

EFFLUENT CONTROL AND ENVIRONMENTAL PROTECTION

Effective Date: 03/12/2021

PROGRAM APPLICABILITY: 2600B, 2602, 2641, 2694A, 2696A, 2801

88045-01 INSPECTION OBJECTIVES

01.01 Determine that the licensee's environmental protection program is in accordance with the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 20, Part 40, Part 61, Part 70 and in compliance with the license application requirements.

88045-02 INSPECTION REQUIREMENTS AND GUIDANCE

02.01 Program Implementation.

a. Inspection Requirements.

1. Determine that the effluent control and environmental protection program is being implemented in compliance with the license requirements.
2. Evaluate if a change occurred in the environmental protection program organization that is applicable to the position-specific requirements of the license. If applicable, verify that the new manager or staff member meets the criteria of the license requirements.

Verify that any changes to the organizational structure in the area of the environmental protection program are in compliance with license requirements, if applicable.

3. Determine whether the licensee is identifying issues in the area of Environmental Protection, entering them into the corrective action program, and correcting the condition as required by license, procedure, and/or NRC requirements. Licensees with an approved CAP will have their corrective action program inspected in accordance with IP 88161. Corrective actions as a result of violations will be inspected in accordance with IP 92702.

b. Inspection Guidance.

1. Discuss any significant changes to the effluent control and environmental protection program made since the last inspection. If there have been no significant changes, then there is no need to pursue in depth.

Discuss any new unplanned releases or contamination identified in the environment or subsurface of the facility or surrounding environment. If new unplanned releases or contamination was identified, discuss how the licensee evaluated data to determine if any changes to its monitoring or survey program was needed to comply with 20.1406(c) and 10 CFR 20.1501(a) and (b).

2. By discussions with licensee staff and management, and review of documentation, determine whether the licensee's organizational structure is in accordance with the license. Focus on whether the qualifications meet the requirements of the license, including years of relevant experience, educational background, and training required for any newly assigned responsibilities.

Examine changes in organizational structure regarding changes in qualifications of personnel, functions, responsibilities, and/ or authorities. Verify that the management organization facilitates a commitment to as low as reasonably achievable (ALARA). Verify that the environmental monitoring program is documented in policy directives designating a person or organizational unit responsible for reviewing the program on an ongoing basis.

If no significant changes have occurred in the organization since the previous inspection, then limit time spent on this section.

3. Perform a screening review of items entered into the corrective action program. Identify safety-significant or repetitive equipment failures or human performance issues that might indicate a trend or warrant additional follow-up.

Identify safety-significant condition reports to follow up on throughout the inspection. Determine, for selected licensee-identified items, whether effective corrective actions have been taken. Discuss with staff to determine if any safety-significant conditions occurred at the plant which were not entered into the corrective action program.

02.02 Procedures.

a. Inspection Requirements.

1. Verify that safety-significant changes to procedures in the area of Environmental Protection are in compliance with license requirements.

Verify that safety-significant changes were made in accordance with the licensee's procedure revision process, if required by the license.

2. Determine whether the licensee is in compliance with the procedures.

b. Inspection Guidance.

1. Select a sample set of procedures that have been changed since the last inspection and determine whether the procedure changes facilitate their use and intent. Focus your review on safety-significant procedure changes. Directly

observe the updated procedures in use, if possible, and discuss the changes with the technicians/ staff using them.

Determine, if significant changes were made, whether the procedures contain clearly written steps for tasks such as sampling, sample preparation for analyses, data recording and storage, reporting sample results, instrument calibration/ functional testing, and actions to be taken for results which are anomalous or exceed established limits.

Determine whether these procedures:

- (a) Were changed, reviewed, and approved in accordance with the licensee's procedural control system;
 - (b) Updates were addressed and communicated through training; and
 - (c) Continue to effectively implement regulatory requirements for the control of effluents and minimization of contamination into the site environment.
2. Throughout the inspection, verify that the licensee is adequately following procedures. Determine if procedural steps are being adequately followed by direct observation of employees performing the associated tasks and through discussions with employees.

02.03 Audits and Quality Assurance.

a. Inspection Requirements.

