

PART 52, FACILITIES AND EQUIPMENT

PROGRAM APPLICABILITY: IMC 2504 B

83536-01 INSPECTION OBJECTIVE

01.01 To inspect for readiness of the plant with respect to *Title 10 of the Code of Federal Regulations (10 CFR)* CFR Part 20, “*Standards for Protection against Radiation,*” based on the licensee’s processes for integration of site programs and procedures with facilities and equipment used for radiation protection purposes as provided by design and site-specific features.

01.02 To determine whether the programs for operation and maintenance of facilities and equipment for radiation protection activities as described in the *Final Safety Analysis Report (FSAR)* are adequate to support the radiation protection program objectives, including normal operation, anticipated operational occurrences, and accident conditions. This inspection procedure focuses on the program’s readiness for use by plant personnel.

01.03 10 CFR Part 20 requires licensees to have and operate facilities and equipment sufficient to quantify radiation exposure and to protect personnel. Performance in this area is judged on whether the licensee has taken appropriate measures to establish and maintain this equipment and facilities. Some aspects of the facilities and equipment program, such as: organization, facilities, instrumentation and equipment, training, and procedures may be fulfilled by the radiation protection program procedures described in NEI 07-03A, “Generic FSAR Template Guidance for Radiation Protection Program Description.” This process provides an acceptable template for assuring that some aspects of the radiation protection program meets applicable NRC regulations and guidance for operating and maintaining some facilities and equipment. NEI 07-03A describes a radiation protection program that will be implemented in stages consistent with the following milestones:

- Prior to initial receipt of by-product, source, or special nuclear materials (excluding exempt quantities as described in 10 CFR 30.18).
- Prior to receiving reactor fuel.
- Prior to initial loading of fuel in the reactor.
- Prior to initial transfer, transport or disposal of radioactive materials.

For those licensees that have elected to demonstrate compliance to the requirements of 10 CFR Part 20 via alternate methods, and for those program aspects not specifically addressed by an approved template, SECY-04-0032, “Programmatic Information Needed for Approval of a Combined License Application Without Inspections, Tests, Analyses, and Acceptance Criteria [ITAAC],” notes that in the absence of ITAAC, “fully described” should be

understood to mean that the program is clearly and sufficiently described in terms of the scope and level of detail to allow a reasonable assurance finding of acceptability at the **combined license (COL)** stage.

83536-02 INSPECTION REQUIREMENTS

General Inspection Guidance

If the unit being constructed is at a site with existing operational units for which the same program will be used at all units, then this program may not require the same level of inspection as that required for units being constructed at sites with no operational units. This is consistent with the aseline Inspection Program requirements identified in Inspection Manual Chapter 2506, "Construction Reactor Oversight Process General Guidance and Basis Document." At sites with an operating unit where the licensee has chosen to take credit for similar operational programs as those that are already in use, the inspectors shall focus on the differences between the program already in use and the newly developed program. The operational program inspection should focus on those steps in the IMC 2504 inspection procedures where the inspectors cannot verify that the operational program, equipment, and components are the same, or substantially similar to, that of the operating unit. If the operational program, equipment, and components are the same, or substantially similar to, the operating unit, then only complete the following minimum inspection requirements:

Part 52 Licensees Collocated with an Existing Operational Unit

Minimum Inspection Requirements:

- a. Verify that the 10 CFR Part 52 licensee has incorporated the operational plant's procedures for operation and maintenance of facilities and equipment into their program.
- b. Verify via walkdowns that personnel and equipment decontamination facilities are sufficient to support plant operations.
- c. Verify via walkdowns that radiologically controlled area (RCA) entry and exit points have been established and that sufficient calibrated personnel and equipment survey instrumentation has been provided (e.g., personnel contamination and small article monitors).
- d. Verify via walkdowns that adequate facilities for storage and control of contaminated tools are provided (e.g., hot tool room).

Inspection Guidance: Verification of procedure incorporation should include a review of procedure cover sheet information (e.g., procedure titles and site applicability, management approvals, revision history, etc.), and a limited review of the procedure itself for applicability to the 10 CFR Part 52 site. The licensee may have developed specific procedures due to differences in plant design or layout. If so, review the site-specific design differences for conformance with the FSAR and review procedures for adequate inclusion of the site-specific design differences. The inspector can find applicable guidance throughout Inspection Procedure (IP) 83536. Where applicable, review these inspection activities for compliance with 10 CFR Part 20, 10 CFR Part 52, and the FSAR.

