

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

## **DOE O 425.1D**

VERIFICATION OF READINESS TO START UP OR RESTART  
NUCLEAR FACILITIES



**DOE O 425.1D  
VERIFICATION OF READINESS TO START UP OR  
RESTART NUCLEAR FACILITIES  
FAMILIAR LEVEL**

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**OBJECTIVES**

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

1. What is the purpose of DOE O 425.1D, *Verification of Readiness to Startup or Restart Nuclear Facilities*?
2. What are the requirements for determining the level of readiness review [operational readiness reviews (ORRs) and readiness assessments (RAs)]?
3. What are the requirements for determining the startup authorization authority?
4. What are the requirements for startup notification reports?
5. What are the requirements for ORRs and RAs?
6. What are the core requirements?
7. What are the requirements for DOE and headquarters line management oversight of the startup or restart process?
8. What are the records management requirements?
9. What are the responsibilities of DOE/NNSA line management regarding the verification of readiness to start up or restart nuclear facilities, activities, or operations?

**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**

10 CFR 830.204, “Documented Safety Analysis.” January 1, 2011.

DOE O 226.1A *Implementation of Department of Energy Oversight Policy*. April 25, 2011

DOE O 243.1, *Records Management Program*. February 3, 2006.

DOE O 425.1D, *Verification of Readiness to Start Up or Restart Nuclear Facilities*. April 16, 2010.

DOE-HDBK-3012-2003, *Guide to Good Practices for Operational Readiness Reviews, Team Leader’s Guide*. 2003.

DOE-STD-3006-2010, *Planning and Conducting Readiness Reviews*. 2010.

## **INTRODUCTION**

The familiar level of this module is divided into three sections. In the first section we will discuss the purpose of DOE O 425.1D and the requirements for 1) determining the level of readiness review (RR), 2) determining the startup authorization authority (SAA), and 3) the startup notification report. In the second section we will discuss 1) the requirements applicable to DOE ORRs and DOE RAs, and 2) the core requirements. In the third section we will discuss the 1) requirements for DOE field element and headquarters line management oversight of the startup or restart process, 2) requirements for the records management program, and 3) responsibilities of DOE/NNSA line management.

We have provided several examples and practices throughout the module to help familiarize you with the material. The practice will also help prepare you for the criterion test.

Before continuing, you should obtain a copy of the resources. Copies of the Orders and standards are available at <https://www.directives.doe.gov/directives> and <http://www.hss.doe.gov/nuclearsafety/ns/techstds/standard.html> respectively, or through the course manager.

## **SECTION 1: PURPOSE OF DOE O 425.1D AND READINESS REVIEW, STARTUP AUTHORIZATION AUTHORITY AND STARTUP NOTIFICATION REPORT REQUIREMENTS**

### **Purpose**

The purpose of DOE O 425.1D is to establish the requirements for verifying readiness for startup of new hazard category 1, 2, and 3 nuclear facilities, activities, and operations, and for the restart of existing hazard category 1, 2, and 3 nuclear facilities, activities, and operations that have been shut down. The RRs, ORRs, or RAs are not intended to be line management tools to achieve readiness. Rather, the RRs provide an independent verification of readiness to start or restart operations.

### **Requirements**

#### Determining the Level of RR

DOE line management must evaluate the need to perform an RR prior to the startup and restart of hazard category 1, 2, and 3 nuclear facilities, activities, or operations.

