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Exam Preview:

1. The Readiness Review process was developed to provide a high degree of confidence that new and restarted DOE nuclear facility operations will be conducted as intended by the design and safety basis.
 - a. True
 - b. False
2. Using the Definitions section of the reference material, which of the following terms matches the description: The set of CRs and the physical boundaries evaluated by the ORR or RA team during the RR?
 - a. Implementation Plan
 - b. Breadth
 - c. Depth
 - d. Design Feature
3. The responsibility for achieving a state of readiness to safely conduct nuclear operations resides partially with the line management of the facility or programmatic line management.
 - a. True
 - b. False
4. According to the reference material, each _____ (or on a periodicity as defined by the PSO) the contractor is required to prepare and submit an SNR to its immediate DOE Line Management that identifies all startups or restarts requiring a RR.
 - a. Year
 - b. Week
 - c. Quarter
 - d. Month

5. According to the reference material, at least _____ before the projected date for achieving readiness, contractor line management should prepare the POA.
 - a. 3 months
 - b. 6 months
 - c. 8 months
 - d. 1 year
6. The ORR is a performance-based assessment that includes observing and documenting the responses of operating and support program personnel to normal and off-normal events as demonstrated by drills, preoperational tests, and exercises.
 - a. True
 - b. False
7. In the event that the requirement for an ORR is identified less than _____ before the estimated start, the POA should be expeditiously developed, reviewed, and approved so that the ORR schedule is maintained.
 - a. 3 months
 - b. 5 months
 - c. 2 months
 - d. 4 months
8. When a DOE RR is required, the declaration of readiness (the Readiness to Proceed Memorandum) for the DOE RR is submitted before the contractor RR, and planning for resolution of all identified findings, are complete.
 - a. True
 - b. False
9. According to the reference material, the ORR should take no more than ____ weeks, with four to six days of actual field work.
 - a. 2
 - b. 3
 - c. 4
 - d. 5
10. According to the reference material, which hazard category corresponds to the following statement: The hazard analysis shows the potential for only significant localized consequences?
 - a. Category 1
 - b. Category 2
 - c. Category 3
 - d. Category 4

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FOREWORD

1. This Department of Energy (DOE) technical standard is approved for use by all DOE Components and their contractors.
2. DOE technical standards, such as this Standard, do not establish requirements. However, all or part of the provisions in a DOE standard can become requirements under the following circumstances:
 - a. They are explicitly stated to be a requirements in a DOE requirement documents; or
 - b. The organization makes a commitment to meet a standard in a contract or in an implementation plan or program plan required by a DOE requirements document.

Throughout this Standard, only the word “must” is used to denote actions which are required to be performed to assure adequate implementation of the Order. This Standard cannot create or imply, directly or indirectly a requirement that is not in the Order. Every effort has been made to minimize “directive” type of statements which could be interpreted as requirements. However, as mentioned above, only “must” statements denote Order requirements, regardless of the grammatical structure.

3. Comments in the form of recommendations, pertinent data and lessons learned that may improve this document should be sent to:

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1 SCOPE, PURPOSE, AND ORGANIZATION

1.1 Scope.

Department of Energy (DOE) Order (O) 425.1D, *Verification of Readiness to Startup or Restart Nuclear Facilities*, specifies the conditions and circumstances under which a Readiness Review (RR) is required as part of a new start or restart process. This Standard provides standardized methods and approaches for planning and conducting RRs. This Standard also provides guidance for preparation of exemption requests in accordance with DOE O 251.1C. DOE O 425.1D requirements for RRs apply both to responsible contractors and to DOE. Accordingly, the methods and approaches provided in this Standard are applicable to both contractors and DOE.

1.2 Purpose.

This Standard describes acceptable methods and approaches for meeting the RR requirements of DOE O 425.1D. Specifically this Standard describes methods and approaches for:

1. determining the type of RR that is appropriate to the specific facility startup consistent with the history, hazards, and complexity of the facility being started up or restarted;
2. developing the Startup Notification Report (SNR) which documents the results of the process for determining the type of readiness;
3. conducting the RR, including development of the Plan of Action (POA) and Implementation Plan (IP), selection of team members, and performance and documentation of the RR;
4. achieving readiness; and,
5. providing examples of process deliverables to include a writing guide and suggested processes for achieving readiness.

The requirements in DOE O 425.1D are only applicable to startup or restart of Hazard Category 1, 2, or 3 nuclear facility, activity or operation. This Standard provides acceptable methods and approaches for meeting the specific requirements of that Order.

The methods and approaches provided in this Standard may be useful to line managers regarding the startup or restart of radiological facilities or non-nuclear facilities in accordance with the requirements of DOE O 430.1A. DOE line managers are encouraged to consider the methods and approaches in this Standard when developing requirements or procedures for startup or restart of radiological or non-nuclear facilities.

1.3 Organization of the Standard.

1.3.1 Overview of the Readiness Review Process.

This section provides a history and sequential summary of the actions, responsibilities, decisions, and documents associated with the Operational Readiness Review (ORR) and Readiness Assessment (RA) processes. It is organized starting with the type of RR required, development of RR plans, achieving readiness, and conduct and reporting of RRs. This section also contains general information for gaining an understanding of the principles and the expectations of the ORR or RA processes.

1.3.2 Determining the Scope and the Level of Readiness Review Required.

This section discusses the expectations for determining the level of RR required whenever a nuclear facility is being started or restarted. It contains expectations for the considerations to be included in the process as well as the attributes that should be included in the contractor and DOE procedures that define the process.

1.3.3 Startup Notification Reports.

This section discusses the expectations and requirements for preparing, submitting, and approving SNRs. The discussion includes the expectations for the contents of the SNR as well as the attributes of the contractor and DOE procedures for development, review, and approval of the SNR.

1.3.4 Achieving Readiness.

This section discusses the processes and considerations for achieving readiness in a planned, efficient, and predictable manner. Although the focus and purpose of DOE O 425.1D and this Standard are to verify that readiness has been achieved to commence nuclear operations, the ability to successfully implement the Order and Standard is dependent on the adequacy of contractor processes for achieving readiness.

1.3.5 Roles and Responsibilities.

This section discusses the roles and responsibilities for the processes and activities required by the Order and Standard. It describes the activities of DOE and contractor line management and oversight organizations as well as the RR Team Leader and team members. The requirements for individual expectations are further discussed in the specific sections of the Standard in which the tasks are discussed.

1.3.6 Conduct of Operational Readiness Reviews.

This section provides the detailed processes and methods for planning and conducting an ORR, and is arranged by the time sequence of events associated with the ORR. The discussion includes a description of the required documentation, including a recommended content and format. It also discusses the actions required of line management, the ORR

Team Leader, and team members to accomplish the process, including the actions needed to resolve deficiencies and grant final approval to start nuclear operations.

1.3.7 Conduct of Readiness Assessments.

This section describes the detailed processes and methods for planning and conducting an RA, and is arranged by the time sequence of events associated with the RA. The discussion includes a description of the required documentation, including a recommended content and format. It also discusses the actions required of line management, the RA Team Leader, and team members to accomplish the process, including the actions needed to resolve deficiencies and grant final approval to start nuclear operations.

1.3.8 Exemptions.

For information on processing exemptions, see DOE Order 251.1A: Directive System

1.3.9 Appendices.

The Appendices contain detailed information useful to the individual team members or line managers to assist in preparing the documents required during the ORR or RA process:

- Appendix 1 discusses the recommended use of the graded approach to assist in defining the scope of the RR.
- Appendix 2 contains guidance to clarify the intended scope and review approaches associated with several Core Requirements (CRs) that have caused confusion in the past.
- Appendix 3 is a writer's guide containing information and examples of required or recommended forms and document content. It is intended to assist team members in developing required documents and in documenting their activities and findings.

2 DEFINITIONS

This section defines the terms used in DOE O 425.1D and this Standard. The description or discussion concerning the terms may be expanded or more specific than definitions found in other DOE documents. However, the uses of them in this Standard are consistent with definitions provided in other DOE documents. All definitions used in Section 3 of 10 CFR Part 830, *Nuclear Safety Management*, apply and are included in this listing for convenience and clarity. Definitions from Section 3 of 10 CFR 830 are indicated by an asterisk (*). Where compliance with any section of this standard is required, the terms defined in this section should be used as defined in this section without alteration.

- Administrative Controls (AC)*: The provisions relating to organization and management, procedures, recordkeeping, assessment, and reporting necessary to ensure safe operation of a facility.

- **Authorization Agreement (AA):** Documented basis between DOE and the contractor for high-hazard nuclear facilities (Hazard Categories 1 and 2) that incorporates the results of DOE's review of the contractor's proposed authorization basis for a defined scope of work. The AA contains key terms and conditions (i.e., controls and commitments) under which the contractor is authorized to perform work. Any changes to these terms and conditions require DOE approval.
- **Authorization Basis (AB)*:** Safety documentation supporting the decision to allow a process or facility to operate. Included are corporate operational environmental requirements as found in regulations and specific permits, and, for specific activities, work packages or job safety analyses.
- **Breadth:** The set of CRs and the physical boundaries evaluated by the ORR or RA team during the RR. The breadth is specified in the POA by line management.
- **Core Requirement (CR):** A fundamental area or topic evaluated during an ORR or RA to assess whether a facility can be operated safely.
- **Criteria and Review Approach Document (CRAD):** This document lists the criteria that the technical experts (team members) plan to use to evaluate and describes the objective evidence that is gathered to determine whether the criteria have been met. The review approach consists of evaluating a sampling of documents, hardware/systems, people, and performance. CRADs are a key component of the Implementation Plan (IP) for the RR.
- **Depth:** The depth of a review relates to the level of analysis, documentation, or action by which a review objective is assessed. The depth to which different review objectives are assessed may vary within an individual RR. Depth could vary from a simple records review to a detailed assessment that includes a review of all records, all references, and all involved individuals and physical spaces. The POA establishes the breadth of the review and broadly describes the desired depth. The CRADs, part of the IP, translate the POA description of the depth into practical terms of what is intended be reviewed and by what approach.
- **Design Feature*:** The design features of a nuclear facility specified in the Technical Safety Requirements (TSRs) that, if altered or modified, would have a significant effect on safe operation.
- **Directed Shutdown:** An unscheduled termination of program operations or activities directed by contractor management, local DOE officials, or by DOE Headquarters.
- **Document*:** Recorded information that describes, specifies reports, certifies, requires, or provides data or results.
- **Documented Safety Analysis (DSA)*:** Documented analysis of the extent to which a nuclear facility can be operated safely with respect to workers, the public, and the

environment, including a description of the conditions, safe boundaries, and hazard controls that provide the basis for ensuring safety.

- **Environmental Restoration Activities*:** The processes by which contaminated sites and facilities are identified and characterized and by which contamination is contained, treated, or removed and disposed.
- **Finding:** Nonconformance with a stated requirement that represents either: (1) a systematic failure to establish or implement an adequate program or control; or (2) a significant failure that could result in unacceptable impact on the safety of personnel, the facility, the general public, or the environment during nuclear operations.
- **Fissionable Material*:** A nuclide capable of sustaining a neutron-induced chain reaction (e.g., uranium-233, uranium-235, plutonium-238, plutonium-239, plutonium-241, neptunium-237, americium-241, or curium-244).
- **Graded Approach*:** The process used to determine the level of analysis, documentation, and actions necessary to comply with a requirement that is commensurate with: (1) the relative importance to safety, safeguards, and security; (2) the magnitude of any hazard involved; (3) the lifecycle stage of a facility; (4) the programmatic mission of a facility; (5) the particular characteristics of a facility; (6) the relative importance of radiological and non-radiological hazards; and (7) any other relevant factor.
- **Hazard*:** A source of danger (i.e., material, energy source, or operation) with the potential to cause illness, injury, or death to a person or damage to a facility or to the environment (without regard to the likelihood or credibility of accident scenarios or consequence mitigation).
- **Hazard Category (HC):** The consequences of releases of radioactive or hazardous material are evaluated as required by 10 CFR 830 and classified by the following Hazard Categories:
 - a. Category 1 – The hazard analysis shows the potential for significant offsite consequences.
 - b. Category 2 – The hazard analysis shows the potential for significant onsite consequences.
 - c. Category 3 – The hazard analysis shows the potential for only significant localized consequences.

DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23*, Nuclear Safety Analysis Reports, Change Notice 1, contains additional information on methods and criteria for determining Hazard Categories.

- **Hazard Controls*:** Measures to eliminate, limit, or mitigate hazards to workers, the public, or the environment, including:

- a. physical, design, structural, and engineering features;
 - b. safety structures, systems, and components (SSCs);
 - c. safety management programs (SMPs);
 - d. TSRs; including SACs and,
 - e. other controls necessary to provide adequate protection from hazards.
- **Implementation Plan (IP):** The procedural document by which the RR is conducted. This document implements the scope and direction approved in the POA and defines the depth of the review. Sections 8.2 and 9.3 describe the contents, preparation, and use of the IP.
- **Independent Verification Review (IVR):** A formalized verification of the completeness and adequacy of the implementation of the safety basis (DSA and TSRs) for a nuclear facility. The IVR process is defined in local procedures. A successful IVR, including the resolution of all pre-start issues, may be a prerequisite to the start of an RR as defined in DOE O 425.1D.
- **Interruption:** A cessation of facility program work required to perform scheduled activities (such as programmatic or equipment adjustments, reactor refueling, maintenance, surveillance, tests, inspections, or safety upgrades) or for programmatic reasons unrelated to the facility's ability to operate, such as a funding shortfall, is a planned interruption. Local procedures should define the review requirements for planned interruptions or shutdowns.
- **Limiting Condition for Operation (LCO)*:** The limit that represents the lowest functional capability or performance level of safety SSCs required for safe operations.
- **Limiting Control Settings (LCSs)*:** The settings on safety systems that control process variables to prevent exceeding a safety limit.
- **Major Modification*:** A modification to a DOE nuclear facility that substantially changes the existing safety basis for the facility. This is not the same as a Substantial Modification. See the definition for Substantial Modification below.
- **Management Self Assessment (MSA):** A quality process planned and accomplished by line management to assist in achieving readiness. The process, while not required by DOE O 425.1D or this Standard is an important element in ensuring readiness to start nuclear operations and thus achieve readiness to conduct the RR required by DOE O 425.1D.
- **New Nuclear Facility:** This is a reactor or a nonreactor nuclear facility where an activity is initiated for or on behalf of DOE that includes any related area, structure, facility, or activity to the extent necessary to ensure proper implementation of the requirements established in 10 CFR 830. The term refers to an entire new facility (or conversion of an existing non-nuclear facility to a nuclear mission) devoted to the operation and maintenance of a new program activity, which is generally covered by a unique DSA.

- **Non-reactor Nuclear Facility*:** Those facilities, activities, or operations involve, or will involve, radioactive and/or fissionable materials in such form and quantity that a nuclear or a nuclear explosive hazard potentially exists to workers, the public, or the environment. This excludes accelerators and their operations and activities involving only incidental use and generation of radioactive materials or radiation such as check and calibration sources, use of radioactive sources in research and experimental and analytical laboratory activities, electron microscopes, and X-ray machines.
- **Nuclear Facility*:** Reactor and non-reactor nuclear facilities where an activity is conducted for or on behalf of DOE that includes any related area, structure, facility, or activity to the extent necessary to ensure proper implementation of the requirements established by 10 CFR 830.
- **Nuclear Operations:** As used in this Standard, Nuclear Operations means nuclear facilities, operations, and/or activities that fall within the scope of DOE O 425.1D
- **Operating Limits*:** The limits required to ensure the safe operation of a nuclear facility, including limiting control settings and limiting conditions for operation.
- **Plan of Action (POA):** The document prepared by line management that describes the scope of the RR, the prerequisites to be met to begin the RR, and the proposed Team Leader for the RR. The contractor and DOE both prepare POAs for their respective RRs (in some instances as specified in the SNR, a DOE RA may not be required). Both contractor and DOE POAs when required are submitted to the Startup Approval Authority (SAA) for approval. The designated RR Team Leader(s) develops their IP from the approved POA.
- **Preliminary Documented Safety Analysis (PDSA)*:** Documentation prepared in connection with the design and construction of a new DOE nuclear facility or a major modification to a DOE nuclear facility that provides a reasonable basis for the preliminary conclusion that the nuclear facility can be operated safely through the consideration of factors such as:
 - 1) the nuclear safety design criteria to be satisfied;
 - 2) a safety analysis that derives aspects of design that are necessary to satisfy the nuclear safety design criteria; and,
 - 3) an initial listing of the safety management programs needed to address operational safety considerations.
- **Prerequisites (PR):** A set of specific, measurable actions or conditions identified in the contractor and DOE POAs that are to be completed prior to the start of the respective ORR or RA. At minimum, prerequisites are identified for each of the applicable Core Requirements of DOE O 425.1D.
- **Process*:** A series of actions that achieves an end or result.

- **Program Work:** Work in a reactor or non-reactor nuclear facility that is accomplished to further the goals of the facility mission or the program for which the facility is operated. Program work may include D&D or Environmental Restoration activities when that is the mission of the facility. Program work is not accomplished when an operational facility is shut down. Program work does not include work that would be required to maintain the facility in a safe shutdown condition, minimize radioactive material storage, or accomplish modifications and correct deficiencies required before program work can resume.
- **Quality*:** The condition achieved when an item, service, or process meets or exceeds the user's requirements and expectations.
- **Quality Assurance*:** All those actions that provide confidence that quality is achieved.
- **Quality Assurance Program (QAP)*:** The overall program or management system established to assign quality assurance responsibilities and authorities, define policies and requirements, and provide for the performance and assessment of work.
- **Radiological Facility:** A nuclear facility that is less than nuclear hazard category 1, 2, or 3. DOE O 425.1D does not apply to radiological facilities.
- **Reactor*:** An apparatus that is designed or used to sustain nuclear chain reactions in a controlled manner, such as research, test, and power reactors, critical and pulsed assemblies, and any assembly that is designed to perform subcritical experiments that could potentially reach criticality. Unless modified by words such as containment, vessel, or core, refers to the entire facility, including the housing, equipment, and associated areas devoted to the operation and maintenance of one or more reactor cores.
- **Record*:** A completed document or other medium that provides objective evidence of an item, service, or process.
- **Readiness Assessment (RA):** A review conducted to determine a facility's readiness to start up or restart when an ORR is not required.
- **Readiness Review (RR):** A review conducted to determine readiness to start up or restart a nuclear facility, activity, or operation. There are two types of RRs: ORRs and RAs.
- **Readiness to Proceed (RTP) Memorandum:** The formal document submitted by the contractor certifying the conclusion that the facility is prepared to start or resume nuclear operations. The contractor RR final report and finding closure packages or corrective action plans, along with the appropriate endorsements, are attached to the RTP.
- **Restart:** The resumption of program work. Restarts requiring an RR can occur in operating facilities if the process to be resumed meets RR requirements. A restart RR

in accordance with DOE O 425.1D may be required even if the same program work is ongoing in another portion of the operating facility.

- **Safety Basis (SB)*:** The DSA and hazard controls that provide reasonable assurance that a DOE nuclear facility can be operated safely in a manner that adequately protects workers, the public, and the environment.
- **Safety-Class Structures, Systems, and Components*:** Those SSCs, including portions of process systems, whose preventive or mitigative function is necessary to limit radioactive hazardous material exposure to the public, as identified by the DSA.
- **Safety Evaluation Report (SER)*:** The report prepared by DOE to document.
 - 1) The sufficiency of the DSA for a Hazard Category 1, 2, or 3 nuclear facility;
 - 2) The extent to which a contractor has satisfied the requirements of 10 CFR 830 Subpart B; and,
 - 3) The basis for approval by DOE of the safety basis for the facility, including any conditions for approval.
- **Safety Limits (SL)*:** The limits on process variables associated with those safety-class physical barriers (generally passive) that are necessary for the intended facility function and that are required to guard against the uncontrolled release of radioactive materials.
- **Safety Management Program*(SMP):** A program designed to ensure that a facility is operated in a manner that adequately protects workers, the public, and the environment by covering an area such as quality assurance, maintenance of safety systems, personnel training, conduct of operations, inadvertent criticality protection, emergency preparedness, fire protection, waste management, or radiological protection of workers, the public, and the environment.
- **Safety Management System (SMS)*:** An integrated safety management system established consistent with 48 CFR 970.5223-1.
- **Safety-Significant Structures, Systems, and Components*:** The SSCs that are not designated as safety-class SSCs, but whose preventive or mitigating function is a major contributor to defense in depth or worker safety as determined in the safety basis.
- **Safety Structures, Systems, and Components (SSC)*:** Both safety-class and safety-significant SSCs.
- **Scope:** The overall magnitude of the RR, as defined by the physical breadth and depth of the facilities and equipment to be started, the breadth of CRs selected, and the depth of evaluation of these CRs during the RR. The POA defines the scope of the RR when it establishes the breadth and broadly describes the desired depth.

- **Service***: The performance of work, such as design, manufacturing, construction, fabrication, assembly, decontamination, environmental restoration, waste management, laboratory sample analyses, inspection, nondestructive examination and testing, environmental qualification, equipment qualification, repair, installation, or the like.
- **Shutdown**: (1) A situation in which a reactor is taken subcritical, either manually or automatically, to a safe shutdown condition; (2) a condition in which a nonreactor nuclear facility, activity, or operation ceases; or (3) a condition in which a programmatic nuclear activity ceases (but the structure containing the activity may remain operational, i.e., not shut down). In a shutdown condition, a facility must still meet all applicable TSRs and environmental, safety, and health requirements.
- **Short Interruption**: A cessation of program work required to perform scheduled or unscheduled activities (such as programmatic or equipment adjustments, reactor refueling, maintenance, surveillance, tests, inspections, or safety upgrades) or for programmatic reasons unrelated to the facility's ability to operate, such as a funding shortfall, for which adequate plans pre-exist that ensure a safe restart without the need for a formal RR. Local procedures define the circumstances that are considered short interruptions and the requirements for restart authorization.
- **Specific Administrative Control (SAC)**. An administrative control is designated as a SAC if (1) it is identified in the documented safety analysis as a control needed to prevent or mitigate an accident scenario, and (2) it has a safety function that would be safety significant or safety-class if the function were provided by an SSC. Examples are discrete operator actions, combustible loading program limits, and hazardous material limits protecting hazard analyses or facility categorization. (SACs are not programmatic administrative controls included in TSRs.) (DOE-STD-1186-2004)
- **Startup Authorization Authority (SAA)**: The line manager who is designated in accordance with DOE O 425.1D, section 4.b to authorize the start of nuclear operations when all requirements of the Order have been met. The SAA may range from a senior contractor line manager to the Secretary of Energy. For each startup or restart, the SAA is designated in the SNR.
- **Startup Notification Report (SNR)**: A quarterly report (or at a periodicity as designated by the PSO) by each responsible contractor to identify nuclear facility new starts and restarts scheduled in the next year. The report identifies the facility and, based on the criteria in DOE O 425.1D, specifies whether an ORR or a RA is required. The SNR also identifies the SAA and updates previously provided information.
- **Startup or Restart Plan**: The management plan developed by the responsible contractor that describes the process of deliberate, controlled operations the contractor intends to follow after authorization to start nuclear operations following an RR. Appendix 2 contains additional information on the suggested content of a startup plan.
- **Substantial Process, System or Facility Modification**: A modification that requires that DOE conduct an RA following completion of the contractor's readiness activities.

DOE O 425.1D requires that local site implementing procedures must provide a process for determining when a modification is substantial based on the impact of the changes to the safety basis and the extent and complexity of changes, whether or not these changes resulted in a positive Unreviewed Safety Question (USQ). Contractor and DOE local procedures for determining the level of readiness should include a process for determining whether a substantial modification has occurred. Items to be considered when making the determination should include:

- the number and significance of operational process changes necessary to accommodate the modification;
- the number of procedure changes and the difficulty or significance of the process changes to which the procedures apply;
- changes to the process controls, limits, and instrumentation;
- the necessary level of training or retraining of operational and oversight staff to introduce the modification;
- the significance of the changes to the DSA and TSRs, with emphasis on the operational aspects of the changes; and,
- the level of operational process change and complexity of operational activities.

