT assemble and all personnel are requested to stand clear, as it appears from the 550' level that the IEMC gallery H&V is supplied via E24. The ERT should verify the flow in the H&V duct prior to entering the lower IEMC gallery.

ERT and RPT set up barriers and begin surveys to find the source. Leak is found on a fitting going to the operating bed and R-36 is secured and isolated.

The drill monitor in the IEM Cell gallery shall observe if the ERT and RPT conduct the survey in an organized manner. The actual identification of the leak location is at the drill monitors' discretion.

SECTION V. TERMINATION and RESTORATION

Drill is terminated when R-36 is secured and isolated after the leak has been found, and CTMT H&V has been secured.

Restart R-36 per SN-82.1-11. Restart CTMT H&V.

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Title: Normal Control Area Heating and Ventilation Failure

Drill Number: 010-02 Revision Number: 0

Drill Scope, Purpose, and Objective:

Submitted By: _____ Date: _____

Reviewed By: _____ Date: _____

Reviewed By: _____ Date: _____

Approved By: _____ Date: _____

Title: Normal Control Area Heating and Ventilation Failure

Drill Number: 010-02 Revision Number: 0

Initial Conditions: Control Area H&V on line at time of initiation.

Pre-drill Notifications: Mark appropriate space as notifications are made.

None.

Precautions and Limitations: None.

Operational limits: None.

Technical Safety Requirements: Control Room Environment Inst. 17.3/4.3.4.5, 17.3.5.3

Drill Team Duties: The main concern of the Drill Coordinator should be that the response is handled logically using procedures and drawings.

Evaluator: The drill evaluator in the control room evaluates control room procedure use, controlled drawing use, and problem solving actions. Field drill evaluator evaluates Shift Supervisor actions.

Safety Monitor: Terminate if Control Room environment becomes uncomfortable, and have ventilation restored.

Drill Initiation: B20 Breaker 29 (supply to B20A) or S42-B20A is opened, resulting in a C-418 alarm due to the loss of E521, E522, E519M1 & M2, R519 and R52l.

Expected Response/Evaluation Criteria:

The Control Room dispatches an operator to C-418 in response to the alarm. The SS watch reports the loss of Control Area H&V and that fault alarms won't clear. The CRA verifies C177B is not the cause.

System knowledge and P&ID's should lead to checking B20A. SS finds the breaker in a tripped condition and attempts to reclose it with Control Room permission. The breaker will not reclose and actions are initiated to get the RSS to fix it.

Title:	Normal Control Area Heating and Ventilation Failure
Drill Number:	010-02 Revision Number: 0

Termination and Restoration:

Termination:	1) Normal completion. The drill may be terminated once the breaker has been determined to be faulty and actions are initiated to get the RSS to fix it. 2) Emergency Termination. If Control Room environment becomes uncomfortable; restore ventilation.
Restoration:	The breaker should be reclosed and Control Area H&V restarted per SN-25.2-I.

Intentionally Blank

Title: Loss of Joy Pant Air Compressors

Drill Number: 2-005 Revision Number: 0

Drill Scope, Purpose, and Objective: Evaluate and prepare the Powerhouse operators and supervisors in the correct response to the loss of the Joy and Westinghouse Plant Air Compressors as per operator aids and operating procedures.

Submitted By: _____ Date: _____

Reviewed By: _____ Date: _____

Reviewed By: _____ Date: _____

Approved By: _____ Date: _____

Title: Loss of Joy Plant Air Compressors

Drill Number: 2-005 Revision Number: 0

SECTION I. INITIAL CONDITIONS

SYSTEM/EQUIPMENT: Powerhouse air system, portable air compressor, air hose.

WATCH STATIONS: Powerhouse operators and supervisory personnel.

SPECIAL EQUIPMENT: None.

PRE-DRILL NOTIFICATIONS: None.

PLANT OPERATING CONDITIONS: Normal operation, one Joy Plant Air Compressor running and the other in standby. The portable air compressor positioned for use outside the powerhouse.

SECTION II. PRECAUTIONS and LIMITATIONS

ABORT LIMITS: Any emergent plant condition requiring immediate response.

OPERATIONAL LIMITS: Limit this drill to about 15 minutes. Do not let the instrument air pressure go lower than 70 PSI. This drill is not intended to interrupt stream to other facilities.