- DOE line management must ensure that a properly scoped RR is planned and conducted to verify readiness for the restart of hazard category 1, 2, and 3 nuclear facilities, activities, or operations unless both of the conditions specified in DOE O 425.1D, section 4.a.(1) are met.
- A DOE ORR must be conducted for any of the following:
  - Initial startup of a newly constructed nuclear facility. For the purpose of this criterion, a newly constructed nuclear facility refers to a new facility (not operation or activity) with a new documented safety analysis (DSA) and associated technical safety requirements (TSRs).
  - Initial startup after conversion of an existing facility to a new nuclear mission with a new DSA and associated TSRs.
  - Restart of a nuclear facility, activity, or operation that has upgraded its hazard categorization to hazard category 1, 2, or 3.
  - Restart after a DOE management official directs the shutdown of a nuclear facility, activity, or operation for safety reasons.
  - Restart of a nuclear facility, activity, or operation after violation of a safety limit.
  - Any situation deemed appropriate by DOE line management.
- A DOE RA must be conducted for any of the following:
  - Initial startup of a new hazard category 1 or 2 activity or operation with a new DSA and associated TSRs.
  - Restart after an extended shutdown for a hazard category 1 or 2 nuclear facility, activity, or operation. (Extended shutdown for a hazard category 1 nuclear facility, activity, and operation is six months, unless, with program secretarial officer (PSO) approval and central technical authority concurrence, this is adjusted up to a maximum of twelve months. For a hazard category 2 nuclear facility, activity, and operation an extended shutdown is 12 months.)

- Startup or restart of a hazard category 1 or 2 nuclear facility, activity, or operation after substantial process, system, or facility modification.
- Any situation deemed appropriate by DOE line management.

#### Determining the Startup Authorization Authority (SAA)

For nuclear facility, activity, or operation startup or restart actions, the SAA must be determined using the following criteria:

- For initial startup of a newly constructed hazard category 1 or 2 nuclear facility (not activity or operation) with a new DSA and associated TSRs, the Secretary of Energy (or designee) must approve startup. For initial startup of a newly constructed hazard category 3 nuclear facility (not activity or operation) with a new DSA and associated TSRs, the cognizant secretarial officer (CSO) (or designee) must approve startup. For initial startup of a newly constructed hazard category 1, 2, or 3 nuclear activity or operation with a new DSA and associated TSRs, approval to start must be granted by an official of a level commensurate with the DSA approval authority.
- For initial startup after conversion of an existing facility to a hazard category 1 or 2 nuclear facility with a new DSA and associated TSRs, the Secretary of Energy (or designee) must approve startup. For initial startup after conversion of an existing facility to a new hazard category 3 nuclear facility with a new DSA and associated TSRs, the CSO (or designee) must approve startup.
- For restart of a nuclear facility, activity, or operation that has upgraded its hazard categorization to hazard category 1 or 2, the Secretary of Energy (or designee) must approve startup. For the restart of a nuclear facility, activity, or operation that has upgraded its hazard categorization to hazard category 3, the CSO (or designee) must approve restart.
- For a shutdown directed by a DOE management official for safety reasons, approval to restart must be granted by an official of a level commensurate with the official ordering the shutdown, unless a higher level is designated by the CSO.
- For a shutdown following violation of a safety limit, approval to restart must be granted by an official of a level commensurate with the approval authority for the safety limit. If the safety limit was approved by a headquarters official, the CSO (or designee) must approve restart. If the safety limit was approved by a field official, the field element manager (or designee) must approve restart.
- For an extended shutdown of a hazard category 1 nuclear facility, activity, or operation, the CSO must approve restart. For an extended shutdown of a hazard category 2 nuclear facility, activity, or operation, the CSO (or designee) must approve restart.
- For a shutdown because of substantial process, system, or facility modifications to a hazard category 1 nuclear facility, activity, or operation, the CSO (or designee) must approve restart. For a shutdown because of substantial process, system, or facility modifications to a hazard category 2 nuclear facility, activity, or operation, the CSO (or designee) must approve restart.
- For startup or restart of a nuclear facility, activity, or operation for which RRs were required because a DOE official deemed it appropriate, the official approving

startup or restart must be at a level commensurate with the official directing the review be conducted.

- In all other cases, as specified in the approved startup notification report (SNR). The SAA may be a senior contractor official if so designated in the SNR.

