

NRC INSPECTION MANUAL

ARCB

INSPECTION PROCEDURE 84529

PART 52, GASEOUS WASTE MANAGEMENT PROGRAM

PROGRAM APPLICABILITY: IMC 2504 Appendix B

84529-01 INSPECTION OBJECTIVES

01.01 Effluents. To determine whether the licensee's effluent and process monitoring program is adequate and conforms with the Final Safety Analysis Report (FSAR) description; whether procedures for instrumentation and equipment to sample and handle radioactive gases, radio-iodines and particulate are adequate; and whether system management is functionally sufficient for expected normal, anticipated operational occurrences (AOO) and accident conditions.

01.02 Gaseous Waste Processing. To determine whether the licensee has processes in place to monitor and ensure that the Gaseous Waste Management System (GWMS) can be operated as intended by the FSAR; that the licensee's processes for evaluating, installing and using mobile Gaseous Waste Processing Systems (GWPS) are adequate for the source terms described in the FSAR; that operational procedures have been written and approved for normal operations and anticipated operational occurrences, and that these procedures are adequate for the management of radioactive gaseous effluents.

01.03 Post-Accident Sampling and Analysis. Determine whether procedures have been approved and are adequate, and instrumentation and equipment to collect and analyze samples and handle radioactive gas, radio-iodines, and particulate samples for accident conditions, are operationally ready.

84529-02 INSPECTION REQUIREMENTS AND INSPECTION GUIDANCE

General Inspection Guidance

As defined in Regulatory Guide (RG) 1.143, Revision 2, "Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light Water Cooled Nuclear Reactor Power Plants," the GWMS begins at the interface valves in each line from other systems provided for collecting wastes that may contain radioactive materials and to include related instrumentation and control systems. The GWMS terminates at the point of controlled discharge to the environment. The GWMS may be permanently installed plant equipment (GWPS), a mobile gaseous waste processing system (MGWPS), or a combination of systems connected to permanently installed plant systems.

Nuclear Energy Institute (NEI) 07-09A, "Generic FSAR Template Guidance for Offsite Dose Calculation Manual (ODCM) Program Description," (Agencywide Documents Access and Management System Accession No. ML091050234) fully describes, at the functional level,

elements of the process and effluent monitoring and sampling programs required by **Title 10 of the Code of Federal Regulations (10 CFR) Part 50**, Appendix I and 10 CFR 52.79(a)(16).

NEI-08-08A Revision 0, "Guidance for Life Cycle Minimization of Contamination," October 2009, (ADAMS Accession No. ML093220530) meets the requirements of 10 CFR 20.1406 for life-cycle minimization of contamination, in part, by addressing the applicable regulatory position elements of Regulatory Guide (RG) 4.21, "Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning." NEI 07-09A in conjunction with NEI 08-08A fully describes the effluent monitoring program. NEI 07-09A, when used in conjunction with NEI 08-08A, provides acceptable templates for assuring that the process and effluent monitoring and sampling, and ground water protection programs meet applicable NRC regulations and guidance. NEI 07-09A and NEI 08-08A describe programs that will be implemented in stages, as specified in FSAR section 13.4.

The NRC staff's Safety Evaluation Reports (SERs) associated with NEI technical reports provide the bases for the use of the referenced templates to describe acceptable operational programs which conform to the applicable regulatory guidance documents. For those licensees that elect to demonstrate compliance with the programmatic requirements of 10 CFR 50.36a, 10 CFR **Part 50**, Appendix I and 10 CFR 52.79(a)(16) or 10 CFR 20.1406 via alternate methods, SECY-04-0032, "Programmatic Information Needed for Approval of a Combined License Without Inspections, Tests, Analyses, and Acceptance Criteria" notes that in the absence of ITAAC, "fully described" is understood to mean that the program is clearly and sufficiently described. For the purposes of this inspection, the program is consistent with the description provided in the FSAR. The FSAR program description may contain a full description of the program consistent with SECY-04-0032, or may incorporate the NEI Templates and required supplemental information.

Where available, use system walk downs and observations of system operation to supplement the programmatic review when completing this procedure.

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 Baseline 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 Inspection Manual Chapter (IMC) 2504 inspection procedures (IP) 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 the following minimum inspection requirements shall be completed, and all other inspection requirements may be omitted:**

Licensees Collocated with an Existing Operational Unit

Minimum Inspection Requirements:

- a. **Verify that the licensee has incorporated the operational plant's procedures for gaseous waste processing and sampling into their program.**

- b. Verify that the gaseous waste processing system(s) are installed and configured as described in the FSAR, using Section 02.01, "Permanently Installed and Mobile Systems," as guidance. (Walkdowns)
- c. Verify that the licensee has the capability to collect and analyze representative samples of gases, particulates, and radio-iodines (including post-accident samples), using Section 02.03, "Gaseous, Radio-iodines, and Particulate Sampling," as guidance.
- d. Review, on a sampling basis, pre-operational test records, for gaseous waste processing system components, using Section 02.04, "Pre-Operational Testing Program," as guidance.
- e. Verify, on a sampling basis, that gaseous process and effluent monitors are installed, calibrated, and operable, using Section 02.05, "Process and Effluent Radiation Monitors and Instrumentation," as guidance. (Walkdowns) (Note: This inspection should not duplicate the efforts of other preoperational inspections. If adequate inspection of the installation, calibration, and operability of the radiation monitors is being addressed under other preoperational inspections, this item may be omitted.)

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 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. Applicable guidance can be found throughout Inspection Procedure (IP) 84529. Where applicable, these inspection activities should be reviewed for compliance with 10 CFR Part 20, 10 CFR Part 52, and the FSAR.

02.01 Determine the status of the operational programs for Permanently Installed and Mobile Systems

Inspection Requirements:

Confirm that the description of Gaseous Waste processing systems provided in program documents are consistent with the description of the permanently installed Gaseous Waste processing system (GWPS) and mobile/temporary Gaseous Waste processing system (MGWPS) used for routine (i.e., in the facility for greater than 90 days), processing of gaseous radioactive wastes described in the FSAR, and reflect the actual facilities provided. Where available, select at least one GWPS and at least one MGWPS.

Inspection Guidance: The FSAR provides the basis for the systems described in facility operating programs and procedures. The licensee programs implement the commitments described in the FSAR, Combined License Information items, the programmatic commitments related to the GWMS specified in the FSAR, and the regulatory commitments specified in FSAR Chapter 1. The FSAR for some designs may provide space for the future use of MGWPSs that may require additional review and analysis before the licensee's may implement routine use of the MGWPS.

- a. Evaluate the program description and procedures describing the functionality and effectiveness of the GWMS in controlling and monitoring gaseous process streams and effluents. The evaluation considers how the program documents capture and evaluate the bases and methods used to derive the functional requirements. Where available, select at least one GWPS and at least one MGWPS.