PRECAUTIONS: Caution should be taken when disconnecting flexible air lines, they may be charged with high pressure air.

DRILL TEAM DUTIES: Provide drill indications at the scene and observe the corrective actions taken by the operations personnel.

Indicate to the operators that the Joy air compressors will not successfully restart.

Evaluators to station themselves in order to observe the set up and valve alignment.

Title: Loss of Joy Plant Air Compressors

Drill Number: 2-005 Revision Number: 0

SECTION III. DRILL INITIATION

Drill Coordinator indicates, with a cue, that the low air pressure annunciator has just alarmed.

OR

Drill Coordinator places the HAND/OFF/AUTO control switch for the compressors in the OFF position. This action is taken as the facility announcement is being made that drills are commencing.

SECTION IV. EXPECTED RESPONSE/EVALUATION CRITERIA

1) Boiler operator informs auxiliary operator that the low air pressure annunciator has alarmed.
2) Boiler operator notifies supervisory watch of the annunciator.
3) Auxiliary operator attempts to restart the Joy Air Compressor, checking briefly the breakers and disconnects (Evaluator simulates a failure to restart).
4) Auxiliary operator ensures that portable air compressor is configured to deliver compressed air to powerhouse.
5) Auxiliary operator starts portable air compressor and puts it in service.
6) Auxiliary operator makes appropriate notifications for repairs of Joy compressors.

SECTION V. TERMINATION and RESTORATION

The drill coordinator will terminate the drill when the objectives of the drill are met. The portable compressor is running and the plant air pressure is rising to the normal operating pressure for that compressor.

Place air system back in original configuration as required by operation needs.

Intentionally Blank

Title: Loss of Non-1E Invertor, D-115

Drill Number: 062-01 Revision Number: 0

Drill Scope, Purpose, and Objective: Determine ability of facility operating personnel to use trouble-shooting techniques to determine the cause of the breaker trip, and take appropriate action based on the determined cause.

Submitted By: _____ Date: _____

Reviewed By: _____ Date: _____

Reviewed By: _____ Date: _____

Approved By: _____ Date: _____

Title: Loss of Non-1E Invertor, D-115

Drill Number: 062-01 Revision Number: 0

Initial Conditions: MHTS temp less than 450 ^{0}F, D-114 must be operating, HTS-S sampling systems must be in a condition to allow an HTS CIS event, Reactor Cover Gas Pressure at 10+2" W.G., Loop #1 control must be operable (52040-1), CH A PAM's must be operable, and at least LLFM A or C must be operable.

Pre-drill Notifications: Mark space as notifications are made.

	Yes
Safeguards and Security	
IEM Cell	

Precautions and Limitations: No Mode 3 or 4 rod testing in progress. Forced cooling not required in the IEM Cell.

Operational limits: Reactor Modes 3 or 4

Technical Safety Requirements: Control Room temperature < 100 ^{0}F; Reactor Cover Gas Pressure >-20 < 40" (Mode 3) or > 0 < 40" (Mode 4); at lease one LLFM (Mode 3) or two LLFM (Mode 4 fuel handling in vessel). 17.3.3.4.2 LLFM Operability, 17.3.5.3 Control Room Temperature, 17.3.2.6.c Reactor Cover Gas Pressure, 17.3.3.4.4 HTS Monitoring Instrumentation, 17.3.3.4.5 Control Room Instrumentation, 17.3.3.3 Post-Accident Monitors, 17.3.2.11 Pressure Transients.

Drill Team Duties: Ensure that actions and responses sufficiently control the casualty.

Evaluator: Monitor procedural usage and trouble-shooting techniques.

Safety Monitor: Do not allow reactor cover gas pressure or IEM cell pressure to exceed Emergency Termination limits.

Drill Initiation: Drill Coordinator trips the D-115 AC output breaker and places a 3x5 card on it stating that the breaker is in a trip-free condition.

Title: Loss of Non-1E Invertor, D-115

Drill Number: 062-01 Revision Number: 0

Expected Response/Evaluation Criteria:

Control - announce and initially respond per appropriate alarm responses. These responses should be prioritized according to the indications and should result in:

(1) stabilization of facility condition,

(2) assessment of facility reveals no apparent cause for the trip, and the breaker remains closed following reclosure.

