

U.S. Department of Energy Orders Self-Study Program

DOE O 5480.19

CONDUCT OF OPERATIONS REQUIREMENTS FOR
DOE FACILITIES



ALBUQUERQUE OPERATIONS OFFICE

Change No: 0 DOE 5480.19 Level: Familiar Date: 7/24/98

DOE ORDER 5480.19
CONDUCT OF OPERATIONS REQUIREMENTS FOR DOE FACILITIES
FAMILIAR LEVEL

OBJECTIVES

Given the Familiar Level of this module and the resources listed below, you will be able to:

1. State the purpose of implementing U.S. Department of Energy (DOE) Order 5480.19
2. Describe typical methods of implementing DOE Order 5480.19 guidelines.
3. State the intent of implementing the following DOE-STD guidelines:
 - DOE-STD-1030-96, Guide to Good Practices for Lockouts and Tagouts
 - DOE-STD-1031-92, Guide to Good Practices for Communications
 - DOE-STD-1032-92, Guide to Good Practices for Operations Organization and Administration
 - DOE-STD-1033-92, Guide to Good Practices Operations and Administration Updates Through Required Reading
 - DOE-STD-1034-93, Guide to Good Practices for Timely Orders to Operators
 - DOE-STD-1035-93, Guide to Good Practices for Log keeping
 - DOE-STD-1038-93, Guide to Good Practices for Operations Turnover
 - DOE-STD-1039-93, Guide to Good Practices for Control of Equipment and System Status
 - DOE-STD-1040-93, Guide to Good Practices for Control of On-shift Training
 - DOE-STD-1042-93, Guide to Good Practices for Control Area Activities

<p>Note: If you think that you can complete the practice at the end of this level without working through the instructional material and/or the examples, complete the practice now. The course manager will check your work. You will need to complete the practice in this level successfully before taking the criterion test.</p>
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RESOURCES

DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities, 5/18/92.
DOE-STD-1030-96, Guide to Good Practices for Lockouts and Tagouts.
DOE-STD-1031-92, Guide to Good Practices for Communications.
DOE-STD-1032-92, Guide to Good Practices for Operations Organization and Administration.
DOE-STD-1033-92, Guide to Good Practices Operations and Administration Updates through Required Reading.
DOE-STD-1034-93, Guide to Good Practices for Timely Orders to Operators.
DOE-STD-1035-93, Guide to Good Practices for Log keeping.
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DOE-STD-1039-93, Guide to Good Practices for Control of Equipment and System Status.
DOE-STD-1040-93, Guide to Good Practices for Control of On-shift Training.
DOE-STD-1042-93, Guide to Good Practices for Control Area Activities.

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INTRODUCTION

The Familiar Level of this module is divided into two sections. In the first section, we will discuss the purpose and scope of this Order, and the eighteen chapters it contains. In the second section, we will discuss the DOE standards that support the Order. We have provided examples and a practice in the module to help familiarize you with the material. The practice will help prepare you for the criterion test.

Before continuing, you should obtain a copy of DOE Order 5480.19 and the DOE standards listed as resources for this module. Copies of the Orders are available on the Los Alamos National Laboratory Website at <http://iosun.lanl.gov:1776/htmls/directives.html> or through the course manager.

Everything you need to know to meet the qualification requirements for this Order is contained in this module. However you should have access to these resources and be familiar with their contents. You may need to refer to these documents to complete the examples, practice, and criterion test.

SECTION 1, DOE ORDER 5480.19

PURPOSE

To provide requirements and guidelines for departmental elements to use in developing directives, plans, and/or procedures relating to the conduct of operations at DOE facilities. The implementation of these requirements and guidelines should result in improved quality and uniformity of operations.

SCOPE

The provisions of this Order apply to all departmental elements and contractors performing work for the department as provided by law and/or contract and as implemented by the appropriate contracting officer.

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REQUIREMENTS

Chapter 1, Operations Organization and Administration

Procedures or other definitive documentation should specify policies that are to be applied for operations. These policies should specify goals and the means to achieve those goals.

The operations supervisor for DOE facilities should be provided with sufficient resources in materials and personnel to accomplish assigned tasks without requiring excessive overtime by the operations staff. These resources should include technical personnel needed to support the operations. A long-range staffing plan that anticipates personnel losses should be developed and implemented.

Operating problems should be documented and evaluated. Based on assessments of these problems, corrective actions should be taken to improve the performance of the operations department performance. Additionally, frequent direct observation of operations activities by supervisors and managers is essential to performance of monitoring operations.

Workers and their supervisors should be held accountable for operating performance. Personnel involved in significant or frequent violations of operating practices should be counseled, retrained, and disciplined, as appropriate. Supervisor performance appraisals and promotions should include an assessment of operating performance.

Formalized supervisory and management training should be incorporated into training programs. This is especially important to the first-line supervisors on shift and should aid them in managing shift activities.

Facility guidance should exist which describes safety preplanning requirements for all operational activities. The guidance should explain the role of safety analysis reviews, job safety analyses, and the handling of safety matters. All operations personnel should understand the safety planning requirements.

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Chapter II, Shift Routines and Operating Practices

The operator responsible for the facility should be promptly notified of all changes in facility status, abnormalities, or difficulties encountered in performing assigned tasks. Similarly, the operator should notify the shift supervisor of any unexpected situations.

Operations personnel should adhere to the requirements of the facility industrial safety program. Proper hearing, eye, head, foot, and respiratory protection should be worn in designated areas to reduce the potential for injury. Similarly, ladders or other approved means should be used to access equipment located in the overhead when permanent steps or catwalks are not available, thus minimizing the potential for accidents. Operators should not routinely climb or walk on facility components and insulation, because this could result in personnel injury or damage to equipment. Operators should exercise appropriate precautions when entering or working in or around energized panels or equipment.

Operator tours should be of sufficient detail to ensure that the status of equipment is known. Each operator should conduct a thorough tour of all areas within his/her responsibility, making appropriate equipment inspections at designated times at least once per shift.

Round inspection sheets are an effective method for providing operators with guidance on the extent to which equipment and areas should be inspected during routine tours. The recording of key equipment parameters during tours provides a record of equipment performance and can be used to reconstruct events leading up to unusual occurrences or system malfunctions. This record permits short-term trending by operators so that undesirable trends and equipment problems can be identified and corrected. Round inspection sheets also facilitate operator turnover of equipment status and are an effective aid in the training and qualification of new operators. Round inspection sheets should be developed and approved by the operations supervisor. They should include areas located within the particular shift position and important parameters for equipment. Where appropriate, equipment parameters should include maximum/ minimum values or expected operating ranges to enable operators to recognize abnormal readings quickly. Safety limits derived from Technical Specifications or Operational Safety Requirements should be highlighted. Equipment should be listed on round sheets in the same order that it would be encountered during a normal tour

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of the operating station, and the round sheets should include a narrative section. Operators should use the narrative section to document major evolutions, causes of abnormal conditions, and actions taken to correct abnormal conditions. A narrative logbook may be substituted for the narrative section on the round sheet. Data should be recorded on round sheets at the times specified by the operations supervisor. When round sheet data is not obtained within one hour of the specified time, the actual time the data was obtained should be noted on the round sheet. Parameters exceeding the specified maximum/minimum values should be circled or otherwise highlighted on the round sheet and promptly reported to the control room and/or the cognizant operations manager. The causes of abnormal indications should be promptly investigated with supervisors becoming involved as appropriate. The round sheet data should be reviewed by a supervisor each shift to identify trends or abnormal readings and to verify that data has been properly recorded. Operator rounds should be periodically monitored by supervisory personnel to ensure that comprehensive tours continue to be conducted, including, as necessary, periodic inspections of equipment and areas not listed on the round sheets.

Operations personnel should be appropriately qualified to follow good personnel protection practices to maintain personnel exposure ALARA. All operators should follow the following requirements.

- Adhere to all posted personnel protection requirements and observe proper practices and precautions while in controlled areas.
- Correctly use appropriate monitoring instruments when required.
- Be cognizant of their exposure levels and take appropriate action to minimize exposures.
- Be knowledgeable of the proper use of radiation work permits, safework permits, or inhalation limits, where applicable.
- Promptly report protection deficiencies and hazards to the control personnel and/or appropriate protection personnel.
- Inform appropriate protection personnel of a evolution or activity that has a potential to significantly change conditions in the facility

Operators should believe instrument readings and treat them as accurate unless proven otherwise. Ignoring an unusual reading because the operator believes an instrument is faulty can cause

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abnormal conditions to be undetected. Operators should check other indications, if possible, when unexpected readings are observed. Prompt action should be taken to investigate the cause of abnormal or unexpected indications so that prompt corrective action can occur. When malfunctioning or inaccurate instruments are discovered, they should be appropriately identified to prevent subsequent confusion and instrument and control personnel should be notified to effect repairs. In situations of operator doubt, operators should be instructed to achieve facility, personnel, and environmental safety above facility production.

When protective devices trip, an attempt should be made to understand the cause of the trip before the device is reset. Normally, before action is taken, an operator should ensure no abnormal condition exists that would preclude reset. However, because the consequences of inappropriately resetting protective devices vary considerably, good judgment and specific guidance are necessary in this area. The operations management should provide the appropriate guidance so that tripped protective devices will be properly addressed.

The shift supervisor, the control room lead operator, or the cognizant manager for a test and research facility should approve all power or process rate changes because these persons are held accountable for safe operation.

The overall operation of the facility should be directed by the operations supervisor for a large DOE facility and by the cognizant manager for a test and research facility. Operations management should ensure that only trained and qualified personnel operate plant equipment.

The operating base is the facility area where an operator returns when he is not performing in-plant duties. An operating base should be established for each shift position. Each operating base should be equipped with appropriate office equipment for the operator to maintain necessary procedures and references and to conduct administrative duties, and necessary communication equipment should be available at the operating base. Shift turnovers should be conducted within those facility areas assigned to the operations department and typically at the operating base.