Inspection Guidance:

1. The program documents describe the type, quantity, capacities and processing rates of components and systems, including compressors, fans, valves, strainers and filters, adsorbent media beds, charcoal beds, compressors, decay tanks, piping, duct work, condensate removal systems, instrumentation (e.g., oxygen sensors) etc., needed to obtain the specified effluent activity concentrations, and automatic control features or interlocks in diverting or terminating releases.
 2. The program description of process input streams to the GWMS is consistent with those described in the FSAR. The program contains instructions on how to evaluate new input streams or input streams with radioactivity or chemical characteristics other than those assumed in the FSAR, and the potential impact on the GWMS (e.g., reduced process efficiency), preferential release of radionuclides from media, increased waste media generation, degradation of the media, exothermic reactions or explosive gas generation.
 3. The program describes the criteria and methods for determining the types, quantity, and specifications of filters, charcoal, adsorbent media, precipitator units, etc., needed to obtain the specified effluent activity concentrations.
 4. The licensee program documents should describe the features of GWPS and MGWPS provided to minimize contamination of the facility, minimize contamination of the environment and to facilitate decommissioning of the facility.
- b. Evaluate the program description and procedures describing the operation of the GWMS. The evaluation considers how the program documents capture and evaluate the bases and methods used to meet operational requirements. Where available, select at least two components from the GWPS and at least two components from the MGWPS.

Inspection Guidance:

1. Proper operation of features used to ensure that interconnections between permanently installed plant systems and mobile processing equipment will avoid (i) the contamination of non-radioactive systems, (ii) uncontrolled and unmonitored releases of radioactive materials to the environment. See guidance given in NUREG-0800, "Standard Review Plan (SRP)," Section 9.3.1, IE Bulletin No. 80-10, and Information Notice 1985-006.

2. Proper operation of features provided to reduce maintenance, equipment downtime, leakage of Gaseous Waste or discharge of radioactive material in gaseous effluents, and to control the venting or purging of radioactive materials to ambient building atmospheres (e.g., controlling pressure drop across filters, controlling moisture content of fluid streams, collection of condensate in process streams, etc.) can reduce operational radiation exposure (ORE) and prevent degradation of GWMS performance.
3. Proper operation of features provided to meet the requirements of 10 CFR 20.1406, (e.g., process system flow, pressure and moisture drains) to prevent pressure transients, media and component damage that cause contamination of the facility and the environment and complicate facilitate facility decommissioning.
4. Proper operation of system controls used to initiate automatic termination of treatment processes, venting and purging, termination of gaseous or particulate radioactive waste releases to the environment, helps to ensure GWMS integrity and prevent inadvertent or unanalyzed releases (e.g., filter media damage due to excess differential pressure, etc.) of radioactive material to the facility or the environment.
5. Proper operation of features provided to accommodate fluctuations in process and Gaseous Waste flow rates (e.g., pressure switches and valves used for automatic tank transfers, temperature controllers for adsorbent systems) which may prevent equipment damage or facility contamination (e.g., relief valve actuation, excessive filter differential pressure, excessive moisture loading on charcoal filter media, media flow bypass, etc.).
6. Proper operation of features provided for shared or interconnected systems at multiunit facilities, that control or limit total gaseous and particulate effluent releases from the facility.
7. For sites with licensees operating two or more reactors, each licensee includes in their respective ODCM a process for notifying other licensees on the same site to ensure that, when combined, effluent concentrations and offsite doses and dose rate limits of 10 CFR Part 20 are not exceeded. Licensee processes and procedures describe how the operation of two or more plants contributing to and sharing a single dose allocation for members of the public under 10 CFR Parts 20.1301, 20.1302, 20.1301(e) and 40 CFR Part 190, will be maintained within limits for the site. The licensee processes describe the mechanism(s) by which releases of gaseous and particulate effluents are coordinated and controlled such that all site licensees are jointly aware of routine and planned releases, and those associated with AOOs as they occur. The licensee processes for controlling site releases should contain formalized documentation from each affected licensee acknowledging the individual licensee's responsibilities and limitations. The processes to be used for modifying joint agreements is described by the licensee.

- c. Evaluate the program processes and procedures for maintaining the radioactive material content of the GWMS and the facility housing the GWMS within the facility licensing bases.

Inspection Guidance: The amount of radioactive material allowed to be contained within the GWPS or facilities housing the MGWPS may be limited by the classification level of the Systems Structures or Components (SSC) specified in the FSAR (see RG 1.143). Licensees are aware of these potential limitations and have processes in place to ensure that the facility design bases are not exceeded. Also, radioactive material content of components, such as adsorbent systems that may be limited by heat removal considerations, radiolytic degeneration of GWMS components such as seals, filtration media or electronics, or explosive gas generation from process system media.

- d. Evaluate the program and procedures describing the processes for monitoring and controlling performance of the GWMS. Where available, select at least two performance parameters of the GWPS and at least two performance parameters of the MGWPS.

Inspection Guidance: The Licensee's program describes the process used to establish the system parameters that need to be monitored to ensure GWMS performance is consistent with that assumed in the design bases. Changes in system flow rates, component differential pressures, removal or filtration efficiencies, or holding times for noble gases in delay beds or tanks are evaluated to ensure the absence of underlying system deficiencies (e.g., changes in system control set points may adversely affect system performance). Licensee processes for ensuring performance (e.g., radionuclide removal efficiencies or decontamination factors) of adsorbent media used in Gaseous Waste processing and treatment systems that meet or exceed those stated in the FSAR, provide continued assurance that the dose objectives of Appendix I 10 CFR Part 50 for gaseous and particulate effluents, the dose limits of 10 CFR Part 20.1301, the requirements of 10 CFR Part 20.1302, and the gaseous and particulate effluent concentration limits of Appendix B (Table 2, Column 1) to 10 CFR Part 20 would be met.

- e. Confirm that the licensee has implemented operational programs on controlling and monitoring potentially explosive gas mixtures and radioactivity levels in offgas system storage tanks and components in accordance with FSAR, Technical Specification (TS) Section 16.5.5 (Programs and Manuals) and FSAR Section 11.3 and BTP 11.5. Where available, select at least two components from the GWPS and at least two components from the MGWPS.

Inspection Guidance:

1. In controlling and monitoring potentially explosive gas mixtures in offgas system components, the licensee's program describes the equipment, process, monitoring methods, alarm functions in monitoring H₂ and O₂ concentration levels, and surveillance requirements. Changes to the licensee's program and procedures are evaluated using the criteria of 10 CFR 50.59; 10 CFR Part 50, Appendix A, GDC 3; RG 1.189; and as specified in FSAR TS 16.5.5 and FSAR Section 11.3 in differentiating whether the offgas system is designed to withstand internal detonations and is seismically qualified.