1. Verify that the licensee has conducted audits or self assessments in the area of Environmental Protection and is in compliance with license requirements, if applicable.

b. Inspection Guidance.

1. Determine if the licensee is required to conduct audits or self assessments. Select internal or contracted audits performed and review audit results. Evaluate if the audit is identifying reoccurring issues, repeat findings, or trends. Determine whether there was a written plan for the audit and if the audit adequately reviewed the audited area. Determine whether systems are being implemented to inform management of audit and inspection results for review and action. Determine if safety-significant audit findings are being tracked through completion by the corrective action program, if required. Verify that safety-significant audit findings are addressed in a timely manner. Determine whether appropriate corrective actions were taken whenever deficiencies were found and whether the licensee verified the effectiveness of the corrective action.

Review the annual ALARA report. Determine if special attention was given in the audits and program reviews conducted to determine that effluents released were ALARA. Determine whether there were provisions for an ongoing review of effluent control and environmental monitoring results.

Determine through interviews, how the licensee ensures the effectiveness of audits. Determine if the licensee uses contractor audits, the use of a secondary (or follow-up) audit system on a periodic basis, and if the audit was conducted by a member of management or a senior technician not directly responsible for the program audited.

Review the licensee's process for placing a company that supplies analytical services on their approved vendors list. Licensees may utilize the services of a contractor to support their effluent analysis program. Under these circumstances verify that the licensee has established mechanisms to periodically evaluate the performance of contractor firms. These measures may include independent audits performed by the licensee or other qualified companies. Additionally, purchase requisitions for contract services may be reviewed to ensure that appropriate performance standards and criteria were included in the scope of the contract. This could include critical attributes such as the lower limit of detection or minimum detection level required to be achieved for a given sample media. Finances should not be discussed.

02.04 Event Review.

a. Inspection Requirements.

1. Determine whether the licensee has implemented a program of reviews that evaluates safety-significant events in the area of Environmental Protection and meets license requirements.

b. Inspection Guidance.

1. Review the events occurring since the last inspection to determine compliance with the license including, as appropriate:
 - (a) The prompt review and evaluation of non-routine events and unusual occurrences;
 - (b) Assessing the significance of non-routine events and unusual occurrences, and reporting them internally and to the U.S. Nuclear Regulatory Commission (NRC);
 - (c) Evaluation of extent of condition of findings; and
 - (d) Ensuring completion of corrective actions related to non-routine events and unusual occurrences.

02.05 Training.

a. Inspection Requirements.

1. Review training in the area of Environmental Protection and evaluate if training is in compliance with license requirements, if applicable.

b. Inspection Guidance.

1. No guidance provided.

02.06 Radioactive Liquid Effluents.

a. Inspection Requirements.

1. Verify that liquid effluents are maintained in accordance with license requirements.
2. Verify that the licensee maintains records for the results of measurements and calculations used to evaluate the release of radioactive effluents to the environment in accordance with 10 CFR 20.2103(b)(4).

b. Inspection Guidance.

1. Through observation of operations, discussions, and documentation reviews, determine whether the licensee is following procedures and is in compliance with license requirements for:
 - (a) Limits on release rates, concentrations, total quantities;
 - (b) Analysis for specific radionuclides;
 - (c) Monitoring of specified release points; and
 - (d) Limits on activity contained in holding or storage tanks.

As time permits: Observe the collection of effluent samples for liquid effluents. Verify that the collection technique is appropriate and activities are performed in accordance with approved procedures.

As time permits: Determine what analyses the licensee utilizes to calculate the liquid effluent discharges. Review effluent discharge records and associated calculations. Determine what assumptions the licensee utilizes in their calculation of liquid effluent discharges. Verify that calculations and analyses are conservative if they are used to support the public dose analysis. If applicable, determine if isotopic ratios used during analysis were impacted by recent changes in newly processed materials. Determine if adequate measures have been established and implemented to identify and monitor adverse trends associated with radiological effluent releases.

2. Examine the radiological effluent monitoring records generated since the last inspection, pertinent non-routine event reports, and a selection of monitoring records equivalent to about two months of operation. Review reports to licensee management relating to effluent controls and releases since the last inspection.