A change that meets one or more of the following criteria should be evaluated using local procedures to determine whether it meets the criteria for a Substantial Process Change:

- 1) Alters the footprint of an existing Hazard Category 1, 2, or 3 facility with the potential to adversely impact one or more credited safety functions of the existing facility;
- 2) Introduces a new hazard not previously analyzed that requires a revision to the Hazards Analysis.

Or if the change:

- 1) Requires the expansion of work into an existing area of a facility that is not currently within the Safety Basis for that facility;
- 2) Requires a structural addition to an existing building or structure that is designed to house hazardous activities or operations and that should require a new or revised Safety Basis;
- 3) Involves environmental remediation activities in a new geographic area, structure, or building, provided that the work can reasonably be expected to encounter quantities of nuclear materials that would require designation as a Hazard Category 2 nuclear facility per DOE-STD-1027-92, Change Notice 1;

- 4) Requires deactivation, decommissioning, or demolition of a facility or activity within a facility.
- Surveillance Requirement (SR)*: A requirement relating to testing, calibration, or inspection to ensure that the necessary operability and quality of safety SSCs and the supporting systems required for safe operations are maintained, that facility operation is within safety limits, and that LCSs and LCOs are met.
- Technical Safety Requirements* (TSR): The limits, controls, and related actions that establish the specific parameters and requisite actions for the safe operation of a nuclear facility; and, as appropriate for the work and the hazards identified in the facility DSA, includes safety limits, operating limits, surveillance requirements, administrative and management controls, use and application provisions, and design features, as well as a bases appendix.
- Unplanned Shutdown: An interruption of an activity or operation at a facility for which adequate procedures do not pre-exist that would permit safe restart of the facility without the conduct of a readiness review.
- Unreviewed Safety Question (USQ)*: A situation where:
 - 1) the probability of occurrence, the consequences of an accident, or the malfunction of equipment important to safety previously evaluated in the DSA could be increased;
 - 2) the possibility of an accident or malfunction of a different type than those previously evaluated in the DSA could be created;
 - 3) a margin of safety could be reduced; or,
 - 4) the DSA may not be bounding or may be otherwise inadequate.
- Unreviewed Safety Question Process*: The mechanism for keeping a safety basis current by reviewing potential USQs, reporting USQs to DOE, and obtaining approval from DOE prior to taking any action that involves a USQ.
- Vital Safety Systems (VSS). Vital safety systems are safety-class systems, safety-significant systems, and other systems that perform an important defense-in-depth safety function.(DOE-STD-1073-2003)

3 OVERVIEW OF THE READINESS REVIEW PROCESS

This section provides the background and overview of the process for verifying readiness to start up or restart nuclear operations within DOE nuclear facilities. DOE O 425.1D establishes the requirements for verifying readiness. This Standard provides guidance on approaches and methods that are acceptable for implementing the requirements of the Order, and includes information that clarifies and expands on requirements included in the Order.

3.1 History and Purpose of Readiness Reviews.

The Readiness Review process was developed to provide a high degree of confidence that new and restarted DOE nuclear facility operations will be conducted as intended by the design and safety basis. A graded independent review approach is used. Independence was deemed necessary to avoid conflicts of interest that could compromise reviewer ability to objectively determine the status of the proposed operation.

The Readiness Review process was modeled after Naval Nuclear Propulsion and Nuclear Regulatory Commission programs and processes. Reviews are based on records review, observation of equipment and operations, and interviews of relevant personnel. In certain cases, two reviews are required (contractor and Federal) due to the current degree of confidence in contractor assurance systems.

Prior to the formal RR process, the method for DOE to authorize the commencement of new nuclear operations was unclear. Both extremes of readiness verification were possible. cursory reviews would raise safety issues while open-ended, extensive reviews could continue indefinitely introducing significant delay and expense to DOE programs.

The RR process identified in this Standard addresses those issues by providing a well defined process. Future improvements in contractor assurance programs may warrant future streamlining of the RR process.

3.2 Differences Between Operational Readiness Reviews and Readiness Assessments.

Readiness reviews required by DOE O 425.1D are grouped into two types: ORRs and RAs. The differences between an ORR and an RA involve the scope of the review. The scope incorporates the breadth and depth of the review and includes the processes, personnel, and equipment being assessed as well as the nuclear SMPs. The scope of a review is defined by the physical or geographic limits of the review, encompassing the systems, facilities, and operations being started, and the CRs that include the SMPs and describe the geographic attributes that must be assessed (see the discussion of CRs in section 3.4 below). If the geographic limits are accurately defined and all CRs fully evaluated, the assumption of DOE O 425.1D is that all elements necessary for determining readiness to start nuclear operations should have been evaluated. The fundamental assumption is that the ORR scope includes all of these elements. In specific cases discussed in DOE O 425.1D and later in this Standard, some CRs may be excluded following a recent satisfactory independent review.

In the case of the RA, the assumption is that only selected elements need to be evaluated to verify readiness to start or restart nuclear operations. The RA assumes that identified elements of the nuclear safety management infrastructure are in a known condition that is satisfactory to support the nuclear operation to be started; therefore, they need not be reevaluated. The scope of the RA should be carefully defined to evaluate those elements that are unique to the operation being started or restarted and to exclude those elements for which there is reason to believe that existing conditions support the nuclear operation being started. In reality, each RA may have a unique scope that may be as comprehensive as an

ORR or as limited as a simple checklist of a few specific items. The scope of the ORR or RA is defined in the POA, which is prepared by line management and approved by the SAA.

As discussed above, in some cases, both the contractor and DOE conduct RRs. In cases when an ORR is required, the contractor and DOE always conduct ORRs. The DOE ORR may not start until the contractor ORR has been completed, the identified findings are resolved or addressed by an approved corrective action plan, and a formal Readiness to Proceed Memorandum has been submitted to DOE. In the case of an RA, there is more flexibility as to whether it is conducted by a contractor only, jointly (when approved), or independently by both the contractor and DOE. The type of RA and its sequencing should reflect the unique operational circumstances as well as the experience and demonstrated competence of the individual contractor as viewed by the SAA.

The DOE RR is different from a properly executed contractor RR because it assesses the adequacy and accuracy of the contractor RR. Because the contractor RR should provide the substantial basis for acceptance of readiness, the DOE RR should assess the scope of the contractor RR and should include verification by sampling contractor results (e.g., verifying the conduct of operations by walking down procedures, observing normal and off-normal operations or training evaluations, and quizzing personnel on training material). The DOE RR should place significant emphasis on the effectiveness of the contractor's preparations through demonstrations of such activities as normal operations, abnormal events, and emergency drills. Additionally, the DOE RR should assess the readiness of the responsible DOE line organization to safely oversee operations and the effectiveness of coordination among organizations. Note that in some situations discussed later in this standard, a DOE RR may not be required.

3.3 Determining the Level of Readiness Review and Contents of the Startup Notification Report.

DOE O 425.1D requires that every startup or restart of a nuclear facility, operation, or activity be evaluated to determine the required level of RR. For routine resumption of a facility, operation, or activity after a short interruption, if approved contractor operational procedures are used no additional RR is required. For conditions that meet DOE Order section 4.a.2.b, an ORR must be conducted. For all other startups or restarts, an RA is required.

As noted earlier, an RA may be as comprehensive as an ORR or as simple as a checklist. The contractor may conduct a single RA, joint RA (when approved), or conduct an RA followed by a second conducted by DOE. The contractors and DOE are required to develop processes by which they assess the projected startups and restarts to determine the level of RR that is required. As discussed later in this Standard, the methodology used for making the determination should be formal and deliberate. All startups and restarts of nuclear operations must be considered.

Each quarter (or on a periodicity as defined by the PSO) the contractor is required to prepare and submit an SNR to its immediate DOE Line Management that identifies all

startups or restarts requiring a RR. Projecting ahead at least one year, the SNR must propose the level of RR and identify the SAA. The SNR must contain adequate information about each operation and facility to support and defend the recommendations being made. DOE Line Management (HQ and Field) approves their respective activities of the SNR for which they are the SAA. Contractors and DOE should develop procedures for the preparation and content of the SNR. A later section in this Standard provides detailed expectations for the processes to develop, review, approve, and maintain the SNR.

3.4 Core Requirements.

DOE O 425.1D specifies 17 CRs that must be considered when planning each ORR/RA (14 for contractor ORRS/RAs and three additional CR for DOE ORRs/RAs). As stated in the Order: “These CRs verify the readiness of personnel, procedures, programs, and equipment within the scope of the RR to safely start nuclear operations.” The fundamental assumption is that if the programs, operations, equipment, and facilities within the physical or geographic scope of the RR are shown to meet all of the elements of the CRs, readiness to start nuclear operations within the facility has been achieved. It is essential that personnel associated with planning and achieving readiness, as well as those responsible for planning and conducting RRs, have a clear understanding of the CRs and how they relate to readiness to start or restart nuclear operations. In aggregate, the CRs should focus the RR on the following broad functional areas:

- implementation of SMPs to fully and effectively support the nuclear facility and nuclear operations within the scope of the RR;
- implementation and maintenance of appropriate nuclear safety basis documentation that has been prepared and approved in accordance with the requirements of 10 CFR 830 Subpart B for the nuclear facility, including all nuclear operations within the scope of the RR;
- physical readiness of the systems and equipment within the scope of the RR;
- personnel readiness and operational proficiency, including emergency and abnormal alarm response for all nuclear operations within the scope of the RR; and.
- readiness of DOE to oversee contractor nuclear operations within the scope of the RR.

The full breadth and depth of every CR may not be required in every situation to verify readiness to start nuclear operation; therefore, it is important that the RR process recognizes the need to tailor or exclude some parts or all of some CRs. Line management tailors the scope of CRs in the POA. Detailed processes and considerations for developing the POA are described in a later section of this Standard.

3.5 Focus and Sequence of Contractor and DOE Readiness Reviews.

This section provides a summary of the normal sequence of events and deliverables of the RR process. It is required that the contractor and DOE have formal procedures to direct the

process. DOE Field Line Management must concur with the contractor's procedures. The times and durations in this discussion are suggested to permit the RR process to proceed efficiently with minimum impact on the critical path to the start of nuclear operations.

The RR process starts upon the determination that a nuclear facility, activity, or operation is to be started or restarted. At that time, the level of the review is determined and the startup is added to the SNR. At least six months before the projected date for achieving readiness, contractor line management should prepare the POA. The POA describes the scope of the RR, lists prerequisites for achieving readiness, and proposes the RR Team Leader. The contractor POA should be submitted four to six months prior to the projected start of the RR.

If DOE is also required to conduct an RR, a DOE POA must also be prepared. The DOE POA must describe the scope of the RR, prerequisites for the DOE RR, and the proposed RR Team Leader.

While it is recognized that the specified timing for preparation of the POA may not always be possible, this timing should be the stated goals of the local procedures. This timing for submission of the POAs permits adequate time for review, comment and approval while not inhibiting the ability of the Team Leader to prepare the IP from an approved POA.

Upon approval, the POA is provided to the approved Team Leader to prepare for the RR. The Team Leader assembles a review team to assist in the preparation of the IP, which includes the CRADs that the team members use to conduct the review. Together, the CRADs incorporate the complete review scope specified in the POA. The IP specifies the methodology for conducting the review and the process and format for documenting the review.

As a part of achieving readiness, the contractor may conduct a management self-assessment. Contractor efforts to achieve readiness may be conducted in accordance with a project management plan, or other project management document. Such management documents should include all elements of the RR scope specified in the POA. Similarly, DOE Line Management achieves readiness to oversee contractor operations. A management self-assessment of DOE Line Management, including management programs to oversee contractor operations, may also be appropriate.

When the contractor has achieved readiness to start or restart a nuclear facility, activity, or operation within the scope of the RR, a formal declaration of readiness is provided and the Team Leader is directed to conduct the review. When a DOE RR is required, the declaration of readiness (the Readiness to Proceed Memorandum) for the DOE RR is not submitted until after the contractor RR, and planning for resolution of all identified findings, are complete.

The RR team conducts the review when the declaration of readiness is received and when directed by the SAA. The RR Team Leader submits the final report to the SAA as a basis for approving the startup or restart. The SAA should issue the final report to line management. Identified findings are designated by the review team as prestart

(i.e., requiring resolution before the start of nuclear operations) or post-start (i.e., can be corrected after startup or restart of nuclear operations). Line management is responsible for developing corrective action plans to resolve the findings and determining when the findings are resolved. Development of acceptable corrective action plans for post-start findings must be completed before the SAA grants authorization to start or restart nuclear operations.

3.6 DOE Headquarters and Field Line Management Oversight Responsibilities.

Verifying readiness to startup or restart nuclear operations in DOE nuclear facilities is an important element in the defense-in-depth process to ensure safety of nuclear operations. As a result, DOE O 425.1D specifies numerous oversight responsibilities of the processes by DOE Field and DOE Headquarters Line Management.

DOE Field Line Management must prepare implementing procedures and concur with contractor implementing procedures in accordance with the Contractor Requirements Document (CRD) in DOE O 425.1D. DOE Line Management (including DOE Headquarters, in some instances), must review and approve the SNR. DOE Field Element Line Management should ensure that all required elements are included in these process documents. Process documentation such as SNRs, POAs, IPs, and RR final reports must be provided to the appropriate PSO via the appropriate line management chain of command. The PSO provides these documents to the appropriate CTA, as well as the Office of Health, Safety and Security (HSS) for information and oversight action as appropriate.

As part of the process for granting authorization to start nuclear operations within the nuclear facility, the adequacy of corrective actions should be assessed. DOE Field Line Management must evaluate the adequacy of the contractor's actions for achieving readiness. DOE Headquarters Line Management must oversee DOE Field processes for verification of readiness to start up and restart nuclear facilities, in accordance with DOE O 226.1A, *Implementation of Department of Energy Oversight Policy*.

3.7 Approval to Start Up or Restart Nuclear Operations.

The end result of the process for verifying readiness to start up or restart nuclear facilities is the authorization to start nuclear operations within the nuclear facility. DOE O 425.1D specifies the SAA who can grant authorization to start nuclear operations. The SAA also approves the SNR and the POA, and directs the start of the RR. If no DOE RR is required, the SAA may be a contractor manager. In such a situation, the SAA is designated by the SNR, which is always approved by a DOE official.

Following completion of the required RR, the team prepares a report that makes a recommendation as to the readiness of the nuclear facility to start nuclear operations. In most cases, the report includes prestart findings that must be resolved before nuclear operations can be authorized to start. Formalized processes are required to evaluate the findings and plan their resolution. When the corrective action plans are developed and approved and the prestart findings are resolved, the SAA authorizes the start of nuclear

operations within the nuclear facility. In situations when the SAA is a DOE line manager, the contractor submits a Readiness To Proceed Memorandum following completion of the contractor RR, develops corrective action plans for the findings from the RR, and resolves all prestart findings with the possible exception of a short list of open issues that must be resolved prior to the start of nuclear operations.

After the Readiness to Proceed Memorandum has been submitted, DOE conducts a RR if required or authorizes the startup or restart of the nuclear facility, activity, or operation once the items on the list of open issues are resolved. When the contractor is the SAA, the contractor line management provides formal documentation to the SAA, which should include the RR report, a corrective action plan to address the findings, and certification that all prestart findings are resolved. With that documentation submitted and accepted, the contractor SAA can authorize the start of nuclear operations.

The SAA authorizes the start or restart of the nuclear facility, activity or operation. In most instances, a startup plan to full operations is suggested. A Startup Plan should provide a formalized and structured initial operation. Compensatory measures, including increased supervisory oversight, may be defined. Final equipment testing may be completed if actual materials are required to be used for the testing. The details of the initial startup period are defined in the Startup Plan that is evaluated through review and observation of implementation during the RR (CR 11).

4 DETERMINING THE SCOPE AND THE LEVEL OF THE READINESS REVIEW

DOE O 425.1D requires that the contractor evaluate the need to perform a RR prior to startup and restart of all nuclear facilities, activities, or operations. This requires that a decision be made as to the requirement for a RR for every startup of a nuclear facility, activity, or operation whether following a weekend shutdown, following a major modification, or starting a new facility. The Order recognizes that for resumption of operations following a short interruption for which approved operating procedures with appropriate attributes are applicable, no additional RR is required. However, the contractor should have a documented decision process for determining the requirement for, and the level of, the RR. Contractors and DOE must have approved procedures that describe the processes by which all requirements of the Order must be accomplished.

DOE O 425.1D also requires that, on a quarterly basis (or at a frequency as specified by the PSO) the contractor prepare and submit for DOE approval an SNR that lists each projected startup of a nuclear facility for which a RR is required. For each startup listed in the SNR, the level of RR should be specified with sufficient information to justify the recommended review level. A part of the process for gaining the necessary information upon which a recommendation can be made is to determine the unique aspects of the startup. The details of the situation surrounding individual startup or restart should provide a basis for making a recommendation as to the level of the RR, as well as the scope of the RR. The SNR must also recommend the identification of the SAA, which may also be based on the scope and type of RR. Detailed discussions of the requirements and contents of the POA and SNR are provided later in this Standard.

Readiness reviews required by DOE O 425.1D are grouped into two types: ORRs and RAs. The differences between an ORR and an RA involve the scope of the review. The scope incorporates the breadth and depth of the review and includes the processes, personnel, and equipment being assessed as well as the nuclear SMPs and the depth or comprehensiveness of the evaluation of each individual SMP. The scope of a review may be defined by the physical or geographic limits of the review, encompassing the systems, facilities, activities, or operations being started or restarted, and the CRs that include the SMPs and describe the geographic attributes that must be assessed (see the discussion of CRs in paragraph 3.4. above). If the geographic limits are accurately defined and all CRs fully evaluated, the assumption of DOE O 425.1D is that all elements necessary for determining readiness to start nuclear activities or operations have been evaluated. The fundamental assumption is that the ORR scope includes all of these elements. In specific cases discussed in DOE O 425.1D and later in this Standard, it is possible to exclude some CRs following a recent satisfactory independent review.

In the case of the RA, the assumption is that only selected elements need to be evaluated to verify readiness to start or restart a nuclear facility, activity, or operation. The RA assumes that identified elements of the nuclear safety management infrastructure are in a known condition that is satisfactory to support the nuclear operation to be started; therefore, they need not be reevaluated. The scope of the RA is carefully defined to evaluate those elements that are unique to the operation being started or restarted and to exclude those elements for which there is reason to believe that existing conditions support the nuclear facility, activity, or operation being started or restarted. In reality, each RA has a unique scope that may be as comprehensive as an ORR or as limited as a simple checklist of a few specific items. The scope of the ORR or RA is defined in the POA, which is prepared by line management and approved by the SAA.

As discussed above, in some cases, both the contractor and DOE conduct independent RRs. In cases when an ORR is required, the contractor and DOE always conduct ORRs. The DOE ORR may not start until the contractor ORR has been completed, the identified findings are resolved or addressed by an approved corrective action plan, and a formal Readiness to Proceed Memorandum has been submitted to DOE. In the case of an RA, there is more flexibility as to whether it is conducted by a contractor only, jointly (when approved), or a contractor and DOE and its sequencing.

The specific elements and processes of the site procedures vary according to the history and culture of the site as well as the level of maturity of the startup processes. However, there are some attributes and considerations that should be included in every site's procedures and processes for determining the scope and level of RR:

- A. Every startup must be considered. A process should be in place to permit site line management to determine which startups meet the criteria to utilize approved operating procedures. The process must consider the length of the shutdown. Operator proficiency and the degree to which that proficiency is maintained should be considered. The process should also consider the details of any maintenance performed and the reliability of post-maintenance retest procedures and documentation. Also, the process should consider any other changes that have occurred during the

shutdown such as physical or procedure modifications. The process should identify the person authorized to make the determination, the documentation required, and the process for overseeing results.

- B. The determination that a restart does not require a RR should include the following considerations:
- The restart can be conducted utilizing contractor-approved operating procedures that provide specific direction for operating systems and equipment during normal operations. The procedures should verify that systems are properly aligned and prepared to start or restart the facility, activity, or operation. Maintenance procedures and work packages should be demonstrated to be complete as a part of verifying readiness to start or restart the facility, activity, or operation. Appropriate preoperational checks should be part of the contractor-approved operating procedures that provide the specific direction for operating systems, and.
 - The restart is a resumption of routine operations after a short interruption such as maintenance activities governed by existing maintenance procedures or process.

The determination as to whether the last condition is met should include the following in aggregate:

- 1) The interruption is less than six months for Hazard Category 1 facility, and less than twelve months for Hazard Category 2 and 3 facilities.
- 2) All maintenance work should be clearly defined in work packages; post-maintenance testing was thorough and completed with satisfactory results. All work packages should be verified to be complete and closed or evaluated and determined not to affect the ability to resume safe operations.
- 3) Operating staff turnover.
- 4) Modifications that have been accomplished during the shutdown period which require process procedure changes or substantive safety basis changes should be considered. Process changes that are complex, procedure changes that require new or significantly different operator actions, changes to safety basis that require new controls, new hazards and hazard controls, and first time startup of new systems are examples of modifications that should normally require a RR.
- 5) The number and significance of updates to the safety basis should be considered when making the determination that no RR is required.
- 6) Changes to operational procedures should be limited to a number and criteria specified in local implementing procedures. The local procedures should require consideration of the significance and complexity of the changes and the underlying processes. For any procedures that are changed, all implementation training should be completed and documented for all members of the operational and support staff.

- If required by local procedures, the process should retain any necessary documents or records that will allow a Facility Representative or other designated DOE representative to identify restarts or startups which the contractor process determined to not require a RR.
- C. For every startup or restart that requires a RR, site procedures and processes that form the bases for the contractor's recommendation of the required level of RR should include the following attributes:

[Note: When the startup or restart clearly meets one of the criteria for conducting an ORR, it may still be useful to evaluate the following areas to assist in defining the scope of the ORR and the preparation of the POA. In some instances, it may not be clear whether the criteria for an ORR have been met. A possible situation is when a new mission is introduced into a nuclear facility but the DSA and TSR are changed only to accommodate the new mission. In that situation, it may be necessary to evaluate the degree to which the new mission utilizes the existing infrastructure to determine whether a full-scope ORR is appropriate. The fact that the DSA and TSRs were only changed rather than completely replaced should not immediately preclude consideration of the need for an ORR.]

1. Hazard Category of Facility or Area where Startup or Restart should be Performed. Identify the Hazard Category as it currently is defined for the facility, building, or area in which work is intended to be started or restarted. Identify the Hazard Category of the activity being started or restarted in an existing facility or area.
2. Startup or Restart Safety Basis Impacts. If there is an updated or revised safety basis associated with the startup, identify the magnitude of the changes. If a change to the safety basis has not been made, evaluate the activity as it is currently planned against the effective safety basis using the USQ process. If changes to safety basis documents should be needed, the elements of the activity should be described that drive these changes and the anticipated approach to making the changes.
3. Startup or Restart Hazards. Identify and evaluate the important hazards associated with the facility, activity or operation being started or restarted. Identify and evaluate the nature of the hazards and the likelihood of their occurrence, compare them with existing hazards, and indicate whether or not they are new to the site, facility, building, or area in which the startup or restart is intended to be conducted. Hazards to be considered that affect the risk or consequences of the nuclear activity being started or restarted should include non-routine, industrial, chemical, radioactive, nuclear criticality, and nuclear material hazards.
4. Startup or Restart Complexity. The impacts of expected safety basis changes should be considered. Identify and evaluate the complexity of the startup or restart. Items to be evaluated include whether significant changes to equipment or processes are needed in order to support the activity being started or restarted. The number and complexity of procedures that require changes or development and any required training and qualification changes should be considered.

