

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

DOE O 425.1B

STARTUP AND RESTART OF NUCLEAR FACILITIES



ALBUQUERQUE OPERATIONS OFFICE

Change No: 1 DOE O 425.1B Level: Familiar Date: 6/15/01
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**DOE O 425.1B
STARTUP AND RESTART OF NUCLEAR FACILITIES
FAMILIAR LEVEL**

OBJECTIVES

Given the familiar level of this module and the resources, you will be able to perform the following:

1. State the purpose of implementing DOE O 425.1B, Startup and Restart of Nuclear Facilities.
2. State the general requirements for operational readiness reviews (ORRs), readiness assessments (RAs), and authorization authority.
3. State the requirements for the following components of the ORR:
 - ORR documentation
 - breadth of ORR
 - ORR plans of action, approval, and content
 - ORR teams
 - criteria and review approaches
 - approval and use of implementation plans
 - certification and verification
 - final report
 - closure of prestart findings
4. List the conditions that require an ORR.
5. State the minimum core requirements (CRs) for developing the breadth of an ORR.

Change No: 1
DOE O 425.1B
Level: Familiar
Date: 6/15/01

6. State the responsibilities for the following positions that are associated with the startup and restart of nuclear facilities:
- DOE and the National Nuclear Security Administration (NNSA) line management
 - Heads of DOE field elements and the Deputy Director, NNSA
 - Assistant Secretary for Environment, Safety, and Health

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 successfully complete the practice in this level before taking the criterion test.

RESOURCES

DOE O 425.1B, Startup and Restart of Nuclear Facilities, 12/21/00.

DOE-STD-3006-00, Planning and Conduct of Operational Readiness Reviews, June 2000.

Change No: 1 DOE O 425.1B Level: Familiar Date: 6/15/01
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INTRODUCTION

DOE O 425.1B establishes the requirement to conduct operational readiness reviews (ORRs) or readiness assessments (RAs) before the restart of an existing nuclear facility or startup of a new nuclear facility. It also establishes the responsibilities and authorities of the responsible contractor and DOE elements in the process leading to a new start or restart.

Throughout the module you will find examples and practices to help familiarize you with the material. The practices will also help prepare you for the criterion test.

Before continuing, you should obtain a copy of all the resources listed for this module. Copies of the Orders are available on the Office of Management and Administration's Web site at <http://www.directives.doe.gov> or through the course manager. Spend some time reviewing the documents so that you are familiar with the sections each contains. You will need to refer to these documents to complete the examples, practice, and criterion test.

SECTION 1, GENERAL REQUIREMENTS

OPERATIONAL READINESS REVIEW

The ORR is an activity to verify that management has brought the facility to a state of readiness to commence or resume program work. The management effort may include management self-assessment activities in preparation for the ORRs. Once management concludes that readiness has been achieved, this state of readiness is independently verified by the contractor ORR and confirmed by the DOE ORR. Only then will the nuclear facility be authorized to resume program work.

An ORR is required when the following conditions occur:

- Initial startups of new hazard category 1, 2, or 3 nuclear facilities.
- Restart after a nuclear facility unplanned shutdown directed by a DOE management official for safety or other appropriate reasons.

Change No: 1 DOE O 425.1B Level: Familiar Date: 6/15/01
--

- Restart after an extended shutdown for hazard category 1 and 2 nuclear facilities. Extended shutdown for a hazard category 1 nuclear facility is 6 months. Extended shutdown for a hazard category 2 nuclear facility is 12 months.
- Restart of hazard category 1 and 2 nuclear facilities after substantial process, system, or facility modifications.
- Restart after a nuclear facility shutdown because of operations outside the safety basis.
- When deemed appropriate by DOE management officials, including restarts of hazard category 3 nuclear facilities.

READINESS ASSESSMENTS

The Order states that an RA may be required whenever an ORR is not required to verify readiness to resume program work. The Order requires that the RA be conducted according to operations office and contractor procedures. Additional requirements for RAs are provided in the specific requirements section of this module.

AUTHORIZATION AUTHORITY

The authorization authority for startup or restart approval is determined by the following guidelines:

- For initial startups of new hazard category 1 and 2 nuclear facilities, the Secretary of Energy (or designee) shall approve startup. For initial startups of new hazard category 3 nuclear facilities, the Secretarial Officer (or designee) shall approve startup. If other DOE Orders require a higher level of startup authorization than this Order, the official described in this Order will recommend startup to the higher level official.
- For shutdowns directed by a DOE management official for safety or other appropriate reasons, authorization to restart shall be granted by an official of a level commensurate with the official ordering the shutdown unless a higher level is designated by the Secretarial Officer.
- For extended shutdowns of hazard category 1 nuclear facilities, the Secretarial Officer shall approve restart. For extended shutdowns of hazard category 2 nuclear facilities, the Secretarial Officer (or designee) shall approve restart.