Review the reports and records for obvious mistakes, anomalous measurements results, trends, missing data, and determine the accuracy of the data in the report or record. Discuss with the licensee if these errors are identified by the review.

02.07 Municipal Sanitary Sewer.

a. Inspection Requirements.

1. Verify that the licensee's liquid disposal to the municipal sanitary sewer, if applicable, is in compliance with 10 CFR 20.2003.

b. Inspection Guidance.

1. Review a sample of records for the liquid releases to the municipal sanitary sewer to determine compliance with concentration and/or quantity limits in the license and regulations. Verify specific license requirements concerning radiological liquid releases, analyses, monitoring and limits on activity.

Determine whether, during analysis, the licensee is evaluating the liquid waste stream for total uranium or soluble uranium. The licensee may only discharge soluble uranium to the municipal sewer per 10 CFR 20.2003 unless special permission was granted by the NRC

02.08 Radioactive Airborne Effluents.

a. Inspection Requirements.

1. Verify that radioactive airborne effluents are maintained in accordance with the license requirement.
2. Verify that the licensee maintains radioactive airborne effluents less than the ALARA constraint in 10 CFR 20.1101(d).
3. Verify that the licensee maintains records for the results of measurements and calculations used to evaluate the release of radioactive effluents to the environment in accordance with 10 CFR 20.2103(b)(4).

b. Inspection Guidance.

1. Through observation of operations, discussions, and record reviews, determine whether the licensee is following procedures and is in compliance with license requirements for:
 - (a) Limits on release rates, concentrations, and/or total quantities;
 - (b) Analyses for specific radionuclides; and
 - (c) Monitoring of specified release points.
 - (d) Sampling methods, equipment, periodic calibrations, and procedures.
 - (e) Sampling devices, material condition, calibration, location, programming, sample data collection/management/transfer, procedures.

(f) Laboratory analysis of samples, licensee and subcontractor laboratory quality assurance and data management, licensee analysis equipment and procedures

As time permits: Observe the collection of effluent samples for airborne effluents. Verify that the collection technique is appropriate and activities are performed in accordance with approved procedures.

As time permits: Determine what analyses the licensee utilizes to calculate the airborne effluent discharges. Review effluent discharge records and associated calculations. Determine what assumptions the licensee utilizes in their calculation of airborne effluent discharges. Verify that calculations and analyses are conservative if they are used to support the public dose analysis. Determine if isotopic ratios used during analysis, if applicable, were impacted by recent changes in newly processed materials. Determine if adequate measures have been established and implemented to identify and monitor adverse trends associated with radiological effluent releases.

2. Verify that the licensee has established a constraint on air emissions of radioactive material to ensure that individual members of the public do not receive more than 10 millirems (mrems) per year from airborne emissions. Radon-222 and its daughters are excluded from the constraint.

If the licensee exceeds the constraint, they must make a report to the NRC in accordance with 10 CFR 20.2203(a) and implement corrective actions.

3. Examine the radiological airborne effluent monitoring records generated since the last inspection, pertinent non-routine event reports, and a selection of monitoring records equivalent to about two months of operation. Review reports to licensee management relating to airborne effluent controls and releases since the last inspection.

Review the reports and records for obvious mistakes, anomalous measurements results, trends, missing data, and determine the accuracy of the data in the report or record.

02.09 Effluent Monitoring.

a. Inspection Requirements.

1. Determine that adequate measures have been established and implemented to verify the maintenance and operability of effluent monitoring equipment to perform the intended functions are in accordance with the license application.
2. Verify that effluent monitoring equipment and processes maintain the set points or action levels as specified in the license or operating procedures.
3. Determine if items relied on for safety (IROFS) are applicable to liquid or airborne discharges. If so, verify that the licensee maintains the equipment in accordance with procedures and licensing requirements.

4. Verify that the licensee ensures that instruments and equipment used for quantitative measurements of effluent monitoring are calibrated periodically for the radiation measured in accordance with 10 CFR 20.1501(b). Verify that the licensee maintains the calibration records in accordance with 10 CFR 20.2103.

b. Inspection Guidance.