5. Control Changes Needed to Support Startup or Restart. Identify and evaluate the nature of the changes to existing controls or new controls needed to conduct the activity or process that is being started or restarted. This attribute should consider the complexity of new or modified controls such as whether multiple new or modified TSR-level controls are required associated with the addition of safety-class or safety-significant equipment or significant modifications to existing TSRs.
6. Status of SMPs. Evaluate the nature of changes required for each SMP to support the startup or restart. Each SMP should be considered individually with a listing of the changes or actions necessary to achieve readiness to commence nuclear operations. The aggregate effect of the SMP status should be considered when determining the level of RR.
7. Prior Startup or Restart Experience. Identify and evaluate any facility, building, or area where the same or similar activities or operations have been performed. Information that is helpful to evaluate includes similarities with existing equipment, hazards, procedures, training, qualification, and processes. It is also important to include the time between the startup of the first and second similar facilities. The greater the time since the original RR, the less credit that should be taken for conditions that were evaluated during the original RR.
8. Justification for Recommended Review Level. Based on the evaluation of the preceding attributes, determine a recommendation for the level of RR. Justification should be provided for the recommended level, connecting the recommended level to the attributes described above. DOE O 425.1D is specific as to the conditions that require an ORR. In most cases, it is clear when these conditions are met and an ORR is recommended. When the circumstances of the startup do not meet the criteria for an ORR, an RA is normally required unless the conditions for a routine restart are met. When an RA is indicated, the level of the RA should be determined by analyzing the information gathered.
9. Determination when a DOE RA is Required. In selected situations, DOE O 425.1D requires both a contractor and a DOE RA. In the remainder of situations when an RA is required, the specific conditions of the startup and the site situation should be evaluated to determine whether a DOE RA is required. The unique aspects of each startup discussed above should be considered when making the determination as to whether a DOE RA is required in addition to the contractor RA. An additional consideration should be the record of the site contractor and individual facility management in successfully achieving readiness to start nuclear operations and the accuracy of the subsequent contractor RRs. The overall confidence of DOE site management in the site contractor's processes, execution, and past record should be an important consideration in the decision whether to require a DOE RA. Only during a DOE RA or joint RA (when approved) should the DOE site management processes and personnel to oversee contractor operations be verified. Therefore, the decision to not require a DOE RA should be reached when it can be confidently

shown by other means that the DOE Site Management programs and processes to oversee contractor operations are current, compliant, and effective. As noted later, when a DOE RA is not required and DOE is the Startup Authorization Authority, DOE Field Element Line Management must verify readiness to oversee contractor operations before the Start of nuclear operations is authorized.

- 10 Recommendation of the SAA. Site procedures should include a process to identify the appropriate recommendation of the SAA. Contractor procedures should discuss which Contractor Line Manager positions may be proposed as SAA. In every case, the SAA should be a senior operational line manager who is not directly responsible (i.e., one or more line managers are “between” the proposed SAA and the manager of the facility) for the facility in which the RR is to occur.
- D. The process by which contractors determine the appropriate RR should contain the following attributes:
1. Consistent Implementation. The process should be accomplished by a trained, dedicated management organization such as a startup group or startup manager. The process should ensure consistent RR level determination across a site.
 2. Structured Documentation is Used and Maintained. Site readiness procedures should provide checklists or decision guides to maintain consistency throughout the process. These procedures must be concurred with by the local DOE office.
 3. Identify levels of RA. If local procedures include provisions for predetermined levels of RAs, they should indicate whether a DOE RA is required and identify the contractor organization responsible for conducting the RA. The procedures may specify that a checklist tailored to the specific startup or restart as prepared by the RA Team Leader is an acceptable Implementation Plan. The options chosen by the site contractor and accepted by DOE local office should be documented in the procedures, and the process as to how the decision is reached should be clear.
 4. Specify Feedback and Improvement Mechanisms for the Process. Site procedures should include a provision for oversight and assessment by the contractor line as well as independent oversight. Site records of the process should support and enable routine oversight by both contractor and DOE organizations.
 5. Process to Identify Routine Restarts not Requiring a RR. Site processes should include provisions for determining that a restart meets the criteria for using approved operating procedures. Site procedures should include a process for making a determination in an uncertain situation and provide for documenting the basis for decisions that support no RR. The records of these determinations should be available for routine review by contractor and DOE oversight personnel.
 6. Basis for the Readiness Review POA. The contractor process should require that the scope of the POA reflect the issues and changes identified and documented

during the process for determining the level of RR. The documentation developed during the determination process could be a reference or attachment to the POA to justify the proposed scope.

- E. DOE Field Element Line Management must develop procedures that define the processes to be utilized to implement the responsibilities of this Order. The following actions and responsibilities should be included:
1. DOE Line Management must concur with the contractor procedures. The DOE processes should discuss the mechanism for obtaining this concurrence and the management personnel who recommend or provide the concurrence.
 2. DOE must approve (if acceptable) the contractor proposals submitted in the SNR. The DOE processes should discuss how this approval should occur and identify the management personnel who recommend or provide the approval. The DOE procedure should discuss how the adequacy of the processes and personnel should be determined.
 3. DOE should have a process for determining the scope of DOE RRs (when required) that uses the results of the contractor determination of the required review level. In particular, DOE must include the three DOE-specific CRs unless a specific basis is provided as to why the CRs need not be included in the RR.
 4. DOE processes should specify the considerations and the basis for the decision as to whether a DOE RA should be required.
 5. DOE Field Element Line Management must review and concur with contractor procedures for implementing the requirements of the CRD. DOE Field Element Line Management must ensure that the contractor properly implements the requirements of the CRD of the Order. Specific elements of DOE oversight must include the elements in DOE O 425.1D Section 4.g.(2).
 6. DOE should establish a formal process to evaluate, endorse, and approve contractor readiness program documents, including the SNR, POA, corrective action plans and closure packages, and Readiness to Proceed Memorandum.

Many sites have developed and successfully used procedures, checklists, and decision strategies to support determination of the requirement for, and level of, RRs. Examples of these procedures are available on the DOE Readiness Review website.

5 STARTUP NOTIFICATION REPORTS

The responsible contractor must submit an SNR in accordance with approved contractor procedures, or change to an existing SNR, that identifies all known facility, activity, or operation new starts and restarts for which a RR is required. The report identifies the facility and specifies whether an ORR or RA is required to verify readiness to commence

or resume operations. The remarks should describe the basis for the recommended actions based on the requirements in DOE O 425.1D. For the SNR to be an effective tool for managing the startup and restart process and ensuring agreement in the process between the contractor and DOE, the required, approved implementing procedures governing these reports should contain the following elements:

- A. The SNR updates the previous quarter's information for startups and restarts that have not yet occurred and adds information for each startup or restart that has been identified since the last report. The SNR must project startups and restarts at least one year ahead. The purpose is to establish early, and at the appropriate level, the startup authorization authority and the appropriate RR methodology for the startup or restart. Changes late in the process routinely lead to delays and additional problems.
- B. Information that is mandatory and suggested to be included in the SNR for each startup or restart is listed in Table 5.1. This information allows DOE to make a timely and informed decision, and confirms that the requirements are understood and implemented.
- C. Each SNR must be reviewed and approved by the DOE Field Element Manager. When the SNR contains some startups or restarts for which the SAA resides within the PSO or the Office of the Secretary, the Field Element Manager should approve those startups or restarts for which he/she is the SAA and provide a recommendation regarding approval, and forward the SNR to the PSO via correspondence for approval of those startups for which Headquarters is the SAA. This ensures agreement at the appropriate level for the startup decision, thus reducing the possibility of last-minute changes of direction, which may be quite costly.
- D. Each SNR, including the Field Element approval and/or recommendations, must be forwarded to the PSO, site Lead Program Secretarial Officer or Cognizant Secretarial Officer (CSO), as appropriate. The PSO or CSO forwards these documents onto the appropriate Central Technical Authority (CTA), and HSS for information. The individual site and Headquarters procedures should determine the processes for SNR review and comment.
- E. Contractor RR activities to start or restart operations requiring an ORR or RA must not commence until DOE has approved the proposed RR method and SAA. Every nuclear startup or restart for which DOE O 425.1D requires a RR must be included in the SNR. Other routine resummptions of operations may be conducted without a RR using normal contractor startup or restart procedures if such specific procedures are in place. Contractor routine procedures must not be developed to avoid a properly scoped RA.
- F. If a startup or restart requiring a RR is identified that is not listed on the current SNR that might occur before submittal of the next periodic SNR, an updated SNR should be submitted to ensure timely agreement on the details of the RR process for that startup or restart.

- G. To ensure that the SNR contains all the information required by the Order in a manageable and consistent format, contractor procedures should require that the SNR include the information listed in Table 5-1:

TABLE 5-1 Information to be Included in the SNR
***- mandatory items**

Index	Item	Description
1.	SNR Unique Identifier	This identifier should contain: <ul style="list-style-type: none"> • DOE Secretarial Office operationally responsible for this SNR item; • DOE Field Element that approves the SNR (note that this can be a Headquarters organization); • Contractor; • Fiscal year of initial submittal on the SNR; and • Sequential number for the specific item on the SNR for that fiscal year. For example: NA-YSO-B&WY12-2007-001
2.	Facility and Hazard Category*	The physical location where the startup or restart is intended to take place along with its Hazard Category. This may be a specific building, a complex of various buildings, or a transportation vehicle. It should be designated at the same level as the safety basis that applies apply to the startup or restart.
3.	Short Title	A brief descriptive sentence describing the startup or restart in general terms.
4.	Date of Last Operation*	For restarts only, this is the date nuclear operations were last performed in the location where they are intended to be restarted.
5.	Reason for Non-Operation*	The reasons the facility or activity is not operational (e.g., lack of program work, maintenance, outage, safety concerns, event, new process)
6.	Projected Startup Date*	The month and year that the startup or restart is projected to be authorized for operation. Specific annotation should be included if the date has changed from the previous estimate and the reason for the change. The explanation may be included with other comments in Block 11.
7.	Projected date for submittal of POA*	The month and year when the contractor POA is intended to be submitted. This action should occur four to six months prior to the start of the RR.
8.	Proposed Type of RR*/ Justification for proposed type of RR*	The type of readiness verification proposed (i.e., ORR or RA). Also indicate whether a DOE RR is required or recommended. Provide the basis for why the proposed RR is appropriate. This should be as specific as possible to facilitate DOE review and approval
9.	Proposed Startup Authorization Authority *	The specific position that is proposed to authorize the startup or restart after successful completion of the readiness verification.
10.	Approval Status	This entry reflects that the particular SNR item has either been previously approved or that it is being submitted for DOE approval. It may also be used to indicate that the specific item has been completed, in which case it would be removed from the next update.
11.	Description & Comments	A description of the startup or restart including hazards, complexity, and impacts on items such as the safety basis. This should consider classification elements and a classified supplement may be used if needed.

Index	Item	Description
		The intent is to provide sufficient information to allow for DOE approval of the SNR item. Comments may include such items as the current status (e.g., testing, training, management self-assessment (MSA), RA, or ORR) and the basis for changes such as the projected startup date.
12.	Contact	The name, phone, number, e-mail address, or other means to reach the person most knowledgeable of the details of the startup or restart.

6 ACHIEVING READINESS

The responsibility for achieving a state of readiness to safely conduct nuclear operations resides solely with the line management of the facility or programmatic line management. The CRs described in DOE O 425.1D provide a summary of the critical issues that should be considered in preparation for operations. In general terms, readiness applies to the areas of personnel (e.g. training, proficiency, numbers), equipment (safety and process systems), and safety management programs (e.g. safety basis implementation, operational formality, maintenance, ISM, quality).

For complex projects, it is useful for the project to formally map the CRs to specific actions that are intended to meet the CRs. Required actions can then be scheduled as part of the project plan so that an integrated plan exists to achieve readiness as the project nears completion.

DOE O 425.1D provides requirements for specific prerequisite actions to take to improve the likelihood of a successful startup or restart. Establishing these prerequisites and verifying their completion guide the process of achieving readiness as well as contribute greatly to its success. A critical success factor is the rigor with which line management determines that the prerequisites have been met and readiness has been achieved. A robust line readiness verification or MSA program that is part of or in addition to the site Quality Assurance (QA) Management Assessment requirements may be a key element in the ability to determine that readiness has been achieved.

Achieving readiness to start nuclear operations is not specifically within the scope of DOE O 425.1D and this Standard. Rather, the purpose is to verify that readiness has been achieved to start nuclear operations. However, experience has shown that unless the contractor clearly understands the important elements of planning and achieving readiness, the contractor's RRs may not be successful. It is therefore important to discuss the important elements of a process for planning and achieving readiness in this Standard. When the process is understood and followed, the probability of a successful and timely RR is increased.

7 ROLES AND RESPONSIBILITIES

7.1 Contractor Line Management.

Contractor line management should plan for and achieve readiness to conduct nuclear operations. The prior section provide some lessons learned and successful practices for

achieving readiness and should be considered for incorporation into the processes and procedures.

DOE O 425.1D requires that contractor line management must develop procedures to define the processes that must be used to implement the responsibilities of this CRD. These procedures must be submitted to DOE Line Management for concurrence. Contractor line management roles and responsibilities, as specified in DOE O 425.1D should be further defined in the contractor procedures to include the following:

- Identify each startup and restart of a nuclear facility and propose the level of RR required, in accordance with contractor procedures discussed above.
- Prepare and submit to its immediate DOE Line Management a quarterly SNR (or a frequency as specified by the PSO) that includes each startup or restart for which a RR is required.
- In order to ensure adequate preparation for the RR, contractor procedures should suggest that six months prior to the projected date for starting the RR, a POA should be prepared and submitted.
- Support the Team Leader who is approved in the POA to lead the RR; make the Team Leader available; make available and support the selected team members, and support the preparations for the RR as requested by the Team Leader.
- Verify that readiness has been achieved by verifying that all prerequisites from the POA have been met, all punch-list items have been resolved to support operations, and that all actions from the project management plan for achieving readiness have been satisfactorily completed. This action may frequently be accomplished through use of an MSA process.
- When readiness to start nuclear operations has been achieved, submit a formal written statement to senior contractor management stating that readiness has been achieved and requesting that the contractor RR be started. Any open items that require resolution prior to starting nuclear operations must be identified; this should be a short and manageable list. Contractor line management has verified that the 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 Contractor's ORR team to review the closure process.
- Direct the contractor RR to start and support it as necessary.
- To optimize the conduct of the RR, contractor management should: track the progress of the RR. Recognize and resolve issues and problems as they occur. Provide knowledgeable counterparts to each RR team member. Gather information from the counterparts that should enable management to respond to issues and inadequacies identified during the RR. Acknowledge that support for the RR should be a full-time

job for the facility management team and assigned counterparts to achieve optimum success.

- Resolve findings identified during the RR in a competent and thorough manner. Prepare comprehensive corrective action plans to resolve pre-start and post-start findings. Assign adequate resources to accomplish the actions identified in the corrective action plans. Thoroughly review the actions committed to and verify that all actions were completed. Senior management should be involved in the process of closing out findings identified during the RR.
- If DOE is the SAA, prepare the Readiness to Proceed Memorandum and forward to DOE with all required enclosures.
- If DOE conducts a RR, support that review as discussed above.
- When the SAA authorizes the start of nuclear operations, commence operations in accordance with the provisions of the startup plan (see Appendix 2 for additional guidance concerning startup plans). Follow the sequence of deliberate operations and oversight identified in the startup plan until proficiency has been gained and the hold points of the startup plan have been met, at which time full and unrestricted operations may be appropriate.
- Track and complete the corrective action plans for post-start findings from the contractor and DOE RRs.
- Evaluate process results to identify lessons learned and improvements that may be appropriate for future startup efforts.

7.2 DOE Field Element Line Management.

DOE Field and Headquarters Line Management must prepare procedures that define processes for implementing the requirements of DOE O 425.1D. The procedures should assign responsibilities to individuals having competence commensurate with their assigned responsibilities. Other sections of this Standard provide expectations and attributes of the procedures.

DOE Field Element Line Management must review and concur with contractor procedures for implementing the CRD requirements in DOE O 425.1D and must ensure that the contractor properly implements CRD requirements. Key elements of an oversight program must include:

- Ensuring that the contractor prepares and submits quarterly SNRs that accurately reflect all required RRs;
- Ensuring that the contractor develops a POA that adequately defines the scope of the RR;

- Ensuring that the contractor POA specifies the appropriate prerequisites for commencing the contractor RR;
- Evaluating the qualifications of contractor RR team members;
- Evaluating the adequacy of the contractor RR;
- Verifying that the contractor RR final report adequately describes the review and contains sufficient detail to support its conclusion regarding startup or restart;
- Ensuring that the contractor and DOE have satisfactorily resolved all pre-start findings identified during the RRs prior to startup or restart of the facility; and
- Ensuring that the contractor and DOE have developed and implemented approved corrective action plans for post-start findings;

DOE Elements should achieve and verify their readiness to oversee the contractor operations that are being started or restarted. DOE oversight programs should be assessed and updated as necessary. DOE Field Element endorsement of the contractor Readiness to Proceed Memorandum should document its conclusion that it is ready to conduct this oversight. Additional responsibilities can include:

- approval or endorsement of the SNR;
- preparation of a POA for the DOE RR;
- review and approval or endorsement of, the contractor POA;
- routine oversight of the contractor processes for achieving readiness;
- oversight of the contractor RR;
- achieving readiness for DOE to oversee contractor operations;
- approval of contractor corrective action plans for findings from DOE RRs;
- verifying closure of findings from the contractor and DOE RRs;
- evaluation and endorsement to the SAA of the contractor Readiness to Proceed Memorandum when the SAA is a DOE official; and,
- oversight of initial contractor operations, with particular emphasis on compliance, and with the limitations and compensatory measures specified in the approved contractor startup plan.

7.3 DOE Headquarters Line Management, including Oversight Organizations.

DOE Headquarters organizations must develop procedures that define the mechanisms by which they oversee the RR process. These procedures describe the flow of process documentation to Headquarters for review and approval. Headquarters roles and responsibilities should be clearly defined in these procedures.

DOE Headquarters Line Management oversee DOE Field processes to verify readiness to start up and restart nuclear facilities in accordance with DOE O 226.1A, *Implementation of Department of Energy Oversight Policy*, DOE O 425.1D, and the provisions of this Standard.

DOE O 425.1D, Section 5.b specifies that DOE independent oversight of the ORR process is HSS's responsibility. To ensure that startups and restarts of DOE nuclear facilities proceed in a timely fashion, it is incumbent upon the contractors, Field Element Managers, and Secretarial Officers to ensure that the PSO, site Lead PSO or CSO, as appropriate, the CTAs, and HSS are provided with appropriate documentation to review throughout the process. In its role of independent oversight, HSS may provide comments to these organizations in a timely fashion to ensure that concerns are addressed with minimal impact on the startup and restart schedule.

7.4 Office of Health, Safety and Security.

In addition to the general Departmental responsibilities specified in DOE M 411.1-1C, *Safety Management Functions, Responsibilities, and Authorities Manual (FRAM)*, HSS exercises independent oversight of the startup and restart process for nuclear facilities. This responsibility specifically entails the following:

- In coordination with the PSO, may perform independent reviews of startup and restart activities as appropriate and provides results of these reviews to the PSO/CSOs for resolution.
- Reviews and comments as appropriate on the PSO, Field Element, and contractor procedures for startup or restart of nuclear facilities and provides results of these reviews to the PSO/CSOs for resolution.
- Provides timely reviews and comments on SNRs, contractor and DOE POAs, IPs, and final reports for startup or restart of nuclear facilities.

7.5 Readiness Review Team Leader.

The RR Team Leader is nominated by line management in the POA and approved by the SAA. The roles and responsibilities of the Team Leader are the same for ORRs and RAs. The qualifications for the RR Team Leader should include:

- technical familiarity with the activities and functional areas being reviewed;
- previous performance-based review experience or training;

- demonstrated leadership and managerial skills, including seniority in relation to the members of the RR team, to permit smooth management of the RR team; and
- RR experience or formal training; and,
- knowledge of facility, activity or operation.

The Team Leader and Senior Advisor must not be from offices assigned direct line management responsibility for the work being reviewed. Any exceptions require approval of the startup authorization authority.

The extent of the Team Leader's responsibilities may require that he or she be formally released from other duties. The RR Team Leader should keep management informed of the team's progress and findings.

The RR Team Leader is responsible for managing and conducting the RR process. The Team Leader selects the RR team members to conduct the RR. The information in the RR POA guides the Team Leader in defining the areas requiring inclusion and the number of team members needed. 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. Appendix 3 includes an example form for use in consolidating the required information.

Team member qualifications must be determined and documented by the Team Leader. The Team Leader must document the team members' freedom from a conflict of interest in area that they are assigned.

Each team member must meet the minimum qualification requirements, as discussed in the team member section.

The Team Leader is responsible for the following activities, each of which is discussed in more detail in later sections.

- Ensure that the team prepares the IP in accordance with the scope (breadth and depth) defined in the POA. RR team members and senior members assist in developing the IP.
- Approves the RR IP. Although copies are provided to line management and DOE Headquarters for information, the responsibility for approving the IP rests solely with the Team Leader.
- Executes the RR in accordance with the IP. Manages the preparation, approves and submits the RR final report. Sections 8.9 and 9.10 discuss this report.

Note that DOE-HDBK-3012, *Guide to Good Practices for ORRs (ORR), Team Leader's Guide*, provides information useful to a RR Team Leader in preparing for and conducting an ORR or RA. The handbook contains discussion on suggested processes for preparation and conduct of the review. It also contains a lessons-learned section that is a compilation

of the lessons learned from conducting RRs. The Handbook is a useful guide for both experienced Team Leaders and those with less experience. Additional information to assist the Team Leader in preparing for the ORR is available on the DOE Readiness Review website.

7.6 Readiness Review Team Members.

Readiness reviews teams are comprised of individuals representing disciplines as necessary or as appropriate. Team members are individually chosen by the Team Leader. The Team Leader should ensure their backgrounds demonstrate technical competence and experience in all subject areas and SMPs within the scope of the review. The RR team should be technically competent to assess all functional areas and CRs defined in the POA. The number of members should be determined by the scope of the RR and the size and complexity of the facility.

Each team member should meet the following minimum qualification requirements:

- Technical knowledge of the area assigned for evaluation. The knowledge should include experience working in the technical area.
- Knowledge of performance-based assessment processes and methods. This knowledge may be gained through experience as an auditor or inspector or through training that is evaluated as acceptable by the Team Leader.
- Facility-specific information that may be gained through a combination of required reading and facility tours and presentations.
- Independence, in that no team member may review his or her own work or work for which he or she was the responsible manager.
- Ability to commit the necessary time and effort to fully support the RR schedule. The Team Leader should interact with each prospective team member's management to gain support for the commitment to the RR team (i.e., the team member's management commits to the team member's full support of the RR). It is critical to the success of the RR that the managers of the team members provide for this level of support for the RR. The Team Leader should recognize this requirement when selecting the team members.

Team members are responsible for assessing the adequacy of readiness by conducting reviews in selected areas important to the safe startup or resumption of operations. The team members should assist the Team Leader, and senior members if applicable, in defining the depth of review in their assigned areas; documenting the criteria and review approach for their assigned areas, subject to approval by the Senior Advisors and the Team Leader; attending team meetings to coordinate activities with other team members; documenting their own activities, findings, and conclusions in a manner specified by the Team Leader and the Senior Advisors; and concurring with the content of RR final report

in the areas for which they were responsible. If necessary, any differing opinions should be addressed in the report

Representatives from operations, environment and regulatory compliance, safety, engineering, technical, and quality assurance organizations on site, but not directly responsible for the conduct or supervision of the work being reviewed, may be selected as team members. An individual's knowledge of the particular systems, processes, safety documentation, or facility, as well as knowledge of the RR process, should be considered in determining his or her fitness as a member of the team.

Team members should be able to conduct a broad range of tasks, including, but not limited to, the following:

- Developing or providing input to the CRAD for the functional area to which he or she is assigned;
- Reviewing as-built drawings and other applicable procedures and documents;
- Compiling supporting documentation to prepare for and conduct the RR;
- Determining whether the activity complies with applicable environmental requirements and Federal and state laws and regulations;
- Conducting the review in accordance with the criteria and performance objectives in the IP or as assigned by the Team Leader;
- Concurring with the determination of readiness to commence nuclear operations and the conclusions presented in the RR report in the team members area of assessment;
- Submitting completed certification documentation for review and approval; including preparing supporting or special reports;
- Working with other RR team personnel to ensure timely resolution of the unresolved questions and concerns;
- Assisting, the Team Leader and senior members in preparing the final report, as requested.

8 OPERATIONAL READINESS REVIEWS

8.1 Plan of Action.

For new starts and restarts requiring an ORR, the responsible contractor must indicate in the SNR its intent to conduct an ORR and briefly describe the proposed process. Approximately six months before the projected date for the contractor's ORR, the contractor should prepare and submit for approval the ORR POA. This timing is recommended in order that the ORR process can proceed in an efficient manner that does not impact the schedule of readiness. In the event that the requirement for an ORR is

identified less than four months before the estimated start, the POA should be expeditiously developed, reviewed, and approved so that the ORR schedule is maintained.