#### Startup Notification Report

DOE line management procedures concerning the SNR prepared by the contractor in accordance with the contractor requirements document must address the following:

- DOE line management must ensure that SNRs are submitted quarterly or on a periodicity as defined by the PSO.
- DOE line management must ensure that SNRs project ahead at least one year, update information from previously approved SNRs for startups and restarts that have not yet occurred, and add information for each startup or restart that has been identified since the last approved SNR.
- DOE line management must ensure that every startup or restart determined to require a RR is included in the SNR.
- Each SNR must be reviewed and approved by DOE field element management. When the SNR includes activities for which the SAA resides at headquarters the field element management must approve or reject the activities on the SNR for which the field element is the SAA and must comment and make a recommendation regarding approval for those activities requiring headquarters approval.
- Each SNR, including field element approval and/or recommendations, must be forwarded to the PSO, the site lead PSO or CSO, as appropriate, the appropriate CTA, and the Office of Health, Safety, and Security (HSS) for information.
- Contractor and DOE RRs must not commence until DOE has approved the SNR.

**Note: You do not have to do example 1 on the following page, but it is a good time to check your skill or knowledge of the information covered. You may do example 1 or go to section 2.**





**EXAMPLE 1 SELF-CHECK**

1. What is the purpose of DOE O 425.1D?

The purpose of DOE O 425.1D is to establish the requirements for verifying readiness for startup of new hazard category 1, 2, and 3 nuclear facilities, activities, and operations, and for the restart of existing hazard category 1, 2, and 3 nuclear facilities, activities, and operations that have been shut down.

2. What must the readiness review process demonstrate?

The readiness review process must, in all cases, demonstrate there is a reasonable assurance for adequate protection of workers, the public and the environment from adverse consequences from the start (or restart) of a hazard category 1, 2, or 3 nuclear facility, activity, or operation.

3. Who is the startup authorization authority for initial startup of a newly constructed hazard category 1, 2, or 3 nuclear activity or operation (not a facility) with a new documented safety analysis and associated technical safety requirements?

The startup authorization authority in this case is an official of a level commensurate with the DSA approval authority.

4. What must DOE line management ensure in regard to the content of startup notification reports (SNRs)?

DOE line management must ensure that SNRs

- project ahead at least one year
- update information from previously approved SNRs for startups and restarts that have not yet occurred
- add information for each startup or restart that has been identified since the last approved SNR
- include every startup or restart determined to require a readiness review

## **SECTION 2: REQUIREMENTS FOR DOE ORRs AND RAS, AND THE CORE REQUIREMENTS**

### **Requirements Applicable to DOE ORRs**

**Note: DOE-HDBK-3012, (Guide to Good Practices for Operational Readiness Reviews, Team Leader's Guide), provides information useful to team leaders in preparing for and conducting RRs.**

DOE line management must develop a plan of action (POA), which describes the scope of the ORR. The POA must provide a clear discussion of the physical or geographic scope of the ORR and a clear description of the structures, systems, and components (SSCs), individual processes, and programs that are within the scope of the ORR. The POA must also designate the proposed ORR team leader.

- All core requirements identified in section 4.f. of DOE O 425.1D must be addressed when developing the breadth of the ORR. The POA may also define the depth or tailoring for each core requirement to more fully describe the total required scope of the ORR.
- In order to justify not performing evaluation of a core requirement, or portion thereof, the POA must reference a timely, independent review that addressed a core requirement in a technically satisfactory manner, provided the review being referenced determined the requirements were successfully implemented.
- The POA must include the prerequisites for starting the DOE ORR. The prerequisites must define measurable actions or deliverables for each DOE specific core requirement that is to be reviewed in the ORR. Prerequisites must also address DOE oversight of contractor preparations and DOE readiness to oversee contractor operations within the scope of the ORR.
- DOE line management must forward the DOE POA to the SAA. DOE line management must also forward the DOE POA to the PSO, the site lead PSO or CSO, as appropriate, the appropriate CTA, and HSS for information.
- The DOE POA must be approved by the SAA prior to the start of the review. The SAA provides the POA to the designated team leader.

The ORR team leader must select the DOE ORR team members.

- Team members must meet the qualification and training requirements specified in DOE O 425.1D, section 4.d.(2)(a).
- The ORR team must not include as senior members (i.e., team leader, subteam leader, senior advisor) individuals from offices that are assigned direct line management responsibility for the work being reviewed. Any exceptions require SAA approval.
- The ORR team leader must determine and document the qualifications of the team members and their freedom from a conflict of interest in the areas they are assigned to review.
- DOE line management must support the DOE ORR team leader in staffing the DOE ORR team.