1. If applicable, review surveillance packages for effluent monitors with automatic actions and verify the automatic functions of the component or device are adequately tested.
2. Through observation of operations, discussions, and documentation reviews, determine whether the licensee is following procedures and is in compliance with license requirements for setpoints for equipment alarms and/or are properly applying action levels.

If applicable, verify that the setpoints of effluent and process monitors were set forth in written procedures along with instructions which describe the rules and authority required to change specified set points. Determine if the bases for each setpoint are understood by the responsible operator/technician.

The comparison of monitor readings with laboratory measurements of radioactive material in the release path can demonstrate that the response of the monitor is within an acceptable range for values which form the bases for the alarm and trip set points.

3. Determine if IROFS prevent the inadvertent discharge of liquid waste to an unfavorable geometry tank. Ensure that for those facilities in which liquid effluents are transferred from favorable to unfavorable geometry collection tanks, prior to release, that the channel functional test verifies the operability of components with automatic functions. An example of this type of system is the closure of an isolation valve located downstream of a favorable geometry collection tank to prevent flow to an unfavorable geometry collection tank. Set points to prevent transfer of high uranium content liquid to unfavorable geometry collection tanks may differ from those set points established to maintain effluent release limits.
4. Through observation of operations, discussions, and documentation reviews, determine whether the licensee is following procedures and is in compliance with license requirements for calibrations and functional tests. Examine records of the calibration of analytical and counting equipment to determine if they are performed at the required frequencies.

Verify that the calibration ensures the continued adequacy and operability of the instrument. The adequacy of the instrument is based on its stability with time and its ability to reproduce measurements within acceptable limits. The acceptable limits should be specified in the operating procedures for calibration. The useful range of the instrument should encompass the normal and reasonably expected values of the monitored variable, including values expected from anticipated operational upset occurrences.

02.10 Semiannual Effluent Reports.

a. Inspection Requirements.

1. Determine that the licensee is in compliance with the effluent monitoring report as required by licensing documents, 10 CFR 70.59, and/ or 10 CFR 40.65.

b. Inspection Guidance.

1. Verify that the licensee issued the reports within the specified timeframes and that the reports include the quantities of the principal radionuclides released to unrestricted areas in liquid and gaseous effluents.

Note: Additional guidance can be found in Regulatory Guide (RG) 4.16. For example, Section 6 states that 'Licensees should not use the terms "not detected," "MDC," or similar terms. Licensees should report each value with its associated uncertainty; however, if the analytical value is negative, a value of zero and the estimated uncertainty of the original value should be reported.' NCRP Report 58 provides the guidance that 'Negative values (below background) are as valid a measurement as positive values and should be retained in series of data.' In either event, the inspector should be aware if the licensee is utilizing the results in a non-conservative calculation.

02.11 Quality Control of Analytical Measurements.

a. Inspection Requirements.

1. Determine if the licensee ensures the accuracy of analytical measurements in accordance with the license requirements.

b. Inspection Guidance.

1. During inspection planning, verify that the licensee has a license requirement for quality control. If a license requirement does not exist, consider omitting this section.

Through the observation of analytical laboratory activities, discussions, and review of records, determine whether the types and numbers of quality control measurements are made at the required frequencies as specified in procedures or as required by the license. Determine whether the licensee's criteria for accepting or rejecting analytical measurement results are included in the procedures. Verify whether procedures for evaluating and correcting deficiencies in results are being implemented.

Review changes in sample analytical methods since the last inspection, if applicable, and determine whether the current accuracy is at least as good as, or better than, the accuracy level before the changes were made.

02.12 Public Dose Analysis.

a. Inspection Requirements.

1. Verify that the licensee has conducted operations so the total dose to the public is in accordance with 10 CFR 20.1301 and 20.1302.
 2. Verify that, if applicable, the licensee demonstrated compliance with 10 CFR 20.1301(e) and 40 CFR part 190.
 3. Verify that the public dose records are being maintained in accordance with 10 CFR 20.2107.
- b. Inspection Guidance.
1. Review dose assessment records and verify that the total effective dose equivalent to individual members of the public from the licensed operation does not exceed 100 mrem in a year. This result does not include:
 - (a) dose contributions from background radiation;
 - (b) dose contributions from medical administration to an individual; or
 - (c) licensee disposal of radioactive material into sanitary sewage in accordance with 10 CFR 20.2003.