Change No: 1 DOE O 425.1B Level: Familiar Date: 6/15/01
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- For shutdowns because of substantial plant or facility modifications of hazard category 1 nuclear facilities that require changes in the safety basis previously approved by DOE, the Secretarial Officer shall approve restart. For such shutdowns of hazard category 2 nuclear facilities, the Secretarial Officer (or designee) shall approve restart.
- For facility shutdowns due to operations outside the safety basis, the official approving restart shall be commensurate with the approval authority for the safety basis. If a Headquarters official approved the safety basis, the Secretarial Officer (or designee) shall approve restart. If a field official approved the safety basis, the operations office manager (or designee) shall approve restart.
- For startups or restarts of nuclear facilities for which ORRs were required as a result of a DOE official deeming it appropriate, the official approving startup or restart shall be of a level commensurate with the official directing the review. If a Headquarters official directed an ORR be performed, the Secretarial Officer (or designee) shall approve the startup or restart. If a field official directed an ORR, the operations office manager (or designee) shall approve the startup or restart.

ORR DOCUMENTATION

DOE line management shall require contractors to prepare the following documents:

- startup/restart notification reports
- plans of action
- ORR implementation plans

Startup Notification Report

The contractor is required to prepare startup notification reports (SNRs). SNRs must be submitted at a periodicity specified by DOE. Each SNR must

- project at least 1 year ahead,
- update information from previous periods for startups that have not yet occurred, and
- add information for each startup or restart that has been identified since the last report.

Change No: 1 DOE O 425.1B Level: Familiar Date: 6/15/01
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DOE approves the SNR. The procedures should require the following elements:

- a brief description of the facility or program work,
- the reason for non-operation,
- the approximate date operations were last conducted (for restarts) and the projected date for the startup,
- the proposed type of readiness review,
- the basis or justification for proposed type of readiness review, and
- the proposed authorization authority.

Contractor readiness review action to start or restart operations should not commence until the DOE authorization authority has approved the proposed readiness review process.

Every startup or restart of a nuclear operation other than routine resumption of operations after a short, planned interruption should be included in the SNR. These startups, requiring review, should be started or restarted using an ORR or a properly scoped RA.

The breadth of the ORR should include the identification of the processes, documentation, and management controls. The functional areas to be assessed during the ORR should be identified. A graded approach can be used as part of the process used to determine the depth to which each CR will be reviewed.

A unique or complex activity should involve a review with a more extensive scope than a routine restart of an existing activity. The facility's size, complexity, and degree of independence from site support will affect this scope. Attention should be given to the interface between new activities and existing functions.

ORR Plan of Action

The responsible contractor and DOE each prepare an ORR plan of action. The ORR plan of action is the document, prepared by line management, that describes the breadth and the prerequisites of the ORR, and what will be evaluated by the ORR, based on the extent of the activities involved in the restart or startup. Through the process of the ORR plan of action, the proper authority in the DOE concurs with or approves the planning for the ORR process. Once approved, the ORR plans of action are distributed to responsible or

Change No: 1 DOE O 425.1B Level: Familiar Date: 6/15/01
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interested groups within and outside the DOE. Distribution outside of DOE should be according to Department procedures.

The ORR plans of action are forwarded via management to the designated approval authority for the particular restart or new start. A copy of the proposed plan of action will be provided to EH for review and comment. The approval authority will approve the plans of action for the contractor and DOE ORRs.

The amount of detail in each ORR plan of action will vary with the complexity of the facility and the situation. The level of detail must be adequate to justify the decisions being proposed to a skeptical reviewer. The detail must be adequate for preparers, reviewers, and the approver to defend the decisions being made.

The Area Office, operations office, or Headquarters facility management prepares the DOE ORR plan of action. The responsible contractor's recommended ORR plan of action or approved project startup plan will provide a starting point for the DOE ORR plan of action.

The ORR plan of action will contain the following elements:

- name and description of the facility being started
- identification of the responsible contractor
- designation of action as a new start or restart
- new start discussion, including hazard categorization and acquisition costs
- restart discussion if the action is a restart, including:
 - hazard categorization
 - cause for shutdown
 - duration of shutdown
 - repairs and modifications accomplished during shutdown
 - any anticipated process changes following restart
 - proposed breadth for the ORR
 - ORR prerequisites
 - estimated ORR start date and duration
 - proposed ORR team leader
 - requirement for senior advisors

- official to approve start of DOE ORR
- official to approve startup or restart of the facility
- reviewers and approver
- distribution

ORR TEAMS

A multidisciplined team of experts, including individuals knowledgeable in public and worker safety and health, and environmental protection, will conduct each ORR. Team members will be individually chosen by the ORR team leader to ensure that collectively their backgrounds will include the important facets of operations to be reviewed. The experts will also be chosen to ensure the ORR team covers all functional areas required by the ORR breadth defined in the ORR plan of action. The number of members is determined by the scope of the ORR and the size and complexity of the facility. Each team member must have the following qualifications:

- technical knowledge of the area assigned for evaluation, including experience working in the technical area;
- knowledge of performance-based assessment processes and methods; and
- knowledge of facility-specific information.