The operating bases should be located at a convenient place within the area of responsibility for that shift position.

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Written material that does not relate to operation and the use of entertainment devices by on-duty operations personnel should be prohibited to minimize distractions from their responsibilities. Written material and entertainment devices should not be brought to work stations.

Chapter III, Control Area Activities

Control area access should be limited to those persons on official business only. The at-the-controls area of the control room should be clearly identified, and all persons who are granted access to the control room should understand its boundary. Access to the at-the-controls area should be restricted to persons who need to be in the area. Designated individuals should grant entry into this area, and persons who might need to enter this area should know who could grant access.

Professional behavior should be displayed in the control area at all times. Only activities essential to supporting operation and activities authorized by management should be conducted in the control area. Potentially distracting activities should be prohibited. Non-job-related discussions should be minimized so as not to interfere with conduct of the shift or monitoring of key parameters.

Operators should be alert and attentive to control panel indications and alarms. Control panel indications should be monitored frequently, and prompt action should be taken to determine the cause of and correct abnormalities. Emphasis should be placed on closely monitoring and trending to detect problem situations early. Operator response to alarms should be timely, and actions should be taken to address and correct the alarm causes. All reasonable action should be taken to clear alarming conditions.

Duties assigned to operators should not interfere with their ability to monitor facility parameters. Activities such as preparation of tagging orders, reviews of operating procedures, required reading, and review of maintenance work activities should not comprise a major portion of these operators' shift responsibilities. The administrative workload of operators responsible for monitoring and operating the control board should be minimized.

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Only persons specifically authorized by the administrative procedures of the operations department should operate control area equipment. When trainees operate this equipment, they should be supervised and controlled by the operator who normally would perform the operations.

Chapter IV, Communications

Methods should be implemented to ensure all facility personnel are promptly alerted to facility emergencies. When personnel are working in areas where the public address system or emergency signals cannot be heard, alternate methods for alerting these persons should be utilized. Flashing lights, personal pagers that vibrate and can be felt, and persons dedicated to notifications are examples of alternate methods that might be effective.

Use of the facility public address system should be administratively controlled to ensure it retains its effectiveness in contacting plant personnel. Excessive use of the public address system for paging of personnel and unnecessary announcements should be avoided because excessive use can reduce the impact of important announcements and can be distracting. Facility telephones and other point-to-point communications channels should be used in lieu of the public address system whenever practical.

Methods should be implemented to ensure that control areas could quickly contact on-shift operators or supervisors.

Portable radios can be an effective means of providing mobile point-to-point communications and may be used for this purpose. However, radio usage should not be allowed in areas where electronic interference with plant equipment may result. Areas where radio use is prohibited should be delineated.

Only abbreviations and acronyms obtained from an approved list should be used in facility communications.

Oral instructions should be clear and concise. In all communications, the sender and intended receiver should be readily identifiable. Instructions involving the operation of equipment should be

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repeated by the receiver to the extent necessary for the sender to ensure the instructions are correctly understood.

Chapter V, Control of On-shift Training

On-shift training should be conducted in accordance with training programs that specifically identify items the trainee must accomplish on shift. The knowledge requirements for each item should be defined as well as what the trainee must do. The instructor and the trainee should understand what is required for each training item.

Qualified operators should conduct on-shift training. This may require the successful completion of appropriate instructor training requirements for on-shift training. However, operator-qualified training department personnel may also be used. The on-shift instructors should be specifically selected, taking into account communication skills, technical knowledge, and ability to provide trainees with hands-on experience. In many cases, the trainees will actually be operating equipment; this requires special instructor techniques in order to prevent misoperation or damage of equipment.

Whenever trainees operate equipment, a qualified operator serving as an on-shift instructor should observe the trainee to ensure the trainee does not make an error that could adversely impact the facility. Until the trainee has demonstrated reasonable proficiency in an operation, he/she should discuss the procedure steps, cautions, and notes with the instructor.

The operations supervisor should approve the operator qualification program, and changes to the program should be coordinated with the training department. For operating positions requiring certification, qualifications should be based on one-to-one instruction at that station.

Completion of the operator qualification program should be formally documented. Classroom requirements and written exam results should be documented by training department instructors. Instructors should document on-shift training and system checkouts.

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Trainee operation of equipment should be immediately suspended during unanticipated or abnormal events, accident conditions, or whenever the operations personnel or on-shift instructor believes suspension is necessary to ensure safe and reliable facility operation.

The maximum number of trainees allowed to simultaneously participate in any particular training evolution needs to be considered. Consideration should be given to training effectiveness and to the potential for adverse effects on the facility.

Chapter VI, Investigation of Abnormal Events

Events that occur in the facility and adversely affect operations, personnel safety, or DOE requirements should receive a thorough investigation. The criteria for when to perform an event investigation should be clearly established. Specific events requiring investigation should be listed for supervisory use, along with criteria for use in deciding what near miss situations should receive review. The following conditions and situation should require an investigation:

- Design limits are violated.
- Facility system performance is unusual, abnormal or unexplained.
- Facility safety conditions are abnormal or unexplained.
- Safety or system features are improperly positioned.
- Reportability to DOE or other agencies is appropriate.
- An unplanned shutdown or significant loss of operation occurs.
- A procedural violation or personnel error occurs that caused or could have caused serious personnel injury or equipment damage or could have affected facility safety.
- Equipment failure occurs that could affect facility capability or safety.
- Radiological or toxic material limits are exceeded or radioactive or toxic material is lost/released.
- Actual or attempted sabotage is suspected.
- Chemistry or process parameters are out of specification or indicate unexplained trends.
- A department head or the facility safety review committee deems an investigation is appropriate.
- Special nuclear material is lost.
- Repetitive problems occur.

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The operations supervisor or another manager should be responsible for event investigations. He/she may delegate specific investigations or portions of investigations to other personnel.

The credibility of the investigative process is highly dependent on the knowledge and experience of the individuals performing the investigation. It is important that individuals performing an investigation be technically knowledgeable and well respected by the facility staff. Additionally, investigators should not have a bias or a vested interest in the results of the investigation. Investigators should be trained in facility systems and operations and other major disciplines appropriate for the event under investigation. Additionally, investigators should be trained in techniques for conducting an investigation.

Sufficient data must be collected to allow the event investigators to perform a reconstruction and analysis of the event. An individual should be assigned responsibility for collecting the required information and assembling the information for review. It is important to collect the necessary information as soon as possible after the event. Information should be gathered in the following areas:

- Initial facility conditions
- Statements of operators and personnel involved in the event
- Pertinent computed printouts and strip charts
- Pertinent documentation as required to establish conditions prior to and during the event

Upon completion of the data collection, a structured review of the abnormal event should occur. The format of the investigation will depend upon the significance of the event. Each event investigation should include the following steps, with emphasis placed on each individual step depending upon the severity or potential consequences of the event.

- Event reconstruction
- Event analysis and evaluation
- Root-cause determination
- Corrective action determination

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An investigative report should be prepared in a time frame determined by the responsible authority. The report should include a description of the, a discussion of the impact of the event, root cause, the lessons learned, and the proposed corrective action(s). The report should include positive aspects of the event.

In-house events should be evaluated by the operations supervisor to determine if the event should be included in the training program for operations personnel. In some cases, due to the severity or possible safety consequences of some events, it is appropriate to train shift operations personnel on the event immediately. A mechanism should exist so that appropriate shift personnel could be immediately trained on an event when they next report for work.

Patterns of deficiencies such as operator errors or inadequate procedures should be trended. A periodic summary report of events, causes, and trends should be submitted to department heads, the facility manager, and appropriate managers. Department heads should ensure training programs include appropriate material from the summary report.

Acts of known or suspected sabotage are a special case of event investigations. If an act of sabotage is discovered or suspected, it is important to begin an investigation immediately and to accomplish the following:

- Determine the condition of the affected system(s) and ensure the operability of all safety-related systems.
- Decide if continued operation is justified or if systems are available to support safe facility shutdown.
- Minimize the impact of discovered acts of sabotage and deter future acts of sabotage.

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Chapter VII, Notifications

Procedures should be developed to address appropriate notifications and should include the following elements:

- Specific responsibilities for notifications;
- Identification of events and conditions requiring notifications;
- Identification of primary and alternate personnel to be notified for various situations;
- Establishment of time requirements for notifications that are consistent with the facility emergency plan; and
- Definition of record keeping requirements that documents the reason for notifications, the time of notifications, and the person notified.

The operations supervisor should ensure that all appropriate personnel receive notification when required. Other individuals may accomplish the actual notification of specific individuals or agencies.

Names of primary and alternate contacts and current phone numbers and page codes should be readily available to the person assigned to make the notifications.

All notifications should be documented. Fill-in-the-blank forms for different types of situations might be useful as a checklist and for providing necessary documentation.

Adequate communication equipment should be maintained in the main control area to meet the objectives of this chapter.

Chapter VIII, Control of Equipment and System Status

The operations supervisor is responsible for maintaining proper configuration and should authorize status changes to major equipment and systems. Changes in the status of facility equipment and systems should be reported to the governing stations or to the individual who authorized the change.

Typically, changes in status of safety-related equipment and systems should be authorized by the supervisor and reported to the control area. Authorization of status changes to equipment and systems of lesser importance may be delegated by the operations supervisor to other cognizant shift positions.

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Before placing the equipment or system into operation, individual components for facility equipment and systems should be properly aligned or checked for proper alignment. An initial alignment of valves, switches, and breakers establishes a baseline configuration against which further operations may be measured. Once the equipment or system is properly aligned and is operating in accordance with operating procedures, frequent complete alignments of all individual components may not be necessary. Alignment checklists should be used to guide the operator in establishing the correct component positions. The alignment checklists should include provisions for equipment nomenclature that matches the nomenclature placed on the component, a location for individual documentation of the check of each component, the required alignment position for each component, and a location for annotating deviations from the required alignment. The supervisor should review and approve completed alignment checklists.