2. In controlling and monitoring the inventory of radioactivity in offgas system components, the licensee's program describes the equipment, process, radioactivity monitoring methods, alarm functions in maintaining inventories, and surveillance requirements. Changes to the licensee's program and procedures are evaluated using the criteria of 10 CFR 50.59, and as specified in FSAR TS 16.5.5 and dose acceptance criterion of FSAR Section 11.3 and BTP 11.5 in differentiating whether the offgas system is designed to withstand internal detonations and is seismically qualified.

02.02 Maintenance, testing, inspection and service life.

Inspection Requirements:

- a. Evaluate the program description and procedures describing maintenance of the GWMS. The evaluation considers how the program documents capture and evaluate the bases and methods used to meet the requirements of the preventative maintenance program. Where available, select at least two components from the permanently installed Gaseous Waste processing system (GWPS) and at least two components from the mobile/temporary Gaseous Waste processing system (MGWPS).

Inspection Guidance:

1. Proper operation of the GWMS is contingent upon the performance of the relevant types of preventive maintenance at the required frequencies. Consistent with the requirements of 10 CFR 50.36a(a)(1) and 10 CFR 50.34a(c)(1), the licensee is to maintain and use radioactive waste systems. Use of methods recommended by the manufacturer, supplemented by information available as a result of industry experience and standards form the basis for the processes the licensee uses to establish and preserve the required maintenance practices. Processes should be established for evaluating and documenting deviations from the recommended practices for preventive maintenance. Processes should be established for monitoring the effect of maintenance, and where necessary, changing the periodicity as mandated by changes in operational programs or when new equipment is placed into operation. Preventative maintenance activities, such as checking/replacing filter seals, moisture traps and gas venting filters can reduce operational radiation exposure (ORE) and degradation of GWMS performance. Preventative maintenance activities such as checking/lubricating valve linkages and dampers can prevent uncontrolled releases of radioactive material by ensuring that valves and dampers remain functional. **American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME) N509 2002 and ANSI/ASME N510** provide guidance related to the testing of air treatment and handling components.
2. Proper operation of the features of the GWMS provided to minimize contamination of the facility, minimize contamination of the environment and facilitate decommissioning of the facility, require periodic maintenance and inspection. Licensees have processes established for evaluating the continued effectiveness of these features (e.g., maintenance of differential pressure detection devices for filter media, moisture control in charcoal beds, preventing chemical poisoning of charcoal beds and filters, etc.).

- b. Evaluate the program description and procedures describing testing of the GWMS. The evaluation considers how the program documents capture and evaluate the bases and methods used to meet testing requirements. Where available, select at least two components from the GWPS and at least two components from the MGWPS.

Inspection Guidance: Proper operation of the GWMS is contingent upon the performance of the relevant types of testing at the required frequencies. Testing recommended by the manufacturer and standards, supplemented by information available as a result of industry experience and standards, form the basis for the processes the licensee uses to establish and preserve the required testing practices. Processes should be established for evaluating and documenting deviations from the recommended practices for testing. Processes should be established for monitoring the historic performance of components, and where necessary, changing the testing periodicity. Testing activities such as checking relief valve settings, isolation valve function and operation of tank pressure control devices can prevent system damage and prevent degradation of GWMS performance (e.g., media deformation due to excessive pressure differentials or high moisture conditions). Testing of components, such as backflow preventers, can prevent cross contamination of plant systems. See the guidance given in SRP Section 9.3.1, IE Bulletin No. 80-10, and Information Notice 1985-006 and Information Notice 92-32.

- c. Evaluate the program description and procedures describing monitoring and controlling the service life of GWMS components. The evaluation considers how the program documents capture and evaluate the bases and methods used to meet service life requirements. Where available, select at least two components from the GWPS and at least two components from the MGWPS.

Inspection Guidance: Proper operation of the GWMS is contingent upon ensuring that components are operated within allowable service durations. Establishing requirements based on manufacturer recommendations, supplemented by information available as a result of industry experience and standards form the basis for the processes the licensee uses to establish and preserve the operational integrity and service life for components and consumable media during storage. Processes should be established for evaluating and documenting deviations from the recommended service life. Processes should be established for monitoring the actual service life of components, and where necessary, changing the storage and operating conditions or the allowable service duration. Components, such as backflow preventers, diaphragm valves and flexible metal hoses have service life limitations. These service life limitations may be adversely impacted by storage and operating conditions (e.g., minimum bend radius, operating temperature curves, chemical exposure limitations etc.). See guidance given in industry documents such as the Electric Power Research Institute (EPRI) Report 1014800 "Plant Support Engineering: Elastomer Handbook for Nuclear Power Plants." Exceeding service limits, such as minimum bend radius or maximum operating temperature, may result in premature catastrophic failure of hoses. Exceeding service/storage limitations on valve diaphragms may result in failure of the valve to operate when required, leakage through the valve resulting in hot spots, or leaks out of the valve that cause facility or environmental damage. Exceeding service life limitations on components, such as filtration media, rubber and synthetic seals, or tank liquid-to-air barrier diaphragms, may result in tears or punctures that cause environmental contamination. Exceeding the service life on components used to limit or minimize the

spread of contamination (e.g., ventilation system damper piston seals) may result in increased contamination of the facility or the environment and complicate facility decommissioning. See NRC Information Notice 2012-12 and NRC Information Notice 91-082.

- d. Evaluate the program description and procedures describing monitoring and controlling the inspection of GWMS components. The evaluation considers how the program documents capture and evaluate the bases and methods used to meet monitoring and inspection requirements. Where available, select at least two components from the GWPS and at least two components from the MGWPS.

Inspection Guidance: Proper operation of the GWMS is contingent upon the performance of the types of inspections at the required frequencies. Establishing requirements based on manufacturer recommendations, supplemented by information available as a result of industry experience and standards, form the basis for the processes the licensee uses to establish component inspection frequencies. Processes should be established for evaluating and documenting deviations from the recommended practices for inspections. Processes should be established for monitoring the adequacy of inspections of components, and where necessary, changing the inspection frequencies. Minimization of contamination of the facility or the environment is assured by the performance of inspections that can detect and effect repairs at an early stage. Inspections for corrosion due to caustic materials used in the process fluid (e.g., media regeneration chemicals) can maintain system integrity and extend equipment life.

- e. Evaluate the program description and procedures describing the leakage control program for systems outside containment that contain (or might contain) accident source term concentration of radioactive materials following an accident. Where available, select at least two components from the GWPS and at least two components from the plant sampling system.