02.01 Facilities. Determine whether the integration of designed facilities for radiation protection and the licensee's procedures and processes are adequate to support the radiation protection program.

Review effectiveness of the licensee's methods for incorporating aspects of the facility design into programs for facilities that will be used for radiation protection program activities, including:

- a. Operations in radiation protection instrument calibration areas, including:
 1. The licensee's evaluation of the impact of the radiation protection instrument calibration area on personnel and small equipment contamination monitoring instruments, low-level monitoring or counting systems, sensitivity and reliability as a result of transient background rates.
 2. Assurance that processes available for calibration of air sampling and air borne radioactivity monitoring instruments address all expected types, energy, exposure ranges, and operating parameters (e.g., vacuum) expected during use.
 3. Processes for evaluating and handling equipment and instruments with external or internal contamination.
 4. Assurance that proper personnel protection calibration source interlocks and facility radiation monitoring alarms and door locks are included to prevent unauthorized access during open and unshielded source use.
 5. Assurance that calibration sources are registered with the National Source Tracking System if required.
- b. Operation of facilities used to clean, repair, and decontaminate personal protective equipment, radiation monitoring instruments, hand tools, electromechanical parts, or other material, including processes for minimizing waste generation or segregation of contaminated materials, and the minimization of personnel exposure to external and internal material during decontamination activities. The inspector should consider the effect of normal operation and outages on material flow paths, amount of material to be handled, and the impact of conditional operations (e.g., temporary radioactive material storage) on the operation of the facilities provided.
- c. Control of personnel entrance and exit into radiologically controlled areas such as the personnel entrance to the containment building and radioactive waste processing areas. Determine how the program addresses considerations such as:
 1. Access during normal operations and anticipated outage conditions.
 2. How the development of the access control procedures considered the impact of other required program elements (e.g., industrial safety for heat stress. See DHHS (NIOSH) Publication No. 86-113, "Criteria for a Recommended Standard--Occupational Exposure to Hot Environments.")
 3. How the development of the access control program addressed the emergency egress features (e.g., emergency air locks, or fire exits) of the design.

4. How the program addresses the interaction of the use of access design features with other plant systems. (e.g., the impact of openings on ventilation system controls or fire protection barriers).
 5. Storage, issuance and controls (e.g., background monitoring and issuing controls) for dosimeters of legal record (DLR).
 6. Storage, issuance, pre-use checks, and configuration control (e.g., dosimeter setpoint programming) and post use checks (e.g., alarm condition monitoring), for electronic dosimetry.
- d. Operation of personnel decontamination and monitoring areas during normal operations and expected outage conditions. Determine how the program addresses considerations such as:
1. The use of showers, basins, and related personnel decontamination facilities, including the segregation of contaminated personnel and personal items using a mixed gender workforce. The review should examine how the facility is sanitized.
 2. Provision and use of personnel decontamination survey instruments, including the movement of contaminated personnel to decontamination facilities.
 3. How operating procedures for such facilities address potentially contaminated waste-water and area ventilation systems.
 4. Collection and disposal of contaminated personal clothing and provisions for replacement clothing.
- e. Review processes established for personnel entry into radiologically controlled areas of the plant, including use of personal clothing change rooms, including the methods provided for transiting from the personal decontamination area. Evaluate methods used to assess the need for and use of lockers for permanent and contract maintenance workers who may be required during major outages.
- f. Determine how the licensee assigns and controls areas for safe storage of contaminated equipment. Determine how the program addresses considerations such as:
1. How storage and retrieval methods minimize the potential for personnel external, internal and contamination exposure, and the potential for facility contamination.
 2. Storage, inventory, refurbishment and issuance of periodically used equipment (e.g., scaffolds or temporary lighting provided for outage use).
 3. How the licensee processes provided for the identification and control of potentially contaminated components and equipment that has been removed from systems for onsite refurbishment or repairs, staged for return to vendors or repaired/refurbished, minimizes the spread of contamination and minimizes personnel exposure as a result of handling, storage and proper reuse of these items.