- The ORR team must develop an ORR implementation plan (IP). The ORR IP documents the evaluation criteria and the review approaches based on the scope defined in the ORR POA. The ORR team leader approves the ORR IP.
- DOE line management must forward the DOE IP to the SAA, site lead PSO or CSO, as appropriate, the appropriate CTA, and HSS for information.
- Prior to starting the ORR, DOE line management
  - has received a readiness to proceed memorandum from the responsible contractor certifying that the facility, activity, or operation is ready for startup or restart and this has been verified by the contractor ORR.
  - must verify that the contractor's preparations for startup or restart have been completed with the exception of a manageable list of open prestart issues. The prestart issues must have a well-defined schedule for closure to allow the DOE ORR team to review the closure process.
  - must verify that the DOE ORR POA prerequisites have been met.
  - in the verification process, must document their actions to verify field element and contractor readiness.

Upon completion of the DOE ORR, the DOE ORR team leader, with support from individual team members, must prepare, approve, and submit a final report to the SAA.

- The final report must document the results of the ORR and make a conclusion as to whether startup or restart of the nuclear facility, activity, or operation can proceed safely. The ORR final report must state whether the contractor has established the items listed in DOE O 425.1D, section 4.d.(8)(a).
- The final report must be of adequate detail to support its conclusion, such that a knowledgeable reader would reasonably be expected to draw the same conclusions.
- The final report should include a statement regarding the team leader's assessment of the adequacy of the implementation of the core functions and guiding principles of integrated safety management (ISM) at the facility undergoing the review.
- There must be a lessons learned section of the final report that may relate to design, construction, operation, and decommissioning of similar facilities, activities or operations and to help guide future RR efforts.
- The team leader must approve the final report, and each team member must approve the section of the final report for which he or she was responsible.

The final report must be submitted to the SAA as a basis for approving the startup or restart of the nuclear facility, activity, or operation. A copy of the final report must be forwarded to the PSO, the site lead PSO or CSO, as appropriate, the appropriate CTA, and HSS for information.

Closure of DOE ORR findings must include

- development of corrective action plans approved by DOE to correct the findings. Action plans must provide evaluation of, and address, any overall programmatic deficiencies and causes.
- creation of a finding closure package that must include a brief description of actual corrective actions taken, evidence of completion, and reasons for concluding that closure has been achieved.

- DOE verification of closure of prestart findings. The organization verifying the closure must be designated by the SAA.

DOE line management must ensure that the contractor and DOE have satisfactorily resolved all prestart findings of the DOE and contractor ORRs prior to startup or restart of the facility, activity, or operation. The SAA may approve startup or restart after prestart findings are resolved.

### **Requirements Applicable to DOE RAs**

The requirements for performing RAs as described below may be tailored with approval of the PSO and concurrence from the CTA.

The DOE RA must use a graded approach to the tenets of ORR requirements specified in this Order. An RA may be as short and simple as a checklist, or may approach the breadth and depth of an ORR, depending on the causes and duration of the shutdown and the modifications accomplished during the shutdown. In view of the flexibility to fit the rigor of the RA to the circumstances of the startup/restart situation, DOE must not develop readiness review processes similar to RAs but called something different.

DOE line management must develop a POA, which describes the scope of the RA. The POA must provide a clear discussion of the physical or geographic scope of the RA and a clear definition of the SSCs, individual processes, and programs that are within the scope of the RA. The POA must also designate the proposed RA team leader.