Inspection Guidance: Establishing a leakage control program for systems outside of containment that contain (or might contain) accident source term concentration of radioactive materials following an accident provides a level of assurance that the health and safety of the plant workers and the public will be adequately protected. 10 CFR 50.34.f(2)(xxvi) using the guidance of NUREG-0737, Supplement 1, "Clarification of TMI Action Plan Requirements: Requirements for Emergency Response Capability (NUREG-0737," Item III.D.1.1, requires leakage control and detection for systems outside containment that might contain highly radioactive fluids, and requires licensees to submit a leakage control program, including an initial test program and a schedule for retesting systems. Licensee programs describe the initial and periodic testing of these systems. If any systems, listed in NUREG-0737 Item III.D.1.1, expected to contain radioactive materials after an accident are excluded from the leakage detection program, the licensee should have justified the exclusion of these systems from the testing and monitoring requirements.

- f. Evaluate the program description and procedures describing maintenance of the explosive or combustible gas monitoring instruments. Where available, select at least two components from the GWPS and at least two components from the plant sampling system. Where available, select at least two components from the GWPS and at least two components from the MGWPS.

Inspection Guidance: Proper operation of the GWMS is contingent upon the performance instrumentation and controls provided to monitor and limit the concentrations of potentially explosive gases. The licensee's program describes the maintenance and testing of sensing equipment, controls and alarm functions for monitoring and controlling H₂ and O₂ concentration levels of potentially explosive gas mixtures in off gas systems. The licensee's programs and procedures should describe the types and bases for surveillance requirements.

02.03 Gaseous, Radio-iodines, and Particulate Sampling.

Determine the adequacy of processes for operating process and effluent gaseous and particulate sampling systems for normal operations and anticipated operational occurrences. Determine the adequacy of procedures for sampling post-accident sampling system process gas, radio-iodine, and particulate effluents under accident conditions.

Inspection Requirements:

- a. Confirm that procedures for operating sampling systems for process system gases, radio-iodines and particulates, and gaseous and particulate wastes include the use of design features identified in the FSAR, and experienced gained from the operating industry. Select three sampling points, one for noble gases, one for radio-iodines, and one for particulates, from a selected GWMS and its sampling system.

Inspection Guidance: The program includes procedures for the operation of ventilation systems that assures that sample collection points remain properly ventilated during normal, AOO and accident conditions. The program should address sample system ventilation during normally expected ventilation system configurations and routine ventilation system maintenance (e.g., ventilation system filter changes or fan lubrications). The program should identify and describe the use of special tools (e.g., quick disconnects, sample handling tools) or equipment. The program should identify and describe the use of features provided to reduce occupational radiation exposures (ORE) (e.g., the maximum allowable sample stream flow rates to prevent exposure to N-16 radiation) and processes to reduce source term build-up (e.g., post sample flushing) in sampling system piping and valves and sampling work stations.

- b. Confirm that testing and maintenance procedures of systems for sampling process gases and particulates and gaseous and particulate wastes include the use of design features identified in the FSAR and experienced gained from the operating industry. Select three sampling points, one for noble gases, one for radio-iodines, and one for particulates, from a selected GWMS and its sampling system.

Inspection Guidance: The program describes the processes for determining required sample hood flow rates, and how the minimum flow rates are maintained. The program should identify and describe the maintenance of features provided to reduce OREs (e.g., and that contaminated flushing fluids or gases are routed to a proper waste subsystem and not vented locally to reduce source term build-up and localized contamination). The program describes the types and periodicity of testing and maintenance required to ensure the function of the sampling system (e.g., testing of sample line heat trace circuits, testing of interlocks).

- c. Evaluate the adequacy of procedures and processes for obtaining routine grab samples, from the GWMS and other plant process fluid streams. Select three sampling points, one for noble gases, one for radio-iodines, and one for particulates, from a selected GWMS and its sampling system.

Inspection Guidance: The program and procedures describe the processes for obtaining local grab samples from non-radioactive systems that may be subject to radiological contamination (e.g., instrument air, station air, PWR turbine hall ventilation) and components such as gas collection tanks. Licensee processes and procedures should describe the methods for the control and operation of sample stations that reduce leakage and spillage, prevent the introduction of chemicals to the GWMS that may degrade filtration media performance, and reduce ORE due to sampling. Procedures should address the use of provisions to purge and drain sample lines back to the system of origin or to an appropriate waste treatment system.

- d. Evaluate the adequacy of the program for ensuring representative sampling. Select three sampling points, one for noble gases, one for radio-iodines, and one for particulates, from a selected GWMS and its sampling system.

Inspection Guidance: The program describes the processes to ensure manual and process samples are representative of process system fluids. The program contains provisions for evaluating or addressing, line deposition, flow or loop seals, radiation monitor sensitivities changes related to decay, sample losses (i.e., line plate out, line deposition, non-isokinetic sampling), sample condensation, pressure and temperature correction of samples or delay in flow reaching monitors or sample points, and how these factors affect set point selection and calibrations. See NRC Information Notice 2013-13 and ANSI/Health Physics Society (HPS) 13.1-2011.

- e. Review the adequacy of the program for identifying sample points and establishing sampling frequencies. Select three sampling points, one for noble gases, one for radio-iodines, and one for particulates, from a selected GWMS and its sampling system.

Inspection Guidance: The program describes the process for determining GWMS and plant sampling points, and the required sampling frequency. The basis for selection of the sample point should be described (e.g., from the FSAR but not specified in the FSAR such as monitoring of the performance of GWMS filters and charcoal beds, etc.). The basis for the assigned sampling frequency for each identified sample point should be described. The licensee's program should describe the methods for identifying the appropriate sampling techniques (e.g., automatic timed sampling, automatic grab sampling) and the associated monitoring processes, to ensure that samples of effluent streams are representative, see ANSI/HPS 13.1-2011.

- f. Review the processes and procedures for sampling process streams and effluents under accident conditions to determine that they will provide representative samples. Select three sampling points, one for noble gases, one for radio-iodines, and one for particulates, from a selected GWMS and its sampling system.

Inspection Guidance: Using the requirements in 10 CFR 50.34(f)(2)(vii), (viii), (xiv)(E), (xvii), (xxvi), and (xxvii), and the applicable guidance in RGs 1.97 and 1.101, NUREG-0737, Items

II.B.2 and II.B.3, SRP Section 9.3.2, and the licensee's Emergency Plan and Implementation Procedures, the reviewer ensures that:

The licensee's implementation procedures for sampling address provisions for:

- Purging sample lines.
- Minimizing sample loss or distortion in sample chemical and physical composition.
- Preventing blockage of sample lines.
- Appropriately disposing of samples.
- Ensuring the effectiveness of ventilation exhaust from sampling stations
- Ensuring that samples are representative of the system or component contents.

If inline sample monitoring instruments are used, the licensee procedures identify the processes for obtaining backup grab sampling. The licensee's programs and procedures describe the methods for evaluating shielding provisions at sampling stations that are considered vital areas. The licensee's programs and procedures describe the processes for taking, handling, packaging, and transporting samples safely from the sampling stations to designated location(s) for analysis. Note: Inspection guidance concerning laboratory analyses is described in other sections of the Inspection Manual.

