U.S. Department of Energy
Washington, DC

ORDER

NE O 425.1

Approved: August-2025
Chg 1 (MinChg): January 2026

SUBJECT: VERIFICATION OF READINESS TO STARTUP OR RESTART HAZARD CATEGORY 1 AND 2 NUCLEAR FACILITIES

1. PURPOSE. This Order of the Department of Energy (DOE) establishes the requirements for the Office of Nuclear Energy (NE) Readiness Reviews (RRs). RRs are used to verify the readiness for startup and restart of Hazard Category (HC) 1 and 2 nuclear facilities, operations, or activities as described within this Order. This includes verification of the engineering processes used to determine operational capability, the effectiveness of safety systems and safety management programs, and the proper implementation of the documented safety basis.

2. CANCELS/SUPERSEDES.

   This Order applies in lieu of DOE O 425.1E (current version) with respect to the facilities and activities covered by Section 3 below. Cancellation of a directive does not, by itself, modify or otherwise affect any contractual or regulatory obligation to comply with the directive. Contractor Requirements Documents (CRDs) that have been incorporated into a contract remain in effect throughout the term of the contract unless and until the contract or regulatory commitment is modified to either eliminate requirements that are no longer applicable or substitute a new set of requirements.

3. APPLICABILITY.

   a. Departmental Elements. This Order applies to all Departmental elements including NNSA, and their associated field element(s),[1] to the extent they are involved with facilities and activities described in paragraph 3.b.

   b. NE Facilities and Activities. Except as stated in paragraph 3.d., this Order applies to all facilities and activities under the responsibility of NE, including nuclear facilities and nuclear activities authorized by NE. Such nuclear activities include the design, construction, management, operation, decontamination, decommissioning, or demolition of nuclear facilities.

   c. Contractors. Except as stated in paragraph 3.d., this Order sets forth conditions to be applied to contractors performing work that involves facilities and activities described in paragraph 3.b. The CRD must be included in contracts under which the contractor is involved with such facilities and activities.

   d. Equivalencies and Exemptions.

[1] Operations offices, service centers, site offices, area offices, field offices, government-owned government-operated facilities, and regional offices of federally-staffed laboratories that report directly to a DOE Headquarters office.

1) Exemption. In accordance with the responsibilities and authorities assigned by Executive Order 12344, codified at 50 United States Code (U.S.C.) sections 2406 and 2511, and to ensure consistency throughout the joint Navy/DOE Naval Nuclear Propulsion Program, the Deputy Administrator for Naval Reactors (Director) implements and oversees requirements and practices pertaining to this directive for activities under the Director's cognizance, as deemed appropriate.

2) Exemption. This Order does not apply to activities regulated by either the Nuclear Regulatory Commission (NRC) or the authorities of a State under an agreement with the NRC per the Atomic Energy Act of 1954, as amended (AEA).

3) Other Equivalencies/Exemptions. Any other equivalency or exemption to this Order requires the approval of NE's Safety Basis Approval Authority (SBAA). Requests for equivalencies/exemptions will be adjudicated by NE's SBAA within 14 calendar days of receipt of a substantially complete request.

4. REQUIREMENTS.

a. DOE Line Management must ensure that properly scoped RRs are planned and conducted to verify readiness for the startup or restart of HC 1 and 2 nuclear facilities, activities, or operations.

b. HC 1 and 2 nuclear facilities, activities, or operations may be started (or restarted) only after RRs have been conducted and the approvals specified in this Order have been received.

c. RR Process DOE Line Management must develop procedures that define the RR process that will be utilized to implement this Order. The RR process must, in all cases, demonstrate there is a reasonable assurance for adequate protection of workers, the public, and the environment from adverse consequences from the startup (or restart) of a HC 1 and 2 nuclear facility, activity, or operation. The readiness process is illustrated within Attachment 2, *Readiness Review Process Flow Chart*.

(1) Communication. The Prime Contractor will communicate projected RR activities to the SBAA or designee.

(2) Notification of Intent to Startup. The Prime Contractor should provide formal correspondence to DOE 90 days prior to the start of the RR, but no earlier than SBAA approval of the Preliminary Documented Safety Analysis, if applicable. The SBAA will review the notification, inform the Startup Approval Authority (SAA), and if applicable, coordinate the RR

team. SAA determination is in accordance with Attachment 3, *Startup Approval Authority and Readiness Review Determination Criteria.*

(a) The notification of Intent to Startup will include the submittal of the Readiness Review Plan (RP).