- All core requirements identified in section 4.f. of DOE O 425.1D must be evaluated for applicability for inclusion in the scope of the RA. The POA for the RA must provide a basis for justifying the exclusion of any core requirement that will not be assessed during the RA. The level of detail provided in the justification should be commensurate with the complexity of the review and of the operation, such that a knowledgeable reader would reasonably be expected to draw the same conclusions. The POA may also discuss the depth or tailoring for each core requirement to more fully describe the total required scope of the RA. The development of the scope must be based, in part, on the status of and changes to the facility, operating procedures, safety basis documents, hazards, operational conditions, and personnel.
- The POA for the DOE RA must include the prerequisites for starting the DOE RA. Prerequisites define measurable actions or deliverables that, when completed, provide assurance that readiness has been achieved for each DOE specific core requirement that is to be reviewed in the RA. Prerequisites must also address DOE oversight of contractor preparations and DOE's readiness to oversee contractor operations within the scope of the RA.
- DOE line management must forward the DOE POA to the SAA, DOE line management must also forward the DOE POA to the PSO, the site lead PSO or CSO, as appropriate, the appropriate CTA, and HSS for information.
- The DOE POA must be approved by the SAA prior to the start of the review. The SAA provides the POA to the designated team leader.

The RA team leader must select the DOE RA team members.

- Team members must meet the qualification and training requirements listed in DOE O 425.1D, section 4.e.(3)[a].
- An RA team member must not review work for which she or he is directly responsible.
- The RA team leader must determine and document the qualification of RA team members and their freedom from a conflict of interest in the areas they are assigned to review.
- DOE line management must support the DOE RA team leader in staffing the DOE RA team.

The DOE RA team must develop an RA IP. The DOE RA IP documents the evaluation criteria and the review approaches based on the scope given in the DOE RA POA. The DOE RA team leader approves the RA IP. A DOE RA IP that is developed by the DOE RA team and approved by the team leader may be as short and simple as a restart check procedure, or may approach the breadth and depth of an ORR IP. The IP must include the full RA scope defined in the DOE POA.

DOE line management must forward the DOE RA IP to the SAA, cognizant PSO, the site lead PSO or CSO, as appropriate, the appropriate CTA, and HSS for information.

Prior to starting the DOE RA:

- DOE line management has received a readiness to proceed memorandum from the responsible contractor certifying that the facility, activity, or operation is ready for startup or restart.
- DOE line management must verify that the contractor's preparations for startup or restart have been completed with the exception of a manageable list of open prestart issues. The prestart issues must have a well-defined schedule for closure to allow the DOE RA team to review the closure process.
- DOE line management must verify that the DOE RA POA prerequisites have been met.
- In the verification process, DOE field element line management must document their actions to verify field element and contractor readiness

Specific events significant to the startup and restart process that occur prior to the formal commencement of the DOE RA (e.g., site emergency response drills) may be reviewed by the DOE RA team at the time they are conducted.

Upon direction of the SAA, the RA may commence. The RA team must use the IP to conduct the RA.

Upon completion of the DOE RA, the DOE RA team leader must prepare, approve, and submit a final report to the SAA. The final report is approved by the team leader and each team member approves the section of the final report for which he or she was responsible. There will be a provision for dissenting professional opinions if agreement cannot be achieved.

- The final report must document the results of the RA and make a conclusion as to whether startup or restart of the nuclear facility, activity, or operation can proceed safely. The final report must be adequately detailed to support its conclusion, such that a knowledgeable reader would reasonably be expected to draw the same conclusions.
- There must be a lessons learned section of the final report that may relate to design, construction, operation, and decommissioning of similar facilities, activities, or operations and future RR efforts.

The final report must be submitted to the SAA to be used as a basis for approving the startup or restart of the nuclear facility, activity, or operation. A copy of the final RA report must be forwarded to the PSO, the site lead PSO or CSO, as appropriate, the appropriate CTA, and HSS for information.

Closure of DOE RA findings must include the following:

- Development of corrective action plans approved by DOE to correct the findings. Action plans must provide evaluation of, and address any overall programmatic deficiencies and causes.
- Creation of a finding closure package which must include a brief description of actual corrective actions taken, evidence of completion, and reasons for concluding that closure has been achieved.
- DOE verification of closure of prestart findings. The organization verifying the closure must be designated by the SAA.

DOE line management must ensure that the contractor and DOE have satisfactorily resolved all prestart findings of the contractor and DOE RAs prior to startup or restart of the facility, activity, or operation. The SAA may approve startup or restart after prestart findings are resolved.