Locks and tags should be used on those components that require special administrative control for safety or other reasons. Additionally, Locks and tags should alert the operator of the importance of the component and remind him/her that special controls over repositioning are to be maintained.

Administrative controls should be established to document compliance with requirements of operational limits. The operations supervisor should be cognizant of action taken to comply with operational limit requirements and should ensure that the actions taken are appropriate and correct or that they mitigate any adverse consequences to the facility. Logs, status sheets, turnover checklists, or other appropriate documentation should reflect the entry conditions and actions that are taken in response to operational limit requirements. Appropriate operating personnel should be apprised of limiting conditions for operations and actions for which they may be responsible. Responsible personnel should periodically review the limiting conditions for operation and action statements in effect to ensure that the required actions are met.

Equipment deficiencies should be noted by facility operating personnel and identified in the work control system for correction. Methods that identify deficient equipment to operating personnel should be established.

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The operations supervisor or his/her designee should authorize all shift activities on equipment that is important to safety, that affects operations, or that changes control indications or alarms. This authorization should be in writing on the document controlling the work. Documentation of the status of work in progress should be available in the control area for review by operating personnel.

Equipment should be tested following maintenance to demonstrate that it is capable of performing its intended function. The testing should include performance of all functions that may have been affected by the maintenance. The testing should also verify that the maintenance performed served to correct the original problem and that no new problems were introduced. Any testing following maintenance should be specified on the maintenance work order or accompanying documentation. The operations supervisor should ensure that testing appropriately proves equipment operability.

The status of control panel and/or local panel alarms should be readily available to appropriate operating personnel. Information that should be available includes alarms that are totally disabled, alarms with individual inputs disabled, alarms with temporarily changed setpoints, alarms that are normally lighted during power operation, and multiple input alarms that do not reflash when more than one input is activated.

Administrative control systems should be established for installation of temporary modifications such as electrical jumpers, lifted leads, pulled circuit boards, disabled annunciators/alarms, mechanical jumpers/bypasses, temporary setpoint changes, installed or removed block flanges, disabled relief or safety valves, installed or removed filters or strainers, plugged floor drains, and temporary pipe supports.

A system should be established to ensure that the operations personnel receive and utilize the latest revisions of engineering drawings and specifications. Operations personnel should be made aware of all changes to these documents. The document distribution should include all operations related activities such as procedures review groups, maintenance groups, facility safety analysis groups, and testing groups.

Chapter IX, Lockouts and Tagouts

Locks and Tags should be placed on controls when for safety or other special administrative reasons controls must be established. Lockout is the application of a lock on a control to render the control inoperative. Tagout is the application of a danger or warning device on the control, which indicates that the control is not to be used except under conditions indicated by the tag. Tags should be placed on the control that is tagged out, or as close as possible to indicate clearly the condition.

Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware should be provided for isolating, securing, or blocking machines or equipment from energy sources.

Lockout and Tagout devices should be singularly identified (should be the only devices used for controlling energy and should not used for other purposes) and should meet the following requirements:

- Durable
- Standardized
- Substantial
- Identifiable
- Warning

A Lockout/Tagout program should be established consisting of procedures to control potentially hazardous energy and materials and personnel training. This program should ensure that potentially hazardous energy or toxic material sources are isolated and rendered inoperative during servicing or maintenance or in any case where unexpected energizing, startup, or release of stored energy or toxic material can cause injury.

Procedures should be developed, documented, validated, and used for control of potentially hazardous energy or material. Procedures should clearly and specifically state the scope, purpose, authorization, rules, and techniques of the Lockout/Tagout program. Procedures should include the following:

- Specific statement of intent of use;
- Specific procedural steps for isolating, blocking and securing machines or equipment for hazardous energy or material;

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- Specific procedural steps for the placement, removal, and transfer of the Lockout/Tagout device(s); and
- Specific requirements to test machines and to determine and verify the effectiveness of Lockout, Tagout or other control measures.

The established procedure for the application of energy should cover the elements and actions in the following sequence:

- Prepare for shutdown.
- Shutdown machine or equipment.
- Isolate equipment.
- Affix locks or tags.
- Relieve, disconnect, or restrain stored or residual energy
- Verify that isolation and de energization have been accomplished.
- Release from lockout/tagout.

Temporary removal of Lockout/tagout devices should be discouraged. However, situations in which Lockout/tagout devices must be temporarily removed and the equipment energized, the following sequence of operations should be followed:

- Clear the equipment of tools and materials.
- Remove personnel from the equipment area.
- Remove the Lockout/tagout device as procedures indicate.
- Energize and proceed with testing or positioning.
- De-energize all systems and reapply the lockout/tagout.

Periodic inspections should be conducted by authorized personnel, supervisor, or appropriate manager, to determine whether procedures are being followed and to correct any deviations or inadequacies observed. Inspections should include a review of the responsibilities of personnel and supervisors. The supervisor or appropriate manager should certify that the periodic inspections have been performed, documenting the equipment and procedures involved, dates of inspection, personnel participating in the inspections, and personnel performing the inspections.

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Caution tags should not be used for personnel protection. Administration of caution tags could, however, be accomplished as part of the Lockout/Tagout program or it could be covered separately. The use of caution tags should be restricted to those situations in which a component or system is functional, but when some precaution or item(s) of information is necessary prior to operation. In addition, the program should include the following elements:

- Caution tags should be uniquely identifiable and different in appearance from other station tags.
- Situations that require special operator or management precautions should be brought to the shift supervisor's attention.
- A record of all active caution tags and associated information should be available to the appropriate personnel
- Caution tags should be placed so that they do not interfere with or obscure indications, switches, or other control devices.

Training should be provided and documented to ensure that the purpose and function of the Lockout/Tagout program is understood by all personnel and that they have the knowledge and skills required for safe application, use, and removal of Lockouts and Tagouts. Training should include the following:

- Recognition of applicable hazardous energy sources, type and magnitude of energy or materials involved and methods to isolate and control.
- Personnel involved should be instructed in the purpose and use of the Lockout/Tagout procedures.
- All personnel who may enter the area should be trained to recognize the Lockout/tagout and to understand the procedure and prohibition relating to attempts to restart or re-energize machines or equipment.

A supervisor or appropriate manager should notify affected personnel of the application and removal of Lockout/tagout devices. Notification should be given before the devices are applied and after they are removed.

Whenever outside servicing personnel are to be engaged in activities covered by the scope of the

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Lockout/tagout program, the facility and the outside contractor should inform each other of their respective Lockout/tagout procedures and should ensure that their personnel are aware of the changes. When a crew, craft department or other group performs servicing or maintenance they should use a procedure that will provide for equivalent safety provided by the personal Lockout or tagout device.

Specific procedures should be used during shift or personnel changes to ensure the continuity of Lockout or Tagout protection, including provision for the orderly transfer of Lockout or Tagout devices between personnel or shifts.

Chapter X, Independent Verification

Components that are critical to ensure safe and reliable operation should receive an independent verification of their position when circumstances warrant. These components should be identified explicitly in facility procedures or other official documents so that unnecessary interpretation of requirements will be minimized. Each facility should use an accepted safety analysis method and/or expert opinion to determine its own facility specific list of systems and components.

All components in systems that have safety-related functions should be considered for independent verification. However, if the following criteria have been met, some components might not need independent verification:

- Mispositioning would not affect system performance. For example, if an engineering analysis has shown that mispositioned vent or drain valves do not affect system performance, they might not require independent verification.
- The mispositioning would be known immediately to an operator. For example, resetting a steam-supply trip valve might not require independent verification if an annunciator alarm in the control room were available to alert operators to an improperly reset valve. However, such annunciator alarms should be independent from the valve position lights associated with main control board valve operation switches. Valve position lights alone should not warrant exemption from independent verification requirements, because these lights might not alert operators to a mispositioned valve. Mispositionings have occurred when main control board indication was available.

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- Significant radiation exposure would be received by the person(s) performing the independent verification. In this case, alternate means for independent verification that does not involve radiation exposure, such as observing process parameters should be considered.

Components should receive independent verification when the equipment they serve must be available and when a reasonable possibility exists that the components might have been mispositioned. Independent verification is appropriate in the following situations.

- Returning equipment to service following maintenance or testing
- Removing equipment from service
- System lineups
- Periodic checks during facility operation

Each facility should use its most experienced personnel to develop independent verification instructions, using applicable manufacturer's recommendations where available. The instructions should describe the techniques for verifying manual valves, motor- and air-operated valves, solenoid-operated valves, circuit breakers, blank flanges, removable links and fuses, and the availability of control power. These instructions will help to ensure that operators use approved methods when verifying component positions and will help provide uniformity in operator performance.

Chapter XI, Log keeping

Narrative logs should be established at all key shift positions. As a minimum, the operations supervisor or the control area operator should maintain a narrative log.

Information should be promptly recorded in the logs. Delaying the recording of activities or events often leads to incomplete or inaccurate entries.

The operations supervisor should provide written guidance to define thoroughly the type and scope of entries for each log and the format for making entries. The following information should be recorded in at least one station log, although any one log might not contain all these items:

- facility mode or condition

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- criticalities and appropriate critical data
- abnormal facility configurations
- status changes to safety-related and other major facility equipment
- occurrence of any reportable events
- initiation and completion of surveillance tests
- entering and exiting operational limit actions
- security incidents
- out-of-specification chemistry or process results
- shift reliefs

Log entries should be made so that they can be easily read and understood. Additionally, the log entries should be readily reproducible with standard photocopy machines. For these reasons, black, waterproof ink is recommended.

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A standardized method for correcting any erroneous entries should be established. The method chosen should not obscure the incorrect entry. Log entries should not be erased or covered up. Corrections can be made by placing a single line through the incorrect entry and writing the correct entry in a nearby space. All corrections should be initialed and dated.