(3) RP Content and Approval

(a) Content. The Prime Contractor will develop an RP. A graded approach must be used in developing the scope of the RP. The RP may take into consideration the maturity of the Prime Contractor existing safety management programs that are in place to implement the Core Requirements (CRs). The level of detail should also be commensurate with the complexity of the startup or restart. It may be appropriate to perform readiness reviews in a segmented approach to allow flexibility in managing specific activities (e.g., fuel receipt/storage/loading before initial startup). All listed documentation must be included unless it is not applicable to the specific scope of the activity. Contents of the RP must include:

1 A scope and purpose that addresses all Attachment 4, *Core Requirements (CRs)*. Exclusion of any CRs must be documented and justified within the RP.

2 Prerequisites, as defined in Attachment 5, that must be completed prior to the start of the RR. This should include documentation ensuring system operability verification and testing (to the extent practicable).

3 A description of the physical and administrative boundaries of the RR.

4 A description of the structures, systems, and components (SSCs) covered by the RR.

5 A description of safety management and security programs to be reviewed.

6 Proposed activities for the on-site review including demonstrations, interviews, and drills as applicable.

(b) RP Approval. For Contractor RR, the SAA will review and approve the RP with SBAA concurrence. For DOE RR, the RP must be reviewed and approved by the SBAA 30 days following the submittal.

(4) DOE RR Team Composition. The RR Team Leader must select the RR Team Members. The RR Team Leader must not be assigned to assess facilities, activities, or operations for which they have direct responsibilities. Team Members should not be assigned to assess facilities, activities, or operations for which they have direct responsibilities to the maximum extent possible. Team Leader and Members qualifications shall address the following requirements:

(a) Technical knowledge of the area assigned for evaluation, including experience working in the technical area.

(b) Knowledge of the performance-based assessment process and methods.

(c) Knowledge of the facility, activity, or operations-specific information.

(5) Prior to starting the RR:

1 The Prime Contractor prerequisites have been met or have compensatory measures that have been documented and approved.

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

(6) Readiness to Proceed. The SBAA must submit to the DOE RR team leader their authorization to commence the RR.

(7) Commencement of RR.

(a) Upon receipt of the authorization to commence the RR, the RR Team will initiate the RR, in accordance with the approved RP.

(b) The RR will be executed in accordance with the approved RP.

(c) The RR schedule will normally consist of:

1 One week of document review

2 One week of on-site interviews and performance reviews as planned in the RP.

3 One week to prepare the final report.

4 Deviations from this schedule due to readiness segmentation may be justified and approved in the RP.

(8) RR Final Report. The final report must be prepared and approved by the RR Team Leader; concurred on by each Team Member; and each Team Member must approve the section for which they are responsible.

(a) The final report documents the results of the RR and make a conclusion as to whether startup or restart of the nuclear facility, activity, or operation can proceed safely. The RR final report must state whether the Prime Contractor has established the following:

1 An agreed-upon set of requirements to govern safe operations of the facility, activity, or operation has been formalized with DOE through the contract or other enforceable mechanism;

2 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,

3 In the opinion of the RR team, adequate protection of the public health and safety, of worker safety, and the environment will be maintained.

(b) If appropriate, the final report will include a Minority Opinion section that will give Team Members an opportunity to convey differing opinions to the SBAA.

(c) Any lessons learned during the RR may be documented in a lessons learned section of the final report.

(9) Final Report Submittal. The final report must be submitted to the SAA to be used as a basis for approving the startup or restart of the nuclear facility, activity, or operation. A copy of the final RR report must be forwarded to the Prime Contractor and NE-1. A copy must be forwarded to the NE CTA and may be forwarded to EHSS, and EA for information.

(10) Closure of Findings. The closure of findings must be consistent with the Issues Management Process in NE O 226.1, *Implementation of Department of Energy Oversight Policy*, current version.

(11) Restart and Startup Approval. DOE Line Management must ensure that the Prime Contractor has satisfactorily resolved all prestart findings identified during the RR prior to startup or restart of the facility, activity, or operation. The SAA, as identified in Attachment 3, may approve startup or restart only after prestart findings are resolved, compensatory measures are in place (if needed), and approved Corrective Action Plans are in place to address any open post-start findings.

(12) Approval to Proceed. The SAA must provide an Approval to Proceed Memorandum to the responsible Prime Contractor authorizing startup or restart.

d. Records Management Program. Requirements for maintenance and disposition of Federal records, such as those pertaining to RRs, are provided under the general guidance of DOE O 243.1, *Records Management Program*, current version. The disposition, including destruction, of Federal records must be in accordance with:

(1) The General Records Schedules, as published by the National Archives and Records Administration (NARA), or

(2) DOE records disposition authority (Standard Form 115, *Request for Records Disposition Authority*), as approved by NARA.