The POA must provide the proposed ORR scope, the prerequisites for starting the ORR and, the proposed Team Leader. The POA should also provided the ORR schedule, including estimated start date and duration, and any other information required by DOE O 425.1D and information unique to the proposed ORR.

The POA is prepared by line management and describes the breadth of, and the prerequisites for, the ORR. The POA is the document in which line management describes what must be evaluated by the ORR, based on the extent of the activities involved in the resumption or startup. Through the process of the POA, the proper authority within DOE concurs with or approves the planning for the ORR. The ORR process is then conducted in accordance with the POA.

The POA is submitted to the designated SAA for review and approval. If the SAA resides with DOE, the contractor's POA should be submitted to the cognizant DOE Line Management. DOE Line Management shall forward the contractors POA to the SAA with its recommendation for disposition. A copy of the proposed POA is provided to the PSO, the site Lead Program Secretarial Officer or CSO, as appropriate, the appropriate CTA, and HSS for information and action in accordance with the individual office's implementing procedures for DOE O 425.1D.

The level of detail in each POA varies with the complexity of the facility and the operations or activity being started or restarted. The level of detail should be adequate to justify to a skeptical reviewer the decisions being proposed. The detail should be adequate for preparers, reviewers, and the Team Leader to defend the decisions being made. In addition, the POA contains the details of the intended scope of the ORR that guides the development of the IP and ultimately the ORR. Through the level of detail in the POA, line management proposes, and the SAA approves, the specific areas that are intended to be reviewed, the desired depth of the review, and the areas that line management have determined require a lesser or no review.

When the POA lacks the necessary level of detail for the scope, the ORR team has no choice except to apply the most comprehensive scope to the IP and the ORR. The unintended result is an increase in the time and effort required to conduct the ORR, forcing the evaluation of areas that DOE and contractor line management have agreed do not require additional review.

In general, the POA should be very specific as to the systems, programs, processes, and equipment within the scope of the ORR. Also, the POA should discuss the level of detail expected of each CR. In the case of CR 1, each SMP within the scope of the ORR, along with the appropriate breadth and depth of the review, is identified. For example, the review of a specific SMP may require only the implementation of the program within a specific process or system. In other cases, it may be appropriate to review the entire SMP from the contract requirement through implementation mechanisms and its implementation within the facility. In each case, the POA should provide the specificity so that the IP reflects the

appropriate scope approved by the SAA. The POA also specifies the prerequisites for starting the ORR and identifies the proposed ORR Team Leader.

DOE O 425.1D allows omitting all or part of a CR in the scope of the ORR. To utilize this provision, a prior successful, independent and timely review should have occurred within 12 months unless justification can be made for a longer period. Justification may include a robust, ongoing management and independent assessment program (criteria 9 and 10 of a compliant 10 CFR 830.120 Quality Assurance program) of the subject that could extend the baseline provided by the independent review. For the review to be independent, it must have been accomplished by an independent assessment organization or team. Examples include previous RRs, Integrated Safety Management System (ISMS) verifications, comprehensive program audits, and external assessments that are sufficiently comprehensive to provide assurance as to the status of the particular program being considered.

The contractor ORR POA should provide the starting point for the DOE POA. The DOE POA should include prerequisites that ensure the readiness of DOE programs and personnel to oversee contractor operation.

The DOE ORR POA includes in the breadth all areas appropriate to the responsible contractor POA and a thorough review of the DOE management organization to determine its capability to oversee the facility operations to be started or restarted. The DOE ORR POA should include prerequisites, Team Leader designation, breadth of the DOE ORR, estimated schedule and duration, and additional information required by DOE O 425.1D. The DOE POA is formally submitted to the appropriate SAA by cognizant line management. Once approved, the DOE POA is provided by the SAA to the PSO, the site Lead Program Secretarial Officer or CSO, as appropriate, the appropriate CTA, and HSS for information. The SAA shall provide a copy of the POA to the ORR Team Leader.

Each POA contains the following elements:

- Name of the Facility or Activity Being Started: The name should be specific to the facility or activity being evaluated and started or restarted. For example, if a single process within a building is to be restarted, the facility name would be the process name. On the other hand, if the process encompasses several buildings and an area, the name would be the encompassing process name.
- Description of Facility or Activity: This should include buildings, systems, and processes included in the startup or restart. The description is instrumental in defining the scope of the review. For example, if most support functions and procedures are outside the boundary of the facility being started up, the ORR scope should focus on interfaces with existing programs. This section of the POA should define the physical scope of the ORR. The physical scope may include systems, structures, or processes.
- Identification of the Responsible Contractor: This should be the contractor who certifies readiness of the facility to operate. It is normally the contractor who submits the contractor POA.

- Designation of Action as a New Start or Restart: This should be the identification as to whether the facility is being started for the first time or being restarted. It is reasonable that a new process within an existing building would be a new startup. Resumption of a process after an extended period of no operation would most reasonably be a restart.
- New Start Discussion: The following elements or details about the facility or process should be included to support or create the basis for the recommended decisions:
 - a. hazard categorization for new facilities and the basis for their designation;
 - b. status of the DSA and TSRs. The discussion should indicate whether there is a new or revised DSA and TSR, the status of implementation, and when the latest IVR was performed to ensure adequacy and completeness. Any re-verifications should also be discussed; and
- Restart Discussion: If the action is a restart of an existing facility or process, the following information should be provided to support the follow-on decisions:
 - a. hazard categorization of the facility when restarted and the basis for determination (e.g., criticality, explosive, chemical, environmental). In the event that no formal hazard categorization has been made, a discussion of the relative hazard may be appropriate;
 - b. cause of the shutdown;
 - c. duration of the shutdown;
 - d. repairs accomplished during the shutdown period;
 - e. modifications accomplished during the shutdown period and their effect on the approved safety basis;
 - f. any anticipated process changes following restart; and,
 - g. status of the DSA and TSRs, including a history of IVRs or other verification reviews.

8.1.1. Proposed scope of the ORR.

This is intended to be a key section of the POA. The breadth is the top-tier CRs, and should be derived starting with the CRs listed in DOE O 425.1D and the physical scope in the facility description. In order to justify not performing evaluation of a core requirement, or portion thereof, the POA may 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 breadth of the DOE POA should consider the results of the contractor ORR as well as DOE management and oversight programs.

The discussion of the ORR scope in the POA supports the development in the IP of the depth of each aspect of the ORR. In support of this function of the POA, and to ensure maximum understanding regarding the intention of the SAA as to what may be reviewed, care and attention to detail are important in developing this section. The

scope should start with a clear discussion of the physical or geographic scope of the ORR. A clear definition of the SSCs and the individual processes or activities within the scope of the ORR should be provided. Experience indicates that clarity may be best achieved when each CR is discussed individually.

The POA must include justification for any CRs that are not included in the ORR. For the CRs that are included, the discussion should clearly describe the detail or depth to which each is to be reviewed. In some cases, only the interface with site infrastructure programs may need to be included. In other cases, the entire site-wide program may be evaluated. The basis or rationale for the scope of each CR being included in the ORR should be discussed to ensure that the IP reflects the expectations of line management as approved by the SAA.

The discussions should include reference to site-wide as well as facility-specific reviews that provide a basis for the ORR. Evaluations such as previous ORRs, ISMS verifications, independent DOE or contractor reviews, or similar reviews may reduce the necessary depth of review for individual CRs. Similarly, the recent history of the facility, site, or activity may be important in defining the level of detail or depth of individual portions of the review. Conditions such as recent occurrences, investigations, or systemic issues identified within the site may be the basis for an increase in the breadth or depth of the review of individual CRs.

8.1.2. ORR Prerequisites.

Defining the prerequisite conditions to be met by facility management prior to the start of the ORR (appropriate for both the contractor and DOE ORRs) is intended to be an important element of a successful ORR. The process that the contractor uses to achieve readiness, through management actions and confirming readiness through the ORR process should be reflected in the prerequisites.

The contractor POA prerequisites must address each CR contained in the CRD of DOE O 425.1D. The DOE POA prerequisites must address each CR that applies to DOE as well as the overall prerequisites that the contractor ORR has been completed. The DOE POA prerequisites must address the readiness of DOE management and Field Element programs and assigned personnel who monitor facility operations. Adequate detail should be included to permit an understanding of the programs and personnel that are considered essential to provide adequate oversight of the facility or process for startup or restart.

The prerequisite section of both the contractor and DOE ORR POAs should refer to specific items such as a project management plan, a readiness self-assessment plan, a compliance assessment program, safety documentation such as the DSA and TSRs (including any IVR that demonstrated satisfactory implementation), or environmental assessments or impact studies. The DOE POA should contain specific prerequisites that, when completed, provide confidence that DOE is ready to oversee contractor operations that are about to be started or restarted. The prerequisites must be described in terms of specific measurable items.

In aggregate, the prerequisites provide assurance that the contractor and DOE have achieved readiness to start nuclear operations within the facility and that the infrastructure programs are sufficiently robust and mature to ensure that readiness to conduct nuclear operations is achieved and maintained

8.1.3. Estimated ORR Start Date and Duration.

The ORR start date is for planning purposes only and should be the best estimate. Identification of a date is not to infer that the ORR is schedule-driven rather than readiness-driven. The DOE ORR estimated start dates, as well as the contractor ORR schedule, should be provided for information in the contractor POA to assist DOE management in planning for the DOE ORR.

8.1.4. Proposed ORR Team Leader.

The POA must identify a qualified Team Leader who should be a senior employee with adequate experience and knowledge to effectively lead the evaluation of the facility. The basis for the qualifications should be summarized in the POA and include:

- technical familiarity with the activities and functional areas being reviewed;
- previous performance-based review experience or training;
- demonstrated leadership and managerial skills, including seniority in relation to the members of the RR team, to permit smooth management of the RR team; and
- RR experience or formal training; and,
- knowledge of facility, activity or operation.

The Team Leader and Senior Advisor must be independent; neither must be from offices assigned direct line management responsibility for the work being reviewed; any exceptions require approval of the startup authorization authority. The appointment of the Team Leader is approved by the SAA when the overall POA is approved.

8.1.5. Senior Advisors.

Senior Advisors are recommended for both contractor and DOE ORRs with a complex scope or within a complex facility. In many instances, Senior Advisors may not be needed, particularly if the Team Leader has significant ORR experience. On other occasions, a single Senior Advisor to assist the Team Leader may be appropriate; or, for particularly complex or controversial ORRs of high-hazard facility, activity, or operation, as many as three Senior Advisors may be advisable. The qualifications for Senior Advisors may be included in the POA. However, whether or not identified by the POA, the Team Leader has the prerogative to select a Senior Advisor. For most

ORRs, a Senior Advisor may be a critical assistant to the Team Leader.

8.1.6. Official to Approve the Start of the ORR and Approve Startup or Restart of the Facility, Activity, or Operation.

For the DOE ORR, this is the SAA designated in the approved SNR. Designation of the SAA is made in accordance with the requirements of DOE O 425.1D. For the contractor ORR, the official designated to approve the start of the ORR should be a line manager senior to the manager responsible for achieving overall readiness to start operations.

8.1.7. Reviewers' Approval.

The individuals who prepared and reviewed the document should be identified by name and title.

8.1.8. Distribution.

This is a listing of the individuals and organizations who should receive copies of the POA following its approval. Individuals who have either responsibilities or interests in the new start or restart process are listed. The approved ORR POA forms the basis for ORR activity in the restart or startup process and should therefore be distributed to all interested individuals and organizations.

8.1.9 Approve the Plan of Action.

Line Management submits the POA to the SAA for approval. The POA must be approved by the SAA.

8.2 Operational Readiness Review Implementation Plan.

The IP is the plan for conducting the ORR. It should include the checklists, evaluation criteria, review methodology, qualification requirements for team members, and reporting expectations, as necessary, to efficiently execute and report the results of the ORR.

The IP must be developed by the ORR team and approved by the Team Leader. It should be provided to contractor and DOE Line Management for information. The usual process should be for the Team Leader to develop an initial draft of the IP that is then reviewed and tailored by the individual team members.

The IP defines the ORR scope to be consistent with the breadth and conditions of the startup or restart, as described in the approved POA and provides the depth of the intended review. If a previous timely ORR has been completed for the facility being reviewed, the IP and subsequent ORR should place emphasis on the operations that have changed since the last review and the effectiveness of the corrective actions developed to address the findings.

The approved POA is provided to the ORR Team Leader, who then identifies the necessary team membership to conduct the ORR. The Team Leader, with the assistance of the team, develops the IP consistent with the breadth defined in the ORR POA and the specific facility involved. The IP must include CRADs based on the scope defined in the POA.

The IP for the DOE ORR should reflect that the DOE ORR is different from a properly executed contractor ORR. The DOE ORR should assess the adequacy and accuracy of the contractor ORR. Because the contractor ORR provides the substantial basis for acceptance of readiness, the DOE ORR should assess the scope of the contractor ORR and should sample contractor results (e.g., verify conduct of operations by walking down procedures, observe normal and off-normal operations or training evaluations, quiz personnel on training material). The DOE ORR should place significant emphasis on the effectiveness of the contractor's preparations through conducting demonstrations of normal operations, abnormal events, and emergency drills. Additionally, the DOE ORR should assess the readiness of the responsible DOE line organization(s) to oversee the safe management of operations and the effectiveness of coordination among organizations.

The IP is intended to document not only the process the team uses to conduct the review, but also is intended to define the rationale for that process. In documenting the process, the team may evaluate the selection of criteria and review approaches, the procedures that it uses to develop findings and conclusions, and the criteria to be applied to categorize findings as prestart and post-start. The IP provides for evaluating the breadth and depth of the ORR.

The IP should be sufficiently detailed to provide information to management and guidance to the ORR team members. The team preparing the IP should have a thorough understanding of the facility and its associated issues. Onsite facility visits and interviews may be required before the IP can be adequately developed and finalized.

The IP should be provided by the Team Leader to appropriate oversight and higher-level DOE management before the DOE ORR begins.

8.3 Implementation Plan Format.

The following format is recommended. Alternative formats may be specified in local procedures so long as they include the required items and lead to a successful ORR result.

- **Introduction and Background:** The introduction should describe the activity that is intended to be reviewed and the reason for shutdown (if a restart). The background section describes the basic process, hazards, and issues associated with the activity to be reviewed.
- **Purpose:** This section should describe the reasons why the review is being conducted and provides the basic insights for the defined scope of the review.

- Scope: This section should describe the scope that defines the physical and administrative boundaries of the facility, justifies those defined boundaries, and supports function reviews relative to each of the following:
 - Plant and equipment readiness;
 - Management and personnel readiness; and
 - Management programs (e.g., procedures and plans) readiness.

The scope section should describe the approved scope from the approved POA. Each breadth element (core requirement) required by the POA must be incorporated into the IP. The depth to which each scope element is evaluated is specified and quantified by the IP criteria and review approaches (CRADs) to be consistent with the discussion in POA.

The scope (CRADs) defines the physical scope, including facilities, systems, and processes. In addition, it should describe the level of review of the various site infrastructure SMPs that comprise the site ISMS.

- Prerequisites: The IP should summarize the prerequisites for starting the ORR, including those specified in the POA. The team should not develop the prerequisites, but they should understand them and may use them in developing the criteria and lines of inquiry for the individual CRADs.
- Review Approach: This section should define the generic approach by which the review is conducted and provides an introduction to the ORR process. The ORR CRADs should be discussed in this section. The methodology for classifying findings as prestart and post-start should be defined here, as should the method for report preparation. The CRADs may be included as an appendix to the IP.

The reviews conducted by each team are guided by CRADs, which are grouped into functional areas. The ORR Team Leader should select the functional areas and their groupings. The selections should be based on the ORR scope and the expertise of the team members.

CRADs are used in the IP to establish the depth of the ORR and provide guidance to the ORR team members. As such, the quality of these documents significantly impacts the overall quality of the ORR. CRADs are the bases used to evaluate the CRs of an ORR. The CRs of an ORR include the 17 CRs from DOE O 425.1D (14 of which apply to the contractor ORR), as well as any additional CRs specific to the particular ORR. Each CR is evaluated based on the criteria established. The criteria should be as specific and objective as possible.

The CRADs should provide the means by which the graded approach is applied to the scope of the ORR. The areas that are significant to the startup or the shutdown should be assessed in greater depth than other areas. For example, if, during a maintenance shutdown, a system was modified or a new system was added, the training, procedures, documentation, and safety basis for the new system should be reviewed exhaustively.

Another system in that same facility that did not undergo modification would receive a less comprehensive review that would involve a sampling of the training and procedures associated with the system.

For example, the team could interview 20 percent of the qualified operators of unmodified systems to assess their level of knowledge, and a larger percentage for operators of modified or new systems. In a shutdown that was caused by a DSA or TSR or safety limit violation due to a personnel error, the training and qualification program for the facility should be assessed in detail, while safety basis implementation would need a less comprehensive assessment. For a new high-hazard facility, the depth of the review should be complete in all areas. For a restart of a low-hazard facility, the review should be focused on the areas significant to the startup or shutdown, with the remaining core areas addressed to a lesser extent via less extensive criteria. In general, the discussion in the POA guides the level of detail in any particular review area.

The Objective in each CRAD should include all, or selected portions, of one or more CRs. The IP must include all CRs as specified in the POA. This ensures that all CRs are addressed regardless of the approach used in developing the criteria. The criteria that address the CR or portion of a CR should follow, and be related clearly to, these requirements. Each criterion, should be a statement of the specific actions or attributes the team member(s) use to make a judgment as to the readiness of the site, facility, or process to operate in this specific area.

The Review Approach section of the CRAD should describe the documents to be reviewed, the personnel to be interviewed, and the shift evolutions, including tours and walkdowns, to be observed that enable the team to reach a conclusion as to whether the criteria have been met. The final portion of the CRAD should include any references DOE Orders, Standards, or site-specific requirements against which the preceding criteria are to be assessed. The alpha-numeric identification methodology chosen for the ORR implementation plan should represent a logical “work breakdown structure” chosen to describe the entire ORR effort so that all elements can be related back to the core requirements for safe operation of the facility. Examples are presented in the writing guide in Appendix 3.

The initial criterion in each CRAD for the DOE ORR may be an assessment of the adequacy of the contractor ORR in the Objective section. The Review Approach section for the DOE ORR should include an evaluation of the contractor ORR, including the final report, the corrective action plans, and the finding closure reports. Interviews with members of the contractor ORR team may also be specified in the Review Approach, as well as a sampling of the contractor ORR field work.

The effectiveness and completeness of the ORR may depend in large measure on the quality of the CRADs. A critical element in developing each CRAD is the thoughtful input by the team member who use it. It is thus important that the ORR team members be selected early and that they actively participate in developing the IP. Additional

discussion concerning the development of CRADs, as well as example CRADs, is included in Appendix 3, the Writing Guide.

- ORR Preparations: This section describes any preparations, including pre-visits and document reviews, for example, that may be undertaken prior to the onsite review. A discussion of qualifications and training considerations for ORR team members may appear here.
- ORR Process: This section describes how the ORR is intended to be conducted. Subjects include the sequence of activities from the initial in-briefing through the final out-briefing, including record reviews, interviews, and operational demonstrations. The section should discuss the conduct of team meetings, the overall decision process, and developing the final report. Some discussion may be appropriate as to how evolutions and upsets should be conducted and observed.
- Administration: This section should describe the mechanism for ORR-related meetings, correspondence, communications, and team structure. The ORR team composition, organization, interface requirements, and any oversight groups and DOE organizations to be involved in the review should be discussed in this section.
- Reporting and Resolutions: This section should detail the methods that the ORR team should use to report review results.
- Schedule: This section should include a discussion of the proposed schedule for any preparation, previsits, the onsite review, report preparation, and closeout.
- Appendices: The Appendices should include the CRADs that the team members should use. The Appendices may also include reporting forms, writing guides, team resumes, and other sections that would be appropriate to append. The Appendices to this Standard, as well as the Team Leader's Guide and DOE Readiness Review web site, contain information and examples that may be useful during development of the Appendices for the ORR IP.

8.4 Conduct of Operational Readiness Reviews.

The purpose of the ORR is intended to examine the aspects of the activity under review and to ensure that the equipment, procedures, and personnel associated with the activity are ready for startup and safe operation. The ORR is also intended to verify that the site infrastructure, including the SMPs, ensures that the status of readiness to safely conduct nuclear operations should be sustained throughout the operating cycle.

The ORR is a performance-based assessment that includes observing and documenting the responses of operating and support program personnel to normal and off-normal events as demonstrated by drills, preoperational tests, and exercises. In addition, field assessments should be conducted to verify that field configurations match the applicable supporting documentation. The ORR team should also conduct interviews with personnel, including management, to evaluate their readiness to conduct operations. The IP guides the evaluations.

The ORR team must verify that the approved requirements documentation is in place and the procedures, personnel, equipment, and systems support the requirements. The RR process is not intended to be used to approve the foundation documentation such as a Safety Basis.

Critical to the establishment of operational requirements are formal agreements between the operating contractor and DOE that delineate these requirements. These are generally in the form of a contract section J attachment, which is required by the DEAR for nuclear facilities. The DEAR includes requirements that govern the safe operations of a facility. The listing of these requirements is frequently described as Contract List A (laws and regulations) and List B (DOE directives).

The team should perform a systematic review of the facility's compliance with these requirements. In many situations, a recent verification of implementation of the contract's requirements documents into site manuals of practice is available. In those situations, it is only necessary for the ORR team to verify implementation of the site manuals of practice in the facility or activity being evaluated. These requirements should be verified by the operating entity to have been implemented in the facility, or DOE-approved compensatory measures put in place during the period of implementation. DOE should approve the compensatory measures and the implementation period if needed.

Prior to the ORR starting, 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. As DOE O 425.1D states, it may be appropriate for the ORR team to observe events significant to the startup process before the ORR begins. Experience indicates that the events meeting this criterion are emergency management exercises initiated in the facility within the scope of the ORR. Because it is difficult to plan and schedule emergency management exercises during an ORR, it is appropriate for the ORR teams (both contractor and DOE) to observe the exercise when it occurs. When this situation occurs, it is important that the DOE and contractor ORR team members maintain independence of their observations and conclusions which are included in the individual ORR reports.

For the observation to be a valuable contribution to the ORR, the exercise should have the initiating event within the facility being started, all emergency management documentation for the facility should be complete, and personnel should be trained in emergency management procedures. It is not normally possible to meet these criteria more than a month or two before readiness is achieved to start the ORR. In very unusual circumstances, there may be other unique events that should be observed by the team before the ORR begins. This may include a one-time, high-risk test of a component or system within the scope of the ORR or a complex, integrated test sequence. However, normally it is adequate for the ORR team to review the results of the testing. Since the testing is normally not accomplished by operations personnel and not conducted in a manner to demonstrate formality of operations or personnel capabilities, direct observation of such testing is of little value towards demonstration of readiness to start nuclear operations.

Unsuccessful ORRs

The assumption of the ORR process is that before it commences, readiness to start nuclear operations has been essentially achieved and that the ORR team can recommend authorization to start operations when the prestart findings have been resolved. However, in rare instances, the number or magnitude of the findings may be such that the team is unable to conclude that resolving the findings may lead to a condition of readiness to start nuclear operations. Such a conclusion recognizes that because the ORR process is executed through sampling, some important elements of readiness may not be evaluated because of findings that have been identified. For example, if the TSRs are not fully implemented, it is not possible to assess the adequacy of the individual implementation mechanisms. In another example, if the training and qualification requirements were not adequately defined, it may not be possible to determine the adequacy of the knowledge and competence of the operating personnel since they had not received appropriate training. However, there is no firm definition as to when an ORR should be stopped. All facts and issues should be evaluated to determine an answer to the question of whether the ORR team is convinced that readiness has been achieved and whether nuclear operations can be safely started when the identified prestart findings are resolved.

The ORR team should not casually reach its decision to stop an ORR or reach an unsatisfactory conclusion, but should instead carefully consider all of the facts that led to its conclusion. The basis for the team's decision should be supported with specific issues and examples

In general, there are two situations that could arise. In the first situation, the team identifies many areas in which numerous issues are identified, which leads the team to a conclusion that the ORR is unsatisfactory and should be repeated. The repeat ORR can commence after line management implements corrective actions to address the identified issues and recertifies readiness to start nuclear operations. It may be appropriate to develop a new POA and IP for the repeat ORR or simply repeat the ORR using the same POA and IP.

