U.S. Department of Energy
Washington, D.C.

ORDER

DOE O 433.1B

Approved: 4-21-2010
Chg 1: 3-12-2013

SUBJECT: MAINTENANCE MANAGEMENT PROGRAM FOR DOE NUCLEAR FACILITIES

1. PURPOSE. To define the safety management program required by Title 10 Code of Federal Regulations (CFR) 830.204(b)(5) for maintenance and the reliable performance of structures, systems and components (SSCs) that are part of the safety basis required by 10 CFR 830.202 at hazard category 1, 2 and 3 Department of Energy (DOE) nuclear facilities.

2. CANCELLATION. DOE O 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*, dated 2-13-07. 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 or attached to a contract remain in effect throughout the term of the contract unless and until the contract is modified to either eliminate requirements that are no longer applicable or substitute a new set of requirements.

3. APPLICABILITY.

   a. Departmental Applicability. This Order applies to all DOE elements involved in the maintenance of DOE hazard category 1, 2, and 3 nuclear facilities and automatically applies to DOE elements created after it is issued. This includes both Government-owned and Government-operated (GOGO) and Government-owned and Contractor-operated (GOCO) nuclear facilities.

      The Administrator of the National Nuclear Security Administration (NNSA) must assure that NNSA employees and contractors comply with their respective responsibilities under this directive. Nothing in this Order will be construed to interfere with the NNSA Administrator's authority under section 3212(d) of Public Law (P.L.) 106-65 to establish Administration-specific policies, unless disapproved by the Secretary.

   b. DOE Contractors. Except for the equivalencies and exemptions in paragraph 3.c, the Contractor Requirements Document (CRD, Attachment 1) sets forth requirements of this Order that will apply to contracts that include the CRD. The CRD requirements apply to all contractors responsible for managing and maintaining DOE-owned or -leased hazard category 1, 2, and 3 nuclear facilities. Contractors must comply with the requirements listed in the CRD to the extent set forth in their contracts.

   c. Equivalencies and Exemptions. Equivalencies and exemptions to this Order are processed in accordance with DOE O 251.1C, *Departmental Directives Program*.

Central Technical Authority (or designee) concurrence is required for both exemptions and equivalencies to this Order for nuclear facilities.

(1) Equivalency. In accordance with the responsibilities and authorities assigned by Executive Order 12344, codified at 50 U.S.C. sections 2406 and 2511 and to ensure consistency through the joint Navy/DOE Naval Nuclear Propulsion Program, the Deputy Administrator for Naval Reactors (Director) will implement and oversee requirements and practices pertaining to this Directive for activities under the Director's cognizance, as deemed appropriate.

(2) Exemption. Radiological facilities (e.g., facilities with quantities of hazardous radioactive materials which fall below the hazard category 3 threshold per DOE Standard 1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*) are excluded from the provisions of this Order; however, the maintenance management program requirements of DOE O 430.1B Chg 2, *Real Property Asset Management*, are applicable to radiological facilities. Radiological facilities that warrant additional controls may apply appropriate requirements of this Order until further guidance is issued.

(3) Exemption. This Order does not apply to those portions of nuclear facility maintenance programs that are subject to regulation by other Federal agencies such as the U.S. Nuclear Regulatory Commission.

(4) Exemption. This Order does not apply to the Bonneville Power Administration (BPA), in accordance with Secretarial Delegation Order Number 00-033.00B to the BPA Administrator and Chief Executive Officer, dated 7-20-09.