- g. Evaluate the methods used to assess how potential radioactive release paths from normally non-radioactive systems are identified, monitored, and/or sampled (IE Bulletin No. 80-10). Select at least two non-radioactive SSCs that, based on operational experience, may become contaminated.

Inspection Guidance: The licensee's programs describe the processes for identifying non-radiological systems that may be subject to radiological contamination. Procedures describe methods to avoid the contamination of non-radioactive systems and prevent uncontrolled and unmonitored releases of radioactive materials to the environment. Procedures are established for evaluating the regulatory implications, license conditions, and reporting requirements in the event of radioactive leakage into and cross contamination of non-radioactive systems. The licensee procedures address minimizing contamination of the facility and environment and minimizing decommissioning cost, when there is a determination that continued system operation with radioactive leakage into non-radioactive systems is required.

02.04 Pre-Operational Testing Program.

Determine whether the pre-operational testing program for the GWMS is adequate. Determine how the results of the pre-operational test program were evaluated and used to adjust the operational program, and operational testing program.

Inspection Requirements:

- a. Review the licensee testing program for the GWMS, including the GWPS and MGWPS expected to be used for routine processing, as described in the FSAR. Where available, select at least two tests of the GWPS and at least two tests of the MGWPS.

Inspection Guidance: The licensee's pre-operational test program for GWMS uses the guidance contained in ANSI/ASME N509 2002 and ANSI/ASME N510 which provide guidance related to the testing of air treatment and handling components, and include requirements and the bases for:

1. The test procedures for each portion of the GWMS described in the FSAR.
 2. Test requirements, prerequisites, and acceptance criteria.
 3. Testing the functionality of provisions for flushing or purging of sample lines, decontamination of sampling components, wiring checks, mechanical and operational integrity, automatic control features and interlocks, and leak tightness tests.
 4. Test requirements for temporary connections between mobile processing and temporary treatment systems and permanently installed plant systems.
 5. Requirements for initial operational performance tests and calibration of instrumentation before implementing the testing of the GWMS.
 6. Test requirements for MGWPS expected to be used for routine processing.
 7. Testing that verifies the ability of the GWMS to obtain the required set points (e.g., detection limits).
- b. Evaluate the effectiveness of the licensee's program covering the review and evaluation of pre-operational test results and incorporation of those results into operational programs. Where available, select at least one test result of the GWPS and at least one test result of the MGWPS.

Inspection Guidance: The licensee's processes for evaluating the pre-operational test program for GWMS describes:

1. Processes for identifying and incorporating relevant system performance (i.e., system performance that was below that expected in the design) information into the operating program and operational maintenance programs.
2. Processes for using the corrective action program for identification, tracking and resolution of system operation problems, including any required system alterations, identified as a result of the pre-operational test program, and inclusion into or as a follow-up action to the **Quality Assurance (QA)/Quality Control (QC)** program.

02.05 Process and Effluent Radiation Monitors and Instrumentation.

Determine the adequacy of the program for operation, calibration, and testing of process and effluent radiological sampling and monitoring instrumentation for the GWMS. These considerations may be addressed in other inspection areas, such as TS, the ODCM, the REMP, and inspection of certain preoperational tests. Care should be exercised both to avoid redundant inspections and to ensure adequate evaluation of issues not inspected in other program areas, but which also affect Gaseous Waste management.

Inspection Requirements:

- a. Determine that the program captures the calibration requirements that are included in the plant's TSs under 10 CFR Part 50.36a using the guidance provided in RGs 1.21, 1.33, 1.105 and 4.15. Select at least two instruments from the GWMS and at least two instruments from the process radiation monitoring system.

Inspection Guidance: Consistent with the requirements of 10 CFR 50.36a(a)(1) and 10 CFR 50.34a(c)(1), the licensee is to maintain and use radioactive waste systems. The licensee programs should describe the processes used to establish calibration requirements and frequencies. The guidance contained in RG 1.105 "Setpoints for Safety-Related Instrumentation" is used to establish calibration frequencies for safety related components. The licensee describes the bases, including relevant industry standards, for establishing the calibration of non-safety related systems. Processes should be established for monitoring the effectiveness of calibration frequency, and where necessary, changing the periodicity. The program describes the processes to be followed when as found instrument parameters are outside of acceptable bounds. The program describes the processes to be used to establish allowable minimum and maximum instrument parameters (e.g., limitations on detector applied high voltage). The instruments of primary interest should be point of discharge related control instruments and radiation monitoring instruments. The program ensures that instrumentation response characteristics (e.g., dynamic response ranges, sensitivity levels, and lower limits of detection) are consistent with plant-derived radionuclide distributions expected to occur during normal operation, AOOs, and accident conditions. The program describes the process for establishing calibration methods, evaluating response characteristics, establishing radionuclide mixes for calibration sources, and documenting traceability of calibration standards and sources. See NRC Regulatory Issue Summary 2009-02, Rev. 1, NRC Information Notice 2005-24, and ANSI N42.18-2004.

- b. Evaluate the program description of the processes and procedures used in obtaining and analyzing samples of gaseous and ventilation systems following an accident. Select three sampling points, one for noble gases, one for radio-iodines, and one for particulates, from a selected GWMS and its sampling system that requires a sample following an accident.

Inspection Guidance: If TSs address post-accident sampling, then ensure that the licensee's processes and procedures correctly implement TS requirements. If TSs do not address post-accident sampling, refer instead to: "Notice of Availability for

Referencing in License Amendment Applications Model Safety Evaluation on Technical Specification Improvement to Eliminate Requirements on Post Accident Sampling Systems Using the Consolidated Line Item Improvement Process,” (ADAMS ML003750475). If the licensee is using this methodology, then ensure that the program:

1. Maintains contingency plans for obtaining and analyzing highly radioactive samples of containment atmosphere,
 2. Maintains a capability for classifying fuel damage events at the Alert Level threshold (typically at the 300 micro Ci/ml iodine dose equivalent), and
 3. Maintains the capability to monitor radio-iodines that have been released to offsite environs.
- c. Evaluate the program description and procedures for determining instrumentation set points. Select at least two instruments from the GWMS and at least two instruments from the radiation monitoring system.