Consult the cognizant Field Element Records Officer for guidance.

5. RESPONSIBILITIES.

a. DOE Headquarters Line Management.

(1) DOE Headquarters Line Management must oversee DOE field methods for verifying readiness to startup and restart nuclear facilities, activities, or operations in accordance with NE O 226.1, *Implementation of Department of Energy Oversight Policy*, current version.

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

b. DOE Field Element Management.

(1) DOE Field Element Management must ensure that the Prime Contractor properly implements the requirements of the CRD in this Order. Establish procedures as necessary to manage the verification of readiness to startup or restart nuclear facilities, activities, or operations in accordance with the requirements of this Order.

c. Office of Enterprise Assessments. In coordination with the PSO, performs independent reviews of startup and restart activities as requested by NE-1 or the Secretary of Energy and provide results of these reviews to PSOs for information.

6. REFERENCES.

   a. Title 10 CFR Part 830, *Nuclear Safety Management.*

   b. 10 CFR Part 835, *Occupational Radiation Protection*

   c. 49 CFR, Part 173, Subpart I, Class 7 (Radioactive Materials)

   d. NE O 226.1, *Implementation of Department of Energy Oversight Policy*, current version.

   e. DOE O 243.1, *Records Management Program*, current version.

   f. NE O 420.1, *Facility Safety*, current version.

   g. NE O 422.1, *Conduct of Operations*, current version.

   h. NE O 433.1, *Maintenance Management Program for DOE Nuclear Facilities*, current version.

   i. NE-STD-1027-2025, *Hazard Categorization of DOE Nuclear Facilities*.

   j. DOE-STD-1073-2016, *Configuration Management*.

   k. DOE-STD-1189-2016, *Integration of Safety into the Design Process.*

   l. DOE-STD-3007-2007, *Guidelines for Preparing Criticality Safety Evaluations at Department of Energy Non-Reactor Nuclear Facilities*.

7. DEFINITIONS. See Attachment 5.

8. CONTACT. Questions concerning this Order should be referred to the Office of Nuclear Energy.

BY ORDER OF THE SECRETARY OF ENERGY:

JAMES P. DANLY
Deputy Secretary

ATTACHMENT 1
CONTRACTOR REQUIREMENTS DOCUMENT
NE O 425.1, *VERIFICATION OF READINESS TO STARTUP OR RESTART HAZARD CATEGORY 1 AND 2 NUCLEAR FACILITIES*

In addition to the requirements set forth in this CRD, contractors are responsible for complying with Attachments 3 and 4 of this Order, referenced in and made a part of this CRD, which provide program requirements and/or information applicable to contracts in which this CRD is inserted.

1. Department of Energy (DOE) Contractor Responsibilities. This Contractor Requirements Document (CRD) applies to all nuclear facilities, activities, and operations classified as Hazard Categories 1 and 2 as defined in 10 CFR Part 830. Regardless of the performer of the work, the contractor is responsible for complying with the requirements of this CRD and flowing down CRD requirements to subcontractors at any tier to the extent necessary to ensure contractor compliance.

2. Contractor Requirements. Contractor Line Management must develop procedures to define the processes that will be used to implement the responsibilities of this CRD. The procedures must be submitted to the DOE Safety Basis Approval Authority (SBAA) for review.

   The Contractor must not develop RR processes similar to RRs that exempt facilities, activities, or operations from following the RR process described in this Order.

   a. RR Process. The RR process must, in all cases, demonstrate there is a reasonable assurance for adequate protection of workers, the public, and the environment from adverse consequences from the start (or restart) of a HC 1 and 2 nuclear facility, activity, or operation. The readiness process is described under Attachment 2, *Readiness Review Process Flow Chart*, and Attachment 5, *Definitions*. For a RR the contractor must prepare: an intent to startup notification, a review plan (RP) and a final report. The contractor will perform the RR when the Startup Approval Authority (SAA) is the Senior Contractor Official. Attachment 3 describes how to determine the appropriate SAA.

      (1) Communication. Contractor must communicate projected RR activities to the appropriate SBAA or designee.

      (2) Notification of Intent to Startup. The Prime Contractor should provide formal correspondence to DOE 90 days prior to the start of the RR, but no earlier than SBAA approval of the Preliminary Documented Safety Analysis, if applicable. The Senior Contractor Official will coordinate the RR.

         (a) The notification of Intent to Startup will include the submittal of the Readiness RP to the SBAA.