- g. Determine processes used for storing and assuring adequate supplies of portable radiation survey equipment, signs, ropes, respiratory protection equipment, protective clothing, etc. Determine how equipment and instruments ready for immediate use are segregated from defective or unavailable (e.g., not source checked or past inspection interval) items.
- h. Review methods used by the licensee to ensure that use of facility design features and tools or equipment provided as part of the facility design are adequately reflected in training provided to permanent and supplemental maintenance and radiation protection personnel.
- i. Determine methods used to ensure availability of sufficient office space to accommodate temporary and permanent radiation protection staff. Determine the methods used by the licensee to ensure the durability, legibility and retrieval of permanent records and technical literature.
- j. Review procedures for the use of onsite medical treatment/first-aid facilities provided for treatment of contaminated injured persons, including the use of equipment and the handling, transporting, and treatment of personnel. Determine the methods used to ensure that personnel have access to these facilities at all times. If support facilities outside the control of the licensee (such as offsite medical clinics or emergency rooms) will be used, written agreements with these facilities should be reviewed to determine that they are established in a manner consistent with licensee policy, and are both current and adequate to provide the needed functions.
- k. Determine effectiveness of methods and processes used by the licensee to ensure proper storage and staging of equipment and materials. Determine how the program addresses considerations such as:
 - 1. Preventing degradation of respiratory protection equipment function due to temperature extremes (e.g., limits on **Self-Contained Breathing Apparatus** cylinder dew point based on minimum staging area temperature), adverse environmental conditions (e.g., exposure to ultraviolet light, or corrosive atmospheres) or physical deformation resulting from storage conditions.
 - 2. Segregation of hoses used for breathing air from process equipment hoses.
 - 3. Shelf life and environmental limitations for air sampling media.
 - 4. Shelf life and environmental limitations for the storage of portable ventilation filtration media (e.g., dampness of HEPA filters, or chemical degradation of charcoal filters)
 - 5. Safe segregation and storage of chemicals (e.g., contamination prevention agents or decontamination agents) **used** by radiation protection personnel.
 - 6. Prevention of Radiation Degradation of items such as hoses, ropes (e.g., specifying the use of steel cables) and power cables used to support underwater operations or under water storage of radioactive materials.

02.02 Equipment. Determine whether equipment for radiation protection activities is provided as described in the FSAR and other controlling documents and is technically and quantitatively sufficient to support the radiation protection program.

Evaluation of equipment should include survey and analytical equipment not inspected as part of other construction inspection procedures, such as:

- a. IP 83533 - "Part 52, External Occupational Exposure Control and Personal Dosimetry."
- b. IP 83534 - "Part 52, Internal Exposure Control and Assessment."
- c. IP 83535 - "Part 52, Control of Radioactive Materials and Contamination, Surveys, and Monitoring."
- d. There may be considerable overlap of issues associated with the above-noted procedures. The focus of this procedure should be on how the licensee provided program has addressed and complements the design, and any updates or modifications resulting from either experience during the development of the plant or gained from experience with other operating facilities.
- e. Examples of equipment that should be considered include:
 1. Portable ventilation units equipped with high-efficiency filters.
 2. Temporary shielding materials that are readily transportable and adaptable to various configurations.
 3. Cavity shields for streaming that may require removal/periodic replacement during outages and provisions for proper handling of these operations.
 4. Equipment to facilitate communications throughout the plant, including communication devices for use in high radiation areas, contaminated areas, and inside containment structures.
 5. Equipment used to clean, repair, and decontaminate personal protective equipment, monitoring instruments, hand tools, parts, or other material.
 6. Appropriate supplies, equipment, and procedures to handle large numbers of contaminated people and provisions for decontamination of personnel, vehicles, and equipment evacuated from the site in the event of an accident.
 7. The provisions for exclusion of personnel from areas subject to high transient dose rates as a result of the movement of irradiated fuel or irradiated reactor vessel component.
- f. Evaluate the procedures and processes established for the use, maintenance and control of radiation protection design features, such as:
 1. Very High Radiation Area boundary barriers.
 2. Shield plugs.

3. Maintenance ventilation systems.
 4. Plant lighting exposure reduction features.
- g. Determine the processes and methods established for the identification, control and storage of sources of radiation exposure, such as, movable incore instrument detectors, special nuclear material sources, spare radiation monitoring system detectors with built in sources, instrument calibration and response check sources.
 - h. Determine the effectiveness of processes and methods used to identify, prioritize and rectify deficiencies and malfunctions of designed features or site provided equipment needed by maintenance, operations and radiation protection personnel, provided for personnel protection, reduction of operational radiation exposure or minimization of contamination of the facility or environment.
 - i. Determine the adequacy of the licensee methods used to establish the functional requirements, types, quality and quantity of equipment needed to support the radiation protection program.

02.03 Programs. Determine the licensee's actions to address and properly document development of the program from the functional program description provided to NRC staff during the application review process. Focus is on readiness for operation consistent with 10 CFR 20.

