INSPECTION TECHNICAL PROCEDURE

I-140

RADIOLOGICAL CONTROL PROGRAMMATIC ASSESSMENT

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Revision 1

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1.0 PURPOSE

This procedure provides guidance for assessing the Contractor's Radiological Control Program (RCP). This guidance is based on the requirements in: 10 CFR 835, the Safety Requirements Document (SRD), Radiation Protection Program (RPP), Integrated Safety Management Plan (ISMP), Quality Assurance Manual (QAM), and the Preliminary Safety Analysis Report.

This inspection procedure assesses the adequacy and effectiveness of the following:

- RCP incorporation of authorization basis commitments
- RCP implementing procedures
- Technical adequacy of the RCP and its implementing procedures to ensure radiological safety.

NOTE: This procedure references RPP sections as the basis of many of the requirements. At the time of its writing, the RPP was approved for design and construction. When the revised RPP is approved for operations, this procedure will be reviewed to ensure the inspection attributes and references are appropriate.

2.0 OBJECTIVES

This procedure verifies the Contractor's development, implementation, and maintenance of an RCP addressing the topics presented in the RPP, SRD, ISMP, other authorization basis documents, and subsequent Contractor commitments. The procedure also verifies the RCP includes procedures implementing the RCP topics and incorporates the guidance necessary to ensure compliance with the authorization basis.

This procedure will result in some overlap with other Office of River Protection (ORP) Inspection Technical Procedures (ITPs) covering radiation protection, management controls, training, and quality assurance. Adverse observations resulting from this inspection may warrant implementation of specific ITP inspection procedures in the deficient area. Similarly, adverse observations during the conduct of specific ITP inspection procedures may trigger implementation of this procedure to determine if failure to establish, implement, or maintain the RCP is the root or contributing cause of the adverse observations.

3.0 BACKGROUND

The RCP contains programs and procedures to ensure the requirements of 10 CFR 835 and SRD Safety Criterion (SC) 5.0-1 are met. The DOE approved RPP describes programs and procedures to provide reasonable assurance of compliance with each requirement of 10 CFR 835. Procedures implementing the RPP are a part of the RCP. Procedures implementing other programs like respiratory protection, and provisions for the temporary storage, packaging, and handling of facility generated solid radioactive wastes are presented in SRD Sections 5.0, 5.1, and 5.2 and must be covered by the RCP.

4.0 INSPECTION REQUIREMENTS

4.1 Adequacy and Effectiveness of the RCP Incorporation of Authorization Basis Commitments

The inspector should verify the Contractor's development, implementation, and maintenance of an RCP addressing the requirements in 10 CFR 835 and the additional Safety Criteria provided in SRD Volume II, Sections 5.0, 5.1, and 5.2. (SRD, Safety Criterion (SC) 5.0-1, 5.0-2, 5.1-1, 5.1-2, 5.1-3, 5.1-4, and 5.2-1)

4.2 Adequacy and Effectiveness of RCP Implementing Procedures

The inspector should verify the RCP includes implementing procedures to ensure the RPP requirements, and other subsequent commitments, are effectively implemented. (SRD, SC 5.0-1, 5.0-2, 5.1-1, 5.1-2, 5.1-3, 5.1-4, and 5.2-1; and ISMP, Section 1.0)

4.3 Adequacy and Effectiveness of Implementation of the RCP Implementing Procedures to Ensure Radiological Safety

The inspector should verify the RCP implementing procedures are being followed. (QAM, Policy Q-05.1)

5.0 INSPECTION GUIDANCE

Inspection guidance is provided to assist inspectors in addressing the requirements in Section 4.0 of this procedure.

For each of the inspection elements, the inspector should review the core requirements applicable to the stage of the project being inspected, and focus on an aspect of each element having safety impact. For example, the RCP should address monitoring for residual contamination during site preparation and radiography during construction. Accordingly, implementation of this procedure during construction might focus on how the Contractor has addressed use of sealed radioactive sources on site by licensed sub-contractors in its RCP.

Since the RCP is not required by the Contract to be reviewed or approved by the ORP, it is important it be changed and maintained according to the QAM, Policy Q-06.1,"Document Control." During this inspection, the inspector should confirm the RCP continues to implement the requirements in the authorization basis. Section 7.1 of the *Preliminary Safety Analysis Report to Support Partial Construction Authorization; General Information* references the *Radiological Control Program*, which describes how requirements for ensuring radiation safety are addressed by the project. This document should also be used as guidance in assessing implementation of the RCP. If the inspection reveals the Contractor has failed to maintain the connection, the inspector should address the observation as an example of the efficacy of the Contractor's document/procedure control process.

At the completion of this inspection, the ORP should be able to describe the adequacy and effectiveness of the Contractor's implementation of radiation protection related authorization basis requirements in its RCP and procedures.