Termination and Restoration:

Termination: 1) Normal completion: Normal operation of D-115 is restored.
2) Emergency Termination: Control Room temperature approaching 90°F; Reactor Cover Gas > 15" and increasing or <5" and decreasing; or, IEM Cell pressure > 0" and increasing or < -8" and decreasing. Any HTS temperature outside a 400-440°F band.

Restoration: D-115 is operating per facility procedures.

Intentionally Blank

APPENDIX B - EXAMPLE DRILL SCENARIOS

Title: Remote retrieval of a 1000 Curie source from the Storage Canal using Auxiliary Retrieval Equipment (table-top discussion with walkthrough to follow or in-plant perform)

Drill Number: 01-001 Revision Number: 0

Drill Scope, Purpose, and Objective: Operator retrieves a 1000 Curie source from the Canal using Auxiliary Retrieval Equipment.

Submitted By: _____ Date: _____

Reviewed By: _____ Date: _____

Reviewed By: _____ Date: _____

Approved By: _____ Date: _____

Title: Remote retrieval of a 1000 Curie source from the Storage Canal using Auxiliary Retrieval Equipment (table-top discussion with walkthrough to follow or in-plant perform)

Drill Number: 01-001 Revision Number: 0

Initial Conditions: The 75 pound encapsulated source is being moved within the storage canal using the primary crane. For in-plant drills the dummy source should be suspended from the primary crane.

Pre-drill Notifications: Mark space as notifications are made. **Make notifications only for in-plant drill.**

Notify Safeguards and Security and Emergency Operating Center of the drill and not to respond. Notify Radiation Protection of the commencement of the drill and to supply personnel as requested.

	Yes
Safeguards and Security	
Emergency Operating Center	
Radiation Protection	

Precautions and Limitations: The actual source is not to be used in the drill if run in-plant. **The dummy source is the only source weight authorized to be used**. The primary crane is manually moved out of the working area or the canal.

Operational limits: The weight of the source is to be verified within the operating limits or the auxiliary retrieval equipment prior to allowing movement of the source.

Needed only for in-plant perform. All equipment is to be operated within existing facility procedures.

Technical Safety Requirements: Limiting Condition for Operation 3.5.16 of 100 lbs. maximum to be lifted by the auxiliary retrieval equipment, to prevent damage to the auxiliary retrieval equipment which might result in a dropped source and subsequent release of radioactive material into the canal cooling system.

Title: Remote retrieval of a 1000 Curie source from the Storage Canal using Auxiliary Retrieval Equipment (table-top discussion with walkthrough to follow or in-plant perform)

Drill Number: 01-001 Revision Number: 0

Drill Team Duties: Provide cues and props as required to make the drill effective.

Evaluator: Listen to the description for the manual operation for removal of the primary crane from the operating area of the canal and the subsequent setup of the auxiliary retrieval equipment. Ensure that facility procedures are used for all operations and that all communications are such that the operation can be understood and personnel could act accordingly.

Safety Monitor: **For in-plant drills, verify that the dummy source is suspended from the primary crane. The dummy source can be verified by its black and orange color scheme.** Combined with evaluator duties for discussion drill. Ensure that all operations would be performed by facility procedures with all attendant approvals. If operator would place facility personnel, the environment, or equipment in jeopardy, the safety monitor is to signal the end of the drill.

Drill Initiation: Describe the initial conditions to the operator, then have the crane operator inform the Control Room that the primary crane has malfunctioned and will not respond to either the main or backup controls.

Title: Remote retrieval of a 1000 Curie source from the Storage Canal using Auxiliary Retrieval Equipment (table-top discussion with walkthrough to follow or in-plant perform)

Drill Number: 01-001 Revision Number: 0

Expected Response/Evaluation Criteria:

1) The operator should inform the Control Room of the primary crane problem.
2) Operator describes the actions used in verifying primary crane is not functioning properly.
3) Notifications to be made by Control Room personnel. All necessary personnel would respond.
4) The auxiliary crane should be moved into position and hooked on to the source. The primary crane should then be detached from the source and moved out of the way and Danger Tagged Out-of-Commission.
5) The auxiliary crane should be used to complete the source move.

Evaluation Criteria

IMPLEMENT appropriate operating procedures, abiding by cautions and limitation.