Review records for external dose measurements made at the site boundary and verify that the dose in an unrestricted area from external sources does not exceed 2 mrem in one hour.

Effluent concentration values provided in 10 CFR 20, Appendix B for liquid and airborne effluent releases correspond to an annual dose of 50 mrem in a year from either release pathway. Sum of the fractions is necessary if multiple radionuclides are released through an effluent stream.

Focus on reviewing records from the previous year for which complete records are available when evaluating licensee compliance with public dose limits.

Note: If a company maintains an NRC-regulated facility and an agreement state facility in the same complex, the public dose analysis should include releases from both facilities.

2. EPA's Part 190 is applicable to chemical conversion facilities, uranium enrichment facilities, and uranium fuel fabrication facilities which support commercial nuclear power.

Review records and verify that licensee operations are conducted in such a manner as to provide reasonable assurance that the annual dose equivalent to a member of the public does not exceed 25 mrem to the whole body, 75 mrem to the thyroid, and 25 mrem to any other organ as a result of exposures to planned discharges of radioactive material to the general environment and to radiation from these operations.

Verify that if a licensee exceeds these standards, it is reported to the NRC per 10 CFR 20.2203(a)(4).

3. No guidance provided.

02.13 Environmental Sampling.

a. Inspection Requirements.

1. Verify that licensee is in compliance with the license, if applicable, regarding environmental sampling of surface water, sediment, soil, vegetation, ambient air, groundwater, direct radiation, and/ or sanitary sewer sludge.

b. Inspection Guidance.

1. Determine, by review of records and discussions with licensee personnel, whether environmental sampling analyses were adequate, whether the number and location of sampling points are adequate to detect radioactivity as required by 10 CFR 20.1501(a), and in compliance with the license requirements.

Examine the environmental sampling and analysis records generated since the last inspection. These may include a selection of environmental sampling records, vendor or contractor laboratory sample reports, and pertinent non-routine event reports. Review environmental monitoring reports to licensee management since the last inspection.

Verify that if a licensee exceeded a level of radiation or a radioactive material concentration in excess of an applicable limit in the license for a restricted area or 10 times an applicable limit in the license or Part 20, that it was reported to the NRC per 10 CFR 20.2203.

As time permits: Verify that ambient air monitoring stations are capable of monitoring on-site and off-site ambient airborne radioactivity concentrations due to licensee operations. Through observation of operations, discussions, and record reviews, determine whether the licensee is following procedures and is in compliance with license requirements for analyses of specific radionuclides and monitoring at specified locations. Verify radiation dose measurement stations, if applicable, as required by the license.

As time permits: Inspect a selection of sampling locations during sample collection time, if practicable. If it is known in advance when the licensee will be taking environmental samples, attempt to schedule the inspection in order to directly observe the sampling activities to determine if they are done per the applicable procedures. Observe equipment functional tests if any are being performed when onsite. Such observations should be done only to the extent that the inspector is satisfied that sampling is being done in accordance with procedures. Discuss sampling processes with the field and laboratory technicians to determine if they are being conducted according to procedures.

02.14 Minimizing Facility and Environmental Contamination and Facilitating Decommissioning

a. Inspection Requirements.

1. Verify that the licensee is maintaining records important to decommissioning. [10 CFR 70.25(g)]
2. Verify that the licensee, to the extent practical, conducts operations to minimize the introduction of residual radioactivity into the site, including the subsurface. [10 CFR 20.1406(a)¹, if applicable and 10 CFR 20.1406(c)]

b. Inspection Guidance

1. Consistent with the requirements of 10 CFR 70.25(g), the licensee's program shall include records of information important to the decommissioning of a facility including records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site. Where available, use system walk downs, observations of system operation, and review of condition reports to supplement the programmatic review when completing this procedure.