4. REQUIREMENTS. DOE G 433.1-1A, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1*, provides acceptable approaches for meeting the requirements of this Order. DOE G 433.1-1A references Federal regulations, DOE directives, and industry best practices using a graded approach regarding implementation of requirements for maintaining DOE-owned Government property. Graded approach is defined in 10 CFR 830.3 and guidance for applying it is provided in DOE G 433.1-1A.

a. All hazard category 1, 2, or 3 nuclear facilities, as defined in DOE Standard 1027-92, must conduct all maintenance of SSCs that are part of the safety basis in compliance with an approved nuclear maintenance management program (NMMP).

b. NMMPs for GOCO facilities must demonstrate compliance with the requirements contained in the CRD of this Order (Attachment 1) and must be approved by the

respective Field Office Manager; approval consists of reviewing NMMP description documentation and evaluating its compliance with Attachment 1. NMMPs for GOGO facilities must demonstrate compliance with the requirements contained in Attachment 2 of this Order and must be approved by the respective Secretarial Officer (SO) or designee; approval consists of reviewing NMMP description documentation and evaluating its compliance with Attachment 2. Approval of NMMP description documentation is required prior to startup of new hazard category 1, 2, and 3 nuclear facilities and at least every three years for all hazard category 1, 2, and 3 nuclear facilities.

c. Changes to NMMPs must be reviewed under the unreviewed safety question (USQ) process to ensure that SSCs are maintained and operated within the approved safety basis, as required by 10 CFR part 830, *Nuclear Safety Management,* Part B-*Safety Basis Requirements*. Changes which would result in an unreviewed safety question must be approved prior to the change taking effect.

d. Assessments of NMMP implementation must be conducted, at least every three years or less frequent if directed by the SO in accordance with DOE O 226.1B, *Implementation of Department of Energy Oversight Policy,* to evaluate whether all CRD requirements are appropriately implemented.

e. Periodic self assessments in accordance with DOE O 226.1B must be conducted to evaluate the effectiveness of oversight of NMMPs.

f. A single maintenance program may be used to address the requirements of this Order and the requirements of DOE O 430.1B Chg 2, *Real Property Asset Management*.

g. Full implementation of the requirements in this Order must be accomplished within 1 year of its issuance, unless a different implementation schedule is approved by the SO with concurrence of the Central Technical Authorities (CTA).

5. RESPONSIBILITIES.

a. Secretarial Officers, including NNSA Administrator and Deputy Administrator for Defense Programs (SOs).

(1) Ensure that the requirements of this Order are implemented for facilities, activities, or programs under their cognizance.

(2) For GOGO activities under their cognizance, approve or designate the approval authority for nuclear maintenance management program documentation prepared in accordance with the CRD, Attachment 1.

(3) Ensure that contractors conduct maintenance of SSCs in accordance with a DOE/NNSA approved NMMP.

(4) Review and approve requests for equivalencies and exemptions from requirements of this Order after resolving comments in accordance with DOE O 251.1C.

(5) Ensure that field office managers notify contracting officers when contracts are affected by this Order.

b. Chief Health, Safety and Security Officer.

(1) Develops and coordinates proposed new or revised policies, directives, requirements, guidance, and technical standards related to this Order and CRD.

(2) Interprets or clarifies provisions of this Order and CRD, and provides advice and assistance on policy implementation.

(3) Provides input to CTAs regarding interpretation of DOE safety policy relating to the requirements of this Order.

(4) Provides comments on requests for equivalencies and exemptions from the requirements of this Order.

(5) Plans and conducts assessments to determine compliance with the requirements of this Order, in accordance with DOE O 227.1, *Independent Oversight Program.*

c. Central Technical Authorities (CTAs).

(1) Concur with decisions regarding applicability of contractor requirements documents related to this Order, in accordance with DOE O 410.1, *Central Technical Authority Responsibilities Regarding Nuclear Safety Requirements.*

(2) Concur with exemptions and equivalencies to this Order for nuclear facilities.

d. Field Office Managers (including NNSA).

(1) Ensure that maintenance activities and programs at hazard category 1, 2, and 3 nuclear facilities under their purview are conducted in compliance with the requirements of this Order.

(2) Ensure that sufficient resources are requested to meet the requirements of this Order and to ensure that safety SSCs are sufficiently maintained to perform their assigned safety function.

(3) Ensure that cost-effective NMMPs are developed and implemented for all hazard category 1, 2, and 3 DOE nuclear facilities.