In the second situation, many functional areas of the ORR are adequately prepared to support nuclear operations; however, deficiencies are identified in some important functional areas to the extent that it was not appropriate to simply identify findings to be corrected. In such a case, it may be appropriate to complete the ORR for the functional areas that are ready to support nuclear operations and finalize the report in those functional areas. For the inadequate functional areas, the ORR may be suspended until the deficient functional areas are remediated. If the option to suspend the ORR is chosen and agreed to by the SAA, the interim report should provide line management general information concerning the areas of inadequacy, but not a punch-list upon which they should focus all attention. Once line management has fully evaluated the areas of inadequacy and taken corrective actions to bring them into a state of readiness to support nuclear operations, the ORR may be resumed in the deficient functional areas.

The Team Leader and the SAA should be aware of the possibility of an unsuccessful ORR and decide how it should be handled. Because the Team Leader works for the SAA, who

directed the start of the ORR, suspending the ORR should only occur with the SAA's agreement. If the SAA does not agree, the team is obligated to complete the ORR and determine that readiness to start nuclear operations has not been achieved, in which case repeating the ORR is the only alternative.

Some organizations within DOE believe that it is never appropriate to suspend and restart an ORR and that if an ORR cannot be completed, the entire process should be repeated. However, in cases where an ORR can be satisfactorily completed in some functional areas, it may be appropriate to take credit for the functional areas that were satisfactory and grade the POA accordingly. The decision to take credit for the successful portions of the initial ORR should be weighed carefully against time constraints and any changes that have taken place since the first ORR. In every case, there should be close coordination and agreement between contractor line management, DOE Field Line Management, and the SAA who must approve the POA for the second ORR.

8.5 Contractor Operational Readiness Reviews.

Contractor procedures governing the conduct of ORRs should include a provision that, prior to commencing, line management must certify in writing that all prerequisites specified in the POA have been met. A manageable list of open items may exist, as discussed below, at the time the contractor ORR starts.

Once contractor line management has determined that readiness has been achieved by meeting all of the prerequisites specified in the approved contractor ORR POA, the ORR must be conducted and reported in accordance with the contractor ORR IP. The contractor must formally declare readiness before the ORR begins. A formal Readiness to Proceed Memorandum must be prepared by contractor line management only when readiness to start operations has been achieved and the prerequisites specified in the POA have been met. The results of the line management MSA or other type of assessment, including resolution of identified issues, should be included with the declaration of readiness to start the contractor ORR.

The contractor must commence its ORR only when the approved prerequisites have been completed. However, there may be events that occur before the ORR begins, such as periodic emergency preparedness drills or complex system testing, when the ORR team may monitor the event when it occurs rather than wait until the review begins. This early review is appropriate. The activity should be documented in the ORR final report. It may also be appropriate for the ORR team to conduct pre-ORR activities necessary to gain the familiarization, understanding, and qualification necessary to prepare the ORR IP and conduct the ORR prior to prerequisites being met.

Qualified personnel in the necessary functional areas conduct ORRs. The number of team members varies with the scope of the ORR and the size and complexity of the facility. The Team Leader and Senior Advisor must not be from offices assigned direct line management responsibility for the work being reviewed by the startup or restart authority. All ORR team members should have demonstrated assessment expertise in addition to

technical expertise. ORR team members must not review their own work or that for which they are responsible.

The sequence and methodology for the ORR is described in the IP. Additional guidance for the preparation and conduct of the ORR is provided in DOE-HDBK-3012, *Guide to Good Practices for Operational Readiness Reviews (ORR), Team Leader's Guide*. In general, ORRs include a pre-visit by the team to become familiar with the site and the physical scope of the ORR. Administrative requirements such as access and safety training should be completed. When line management has determined that readiness to start nuclear operations has been achieved, the ORR Team Leader should be directed by the SAA to start the actual ORR.

The ORR should take no more than two weeks, with four to six days of actual field work. The sequence of activities should normally start with record reviews, followed by operational demonstrations and upset response demonstrations, and concluding with interviews. The final report should be developed during and following the ORR. Factual accuracy should be verified as the report is being finalized, with the goal of providing the final report at the out-briefing at the end of the two-week ORR period. This timeline is important for several reasons: the need to expeditiously start operations, controlling the extent of the review, and recognizing that the team members have other work assignments that are suspended during the period of the ORR. Many years of experience have demonstrated the effectiveness of this controlled timeline to accomplish a satisfactory ORR and determine readiness to start nuclear operations.

ORR evaluations should place particular emphasis on the SSCs that are important to nuclear safety (relevant to public and worker safety and health) or of particular importance to the safety of the planned nuclear operation of the activity. The results of these evaluations should be included in the final report.

DOE or Field Element personnel should observe and evaluate the contractor ORR process. It is therefore important that the ORR process be open and well-defined to permit DOE oversight. Team meetings should be informative for the benefit of the team as well as for DOE. Interviews and record reviews, as well as evolutions and drills, should be scheduled in a manner that fosters openness. The ORR Team Leader should coordinate with DOE oversight personnel to facilitate their observation and evaluation of the contractor ORR.

Documentation of the methodology, criteria, and results of the contractor ORR is important to the credibility of the review and the foundation for the follow-on DOE ORR. The value of the review depends in large part on the thoroughness of the ORR and the adequacy of its scope (breadth and depth). Section 8.4 and Appendix 3 of this Standard provide additional guidance on recording the results of the ORR.

Once the contractor ORR process has been completed, the contractor must develop a corrective action plan. The plan should provide the methodology and the schedule for resolving the findings. Prior to issuing the Readiness to Proceed Memorandum to DOE, indicating that readiness to start nuclear operations has been achieved, a manageable list of open prestart issues may exist provided they have a well-defined schedule for closure.

DOE must not begin its ORR until the contractor's Readiness to Proceed Memorandum has been received.

8.6 Readiness to Proceed Memorandum.

The Readiness to Proceed Memorandum is the formal communication from the contractor to DOE stating that the facility has been brought to a state of readiness to start or restart nuclear operations. The Memorandum is a prerequisite to the DOE ORR. The Field Element should use the contents of the Readiness to Proceed Memorandum, coupled with its own routine management understanding of the status of the facility, as a basis for the recommendation or decision to commence the DOE ORR.

The contractor ORR final report should be an enclosure to the Readiness to Proceed Memorandum. The Readiness to Proceed Memorandum indicates the status of resolution of prestart findings and a corrective action plan for post-start findings. The DOE line management shall forward the Readiness to Proceed Memorandum onto the SAA with evaluation of the readiness of the contractor to startup or restart of the facility, activity or operation. In addition, the DOE Line Management must also certify its readiness to oversee the contractor's activities related to the startup or restart of the facility, activity or operation in question.

The Readiness to Proceed Memorandum should not be submitted until all actions required for startup or restart have been completed, with the exception of a manageable list of open prestart items that have a well-defined plan and schedule for closure. There should be no unresolved issues in the path to closure of these prestart items.

If there is an excessive number of open items at the time the Readiness to Proceed Memorandum is submitted to DOE, the initial conclusion is that contractor management and ORR processes were not successful. The DOE ORR should not start until the situation is resolved.

The following items provide guidance on the acceptability of the open prestart items at the time the contractor submits the Readiness to Proceed Memorandum:

- Each open pre-start issue shall be identified in the Readiness to Proceed Memorandum.
- In determining how many open items are acceptable, line management should understand that every functional area should be sufficiently well developed in its elements to permit its evaluation in the ORR. For example, one or more open items indicating that a key program has not yet been developed and implemented should not be acceptable because the functional area could not be adequately reviewed in the ORR. Such an open item should be acceptable only if the key program were to be fully established before the ORR is complete.
- Each open item must be addressed in a corrective action plan. An open item such as "the required environmental permits have not been requested or approved" would not be acceptable because many other facility procedures and activities are potentially impacted by the corrective actions to the identified open item. The schedule for

completion of the corrective action plan should be consistent with the timing for the completion of the ORR so that the ORR may evaluate the corrective action plan and the progress in completing the planned activities.

In summary, the open items should be few in number, well-defined with a well defined corrective action plan, able to be completed on a schedule consistent with the ORR schedule, and not of such a nature to preclude an adequate review of any specific area by the ORR.

8.7 DOE Action Following Receipt of the Readiness to Proceed Memorandum.

DOE Operations or Field Element Line Management should review the submitted Readiness to Proceed Memorandum, which involves verifying the accuracy of the included information, evaluating the completeness of the open items listing, and determining whether the corrective actions and time estimates are realistic.

DOE Field Element Line Management responsible for overseeing contractor operations must prepare an endorsement to the Readiness to Proceed Memorandum before forwarding it to the SAA. The DOE Line Management endorsement should discuss two important elements:

- DOE Field Element Line Management's assessment of the readiness of the contractor to commence operations. This assessment should be based on the day-to-day observation of contractor activities and an assessment of the adequacy of the contractor ORR and the associated corrective actions.
- Readiness of DOE Field Element Line Management to oversee contractor operations following startup, including meeting prerequisites and CRs in the DOE POA. The basis for the conclusion, including the results of any DOE Line Management self-assessments conducted in anticipation of startup, should be included in the endorsement.

DOE Field Element Line Management must forward the Readiness to Proceed Memorandum to the SAA with a recommendation as to whether the memorandum should be accepted and the DOE ORR begun as scheduled, or whether additional information or action is needed from the contractor or additional actions should be taken by DOE Field Element Line Management. SAA makes the determination to proceed or not to proceed with the ORR.

Following the DOE Field Element Line Management review, the Readiness to Proceed Memorandum should be either returned to the contractor with identified comments or forwarded recommending approval to start the DOE ORR. Each DOE management endorsement should identify programs and personnel positions that have been verified as ready to support facility operations, indicate how the evaluation was accomplished, and specify the actions taken to achieve the state of readiness to oversee operations. The acceptable Readiness to Proceed Memorandum is forwarded to the SAA for approval. DOE Field Element or Headquarters implementing procedures may also require the RTP to be provided to other organizations for information.

The Readiness to Proceed Memorandum with its enclosures and endorsements should be retained as a part of the facility, activity, or operation startup or restart record, as well as the ORR final report and associated documentation as specified in local documentation control procedures. Experiences and lessons learned in managing the Readiness to Proceed Memorandum and process should be included in the lessons learned section of the ORR final report.

8.8 DOE Operational Readiness Reviews.

The DOE ORR must not commence until the contractor has reported in writing its readiness to commence operations. Following receipt of the Contractor Readiness to Proceed Memorandum, the Field Element Manager or designee may concur with the contractor's readiness, must verify DOE management readiness, including meeting the DOE prerequisites in the DOE POA, and may recommend to the SAA that the DOE ORR commence.

The prerequisites for starting a DOE ORR must be specified in the DOE POA, as required by DOE O 425.1D. The specifics vary with each ORR, but the basic principle is that the DOE ORR should not commence until management has determined the facility is ready to operate, including readiness of the DOE Field Office to oversee contractor operations.

When directed by the SAA, the DOE ORR must be conducted in accordance with the IP prepared by the team and approved by the Team Leader. The DOE ORR team conducts and prepares the final report in accordance with the IP. The DOE ORR should include a detailed review of the contractor ORR and other performance assessments in accordance with the approved scope. Following completion of the DOE ORR and resolution of prestart findings, DOE management may recommend to the SAA that startup approval be granted.

The DOE ORR team should assess the technical and managerial qualifications of those in the DOE Field Element responsible for providing direction and guidance to the contractor, including Facility Representatives. A similar review should be made of the qualifications of contractor personnel responsible for facility operations.

In most cases, a key element of the DOE ORR is a detailed review of the methods and results of the contractor ORR. The results, including corrective actions, should be assessed for adequacy and effectiveness. The DOE ORR team should conduct additional detailed assessments to verify the findings of the contractor ORR and review areas that may not have received an adequate review in the contractor ORR. The DOE ORR should not duplicate the contractor ORR; it is intended that the DOE ORR validate the accuracy and completeness of the contractor ORR and verify the readiness of the DOE line organization to oversee the contractor nuclear operations within the scope of the ORR.

8.9 Documentation of Operational Readiness Review Results.

The final product of the ORR process is the ORR final report, which documents not only findings and conclusions, but the process by which they were developed. The ORR final

report should form the basis for senior management decisions, including startup or restart approval, and should therefore accurately reflect the conditions found during the ORR.

The ORR final report is intended to document the logic of the review and convey the results of the review. It should provide a summary of review activities and confirmation that the criteria and review approaches detailed in the IP were followed, with explanations for any deviations. It should also contain enough detail that the reader can follow the review logic of the ORRs, traceable from the POA to the IP to the ORR findings.

The ORR final report should document the effectiveness of the facility's operational readiness preparation, the contractor ORR, and the readiness of the facility to proceed with startup or restart. The final report should also provide information concerning the readiness of the management system (both the contractor and DOE) to oversee and manage the facility, activity, or operation. If deficiencies exist, the ORR final report should clearly define those, as well as the inadequacies that should be addressed before and after startup. The final report should also address deficiencies identified and corrected during the course of the review.

The validity and defensibility of ORR results should depend largely on the thoroughness with which the process and the observations are documented. The final report should be clear as to what was evaluated and the methodology used during the evaluation.

Final Report Format.

DOE O 425.1D provides some minimum content requirements of the ORR report. It does not, however, provide the format. The following is a suggested format derived from a composite of past DOE ORR final reports. A synopsis of each section is contained below.

- Title Page: The cover and title page should state the subject and the date of the ORR. The report cover should not contain any extraneous information, data, graphics, or pictures.
- Signature Page: This page should contain the signatures of all team members, signifying their agreement as to the report content and conclusion in the areas to which they were assigned. In the event all team member signatures cannot be obtained due to logistical considerations, the Team Leader should gain their concurrence via fax or telephone and sign for them.
- Executive Summary: The Executive Summary should be a one- to three-page synopsis of the review, findings, and the conclusion as to whether the team believes readiness has been achieved. The Executive Summary should introduce information and direct the reader to those portions of the report that provide more detail on the information. Some suggested points for the Executive Summary include:
 - a brief synopsis of the review activity, which provides information concerning the team's evaluation of readiness;
 - the management system's adequacy to oversee the operation;

- a summary evaluation of the adequacy of the ORR preparation (and possibly the ORR program); and,
 - a synopsis of the significant problems and strengths.
- **Table of Contents:** A Table of Contents should be provided to facilitate a review of the report. The Table of Contents should identify, with page numbers, all sections and subsections of the report, illustrations, charts, and appendices.
- **Introduction:** The Introduction should provide information and background regarding the facility being reviewed, the reasons for shutdown (if a restart), the purpose of the ORR, and the scope of the evaluation. Other information that should be provided includes a brief discussion of:
 - the overall objectives of the evaluation;
 - the review process and methodologies used in the review;
 - the team composition; and,
 - definitions applicable to the review.
- **ORR Evaluation:** This section should provide an overall evaluation of readiness, followed by individual functional area summaries. For each functional area, the summary should, in one page or less, discuss the CRs and provide conclusions as to the readiness of the functional area to safely support proposed operations. Conclusions as to the readiness of hardware, personnel, procedures, and the management system that controls each functional area should be addressed, including key issues. Findings identified at any point in the ORR are to be included in the ORR Final Report and formally addressed for resolution and closure regardless of any interim actions which may be taken by line management to address such deficiencies. The evaluation should discuss the prestart and post-start findings associated with the review and provide a conclusion as to the readiness of the facility to begin operation within the scope of that specific functional area.

The detailed results of each CRAD should be included in a comprehensive write-up in the evaluation form (Form 1). The form should describe how the CRAD evaluation should be accomplished and the results of the evaluation. An evaluation should be made of each criterion in the CRAD to discuss whether it was met or not met. The level of detail in the Form 1 should be such that a knowledgeable individual who did not observe the ORR can understand the methodology of the review and the basis for the results. Any deficiencies identified during the course of the evaluation of the CRAD should be discussed in the Form 1 write-up. When deficiencies rise to the level of Findings, they should be indicated on the Form 1 and should be the basis for a Finding form (Form 2).

The Appendix 3 writing guide provides examples of Forms 1 and 2. Also the DOE Readiness Review website contains recent examples of final reports. The Functional Area summary should roll up the results of the review as discussed in the Forms 1 and 2 applicable to the functional area. A critical success factor for ORRs should be the Team Leader's providing examples to the team of acceptable formats for the

forms and the prepared forms containing the information from the CRADs. Appendix 3 and the Team Leaders' Handbook contain additional information on accomplishing and managing the process of reporting the results of the ORR.

Any deviations from the IP should be discussed, along with the reasons for the deviations, and the alternative actions that were taken to compensate, if necessary. Because the ORR Evaluation section provides the basis for the determination of readiness for each CR, it should discuss not only the deficiencies found during the review, but should also discuss those positive aspects that affected the determination. In addition, the ORR final report should also identify as Opportunities for Improvement those items that are not findings; but that, if addressed, would lead to excellence in operations. The detailed documentation to support the conclusions may be included in an appendix consisting of the individual CRAD or Lines of enquiry with the accompanying Assessment Forms. See Appendix 3 for additional details.

- Status of Requirements: The ORR final report must state whether the facility has established the following:
 - an agreed-upon set of requirements for governing safe operations of the facility, activity or operation;
 - that this set of requirements has been formalized with DOE through the contract or other enforceable mechanism;
 - that these requirements have been appropriately implemented in the facility, activity or operation, or appropriate compensatory measures, formally approved by DOE, are in place during the period prior to full implementation; and that,
 - in the opinion of the DOE ORR team, adequate protection of the public health and safety, worker safety, and the environment will be maintained.
- Implementation of ISMS: The core requirements, in aggregate, should address many of the core functions and guiding principles of Integrated Safety Management (ISM). The final report should include a statement regarding the Team Leader's assessment of the adequacy of the implementation of those functions and principles which were addressed by the ORR at the facility undergoing the review. This should not be direction or inference that any additional review be added to the ORR process to address ISM. Only to the extent that the ISM processes are visible in the established review should they be evaluated and commented on.
- Lessons Learned: Each ORR final report must contain a section on lessons learned to be used by both contractor and DOE to improve the ORR process. These lessons should provide information on problems encountered by the review team, adequacies or inadequacies concerning the review, design, and implementation, expertise, or any other relevant factors or information that may be used by future review teams.

The ORR must also identify lessons learned applicable to similar facilities. Lessons learned in areas such as operations, procedures, design, or documentation may also be identified. The ORR team must include these lessons learned in the report as well. Facility management or DOE management is then responsible for promulgating these lessons in accordance with established procedures. The ORR final report may be issued before the lessons learned section is written to avoid delays in issuing the report. However, each ORR report must contain a lessons-learned section, as required by DOE O 425.1D.

- Dissenting Professional Opinions: The ORR process provides an opportunity for team members to submit dissenting professional opinions which should be documented and appended to the final report. There must be a provision for differing professional opinions if agreement cannot be achieved.

While the team should strive to reach a consensus concerning all aspects of the review, DOE recognizes that professional judgment does not always allow for complete agreement. In cases of disagreement, the Team Leader makes the final recommendation concerning the disposition of the finding or concern. However, discussion of all aspects of the finding should be provided in the final report to provide the SAA with all relevant information on which to base his or her decision.

If a team member feels that aspects of his or her opinions have not been adequately represented, that member should file a dissenting professional opinion. The written report of the dissenting professional opinion is appended to the ORR final report for review by the SAA.

- Appendices: Appendices are intended to provide data that support the final report. Data that should be considered for appendices include:
 - the IP*;
 - the CRADs*;
 - a listing of the team members and their resumes*;
 - the POA*
 - Evaluation of criteria (Forms 1);
 - the Prestart Findings summary (Forms 2); and,
 - the Post-start Findings summary (Forms 2).

The asterisked items may be referenced but not included in the final report and maintained with the readiness records.

- Distribution: A SSA provides a copy of the final report to the cognizant DOE Line Management. DOE Line Management provides the report to cognizant contractor line management for action.

8.10 Prestart and Post-Start Findings.

Findings should be defined as follows:

- Nonconformance with a stated requirement that represents either:
 - a systematic failure to establish or implement an adequate program or control; or
 - a significant failure that could result in unacceptable impact on the safety of personnel, the facility, the general public, or the environment during nuclear operations.

During the ORR the team may identify individual deficient conditions. Frequently, the deficient conditions, when evaluated together, may reflect a programmatic or implementation weakness that is of concern and require corrective action to ensure that operations are conducted safely when started (prestart finding), or requires corrective action to mitigate longer-term concerns or programmatic deterioration (post-start finding).

As discussed above, findings should be discussed on Form 1 and documented on Form 2. The rollup or individual deficient conditions should be identified as findings. One of the important tasks of the team should be to identify the significant findings that impact the adequacy of programmatic support or indicate inadequate implementation of important operational conditions. It is always possible to identify individual deficiencies. The challenge may be to determine when a group of seemingly minor individual issues is indicative of a more systemic issue that should be identified as a finding.

The IP should provide a standardized method for identifying findings using the requirements identified within the criteria. Each finding should be clearly described, providing examples of the individual issues that comprise the finding. The finding should describe what is deficient, provide the reference to the requirement with which it is deficient, and be written in a manner permitting corrective action to resolve it.

Each finding should be identified as to whether or not, it must be resolved prior to startup of operations. Criteria for arriving at this opinion should be published or referenced in the IP. It may also be appropriate to identify the level of management (i.e., contractor, DOE Field, or DOE Headquarters) at which the finding should be closed. While the ORR team may assist management in reviewing the action taken on a finding, responsibility for its resolution should reside with line management. Form 2s should further discuss identified findings.

8.11 Corrective Action Plans.

The contractor and DOE must prepare corrective action plans for all findings identified as applicable. The DOE and contractor implementing procedures should specify the process and format for evaluating and documenting findings. Form 3, described in Appendix 3 writing guide, may provide the required documentation to describe corrective actions and close the finding. The action plan should contain the following elements:

- The finding, as written in the report submitted by the ORR team, and whether the finding is a prestart or post-start finding.
- A detailed proposed action plan for addressing the deficiencies identified in that finding. The proposed action plan should evaluate any overall programmatic deficiencies related to a specific finding that could lead to similar occurrences and include actions to address these deficiencies. For findings identified during the DOE ORR, DOE must approve the contractor's proposed corrective action plan.
- The proposed dates when the actions are intended to be completed. If the corrective actions for a finding are phased, the dates for each phase should be detailed.
- If it is a post-start finding, a description of the risks and mitigating actions or compensatory measures, if any, to be taken during the interim that are intended to reduce the risks to an acceptable level before final corrective action. DOE Line Management should verify that the corrective action plan has been entered into the appropriate assurance program issues management system.
- If some corrective actions for prestart findings would occur after the startup of operations, the risks and mitigating factors or compensatory measures should be clearly identified. The actions that are required prior to the startup of operations must be completed and closed with a final closure package, as discussed below, before operations can be started.

Findings and associated corrective actions for the contractor and DOE ORRs should be entered and managed via the site corrective action or action tracking processes.

8.12 Operational Readiness Review Follow-up Activities.

The ORR process continues beyond the completion of the ORR and the finalizing of the report. Several actions may require the participation of the Team Leader and team members. The Team Leader should notify all team members of future involvement concerning closeout briefings, interpretation (and possible justification) of findings, review of corrective action plans for adequacy, and review of final closure actions. It should be clearly understood that line management is solely responsible for resolving findings and accepting the corrective action plan and the adequacy of the corrective actions. However, since the team members are most familiar with the details of the findings, line management may request members of the team to assist during the process for closing findings. It should be clear that line management should not defer to the team on deciding on the adequacy of the corrective action plans or the corrective actions actually taken.

The Team Leader should coordinate any follow-up meetings, which include closeout meetings with the affected facility and line management, team debriefings, and presentation of the report to DOE and contractor upper management. The Team Leader may be required by the Secretarial Officer or other appointing authority to present the team report to upper DOE management. Presentations may be required to internal or external

interested groups as well. In addition, it may be appropriate for the Team Leader to recommend an organization to verify proper closure of individual prestart findings.