(3) RP Content and Approval

(a) Content. The Prime Contractor will develop a RP. A graded approach must be used in developing the scope of the RP. The RP may take into consideration the maturity of the Prime Contractor existing safety management programs that are in place to implement the Core Requirements (CRs). The level of detail should also be commensurate with the complexity of the startup or restart. It may be appropriate to perform RRs in a segmented approach to allow flexibility in managing specific activities (e.g., fuel receipt/storage/loading before initial startup). All listed documentation must be included unless it is not applicable to the specific scope of the activity. Contents of the RP must include:

1 A scope and purpose that addresses all Attachment 4, *Core Requirements (CRs)*. Exclusion of any CRs must be documented and justified within the RP.

2 Prerequisites, as defined in Attachment 5, that must be completed prior to the start of the RR. This should include documentation ensuring system operability verification and testing (to the extent practicable).

3 A description of the physical and administrative boundaries of the RR.

4 A description of the structures, systems, and components (SSCs) covered by the RR.

5 A description of safety management and security programs to be reviewed.

6 Proposed activities for the on-site review, including demonstrations, interviews, and drills as applicable.

(b) RP Approval. For Contractor RR, the SAA will approve the RP with SBAA concurrence. For DOE RR, the RP must be reviewed and approved by the SBAA 30 days following the submittal.

(4) Contractor RR (CRR) Team Composition. The CRR team leader must select the RR team members. CRR Team Leader and Team Members must not be assigned to assess facilities, activities, or operations for which they have direct responsibilities. Team Leader and Members qualifications and requirements:

(a) Technical knowledge of the area assigned for evaluation, including experience working in the technical area.

(b) Knowledge of the performance-based assessment process and methods.

(c) Knowledge of the facility, activity, or operations-specific information.

(5) Prior to starting the CRR:

1 The Prime Contractor prerequisites have been met or have compensatory measures that have been documented and approved.

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

(6) Readiness to Proceed. The SAA must submit to the CRR Team Leader their authorization to commence the CRR.

(7) Commencement of CRR.

(a) Upon receipt of the authorization to commence the CRR, the CRR Team will initiate the CRR, in accordance with the approved RP.

(b) The RR will be executed in accordance with the approved RP.

(8) Contractor RR Final Report. The final report must be prepared and approved by the CRR Team Leader; concurred on by each team member; and each Team Member must approve the section for which they are responsible.

(a) The final report documents the results of the CRR and makes a conclusion as to whether startup or restart of the nuclear facility, activity, or operation can proceed safely. The CRR final report must state whether the contractor has established the following:

1 An agreed-upon set of requirements to govern safe operations of the facility, activity, or operation has been formalized with DOE through the contract or other enforceable mechanism;

2 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,

3 In the opinion of the CRR team, adequate protection of the public health and safety, of worker safety, and the environment will be maintained.

(b) If appropriate, the final report will include a Minority Opinion section that will give team members an opportunity to convey differing opinions to the SAA.

(c) Any lessons learned during the RR may be documented in a lessons learned section of the final report.

(9) Final Report Submittal. The final report must be submitted to the SAA.

(10) Closure of Findings. Contractor Line Management closure of Contractor RR findings must be consistent with the Issues Management Process in NE O 226.1, *Implementation of Department of Energy Oversight Policy*, current version.

(11) Restart and Startup Approval. Senior Contracting Official must ensure all prestart findings identified during the RR are satisfactorily resolved prior to startup or restart of the facility, activity, or operation. The SAA may approve startup or restart only after prestart findings are resolved, compensatory measures are in place (if needed), and approved Corrective Action Plans (CAPs) are in place to address any open post-start findings.

b. Records Management Program. Requirements for maintenance and disposition of Federal records, such as those pertaining to RRs, are provided under the general guidance of DOE O 243.1, *Records Management Program,* current version. The disposition, including destruction, of Federal records must be in accordance with:

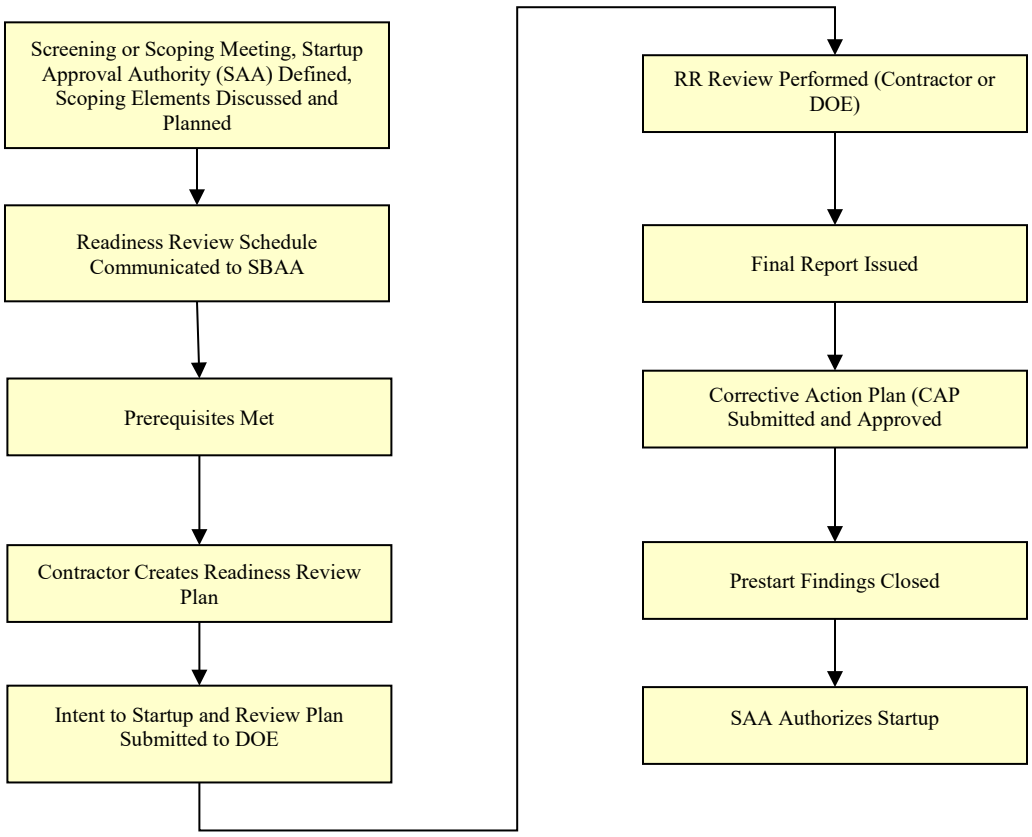
(1) The General Records Schedules, as published by the National Archives and Records Administration (NARA), or

(2) DOE records disposition authority (Standard Form 115, Request for Records Disposition Authority), as approved by NARA.

Consult the cognizant Field Element Office Records Officer for guidance.

ATTACHMENT 2
READINESS REVIEW PROCESS FLOWCHART

This Attachment provides information associated with this Order as well as information applicable to contracts in which the associated Attachment 1, CRD, is inserted. The flow chart describes the RR process as it relates to a Contractor and DOE RR. Either a Contractor RR or a DOE RR will be performed as in accordance with the determination criteria of Attachment 3, *Startup Approval Authority (SAA), and Readiness Review (RR) Determination Criteria*.



ATTACHMENT 3
STARTUP APPROVAL AUTHORITY (SAA), AND READINESS REVIEW (RR) DETERMINATION CRITERIA

This Attachment provides information and/or requirements associated with this Order as well as information and/or requirements applicable to contracts in which the associated Attachment 1, CRD is inserted.

1. For nuclear facility, activity, or operation startups or restarts the Approval Authority must be determined using the criteria in the Attachment 3, Table 1, *SAA and RR Determination Criteria*. Determining the level of authority (SAA) must be commensurate with RR Criteria.

2. DOE line management must ensure that a properly scoped RR is planned and conducted to verify readiness for the restart of Hazard Category (HC) 1 and 2 nuclear facilities, activities, or operations, unless both of the following conditions are met:

    a. The restart is a resumption of routine operations after a short interruption (such as maintenance activities governed by existing maintenance procedures and processes) as defined in local procedures; and

    b. The restart is conducted using contractor approved operating procedures that provide specific direction for operating systems and equipment during normal conditions.

3. Justification for the SAA and RR determination must be documented in writing to the SBAA 90 days prior to the RR beginning with a copy sent to the PSO and CTA. If a RR is not to be performed, the contractor's standard operating procedures for startup or restart will be used.