1	2	3	4
Referred to incorrect procedure and failed to correct the error.	Problems and failures in referring to procedures in important instances.	Minor difficulties and oversights in referring to appropriate procedures.	Timely, accurate enactment of procedure.

IDENTIFY plant conditions requiring entry into abnormal procedures.

1	2	3	4
Serious omissions, delays in recognizing events.	Some delays in recognizing off-normal conditions.	Minor delays in recognizing off-normal conditions.	Quick and accurate recognition.

Title:	Remote retrieval of a 1000 Curie source from the Storage Canal using Auxiliary Retrieval Equipment (table-top discussion with walkthrough to follow or in-plant perform)
Drill Number:	01-001 Revision Number: 0

Termination and Restoration:

Termination:	1) Normal completion: The auxiliary crane has been used to complete the source move. 2) Emergency Termination: None.
Restoration:	Store the auxiliary crane, restore operation of the primary crane. **Needed only for in-plant drill.** Store the dummy source.

Intentionally Blank

Title: Evaporator Feed Tank Header Line Leak

Drill Number: WEACDC04 Revision Number: 0

Drill Scope, Purpose, and Objective: Using appropriate facility procedures, identify and respond to a radioactive liquid leak emanating from a broken weld in the Evaporator Sump system.

Submitted By: _____ Date: _____

Reviewed By: _____ Date: _____

Reviewed By: _____ Date: _____

Approved By: _____ Date: _____

Title: Evaporator Feed Tank Header Line Leak

Drill Number: WEACDC04 Revision Number: 0

DRILL TEAM GUIDELINES

Drill Ground Rules:

1. The drill scenario will not include any actions or situations that will degrade the condition of equipment, systems, and supplies.
2. The drill scenario will not include any actions or situations that will affect the detection and assessment of, and the response to, actual emergencies.
3. During the drill, no action shall be taken that compromise facility, area, site, or public safety.

Standard Drill Conditions:

1. The facility will be accessible, and the area required for drill performance will be in an operationally safe condition.
2. All required references will be available for performance of the drill.
3. Unless otherwise noted, initiating cues and terminating cues are at the direction of the Drill Coordinator.

Actions to be Simulated:

Most drill activities are performed as if an incident were actually occurring. The following actions will be SIMULATED, if and when these actions are indicated in response to the simulated scenario events.

- None.

The evaluator may direct participants to simulate additional activities to avoid performing actions that may cause adverse of undesired effects.

Responsibilities:

The Drill Coordinator shall perform the following actions:

1. Review the drill, ensuring that the requirements and standards reflect the most recent revisions to referenced procedures and modifications to facility equipment.
2. Ensure areas in which the drill will be conducted are accessible.
3. Conduct the pre-drill briefing with drill team members.
4. Ensure drill team members are familiar with respective assignments and responsibilities.
5. When all drill team stations are manned, initiate the drill.

Title:	Evaporator Feed Tank Header Line Leak
Drill Number:	WEACDC04 Revision Number: 0

6. Ensure each drill team member notes, on a drill chronology log, all actions or events observed during the course of the drill, to include pertinent comments.
7. Upon termination of drill, return all facility equipment and systems to the required pre-drill state.
8. Discuss crew performance with drill team members.
9. Coordinate a formal drill critique with the drill participants.
10. Complete a drill summary and route to all required personnel.

DRILL TEAM PREPARATION

Estimated Drill Duration:

- 2 hours

Drill Team Aids:

Props and equipment required:

- Process water hose placed over piping and running to simulate leak rate and a blue ribbon to indicate leak location.

Pre-drill Notifications:

The Drill Coordinator is responsible for making the following notifications prior to initiating drill:

NOTE: Unannounced drill do not require notifications, but courtesy notifications are suggested.
Unannounced drills require no pre-drill announcement.

1. Request ETF Control Room (X-XXXX) make the following pre-drill announcement:

   "The Effluent Treatment Facility will be conducting facility drills. Please keep non-essential radio traffic to a minimum."

2. Inform Radiological Controls (X-XXXX) of scheduled drill activities.

Pre-drill Briefing (Conducted by Drill Coordinator):

Activities of Drill Coordinator:

Title: Evaporator Feed Tank Header Line Leak

Drill Number: WEACDC04 Revision Number: 0

1. Issue all drill team members a copy of applicable portions of the scenario package, a drill chronology log, and any required cue cards or sheets.
2. Provide instructions to drill team members:

    - Direct any difficulties encountered to the Drill Coordinator.
    - Any significant violation of a SAFETY RULE or SECURITY RULE may terminate the drill.