Determine from the licensee's submissions regarding what commitments to or incorporation by reference were made with respect to national standards or other guidance documents, and whether there have been any changes, amendment proposals, impact evaluations, or other remedial or compensatory actions by the licensee that affect adequacy of the program, or that have not already been reviewed by NRC staff.

83536-03 RESOURCE ESTIMATE

Approximately 40 hours of direct inspection effort will be required to implement this procedure. An inspection of the program and related procedures and records will require health physicists trained in control of radioactive materials and contamination, surveys, and monitoring and in inspection techniques as they relate to nuclear power facilities.

The actual hours required to complete the inspection may vary from this estimate. The inspection hours allocated for this inspection are an estimate for budgeting purposes. The hours expended for this inspection should consider plant specific design features and operational programs. The level of effort expended in such inspections should be recorded for the purpose of planning future inspections and updating budget allocations. If this inspection procedure is performed at a 10 CFR Part 52 licensee collocated with an existing operational unit and the operational program, equipment, and components are the same, or substantially similar to, that of the operating unit, inspection effort is expected to require approximately 20 hours of direct inspection effort.

83536-04 REFERENCES

NRC Inspection Manual Chapters 2501, 2502, 2503, and 2504

Public Law 91-596 84 Statute 1590 December 29, 1970, as amended through January 1, 2004 ("Occupational Safety and Health Act of 1970") "General Duty Clause," Section 5(a)(1)

Regulatory Guide 1.97, Revision 4, "Criteria for Accident Monitoring Instrumentation for Nuclear Power Plants," June 2006. U.S. Nuclear Regulatory Commission, Washington, DC

Regulatory Guide 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)," June 2007. U.S. Nuclear Regulatory Commission, Washington, DC

NUREG-0800, Revision 3, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," Chapters 11, "Radioactive Waste Management," and 12, "Radiation Protection," March 2007. U.S. Nuclear Regulatory Commission, Washington, DC

SECY-10-0043, "Blending of Low-Level Radioactive Waste," April 2010. U.S. Nuclear Regulatory Commission, Washington, DC

SECY-06-0114, "Description of the Construction Inspection Program for Plants Licensed under 10 CFR Part 52," May 2006. U.S. Nuclear Regulatory Commission, Washington, DC

SECY-05-197, "Review of Operational Programs in a Combined License Application and Generic Emergency Planning Inspections, Tests, Analyses and Acceptance Criteria," October 28, 2005. U.S. Nuclear Regulatory Commission, Washington, DC

SRM-SECY-04-0032, "Programmatic Information Needed for Approval of a Combined License Without Inspections, Tests, Analyses, and Acceptance Criteria," May 2004. U.S. Nuclear Regulatory Commission, Washington, DC

ANSI/ANS-HPSSC 6.8.1-1981, "Location and Design Criteria for Area Radiation Monitoring Systems for Light-Water Nuclear Reactors," 1981. Health Physics Society, McLean, VA

DHHS (NIOSH) Publication No. 86-113, "Criteria for a Recommended Standard--Occupational Exposure to Hot Environments," April 1986. National Institute for Occupational Safety and Health, New York, NY

NEI 07-03A [Revision 0] "Generic FSAR Template Guidance for Radiation Protection Program Description" and the associated NRC SER (ADAMS Accession No. ML0914906841)

83536-05 PROCEDURE COMPLETION

This procedure will be closed upon satisfactory inspection results verifying that an adequate program exists and processes are in place to control and assess internal exposure. The inspection should demonstrate the program can be inspected under the **reactor oversight process**.

END

Attachment 1: Revision History for Construction Inspection Procedure 83536

ATTACHMENT 1

Revision History for Construction Inspection Procedure 83536

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public Information)
	ML0818207371 10/27/10 CN 10-022	<p>Initial issue to support inspections of operational programs described in IMC 2504, Construction Inspection Program – Inspection of Construction and Operational Programs.</p> <p>Derived from original procedure 83527 of 01/01/1984 to address 10 CFR Part 52, initial test program, updates of NRC guidance, including risk-informed, performance-based inspection and enforcement policies.</p> <p>Completed search of CNs for previous 4 years and no commitments were found.</p>	N/A	ML102660634
	ML20044F978 03/04/20 CN 20-013	Revises guidance for units being constructed at a site with existing operational units for which the same program will be used at all units and conditionally lowers the Resource Estimate.		ML20044G119