4. If any of the following conditions occur a RR must be conducted in accordance with this Order. Additional criteria are included in Attachment 3, Table 1 *SAA and RR Determination Criteria*:

    a. Initial Reactor Startup.

    b. Initial startup of a newly constructed HC 1 or 2 non-reactor nuclear facility. For the purpose of this criterion, a newly constructed HC 1 or 2 non-reactor nuclear facility refers to a new facility (not operation or activity) with a new Safety Basis (SB) Documentation (new Safety Evaluation Report [SER], Documented Safety Analysis [DSA], and Technical Safety Requirements [TSRs]).

    c. Initial startup after conversion of an existing facility to a new nuclear mission with a new Safety Basis Documentation (new SER, DSA and TSRs).

    d. Restart of nuclear facility, activity, or operation that has upgraded its hazard categorization to HC 1 or 2.

e. Restart after a DOE management official directs the shutdown of a nuclear facility, activity, or operation for safety reasons.

f. Restart after an extended shutdown for a HC 1 or 2 nuclear facility, activity, or operation. Extended shutdown for a HC 1 or 2 nuclear facility, activity, or operation is defined as 24 months.

g. Restart of a HC 1 or 2 nuclear facility, activity, or operation after major modification (determination of "major modifications" is made per DOE-STD-1189).

h. Initial startup of a new HC 1 or 2 activity or operation after major modification (determination of "major modifications" is made per DOE-STD-1189) within a HC 1 or 2 nuclear facility.

i. Startup or Restart of facility, activity, or operation as directed by DOE Line Management.

Table 1: SAA and RR Determination Criteria

	Startup Approval Authority
Activity	**Hazard Category 1 and 2**
Off Site	
Initial Reactor Startup	Secretary of Energy or designee
Any other activity listed below	PSO or designee
On Site	
Initial Reactor Startup	Secretary of Energy or designee
Initial startup of a newly constructed HC 1 or 2 non-reactor nuclear facility. For the purpose of this criterion, a newly constructed HC 1 or 2 non-reactor nuclear facility refers to a new facility (not operation or activity) with a new Safety Basis Documentation (new SER, DSA, and TSRs).	SBAA or designee
Initial startup after conversion of an existing facility to a new nuclear mission with a new Safety Basis Documentation (new SER, DSA and TSRs).[1]	SBAA or designee

Restart of nuclear facility, activity, or operation that has upgraded its hazard categorization to HC 1 or 2.	SBAA or designee
Restart after a DOE management official directs the shutdown of a nuclear facility, activity, or operation for safety reasons.	SBAA or designee
Restart after extended shutdown for a HC 1 or 2 nuclear facility, activity, or operation.[2]	>24 months Senior Contractor Official
Restart of a HC 1 or 2 nuclear facility, activity, or operation after major modification[3]	Senior Contractor Official
Initial startup of a new HC 1 or 2 activity or operation after major modification within a H C 1 or 2 facility.[3]	Senior Contractor Official
Startup or Restart of facility, activity, or operation as directed by DOE Line Management.	SBAA or designee
For all other cases as:	Senior Contractor Official

Note 1: New includes “New Construction.”

Note 2: Extended shutdown for a HC 1 or 2 nuclear facility, activity, and operation is defined as 24 months.

Note 3: Determination of “major modifications” is made per DOE-STD-1189.

ATTACHMENT 4
CORE REQUIREMENTS (CRs)

This Attachment provides information and/or requirements applicable to contracts in which the Attachment 1, Contractor Requirements Document (CRD) is inserted. This Attachment defines the CRs used in in this Order.

1. CRs verify the readiness of personnel, procedures, programs, and equipment within the scope of the RR to safely startup or restart a nuclear facility, activity, or operation. The CRs are aligned according to specific Functional Areas (FAs) or Safety Management Programs (SMPs) that are developed and implemented across Department of Energy (DOE) sites to ensure activities are performed in a manner that adequately protects workers, the public, and the environment. Cross-cutting requirements are applicable to each of these programs and need to be evaluated to ensure their success.

    a. Each CR listed as applicable in the RP must be evaluated against the following cross-cutting requirements (cross-cutting requirements may be excluded and documented in the RP with appropriate justifications):

        (1) FA or SMP documents have been approved by DOE, if required by DOE Order, CFRs, or direction.

        (2) FA or SMP implementing procedures have been effectively implemented in support of the facility and clearly define roles, responsibilities, and reporting relationships.

        (3) A sufficient number of qualified personnel are available to effectively implement the FA or SMP in support of the facility.

        (4) Adequate facilities and equipment are available to ensure that the FA or SMP can be performed adequately for safe facility operation.

        (5) Line Management and Personnel level of knowledge is adequate based on examination results, direct observation during performance demonstrations, and interviews.

        (6) Line Management and Personnel exhibit an awareness of public and worker safety and health and environmental protection requirements and, through their actions, demonstrate a high-priority commitment to comply with these requirements.