The team leader must ensure the ORR records contain the information to certify the qualification of team members. This information would normally be obtained through individual resumes, required reading records, and training records.

The ORR teams shall not include individuals from offices assigned direct line management responsibility for the work being reviewed. Additionally, no ORR team member should review work for which he or she is directly responsible.

CRITERIA AND REVIEW APPROACHES

The reviews conducted by each ORR team will be guided by criteria and review approaches (CRAs) defined in the ORR implementation plan. The CRAs should be grouped into functional areas. The selection of functional areas and the specific groupings will be at the discretion of the ORR team leader. The selection should be based on the scope of the ORR and the expertise of the team members.

ORR IMPLEMENTATION PLANS

The team responsible for conducting the ORR develops the ORR implementation plan. The team leader designated in the ORR plan of action approves the implementation plan. This ORR implementation plan documents not only the process by which the team conducts the review, but also defines the rationale for that process. The documentation includes the selection of CRAs and the procedures by which the team will develop findings and conclusions and the criteria to be applied to categorize findings as prestart and poststart. The ORR implementation plan is the document that provides the ORR breadth and execution of other details in the approved ORR plan of action.

The ORR implementation plan should provide sufficient detail to serve as information to management and as guidance to the ORR team members. The team preparing the ORR implementation plan should have a thorough understanding of the facility and its associated issues.

The team leader should provide the implementation plan to appropriate oversight and higher-level DOE management before commencement of the DOE ORR.

The ORR implementation plan should contain the following sections:

- introduction/background
- purpose
- scope
- ORR prerequisites
- overall approach
- ORR preparations
- ORR process
- administration
- reporting and resolutions
- schedule
- appendixes

Change No: 1 DOE O 425.1B Level: Familiar Date: 6/15/01
--

CERTIFICATION AND VERIFICATION

The prerequisites for starting the DOE ORR are as follows:

- DOE line management has received correspondence from the responsible contractor certifying that the facility is ready for startup or restart, and this has been verified by the contractor ORR.
- DOE line management has verified that the contractor's preparations for startup or restart have been completed.
- DOE line management has certified that the ORR meets the DOE plan of action that includes the applicable DOE-specific CRs.

At the start of the DOE ORR, all actions required for startup or restart shall be complete with the exception of a manageable list of open prestart findings that have a well-defined schedule for closure to allow review of the results of the closure process by the DOE ORR team. In the certification and verification process, DOE operations office line management shall document their actions taken to verify operations office and contractor readiness, including review of closure of contractor ORR findings, assessments of completion of defined prerequisites, and other assessments performed to ascertain readiness. The DOE ORR team shall review specific events significant to the startup and restart process that occur before the formal commencement of the DOE ORR when they are conducted.

ORR FINAL REPORT

The final report should contain a brief summary of the review activities, the conclusions reached, the basis for those conclusions, and the findings identified. The ORR final report may also identify observations that would not impact startup, restart, or shutdown but, if corrected, could lead to excellence in operations. The ORR final report shall include a conclusion as to whether startup or restart of the facility can proceed safely. Additionally, there shall be a statement in the ORR final report as to whether all identified non-compliances or schedules for gaining compliance with applicable DOE Orders, directives, and standards/requirements identification documents have been identified in writing; have been formally approved; and in the opinion of the ORR team, maintain adequate protection of the public health and safety, worker safety, and the environment.

The ORR final report should include a section describing the lessons learned during the ORR, including a discussion of the process and the technical issues identified.

The ORR final report should include a section that provides the ORR team members the opportunity to discuss differing professional opinions, non-judgmental general comments, and observations.

The following is a suggested format for the ORR final report.