8.13 Action Tracking and Closure Methodology.

Monitoring and verifying the satisfactory closure of prestart findings from both the contractor and DOE ORRs is a line management responsibility. The ORR Team Leader and team members may be requested to assist in verifying or resolving prestart findings. DOE O 425.1D defines elements of the required process to close ORR prestart findings. This is accomplished by developing a closure package that is reviewed and verified by DOE Line Management for findings from the DOE ORR. These procedures should be documented either in a facility-wide process for issues management tracking or the specific implementation of the requirements of DOE O 425.1D. Closure packages should contain the following information:

- The finding, taken verbatim from the original report, identified as a prestart or post-start finding.
- The actions proposed in the action plan developed, submitted, and approved with the original completion schedule.
- A brief description of the corrective actions taken, reasons for concluding that closure has been achieved, and objective evidence supporting closure. The referenced documents or objective evidence illustrating the corrective actions and the dates of the actions should also be included.
- Signatures of the appropriate line management, as defined by the site procedures or within the ORR IP. A draft closure form is provided as Form 3, ORR Finding Resolution Form, in Appendix 3.
- DOE verification (DOE ORR findings, at a minimum) of the adequacy and completion of the corrective actions.

8.14 DOE Line Management Oversight of the Operational Readiness Review Process.

Throughout the ORR process, various Headquarters, Field Element, and external oversight organizations may become involved in the process. To ensure that proper liaison occurs, documentation from each step in the process should be provided to the appropriate internal and external oversight groups for information and comment. In most cases, the documentation is provided after approval by the appropriate management official. It should be stressed, however, that all information should be provided in a timely manner if all organizations are to execute their responsibilities without delaying critical steps in the process. Frequent liaison should occur between management and oversight organizations at each level, both internal and external, to ensure that all responsibilities and commitments are fulfilled. Transmittal of DOE documents to agencies outside of DOE should follow established procedures.

DOE Field Element personnel should observe and evaluate the contractor ORR process. The ORR process should be open and defined to permit DOE oversight. Team meetings should be informative for the benefit of the team as well as DOE oversight. Interviews, record reviews, evolutions, and drills should be scheduled in a manner to support openness. The ORR Team Leader should coordinate with DOE oversight personnel to facilitate their responsibility for observing and evaluating the contractor ORR.

The following items are a compilation of the required and recommended responsibilities of the DOE Field Offices in executing the new start and the restart ORR processes.

- Review and approve, or review and forward for approval, the contractor ORR POA.
- Provide day-to-day oversight of the contractor's activities to achieve and verify readiness to conduct operations, including a review of the contractor ORR report and prestart finding closure plans and closure documentation. Through this day-to-day oversight, DOE Field Element Line Management provide knowledgeable recommendations concerning the contractor's actions and proposals.
- Review, and take appropriate action on, the contractor Readiness to Proceed Memorandum. If the Operations or Field Element Manager is the SAA, he or she grants authority to conduct the DOE ORR. For other new starts and restarts, the DOE Field Element Manager forwards the Readiness to Proceed Memorandum to Headquarters recommending that the DOE ORR be started when it is satisfied that the facility is ready to be operated safely, Field Element Line Management personnel are ready to oversee contractor activity, and DOE oversight processes and procedures are in place.
- DOE Field Element Line Management responsible for oversight of contractor operations shall prepare an endorsement to the Readiness to Proceed Memorandum when forwarding it to the SAA, even when the SAA is the DOE Field Element Manager. The DOE Line Management endorsement should contain two important elements:
 - a discussion of DOE Line Management's assessment of the contractor's readiness to commence operations. This assessment should be based on the day-to-day observation of contractor activities and an evaluation of the adequacy of the contractor ORR and associated corrective actions; and
 - concurrence with the status of prestart findings and a recommendation to the appropriate decision official to authorize startup or restart after the DOE ORR is complete and all prestart findings are closed. In cases when the Element Manager is the designated SAA, he or she must authorize the startup or restart.

DOE Prestart Findings Closure Process. Evaluate the contractor's prestart finding closure process and verify closure of DOE ORR prestart findings as designated by the SAA. To verify closure, support may be requested from

the DOE ORR Team Leader or team members; however, closure verification remains a line management responsibility. DOE Line Management verifies the adequacy of corrective action plans for all findings from the DOE ORR.

See Section 7 above for additional discussion on the roles and responsibilities of DOE Line Management and oversight organizations.

8.15 Independent Oversight Organizations.

DOE O 425.1D, Section 5.b specifically indicates that DOE independent oversight of the ORR and ORR process is the responsibility of HSS. To ensure that the startups and restarts of DOE nuclear facilities proceed in a timely fashion, it is incumbent upon the contractors, Field Element Managers, and Secretarial Officers to provide the appropriate review documentation to the PSO, Site Lead PSO or CSO, the appropriate CTA, and HSS throughout the process. It is also incumbent upon HSS to provide comments to these organizations in a timely fashion to ensure that their concerns are addressed with minimal impact on the startup or restart schedule.

HSS. In addition to the general Departmental responsibilities specified in DOE M 411.1-1C and the DOE FRAM, HSS exercises independent oversight of the startup and restart process for nuclear facilities. This responsibility entails the following:

- In coordination with the PSO, performing independent reviews of startup and restart activities as appropriate and providing the results of these reviews to the CSOs for resolution.
- Reviewing and commenting as appropriate on the PSO, Field Element, and contractor procedures for startup or restart of nuclear facilities and providing the results of these reviews to CSOs for resolution. Reviewing and commenting on SNRs, contractor and DOE POAs, IPs, and ORR final reports.

8.16 Authorization to Start Operations.

When the DOE ORR is complete, all prestart findings are resolved, and satisfactory corrective action plans are prepared for post-start findings, DOE Line Management concurs on the satisfactory status of prestart and post-start findings and should recommend that the SAA authorize the start of operations. The designated SAA reviews the results of the contractor and DOE ORRs and, when satisfied with the status of all prestart and post-start findings, approves startup of nuclear operations. In cases when the Field Element Manager is the designated SAA, he or she authorizes the Startup of nuclear facility, activity, or operations and may inform the designated secretarial officer as required by local and Headquarters implementing procedures.

9 **READINESS ASSESSMENTS**

The majority of RRs that are planned and accomplished to meet the requirements of DOE O 425.1D are RAs. The scope and complexity of RAs may range from a simple checklist, if local procedures permit, to a scope that approximates that of an ORR. This section of the

Standard discusses the processes for planning and conducting an RA. The discussion refers to or defers to the tailored processes in the local procedures for the planning and conduct of RAs. Local implementing procedures for RAs should provide detailed processes and expectations for the unique aspects of RAs permitted in the order such as use of checklists and parallel accomplishment of contractor and DOE RAs. Both of these situations are identified in the following sections but detailed processes are not defined. The detailed processes should be developed in local procedures prior to using a POA/IP checklist to conduct an RA.

Section 4 of this standard discusses the recommended process to be followed by the contractor and DOE to determine the level and scope of the RR. A critical aspect of the process is the expectation that the contractor and DOE develop implementing procedures to formalize and guide these processes. The implementing procedures must describe the process for evaluating the startup to decide on the type of RR required. The process should address a number of elements that form the basis for determining the level of the required RR. In addition, when the process leads to a determination that an RA is the appropriate level of RR, there should also be a determination as to whether DOE needs to conduct an RA in addition to the contractor. A properly documented determination provides information that should be considered when developing the scope of the RA. That scope is documented in the RA POA. When a DOE RA is required, the DOE and contractor processes for determining the level of an RR should provide the information necessary to define the scope of the DOE RA as well.

9.1 Plan of Action.

The POA provides the proposed RA scope, the prerequisites for starting the RA and the proposed RA Team Leader. The POA should include, the RA schedule, including the estimated start date and duration and other information unique to the proposed RA. The contractor's POA is reviewed by the Field Element Manager or designee and approved or forwarded to the designated SAA with a recommendation for approval. When the contractor is the SAA, the approved POA must be provided to the DOE Field Element for information. DOE O 425.1D specifies that the POA may be as simple as a checklist or as comprehensive as that for an ORR. If the approved format for the RA POA differs from that for an ORR, the format, minimum contents, and manner of usage should be specifically discussed in the approved contractor and DOE implementing procedures. DOE O 425.1D specifies that the POA must define the scope and prerequisites and identify the Team Leader for the RA. Local procedures should also reflect these requirements.

Standing RA checklists may be used to provide the framework and guide for scoping and tailoring the RA for the specific startup or restart. Every RA POA should be prepared that accurately specifies the required RA scope and tailoring consistent with the unique conditions and situations associated with the specific startup or restart. Contractor procedures should establish a goal that the POA should be prepared approximately six months prior to the projected start date for the RA. When the need for an RA is identified less than six months prior to the projected start date, the POA should be prepared as soon as possible so as to avoid the RA process from impacting the schedule for determination of readiness.

As specified in DOE O 425.1D, the RA POA must define an adequate scope to fully describe the intent of the RA. The evaluation that was used to determine that an RA was the appropriate level of RR should be used in defining the RA scope. The scope should provide a detailed description of the activities, operations, structures, and process systems and equipment being started or restarted. Each CR listed in DOE O 425.1D must be evaluated for inclusion in the scope of the RA. The POA must justify the exclusion of any CR that may 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 an independent reader would reasonably be expected to draw the same conclusion. The basis for not including a CR may be that no changes have occurred during the shutdown and that confidence has been maintained in the adequacy of the program or function within the scope of the startup or restart.

Another example that supports excluding a CR is when the SMP was previously determined to be satisfactory and implementation within the facility being restarted did not change (e.g., the change in the activity would not require a review of the CR, as the SMP functions are adequate for the new activity and did not change). The explanation needs to be brief but meaningful, and acceptable to the SAA. Some CRs may be included, but tailored to more fully describe the total 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. For example, many SMPs may be included only to the degree necessary to determine that the site SMP processes were adequately implemented within the scope of the RA. The POA must include a prerequisite section that defines the prerequisites for declaring readiness to start nuclear operations. The prerequisites must, at a minimum, address each CR that is within the scope of the RA. Clarity in the discussion of the manner in which the CR should be tailored is important to ensure that the RA IP accurately reflects the intended scope of the RA.

The POA is submitted to the designated SAA for review and approval. If the SAA resides with DOE, the contractor's POA should be submitted to the cognizant DOE Line Management. DOE Line Management shall forward the contractor's POA to the SAA with its recommendation for disposition. A copy of the proposed POA is provided to the PSO, the site Lead Program Secretarial Officer or CSO, as appropriate, the appropriate CTA, and HSS for information and action in accordance with the individual office's implementing procedures for DOE O 425.1D.

The level of detail in each POA varies with the complexity of the facility and the situation under which the activity is being started or restarted. As a rule of thumb, the level of detail should be adequate to justify to a skeptical reviewer the overall scope being proposed, including the tailoring of each CR. The detail should be adequate to defend the decisions being made to preparers, reviewers, and the SAA.

In cases where a DOE RA is to be conducted. Following receipt of the contractor POA, the DOE Line Management organization prepares a DOE RA POA for each nuclear facility new start and restart for which a DOE RA is required. The contractor POA should provide

the starting point for the DOE POA. The DOE POA must include prerequisites that ensure readiness of DOE programs and personnel to oversee contractor operations. Prerequisites in the DOE POA should also ensure that the contractor RA process has been completed in accordance with the approved site processes and procedures. When a DOE RA would be conducted in parallel with the contractor RA, the DOE POA must specify the prerequisites for starting the DOE RA. The DOE POA should also discuss the purpose of conducting the RAs in parallel and the expectations for DOE RA Team's performance in the conduct of the parallel DOE RA.

The DOE RA POA should include in its breath all areas appropriate to the responsible contractor POA and a thorough review of the DOE management organization to determine its capability to oversee the facility, activity, or operation to be started or restarted. The DOE RA POA should include prerequisites, Team Leader designation, breadth of the DOE RAs, estimated schedule and duration, and additional information required by DOE O 425.1D. The DOE POA is formally transmitted via management to the appropriate SAA. Once approved, the DOE POA is provided to the PSO, the site Lead PSO or CSO, as appropriate, the appropriate CTA, and HSS for information.

Each POA should contain the following elements.

- Name of the Facility, Activity, or Operation Being Started: The name should be specific to what is to be evaluated and started. For example, if a single process within a building is being started or restarted, the facility name is the process name. On the other hand, if the process encompasses several buildings and an area, the name would be the encompassing process name.
- Description of Facility, Activity or Operation: This should include buildings, systems, and processes included in the startup or restart. The description may be instrumental in defining the scope of the review. For example, if most support functions and procedures are outside the boundary of the facility being started up, the RA scope focuses on interfaces with existing programs. This section of the POA should define the physical scope of the RA. The physical scope may include systems, structures, or processes.
- Identification of the Responsible Contractor: This should be the contractor who certifies readiness of the facility, activity, or operation to operate. It is normally the contractor who submits the contractor POA.
- Designation of Action as a New Start or Restart: This should be the identification as to whether the facility, activity, or operation is being started for the first time or being restarted. It is reasonable that a new process within an existing building would constitute a new startup. Resumption of a process after an extended period of no operation would most reasonably be a restart.
- New Start Discussion: The following elements or details of the facility, activity, or operation should be included to support or create the basis for the recommended decisions:
 - Hazard categorization of the new facility and the basis for its designation; and

- Restart Discussion. If the action is a restart of an existing facility, activity, or operation, the following information should be provided to support the follow-on decisions. This information should be available from the determination that an RA was the appropriate level of RR:
 - hazard categorization of the facility, activity, or operation when restarted and the basis for determination. In the event that no formal hazard categorization has been made, a discussion of the relative hazard may be appropriate;
 - the cause of the shutdown;
 - the duration of the shutdown;
 - repairs accomplished during the shutdown period;
 - modifications accomplished during the shutdown period and their effect on the approved safety basis;
 - any anticipated process changes following restart; and,
 - status of the DSA & TSR, including a history of IVRS or other reviews as applicable

9.1.1 Proposed Scope of the Readiness Assessment.

This should be a key section of the POA. The scope should be developed starting with the CRs listed in DOE O 425.1D and the physical scope in the facility, activity, or operation description. The discussion should support the decision to eliminate or tailor any CRs, as discussed above. The DOE POA scope should include the scope of the contractor RA and address DOE management and oversight programs.

The discussion of the scope of the RA in the POA supports the development of the IP for each functional area. Attention to detail should be particularly important in developing the scope to ensure that the all involved individuals and organizations have a complete understanding of the areas to be reviewed.

The scope should start with a clear discussion of the physical or geographic scope of the RA. A clear definition of the SSCs, as well as the individual processes or activities within the scope of the RA, should be provided to ensure the proper focus of the RA. Experience indicates that clarity can be best achieved when each CR is discussed individually.

The discussion should include justification for any CRs that are excluded in the RA. For the remaining CRs, the discussion should clearly describe the detail or depth to which each is to be reviewed. In some cases, only the interface with site infrastructure programs may need to be included. In other cases, the entire site-wide program may need to be evaluated.

The discussions should refer to site-wide and facility-specific reviews that provide a basis for the RA. Evaluations such as previous RAs, ISMS verifications, independent DOE or contractor reviews, IVRs, or similar reviews may reduce the necessary depth of review

for individual CRs. Similarly, the recent history of the facility, site, or activity may be important in defining the level of detail or depth of individual portions of the review. Conditions such as recent occurrences, investigations, or systemic issues identified within the site may form the basis for an increase in the breadth or depth of the review of individual CRs. The final scope should be consistent with the evaluation that was documented when the level of RR was determined.

When a parallel Contractor and DOE RA has been approved in the SNR, the discussion of the scope of the DOE RA should include the expectations of performance of the DOE RA team to ensure independent evaluation of readiness.

9.1.2 Readiness Assessment Prerequisites.

Prerequisites provide line management, the contractor, and DOE with criteria as to when the activity is ready for startup or restart. The contractor POA prerequisites must address each CR contained in DOE O 425.1D within the scope of the RA. The DOE POA prerequisites should address the readiness of DOE management and Field Element programs and assigned personnel who monitor facility operations. The DOE POA prerequisites should also address the completeness and adequacy of the contractor RA process.

Adequate detail should be included to permit an understanding of the programs and personnel considered essential to adequately oversee the facility or process for startup or restart. The prerequisites section of both the contractor and DOE RA POAs may refer to specific items such as a project management plan, a readiness self-assessment plan, a compliance assessment program, safety documentation such as DSAs and TSRs, including recently completed IVRs, if possible, or environmental assessments or impact studies, if they were required to achieve readiness to commence nuclear operations. The prerequisites must be described in terms of specific measurable activities that must be accomplished before the RA begins in order to ensure that readiness has been achieved to start nuclear operations.

The prerequisites for starting an RA vary with each RA, but the basic principle is that the contractor RA must not commence until management has determined that the facility is ready to operate. The DOE RA must not commence until the contractor submitted the Readiness to Proceed Memorandum certifying its readiness to commence operations and until DOE management is ready to oversee operations. The prerequisites specified in the POAs may refer to, for example, phases of the startup process, conditions of the project management plan, specific consent or compliance agreements, or IP status to quantify the method for achieving readiness. Prerequisites should be specific and verifiable. The DOE POA should contain specific prerequisites that, when completed, provide confidence that DOE is ready to oversee contractor operations that are about to be started.

As noted above, when the SNR approves a parallel contractor and DOE RA, the prerequisites in the DOE POA should be clear and specific as to what conditions must be met to start the DOE RA. The prerequisites should consider both the status of the facility readiness and the readiness of the DOE Field Element to oversee contractor operations.

In the situation of a parallel RA, it may be appropriate for DOE Field Element to consider the status of the contractor MSA or similar verification processes when determining readiness to start the DOE RA.

9.1.3 Estimated Readiness Assessment Start Date and Duration.

The estimated start date is for planning purposes only. Identifying a date should not infer that the RA start is schedule-driven rather than readiness-driven. The DOE RA estimated start dates, as well as the contractor RA schedule, should be provided for information in the contractor POA to assist DOE Line Management in planning for the DOE RA.

9.1.4 Proposed Readiness Assessment Team Leader.

The POA must identify a qualified Team Leader who should be a senior employee with adequate experience and knowledge to effectively lead the evaluation of the facility. The basis for the qualifications should be summarized in the POA and include:

- technical familiarity with the activities and functional areas being reviewed;
- previous performance-based review experience or training;
- demonstrated leadership and managerial skills, including seniority in relation to the members of the RR team, to permit smooth management of the RR team;
- RR experience or formal training; and,
- knowledge of facility, activity or operation.

The Team Leader and Senior Advisor must be independent; neither must be from offices assigned direct line management responsibility for the work being reviewed: any exceptions require approval of the startup authorization authority. The appointment of the Team Leader is approved by the SAA when the overall POA is approved. The appointment of the Team Leader is approved by the SAA upon approval of the RA POA.

9.1.5 Senior Advisors.

Senior Advisors are recommended for contractor and DOE RAs with a complex scope or within a complex facility. In many instances, Senior Advisors may not be needed, particularly if the Team Leader has significant RA experience. On other occasions, a single Senior Advisor may be appropriate to assist the Team Leader; or, for particularly complex or controversial RAs of high-hazard facilities, as many as three Senior Advisors may be advisable. The qualifications for the Senior Advisor may be included in the POA. However, it is also within the prerogative of the Team Leader to select Senior Advisors if he or she deems it appropriate.

9.1.6 Official to Approve the Start of the Readiness Assessment and Approve Startup or Restart of the Facility.

The start of the DOE RA is directed by the SAA, who is identified in the approved SNR in accordance with the requirements of DOE O 425.1D. For the contractor RA, the

official designated to direct the start of the RA should be a line manager senior to the manager responsible for achieving overall readiness to start operations.

9.1.7 Reviewers' Approval.

The individuals who prepared and reviewed this document should be listed by name and title. Their signature certifies that they should have reviewed the document and recommend approval by the SAA.

9.1.8 Distribution.

This is a listing of the individuals and organizations that should receive copies of the POA following its approval. These entities have either responsibilities or interests in the new start or restart process. The approved POAs form the basis for RA activity in the restart or startup process. They should therefore be distributed to all interested individuals and organizations. When the SAA is a contractor official, the approved POA must be forwarded to the local DOE Line Management. DOE Line Management must distribute the POA to the PSO, the site Lead PSO or CSO, as appropriate, the appropriate CTA and HSS for information.

9.1.9 Approve the Plan of Action

Line management submits the POA to the SAA for approval. The POA must be approved by the SAA.

9.2 Readiness Assessment Implementation Plan.

The approved POA should be provided to the designated RA Team Leader. The Team Leader identifies the team members who must conduct the RA. The Team Leader, with the assistance of the team, develops the IP consistent with the breadth defined in the RA POA and the facility involved. The IP must identify all of the necessary criteria and review approaches so that the team can determine whether readiness to safely start up and operate the specified facility has been achieved.

DOE O 425.1D specifies that the IP may be as simple as a checklist or as comprehensive as that for an ORR. If the approved format for the RA IP differs from that for an ORR, the format, minimum contents, and manner of usage should be specifically discussed in the approved contractor and DOE implementing procedures. DOE O 425.1D specifies that the IP must be developed by the RA team and that it must reflect the scope of the RA defined in the approved POA. Local procedures should also reflect this requirement. Every RA IP should be a document that accurately incorporates the RA scope and tailoring reflected in the approved POA.

The IP defines the RA depth in a manner consistent with the scope and conditions for startup or restart, as reflected in the approved POA. If a previous timely RA was completed for the facility being reviewed, the RA POA should so indicate, and the IP and subsequent RA should stress the operations that have changed since the last review as well as the effectiveness of corrective actions for any findings.

The RA is conducted by a team of experts chosen by the Team Leader to ensure that, collectively, they can address all of the facets of operations to be reviewed. Management should also be supportive of team members' release from their current duties to support the RA. The number of members may be determined by the scope of the RA and the size and complexity of the facility.

A key responsibility of the Team Leader is selecting the team members based on their qualifications. Each team member should have the qualifications discussed in section 7.6.

The Team Leader must determine and document the team members' qualifications. This information should normally be provided through individual resumes, required reading, and training records. Appendix 3 includes an example form for consolidating the required information.

The roles and responsibilities of the Team Leader and the team members are more completely discussed in section 7.5 and 7.6 above.

The IP should not only document the process the team uses to conduct the review, but should also define the rationale for that process. The documentation should include the selection of criteria and review approaches and the criteria for categorizing findings as prestart or post-start. The IP must reflect the breadth of the RA as described in the POA.

DOE O 425.1D specifies that the IP may range from a simple checklist to a review approach as comprehensive as that of an ORR. Local implementing procedures should specify the IP format. The IP should include all of the information discussed below that is relevant to the specific RA. The IP must be prepared by the team and approved by the Team Leader. The IP must reflect the specific scope and tailoring for the RA provided in the approved POA. The IP should be provided by the Team Leader to the SAA before the RA begins. Contractor line management must forward the RA IP to local DOE Line Management for information.

The IP should provide sufficient detail to serve as both information to management and guidance to the RA team members. Predevelopment onsite facility visits and interviews may be required before the IP can be adequately developed. The following sections are suggested. The information below should be included as applicable for the RA, regardless of the format specified by the local implementing procedures.

9.2.1 Format for Implementation Plan.

- **Introduction and Background:** The Introduction should describe the activity that should be reviewed and the reason for shutdown (if a restart). The Background section should provide background information concerning the basic process, hazards, and issues associated with the activity to be reviewed.
- **Purpose:** Describes the reasons for the review and provides the basic insights for the defined scope of the review.

- Scope: The scope defines the physical and administrative boundaries of the facility, justifies the defined boundaries, and supports a functional review relative to each of the following:
 - plant and equipment (hardware) readiness;
 - management and personnel readiness; and,
 - SMP (e.g., procedures, plans) readiness.

The Scope section of the IP should reflect the approved scope from the approved POA. Each scope element required by the POA must be incorporated into the IP. The depth to which each scope element is evaluated is specified and quantified by the IP criteria and review approaches (CRADs), consistent with the discussion in the approved POA.

- Prerequisites: The IP should summarize the prerequisites specified in the approved POA. It should not be the responsibility of the RA team to develop the prerequisites, but they should understand them because of their usefulness in developing lines of inquiry for the individual CRADs. This section of the IP should also include the prerequisites that are the responsibility of the team or Team Leader in preparing to conduct the RA.
- Review Approach: This section should define the generic approach by which the review may be conducted and provides an introduction to the RA process. The RA CRADs should be defined by the processes described in this section. The means for classifying findings as prestart and post-start should be defined here, as well as the method for report preparation, finding resolution, and methods of closure. In the event that checklists or other locally approved methods for defining the lines of inquiry other than CRADs may be used, the approved method may be described in this section.