Control area logs should be reviewed periodically by the operations supervisor and the control area operator or an appropriate supervisor should review logs kept by operators outside the control area. These reviews should ensure that entries are accurate and adequate.

Management should provide written guidance on the disposition of completed logs. This guidance should address the following:

- Making the logs available for operators who return after periods of absence from their regular duties,
- Storing the completed logs to ensure preservation for the expected life of the facility, and
- Retrieving stored logs should this become necessary.

Chapter XII, Operations Turnover

Supervisory positions should have a turnover checklist for the turnover process.

Equipment operator checklists, or other formal documents, should note major components status, abnormal lineups, valid alarms on all pertinent local control panels, and surveillances or evolutions planned or in progress. Provisions should also be made for documenting that the oncoming operator has performed a review of round sheets and narrative logs.

Operator checklists or other documents reviewed at shift change should record vital information about facility status. Operator checklists may require documenting reviews of certain facility status documents.

Operations supervisory checklists or other documents reviewed at shift change should provide vital information about facility status. Operations supervisory checklists should require documenting review of certain status documents.

Oncoming operators and supervisors should review documents specified on their checklists prior to

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assuming responsibility for their shift position. Document review should be as intensive as necessary for the oncoming personnel to understand important history, present status, and planned events. Normally, narrative log entries for the previous 24-hour period or since his/her last shift should be reviewed. Status logs should be reviewed so that the operator and supervisors are familiar with all currently active entries, with an emphasis on what has changed since he/she last had the shift.

Walkdowns of appropriate control panels should be conducted by each shift watchstander. The purpose of a panel walkdown is to determine plant status through observation of system lineups, switch positions, lighted annunciators, chart recorders, and status lights.

At a time when facility conditions are stable, the offgoing supervisor or operator should explain all items noted on the turnover checklist, and the oncoming operator or supervisor should ask any pertinent questions. When all operations personnel are satisfied that the oncoming crew is fully cognizant of the plant conditions, the oncoming operators and supervisors should state that he/she is assuming responsibility for the shift position with an entry into the log.

Crew briefing should be conducted by the operations supervisor as required and may be conducted after he has accepted responsibility for the shift. The briefing should include a review of the status, problems with equipment, and evolutions in progress or planned during the shift. In addition to shift operators, personnel from support groups should also attend briefings when their activities can directly affect operations.

Reliefs occurring during the shift should have a turnover to ensure that the oncoming person is at least as knowledgeable of the conditions as he would have been had a complete shift turnover process been conducted.

Chapter XIII, Operations Aspects of Facility Chemistry and Unique Processes

The operations supervisor should define each operator's specific responsibilities with respect to process control. Operators should monitor chemistry or process parameters using control room instruments and other instruments related to equipment under operations control. Operators should be able to recognize out-of-specification conditions or adverse trends and be familiar with

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corrective actions associated with chemistry or process problems. Operators should consult and be advised by chemistry or technical process department personnel.

Operators should be knowledgeable about aspects of facility processes and safety that affect operation and should be able to analyze off-normal situations and take appropriate action to correct the causes(s) of problems. Examples of the types of concepts and processes with which operations personnel should be familiar include the following:

- Concepts of pH, conductivity, and dissolved oxygen and the effect these parameters have on the facility;
- The radiochemical indications of failed fuel;
- How demineralizers work and how to determine if they are performing inefficiently;
- The purpose and hazards associated with facility storage and use of such chemicals as boron, acids, caustics, chromates, hydrazine, ammonia, solvents containing chlorinated hydrocarbons, and chemicals containing organics;
- Chemical and radiochemical parameters, including calculations associated with technical specifications/operational safety requirements;
- Chemistry parameters monitored in the control room or on local panels under the responsibility of facility equipment operators;
- Properties and hazards of such gases as hydrogen, nitrogen, carbon dioxide, chlorine, and halon
- Corrosion problems, including stress corrosion, intergranular cracking, and ammonia attack of copper alloys;
- The chemical constraints, process equipment, and controls associated with the radioactive or toxic waste systems;
- Operation of such water pretreatment equipment as clarifiers or charcoal filters;
- Knowledge of operating limits and characteristics of off-normal and unique processes; and
- Knowledge of appropriate response and recovery from off-normal or hazardous conditions.

Each operator should be capable of correctly interpreting the chemistry or process parameters that he is responsible for and be able to provide appropriate, timely, corrective action when required. High air leakage and poor quality makeup water are examples of conditions that could require

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operator identification and response.

If possible, operators should inform appropriate process personnel prior to commencing evolutions that could potentially affect facility processes or require action from support technicians. Operators should receive reports from the process department on key day-to-day process results and problems. When process-related problems occur, operations and process-personnel should work closely to provide prompt corrective action.

Chapter XIV, Required Reading

A list of the types of documents to be included in the required reading file should be maintained.

The list should include the following documents:

- procedure changes
- equipment design changes
- related industry and in-house operating experience information
- other information necessary to keep operations department personnel aware of current facility activities

A method should be in place to designate which documents need to be read by the individuals filling each position, and the reading file should be readily available to those individuals.

A required completion date should be designated for reading each document. This date would be determined based on the nature of the material. Personnel should complete their reading assignments by the required date. Certain documents may be designated for immediate reading. These should be read before assuming responsibility for a shift position.

Completion of reading should be documented, and the documentation should be retained.

The reading file should be periodically reviewed to ensure that all department personnel complete readings by the required dates. Material that has been read by all appropriate personnel should be removed from the active file. A dead file may be maintained as a reference.

Chapter XV, Timely Orders to Operators

Information such as special operations, administrative directions, special data-collection requirements, plotting process parameters, and other similar short-term matters can be included in operator orders. Examples of orders could include instructions on the need for and performance of specific evolutions or tests; it could also include work priorities, announcements of policy information, and administrative information. Orders should be clearly written, dated, and maintained in the control room. Information and policies intended as permanent should be incorporated into appropriate administrative procedures.

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Operator orders should be issued by the operations supervisor or his/her designee whenever necessary to communicate instructions to the shift personnel. Shift personnel should segregate operator orders into daily and long-term orders in order to facilitate review. Daily orders that are postponed or prolonged should have daily review or updates. Reviews of long-term orders may not be required on a daily basis but should be made periodically and when changes occur. Appropriate operations personnel should review the orders early in the shift and document their review by initialing the log or notebook.

Orders that are no longer applicable or are outdated should be promptly removed or canceled. The operations supervisor should periodically review the operator orders to ensure that only applicable and current orders remain effective.

Chapter XVI, Operations Procedures

To ensure consistency among operations procedures, the methods for developing new procedures, including procedure formats, should be clearly defined. Administrative procedures and/or writers' guides should direct the development and review process for procedures. Procedures should be developed for all anticipated operations, evolutions, tests, and abnormal or emergency situations. Annunciator/alarm response procedures that guide the operator in verifying abnormal conditions or changes in plant status and provide the appropriate corrective action should be developed for all alarm panels. All procedures should provide administrative and technical direction to conduct the intent of the procedure effectively. The extent of detail in a procedure should depend on the complexity of the task, the experience and training of the user(s), the frequency of performance, and the significance of the consequences of error.

To provide uniformity in operations procedures, the content of procedures should conform to prescribed guidelines. The procedure aspects described below should be followed when developing operations procedures:

- The scope and applicability of individual procedures should be readily apparent. Procedures with single-unit applicability should be distinctively identified to avoid confusion with sister-unit procedures. In addition, to enhance rapid retrieval, emergency procedures should be distinguishable from other procedures. Color-coding could be used for these purposes.
- Procedures should incorporate appropriate information from applicable source documents, such as the facility design documents, safety analysis documents, and vendor technical manuals.
- Prerequisites and initial conditions should be detailed. Careful consideration should be given to the location of this information within the procedure to help ensure that the intent of the procedure is understood. In addition, any hoses, tools, or other temporary testing equipment should be verified operable, calibrated, or inspected and in good condition where possible, before implementing any test procedure, to ensure that they function as expected during the test. These verifications should be identified in the prerequisite section, with completion sign-offs required. Hold points should be clearly delineated.
- Definitions used in the procedure should be explained.
- Procedures should be easily understood, and actions should be clearly stated.
- Procedures should contain only one action per step.
- Procedures should contain sufficient but not excessive detail. The skill level, experience, and training of the users should be considered.
- Warnings, notes, and cautions should be easily identifiable and should not contain action statements. The probability of missing an action step increases when it is included in a warning, note, or caution.
- Warnings and cautions should precede the step to which they apply. Warnings, notes, and cautions should appear on the same page as the step to which they apply. This ensures that operators are alerted to necessary information before performing a procedural step.
- Procedures should be technically and administratively accurate.
- Individual sign-offs should be provided for selected critical steps. One sign-off should not be applied to more than one action.

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- Limits and/or tolerances for operating parameters should be specified and should be consistent with the readable accuracy of instrumentation. Operators should not be required to perform mental arithmetic to determine if a specified parameter is acceptable.
- Acceptance criteria for surveillance or test procedures should be easily discerned, including tolerances and units. If calculations are needed to compare data to acceptance criteria, the calculations should be clearly explained.
- Sequence of procedural steps should conform to the normal or expected operational sequence. Training on this sequence, reinforced with procedures that show the same sequence, will serve to improve operator performance by development of patterns of action that are more easily remembered.
- Procedures should be developed with consideration for the human-factor aspects of their intended use. For example, references to components should exactly match drawing and label-plate identifiers, units should be the same as those marked on applicable instrumentation, and charts and graphs should be easily read and interpreted. Important factors should be highlighted.
- Emergency operating procedures should provide guidance in responding to single and multiple casualties.
- Portions or steps of other procedures that are used or referred to when performing a procedure should be specifically identified within the procedure so that operators will not be confused when transferring between procedures.
- Component or system shutdown and restoration requirements following shutdown or a surveillance or test activity should be specific and controlled by the procedure.