- Title page (cover) – The cover and title page state the subject and the date of the review or evaluation.
- Signature page – The signatures on the final report should include all team members.
- Table of contents – The table of contents should identify, with page numbers, all sections and subsections of the report, illustrations, charts, and appendixes.
- Executive summary – This summary is a one- to three-page synopsis of the review, findings, and readiness determination. The executive summary should introduce information and direct the reader to those portions of the report that provide more detail concerning the information.
- Introduction – The introduction should provide information and background regarding the facility being reviewed, the reason for shutdown (if a restart), the purpose of the review, and the scope of the activity evaluation.
- ORR evaluations – The report should discuss each CR and provide conclusions as to the readiness for each major area. Conclusions as to the readiness of hardware, personnel, procedures, and the management system that controls each review area should be addressed. The evaluation should discuss the prestart and poststart findings associated with the review and provide a conclusion as to the readiness of the facility to begin operation. Any deviations from the implementation plan should be discussed, along with the reasons for the deviation, and what alternative actions were taken to compensate, if required. The evaluation section should provide not only the deficiencies found during the review, but should also discuss those positive aspects that affected the determination. Additionally, the evaluation should also identify as observations those items that are not findings, but if addressed, would lead to excellence in operations.

- Lessons learned – The report should identify lessons learned that may be applied to design, construction, operation, and decommissioning of similar facilities and to future ORRs.
- Appendixes – Appendixes should be provided for information that supports the actual report. Material that should be considered for appendixes include the
 - implementation plan
 - criteria and review approaches
 - ORR activities plan
 - team list and resumes
 - evaluation of criteria
 - prestart findings summary
 - poststart findings summary

CLOSURE AND RESOLUTION OF PRESTART FINDINGS

Monitoring and verification of satisfactory closure of prestart findings from the contractor and DOE ORRs are management responsibilities. The ORR team leader and team members may be required to assist in the verification or adequate resolution of prestart findings. Closure is accomplished by development of a closure package that is reviewed and certified by the facility management and further reviewed by DOE management.

Closure packages should contain the following information:

- the finding, written verbatim from the original report;
- the actions proposed in the action plan developed, submitted, and approved with the original completion schedule;
- a brief description of the corrective action taken and reasons for concluding that closure has been achieved and how referenced documents support closure;
- signatures of appropriate facility management; and
- DOE verification.

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 example 1 or go to section 2.

Change No: 1 DOE O 425.1B Level: Familiar Date: 6/15/01
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EXAMPLE 1

Using the familiar level of this module and the resources, complete the following exercises.

1. State in your words what DOE hopes to achieve by implementing DOE O 425.1B.
2. List the documents that are generated in an ORR process.
3. List two components that should be addressed in the breadth (scope) of the ORR.

Change No: 1
DOE O 425.1B
Level: Familiar
Date: 6/15/01

4. Describe how ORR team members are selected.

5. List the sections that should be included in the ORR final report.

Note: When you are finished, compare your answers to those contained in the example 1 self-check. When you are satisfied with your answers, go to section 2.

EXAMPLE 1 SELF-CHECK

Using the familiar level of this module and the resources, complete the following exercises.

1. State in your words what DOE hopes to achieve by implementing DOE O 425.1.B.

DOE O 425.1 establishes the requirement to conduct ORRs or RAs before the restart of an existing nuclear facility or startup of a new nuclear facility. It also establishes the responsibilities and authorities of the responsible contractor and DOE elements in the process leading to a new start or restart.

2. List the documents that are generated in an ORR process.

- startup/restart notification reports
- plans of action
- ORR implementation plans
- final reports

3. List two components that should be addressed in the breadth (scope) of the ORR.

The breadth of the ORR should include the identification of the processes, documentation, and management controls. The functional areas to be assessed during the ORR should be identified.

Change No: 1 DOE O 425.1B Level: Familiar Date: 6/15/01
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4. Describe how ORR team members are selected.

The team leader selects team members. Selection is based on knowledge of and experience with the activity being reviewed.

5. List the sections that should be included in the ORR final report.

- title page
- signature page
- table of contents
- executive summary
- introduction
- ORR evaluation
- lessons learned
- appendixes

SECTION 2, READINESS ASSESSMENTS

When an ORR is not required, an RA should be considered to verify readiness to start or resume program work. The operations office is required to develop procedures to gain approval to start or resume program work when an RA is required. The procedures should indicate what standard procedures would be used when neither an ORR nor an RA is required to verify readiness to resume program work.

The responsible contractor must execute the RA. Therefore, the responsible contractor's procedures should contain provisions and processes for RAs.

PRINCIPLES OF ORRS RELEVANT TO RAS

Several principles relevant to ORRs are equally applicable to RAs.

- The RA is not a method to gain readiness to start or resume program work. It is, however, verification that management has achieved readiness to resume operation before the restart.
- A formal procedure should be used to conduct the RA.
- The results of the RA should be auditable and retained in the records of the facility with a record that any findings during the RA were resolved.
- A graded approach should be used to develop the scope of the RA.
- The responsible contractor must inform the operations office of the startups that require RAs.
- Prerequisite conditions for the conduct of the RA should be identified in a contractor's procedure.
- RA team members require technical and assessment qualification to ensure the credibility of the results of the RA.
- There is flexibility within the expectations for an RA. Therefore, it should not be necessary for the contractor to define any other readiness review processes. If a readiness review is need, the ORR/RA process should be used. If a readiness review is not required, the restart should be conducted using facility or activity operating procedures.