The licensee's programs and procedures should describe the methods for collection, retention, and retrieval of records related to instances of facility and environmental contamination and operational events that are of interest for decommissioning or that result in residual contamination. These programs and procedures ensure that records of leaks, spills, and remediation efforts are retained and retrievable to meet the requirements of 10 CFR 70.25(g).

By review of records of events important to decommissioning, ensure licensee's records reflect contamination that may remain after any cleanup procedures or when there is reasonable likelihood that contaminants may have spread to inaccessible areas in the case of possible seepage into porous materials such as concrete. Ensure records include any known information on identification of involved nuclides, quantities, forms, and concentrations.

By record review and discussion, determine whether the licensee is documenting locations and amounts of residual radioactivity in decommissioning records as required by 10 CFR 20.1501(b).

Assess how the licensee's programs and procedures address potential sources of contamination not specifically described in the license application. Review the processes and system walk downs used by the licensee to assess the completeness of contamination control measures. This can be done by reviewing the licensee's programs and procedures to verify they describe the evaluation process for leaks and spills.

¹ 10 CFR 20.1406(a) applies to applicants for licenses whose applications are submitted after August 20, 1997.

a) The licensee's programs and procedures should describe the methodology used for establishing the location of early leakage detection and contamination migration monitoring points.

Verifying the programs and procedures describe the types and frequencies of samples from locations near potential sources of radioactive material.

b) The licensee's program and procedures should describe the processes to be used to identify areas where hard to detect leaks may occur (e.g., inaccessible areas where low-volume, high-activity concentration may exist).

c) Verifying the licensee's processes describe the methods to be employed to identify leaks that could, over an extended period of time, result in the accumulation of subsurface residual contamination.

d) Examine the procedures used by the licensee to develop and maintain its conceptual site model (if applicable), and evaluate how the licensee's processes for early detection of leakage have been implemented.

02.15 Radioactive Waste Classification, Characterization, and Storage.

a. Inspection Requirements.

1. Verify the licensee has established a program to identify and properly classify radioactive waste streams associated with plant operations in accordance with the requirements of 10 CFR 61.55 and the license.
2. Verify the licensee has established and implemented adequate methods to ensure the proper characterization of radioactive waste.
3. Verify the licensee has established measures to ensure the proper labeling and handling of solid radioactive waste storage containers while in interim storage prior to shipment and/or disposal offsite.

b. Inspection Guidance:

1. Review the licensee's documentation and records of activities that have been established and are being maintained to determine whether low level radioactive wastes are properly classified according to 10 CFR 61.55. Determine whether such efforts reasonably determine whether a realistic representation has been accomplished (Subsection III.A.1 of Appendix G to 10 CFR Part 20).

Review the license requirements for authorized releases of radioactive nuclides in liquid and solid products transferred to non-NRC licensed entities to assure they meet the license and waste compact requirements. Waste compact requirements should be implemented in the disposal site license. Review whether the method used by the licensee is adequate to determine radionuclide concentrations in order to classify waste.

Review the license requirements for authorized release guidelines for byproduct

materials transferred to unlicensed persons. Chemical process byproducts in liquid and solid form such as ammonium hydroxide, hydrogen fluoride and calcium fluoride are frequently sold to unlicensed commercial customers. Depending on the facility and processes, uranium and plutonium release criteria will be specified in the license. These criteria and the analysis supporting the releases should be reviewed for compliance with the criteria specified in the license.

Ensure that new waste streams and changes to existing waste streams have been properly classified and characterized. Review licensee procedures to determine if they address these changes.

Licensees may utilize the services of a contract analytical laboratory to analyze samples to determine waste stream classification. Under these circumstances verify that the licensee has established mechanisms to periodically evaluate the performance of the contractor analytical laboratory. These measures may include independent audits performed by the licensee or other qualified companies. Additionally purchase requisitions for contract services should be reviewed to ensure that appropriate performance standards and criteria have been included in the scope of the contract. This could include critical attributes such as the lower limit of detection or minimum detection level required to be achieved. Review the licensee's process for placing a company that supplies analytical services on their approved vendors list.