3. Make drill team assignments, instructing drill team members of their specific responsibilities during the drill.
4. Review scenario summary and expected sequence of events.
5. Ensure all drill team members either possess or are issued proper identification (colored hats).
6. Initial facility conditions: None.
7. Technical Safety Requirement/Operational Safety Requirement Considerations: None.
8. Systems affected: Equipment Drains and Evaporator Sumps.
9. Methods of communications: Two-way radio.
10. Drill safety concerns: None.
11. Drill abort limits: None.
12. Identify/select affected equipment or scenario options>

    - A. Contamination levels of 200 CPM at source > background.
    - B. Contamination levels of 2000 CPM at source > background.
    - C. Contaminated operator. (To be used only if operator is potentially contaminated during the drill)

13. Termination point:

    - Source of spill isolated/stopped, contaminated personnel evacuated, spill area isolated and surveyed, leakage contained.

14. Obtain facility permission to conduct drill.

Instructions to Drill Participants:

1. The Shift Supervisor or Shift Manager may terminate or suspend the drill for just cause at any time.

Title:	Evaporator Feed Tank Header Line Leak
Drill Number:	WEACDC04 Revision Number: 0

2. Use required drill communications, that is, "THIS IS A DRILL," before and after each drill-related communication over radios or public address systems.
3. Assume the following initial facility conditions: ("•" indicates a required initial condition for this scenario, "*" indicates a distraction to be used at the discretion of the drill coordinator). Note: For distractor selected, provide crew with appropriate procedure,

   * Rainfall has been very heavy for the past 24 hours
   * Truck filling Caustic Storage Tank.
   * GA-6 monitor testing in progress.
   * Truck filling Acid Storage Tank.
   * Chemical cleaning of filters in progress.
   * Unloading DWPF Tanker.
   • All other conditions are "as is."

4. Respond to drill conditions **AS IF THEY ARE REAL.**

DRILL EVENT GUIDE

CONDITION	RESPONSE/EVALUATION CRITERIA
* Denotes critical action step	
Initiating CUE: Drill Controller calls Control Room to report water leaking from piping between Feed Tank and Treatment Building.	**Operator(s) at the scene:** Reported spill to control room, including the following:
Between Feed Tank and building	* Location of leak/spill.
Contaminated Sump discharge	* Type of spill.
CUE: Failed weld at elbow	Source/cause of leak/spill.
CUE: As is	Wind speed and direction.
CUE: Only if self-contaminated	Contaminated personnel.

Title: Evaporator Feed Tank Header Line Leak

Drill Number: WEACDC04 Revision Number: 0

NOTE: Source can be stopped by completing either of;

A: Stop all flow into header: Cleaning solutions, Evaporator Sump Pumps, Dike Sump Pumps.

CONDITION

B: Re-route Header to WWCT.

Between Feed Tank and building

Contaminated Sump discharge

CUE: Failed weld at elbow

CUE: As is

CUE: Only if self-contaminated

Recommendations to stop spill.

* Spill was stopped at the source.

RESPONSE/EVALUATION CRITERIA

Reported immediately when spill has stopped.
Appropriate protective equipment was donned.
Warned other personnel away from spill area.
Barricaded and/or roped off area as needed.

Control Room Operations

Reported spill to Supervision and SRSOC, including the following:

* Location of leak/spill

* Type of spill.

Source/cause of leak/spill.

Size and estimated amount of spill.

Wind speed and direction.

Personnel contamination.

* Notified RCO and Industrial Hygiene.

Immediately reported when spill was stopped.