Change No: 1 DOE O 425.1B Level: Familiar Date: 6/15/01
--

ACCEPTABLE PROCEDURAL EXCEPTIONS TO ORRS

The operations office may specify procedures that are different from those for the ORR process in the following areas:

- For routine restarts when little maintenance and few minor modifications have occurred, but an RA is required, it may be appropriate for the responsible contractor to use a pre-approved checklist and have the results monitored or reviewed by a member of the operations office.
- The sequence of the contractor and operations office RAs could be more flexible when authorized by the restart authority.
- The independence of the team members from management could be less rigorous for the RA.
- The requirement for formal, written notification of readiness to resume operations provided to the operations office could be modified.
- The formal RA record must be adequate to identify what was done, the results, and the recommendation concerning resumption of operations by the individuals who conducted the RA.
- The RA plan or checklist may not contain all elements of an ORR implementation plan.

SECTION 3, MINIMUM CORE REQUIREMENTS

To achieve the necessary breadth, each of the minimum CRs listed on the following pages must be addressed when developing an ORR. Justification must be provided in the plan of action if it is determined that a particular CR will not be reviewed. An appropriate set of the CRs should be selected when developing the breadth of an RA. The purpose of these CRs is to assess the readiness of facility personnel, programs, and equipment to conduct work safely. These CRs are directly related to the seven guiding principles of integrated safety management. The CRs apply to DOE and the contractor.

The numbers in parentheses following each CR are the numbers of the CRs as they appear in the previous version of this Order.

GUIDING PRINCIPLE 1

Line management is responsible for the protection of employees, the public, and the environment.

1. Line management has established programs to ensure safe accomplishment of work. Personnel exhibit an awareness of public and worker safety, health, and environmental protection requirements and, through their actions, demonstrate a high-priority commitment to comply with these requirements. (CRs 8 and 14)

GUIDING PRINCIPLE 2

Clear and unambiguous lines of authority and responsibility for ensuring ES&H are established and maintained at all organizational levels.

2. Functions, assignments, responsibilities, and reporting relationships are clearly defined, understood, and implemented with line management responsibility for control of safety. (CR 11)

GUIDING PRINCIPLE 3

Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

3. The selection, training, and qualification programs for operations and operations support personnel have been established, documented, and implemented. The selection process and applicable position-specific training for managers ensure competence commensurate with responsibilities. (CRs 2 and 19)
4. The level of knowledge of managers, operations, and operations support personnel is adequate based on reviews of examinations and examination results and selected interviews of managers, operating, and operations support personnel. (CRs 3 and 19)
5. Modifications to the facility have been reviewed for potential impacts on training and qualification. Training has been performed to incorporate all aspects of these changes. (CR 18b)

GUIDING PRINCIPLE 4

Resources are effectively allocated to address ES&H, programmatic, and operational considerations. Protecting employees, the public, and the environment is a priority whenever activities are planned and performed.

6. Sufficient numbers of qualified personnel are available to conduct and support operations. Adequate facilities and equipment are available to ensure operational support services are adequate for operations. (CRs 8 and 13)

GUIDING PRINCIPLE 5

Before work is performed, the associated hazards are evaluated and a set of standards and requirements are established which, if properly implemented, provide adequate assurance that employees, the public, and the environment are protected from adverse consequences.

7. Facility safety documentation describes the safety envelope of the facility. The safety documentation should characterize the hazards and risks associated with the facility and should identify preventive and mitigating measures that protect workers and the public from those hazards and risks. Safety structures, systems, and components (SSCs) are defined and a system to maintain control over their design and modification is established. (CR 4)
8. A program is in place to confirm and periodically reconfirm the condition and operability of safety SSCs. This includes examinations of records of tests and calibration of these systems. The material condition of all safety, process, and utility systems will support the safe conduct of work. (CR 5)
9. The facility systems and procedures are consistent with the description of the facility, procedures, and accident analysis included in the safety basis. (CR 15)

GUIDING PRINCIPLE 6

Administrative and engineering controls to prevent and mitigate hazards are tailored to the work being performed and associated hazards. Emphasis should be on designing the work controls to reduce or eliminate the hazards and to prevent accidents, unplanned releases, and exposures.