(4) Ensure that the requirements of this Order are incorporated into contracts, subcontracts, and support services contracts for hazard category 1, 2, and 3 nuclear facilities as appropriate

(5) Notify contracting officers when contracts are affected by this Order.

(6) Review and approve NMMP program description documentation that demonstrates compliance with the Specific Requirements in the CRD, Attachment 1.

(7) Conduct comprehensive self assessments and assessments of contractor maintenance management programs as specified in paragraph 4 above and in accordance with DOE O 226.1B.

e. Contracting Officers.

(1) Incorporate the CRD into affected contracts in a timely manner when notified.

(2) Ensure that applicable maintenance related codes and standards are incorporated into contracts and other procurement documents.

6. REFERENCES.

a. DOE O 226.1B, *Implementation of Department of Energy Oversight Policy*, dated 4-25-11.

b. DOE O 251.1C, *Departmental Directives Program*, dated 1-15-09.

c. DOE O 410.1, *Central Technical Authority Responsibilities Regarding Nuclear Safety Requirements*, dated 8-28-07.

d. DOE O 414.1D, *Quality Assurance*, dated 4-25-11.

e. DOE O 420.1C, *Facility Safety*, dated 12-4-12.

f. DOE G 424.1-1B, *Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements*, dated 4-8-10.

g. DOE O 430.1B Chg 2, *Real Property Asset Management,* dated 4-25-11.

h. DOE G 433.1-1A, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1B,* dated 9-12-11.

i. DOE O 440.1B Chg 1, *Worker Protection Program for DOE (Including the National Nuclear Security Administration) Federal Employees*, dated 8-21-12.

j. DOE G 450.4-1C, *Integrated Safety Management System Guide*, dated 9-29-11.

k. DOE O 450.2, *Integrated Safety Management*, dated 4-25-11.

l. DOE O 227.1, *Independent Oversight Program*, dated 8-30-11.

m. DOE O 458.1, Admin Chg 3, *Radiation Protection of the Public and the Environment*, dated 2-11-11.

n. DOE O 422.1, *Conduct of Operations*, dated 6-29-10.

o. DOE O 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*, dated 4-21-10.

p. DOE STD 1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*, dated December 1992 (Chg 1, September 1997).

q. 10 CFR part 830, Nuclear Safety Management; Subpart A, Quality Assurance Requirements.

r. 10 CFR part 830, Nuclear Safety Management; Subpart B, Safety Basis Requirements.

s. 10 CFR part 835, Occupational Radiation Protection.

t. 10 CFR part 850, Chronic Beryllium Disease Prevention Program.

u. 10 CFR part 851, Worker Safety and Health Program.

v. 48 CFR 970.5223-1, Integration of Environment, Safety and Health into Work Planning and Execution.

w. Title XXXII of P.L. 106-65, National Nuclear Security Administration Act, as amended, which established a separately organized agency within the Department of Energy.

x. Executive Order 12344, Naval Nuclear Propulsion Program.

7. CONTACT. Questions concerning this directive should be addressed to the Office of Nuclear Safety, Quality Assurance and Environment at 202-586-5680.

BY ORDER OF THE SECRETARY OF ENERGY:

DANIEL B. PONEMAN
Deputy Secretary

CONTRACTOR REQUIREMENTS DOCUMENT
DOE O 433.1B, *MAINTENANCE MANAGEMENT PROGRAM FOR DOE NUCLEAR FACILITIES*

Contractors at hazard category 1, 2, and 3 nuclear facilities must comply with the requirements listed in this Contractor Requirements Document (CRD) to the extent set forth in their contracts. Maintenance Management Program requirements applicable to this CRD are provided in Attachment 2. 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.

The provisions of this CRD apply to Department of Energy (DOE) and National Nuclear Security Administration (NNSA) contractors.