2. Review the licensee's documentation and records of activities which have been established and are being maintained to determine whether low level radioactive waste (LLRW) meets the waste characteristics of 10 CFR 61.56. (Subsection III.A.1 of Appendix G to 10 CFR Part 20).
3. Check posting of storage areas and labeling of a selected number of containers. Check to determine that packages are clearly and properly labeled in accordance with 10 CFR 20.1904 and 20.1905, and that LLRW is transferred or disposed in accordance with 10 CFR 20.2006.

There may not be specific requirements included in the license relating to the onsite storage of solid radioactive waste; however, the licensee's program should address the requirements of 10 CFR 20.2001 and 20.2101, .2102, .2103, .2108, and .2110.

Examine a representative number of packages for signs of swelling, leakage, deformation, or deterioration (i.e., rusting or other corrosion which may lead to breach).

Confirm that the licensee is within authorized possession limits.

Confirm that accumulations of stored radionuclides of concern are less than Category 2 quantities or, if exceeded, appropriate increased controls have been implemented.

02.16 Waste Burial.

a. Inspection Requirements:

1. Determine if the licensee had buried radioactive waste on site prior to January 1981. Verify that the licensee is controlling and monitoring the disposal site. If applicable, verify that the licensee maintains management measures in accordance with the licensee's radioactive waste management program. Verify that the licensee maintains waste burial records in compliance with 10 CFR 20.2108.

b. Inspection Guidance:

1. If low level radioactive material is buried on-site, determine that it meets the criteria contained in 10 CFR 20.2002, "Method for Obtaining Approval of Proposed Disposal Procedures," and 10 CFR 20.2108, "Records of Waste Disposal." This guidance is not applicable for waste burial sites that have already been decommissioned. This guidance is applicable to Babcock and Wilcox Nuclear Operations Group.

Review a sample of environmental sampling results to ensure that the licensee is controlling and monitoring the area. Determine if the licensee is in excess of action levels as listed in the license application or procedures. Determine if the licensee is tracking or trending elevated sampling results and controlling the spread of environmental contamination.

Determine if the licensee buries non-radiological waste on-site, e.g., in a landfill. Determine whether a monitoring program exists which ensures that the waste is indeed "nonradioactive." Verify that the licensee is in compliance with their procedures or the license application, if applicable.

Note: Prior to January 28, 1981, former regulatory criteria contained in 10 CFR 20.304, Disposal by Burial in Soil, permitted the burial of small quantities of licensed materials in soil without specific Commission authorization, but records of the disposal were required to be maintained by former 10 CFR 20.401, Records of Disposal, until the Commission authorized their disposition.

02.17 Effluent Treatment.

a. Inspection Requirements.

1. Verify that the waste water treatment facility, if applicable, is in compliance with the license and Integrated Safety Analysis (ISA) Summary.
2. Verify that the airborne effluent scrubbers, HEPA filters, and/ or filters are in accordance with the license and ISA Summary.

b. Inspection Guidance.

1. Conduct a walk down of the waste water treatment facility and determine that operations are performed in accordance with approved procedures. Verify that the system is capable of removing and processing the radioactive contaminants for which the process is designed to handle. Determine if filter systems, resin

treatment systems, or other waste water treatment media are designed to treat waste water as specified by the licensee's program, as applicable.

Identify changes in the facility operations, including changes in product or source term. Verify that steps were taken during effluent treatment to address chemical changes in the effluent stream. Verify that steps were taken to verify that changes were evaluated to ensure there was no adverse impact on the ability of the waste water treatment facility to perform its intended function.

Discuss action levels associated with radioactivity concentration levels in waste water effluent streams, as applicable, and review records to verify that these action levels were maintained.

Select a sample of IROFS, if applicable, associated with the waste water treatment facility and verify that IROFS are capable of performing their intended function and are maintained operable.

Note: If the licensee process places restrictions on allowable uranium concentrations in waste water process streams, e.g., less than 300 parts per million (ppm), prior to treatment in the waste water treatment facility then IROFS may not be associated with the waste water treatment facility. This situation may be encountered at facilities that place limitations on uranium concentrations for criticality control purposes thus negating the need for criticality controls in the waste water treatment facility.