Change No: 1 DOE O 425.1B Level: Familiar Date: 6/15/01
--

10. Adequate and correct procedures and safety limits are in place for operating the process and utility systems, including any revisions for modifications to the facility. (CRs 1 and 18a)
11. A routine drill and emergency operations drill program, including program records, has been established and implemented. (CR 9)
12. An adequate startup or restart program has been developed that includes plans for graded operations and testing after startup or resumption to confirm operability of the equipment, the viability of procedures, and the performance and knowledge of the operators. The plans should indicate validation processes for equipment, procedures, and operators after startup or resumption of operations including any required restrictions and additional oversight. (CR 10)
13. The formality and discipline of operations is adequate to conduct work safely, and programs are in place to maintain this formality and discipline. (CR 12)

GUIDING PRINCIPLE 7

The conditions and requirements to be satisfied for operations to be initiated and conducted are established and agreed on by DOE and the contractor. These conditions and requirements are on the contractor. Documentation and the level of authority for agreement shall be tailored to the complexity and hazards associated with the work and shall be established in a safety management system.

14. Formal agreements between the operating contractor and DOE have been established to govern the safe operations of the facility. A systematic review of the facility's conformance to these requirements has been performed. These requirements have been implemented in the facility, or compensatory measures are in place and formally agreed to during the period of implementation. DOE approves the compensatory measures and the implementation period. (CR 7)
15. A feedback and improvement process has been established to identify, evaluate, and resolve deficiencies and recommendations made by oversight groups, official review teams, audit organizations, and the operating contractor. (CR 6)

Change No: 1 DOE O 425.1B Level: Familiar Date: 6/15/01
--

Additional DOE oversight requirements include the following.

16. The technical and managerial qualifications of personnel at the DOE field organization and at DOE Headquarters who have been assigned responsibilities for providing direction and guidance to the contractor, including the facility representatives (FRs), are adequate. (CR 16)
17. The breadth, depth, and results of the responsible contractor RA are adequate to verify the readiness of hardware, personnel, and management programs for operations. (CR 17)
18. DOE operations office oversight programs, such as occurrence reporting, FRs, corrective action, and quality assurance programs, are adequate. (CR 20)

SECTION 4, RESPONSIBILITIES

The following responsibilities are assigned for this Order.

DOE AND NNSA LINE MANAGEMENT

- Establish procedures as necessary to manage startup and restart actions according to the requirements of this Order.
- Exercise the delegation authority and document all delegations of authority made under the provisions granted by this Order.

HEADS OF DOE ELEMENTS AND DEPUTY DIRECTOR, NNSA

- Ensure that initiators of procurement requests indicate if the requirements in the contractor requirements document are to be applied to the award or sub-awards resulting from the procurement request.

ASSISTANT SECRETARY FOR ENVIRONMENT, SAFETY AND HEALTH (EH-1)

- Performs independent reviews of startup and restart activities and provides results of these reviews to DOE ORR team leaders, cognizant operations office managers, and CSOs for resolution.

Change No: 1
DOE O 425.1B
Level: Familiar
Date: 6/15/01

- Assesses the Secretarial Officer, operations office, and contractor procedures for startup or restart of nuclear facilities and provides periodic reports to the Secretary on their effectiveness.
- Reviews and comments on contractor and DOE plans of action and ORR implementation plans for startup or restart of nuclear facilities.
- Reviews and comments on the ORR final report recommendations regarding startup or restart to the DOE approving official.
- Provides any dissenting opinion on the readiness of a facility to startup or restart to DOE line management or the Secretary if a significant safety concern is not being properly corrected.
- Concurs in the final decision to startup or restart a nuclear facility, if requested to do so.

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

EXAMPLE 2 SELF-CHECK

1. State the conditions under which an RA should be considered.

An RA should be considered any time an ORR is not required for a restart or startup of a nuclear facility.

2. State three principles of ORRs that are also relevant to RAs.

Any three of the following constitute a correct answer.

- The RA is not a method to gain readiness to start or resume program work. It is, however, verification that management has achieved readiness to resume operation before the restart.
- A formal procedure should be used to conduct the RA.
- The results of the RA should be auditable and retained in the records of the facility with a record that any findings during the RA were resolved.
- A graded approach should be used to develop the scope of the RA.
- The responsible contractor must inform the operations office of the startups that require RAs.
- Prerequisite conditions for the conduct of the RA should be identified in a contractor's procedure.
- RA team members require technical and assessment qualification to ensure the credibility of the results of the RA.

3. State three acceptable procedural exceptions to ORRs that may be applied to RAs.

Any three of the following constitute a correct answer.

The operations office may specify procedures that are different from those for the ORR process in the following areas.

- For routine restarts when little maintenance and few minor modifications have occurred, but an RA is required, it may be appropriate for the responsible contractor to use a pre-approved checklist and have the results monitored or reviewed by a member of the operations office.