MAINTENANCE MANAGEMENT PROGRAM REQUIREMENTS FOR DOE NUCLEAR FACILITIES

1. GENERAL REQUIREMENTS.

   a. Federal and contractor organizations responsible for hazard category 1, 2, or 3 nuclear facilities, as defined by DOE Standard 1027-92 must develop and implement a nuclear maintenance management program (NMMP) through tailored application (e.g., graded approach) of the Specific Requirements in this attachment. The definition of graded approach is provided in Title 10 Code of Federal Regulations (CFR) 830.3. The NMMP must describe the safety management program for maintenance and the reliable performance of structures, systems and components (SSCs) that are part of the safety basis at hazard category 1, 2 and 3 DOE nuclear facilities. Guidance on applying the Specific Requirements, including a graded approach, is provided in DOE G 433.1-1A, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1*. The referenced Guide is available on the DOE Directives web site, www.directives.doe.gov.

   b. Federal and contractor organizations must conduct all maintenance of SSCs that are part of the safety basis in compliance with an approved NMMP.

   c. Federal and contractor organizations must ensure that equivalencies and exemptions from the maintenance management program elements of this attachment are identified, formally documented with supporting justification, and approved in accordance with DOE O 251.1C. Central Technical Authority (CTA) or designee concurrence is required for both exemptions and equivalencies to this Order for nuclear facilities.

   d. Federal and contractor organizations must implement the NMMP through federal or contractor-approved documents, respectively. This is normally accomplished with a manual or a set of implementing procedures.

   e. Federal and contractor organizations must submit NMMP description documentation to DOE/NNSA for review and approval prior to the startup of new hazard category 1, 2, and 3 nuclear facilities and at least every three years for all nuclear facilities. NMMP description documentation must be, at a minimum, an applicability matrix or a combination of multiple documents. The following elements must be covered:

      (1) Correlation of the Specific Requirements in this attachment to the applicable facilities;

      (2) Correlation of the implementing documents (i.e., procedures, work instructions, etc.) to the Specific Requirements in this attachment; and

(3) Documentation of the basis for applying a graded approach, if applicable.

f. Federal and contractor organizations with previously approved maintenance management program documentation must submit either an addendum or page changes to the program documentation to reflect the changes made as a result of the implementation of requirements in this attachment. If no changes are needed, a memorandum to that effect may be submitted as the addendum. Changes must be submitted to DOE/NNSA for approval within 90 days from the date of inclusion of the requirements in this attachment in the contract.

g. Federal and contractor organizations must conduct assessments of NMMP implementation, at least every three years or less frequent if directed by the DOE/NNSA SO in accordance with DOE O 226.1B and 10 CFR part 830 subpart A. DOE G 433.1-1A provides acceptable approaches for conducting NMMP assessments.

h. Federal and contractor organizations must ensure that NMMPs are identified in the applicable documented safety analysis (DSA) in accordance with 10 CFR 830.204.

i. Federal and contractor organizations must review proposed changes to the NMMP, which could affect the performance of safety SSCs, as part of the ongoing unreviewed safety question (USQ) process. This review is intended to evaluate whether safety SSCs are maintained and operated within the approved safety basis, as required by 10 CFR 830.203. Changes which would result in a positive USQ must be submitted to DOE/NNSA for approval prior to the change taking effect.

j. These requirements will be fully implemented within 1 year of its issuance, unless a different implementation schedule is approved by the SO with concurrence of the CTA.

2. SPECIFIC REQUIREMENTS. The NMMP must clearly address the following:

a. Integration with Regulations and DOE Orders and Manuals (and their CRDs). The NMMP must be integrated with applicable programs (e.g., Safety Management Programs) and requirements identified by Federal regulations and other DOE Orders and Manuals (and their CRDs) to include.

(1) The following directives (and their CRDs).