Title:	Evaporator Feed Tank Header Line Leak
Drill Number:	WEACDC04 Revision Number: 0

CONDITION	RESPONSE/EVALUATION CRITERIA
	* Recorded time in the appropriate section of 241-FH-9562.
	Supervisor/Manager
	Notified SRSOC immediately.
	* Classified event IAW Procedure Manual 9B5.
	Advised Waste Management line organization and WMEC of spill ASAP.
	Supervisor/Manager personally inspected spill area to review immediate actions taken and recommend additional actions.
	Assessed effectiveness of immediate actions to stop and contain spill, then request additional assistance as needed.
	Radiological Controls
CUE: Personnel contamination will only occur if operators potentially contaminate themselves. Personnel contamination levels vary by scenario option (A/B): For option A: 150 CPM > bkgd For option B: 1500 CPM > bkgd	Evacuated any (potentially) contaminated personnel
	Established personnel protection requirements at the scene.
CUE: No airborne contamination	Obtained air sample in the spill area.
CUE: 200 CPM > bkgd (option A), 2000 CPM > bkgd (option B), No alpha contamination (either option)	Surveyed area to assess hazards and define spill area.

Title:	Evaporator Feed Tank Header Line Leak
Drill Number:	WEACDC04 Revision Number: 0

Established entry requirements for spill area.

Contaminated materials were disposed of IAW 5Q Manual

POST-DRILL ACTIVITIES

FACILITY RESTORATION

Restore all facility equipment and systems to their required pre-drill state and perform an independent verification to ensure completion.

- Return process water hose to original location, if used.
- Return Evaporator Sump Pumps to "Auto," if applicable.

POST-DRILL NOTIFICATIONS

The Drill Coordinator is responsible for notifying the following that the ETF drill is complete:

- ETF control room (X-XXXX), request the following post-drill announcement: "The Effluent Treatment Facility has completed facility drills."

POST-DRILL DISCUSSION

Discuss with the crew, short and long range impact on facility conditions resulting from the given scenario.

- Alternate ways of pumping sumps until repairs are completed.

Title:	Fire in Diesel Generator Area
Drill Number:	30.94.04.3 Revision Number: 0
Drill Scope, Purpose, and Objective:	Provide shift team training in casualty response and to permit evaluation of their performance when responding to a fire in the diesel generator area.

Submitted By: _____ Date: _____

Reviewed By: _____ Date: _____

Reviewed By: _____ Date: _____

Approved By: _____ Date: _____

Title: Fire in Diesel Generator Area

Drill Number: 30.94.04.3 Revision Number: 0

Initial Conditions:

This drill will be performed in the ATR concurrently with operating crew plant familiarization (fast cruise) and Experiment Loop Chemistry Conditioning. This drill is not intended to interfere with the routine operations of the TRA. The reactor will simulate being shutdown during this drill. The M-42 or M-43 diesel generator is supplying the normal diesel loads. The diesel generator may be shutdown during this drill with the emergency diesel M-6 in auto for picking up the load. General maintenance was completed on the standby diesel generator and the diesel generator area has not been cleaned up.

Pre-drill Notifications: Mark Yes space as notifications are made.

A warning call will be placed to the INEL Fire Department prior to the drill and it is planned that the Fire Department will not actually respond to TRA. Protection Technology Idaho (PTI) will be informed of the drill and will not respond to the drill activities. The Warning Communications Center (WCC) will be informed of the drill activities and will be expected to participate in the drill activities (notifications). The TRA Duty Officer will be informed of the drill activities and will be expected to participate in the drill activities (notifications). Life Safety Systems (LSS) will be informed of the drill activities and will be expected to participate in the drill activities.

	Yes
Fire Department	
Protection Technology Idaho	
Emergency Operating Center	
Life Safety Systems	

Title:	Fire in Diesel Generator Area
Drill Number:	30.94.04.3 Revision Number: 0
Precautions and Limitations:	The diesel generator area fire system must remain operational All plant heating and ventilation systems must remain as intended by the plant operating crew, except affected areas. Loop conditioning should not be interrupted by this activity.
Operational limits:	None.
Technical Safety Requirements:	None.

Title: Fire in Diesel Generator Area

Drill Number: 30.94.04.3 Revision Number: 0

Drill Team Duties: Provide cues and props as required to make the drill effective which are:

a) Fire - Team Member waving a red blanket, red flag, or red flashing light.

b) Light Smoke - Team Member waving a grey blanket, grey flag, or grey plastic bag.

c) Fire Out/Smoke Clear - Team Member waving a white blanket, white flag, or white plastic bag.

d) Breaker Open/Closed/Tripped - Magnetic laminated sign indicating breaker status.

e) Valve Open/Closed/Throttled - Laminated tag indicating valve position.

f) Ruptured Pipe - Crumpled aluminum foil wrapped around pipe.