Inspection Guidance: The licensee programs describe the processes used to establish instrumentation set points. The guidance contained in RG 1.105 “Setpoints for Safety-Related Instrumentation” is used to establish set points for safety related instruments. The licensee should describe the bases, including relevant industry standards, for establishing the set points of non-safety related systems. The licensee processes assure continued representative characterization of process and effluent streams with adequate detection capability, sensitivity, operational dynamic response ranges (see plant’s TSs and ANSI N42.18-2004), and accessibility under accident conditions. The licensee’s processes used to establish set points assures that set points of monitors includes consideration of collection efficiencies for sampling media (e.g., silver zeolite or charcoal sample media), particulate filters (fixed or movable), consideration of the filter transport time where applicable, sampling line losses (see NUREG/CR-4757, "Line-Loss Determination for Air Sampler Systems," ADAMS Accession No. ML092390624, and Information Notice 82 49), and corrections for decay or dilution during transit. The processes for determining instrument set points includes consideration of instrument capabilities and limitations, such as detection limits under expected operational conditions and varying radionuclide mix (i.e., background effects during normal operation, AOOs or accident, as appropriate to the instrument function, and equilibrium time for systems using movable filters), range limitations and proximity to instrument transition points (e.g., detector or scale switching points). The licensee’s processes identify and address the potential impact of variation of sampling parameters (e.g., changes in density/pressure of sampled fluid due to local fluid/gas space changes or changes in pressure differential across system components). See NRC Information Notice 2013-01, NRC Information Notice 2013-12.

- d. Evaluate the program description and procedures used to identify, assess and ensure that required functional tests are performed. Select at least two instruments from the radiation monitoring system.

Inspection Guidance: The licensee's program and procedures describe the required functional tests, the required frequency and the bases for the requiring the functional test. The bases may include those recommended by the equipment manufacturer, technical basis documents (e.g. NEI 97-06 uses EPRI Report "PWR Primary-to-Secondary Leak Guidelines" to describe the leakage monitoring program elements needed to reliably detect the level and the rate of change of radioactivity in the secondary plant), and industry operating experience. Functional test(s) should be identified for all monitoring systems including tests of alarms, setpoints, operational and functional checks using check sources and electronic signals, and auto isolation initiated by trips of alarm setpoints. See NRC Information Notice 2013-13.

- e. Evaluate the program description and procedures used to enter and control parameters of electronic instruments, programmable logic controllers, and computer systems. Select at least two instruments from the GWMS and at least two instruments from the radiation monitoring system.

Inspection Guidance: The licensee's program and procedures describe the methods for identifying controllers, instruments and digital processing systems (e.g., computers) used for the GWMS or the radiation monitoring system that may contain programmable electronic parameters (within software and firmware) that could affect the operation or response of the device or system. The licensee's programs and procedures describe the method for specifying, setting and verifying these parameters. The licensee's processes should address settings and control of these parameters prior to initial operation, for calibration or testing and prior to returning to service following maintenance or testing. The inspector reviews and evaluates calibration and other documentation (e.g., system software validation and verification packages) provided by the manufacturer or developed by the licensee and confirms that such information is current with instrumentation system software and firmware upgrades. Particular attention should be given to those sampling and monitoring systems not specifically identified in TSs (e.g., mobile or temporary processing systems and components, or effluent controls).

- f. Evaluate the program description and procedures used to periodically verify continued operability of gaseous process and effluent monitors described in the FSAR. Select at least two instruments from the radiation monitoring system.

Inspection Guidance: The licensee's program and procedures describe the programs and procedures used to periodically verify the continued operability of radiation monitoring equipment (e.g., sampling flow rates, acceptable differential pressures, local and remote alarms, local and remote control panels, built-in check sources, etc.). A list of monitors typically required is included in SRP Section 11.5. The licensee's processes address the performance and service life of sample media (e.g., filter loading, charcoal cartridge saturation, etc.). The licensee processes for assessing media performance, address the adverse impact of potential contaminants (e.g., volatile organic compounds, high humidity impacts on charcoal sample media, or dust loading on filter media), would provide continued assurance that the dose objectives of Appendix I 10 CFR Part 50 for liquid effluents, the dose limits of 10 CFR Part 20.1301, the requirements of 10 CFR Part 20.1302, and the gaseous effluent concentration limits of Appendix B (Table 2, Column 1) to 10 CFR Part 20 would be met.

02.06 Design and Configuration control.

Inspection Requirements:

- a. Evaluate any changes to the GWMS, including the use of mobile waste processing equipment, to ensure that the 10 CFR Part 50.59 evaluation performed in support of the changes demonstrates that the change does not alter the technical and regulatory commitments of the FSAR. Where available, select at least one change evaluation for the permanently installed Gaseous Waste processing system (GWPS) and at least one change evaluation for the mobile/temporary Gaseous Waste processing system (MGWPS).

Inspection Guidance: The FSAR provides the licensing bases for the systems described in facility operating programs and procedures. The licensee programs implement the commitments described in the FSAR Combined License Information items, the programmatic commitments related to the GWMS specified in the FSAR, and the regulatory commitments specified in FSAR Chapter 1 (e.g., RG 1.143). The FSAR for some designs may provide space for the future use of MGWPSs. Consistent with the guidance provided in RG 1.187, and the endorsed NEI report 96-07, alterations to the facility in place longer than 90 days should be evaluated utilizing the process described in 10 CFR 50.59 and IE Circular 80-18. The 10 CFR 50.59 evaluations performed for the long term use of these types of systems address the regulatory bases for waste systems described in FSAR chapter 1.

- b. Confirm that the program ensures routine use of an added MGWPS is evaluated using the licensing bases source terms described in the FSAR. Where available, evaluate at least one mobile/temporary Gaseous Waste processing system (MGWPS).

Inspection Guidance: Using the licensing bases described in the FSAR for the GWPS to address the routine use of temporary or mobile processing SSCs ensures that proper radiation shielding and ventilation controls are available to protect plant personnel during operation and maintenance. To ensure that individual and collective occupational exposures, from permanent and mobile GWMS components, are **as low as reasonably achievable (ALARA)**, MGWPS to be used for routine processing of gaseous radioactive process streams, are capable of meeting the radiological protection criteria for shielding and ventilation relevant to the GWPS, using the design bases fission product source terms specified in FSAR Section 12.2. Licensee processes ensure that where a MGWPS is to be routinely used, the RG 1.143 classification of the facility housing the MGWPS reflects total radionuclide inventory, including that expected in the MGWPS. The licensee's processes ensure that maximum radionuclide inventories within the SSCs housing all GWMS components remain within the licensing bases assumptions **used** to characterize the facility (see RG 1.143). The licensee processes identify the physical and operational interfaces between mobile subsystems and permanently installed plant systems. Guidance can be found in RGs 8.8, 1.143 and ANSI/ANS-N55.6-1992 (reaffirmed 1999).

- c. Confirm that the program ensures the appropriate Quality Assurance (QA) requirements are **used** during operation, maintenance, and modification of the GWMS. Evaluate at least one GWMS system.

Inspection Guidance: The licensee's program describes QA requirements consistent with their licensing bases governing the design, fabrication, procurement, construction, installation, and initial testing of mobile Gaseous Waste management systems and components, consistent with the licensee's QA program, guidance of RGs 1.21, 1.33, 1.143, and 4.15, and SRP Section 17.5 and to the extent of control required by Appendix B to 10 CFR Part 50.