Procedure changes and revisions should conform to the following practices:

- Procedure changes intended for use more than one time should be documented in a location readily available for operator reference. To avoid the possibility of error, these changes should also be referenced in procedure copies used by operators.
- Appropriate procedure changes and revisions should be initiated when procedure inadequacies or errors are noted.

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- Procedure revisions should be initiated when a change has been outstanding for an extended period or when a procedure has been affected by several changes. All currently effective procedure changes should normally be incorporated when the procedure is revised.
- Procedure revisions should be implemented concurrently with modifications. Procedure updates required by temporary modifications should be handled as procedure change and implemented concurrently with the temporary modification installation.
- Important information regarding changed or revised procedures should be communicated to appropriate operations personnel via the required reading system a pre-shift briefing, or a similar method.
- Documentation of the reason for key procedure steps should be maintained and reviewed when implementing changes or revisions that alter these steps.
- The review process should involve verification and validation of the procedure using walkthroughs or similar methods.

The operations supervisor should approve operating procedures. In addition, procedures that affect safety-related equipment and emergency procedures should be reviewed by the facility safety review committee or by another appropriate review mechanism. Procedure revisions should receive the same depth of review and level of approval as the initial versions. New and revised procedures should be approved prior to use.

New and revised operations procedures should be reviewed prior to issuance and at periodic intervals to ensure that the information and instructions are technically accurate and that appropriate human-factor considerations have been included. The frequency of subsequent reviews should be specified.

A controlled copy of all operations procedures should be maintained in the control area for operator reference, and selected controlled procedures should be maintained at other appropriate locations.

Facility operation should be conducted in accordance with applicable procedures that reflect the facility design basis. The requirements for use of procedures should be clearly defined and understood by all operators. If procedures are deficient, a procedure change should be initiated. In

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exception to this policy, operators may take whatever action is necessary during emergency conditions to place the facility in a safe condition, and to protect equipment, personnel, and public safety without first initiating a procedure change.

Chapter XVII, Operator Aid Postings

Any facility employee could develop an operator aid; however, it should be approved prior to posting. Individuals other than operations personnel may often post operator aids. Therefore, all facility personnel should be informed of the importance of controlling posted information and the procedure to be followed when posting information. The operations supervisor, or a higher authority, should approve all operator aids. The person approving an operator aid should ensure that the aid is necessary and correct. Operator aids that alter procedures should not be approved. Instead, appropriate procedures should be changed to incorporate the necessary information.

Operator aids should not be posted in such a way as to obscure instruments or controls. The aids should be located in close proximity to the area of their expected use. The operator aids should, when possible, be protected and should be securely fastened to the equipment to which they refer.

Operator aids should be viewed as a convenience to the individual using them, not a requirement. In most cases, operator aids remind users of information that might otherwise be overlooked and provide guidance that is not procedural in nature. Operator aids may supplement approved procedures, but they should not be used in lieu of approved procedures.

A listing of all approved operator aids should be maintained along with a copy of each aid posted in the facility. This list should be used during periodic reviews of operator aids to help ensure that the posted aids remain current, and to provide a reference copy should an operator aid be missing during the review. The list should be kept in the control area, the operations supervisor's office, or other appropriate location. References from which operator aids were derived, control numbers, and dates of approval should be provided.

The posted operator aids should be reviewed periodically to ensure they are still correct and necessary. In addition, an operator should audit the control area listing to ensure that only currently

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posted aids are recorded on the listing. Operator aids no longer posted should be removed from the listing, and missing aids should be replaced.

Chapter XVIII, Equipment and Piping Labeling

The following components should be labeled:

- valves
- major equipment
- switches
- circuit breakers
- fuse blocks or fuse locations
- instruments and gauges
- busses and motor control centers
- cabinets
- room doors
- emergency equipment
- fire protection systems

Information on labels should be consistent with the information found in facility procedures, valve lineup sheets, and piping and instrument diagrams. Abbreviations and nomenclature used should be standardized and should be understood by facility personnel. Labels should be permanent, securely attached, and have distinguishable, easy-to-read information. Each component label should list a unique component number. The accompanying component noun name or description and power supply, if applicable, should also be provided.

Labels should be placed on or as near as practicable to the equipment to be labeled. The label should be oriented so that is easy to read and so that the correct component is easy to identify.

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Procedures should be established to ensure that misplaced or damaged labels are replaced. A method should exist to help ensure the prompt identification and correction of labeling deficiencies.

Note: You do not have to do Example 1 on the following pages, but it is a good time to check your skill and knowledge of the information covered. You may do the Example 1 or go to Section 2.

EXAMPLE 1 SELF-CHECK

1. List five areas where operational goals should be established.
Any five of the following constitutes a correct answer.
 - minimizing the unavailability of safety systems
 - minimizing personnel errors
 - As-Low-As Reasonably-Achievable (ALARA)
 - minimizing lost facility capability
 - minimizing the number of unscheduled facility shutdowns per year
 - timely completion of scheduled surveillance
 - minimizing the amount of overtime;
 - achieving and maintaining complete staffing and training of shift positions
 - minimizing waste
 - minimizing the number of lighted annunciators

2. State four requirements for control area access.
 - Control area access should be limited to those persons on official business.
 - The at-the-controls area of the control room should be clearly identified.
 - Access to the at-the-controls area should be restricted to persons who need to be in the area.
 - Designated individuals should grant entry into a control area.

3. Identify the position that is responsible for approving the operator qualification program.
Operations supervisor

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4. State three elements that should be included in procedures to address appropriate notifications.

Any three of the following constitutes a correct answer.

- Specific responsibilities for notifications
- Identification of events and conditions requiring notifications
- Identification of primary and alternate personnel to be notified for various situations
- Establishment of time requirements for notifications that are consistent with the facility emergency plan
- Definition of record keeping requirements that documents the reason for notifications, the time of notifications, and the person notified.

5. List five requirements for lockout/tagout devices.

- Durable
- Standardized
- Substantial
- Identifiable
- Warn against hazardous conditions

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SECTION 2, DOE STANDARDS SUPPORTING DOE ORDER 5480.19

This section contains additional information from the DOE standards that was not presented in Section 1 of this module. The combination of the information provided in this and the previous section is sufficient for you to meet the qualification requirements for this Order. However, you should review the actual standards to optimize your knowledge of the material presented.

GUIDELINES

DOE-STD 1030-96, Guide to Good Practices for Lockouts and Tagouts

Use

Lockout/tagout in a DOE facility may serve three functions. The first function is to protect personnel from injury. The second function is to protect systems and equipment from damage. The third function is part of the overall control of equipment and system status. A properly performed lockout/tagout ensures that the operating staff is aware that the affected equipment cannot be operated.

Implementation

Before implementing a lockout/tagout program it is necessary to identify the method of equipment control used in the facility. There are two approaches to equipment control, individual-controlled and centrally controlled.

In some DOE facilities, individual workers operate equipment to produce, assemble, test, or package components or products. Each worker may be responsible for operation and routine maintenance of an individual piece of equipment. For these workers, protection from hazardous energy sources simply means preventing the power from being inadvertently or accidentally turned on while they are performing maintenance.

Other DOE facilities have a central organization that is responsible for operation of the facility's systems that are not necessarily under a single individual's control. The facility may contain highly complex specialized equipment, or it may contain equipment spread over a large area, such as electrical distribution systems. In facilities like these, certain process and specialized safety functions may be required to ensure the safety of personnel, equipment, and the environment.

DOE-STD-1031-92, Good Practices for Communications

Oral Instructions

Verbal instructions should be clear, concise, and correct. Operational communications must be free from ambiguity. Messages that contain words with multiple meanings or similar sounds may be confusing. Slang and expletives should not be used. When communicating alphanumeric information, sender and receiver should use a phonetic alphabet to ensure clarity.

Operational communications should be brief. The key is to keep the message short while still effectively communicating the information. The message should be specific to ensure that the correct unit or component is identified. Noun names and equipment numbers should be used together to ensure that the message is properly transmitted and received.

Operational communication should use a standard format to ensure consistency and effectiveness.

The suggested format, in the appropriate order is as follows:

- Establish communication.
- Transmit message.
- Repeat back message.
- Confirm repeat back.

Face-to-Face Communications

Face-to-face communication is performed when the sender and the receiver are in the presence of each other. The sender's title may be omitted from the message. However, the sender should ensure that the intended receiver receives the message when two or more people are in the immediate area.

Communication Systems

Communication systems should be implemented to ensure that control areas could quickly contact personnel throughout the facility. Additionally, these systems should allow contact between personnel outside of the control area. The following systems will be discussed:

- Party-line communication systems
- Point-to-point communication systems

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- Public address systems

Party-line communication systems allow more than two workstations to communicate on the same communication line at the same time. If a party line communication system is used, the sender should check the line to verify that the line is clear before establishing communications. Additionally, the sender and receiver identification should be included in each message.

Point-to-point communication systems allow only two workstations to communicate on a communication line at one time. If a point-to-point circuit is used, the sender and receiver identification need only be established on the initial contact.

Public address systems may be used to update facility personnel of the status of an abnormal or emergency condition, changes in facility status, or major facility events either in progress or anticipated. Administrative policies and procedures should address the effective control of the public address system. Public address systems should be heard throughout a facility.

Announcements of abnormal or emergency conditions should be made twice. If an audible alarm signal is used in conjunction with the public address system to warn personnel of an abnormal or emergency condition, the alarm should be activated once, before the announcement. When using the public address system to announce remote starting of major equipment, the announcement should be made, followed by a short pause, and then the equipment started. If other communication systems are used to access the public address system, the control area should have the capability to override those systems.