The reviews conducted by each RA team are guided by CRADs, which may be grouped into functional areas. The selection of functional areas and the specific groupings should be decided by the RA Team Leader. The selections should be based on the scope of the RA and the expertise of the team members.

CRADs are the documents used in the IP to establish the depth of the RA and provide guidance to the RA team members. As such, the quality of these documents has a significant impact on the overall quality of the RA. CRADs are the bases used to evaluate the CRs of an RA. The CRs of an RA include the 17 CRs of the DOE O 425.1D, as well as any additional CRs specific to the RA that were specified in the approved POA. Each CR is evaluated based on the established criteria. The criteria should be specific and as objective as possible.

The development of the CRADs is the means through which the graded approach is applied to the scope of the RA. Those areas significant to the startup or to the shutdown should be assessed to a greater extent than other areas. For example, if, during a maintenance shutdown, a system was modified or a new system was added, the training, procedures, documentation, and safety basis for that new system should be thoroughly

reviewed. Another system in that same facility that did not undergo modification would receive a less comprehensive review (i.e., this review could consist of a sampling of the training and procedures associated with the system).

In another example, 20 percent of the qualified operators of unmodified systems could be interviewed to assess their level of knowledge, whereas the percentage could be higher for modified or new systems. In a shutdown that was caused by a DSA or TSR violation due to a personnel error, the training and qualification program for the facility should be assessed in detail, while the implementation of the safety basis itself would need a less comprehensive assessment. For a new, high-hazard facility, the depth of the review should be complete in all areas. For a restart of a low-hazard facility, the review should focus on the areas significant to the startup or shutdown, with the remaining core areas addressed to a lesser extent via less extensive criteria. In general, the discussion in the POA guides the level of detail in any particular review area.

Each CRAD should address a CR or some portion of the CR. This ensures that all CRs are addressed by criteria, regardless of the approach used in developing the criteria. The criterion should clearly and fully address the CR or portion of a CR to which it is ascribed. Each criterion should be a statement of the specific attributes the team member evaluates to reach a conclusion as to the readiness of the site, facility, or process to operate in this specific area.

The next section of the CRAD should be the Review Approach. This section should describe the documents to be reviewed, the personnel to be interviewed, and the shift evolutions, including tours and walkdowns, to be observed that lead to the conclusion as to whether the criteria have been met. The final portion of the CRAD should include any references — DOE Orders, mandatory Standards, or site-specific requirements — against which the preceding criteria are to be assessed. The alpha-numeric identification methodology chosen for the RA implementation plan should represent a logical “work breakdown structure” chosen to describe the entire RA effort so that all elements can be related back to the core requirements for safe operation of the facility. The Appendix 3 writing guide contains some examples of CRAD identifications.

The depth of the evaluation specified by the CRADs or through local procedures and defined lines of inquiry may be unique. The critical and consistent goal is that the review approaches are adequate to fully evaluate the scope defined in the POA and that they are sufficiently detailed to allow a knowledgeable observer to understand the intentions for the RA and agree that the scope specified in the POA is fully addressed.

- **RA Preparations:** This section should describe any preparations, including team pre-visits and document reviews, which may be undertaken prior to the RA. A discussion of qualifications and training considerations for RA team members could appear here.
- **RA Process:** This section should describe how the RA should be conducted, including the sequence of activities from the initial in-briefing through the final out-briefing. The section should discuss the record reviews, interviews, operational demonstrations, team meetings, and the overall decision-making process. The

processes for development of the final report should be included. Some discussion may be appropriate as to how evolutions and upsets should be conducted and observed. This section may paraphrase or summarize the RA process in the approved local implementing procedures.

- Administration: This section should describe the mechanism for RA-related meetings, correspondence, communications, and team structure. The RA team composition, interface requirements, any oversight groups, and DOE organizations to be involved in the review should be discussed in this section.
- Reporting and Resolutions: The section should detail the methods that the RA team would use to report review results.
- Schedule: This section should include a discussion of the proposed schedule for any preparation, the previsit, the onsite review, report preparation, and closeout.
- Appendices: The Appendices should include the specific CRADs or other checklists or lines of inquiry used to conduct the individual assessments. The Appendices may also include reporting forms, a writing guide, team resumes, and other sections appropriate to stand alone in an appendix. The appendices of this Standard, as well as the Team Leader's Guide and the DOE Readiness Review website, may contain information and examples that may be useful during development of the appendices for the IP.

9.3 Conduct of Readiness Assessment

The scope of the RA may not include all core requirements discussed below. In a situation where the POA excludes some CRs, those elements are not evaluated.

The purpose of the RA should be to examine the aspects of the activity under review and to ensure that the equipment, procedures, and personnel associated with the activity are ready for startup and safe operation. In addition, the RA should verify the adequacy of the SMP infrastructure to ensure that the readiness conditions to start nuclear operations are maintained through the operating cycle.

The RA should be a performance-based assessment that includes observing and documenting the responses of operating and support program personnel to normal and off-normal events as demonstrated by drills, preoperational tests, evolutions, and exercises. In addition, field assessments should be conducted to verify that field configurations match the applicable supporting documentation. The RA team should also conduct interviews with personnel, including management, to evaluate their readiness to conduct operations. The scope and extent of the evaluations must conform to the scope specified in the POA that has been accurately reflected in the IP.

The RA must verify that the necessary requirements documentation is in place and adequately supported by procedures, personnel, equipment, and systems. It is not a requirement that the RA process approve the foundation documentation, only to verify that it is complete, approved, and implemented as required by the CRs of DOE O 425.1D.

Critical to the establishment of operational requirements are formal agreements between the operating contractor and DOE, generally in the form of contracts. Part of the contract includes the requirements governing the safe operations of the facility. These are normally identified as List A and List B in the contract section J attachments.

The implementation of the contract requirements for programs that should be within the scope of the IP should be noted by the RA team member reviewing the programs.

Typically an RA should not commence until line management certifies that readiness to start nuclear operations has been achieved. However, as DOE O 425.1D states, it may be appropriate for the RA team to observe events significant to the startup process before the RA begins. Experience indicates that the events meeting this criterion would be emergency management exercises initiated in the facility within the scope of the RA. Because it is difficult to plan and schedule emergency management exercises during an RA, it may be appropriate for the RA teams (both contractor and DOE) to observe the exercise when it occurs.

For the observation to be a valuable contribution to the RA, the exercise should have the initiating event within the facility being started, all emergency management documentation for the facility should be complete, and personnel should be trained in emergency management procedures. It may not be possible to meet these criteria more than a month or two before readiness is achieved to start the RA. In very unusual circumstances, there may be other unique events that should be observed by the team before the RA begins. This could include a one-time, high-risk test of a component or system within the scope of the RA or a complex, integrated test sequence. However, normally it is adequate for the RA team to review the results of the testing. Since the testing is normally not accomplished by operations personnel and not conducted in a manner to demonstrate formality of operations or personnel capabilities, direct observation of such testing is of little value towards demonstration of readiness to start nuclear operations.

9.4 Unsuccessful Readiness Assessments.

The assumption of the RA process is that before it commences, readiness to start nuclear operations has been essentially achieved and that the RA team can recommend authorization to start operations when the prestart findings have been resolved. However, in rare instances, the number or magnitude of the findings may be such that the team is unable to conclude that resolving the findings would lead to a condition of readiness to start nuclear operations. Such a conclusion recognizes that because the RA process is executed through sampling, some important elements of readiness may not be evaluated because of findings that have been identified. For example, if the TSRs are not fully implemented, it is not possible to assess the adequacy of the individual implementation mechanisms. In another example, if the training and qualification requirements were not adequately defined, it may not be possible to determine the adequacy of the knowledge and competence of the operating personnel since they had not received appropriate training. However, there is no firm definition as to when an RA should be stopped. All facts and issues should be evaluated to determine an answer to the question of whether the RA team

is convinced that readiness has been achieved and whether nuclear operations can be safely started when the identified prestart findings are resolved.

The RA team should not casually reach its decision to stop an RA or reach an unsatisfactory conclusion, but instead carefully consider all of the facts that led to its conclusion. The basis for the team's decision should be supported with specific issues and examples. The guidance and counsel of the Senior Advisor may be invaluable.

In general, there are two situations that could arise. In the first situation, the team identifies many areas in which numerous issues are identified, which leads the team to a conclusion that the RA is unsatisfactory and should be repeated in full. The repeat RA may commence after line management implements corrective actions to address the identified issues and recertifies readiness to start nuclear operations. It may be appropriate to develop a new POA and IP for the repeat RA or simply repeat the RA using the same POA and IP.

In the second situation, many functional areas of the RA are adequately prepared to support nuclear operations; however, deficiencies are identified in some important functional areas to the extent that it was not appropriate to simply identify findings to be corrected. In such a case, it may be appropriate to complete the RA for the functional areas that are ready to support nuclear operations and finalize the report in those functional areas. For the inadequate functional areas, the RA may be suspended until the deficient functional areas are remediated. If the option to suspend the RA is chosen and agreed to by the SAA, the interim report should provide line management general information concerning the areas of inadequacy, but not a punch list upon which they should focus all attention. Once line management has fully evaluated the areas of inadequacy and taken corrective actions to bring them into a state of readiness to support nuclear operations, the RA may be resumed in the deficient functional areas.

The Team Leader and the SAA should be aware of the possibility of an unsuccessful RA and decide how it should be handled. Because the Team Leader works for the SAA, who directed the start of the RA, suspending the RA should only occur with the SAA's agreement. If the SAA does not agree, the team is obligated to complete the RA and determine that readiness to start nuclear operations has not been achieved, in which case repeating the RA is the only alternative.

Some organizations within DOE believe that it is never appropriate to suspend and restart an RA and that if an RA cannot be completed, the entire process should be repeated. However, in cases where an RA can be satisfactorily completed in some functional areas, it may be appropriate to take credit for the functional areas that were satisfactory and grade the POA accordingly. The decision to take credit for the successful portions of the initial RA should be weighed carefully against time constraints and any changes that have taken place since the first RA. In every case, there should be close coordination and agreement between contractor line management, DOE Field Line Management, and the SAA who must approve the POA for the second RA.

9.5 Contractor Readiness Assessments.

Contractor procedures governing the conduct of RAs should include a provision that, prior to commencing, line management must verify in writing that all prerequisites specified in the POA have been met. A manageable list of open items may exist, as discussed below, at the time the contractor RA starts.

Once contractor line management has determined that readiness has been achieved by meeting all of the prerequisites specified in the approved contractor RA POA, the contractor formally declares readiness through the Readiness to Proceed Memorandum, and then the RA must be conducted and reported in accordance with the contractor IP.

The contractor must commence its RA only when the approved prerequisites have been completed. However, there may be events that occur before the RA begins, such as periodic emergency preparedness drills or complex system testing, when the RA team may monitor the event when it occurs rather than wait until the review begins. This early review is appropriate. The activity should be documented in the RA final report. It may be also appropriate for the RA team to conduct pre-RA activities necessary to gain the familiarization, understanding, and qualification necessary to prepare the RA IP and conduct the RA prior to prerequisites being met.

The sequence and methodology for the RA should be described in the IP. Additional guidance for the preparation and conduct of the RA is provided in DOE-HDBK-3012, *Guide to Good Practices for Operational Readiness Reviews (ORR), Team Leader's Guide*. The final report should be developed during and following the RA. Examples of forms for the final report are included in the writing guide in Appendix 3. Final reports can be viewed on the DOE Readiness Review website.

The overall responsibility of the RA team is to examine the aspects of the activity under review and assure themselves, management, and DOE that the equipment, procedures, personnel and infrastructure programs, including SMPs associated with the activity, are ready for startup and safe conduct of nuclear operation.

RA evaluations should place particular emphasis on the SSCs that are important to nuclear safety (relevant to public and worker safety and health) or of particular importance to the safety of the planned nuclear operation of the activity. The results of these evaluations are included in the final report.

DOE Field Element personnel should observe and evaluate the contractor RA process. The RA process should be open and well-defined to permit DOE oversight. Team meetings should be informative for the benefit of the team as well as for DOE. Interviews and record reviews, as well as evolutions and drills, should be scheduled in a manner that fosters openness. The Team Leader should coordinate with DOE oversight personnel to facilitate their observation and evaluation of the contractor RA.

Documentation of the methodology, criteria, and results of the contractor RA is important to the credibility of the review and the foundation for the follow-on DOE RA. The value of

the review depends in large part on the thoroughness of the RA and the adequacy of its scope (breadth and depth). Section 9.4 and Appendix 3 of this Standard provide additional guidance on recording the results of the RA.

9.6 Readiness to Proceed Memorandum.

9.6.1 When SAA Resides with Contractor

If the SAA resides with the contractor, the contractor RA team shall develop a final report in accordance with the site's implementing procedures and forward it to the SAA. Upon approval of the SAA, the final report is provided to responsible line management for use in developing a corrective action plan that provides the methodology and the schedule for resolving the findings. The SAA will also provide a copy of the final report to the local DOE Field Element.

For RA where the SAA resides with the contractor, the contractor shall carry out the applicable parts of 9.4 through 9.9.

Upon completion of pre-start corrective action, line management will issue a Readiness to Proceed Memorandum to the SAA, who will then make a determination on authorizing the restart in accordance with section 9.11.

The Readiness to Proceed Memorandum should not be submitted until all actions required for startup or restart have been completed, with the exception of a manageable list of open prestart items that have a well-defined plan and schedule for closure. There should be no unresolved issues in the path to closure of these prestart items.

9.6.2 When SAA Resides with DOE

If the SAA resides with DOE, the contractor RA team shall develop a final report in accordance with the site's implementing procedures and forward it to the applicable contractor line management.

Once the contractor RA process has been completed, the contractor must develop a corrective action plan that provides the methodology and the schedule for resolving the findings. Prior to issuing the Readiness to Proceed Memorandum to DOE, the contractor must resolve all prestart findings and prepare the action plan, including schedule of completion for the remaining findings.

The Readiness to Proceed Memorandum is the formal communication from the contractor to DOE stating that the facility has been brought to a state of readiness to start or restart nuclear operations. The Memorandum is a prerequisite to the DOE RA. The Field Element should use the contents of the Readiness to Proceed Memorandum, coupled with its own routine management understanding of the status of the facility, as a basis for the recommendation or decision to commence the DOE RA.

9.6.3 Contents of the Readiness to Proceed Memorandum

The contractor RA final report should be an enclosure to the Readiness to Proceed Memorandum. The Readiness to Proceed Memorandum indicates the status of resolution of prestart findings and a corrective action plan for post-start findings. If applicable, the DOE Line Management endorsement to the Readiness to Proceed Memorandum should state that the conclusions reached by the contractor RA support the recommendation in the endorsement.

The Readiness to Proceed Memorandum should not be submitted until all actions required for startup or restart have been completed, with the exception of a manageable list of open prestart items that have a well-defined plan and schedule for closure. There should be no unresolved issues in the path to closure of these prestart items.

If there are an excessive number of open items at the time the Readiness to Proceed Memorandum is submitted to the SAA, the initial conclusion is that contractor management and RA processes were not successful. In case where a DOE RA is to be conducted, the DOE RA should not start until the situation is resolved. The submittal should be delayed until there are no open items that would prevent authorization to start nuclear operations. In the situation when the contractor is the SAA, a copy of the complete RTP including all enclosures should be provided to the DOE Field Element Manager.

The following provide guidance on the acceptability of the open prestart items at the time the contractor submits the Readiness to Proceed Memorandum:

- Each open item prerequisite to commencing facility operations should be identified in the Readiness to Proceed Memorandum.
- In determining how many open items are acceptable, it should be recognized by line management that every functional area should be sufficiently well developed in its elements to permit its evaluation in the RA. For example, one or more open items indicating that a key program has not yet been developed and implemented would not be acceptable because the functional area could not be adequately reviewed in the RA. Such an open item would be acceptable only if the key program were to be fully established before the RA is complete.
- Each open item should be explicitly addressed in a corrective action plan. An open item such as “the required environmental permits have not been requested or approved” would not be acceptable because many other facility procedures and activities are potentially impacted by the corrective actions to the identified open item. The schedule for completion of the corrective action plan should be consistent with the timing for the completion of the RA so that the RA may evaluate the corrective action plan and the progress in completing the planned activities.

In summary, the open items should be few in number, well-defined with a well defined corrective action plan, able to be completed on a schedule consistent with the RA schedule, and not of such a nature to preclude an adequate review of any specific area by the RA.

9.7 DOE Action Following Receipt of the Readiness to Proceed Memorandum (For use when DOE is the SAA).

DOE Operations or Field Element Line Management should review the submitted Readiness to Proceed Memorandum, which involves verifying the accuracy of the included information, evaluating the completeness of the open items listing, and determining whether the corrective actions and time estimates are realistic. In addition, the Operations or Field Element must verify that DOE is ready to oversee facility operations as specified in DOE O 425.1D, which requires that DOE Line Management, up to the SAA, document in writing their readiness to oversee operations.

DOE Field Element Line Management forwards the Readiness to Proceed Memorandum to the appropriate DOE Line Manager with a recommendation as to whether the memorandum should be accepted and the DOE RA scheduled, or whether additional information or action is needed from the contractor or additional actions should be taken by DOE Field Element Line Management.

The Readiness to Proceed Memorandum with its enclosures and endorsements should be retained as a part of the facility restart record, as well as the RA final report and associated documentation. Experiences and lessons learned in managing the Readiness to Proceed Memorandum and process should be included in the lessons learned section of the RA final report.

DOE Line Management responsible for overseeing contractor operations should prepare an endorsement to the Readiness to Proceed Memorandum before forwarding it to the restart authority, even when the SAA is at the local DOE Field Office. The DOE Line Management endorsement should discuss two important elements:

- DOE Line Management's assessment of the readiness of the contractor to commence operations. This assessment should be based on the day-to-day observation of contractor activities and an assessment of the adequacy of the contractor RA and the associated corrective actions.
- Readiness of DOE Line Management to oversee contractor operations following startup, including meeting prerequisites and CRs in the DOE POA. The basis for the conclusion, including the results of any DOE Line Management self-assessments conducted in anticipation of startup, should be included in the endorsement.

9.8 DOE Readiness Assessments.

When the approved SNR requires a separate DOE RA, the following principles should be followed:

- The DOE RA should not commence until DOE has received the contractor's Readiness to Proceed Memorandum, signifying its readiness to commence operations, and until DOE management is ready to oversee operations. In the event local procedures provide for parallel DOE and contractor RAs, the procedures should provide clear direction as to how and when the DOE RA is authorized to start.
- The prerequisites for starting an RA must be specified in the DOE POAs, as required by DOE O 425.1D. The specifics vary with each RA, but the basic principle is that the RA must not commence until management has determined that the facility is ready to start or resume nuclear operations.
- The prerequisites identified in the POAs may refer to phases of the startup process, conditions of the project management plan, specific consent or compliance agreements, IVRs, or IP status in order to quantify the method for demonstrating that readiness has been achieved. Prerequisites should be specific and verifiable. The DOE POA should contain specific prerequisites that, when completed, provide assurance that DOE is ready to oversee contractor operations that are about to be started or resumed.

When directed by the SAA, the DOE RA should be conducted and reported in accordance with the DOE IP that reflects the review scope specified in the approved POA. The DOE RA team conducts the RA and prepares the final report in accordance with the IP. The DOE RA should include a detailed review of the contractor's RA and other performance assessments in accordance with the approved scope. Following completion of the DOE RA, resolution of prestart findings, and development of acceptable corrective action plans for post-start findings, DOE management should recommend to the SAA that startup approval be granted.

The DOE RA should include an assessment of the technical and managerial qualifications of those in the DOE Field organization who are responsible for oversight, direction, and guidance to the contractor, including Facility Representatives. A similar review should be made of the qualifications of contractor personnel responsible for facility operations.

In most cases, a key element of the DOE RA is a detailed review of the methods and results of the contractor's RA. The results, including corrective actions, should be assessed for adequacy and effectiveness of the contractor's RR process. The DOE RA should conduct additional selected detailed assessments to verify the findings of the contractor RA and review areas that may not have received an adequate review in the contractor RA. The DOE RA should not be intended or desired to duplicate the contractor RA.

9.9 Documentation of Readiness Assessment Results.

The final product of the RA process is the RA final report, which documents not only findings and conclusions, but the process by which they were developed. Findings identified at any point in RA are to be included in the final report and formally addressed for resolution and closure regardless of any interim actions which may be taken by line management to address such deficiencies.

The RA final report should be the basis for senior management decisions including startup or restart approval, and should therefore accurately reflect the conditions found during the RA.

The RA final report should document the logic of the review and convey the results of the review. It should provide a summary of review activities and confirmation that the criteria and review approaches detailed in the IP were followed, with explanations for any deviations. It should also contain enough detail that the reader can follow the review logic of the RAs, traceable from the POA to the IP to the RA findings.

The RA final report should document the effectiveness of the facility's operational readiness preparation, the contractor RA, and the readiness of the facility to proceed with startup or restart. The final report should also provide information concerning the readiness of the management system (both the contractor and DOE) to oversee and manage the facility, activity, or operation. If deficiencies exist, the RA final report should clearly define those, as well as the inadequacies that should be addressed before and after startup.

The validity and defensibility of RA results should depend largely on the thoroughness with which the process and the observations are documented. The final report should be clear as to what was evaluated and the methodology used during the evaluation.

9.9.1 Final Report Format.

DOE O 425.1D provides requirements for the content of the RA report. The order does not provide the format. For consistency purposes across a site, the format for check list type RAs should be specified in site implementing procedures. For RAs with more substantial scope, the following is a suggested format derived from a composite of past DOE RA final reports. A synopsis of each section is contained below.

- Title Page: The cover and title page should state the subject and the date of the RA. The report cover should not contain any extraneous information, data, graphics, or pictures.
- Signature Page: This page should contain the signatures of all team members, signifying their agreement as to the report content and conclusion in the areas to which they were assigned. In the event all team member signatures cannot be obtained due to logistical considerations, the Team Leader should gain their concurrence via fax or telephone and sign for them.
- Executive Summary: The Executive Summary should be a one- to three-page synopsis of the review, findings, and the conclusion as to whether the team believes readiness has been achieved. The Executive Summary should introduce information and direct the reader to those portions of the report that provide more detail on the information. Some suggested points for the Executive Summary include:
 - a brief summary of the review activity that provides information concerning the team's evaluation of readiness;

- the management system's adequacy to oversee the operation;
 - a summary evaluation of the adequacy of the RA preparation (and possibly the RA program); and.
 - a synopsis of the significant problems and strengths.
- Table of Contents: A Table of Contents should be provided to facilitate a review of the report. The Table of Contents should identify, with page numbers, all sections and subsections of the report, illustrations, charts, and appendices.
- Introduction: The Introduction should provide information and background regarding the facility being reviewed, the reasons for shutdown (if a restart), the purpose of the RA, and the scope of the evaluation. Other information that should be provided includes a brief discussion of:
 - The overall objectives of the evaluation;
 - The review process and methodologies used in the review;
 - The team composition; and
 - Definitions applicable to the review.
- RA Evaluation: This section provides an overall evaluation of readiness, followed by individual functional area summaries. For each functional area, the summary should, in one page or less, discuss the CRs and provide conclusions as to the readiness of the functional area to safely support proposed operations. Conclusions as to the readiness of hardware, personnel, procedures, and the management system that controls each functional area should be addressed, including key issues. The evaluation should discuss the prestart and post-start findings associated with the review and provide a conclusion as to the readiness of the facility to begin operation within the scope of that specific functional area.

Any deviations from the IP should be discussed, along with the reasons for the deviations, and the alternative actions that were taken to compensate, if necessary. Because the RA Evaluation section provides the basis for the determination of readiness for each CR, it should discuss not only the deficiencies found during the review, but should also discuss those positive aspects that affected the determination. In addition, the RA final report should also identify as Opportunities for Improvement those items that are not findings; but that, if addressed, would lead to excellence in operations. The detailed documentation to support the conclusions may be included in an appendix consisting of the individual CRADs, checklists, or other lines of enquiry with the accompanying Assessment Forms. See Appendix 3 for additional details.