Evaluator: During the drill one evaluator will remain in the Reactor Control Room to assist the on duty Shift Manager in differentiating between what is and is not drill activities. Ensure all drill messages start and end with the words "This is a drill, This is a drill".

Be alert to slipping/tripping hazards in and around the diesel generators.

Do not allow any energized electrical panels to be opened.

Safety Monitor: If the fire pull box is activated in the diesel generator area remain in the diesel generator area as a fire watch until the drill is terminated and Life Safety Systems personnel have returned the fire system to an operable condition. If a fire starts in the diesel generator area during the drill the designated fire watch will call the Fire Department at 3-777 to report the fire.

If the diesel that is on fire is shutdown as part of this drill, do not allow use of the remote diesel shutdown switch to shutdown the diesel unless authorized by the drill coordinator. If the remote shutdown switch is used it will shutdown both diesels if running.

Title:	Fire in Diesel Generator Area
Drill Number:	30.94.04.3 Revision Number: 0
Drill Initiation:	The drill will be initiated by the Reactor Auxiliary Operator observing smoke in the diesel generator area. The fire will be from a pile of oily rags piled up on the floor near the east end of M-43 or west end of M-42 diesel (either diesel can be used for this drill). M-42 is the running diesel. The standby diesel generator has just finished having some general maintenance performed on it, this is the source of the oily rags. The diesel generator area is full of light smoke but not to the point of a person having to crawl to avoid smoke or donning Self Contained Breathing Apparatus (SCBA).

Expected Response/Evaluation Criteria:	Circle Yes or No	
1) The fire is identified by the Reactor Auxiliary Operator (RAO).	Yes	No
2) The RAO summons the Fire Department and informs the Shift Manager of the situation.	Yes	No
3) The RAO remotely trips the diesel.	Yes	No
4) The Shift Manager (SM) directs the reactor be shutdown if not already shutdown.	Yes	No
5) Procedure E-0 out and used.	Yes	No
6) Emergency Brigade responds to the fire in the diesel generator area.	Yes	No
7) SM classifies the event and makes notifications.	Yes	No

Title: Fire in Diesel Generator Area

Drill Number: 30.94.04.3 Revision Number: 0

Termination and Restoration:

Termination: 1) Normal completion:

a) The drill will be terminated when all of the following items are accomplished.

b) The Emergency Brigade has responded to the fire emergency.

c) The reactor has been shutdown (as applicable).

d) The Shift Manager has informed appropriate management personnel, the Fire Department and WCC.

e) The above actions and/or procedures have been completed to the extent required by the Drill Coordinator.

2) Emergency Termination: The drill will be aborted when any person makes a mistake in magnitude and/or frequency that, in the opinion of the Drill Team, the drill would challenge a Technical Specification.

Restoration: LSS will be required to reset the fire systems after the drill is completed. Restore either M-42 or M-43 as the operating diesel. Store or dispose of all props used during the drill.

APPENDIX C - EXAMPLE DRILL CUES AND PROPS

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APPENDIX C - EXAMPLE DRILL CUES AND PROPS

The following examples of drill cues and props are a combination of several groupings being used by DOE facilities. This list is not a requirement, nor is it meant to be all inclusive or used as the only grouping of drill cues and props. This is only an example; yours should conform to any requirements of your facility and fit the drill scenario.