Emergency Communication

The facility emergency communication system should ensure that all personnel could be promptly alerted to facility emergencies. The public address system should normally be used to make emergency announcements. Alternate methods, such as flashing lights, personal pagers, and individuals dedicated to notifying in person should be used to alert personnel in high-noise areas. The emergency communications system should also allow personnel from any point in the facility to make emergency communications to the control area. Designated facility telephone numbers should be established to report concerns or problems,

Testing Communication Systems

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Policies and procedures should address testing of communication systems. Emergency communication systems should be tested periodically to ensure that they are operable. The test period for non-emergency communication systems should correlate to the risk associated with not being able to use the communication system. Additionally, a test of a communication system should be performed before conducting procedures that require use of the system, and anytime system operability is in doubt.

A check of all facility areas should be performed to make certain that facility personnel could be alerted to emergency conditions.

DOE-STD 1032-92, Guide to Good Practices for Operations Organization and Administration

Policies

Written policies should ensure consistency in the organization and administration of facility activities.

Facility-wide policies should be developed for activities that affect the entire facility or when they apply to multiple organizations within the facility. Policies for activities specific to an organization should be developed at the organization level.

Policies should be written in a consistent format for effective development and implementation. The required format should be clearly defined. Policy documentation should contain a description of the controls necessary to implement the policy and should specify when and how changes may be made to the policy.

Personnel should understand their authorities, responsibilities, and accountabilities associated with policies. Additionally, personnel should understand their interfaces with other organization, especially during back-shifts and weekends.

Goals

Facility management should develop goals that support DOE and corporate goals. Operating, environmental, and safety goals should be used as motivators for improvement. Goals should be used as a management tool for involving cognizant groups or individuals in improving operating performance and for measuring operating effectiveness. Management, to establish facility priorities

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and monitor progress, can use goals that focus on areas that need improvement and that promote excellence in facility operations.

Goals should be:

- measureable;
- limited in number;
- controlled by the individual or group responsible for their accomplishment;
- clearly communicated, understood, and supported by all members of the responsible organization; and
- composed of input from all levels in the organization responsible for achieving the goals.

Goals should be established in the following areas:

- preventing unavailability of safety systems,
- preventing personnel error,
- maintaining exposure ALARA,
- preventing lost facility capability,
- preventing unscheduled facility shutdowns,
- maximizing the timely completion of scheduled surveillances,
- minimizing the amount of overtime,
- maintaining complete staffing and training of shift positions,
- minimizing or preventing waste, and
- minimizing the number of lighted annunciators and out-of-specification parameters.

Accountability

Management should ensure that all personnel understand the requirements for their assigned workstations and that individuals will be held accountable for their actions. Personnel should be instructed on the benefits of proper operating performance and the possible consequences of inappropriate operating performance.

A well-defined accountability program should define the requirements for handling operating performance problems. Personnel involved in any infraction of operating practices should be counseled on the deviation. Those involved in significant or frequent violations of operating practices should be counseled, retrained, and disciplined, as appropriate.

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Accountability and recognition should be administered in conjunction with the personnel performance appraisal system. Supervisor performance appraisals and promotions should include an assessment of operating performance.

Facility Resources

The operations supervisor should be responsible for identifying to DOE and corporate management the resources required for safe, reliable facility operation. The operations supervisor should also be responsible for providing lower-level managers with the resources to accomplish assigned tasks.

The resources provided should include:

- sufficient personnel to limit overtime;
- adequate permanent work areas to conduct facility activities;
- necessary spare parts and equipment to operate and maintain the facility;
- technical services in areas such as maintenance planning, engineering support, nuclear safety reviews, and interfacing with regulatory agencies;
- administrative services, including contract administration, budget and cost control, and personnel administration; and
- personnel, facilities, and materials for training.

Monitoring Operating Performance

Policies should be established to monitor operating performance with the goal of improving operations. Managers should be knowledgeable of personnel performance, facility activities, and facility conditions in their areas of responsibility. Managers should be involved with the work activities under their cognizance to assess performance and reinforce management standards. Monitoring of facility activities should ensure that they are conducted according to appropriate standards, policies, and procedures, and that problems are identified and corrected promptly.

Management Training

Management training and professional development should be conducted to ensure that highly capable and experienced individuals staff the facility. Management should assess the management needs of the facility and define job prerequisites, including necessary training, experience, professional certifications, and skills development. Criteria should be established for selecting

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personnel to participate in management development. A major goal of the management development effort should be to have qualified personnel in the facility organization ready to be promoted to the next level of management.

Planning for Safety

Facility management and personnel should assume direct responsibility for conducting activities and functions in a manner that emphasizes safety and minimizes the potential for challenges to safety limits and personnel exposure.

Each facility should have guidelines that describe safety-planning requirements for all operational activities. These guidelines should explain the role of safety analysis reports, job safety analyses, and the handling of safety matters. Operational activities should be reviewed to ensure that they address safety planning.

All operations personnel should understand safety-planning requirements. All personnel should be trained to incorporate safety planning into their job routines. Training should include a discussion of the importance of safety planning, methods of safety planning, and the requirements.

DOE-STD-1033-92, Guide to Good Practices for Operations and Administration Updates through Required Reading

File Index

The file index is a management aid for screening documents to ensure appropriate information is placed in the required reading file. It corporate types of documents that provide information that affect the operation of the facility. Additionally, it should include the types of documents that require formal documentation that the information has been read. Examples of the type of documents in a file index are:

- procedure changes or revisions
- temporary modifications to systems or equipment
- new or updated hazard communication information
- company reference manual changes
- policy changes
- related industry event reports

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- occurrence reports
- industry operating experience information
- other information necessary to keep operations department personnel aware of current area activities

Reading Assignments

The appropriate manager or supervisor should assign employees to read only documents that pertain to them. Required reading documents should be kept in the required reading file. This file should be placed in an accessible location that allows personnel to retrieve and read the documents.

Required Dates for Completing Reading Assignments

The appropriate manager should assign a required completion date to the required reading document. When determining the date, the relative importance of the information to the employees should be taken into account. Some documents should be designated for immediate reading while others may be designated for general reading. Examples of immediate reading documents include:

- temporary modifications to a system
- procedure change
- new or updated hazard communication information

When documents are designated for immediate reading, a notification that the document has been issued should be placed in the timely orders to operators.

Documentation

Personnel should document the completion of reading assignments by signature or initials. The documentation used should list the document title or description, required completion date, actual completion date, and a signature or initials verifying the completion of the reading assignment.

Review

The appropriate manager should periodically review the required reading file to ensure completion of reading assignments by the required completion date. One method of formally accomplishing this is by using a review sheet in the required reading file. The sheet should specify the review frequency and provide spaces for the reviewer's signature and date of review. Another method would be to

document the review on the required reading document log.

Completed required reading documents should be removed from the required reading file and retained for reference.

DOE-STD-1034-93, Guide to Good Practices for Timely Orders to Operators

Content and Format

Operator orders should be issued whenever it is necessary to communicate short-term information related to the conduct of facility business. They may be used in either shift or daily work environments, but specifically when there is a need to provide direction or information to workforce personnel in the absence of management. Examples of the types of information to include in operator orders are:

- notification of work priorities;
- special operations;
- non-routine tests;
- data collection programs;
- upcoming events and audits;
- announcements of administrative items, policies, procedures changes, or specific activities;
- and
- notice of documents requiring immediate review in the required reading file.

Operator orders should be clearly written and dated. They should include the length of time the order is to be applicable or a cancellation date. Provisions should be made to document review by appropriate personnel.

Issuing, Segregating, and Reviewing Operator Orders

The manager is responsible for issuing operator orders to personnel. Orders should be issued as necessary and updated daily. The orders should be issued as either daily orders or long term orders. Daily orders contain information such as the announcement of a procedure change or director for a non-routine process. They usually contain action items that will take place on the remaining portion of the day, the following day, or weekends and holidays. The manager may renew daily orders. Long-term orders contain information such as a time-line of work activities

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during a maintenance period.

The orders should be placed in an operator orders book. This book should be maintained in a designated location for easy access. The operator orders book should be divided into two sections: daily orders and long-term orders. Daily orders include those that should be completed in one or two days. Long-term orders include orders that may take several days or longer to complete. The appropriate individuals should review daily orders early in the work period before starting any affected activity. This review should be documented by signature or initials. Long-term orders should be reviewed periodically or when changes occur.

The manager should review the operator orders book periodically to ensure that it only contains current orders. A good management practice is to review the book monthly. Operator orders that are no longer applicable should be removed or canceled. These orders may need to be retained for reference.

DOE-STD-1035-93, Guide to Good Practices for Log keeping

Establishing Operating Logs

Narrative logs should be an accurate history of facility operations. Logs should be established and maintained for all key position. Facilities should develop written guidelines to ensure consistency in maintaining logs. The guidelines should address:

- shift position, processes, or equipment that require logs;
- personnel authorized to make entries in logs;
- standards for information to be recorded in logs;
- format requirements for logs and log entries;
- review requirements for logs; and
- instructions for control of logs and disposition of completed logs.

Timeliness of Recordings

Information should be recorded promptly in the log to ensure accuracy and completeness. If an individual has failed to make a log entry at the proper time, and has since made additional entries, the late entry should be recorded in the next available space. The entry should indicate the actual time of the occurrence and should be identified as a late entry.

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Legibility and Format

Maintaining logs as working documents and permanent legal records requires precautions to preserve the physical integrity of the log. Logs should be maintained in a hardbound ledger with numbered pages, or in a duplicate-type book with numbered pages.

Facilities should provide a method for identifying the persons who make entries in the log. One method is to list the printed name, signature, and initial of all persons making log entries. This may be done as part of the initial entry, or on a separate page or form maintained with the log.

Entries in the log should be easy for others to read and understand. All personnel maintaining a log should ensure that others could easily read their handwriting. The language and style of writing should be in keeping with the intent of a narrative record of operation.

Detailed instructions for log format should be contained in facility guidelines.

Correcting Errors

When someone discovers an error other than the person who made the entry, the person making the discovery should not change the original entry. A new entry should be made in the log at the time of discovery to indicate that an error has been identified. The new entry should include the date and time of the incorrect entry and the incorrect information, and should clearly state the correct information. A note in the margin at the location of the incorrect entry, giving the date and time of the new entry, can be used to inform personnel that an error has been identified.