Change No: 1 DOE O 425.1B Level: Familiar Date: 6/15/01
--

- The sequence of the contractor and operations office RAs could be more flexible when authorized by the restart authority.
 - The independence of the team members from management could be less rigorous for the RA.
 - The requirement for formal, written notification of readiness to resume operations provided to the operations office could be modified.
 - The formal RA record must be adequate to identify what was done, the results, and the recommendation concerning resumption of operations by the individuals who conducted the RA.
 - The RA plan or checklist may not contain all elements of an ORR implementation plan.
4. Identify the position that is responsible for establishing procedures to manage startup and restart actions.
DOE line management
5. Identify the position that is responsible for reviewing the contractor and DOE plans of action.
Assistant Secretary for Environment, Safety, and Health

Change No: 1
DOE O 425.1B
Level: Familiar
Date: 6/15/01

7. Identify the position that is responsible for the following activities associated with ORRs and RAs.
 - A. Exercise the delegation authority and document all delegation of authority.
 - B. Ensure that initiators of procurement requests identify if the requirements in the contractor requirements document are to be applied to the procurement award.
 - C. Perform independent reviews of startup and restart activities.

8. State five minimum CRs for the breadth of an ORR.

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.

Change No: 1 DOE O 425.1B Level: General Date: 6/15/01

**DOE O 425.1B
STARTUP AND RESTART OF NUCLEAR FACILITIES
GENERAL LEVEL**

OBJECTIVES

Given the familiar level of this module, a scenario, and an analysis, you will be able to perform the following:

1. Answer a series of questions related to the scenario and the resources presented in this module.
2. State which requirements included in the resources apply to the situation described in the scenario.

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.

RESOURCES

DOE O 425.1B, Startup and Restart of Nuclear Facilities, 12/21/00.

DOE Orders Self-Study Program, DOE O 425.1B, Familiar Level, 6/15/01.

DOE-STD-3006-00, Planning and Conduct of Operational Readiness Reviews, June 2000.

Change No: 1 DOE O 425.1B Level: General Date: 6/15/01

INTRODUCTION

The familiar level of this module introduced DOE O 425.1B, Startup and Restart of Nuclear Facilities. Several requirements from the resources were discussed. In the general level of this module, students are asked to apply the information contained in the resources to a series of questions related to the Order. Students are also presented with a scenario that depicts a work situation related to the Order. Students will be asked to answer questions that are related to the scenario and the resources covered in this module. Please refer to the resources 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 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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Change No: 1 DOE O 425.1B Level: General Date: 6/15/01

EXAMPLE

Please review the following scenario and then answer the question that follows.

SCENARIO

On December 23, 1996, a facility manager learned that the sensor in a flammable gas detector system for a rotary mode, core-sampling portable exhauster failed its quarterly calibration. Technicians identified inconsistencies in sensor calibration results. The sensor also failed to meet response time requirements. The sensor was not installed in a climate-controlled enclosure, and ambient temperature during the calibration was 20 to 30 °F. The manufacturer's specifications for the sensor required operating temperatures of 70 to 120 °F. Investigators determined that inadequate system design and design reviews resulted in the installation of equipment that could not reliably perform its safety function at low ambient temperatures.

An operational readiness review (ORR) for this facility was completed and startup was authorized on August 13, 1996.

QUESTION

1. Based on your knowledge of DOE O 425.1B, should the inadequate system design have been discovered during the ORR? Explain why or why not.

Change No: 1 DOE O 425.1B Level: General Date: 6/15/01

EXAMPLE SELF-CHECK

1. Based on your knowledge of DOE O 425.1B, should the inadequate system design have been discovered during the ORR? Explain why or why not.

No. The ORR would not be expected to detect design deficiencies. There is no requirement in the Order that is related to reviewing design adequacy.

Change No: 1 DOE O 425.1B Level: General Date: 6/15/01

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 resources 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 questions that follow.

SCENARIO

On June 25, 1997, two nuclear criticality safety (NCS) representatives noted infractions of the posted storage requirements for a fissile material control area (FMCA) during a periodic inspection. The NCS personnel observed that there were five 55-gallon drums, one 10-gallon container, and one 5-gallon container inappropriately located in the FMCA that was only approved for the storage of enriched uranium ingots, derbies, and containers of enriched uranium tetra-fluoride. The inappropriately located containers were filled with samples taken from ingots and derbies stored in the FMCA. The samples consisted of uranium metal turnings with enrichments of 0.95 and 1.25 weight percent (wt.%) U-235.

The ingots and derbies were moved from the FMCA and sampled. The sampled ingots and derbies were then returned to the FMCA. The sampling activity began in October of 1996 and was completed in June of 1997. During that time span, over 1,000 samples were obtained, placed in 4-ounce sample jars, and packaged into the seven containers described above. During the sampling project, some personnel changes occurred, including the assignment of a new supervisor.