2. Conduct a walk down of a sample of stack filtration housings and associated system ventilation duct work and process piping and airborne effluent scrubbers, as applicable. Verify that airborne effluent equipment and systems are operable and maintained in accordance with the licensee's program. Verify the material condition and physical integrity of filter housings and process piping to determine that the systems are capable of treating airborne effluent streams as specified by the licensee's program, as applicable.

Verify that criteria for the periodic replacement of process filters (e.g., HEPA filters and pre-filters) are provided in licensee procedures, as applicable, and the licensee has established and implemented a program to ensure that process filters are changed-out in accordance with approved procedures. Criteria for replacing filters may include limits on differential pressure across filters, limiting the time in-service, the amount of material collected based on weight, or other appropriate criteria. Verify that filter change-out criteria was specified in the licensee's program.

Determine if any changes were made to airborne effluent process streams since the last inspection. Verify that steps were taken to verify that changes were evaluated to ensure that there was no adverse impact on the ability of airborne effluent filtration streams to perform their intended design function.

Determine if IROFS are associated with any airborne effluent process streams and verify that IROFS are capable of performing their intended function and are maintained operable.

88045-03 RESOURCE ESTIMATE

The resource estimate to perform this inspection procedure is [as specified in Table 1 of IMC 2600 Appendix B with a variance of ± 10%](#).

88045-04 PROCEDURE COMPLETION

Implementation of each applicable inspection requirement will constitute completion of this procedure. Individual inspection samples and breadth of review will be determined by the inspector based on requirement compliance, risk- significance of activity, and extent of the activity or records available.

88045-05 REFERENCES

10 CFR 20, "Standards for Protection Against Radiation"

10 CFR 40, "Domestic Licensing of Source Material"

10 CFR 70, "Domestic Licensing of Special Nuclear Material"

40 CFR 190, "Environmental Radiation Protection Standards for Nuclear Power Operations"

NRC, Regulatory Guide 4.13, [Environmental Dosimetry – Performance Specifications, Testing, and Data Analysis](#), Revision 2, dated [June 2019](#)

NRC, Regulatory Guide 4.14, Radiological Effluent and Environmental Monitoring at Uranium Mills, Revision 1, dated April 1980

NRC, Regulatory Guide 4.15, Quality Assurance for Radiological Monitoring Programs (Inception through Normal Operations to License Termination) -- Effluent Streams and the Environment, Revision 2, dated July 2007

NRC, Regulatory Guide 4.16, Monitoring and Reporting Radioactivity in Releases of Radioactive Materials in Liquid and Gaseous Effluents from Nuclear Fuel Processing and Fabrication Plants and Uranium Hexafluoride Production Plants, Revision 2, dated December 2010

[NRC, Regulatory Guide 4.21, Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning](#), dated June 2008

[NRC, Regulatory Guide 4.22, Decommissioning Planning During Operations](#), dated December 2012

National Council on Radiation Protection and Measurements' (NCRP) report 58, "A Handbook of Radioactivity Measurements Procedures," 2nd edition

END

Attachment:
Revision History Sheet for IP 88045

Attachment 1 - Revision History Sheet for IP 88045

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)
N/A	09/05/06 CN 06-020	This document has been revised to: (1) emphasize the risk-informed, performance-based approach to inspection, (2) impose changes to the core inspection program based on operating experience, and (3) remove completed or obsolete MCs and incorporate other fuel cycle MCs into a central location.	N/A	ML061940435
N/A	ML13233A181 02/07/14 CN 14-005	Reorganized for clarity and readability. Reformatted in accordance with IMC 0040. Moved Public Dose Analysis from 88030 to 88045. Included detailed section with lessons learned. Included specific reference and instructions to comply with EPA part 190 public dose requirements. Added 10 CFR 20.1406(c); a new requirement effective in 12/2012. Waste Burial section was transferred from 88035 to 88045. Added Effluent Treatment Section.	Training on CFR40Part 190 required before implementation of IP. 2/28/14	ML13347A954

N/A	ML21063A566 03/12/21 CN 21-013	Revised to implement recommendations from Smarter Fuel Cycle Inspection (ML20077L247 and ML20073G659), and additional guidance to support decommissioning planning during operations.	Complete by March 2021	N/A
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