DOE-STD-1038-93, Guide to Good Practices for Operations Turnover

Much of the information in this guide is presented in Chapter XII of the Order and will not be repeated here. This section of the module will discuss the information not included in the Order that is related to the following topics.

- document review
- panel walkdown
- personnel briefing
- reliefs occurring during the shift

Document Review

On-coming personnel should review documents specified by management before assuming responsibility for their shift positions. Document review should be as intensive as necessary to ensure on-coming personnel understand important history, present status, and scheduled events.

Examples of documents to review include:

- workstation narrative log
- equipment status log
- tagout log
- workstation round/inspection sheets
- temporary modification and jumper logs
- out-of-service annunciator log
- operation limit action log
- shift orders book

In addition to the above documents, supervisors may be required to review the narrative and round/inspection sheets of assigned personnel

Panel Walkdown

Before assuming responsibility for the workstation, the on-coming person should personally verify the status of important system operating parameters. Walkdowns of appropriate instrumentation and control panels should be conducted at each workstation. The purpose of a panel walkdown is to determine facility status through observing system lineups, switch positions, lighted annunciators, chart recorders, and status lights.

On-coming and off-going persons should conduct the walkdown together during the turnover. A discussion of workstation status, trends, and potential problems should occur during this walkdown.

This discussion should be focused on the following items:

- Status of safety-related equipment;
- Running equipment;
- Inoperable equipment, including instrumentation;
- Technical safety requirements, including surveillance requirements;
- Reasons for actuated alarms or annunciators;
- Tagged equipment, including any surveillance/equipment work in progress; and

- Abnormal equipment and component configurations.

Personnel Briefing

Facility policies and procedures should establish guidance pertaining to the time, place, and conduct of personnel briefings. A briefing of shift personnel should occur as part of the turnover process.

Items to cover during the briefing include:

- a review of facility status,
- problems with equipment,
- evolutions in progress or planned for the shift,
- shift orders,
- lessons learned from events occurring elsewhere or during other shifts,
- last-minute changes in facility status or operational function planned for the shift,
- support group work planned for the shift,
- changes to administrative procedures that impact methods of doing work,
- facility maintenance shutdown schedule changes,
- production goals for the shift, and
- other important work-related items.

Reliefs Occurring During the Shift

Turnovers occurring during the shift should meet the same objective as a turnover at the beginning of the shift. If a relief is necessary, the supervisor should be informed of the reason and expected length of time before the off-going person turns over the workstation duties and responsibilities. Before authorizing the relief, the supervisor should ensure the on-coming person is qualified and should verify that facility conditions permit the relief. The following turnover policies should be followed:

- The transfer of duties and responsibilities should occur at time when facility conditions are stable.
- The off-going person should be confident that the on-coming person is fully capable of assuming the duties and responsibilities of the workstation.

- At the end of the turnover the on-coming person should signify to the off-going person that he/she is assuming the responsibility for the workstation and document the transfer with an entry in the appropriate log.

DOE-STD-1939-93, Guide to Good Practices for Control of Equipment and System Status

Much of the information in this guide is presented in Chapter VIII of the Order and will not be repeated here. This section of the module will discuss the information not included in the Order that is related to the following topics.

- alarm status
- temporary modification control

Alarm Status

Alarm systems provide a valuable backup to the operator's monitoring and control of system status. But, just like the system they monitor, alarms require periodic maintenance and are subject to breakdown. It is therefore important that operators know the status of alarms in their areas of responsibility. Facilities should include in their program for control of equipment and system status, measures to ensure that personnel are aware of the status of alarms. The following specific areas should be addressed:

- Alarms that are totally disabled should be identified to operators through the tagout program or through the use of deficiency stickers, color coding of alarm windows, or other positive means of identification.
- Alarms with individual inputs disabled should be identified to operators and documentation should be available reflecting the changed alarm characteristics.
- Alarms with temporarily changed setpoints should be documented for operator reference, and may be further identified by color-coded alarm windows or other positive means.
- Alarms that are lighted during normal operation should be identified by color-coded alarm windows, distinctive labeling, or other positive means.
- Alarms that may be activated by more than one input, but that do not reflash when subsequent inputs are received, should be identified within the alarm response procedures and operator training.

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- Procedures for response to alarm actuation should be controlled and updated to reflect any changes in alarm status.

Temporary Modification Control

Facilities should establish administrative control systems for approving, installing, and monitoring temporary modifications. Before installing the temporary modification, the administrative control system should provide for the following activities:

- Communicate the proposed modification to the design authority to allow for evaluation of the modification's impact on current design activities and system characteristics, approval of the design modification by the design authority, and technical oversight of the installation.
- Perform and document appropriate safety reviews, and obtain all necessary concurrences for approval of the modification.
- Update operating procedures, drawings, and documents as required, and conduct briefings and any necessary training.

DOE-STD-1040-93, Guide to Good Practices for Control of On-shift Training

Administrative Controls for the Conduct of On-shift Training

The training department should specify the requirements for a formal on-shift training process to ensure consistent performance of on-shift training activities. Administrative policies or procedures should be established to govern trainee prerequisites, instructor qualification, and training program coordination.

Before beginning the on-shift training process, the trainee should be taught fundamental technical and administrative knowledge. The fundamental technical knowledge should be derived from a task analysis. The trainee should understand safety practices and procedures, workstation responsibilities and authorities, and administrative procedures.

On-shift training activities should be scheduled based on the operating schedules of the facility. To maximize training within the operating schedule, the training department and the operation department must communicate to integrate their respective schedules.

Supervision and Control of On-shift Training

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The classroom, self-study, and laboratory training portions of the qualification program should provide a trainee with the knowledge and basic skills to perform tasks at a workstation. The on-shift training portion of the qualification program should provide the trainee with actual hands-on operation of the facility while under instruction. Unlike training conducted in a simulator or training facility, on-shift training causes the trainee to impact the status of facility operations. For this reason, the on-shift training must be closely supervised and controlled to prevent the trainee from accidentally operating a component, piece of equipment, or system that might cause danger to personnel, to the environment, or adversely affect the operation of the facility.

Before beginning an on-shift training session, the instructor and the trainee should meet to discuss the upcoming session. This meeting is designed to set the ground rules for the session, discuss the events that will take place, and advise the trainee of the information he or she will be required to know. The trainee should understand what is expected. A standard for control of on-shift training that can be easily understood and followed by the trainee and the instructor should be defined in the administrative policies.

The on-shift training schedule should contain a list of all training that is scheduled for a given period. The training coordinator is responsible for developing the schedule.

The instructor may use the pre-training briefing to determine if the trainee has the required knowledge and skills to perform the training tasks. If the trainee does not have the required knowledge and skills, the instructor must not let the trainee commence training.

An on-shift training session allows a trainee to operate portions of the facility from a specific workstation. Careful and competent supervision of a trainee will prevent mistakes that could lead to an adverse situation. Before beginning a period of on-shift training, the instructor should try to put the trainee at ease. The trainee should perform a turnover with the instructor and also sign into the narrative log. The trainee should annotate in the log that he/she is assuming the duties and responsibilities for the workstation under instruction. Instructors must maintain control of trainees assigned to their workstations. Before allowing a trainee to operate equipment, the instructor should:

- have the trainee review the procedures and reference documents required for performing the task,
- have the trainee explain the action to be performed,
- have the trainee physically identify the component to be manipulated, and

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- assume a position to observe the trainee's action and to prevent the trainee from incorrectly operating the equipment.

The instructor should formally conclude the on-shift training session by informing the trainee that the training session is concluded. The instructor should receive a turnover from the trainee.

Using Trainees to Support Operations

Facility policies should address how trainees may be used to support operations. An example of effective use of trainees would be qualifying a trainee on a task to support the operating schedule, such as fire watch, and then relieving the trainee as soon as possible to allow the trainee to continue with the formal training process. Before assigning trainees to assist in nontask-related activities, supervisors should verify that the trainee has time to perform the assignment and that the assignment will not conflict with the trainee's training schedule.

DOE-STD 1042-93, Guide to Good Practices for Control Area Activities

The information contained in Chapter III of the Order is sufficient to meet the qualification standards for this topic. Therefore no additional material will be presented here.

Note: You do not have to do Example 2 on the following page, but it is a good time to check your skill and knowledge of the information covered. You may do the Example 2 or go directly to the practice.
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EXAMPLE 2 SELF-CHECK

1. Describe the four-step format for operational communication.
 - Establish communication
 - Transmit message
 - Repeat back message
 - Confirm repeat back

2. List the types of documents contained in a file index for required reading.
 - procedure changes or revisions
 - temporary modifications to systems or equipment
 - new or updated hazard communication information
 - company reference manual changes
 - policy changes
 - related industry event reports
 - occurrence reports
 - industry operating experience information
 - other information necessary to keep operations department personnel aware of current area activities

3. Describe the process to be used if an individual fails to make a log entry at the proper time and additional entries have been made into the narrative log.

The late entry should be recorded in the next available space. The entry should indicate the actual time of the occurrence and should be identified as a late entry. A reference mark or notation may be placed in the margin, indicating that an entry has been omitted and is entered later in the log.

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4. List three activities that should be performed before installing a temporary modification.
 - Communicate the proposed modification to the design authority to allow for evaluation of the modification's impact on current design activities and system characteristics, approval of the design modification by the design authority, and technical oversight of the installation.
 - Perform and document appropriate safety reviews, and obtain all necessary concurrences for approval of the modification.
 - Update operating procedures, drawings, and documents as required, and conduct briefings and any necessary training.

5. Describe four activities that an instructor should complete before allowing a trainee to operate equipment.
 - Have the trainee review the procedures and reference documents required for performing the task.
 - Have the trainee explain the action to be performed.
 - Have the trainee physically identify the component to be manipulated.
 - Assume a position to observe the trainee's action and to prevent the trainee from incorrectly operating the equipment.