(a) DOE O 226.1B, *Implementation of Department of Energy Oversight Policy*, dated 4-25-11;

(b) DOE O 414.1D, *Quality Assurance*, dated 4-25-11;

(c) DOE O 420.1C, *Facility Saf*ety, dated 12-4-12;

(d) DOE O 430.1B Chg 2, *Real Property Asset Management*, dated 4-25-11;

(e) DOE O 440.1B Chg 1, *Worker Protection Program for DOE (Including the National Nuclear Security Administration) Federal Employees*, dated 8-21-12;

(f) DOE O 422.1, *Conduct of Operations*, dated 6-29-10;

(g) DOE O 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*, dated 4-21-10;

(h) DOE O 458.1, Admin Chg 3, *Radiation Protection of the Public and the Environment*, dated 2-11-11; and

(i) DOE O 450.2, *Integrated Safety Management*, dated 4-25-11.

(2) Code of Federal Regulations.

(a) 10 CFR part 830, Nuclear Safety Management; Subpart A, Quality Assurance Requirements;

(b) 10 CFR part 830, Nuclear Safety Management; Subpart B, Safety Basis Requirements;

(c) Integrated Safety Management System (ISMS) provisions contained in 48 CFR 970.5223-1, *Integration of Environment, Safety, and Health into Work Planning and Execution;*

(d) 10 CFR part 835, Occupational Radiation Protection;

(e) 10 CFR part 850, Chronic Beryllium Disease Prevention Program; and

(f) 10 CFR part 851, *Worker Safety and Health Program*.

b. Maintenance Organization and Administration. The management structure that applies sufficient resources (e.g., oversight and independent assessment, management involvement, funding, assignment of personnel roles and responsibilities, facilities, tools, and equipment) necessary to support the requirements described in this attachment and ensures integration with other programs.

c. Master Equipment List. The process for developing, implementing, managing, and maintaining the master equipment list (MEL) at a level that clearly identifies the structures, systems, and components (SSCs) that are part of the safety basis.

d. Planning, Scheduling, and Coordination of Maintenance. The process for planning, scheduling, coordination, and control of maintenance activities, and properly emphasizing equipment availability. The process must describe the application of a System Engineer Program in accordance with DOE O 420.1C in the planning and execution of maintenance activities.

e. Types of Maintenance. The process for utilization of appropriate types of maintenance (i.e., preventive maintenance, predictive maintenance, reliability-centered maintenance, surveillance and testing, and corrective maintenance) to provide for safe, efficient, and reliable operation of safety SSCs.

f. Maintenance Procedures. The process for developing and implementing documented and approved work instructions for work on safety SSCs (i.e., work packages, procedures, work instructions, and drawings).

g. Training and Qualification. The training and qualification program for maintenance positions specified in DOE O 426.2.

h. Configuration Management. The incorporation of the configuration management program to control approved modifications and to prevent unauthorized modifications to safety SSCs.

i. Procurement. The appropriate integration of the procurement process with the NMMP to ensure the availability of parts, materials and services for maintenance activities.

j. Maintenance Tool and Equipment Control. The process for control of maintenance tools including calibration of Measuring and Test Equipment.

k. Suspect and Counterfeit Items. The incorporation of the process to prevent the use of suspect and counterfeit items into maintenance procedures and work instructions.

l. Maintenance History. The process for developing and maintaining documented and retrievable maintenance history (i.e., cost data, system availability data, and failure data) to support work planning, performance trending, analysis of problems to determine root causes of unplanned occurrences related to maintenance, and continuous program improvement.

m. Aging Degradation and Technical Obsolescence. The process for conducting inspections to evaluate aging-related degradation and technical obsolescence to determine whether the performance of SSCs is threatened.

n. Seasonal Facility Preservation. The process for ensuring the prevention of damage to safety SSCs from adverse weather conditions.

o. Performance Measures. The process for developing, maintaining, and communicating performance measures to identify maintenance issues requiring corrective action and lessons learned.

p. Facility Condition Inspection. The process for conducting and implementing routine assessment of facilities to identify issues related to operability, reliability, housekeeping, and general condition.

q. Post Maintenance Testing. The process for conducting post maintenance testing to verify that safety SSCs can perform their intended function when returned to service.