        (7) Periodic assessments (independent and/or self) of FA or SMPs are performed to verify continued robust performance. Issues (e.g., findings, deficiencies, observations, or recommendations) from assessments, both internal and external are effectively resolved.

b. The CRs are as follows:

(1) Conduct of Operations, Procedures, and Work Control. A conduct of operations program meets the requirements of NE O 422.1, *Conduct of Operations*. The formality and discipline of operations are adequate to conduct work safely, and programs are in place to maintain this formality and discipline for site/facility processes in accordance with the approved Conduct of Operations Implementation Matrix.

Procedures are approved and in place for operating the facility and systems. The procedures reflect all modifications that have been made to the facility systems. Only the most current revision to each procedure is in use.

(2) Contractor Assurance. An effective Contractor Assurance System (CAS meets the requirements of NE O 226.1, *Implementation of Department of Energy Oversight Policy*. A CAS has been established to identify, evaluate, and resolve deficiencies and recommendations made by Contractor Line Management and independent contractor audit and assessment groups. The process also provides for resolution of issues and recommendations by external official review teams and audit organizations.

(3) Criticality Safety. A Criticality Safety Program (CSP) that meets the requirements of NE O 420.1, *Facility Safety*, has been developed, implemented, and maintained.

Criticality safety evaluations conducted in accordance with DOE-STD-3007-2017, *Guidelines for Preparing Criticality Safety Evaluations at Department of Energy Non-Reactor Nuclear Facilities*, or by other documented methods approved by DOE, must show that entire processes involving fissionable materials will remain subcritical under normal and credible abnormal conditions, including those initiated by design basis events. Implementation of the Criticality Safety Evaluation credited controls is reviewed annually for all operations.

Facilities that conduct operations using fissionable material in a form that could inadvertently accumulate in significant quantities must include procedures for detecting and characterizing accumulations.

(4) Emergency Planning and Preparedness, and Operational Drills. A routine operations drill program and an emergency management drill and exercise program have been established and implemented. Records for each program are adequate to demonstrate the effectiveness of completed drills and exercises as well as planning for future drills and exercises.

(5) Conduct of Engineering. Structures, systems, and components (SSCs) required for safe and compliant operations have been identified, and programs are in place to ensure adequate maintenance, operations, and modifications. These programs include requirements for demonstrating compliance with the design requirements, verifying operability of SSCs, availability of replacement and spare parts, and configuration management of documents and equipment.

(a) The facility has implemented a maintenance program compliant with NE O 433.1, *Maintenance Management Program* for DOE Nuclear Facilities. A program is in place to confirm and periodically assess the condition and operability of SSCs. This includes examinations of records of tests and calibration of these systems. A documented evaluation of maintenance items open before the declaration of readiness (if any) has been conducted to determine if the failure to complete the maintenance item could adversely influence operations.

(b) Provisions have been established for storage, issuance, and availability of an adequate and readily available supply of tools and replacement/repair parts.

(c) Equipment being started up or restarted meets the requirements of NE O 420.1, *Facility Safety*, for the safety functions and process controls credited in the safety documentation, the design has been analyzed to demonstrate compliance with the design inputs, and design outputs provide specific limits, controls, and technical directions for structures, systems and components to the constructor, operator, or modifier.

(d) A configuration management program in accordance with DOE-STD-1073, *Configuration Management* is defined and implemented to control facility modifications with emphasis on SSCs. Authorized modifications within the scope of the RR have been completed and fully closed or evaluated and determined not to affect the ability to safely startup or restart nuclear operations.

(6) Fire Protection. A documented fire protection program in accordance with NE O 420.1, *Facility Safety*, that includes the elements and requirements identified in the Order for design, operations, emergency response, fire analysis and assessments, wildland fire, and specific fire protection program criteria has been developed, implemented, and maintained by the contractor.

(7) Nuclear Safety. Facility/process safety basis (SB) documentation (Documented Safety Analysis (DSA)/Hazard Analysis Report (HAR) and Technical Safety Requirements (TSRs)) characterizes the hazards/risks associated with the facility/process; identifies preventive and mitigating

measures to adequately protect workers, the public, and the environment from those hazards/risks; describes the safety envelope of the facility/process; is approved and controls implemented as required by 10 CFR Part 830, Subpart B, *Nuclear Safety Management.*

A DOE approved Unreviewed Safety Question procedure has been effectively implemented.

Offsite and onsite shipments of hazardous and/or radioactive materials meets applicable requirements as cited in SB documents.

(8) Personnel and Management Training and Qualifications. The selection, training, and qualification programs for personnel performing work at or managing the facility, activity or operation that is starting or restarting have been established, documented, and effectively implemented, and meets the requirements of NE O 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*. Training and qualification requirements for each position encompass the range of assigned duties and activities.