After discovering the inappropriately stored containers in the FMCA, NCS personnel initiated an evaluation of the problem. The evaluation revealed that three of the containers (two 55-gallon drums and the 5-gallon container) were inappropriately identified as enriched unrestricted materials and should have been identified as enriched restricted materials. These containers were re-coded as enriched restricted (by painting the containers red) and moved into a separate, temporary FMCA on June 25, along with the other four containers. It was later discovered that the supervisor assigned to the project

Change No: 1 DOE O 425.1B Level: General Date: 6/15/01

had not been trained as a fissionable material handler's (FMH's) supervisor. DOE suspended nuclear material activities at the facility.

An investigation of the situation revealed the following.

In October 1996, the sample line workers began placing 0.95 wt.% U-235 metal into red-striped, black drums (thereby identifying the material as enriched unrestricted). According to the requirements, this material should have been placed into a red drum and identified as enriched restricted. The workers incorrectly believed that if the enrichment of the metal was less than 1.0 wt.% U-235, then it was enriched unrestricted. All the workers originally assigned to the sample line were trained and qualified as FMHs, but a review of the lesson plan for FMH personnel revealed that packaging requirements were not included in the training. No learning objective was developed for the proper packaging of enriched restricted materials.

In November 1996, an NCS employee removed the FMCA posting for the sample line project. The purpose of an FMCA posting is to alert employees of the presence of enriched restricted materials and to inform employees of the requirements for the storage and handling of the materials inside the area. The NCS employee stated that he checked the area for red drums, and after seeing that all of the red drums in the area were empty, he removed the FMCA postings from around the sample line. What he did not realize was that the enriched restricted metal samples had been placed into black drums and were stored in the area. The procedure for removing FMCA postings requires that the area be checked for the presence of enriched restricted materials before removing the posting. The procedure does not say how to perform the verification. The practice has been for the NCS employee to look for red drums, and if none are present, then the postings are removed. Policy states that FMCA's are to be used exclusively for the storage of enriched restricted materials, but that has not been the practice. Due to logistical circumstances, enriched restricted materials have been located with other materials within an FMCA. The requirements manual states that the primary means for material identification is the lot code marking stenciled on the drums, implying that the color coding of the drums is secondary. The materials involved in this event were properly lot coded, but improperly color coded.

Change No: 1 DOE O 425.1B Level: General Date: 6/15/01

The authorization for the sample line expired in November 1996, and work at the sample line resumed in December 1996. NCS personnel notified management of the pending expiration of the authorization in November, but the information was not passed on to the people performing the work. Personnel did not check to see if the authorization was still valid before activities were resumed. The condition of the workers performing activities with enriched restricted materials without an authorization is a violation of NCS requirements.

The supervisor when the job was restarted was trained as an FMH supervisor and was aware of his responsibilities with regard to NCS requirements. After the job had been restarted with the expired authorization, a new supervisor was assigned to the project (in February 1997) who was not trained as an FMH supervisor. The training matrix indicated that this individual had the required training. However, the individual was not profiled as a supervisor on the matrix. Therefore the fact that he did not have FMH supervisor training was not identified. The training evaluation standard (TES) gives responsibility to project management personnel to ensure that their personnel are properly profiled and trained, but the FMHs were not aware of their responsibilities under the TES and were ignorant of the requirements stated in the TES.

In June 1997, the samples collected during the project were all moved back into the derby and ingot FMCA. This created another NCS procedural violation because the posting for the FMCA prohibited the storage of enriched restricted materials in the area other than derbies, ingots, and uranium tetra-fluoride cans. The area was clearly posted with the storage restrictions described on the posting, but FMHs moved the drums containing the samples into the area anyway. Their rationale was that the metal samples came from that FMCA (in the form of derbies and ingots), so it should be acceptable for them to be returned to that area. They did not understand the reason for the size restriction on storage nor did they note the restriction described on the posting for the area.

The root cause for most of the deficiencies described in this report was management problems, and procedures and policies not adequately defined, disseminated, or enforced. As described above, the policies and procedures used for this task were incomplete, inaccurate, conflicting, or ambiguous. The policies and procedures were confusing to the user, not known to the user, or did not define the correct communication or relationship between departments or groups. When this environment exists, the employees are not

Change No: 1 DOE O 425.1B Level: General Date: 6/15/01

aware that what they are doing is wrong or outside of the intended requirements. Without enforcement of the policies and procedures, there is no accountability for the requirements and no communication to the workforce of management's expectations.

QUESTIONS

1. Do the activities described in the scenario warrant an ORR? Support your answer with a reference from the resources for this module.
2. State the minimum core requirements (CRs) that apply to this situation.

Write your answers to questions 1 and 2 and then bring the completed practice to the course manager for review.

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.