### **Core Requirements**

Core requirements verify the readiness of personnel, procedures, programs, and equipment within the scope of the RR to safely start nuclear operations. These core requirements are directly related to the guiding principles of ISM.

- Line management has established safety management programs to ensure safe accomplishment of work.
- Functions, assignments, responsibilities, and reporting relationships, including those between the line operating organization and environment, safety and health support organizations, are clearly defined, understood, and effectively implemented, with line management responsibility for control of safety.
- The selection, training, and qualification programs for operations and operations support personnel have been established, documented, and effectively implemented.
- Level of knowledge of managers, operations, and operations support personnel is adequate based on reviews of examinations and examination results, selected interviews of managers, operations, and operations support personnel, and observations of operational demonstrations.

- Personnel exhibit an awareness of public and worker safety and health and environmental protection requirements and, through their actions, demonstrate a high-priority commitment to comply with these requirements. Worker safety and health requirements of 10 CFR 851, “Worker Safety and Health Program,” have been implemented within the facility.
- Facility safety documentation (normally DSA and TSRs) is in place that describes the “safety envelope” of the facility.
- A program is in place to confirm and periodically reconfirm the condition and operability of vital safety systems. This includes examinations of records of tests and calibration of these systems.
- The facility systems and procedures, as affected by facility modifications, are consistent with the description of the facility, procedures, and accident analysis and assumptions included in the safety documentation.
- Adequate and accurate procedures and safety limits are approved and in place for operating the process systems and utility systems. The procedures include necessary revisions for all modifications that have been made to the facility.
- A routine operations drill program and an emergency management drill and exercise program have been established and implemented. Records for each program are adequate to demonstrate the effectiveness of completed drills and exercises as well as planning for future drills and exercises.
- An adequate startup or restart program has been developed that includes plans for graded operations and testing after startup or resumption to simultaneously confirm operability of equipment, the viability of procedures, and the performance and knowledge of the operators.
- The formality and discipline of operations are adequate to conduct work safely, and programs are in place to maintain this formality and discipline.
- Formal agreements between the operating contractor and DOE have been established via the contract or other enforceable mechanism to govern safe facility operations.
- An effective feedback and improvement process has been established to identify, evaluate, and resolve deficiencies and recommendations made by contractor line management and independent contractor audit and assessment groups. The process also provides for resolution of issues and recommendations by external official review teams and audit organizations.
- The breadth, depth, and results of the responsible contractor RR, including corrective actions, is adequate to verify the readiness of hardware, personnel, and management programs to support nuclear operations. The RR scope met the requirements of the approved POA.
- The technical and managerial qualifications and competence of those personnel at the DOE field element and at DOE headquarters assigned responsibilities for providing direction and guidance to the contractor, and those assigned oversight responsibilities within the scope of the RR, including the facility representatives, are commensurate with the assigned responsibilities.

- DOE field element management systems for DOE oversight of facility operations, such as oversight and assessment programs, occurrence reporting, facility representatives, corrective actions, and quality assurance programs, are adequate.

**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 to section 3.**



**EXAMPLE 2**

Using the familiar level of this module and the resources, answer the following questions.

1. What are the two required conditions under which a properly planned and conducted DOE readiness review does not need to be performed?
2. What must be described in the plan of action developed in the DOE operational readiness review process?
3. What must closure of DOE readiness assessment findings include?
4. What is the purpose of core requirements in the readiness review process?

5. Who selects operational readiness review team members and what requirements must they meet?

**Note: When you are finished, compare your answers to those contained in the example 2 self-check. When you are satisfied with your answers, go to section 3.**

## **EXAMPLE 2 SELF-CHECK**

1. What are the two required conditions under which a properly planned and conducted DOE readiness review does not need to be performed?
  - The restart is a resumption of routine operations after a short interruption (such as maintenance activities governed by existing maintenance procedures and processes) as defined in local procedures.
  - The restart is conducted using contractor approved operating procedures that provide specific direction for operating systems and equipment during normal conditions.

2. What must be provided by the plan of action (POA) developed in the DOE ORR process?

The POA must provide a clear discussion of the physical or geographic scope of the ORR and a clear description of the SSCs, individual processes, and programs that are within the scope of the ORR. The POA must also designate the proposed ORR team leader.