Modifications to the facility, process, or system have been reviewed for potential impacts on training and qualification. Training has been performed to incorporate all aspects of these changes.

(9) Quality Assurance. A contractor Quality Assurance Program (QAP) meeting the requirements of 10 CFR Part 830, *Nuclear Safety Management*, is in place and has been approved by DOE. The Quality Assurance (QA) criteria described in the QAP have been implemented via the contractor's QA program and integrated with other SMPs. If applicable, the contractor has submitted to DOE their basis of the graded approach used to implement nuclear safety requirements.

(10) Radiation Protection. A Radiation Protection Program compliant with 10 CFR Part 835, *Occupational Radiation Protection* regulations has been documented, approved by DOE, and implemented.

(11) Startup/Restart Startup Plan. An adequate startup plan 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, compensatory measures required during the approach to full operations are described, 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.

(12) Safety and Health. Other SMPs identified in the SB or FAs deemed important to the safety and protection of workers, the public, and the environment are documented, implemented, and maintained. This may include, but is not limited to, areas such as Environmental Protection; Safeguards and Security; Waste Management; and Transportation and Packaging.

(13) Federal Qualifications (DOE Only). The personnel at the DOE Field Element assigned responsibilities for providing direction and guidance to the contractor and those individuals assigned oversight responsibilities (including facility representatives) within the scope of the RR, possess appropriate qualification, knowledge and competence to perform those functions.

(14) DOE Management System (DOE Only). DOE Field Element management systems for oversight of facility operations, such as oversight and assessment programs, facility representatives, technical qualification program, corrective action management system, and quality assurance programs, are adequate.

.

ATTACHMENT 5
DEFINITIONS

This Attachment provides information applicable to contracts in which the Attachment 1,CRD is inserted. This Attachment defines the terms used in and pertinent to this Order. Additional definitions can be found in DOE-STD-3006-2010, *Planning and Conducting Readiness Reviews*.

1. Core Requirement (CR). A fundamental area or topic evaluated during a RR. CRs verify the readiness of personnel, procedures, programs, and equipment within the scope of the RR to safely startup or restart a nuclear operations, facility, or activity. The CRs are aligned according to specific Functional Areas (FAs)/Safety Management Programs (SMPs). See Attachment 4 for a detailed description of CRs.

2. Line Management. Refers the unbroken chain of responsibility that extends from the Secretary of Energy to the Deputy Secretary, to the Secretarial Officers who set program policy and plans and develop assigned programs, to the program and Field Element Managers, and to the contractors and subcontractors who are responsible for execution of these programs.

3. 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. Findings are categorized as either pre-start or post-start (DOE-STD-3006-2010, *Planning and Conducting Readiness Reviews* includes pre/post start finding screening criteria):

    a. Pre-start finding. A finding that reflects a programmatic or implementation weakness that is of concern and requires corrective action to ensure operations are conducted safely when started.

    b. Post-start finding. A finding that requires corrective action to mitigate longer-term concerns or programmatic deterioration.

4. 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 process 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.

5. Nuclear Operations. As used in this Order, Nuclear Operations means nuclear facilities, operations, and/or activities that fall within the scope of this Order.

6. Prerequisites. A set of specific, measurable actions or conditions that the RP has included as part of the scope of the RR. The prerequisites when completed provide assurance that readiness has been achieved. The prerequisites should include verification of engineering reviews, safety basis implementation, procedures, training, system operability, and integrated testing. The prerequisites are to be completed prior to the start of the respective RR.

7. 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.

8. Restart. The resumption of program work. Restarts requiring an RR can occur in operating facilities if the activity or operation to be resumed meets RR requirements. A restart may be required even if the same program work is ongoing in another portion of the operating facility.

9. Scope. The overall magnitude of the RR, as defined by the physical breadth and depth of the facilities, activity, or operation to be started/restarted, the breadth of CRs selected, and the depth of evaluation of these CRs during the RR.

10. 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, operation or activity ceases; or (3) a condition in which a programmatic nuclear operation or activity ceases, but the structure containing the process may remain operational (i.e., not shut down). In a shutdown condition, a facility must still meet all applicable technical safety requirements and environmental, safety, and health requirements.

    A shutdown condition does not apply if the following are maintained current:

    - Safety Significant/Safety Class-SSCs are maintained through a preventative maintenance program
    - Knowledge is maintained through an approved training program
    - Procedures and processes

11. Startup Approval Authority (SAA). The line manager who is designated in accordance with Attachment 3 of this Order to authorize the start of nuclear operations when all requirements of the Order have been met. The SAA may range from a Senior Contractor Official to the Secretary of Energy.