CONDITION	CUES AND PROP USED TO SIMULATE CONDITION
FIRE	Waving a red cloth, flag, plastic bag, or red flashing light
LIGHT SMOKE	Waving a grey cloth, flag, plastic bag, or a smoke generator
HEAVY SMOKE	Waving a black cloth, flag, plastic bag, or a smoke generator
FIRE OUT SMOKE CLEAR	Waving a white cloth, flag, or plastic bag
CAUSTIC SPILL	Orange cloth, flag, or bag on floor
ACID SPILL	Purple cloth, flag, or bag on floor
OIL SPILL	Brown cloth, flag, or bag on floor/ground
CONTAMINATED SPILL	Actual water on the floor or blue cloth, flag, or bag on floor
BREAKER - CLOSED/ OPEN/TRIPPED	Laminated sign indicating breaker status Letters should be large enough to read at 4-6 feet
VALVE - OPEN/ CLOSED/THROTTLED	Laminated sign indicating valve position Letters should be large enough to read at 4-6 feet
RUPTURED PIPE	Crumpled aluminum foil wrapped or taped to a pipe
ALARM	Electronic buzzer
ALARM LIGHT	"Yellow sticky" (or something similar) or laminated sign on alarm light
INJURED/ CONTAMINATED PERSON	Either a "dummy" or live "actor" simulates injury using moulage and makeup or taped on signs
ANALOG INDICATION	Clear plastic stick-on gauge faces with needle indicators (allows actual indications to still be monitored) Small signs with needle pointing to a number hanging on or near meter face
EXPLOSION	"Boom" sign or confetti
DARK, DUE TO SMOKE OR LIGHTS OUT	Darkened face mask or glasses, or the main lights are out with only emergency lighting on. Use caution as personnel injury could occur. Use extra safety monitors to ensure that facility operating personnel do not injure themselves.

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APPENDIX D - EVALUATION CRITERIA

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APPENDIX D - EVALUATION CRITERIA

Evaluation Table

Watchstation _____ Watchstander _____

Activity Evaluated	Activity Observed (yes/no)		Rating of Activity * (Check one that applies)			Comments
	Y	N	E	S	U	
Component and System Interrelationship a. System and Component b. System Interrelations c. Application of Fundamentals						
Reasoning and Judgement a. Properly identified problem b. Anticipation of plant changes						
Team Interaction						
Communications						
Procedure Use						

Evaluator: _____ Date: _____ Time: _____

* E=Excellent S=Satisfactory NI=Needs Improvement U=Unsatisfactory

APPENDIX D - EVALUATION CRITERIA

Description of Evaluation Table Criteria

Evaluation Criteria	Excellent	Satisfactory	Unsatisfactory
Component and System Interrelationship	Understands advanced principles and their applications to plant and equipment operation. Detailed knowledge of system interrelations.	Understands basic principles and their application to plant and equipment operation. Adequate knowledge of system interrelations.	Inadequate knowledge of systems. Does not understand basic principles of equipment operation. Does not know system interrelations.
Reasoning and Judgement	Anticipates abnormal plant or component conditions and corrects the conditions without relying on automatic protective functions.	Recognizes abnormal plant or component conditions. Actions taken will place the plant or component in a safe condition.	Does not recognize abnormal plant or component trends. Actions may place the plant or component in an unsafe condition. Relys exclusively on automatic functions.
Team Interaction	Leads in problem identification and solving. Leads crew actions, aware of others' actions.	Participates in problem identification and solving. Coordinates actions with other crew actions, and usually aware of others' actions.	Inappropriately drives or fails to participate in problem identification and solving. Fails to coordinate with other crew actions, and is seldom aware of others' actions.
Communications	Clear, concise, and understandable. Consistently uses proper protocols and formats.	Clear and understandable, few errors. Normally uses proper protocols and formats.	Has difficulty conveying the message. Does not use proper protocols and formats.
Procedure Use	Understands and uses procedures. Knows the reasons behind the procedures.	Understands and uses procedures.	Does not understand the procedures. Does not use procedures to accomplish tasks.

APPENDIX D - EVALUATION CRITERIA

Evaluation Checklist

	Watchstation Observed _____	Yes	No *	N/O #
1	Did the operator identify the interrelated systems or components?			
2	Did the operator correctly identify the problem?			
3	Were the actions of the operator consistent with the identified problem and solution?			
4	(1) Was the Supervisor notified in a timely manner? (2) Was adequate information of the status of the equipment provided to the Supervisor? (3) Were the communications to others clear, adequate for the situation, and given at the appropriate time?			
5	Was the appropriate procedure used to control the situation?			
* All "No" entries must be fully explained.			# N/O - Not Observed	

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CONCLUDING MATERIAL

Review activity:

DOE
DP
EH
EM
ER
FM
HR
NE

Field Offices
AL
CH
FE
ID
NV
OH
OAK
OR
RL
SR
RFO

Facilities
ANL-W
BNL
EG&G Mound
Hill and Kaiser Rocky Flats
FERMCo
INEL
LLNL
LANL
LMES
ORAU
REECo
WHC
WSRC

Preparing activity:

DOE-EH-31

Project Number:

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