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10. List three types of documents in a required reading program that should be read immediately.

Note: The course manager will check your practice and verify your success at the Familiar Level. When you have successfully completed this practice, go to the General Level module.

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DOE ORDER 5480.19
CONDUCT OF OPERATIONS REQUIREMENTS FOR DOE FACILITIES
GENERAL LEVEL

OBJECTIVES

Given the Familiar Level of this module, and a scenario, you will be able to perform the following:

1. List the key elements you would look for in the contractor's action plan to correct the situation described in the scenario; and
2. State which requirements, sections, or elements of U.S. Department of Energy (DOE) Order 5480.19 apply to the situation described in the scenario.

<p>Note: If you think that you can complete the practice at the end of this level without working through the instructional material and/or the examples, complete the practice now. The course manager will check your work. You will need to complete the practice in this level successfully before taking the criterion test.</p>
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RESOURCES

DOE Orders Self-Study Program, DOE Order 5480.19, Familiar Level, 7/24/98.

DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities, 5/18/92.

DOE-STD-1030-96, Guide to Good Practices for Lockouts and Tagouts.

DOE-STD-1031-92, Guide to Good Practices for Communications.

DOE-STD-1032-92, Guide to Good Practices for Operations Organization and Administration.

DOE-STD-1033-92, Guide to Good Practices Operations and Administration Updates through Required Reading.

DOE-STD-1034-93, Guide to Good Practices for Timely Orders to Operators.

DOE-STD-1035-93, Guide to Good Practices for Log keeping.

DOE-STD-1038-93, Guide to Good Practices for Operations Turnover.

DOE-STD-1039-93, Guide to Good Practices for Control of Equipment and System Status.

DOE-STD-1040-93, Guide to Good Practices for Control of On-shift Training.

DOE-STD-1042-93, Guide to Good Practices for Control Area Activities.

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INTRODUCTION

The Familiar Level of this module introduced the purpose and scope of DOE Order 5480.19 and the DOE standards that support that Order. Several requirements and guidelines associated with the Order were discussed. In the General Level of this module, students are asked to apply the information contained in the Familiar Level, the Order, and DOE standards to a scenario related to the Order. Please refer to the resources listed on the previous page to make your analysis and answer the questions. You are not required to complete the example. However, doing so will help prepare you for the practice and criterion test.

Note: You do not have to do the example on the following page, but it is a good time to check your skill and knowledge of the information covered. You may do the example or go on to the practice.
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EXAMPLE SCENARIO

Please review the following scenario, and then answer these questions.

1. Is the contractor's action plan correct? If not, state what should have been done.
2. Were the correct DOE documents or requirements cited? If not, state the correct documents or requirements.

SCENARIO

On March 16, 1994, electricians partially cut into an energized 120-volt cable. Demolition of cables was being performed under an approved work order. The cable was not identified at the load center as part of the system to be de-energized and consequently it was not de-energized. Also, after the cable was cut, its breaker was discovered in the tripped position. The breaker was switched to the off position and work activities continued. This action violated the facility's requirement to properly lock and tag out energized circuits before starting work. There were no personnel injured and no property damage associated with the incident.

An investigation of the situation revealed the following.

- A spark was observed when the cable was cut, which stopped the demolition work on the project. The project supervisor was notified who inspected the load center and switched the breaker for the 120-volt cable from the tripped position to the off position.
- The employees did not maintain the knowledge and skills necessary to successfully perform assigned tasks. The training department confirmed that the employee who should have performed the lockout/tagout requirements was formally trained on 08/28/91 with no refresher training to date. This certification was performed to the facility's lockout/tagout procedure. The procedure has since been revised and the designated person's training remains current. The subordinates had not received formal training, but had participated in toolbox presentations on the established requirements.

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- The safety task assignment that was noted during the investigation only addressed work assignments.
- The facility did not provide the necessary tools to ensure the success of the job objectives. These tools include defining, disseminating and enforcing lockout/tagout policies.
- The administrative controls that are established in procedures were either not provided or not adequately emphasized.
- The supervisor and electricians collectively did not understand the work scope.
- A discussion was performed before starting work to address job safety conditions. Based on statements in the investigation and the deficiencies, it is perceived that the discussion on lockout/tagout was limited.
- The actions of investigating the electrical panel and switching the breaker to the off position to continue demolition on the project were not correct. However, they were immediate and did eliminate a potential shock incident. For this reason, the possible effects on the site were minimized.

Actions taken by contractor.

- The facility manager suspended all electrical work activities at the site that require energized systems to be isolated, locked and tagged out of service.
- The facility manager disciplined the supervisor in charge of this work order.

Requirements that apply to this scenario

- Locks and tags should be placed on controls when controls must be established for safety or other special administrative reasons. (DOE Order 5480.19, Chapter IX, paragraph C.1.)
- A list of components that should be locked must be established and approved by the operations supervisor. Criteria for locking additional components and necessary authorization should be provided. Specific techniques for verifying the position of locked components should be established. [DOE Order 5480.19, Chapter IX, paragraphs 2.d. (1), (2), and (4)]
- Specific procedural steps for isolating, blocking, and securing machines or equipment for

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hazardous energy should be included in the facility's procedures for lockout/tagout. [DOE Order 5480.19, Chapter IX, paragraph 5.a. (2)]

- A lockout/tagout must isolate all sources of energy or hazardous material that may cause personnel injury or equipment damage. Only controlled drawings, controlled system schematics, or other controlled documents should be used as references to determine or verify isolation points. In the absence of controlled drawings, a qualified person should perform a physical walkdown to ensure that isolation will be achieved by the planned lockout/tagout. (DOE-STD-1030-96, Section 4.2.3.1)

Take some time to review the example scenario and the actions the contractor took or did not take to correct the situation. Then decide if the contractor's actions were complete and correct. Finally, determine if the requirements cited were complete and correct.

Write your answers below and then compare your answer to the one contained in the example self-check.

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EXAMPLE SELF-CHECK

Your answer does not have to match the following exactly. You may have added more corrective actions or cited other requirements from the Order that apply. To be considered correct, your answer must include at least the following.

The actions taken by the contractor were appropriate.

Additional actions not mentioned in the scenario include the following.

- All personnel should be trained on lockout/tagout procedures to ensure consistency in the understanding of job requirements.
- Procedures should be changed to ensure that meetings conducted before starting work include all work-related objectives and direction including hazards and lockout procedures.

The requirements cited were appropriate. Additional requirements that apply include the following.

- Retraining should be provide for all authorized or affected personnel whenever there is a change in job, procedures, machines, equipment or processes that present new hazards. (DOE Order 5480.19, Chapter IX, paragraph 10.d.)
- Training should be provided and documented to ensure that the purpose and function of the lockout/tagout program is understood by all personnel and that they have the knowledge and skills required for safe application, use, and removal of lockouts and tagouts. (DOE Order 5480.19, Chapter IX, paragraph 10.a.)

PRACTICE

This practice is required if your proficiency is to be verified at the General Level. The practice will prepare you for the criterion test. You will need to refer to the Order and DOE standards to answer the questions in the practice correctly. The practice and criterion test will also challenge additional analytical skills that you have acquired in other formal and on-the-job training.

Please review the following scenario and answer the following questions.

1. Was the situation handled correctly? If not, what should have been done?
2. Was the list of requirements, sections, and elements complete and correct? If not, state the correct or omitted requirements.

SCENARIO

On June 3, 1993, a construction worker lost breathing air to his plastic suit, creating a potential for contamination and suffocation. The worker exited the area and received assistance removing the suit. A maintenance mechanic closed the valve supplying breathing air to a manifold supplying the suit to change a filter.

An investigation of the situation revealed the following.

- When work that requires breathing air is being performed, a health protection inspector and a standby operator are required by a training and reference procedure to be present at all times. The standby operator is required to notify the facility control room before starting work requiring use of breathing air, but did not do so because the operator thought a supervisor had notified the control room.
- The mechanic contacted the control room before closing the isolation valve to the air manifold. The control room log sheet did not reflect that anyone requiring breathing air was in the area, so permission to close the valve was granted.
- Before closing the valve, the mechanic walked down the breathing air system to the point of the manifold. A temporary hose ran from the manifold through the floor to another level. The mechanic did not walk down the temporary line.
- The construction employee immediately notified the health protection inspector when he lost breathing air pressure and was instructed to report to the airlock to be cutout of the plastic

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suit by the standby operator. The air in the suit was sufficient for about five minutes of breathing air.

- Subsequently, contrary to procedure, the standby operator left the area to investigate why the breathing air had been lost instead of immediately helping the construction employee remove the suit. When the standby realized that the filter was being changed, she returned to the hut and removed the employee from the hut
- Operations and control room personnel were unaware of the temporary hose connection used to supply breathing air to the lower level. This occurred because the facility was under construction and was not required to report to operations personnel or the control room..

Actions taken by the contractor

- Standby operators will be required to review the procedure for standby operator responsibilities before performing their duties.
- Standby operator's procedures will require operators to notify the control room of the number of people working on breathing air, the length of time, and the manifold to which breathing air is connected.

Requirements that apply to this scenario

- Facility operation should be conducted according to applicable procedures (DOE 5480.19, Chapter XVI, C.6).
- Operators must be aware of equipment and system status and the status of work in progress should be available in the control area. Operations supervisors or their designees should authorize all shift activities important to safety (DOE 5480.19, Chapter VIII, C.1 and 6).

Take some time to review the scenario and the actions the contractor took or did not take to correct the situation. Then decide if the contractor's actions were complete and correct. Finally, determine if the requirements, sections, or elements of DOE Order 5480.19 cited in the scenario were correct.

Write your answers on the next page and then bring the completed practice to the course manager for review

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Note: The course manager will check your practice and verify your success at the General Level. When you have successfully completed this practice, the course manager will give you the criterion test.