02.07 Content and Quality of Programs, Plans, and Procedures.

Inspection Requirements:

- a. Confirm that the licensee's program description includes the types of procedures required by their licensing bases. Evaluate the program description of the GWMS system and Radiation Monitoring system.

Inspection Guidance: The licensee's program includes the relevant procedures listed in Appendix A of RG 1.33; these procedures are required by 10 CFR 50.36a(a)(1) and 10 CFR 50.34a(c)(1), TSs and other NRC guidance documents.

- b. Confirm that the licensee/applicant has an approved ODCM describing the plant's standard radiological effluent controls. Examine the ODCM.

Inspection Guidance: The licensee's program fully describes the ODCM, and the bases for the ODCM. The licensee's program shall describe the method for implementing the ODCM, as described in the FSAR, was implemented. Where the FSAR committed to implementing the NEI-07-09A "Generic FSAR Template Guidance for Offsite Dose Calculation Manual (ODCM) Program Description," (ADAMS Accession No. ML091050234), template, the licensee's program documents describe how licensee specific information required by the template was identified and incorporated into the ODCM. The ODCM contains instructions on how noble gases, radioiodine's, tritium, and particulate effluent releases (with half-lives greater than 8 days) will be monitored, sampled, and analyzed with the results used to establish dose rates and instrumentation parameters in setting alarm setpoints to control or terminate effluent releases at dose rates and limits of 10 CFR Part 20, Appendix B, effluent concentration limits (Table 2, Column 1) in unrestricted areas. Guidance on the development of the ODCM and implementing procedures is contained in NUREG-1301 (PWRs) or NUREG-1302 (BWRs), and NUREG-0133, and NUREG-0543 on compliance with 40 CFR Part 190, as implemented under 10 CFR Part 20.1301(e).

- c. Confirm that the licensee's program contains the appropriate types and quality of programs, plans, and procedures for normal operations, anticipated operational occurrences, and accident conditions. Select at least one procedure for the radiation monitoring system, and where available, one procedure for the GWPS and one procedure for the MGWPS.

Inspection Guidance: The licensee's procedures for sampling and analysis specify the types of samples to be collected, analyses to be performed on each sample, and appropriate sampling and analysis schedules. The required samples and analysis are

consistent with those specified in the FSAR, required by commitments (e.g., Steam Generator Program) required by TS, required to demonstrate compliance with regulations or to assure compliance with the facility design bases. The licensee's program includes procedures for routine calibration and surveillance tests for all instrumentation. The licensee's program includes procedures for operation of equipment/systems and for response to equipment/system alarms or trips and expected under AOO conditions. The licensee's program includes procedures describing the routine and preventative maintenance program. The licensee's program should include procedures for monitoring and evaluating system performance, including:

1. Periodic evaluations of system operational efficiency.
2. Periodic audits and corrective action process for resolving audit findings.
3. Periodic verification of system operational readiness, as designed.

Licensee procedures should clearly define the division of responsibilities and lines of communications among different responsible organizational units (e.g., system operations and management, quality assurance, instrumentation and control, maintenance, and radiochemistry) involved in the operation, calibration, and maintenance of the GWMS and radiation monitoring equipment. Licensee procedures should address how performance indicator values are established and evaluated.

- d. Confirm that changes to the licensee's programs and procedures are appropriately evaluated in accordance with 10 CFR Part 50.59, and guidance such as RG 1.143, and staff recommendations given in IE Circular 80-18. Select at least one procedure that has been changed for the radiation monitoring system, where available at least one procedure change for the GWPS and at least one procedure change for the MGWPS, and where available one change to the ODCM.

Inspection Guidance: The licensee's program describes the process, including the levels of approval and post change requirements for changes to the ODCM, program documents, and operational procedures. Changes to the licensee's procedures are evaluated using the criteria of 10 CFR 50.59, and as specified in the ODCM.

02.08 Definition of Gaseous Waste Management System.

As defined in RG 1.143, the GWMS begins at the interface valves in each line from other systems provided for collecting wastes that may contain radioactive materials and to include related instrumentation and control systems. The GWMS terminates at the point of controlled discharge to the environment. The GWMS may be permanently installed plant equipment (GWPS), a mobile gaseous waste processing system (MGWPS), or a combination of systems connected to permanently installed plant systems.

84529-03 RESOURCE ESTIMATE

It is estimated that approximately 160 hours of direct inspection effort will be required to implement this procedure. An inspection of the GWMS will require several individuals:

- a. Team Leader
- b. Health Physicist
- c. Subject matter expert (SME) in GWMS design and operation. SMEs should be assigned by subsystem or program being inspected.

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 during an 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 IP is performed at a facility 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 80 hours of direct inspection effort. Additional hours may be required if subject matter expert support is needed.

84529-04 REFERENCES

10 CFR Part 20, "Standards for Protection Against Radiation."

10 CFR Part 20.1406, "Minimization of Contamination."

10 CFR 50.34a, "Design Objectives for Equipment to Control Releases of Radioactive Material in Effluents of Nuclear Power Reactors."

10 CFR 50.36a, "Technical Specifications on Effluents from Nuclear Power Reactors."

10 CFR 50.59, "Changes, Tests, and Experiments."

10 CFR Part 50, Appendix A, "General Design Criterion 3, Fire Protection."

10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants."

10 CFR Part 50, Appendix I, "Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion 'As Low As Is Reasonably Achievable' for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents."

IE Bulletin No. 80-10, "Contamination of Non-Radioactive System and Resulting Potential for Unmonitored, Uncontrolled Release of Radioactivity to Environment," May 6, 1980.

IE Information Notice No. 82-43, "Deficiencies in LWR Air Filtration/Ventilation Systems," November 16, 1982.

IE Information Notice No. 82-49, "Correction for Sample Conditions for Air and Gas Monitoring," December 16, 1982.

IE Information Notice 83-52, "Radioactive Waste Gas System Events," (ADAMS Accession No. ML082520419).

IE Circular No. 80-18, "10 CFR 50.59 Safety Evaluations for Changes to Radioactive Waste Treatment Systems," August 22, 1980, Notice of Availability for Referencing in License Amendment Applications Model Safety Evaluation on Technical Specification Improvement to Eliminate Requirements on Post Accident Sampling Systems Using the [Consolidated Line Item Improvement Process] CLIIP (ADAMS Accession No. ML003750475).

NUREG-0133, "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants."

NUREG-0543, "Methods for Demonstrating LWR Compliance with the EPA Uranium Fuel Cycle Standard (40 CFR Part 190)."

NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980, and Supplement 1 (1982).

NUREG-0800 Standard Review Plan, Section 9.3.1, "Compressed Air System," NUREG-0800.

NUREG-0800 Standard Review Plan, Section 9.3.2, "Process and Post-Accident Sampling Systems," NUREG-0800.