3. What must closure of DOE readiness assessment findings include?
  - Development of corrective action plans approved by DOE to correct the findings. Action plans must provide evaluation of, and address any overall programmatic deficiencies and causes.
  - Creation of a finding closure package which must include a brief description of actual corrective actions taken, evidence of completion, and reasons for concluding that closure has been achieved.
  - DOE verification of closure of prestart findings. The organization verifying the closure must be designated by the startup approval authority.

4. What is the purpose of core requirements in the readiness review process?

Core requirements verify the readiness of personnel, procedures, programs, and equipment within the scope of the RR to safely start nuclear operations.

5. Who selects operational readiness review team members and what requirements must they meet?

Operational readiness review team members are selected by the ORR team leader. Members must meet all of the following requirements. They must have

- 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, activity, or operation-specific information.

### **SECTION 3: REQUIREMENTS FOR DOE FIELD ELEMENT AND HEADQUARTERS LINE MANAGEMENT OVERSIGHT, RECORDS MANAGEMENT PROGRAM REQUIREMENTS, AND RESPONSIBILITIES OF DOE/NNSA LINE MANAGEMENT**

#### **Requirements for DOE Field Element and Headquarters Line Management Oversight of the Process for Verifying Readiness to Start Up or Restart Nuclear Facilities**

##### DOE Field Element Line Management

DOE field element line management must review and concur with contractor procedures for implementing the requirements of the contractor requirements document (CRD); then forward the contractor's procedures for implementing the requirements of the CRD, with comment, to the appropriate PSO and CTA as well as HSS.

DOE field element line management must ensure that the contractor properly implements the requirements of the CRD of DOE O 425.1D. Key elements of an oversight program include:

- Ensuring the contractor prepares and submits quarterly SNRs that accurately reflect all RRs required for startup or restart of nuclear facilities, activities, or operations.
- Ensuring the contractor develops a POA that adequately defines the scope of the RR appropriate for the circumstances associated with the startup or restart.
- Ensuring the contractor POA appropriately specifies the prerequisites for starting the contractor's RR.
- Evaluating the adequacy of the qualifications of contractor RR team members.
- When SAA resides with DOE, review and approve the contractor's POA. If SAA does not reside with field element line management, forward the contractor's POA onto the SAA with recommendation for disposition.
- Evaluating the adequacy of the contractor RR.
- Evaluating the contractor RR final report adequately describes the review and contains sufficient detail to support its conclusion.
- Ensuring the contractor and DOE have satisfactorily resolved all prestart findings of the contractor and DOE RR (if applicable) prior to startup or restart of the facility, activity, or operation.
- When applicable, forward, with comment, the contractor's readiness to proceed memorandum to the SAA.
- Ensuring the contractor and DOE have developed and implemented approved corrective action plans for post-start findings.

##### DOE Headquarters Line Management

DOE headquarters line management must oversee DOE field processes for verifying readiness to startup and restart nuclear facilities in accordance with DOE O 226.1B, *Implementation of Department of Energy Oversight Policy*, and DOE-STD-3006, *Planning and Conducting Readiness Reviews*.

### **Records Management Program**

Requirements for maintenance and disposition of Federal records, such as those pertaining to ORRs or RAs, are provided under the general guidance of DOE O 243.1, *Records Management Program*. Consult the cognizant field element records officer for guidance. The disposition, including destruction, of Federal records must be in accordance with

- the general records schedules, as published by the National Archives and Records Administration (NARA), or
- DOE records disposition authority (Standard Form 115, Request for Records Disposition Authority), as approved by NARA.

### **Responsibilities DOE/NNSA Line Management**

Establish procedures as necessary to manage the verification of readiness to start up or restart nuclear facilities, activities, or operations in accordance with the requirements of DOE O 425.1D. Forward these procedures to the appropriate PSO and CTA as well as HSS for information.

Exercise delegation of authority and document all delegations of authority made under the provisions granted by this Order.