- Lessons Learned: Each RA final report should contain a section on lessons learned to be used by both contractor and DOE to improve the RA process. These lessons should provide information on problems encountered by the review team, adequacies or inadequacies concerning the review, design, and implementation, expertise, or any other relevant factors or information that may be used by future review teams.

The RA must also identify lessons learned applicable to similar facilities. Lessons learned in areas such as operations, procedures, design, or documentation may also be identified. The RA team must include these lessons learned in the report as well. Facility management or DOE management should be responsible for promulgating these lessons in accordance with established procedures. The RA final report may be issued before the lessons learned section is written to avoid delays in issuing the report. However, each RA report must contain a lessons-learned section, as required by DOE O 425.1D.

- Dissenting Professional Opinions: The RA process provides an opportunity for team members to submit dissenting professional opinions which should be documented and appended to the final report.

While the team should strive to reach a consensus concerning all aspects of the review, DOE recognizes that professional judgment does not always allow for complete agreement. In cases of disagreement, the Team Leader should make the final decision concerning the disposition of the finding or concern. However, discussion of all aspects of the finding should be provided in the final report to provide the SAA with all relevant information on which to base his or her decision.

If a team member feels that aspects of his or her opinions have not been adequately represented, that member should file a dissenting professional opinion. The written report of the dissenting professional opinion should be appended to the RA final report for review by the SAA.

- Appendices: Appendices provide data that support the final report. Data that should be considered for appendices include:
 - the IP*;
 - the CRADs*;
 - a listing of the team members and their resumes*;
 - the POA*
 - Evaluation of criteria (Forms 1);
 - the Prestart Findings summary (Forms 2); and,
 - the Post-start Findings summary (Forms 2).

The asterisked items may be referenced but not included in the final report and should be maintained with the readiness records.

9.10 Prestart and Post-Start Findings.

Findings should be defined as nonconformance with a stated requirement that represents either:

- a systematic failure to establish or implement an adequate program or control; or,

- a significant failure that could result in unacceptable impact on the safety of personnel, the facility, the general public, or the environment during nuclear operations.

During the RA, it is expected that the team should identify individual deficient conditions. Frequently, the deficient conditions, when evaluated together, may reflect a programmatic or implementation weakness that is of concern and requires corrective action to ensure that operations are conducted safely when started (prestart finding), or requires corrective action to mitigate longer-term concerns or programmatic deterioration (post-start finding). As discussed above, findings should be discussed on Form 1s and documented on Form 2. The rollup or individual deficient conditions should be identified as findings. One of the important tasks of the team is to identify the significant findings that impact the adequacy of programmatic support or indicate inadequate implementation of important operational conditions. It may be possible to identify individual deficiencies. The challenge should be to determine when a group of seemingly minor individual issues are indicative of a more systemic issue that should be identified as a finding.

The IP or local approved procedures also should provide a standardized method for identifying findings using the requirements identified within the criteria. Each finding should be clearly described, providing examples of the individual issues that comprise the finding. The finding should describe what is deficient, provide the reference to the requirement with which it is deficient, and be written in a manner permitting corrective action to resolve it. Each finding should be identified as to whether or not, in the opinion of the RA team leadership, it should be resolved as a prerequisite to startup of operations. Criteria for arriving at this opinion should be published in the IP. It may also be appropriate to identify the level of management (i.e., contractor, DOE Field, or DOE Headquarters) at which the finding should be closed. While the RA team may assist management in reviewing the action taken on a finding, responsibility for its resolution should reside with line management. Form 2, which is discussed in the writing guide in Appendix 3, further discusses identified findings.

9.11 Corrective Action Plans.

The contractor and DOE must prepare corrective action plans for all findings identified in their respective RAs. The DOE and contractor implementing procedures should specify the process and format for evaluating and documenting findings. Form 3, described in Appendix 3 writing guide, may provide the required documentation to describe corrective actions and close the finding. The action plan should contain the following elements:

- The finding, as written in the report submitted by the RA team, and whether the finding is a prestart or post-start finding.
- A detailed proposed action plan for addressing the deficiencies identified in that finding. The proposed action plan should evaluate any overall programmatic deficiencies related to a specific finding that could lead to similar occurrences and include actions to address these deficiencies. For findings identified during the DOE RA, DOE must approve the contractor's proposed corrective action plan.

- The proposed dates when the actions should be completed. If the corrective actions for a finding are phased, the dates for each phase should be detailed.
- If it is a post-start finding, a description of the risks and mitigating actions or compensatory measures, if any, to be taken during the interim that should reduce the risks to an acceptable level before final corrective action. DOE Line Management should verify that the corrective action plan has been entered into the appropriate quality program issues management system.
- If some corrective actions for prestart findings would occur after the startup of operations, the risks and mitigating factors or compensatory measures should be clearly identified. The actions that are required prior to the startup of operations must be clear and closed with a final closure package, as discussed below, before operations can be started.

Findings and associated corrective actions for the contractor and DOE RAs should be entered and managed via the site corrective action or action tracking processes.

9.12 Readiness Assessment Follow-up Activities.

The RA process should not end with the completion of the RA and the finalizing of the report. Several actions may require the participation of the Team Leader and team members. The Team Leader should notify all team members of future involvement concerning closeout briefings, interpretation (and possible justification) of findings, review of corrective action plans for adequacy, and review of final closure actions.

It should be clearly understood that line management is solely responsible for resolving findings and accepting the corrective action plan and the adequacy of the corrective actions. However, since the team members are most familiar with the details of the findings, line management may request members of the team to assist during the process for closing findings. It should always be clear that line management should not defer to the team on deciding on the adequacy of the corrective action plans or the corrective actions actually taken.

The Team Leader should be prepared to coordinate any follow-up meetings, which include closeout meetings with the affected facility and line management, team debriefings, and presentation of the report to DOE and contractor upper management. The Team Leader may be required by the Secretarial Officer or other appointing authority to present the team report to upper DOE Line Management. Presentations may be required to internal or external interested groups as well. In addition, it may be appropriate for the Team Leader to recommend an organization to verify proper closure of individual prestart findings.

9.13 Action Tracking and Closure Methodology.

Monitoring and verifying the satisfactory closure of prestart findings from both the contractor and DOE RAs is a line management responsibility. DOE O 425.1D defines elements of the required process to close RA findings. Closure packages should contain

the following information:

- The finding, taken verbatim from the original report, should be identified as a prestart or post-start finding.
- The actions proposed in the action plan should be developed, submitted, and approved with the original completion schedule.
- A brief description of the corrective actions taken, reasons for concluding that closure has been achieved, and objective evidence supporting closure should be provided. The referenced documents or objective evidence illustrating the corrective actions and the dates of the actions should also be included.
- Signatures of the appropriate line management, as defined by the site procedures or within the RA IP should be included. An example closure form is provided as Form 3, RA Finding Resolution Form, in Appendix 3.
- DOE verification for DOE RA findings, of the adequacy and completion of the corrective actions should be provided.

9.14 DOE Line Management Oversight of the Readiness Assessment Process.

Throughout the RA process, various Headquarters, Field Element, and external oversight organizations may become involved in the process. To ensure that proper liaison occurs, documentation from each step in the process should be provided to the appropriate internal and external oversight groups for information and comment. In most cases, the documentation should be provided after approval by the appropriate management official.

It should be stressed, however, that all information should be provided in a timely manner if all organizations are to execute their responsibilities without delaying critical steps in the process. Frequent liaison should occur between management and oversight organizations at each level, both internal and external, to ensure that all responsibilities and commitments are fulfilled. Transmittal of DOE documents to agencies outside of DOE should follow established procedures.

DOE Field Element personnel should observe and evaluate the contractor RA process. The RA process is open and defined to permit DOE oversight. Team meetings should be informative for the benefit of the team as well as DOE oversight. Interviews, record reviews, evolutions, and drills should be scheduled in a manner to support openness. The RA Team Leader should coordinate with DOE oversight personnel to facilitate their responsibility for observing and facilitating the contractor RA.

The following items are a compilation of the required and recommended responsibilities of the Field Elements in executing the new start and the restart RA processes. Some of these actions may not be required in situations when the contractor is designated in the SNR as the SAA. In all cases, however, DOE should exercise adequate oversight of the RA

process to ensure that the approved procedures are followed and the desired outcome is achieved.

- Review and approve, or review and forward for approval, the contractor RA POA.
- Provide day-to-day oversight of the contractor's activities to achieve and verify readiness to conduct operations, including a review of the contractor RA report and prestart finding closure plans and closure documentation. Through this day-to-day oversight, Element Line Management provides knowledgeable recommendations concerning the contractor's actions and proposals. Day-to-day oversight enables Field Element staff to provide a defensible recommendation on the contractor's Readiness to Proceed Memorandum.
- For cases where SAA resides with the DOE, review, and take appropriate action on, the contractor Readiness to Proceed Memorandum. If the Operations or Field Element Manager is the SAA, he or she grants authority to conduct the DOE RA. For other new starts and restarts, the contractor forwards the Readiness to Proceed Memorandum to Headquarters recommending that the DOE RA be started when it is satisfied that the facility is ready to be operated safely, Field Element Line Management personnel is ready to oversee contractor activity, and procedures are in place.
- For cases where SAA resides with the DOE, DOE Field Element Line Management responsible for oversight of contractor operations should prepare an endorsement to the Readiness to Proceed Memorandum when forwarding it to the SAA. The DOE Line Management endorsement should contain two important elements:
 - a discussion of DOE Line Management's assessment of the contractor's readiness to commence operations. This assessment should be based on the day-to-day observation of contractor activities and an evaluation of the adequacy of the contractor RA and associated corrective actions; and,
 - concurrence with the status of prestart findings and a recommendation to the appropriate decision official to authorize startup or restart after the DOE RA is complete and all prestart findings are closed. In cases when the Field Element Manager is the designated SAA, he or she must authorize the startup or restart and should inform the Secretarial Officer.
- DOE Prestart Findings Closure Process. Evaluate the contractor's prestart finding closure process and verify closure of DOE RA prestart findings as designated by the SAA. To verify closure, support may be requested from the DOE RA Team Leader or team members; however, closure verification remains a line management responsibility. DOE Line Management verifies the adequacy of corrective action plans for all findings from the DOE RA.

See Section 7 above for additional discussion on the roles and responsibilities of DOE Line Management and oversight organizations.

9.15 Independent Oversight Organizations.

DOE O 425.1D, Section 5.b specifically indicates that DOE independent oversight of the RA and RA process is the responsibility of HSS. To ensure that the startups and restarts of DOE nuclear facilities proceed in a timely fashion, it is incumbent upon the contractors, Field Element Managers, and Secretarial Officers to provide the appropriate review documentation to the PSO, site Lead PSO or CSO, the appropriate CTA, and HSS throughout the process. It is also incumbent upon HSS to provide comments to these organizations in a timely fashion to ensure that their concerns are addressed with minimal impact on the startup or restart schedule.

HSS. In addition to the general Departmental responsibilities specified in DOE M 411.1-1C, the DOE FRAM, HSS exercises independent oversight of the startup and restart process for nuclear facilities. This responsibility entails the following:

- In coordination with the PSO, performing independent reviews of startup and restart activities as appropriate and providing the results of these reviews to the CSOs for resolution.
- Reviewing and commenting on SNRs, contractor and DOE POAs, IPs, and RA final reports.

9.16 Authorization to Resume Operations.

In cases where the SAA resides with the contractor. Upon completion of Readiness Assessment activities, including resolution of all prestart findings, and satisfactory corrective action plans are prepared for post-start findings, and a Readiness to Proceed Memorandum has been received, the SAA may grant permission to start or resume operations.

In cases where the SAA resides with DOE. Upon completion of Readiness Assessment activities, receipt of the contractor's Readiness to Proceed Memorandum, DOE Line Management concurrence on the satisfactory status of prestart and post-start findings. DOE Line Management should forward the contractor's Readiness to Proceed Memorandum to the SAA with a recommendation on authorizing the restart or startup of operations or activities. The SAA should inform appropriate Secretarial Officer of their final decision.

10 EQUIVALENCIES AND EXEMPTIONS

DOE O 425.1D specifies that the exemption provisions of DOE O 251.1C, *Departmental Directives Program* are applicable.

APPENDIX 1. RECOMMENDED APPLICATION OF THE GRADED APPROACH IN READINESS REVIEW PLANNING

For the purposes of this Appendix, the graded approach is defined as the process by which the readiness determination is adjusted in the scope of detail required and magnitude of resources needed to be commensurate with the facility's potential impact on safety, environmental compliance, safeguards and security, and its programmatic importance, including the present and future missions. The graded approach is commensurate with:

- The importance to safety, safeguards, and security;
- The magnitude of any hazard involved;
- The lifecycle stage of a facility;
- The programmatic mission of a facility;
- The particular characteristics of a facility;
- The cause and circumstances of the facility shutdown;
- Complexity of the weapons-related or research activity; and
- Other relevant factors.

All RRs consider the minimum set of Core Requirements (CRs) and any additional requirements as deemed necessary for an adequate review (breadth). A recent independent, successful, comprehensive review may be used as justification for eliminating a CR from the breadth of the RR. Additional justification may be provided in the POA to justify the elimination or tailoring of additional CRs. With respect to RR planning, a graded approach should be applied to determine the level of detail (i.e., the depth). The combination of breadth and depth forms the scope of the RR. Proper application of the graded approach is essential to conducting a successful RR. The supporting principle governing the use of the graded approach is that knowledgeable personnel should analyze the factors surrounding the start or restart, determine the depth of the review needed, and appropriately document this determination. Precise documentation facilitates communication with knowledgeable outside officials that the proper level of review has been conducted and that readiness to operate has been accurately verified. The scope of a RR cannot be determined using a cookbook or formulaic approach. Identifying the appropriate depth of a review requires knowledgeable people who identify relevant topics based on their experience, the facility characteristics, the facility operating environment, the operating and support organizations' capabilities, and the risks associated with the proposed startup or restart. The Scope discussion in the approved POA provides a basis for determination of the depth of the review of individual criteria or CRs. Criteria and Review Approach Documents (CRADs) are developed for each CR, specifying the appropriate level of detail.

The following factors and their implications should be considered in developing the depth of either an operational RR or a RA and should be considered when applicable in preparing the POA:

- Physical modifications to the facility: Any modification should be assessed for its potential effect on facility hazards and risks, on the facility safety basis as documented in the Documented Safety Analysis (DSA) and associated Technical Safety Requirements (TSRs), on facility procedures, and on the need for personnel to be trained on the reconfiguration. In addition, the integrity of the facility design baseline may need to be verified.
- Procedural changes: Changed or new procedures should be reviewed to determine if they have been adequately verified and validated, if the operators have been adequately trained on the modified procedures, and if the procedures at the workstations clearly reflect the changes.
- Personnel changes: Continuity of the operations team should be assessed to determine if a significant loss of experienced personnel has occurred and been adequately mitigated. Training and qualification of new and reassigned personnel should be verified.
- Length of shutdown: There is a characteristic loss of operator familiarity with normal facility operations that increases with the length of the shutdown. If the shutdown is unusually long, requalification of the operators may be necessary. There are also physical processes (e.g., corrosion, radioactive decay, evaporation) that may become important following an extended outage. The longer the outage and the more complex the activity during the outage, the more rigorous the review should be to identify unanticipated changes.
- Overall hazard characteristics of the facility: The nature of the hazards and the environment associated with a facility or process are major factors in determining the depth of the RR. For example, the depth of an RR for a facility that handles small quantities of tritium gas may not be as complex as one that handles large quantities of plutonium.
- The complexity of the activity: The size and complexity of the facility or process being reviewed drives the rigor and complexity of the RR. The depth of the review requires that reviewers be able to comprehend and evaluate the criteria. The number of criteria developed should be based on the size and complexity of the facility or process.
- A new process or facility versus the restart of an existing activity: A significantly new process would involve verification of training and qualification of workers and new procedures without any significant reference points available onsite. This should ensure the RR to be more comprehensive than that for a process that has a significant experience base onsite.
- The programmatic significance of subsequent operations: A facility or process that is intended for long-term programmatic operations should require a more comprehensive review in some specific areas than would a temporary operation.
- Introduction of new hazards: The proposed facility evolution should be evaluated for potential new hazards. While some new hazards may be obvious, a critical review is needed to identify subtle new hazards introduced by the startup of new facilities or modification to existing facilities. Modifications made to improve operations in one aspect may unexpectedly introduce hazards in a different area.
- Increase in existing hazards or risks: Modifications to the facility, personnel, or procedures should be evaluated for their potential to increase the hazard level (e.g., by increasing the inventories of hazardous materials) or the hazard potential (e.g., by introducing a new mechanism for the release of hazardous materials).
- Operating history of the facility: The record of operational reliability (e.g., reliability during most recent operation) may identify issues to be addressed in the proposed RR. Additionally, the nature of the facility or process transition to standby or shutdown status should be considered. A shutdown resulting from systemic safety concerns may need greater RR depth

than would a shutdown in response to an individual safety concern (i.e., a TSR violation, potential inadequacy in the safety analysis (PISA), lack of program work or similar non-safety-related causes).

- Confidence in site-wide programs and infrastructure: Even if the proposed startup or restart does not directly involve changes to site programs (e.g., emergency preparedness, site fire response, environmental monitoring), it may be prudent to evaluate these in an RR unless recent reviews have shown them to be acceptable. Startup or restart of a facility is problematic within a significantly flawed site infrastructure. Conversely, a strong record of implementing DOE requirements (e.g., conduct of operations) should allow for a justifiable reduction in depth in that area of the RR.
- Issues raised through other internal or external reviews: The RR may need to verify that previously raised issues have been adequately addressed. These issues may be facility-specific or may relate to the site infrastructure within which the facility operates. Previous RRs, Integrated Safety Management System (ISMS) verifications, or periodic site inspections or assessments may be sources of information as to conditions at the site and the facility. The facility's experiences in implementing the corrective actions and lessons learned may also provide a valuable perspective for determining the depth of the RR. Caution should be exercised in utilizing previous inspections as justification for eliminating a topic or limiting the breadth of review. The adequacy of any previous review to be used in this manner should be equivalent in all respects to the review that would have been conducted during the RR.
- DOE O 425.1D requires that RR final reports document lessons learned. Such lessons may assist in determining the depth of future RRs. Previous reviews may highlight issues to be considered or may provide the justification for doing a less detailed review if recent reviews and restart experience can be cited.
- The extent to which the facility or process has been evaluated or operated using the standards and level of excellence in the RR: In applying the graded approach, the extent to which the facility has utilized or been evaluated against the current nuclear safety standards should be considered. A facility that has operated successfully using the DOE nuclear safety standards may require a less extensive RR depth.

APPENDIX 2. EXPECTATIONS FOR CORE REQUIREMENTS (CRs)

Since the formal inception of the Readiness Review (RR) Program, lessons learned have been generated. Through review of these lessons learned, it has been noted that some of the CRs need further explanation to properly communicate the expectations contained therein. Specifically, CR 13, regarding implementation of established requirements, has generated confusion from both a preparation and an evaluation perspective. CR 11 has generated confusion from a preparation standpoint. Further details regarding these CRs are provided below.

CR 13 states,

(13) Formal agreements between the operating contractor and DOE have been established via the contract or other enforceable mechanism 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 during the period of implementation. The compensatory measures and the implementation period are approved by DOE.

This requirement was established to verify that there were adequate contract requirements, frequently identified as contract List A and List B, to ensure the safety of nuclear operations. The requirement includes implementation of the established requirements at the facility. Organizations have misinterpreted this requirement to be fulfilled through the completion of the Standards/Requirements Identification Document (S/RID) or Work Smart Standards Processes or the existence of a List A and List B. While the completion of the program elements is certainly prerequisite to the proper controls being established in the facility, the facility-level implementation of the contract requirements is the issue of primary concern. The procedures and direction for floor-level operations should implement the established requirements agreed to by DOE and the operating contractor through the S/RID, Work Smart Standard, List A or B, or other acceptable program. The existence and adequacy of these procedures and direction at the floor level should be verified by line management prior to startup or restart and confirmed by the ORR or RA team during the review by their observation of floor-level operations. The Integrated Safety Management (ISM) initiative and the verification of implementation of the approved Integrated Safety Management System (ISMS) have increased the confidence in the adequacy of the contract requirements. It is therefore appropriate, in verifying CR 13, to look to the adequacy of ISMS implementation verifications and re-verifications as evidence of the adequacy of the implementation of the requirements. A re-verification by the RR team is not normally necessary if there is strong evidence of adequacy through ISMS verifications, re-verifications, or the contractor annual ISMS assessment report. At most, it may be appropriate to verify inclusion of the site implementing mechanisms at the facility or process level.

CR 11 states,

(11) 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 plans should indicate validation processes for equipment, procedures, and operators after startup or resumption of operations including any required restrictions and additional oversight.

Compensatory measures required during the approach to full operations are described.

This requirement was established to provide direction for the period following the RR and the startup or restart of the facility. It is recognized that since operations are not authorized prior to and during the RR, actual operations may not be fully validated by a line manager or evaluated by an RR team. Hence, to some degree (greater for a more complex facility), operators may be operating equipment, using procedures, and handling the hazards for the first time immediately following the startup or restart. It is appropriate to establish additional controls, support, and oversight for the initial period following the startup, which is often called the “deliberate operations” phase. Review of the plans for these deliberate operations provide the RR team with an opportunity to judge the complexity of the remaining startup or restart activities, determine the controls to be exercised, and provide an appropriate recommendation to the Startup Authorization Authority (SAA) without having seen these events.

Likewise, the responsible line manager gains confidence that operators, procedures, and equipment have achieved the requisite readiness to conduct work safely. Some sites have provided guidelines for establishing startup or restart controls that accomplish the objectives outlined above. An example of these guidelines is included here for informational purposes. It is appropriate to note that the level of detail and magnitude of the Startup Plan depends largely on the complexity of the activity that is being started or restarted and the degree to which operations can be demonstrated before hazards are introduced. If the majority of operations can be conducted and demonstrated during the preparation and review processes, the Startup Plan may include those operations that could not be demonstrated, or that may be conducted for the first time with the hazard present. Alternatively, for an operation where most of the preparation should be done through walkthroughs and tabletop exercises, the Startup Plan would necessarily be more extensive. In all cases, it is appropriate that the controls specified in the Startup Plan be demonstrated during the RR. The required compensatory oversight and recordkeeping should also be demonstrated. In short, all elements of the Startup Plan should be evaluated in the facility during the RR.

Guidelines for Developing the Startup or Restart Plan

The Startup or Restart Plan should provide for a controlled, deliberate approach to achieving safe, unrestricted facility nuclear operations. Other plans and schedules affecting startup or restart should be summarized in the Startup or Restart Plan so that the startup or restart plan is a complete standalone document that clearly delineates the graded, systematic approach to full operations. The Plan should detail implementation of management and facility activities

necessary to achieve full operations, not simply describe established programs. A key element involves the participation of qualified management personnel in evaluating initial operations testing. As such, the Plan should include specific management observer responsibilities. The following paragraphs provide further guidance on developing the Startup or Restart Plan.

A. Identification of facility management observers necessary for initial operations oversight

1. List the management personnel assigned to conduct initial operational evaluations of the graded operations testing, including summary-level duties, responsibilities, and shift staffing requirements (specific duties and responsibilities should be listed in the remaining sections of the Plan), indicating the duration of the initial operational evaluations. Include recordkeeping expectations and the specific qualifications required of each individual.

B. Equipment operability

1. Identify and describe the integrated tests planned and required to confirm operability of equipment during initial operations. Include the purpose and a summary of the testing acceptance criteria.
2. List management responsibilities for approving the commencement of testing and management observer oversight of test performance. Include management approval requirements for key events or progression to the next phase of testing.
3. Provide a summary-level schedule that clearly illustrates the systematic approach to full operations.

C. Procedure viability

1. Identify and describe the mechanism for verifying the viability of procedures during actual performance, including requirements for management observer participation in the first-time execution of procedures.
2. Summarize the process for procedure changes resulting from the identification of inadequacies in the Field. Include any provisions for increased procedure revision support during the initial execution of procedures.

D. Operator Performance

1. Identify and describe the mechanism for real-time, in-plant management observer evaluations of operator performance to verify the adequacy of operator training.
2. Identify and describe the established mechanism for remediating any identified weaknesses.