NUREG-0800 Standard Review Plan, Section 11.3, "Gaseous Waste Management Systems," NUREG-0800.

NUREG-0800 Standard Review Plan, Section 11.5, "Process and Effluent Radiological Monitoring Instrumentation and Sampling Systems," NUREG-0800.

NUREG-0800 Standard Review Plan Section 12, "Radiation Protection," NUREG-0800.

NUREG-0800 Standard Review Plan, Section 17.5, "Quality Assurance Program Description - Design Certification, Early Site Permit and New License Applicants," NUREG-0800.

NUREG-1301, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors." (With Generic Letter 89-01, Supplement 1) (ADAMS Accession Number ML031290465).

NUREG-1302, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Boiling Water Reactors," (With Generic Letter 89-01, Supplement 1) (ADAMS Accession Number ML031290469).

NRC Information Notice 1985-006, "Contamination of Breathing Air Systems."

NRC Information Notice 1992-032, "Problems Identified with Emergency Ventilation Systems for Near-Site (Within 10 Miles) Emergency Operations Facilities and Technical Support Centers," (ADAMS Accession No. ML031200384).

NRC Information Notice 91-082, "Problems With Diaphragms in Safety-Related Tanks," (ADAMS Accession No. ML082840747).

NRC Information Notice 93-056, "Weakness in Emergency Operating Procedures Found as Result of Steam Generator Tube Rupture."

NRC Information Notice 2005-24, "Nonconservatism in Leakage Detection Sensitivity," NRC Information Notice 2010-27, "Ventilation System Preventive Maintenance and Design Issues," (ADAMS Accession No. ML102450114).

NRC Information Notice 2012-12, "HVAC Design Control Issues Challenge Safety System Function," (ADAMS Accession No. ML12115A012).

NRC Information Notice 2013-01, "Emergency Action Level Thresholds Outside the Range of Radiation Monitors."

NRC Information Notice 2013-12, "Improperly Sloped Instrument Sensing Lines."

NRC Information Notice 2013-13, "Deficiencies With Effluent Radiation Monitoring System Instrumentation."

"Proposed Guidance for Calibration and Surveillance Requirements for Equipment Provided to Meet Item II.F.1, Attachments 1, 2, and 3, NUREG-0737," memorandum from D. G. Eisenhut, NRR, to Regional Administrators, August 16, 1982, with enclosures, (ADAMS Accession No. ML103420044).

Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants."

Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)."

Regulatory Guide 1.52, "Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants."

Regulatory Guide 1.68, "Initial Test Programs for Water-Cooled Nuclear Power Plants."

Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident."

Regulatory Guide 1.101, "Emergency Response Planning and Preparedness for Nuclear Power Reactors."

Regulatory Guide 1.105, "Setpoints for Safety-Related Instrumentation."

Regulatory Guide 1.140, "Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Normal Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants."

Regulatory Guide 1.143, Revision 2, "Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Reactor Power Plants."

Regulatory Guide 1.189, "Fire Protection for Nuclear Power Plants."

Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment."

Regulatory Guide 8.8, "Information Relevant to Ensuring That Occupational Radiation Exposures at Nuclear Power Stations Will Be As Low As Is Reasonably Achievable."

Regulatory Issue Summary 2009-02, Revision 1, "Use of Containment Atmosphere Gaseous Radioactivity Monitors for Reactor Coolant System Leakage Detection Equipment at Nuclear Power Reactors."

ANSI/HPS N13.1-2011 "Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and Ducts of Nuclear Facilities." ¹

ANSI N42.18-2004, "Specification and Performance of On-Site Instrumentation for Continuously Monitoring Radioactivity in Effluents," (Reaffirmation of ANSI N42.18-1980) (Redesignation of ANSI N13.10-1974).²

ANSI/ANS-N55.4-1993, "Gaseous Radioactive Waste Processing Systems for Light-Water Reactor Plants," (Reaffirmed 2007).³

ANSI/ASME N509-2002, "Nuclear Power Plant Air-Cleaning Units and Components," (revision of ANSI/ASME N509-1989 (R1997)).⁴

ANSI/ASME N510-1989, "Testing of Nuclear Air Treatment Systems," (revision of ANSI/ASME N510-1980).⁴

Electric Power Research Institute (EPRI) Report "PWR Primary-to-Secondary Leak Guidelines," (Proprietary version - ADAMS Accession No. ML12065A096, Non-Proprietary version - ADAMS Accession No. ML12065A095) [or the latest approved revision].

Electric Power Research Institute (EPRI) Report 1014800 "Plant Support Engineering: Elastomer Handbook for Nuclear Power Plants."⁵

Nuclear Energy Institute Topical Report NEI-07-09A, "Generic FSAR Template Guidance for Offsite Dose Calculation Manual (ODCM) Program Description," (ADAMS Accession No. ML091050234).

Nuclear Energy Institute Topical Report NEI-08-08A Revision 0 "Guidance for Life Cycle Minimization of Contamination," October 2009, (ADAMS Accession No. ML093220530).

Nuclear Energy Institute 97-06, Revision 3, "Steam Generator Program Guidelines," (ADAMS Accession No. ML111310708) [or the latest approved revision].

¹ Copies of this document may be purchased from Health Physics Society 1313, Dolley Madison Boulevard, Suite 402 McLean, Virginia 22101 [Phone: 703-790-1745]. Purchase information is available through the Health Physics Society Web site at <http://hps.org/>

² Copies of this document may be purchased from the American National Standards Institute (ANSI), 1819 L Street, NW., 6th floor, Washington, DC 20036 [phone: (202) 293-8020]. Purchase information is available through the ANSI Web site at <http://webstore.ansi.org/ansidocstore>.

³ Copies of this document may be purchased from the American Nuclear Society, 555 North Kensington Avenue, La Grange Park, Illinois 60526 [phone: 800-323-3044] <http://www.new.ans.org/>

⁴ Copies of this document may be purchased from ASME. Two Park Avenue, New York, NY 10016-5990, [Phone (800-843-2763)]. Purchase information is available through the ASME Web site at <http://www.asme.org/>

⁵ Available from the Electric Power Research Institute at <http://www.epri.com/>

84529-05 PROCEDURE COMPLETION

This procedure will be closed upon satisfactory inspection results verifying the inspection objectives have been met. The inspection must demonstrate the program can be inspected under the Reactor Oversight Process.

END

Attachment:
Revision History for IP 84529

Attachment 1 - Revision History for Inspection Procedure 84529
Part 52, Gaseous Waste Management Program

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)
N/A	ML14311A191 10/19/16 CN 16-027	Initial draft to support inspections of operational programs described in Manual Chapter 2504, Construction Inspection Program - Inspection of Construction and Operational Programs.	N/A	ML14311A192
	ML20119A530 05/07/20 CN 20-024	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.	N/A	N/A