**Note: You do not have to do example 3 on the following page, but it is a good time to check your skill and knowledge of the information covered. You may do example 3 or go directly to the practice.**



**EXAMPLE 3 SELF-CHECK**

1. What are the two documents with which the disposition (including destruction) of Federal records must be in accordance?

The disposition (including destruction) of Federal records must be in accordance with

- the general records schedules, as published by the National Archives and Records Administration (NARA) or
- DOE records disposition authority (Standard Form 115, Request for Records Disposition Authority), as approved by NARA.

2. What are the two requirements for DOE line management oversight of the startup or restart process?

DOE field element line management must

- review and concur with contractor procedures for implementing the requirements of the CRD; then forward the contractor's procedures for implementing the requirements of the CRD, with comment, to the appropriate PSO and CTA as well as the Office of Health, Safety and Security
- ensure that the contractor properly implements the requirements of the CRD of DOE O 425.1D

3. What position or entity is responsible to review and comment on all reports and plans associated with verifying readiness to start up or restart nuclear facilities?  
The Office of Health, Safety and Security

**Note: When you are satisfied with your example, go on to the practice. The course manager will check your practice and verify your success at the familiar level.**





5. Who must approve the initial startup of an existing facility after conversion to a hazard category 1 or 2 nuclear facility with a new documented safety analysis and associated technical safety requirements?

**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.**

**DOE O 425.1D  
VERIFICATION OF READINESS TO START UP OR  
RESTART NUCLEAR FACILITIES  
FAMILIAR LEVEL**

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**OBJECTIVES**

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

1. Based on your knowledge of DOE O 425.1D and your analysis of the scenarios, should issues such as inadequate system design be discovered during readiness reviews?
2. How do you think the scope of future readiness reviews should be adjusted to address the problems identified in these scenarios?
3. Which requirements, sections or elements of DOE O 425.1D apply to the situations described in the scenarios?

**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 425.1D, *Verification of Readiness to Startup or Restart of Nuclear Facilities*. April 16, 2010.

DOE Orders Self-Study Program, DOE O 425.1D, Familiar Level. June 2011.

DOE-STD-3006-2010, *Planning and Conducting Readiness Reviews*. 2010.

## **INTRODUCTION**

The familiar level of this module introduced the purpose of DOE O 425.1D. Several requirements from the Order and the resources were discussed. In the general level of this module, students are asked to apply the information contained in the familiar level of DOE O 425.1D and the resources to scenarios depicting work situations related to the Order. Students will be asked to answer questions that are related to the scenarios 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 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.**

## **EXAMPLE SCENARIO**

Please review the following scenario and then answer these questions.

1. Based on your knowledge of DOE O 425.1D, should the inadequate system design have been discovered during the operational readiness review (ORR)? Why or why not?
2. What conclusion relating to future ORRs do you think was reached as a result of this event?

### **Scenario**

On December 23, 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 degrees Fahrenheit. The manufacturer's specifications for the sensor required operating temperatures of 70 to 120 degrees Fahrenheit. 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 ORR for this facility was completed and startup was authorized on August 13 of the same year this event occurred.)

Write your answers below and then compare them to the answers in the example self-check.

**EXAMPLE SELF-CHECK**

Your answers do not have to match the following exactly. To be considered correct, your answers must include at least the following.

No, the inadequate system design should not have been discovered during the ORR. The ORR would not be expected to detect design deficiencies. There is no requirement in the Order that is related to reviewing design adequacy.

The investigation of this event reached the following conclusion related to future ORRs:

“...future ORRs should verify the adequacy of the design in relation to the safety analysis, and not assume that the design is adequate.”

## **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 the resources to answer the questions in the practice correctly. The practice and criterion tests will also challenge additional analytical skills that you have acquired in other formal and on-the-job training.

### Practice Scenario

Please review the following scenario and the answer these questions.

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

On June 25, 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 ten-gallon container, and one five-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 and was completed in June of the following year. 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 five-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 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 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 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 FMCAs 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.

The authorization for the sample line expired in November, and work at the sample line resumed in December. 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 who was not trained as an FMH supervisor was assigned to the project. 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 of the following year, 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, employees are not 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.

Write your answers below and on the next page 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.**