5.1 Adequacy and Effectiveness of the RCP Incorporation of Authorization Basis Commitments

To determine if the Contractor has an RCP addressing 10 CFR 835 and other authorization basis requirements, the inspector should:

5.1.1 Verify the RCP addresses each of the following topics from the SRD:

- The RPP (SRD, SC 5.0-1; RCP, Table 1)
- A respiratory protection program (SRD, SC 5.0-2; RCP, Table 1)

5.1.2 Verify the RCP addresses each of the following topics (RCP, Table 2):

- Implementation of the ALARA design goal
- Development of the RPP and implementing procedures
- Training of personnel to the RPP and its procedures
- Selection of qualified personnel to perform work in radiological environments
- Maintenance of records
- Performance of reviews and audits
- Implementation of a lessons-learned program
- Respiratory protection

- Sealed sources
- Solid radioactive waste storage, packaging, and handling.

5.1.3 Verify the RCP addresses each of the functional elements from draft NRC Regulatory Guide 3.52, as required by the SRD[1]:

1. **ALARA (As Low As Reasonably Achievable) Policy –** Policies and procedures used to ensure radiation exposures will be maintained ALARA were described, as were the organizational structure, ALARA committees, and the application of trending analysis to maintain exposures ALARA.

2. **Organizational Relationships and Personnel Qualifications** – A detailed organizational chart for the RCP was provided, and the qualification requirements for the radiological protection personnel and assignment of specific responsibilities and authorities for key functions were identified.

3. **Radiological Control Procedures and Workplace Controls** – The program was described for identifying, developing, maintaining, and using approved written radiological control procedures and Radiation Work Permits (RWPs) for activities related to radiological control.

4. **Radiological Control Training** – The program to provide radiological control training for all personnel who have authorized access to a controlled area was described. Training objectives, management oversight, training methodology, identification of who is required to receive the training, content and frequency of training and refresher training, and the training effectiveness also were described. The review of radiological control training should be coordinated with overall performance based training and qualification system.

5. **Ventilation Systems** – Design of the ventilation systems was described, including specifications of the minimum flow velocity at hood openings, the types of filters and the maximum differential pressure across filters, and the planned frequency and types of tests required to measure ventilation system performance.

6. **Air Sampling** – Air sampling objectives and procedures for radiological controls were described, including the following:

    a. Methods for analyzing airborne concentrations
    b. Methods for calibrating air sampling and counting equipment
    c. Action levels and alarm setpoints
    d. Basis used to determine action levels, investigation levels, and derived air concentrations and the minimum detectable activity for the radionuclides
    e. Frequency and methods of analyzing airborne concentrations
    f. Counting techniques

[1] Appendix G, "Ad Hoc Implementing Standard for Safety Analysis Reports," Section 3.1, "Safety Analysis Report Preparation."

g. Specific calculations and levels
h. Action levels and investigation levels
i. Locations of continuous air monitors, if used, and locations of continuous air monitor annunciators and alarms.

7. **Contamination Control** – The program to control radioactive contamination within the facility was described, including the following:

a. Types and frequencies of surveys
b. Limits for removable and fixed contamination levels
c. Methods and types of instruments used in the surveys
d. Action levels and actions to be taken when the administrative controls or other limiting action levels are exceeded
e. Types and quantities of contamination monitoring equipment
f. Description of personnel (skin and clothing) contamination limits
g. Minimum provisions for personnel decontamination
h. Minimum types of protective clothing
i. Release criteria for radiologically contaminated material
j. Technical criteria and levels for defining contamination areas
k. Requirements for investigating personnel skin or clothing contamination
l. Requirements for frisking each time personnel exit a posted contaminated area
m. Criteria for leak checking sealed sources.

8. **External Exposure** – The program for monitoring personnel external radiation exposure was described, including the means to measure, assess, and record radiation dose to individuals. The type, range, sensitivity, accuracy, and frequency for analyzing personnel dosimeters were described. The submittal committed to participate in the National Voluntary Laboratory Accreditation Program or Department of Energy Laboratory Accreditation Program to test dosimeters.

9. **Internal Exposure** – The program for monitoring personnel internal radiation exposure was described, including the means to measure, assess, and record radiation dose to individuals and the following:

a. Criteria for determining when to monitor an individual's internal exposure
b. Methods for determining the facility and co-located worker intake
c. Frequency of analysis
d. Minimum detection levels
e. Action levels and actions to be taken based on the results.

10. **Combining Internal and External Dose Equivalents** – The program for combining internal and external dose to demonstrate compliance with the dose limits was described, including the procedure used for assessing an individual’s doses according to specific regulatory and contractual requirements.

11. **Respiratory Protection** – The respiratory protection program for radiological controls was described, including the equipment to be used, the conditions under which respiratory protection is required for routine and nonroutine operations, the protection factors to be applied when respirators are used, and the locations of the facility's respiratory equipment.

12. **Instrumentation** – Requirements for measurement instrumentation for radiological controls were described, including the policy for maintaining and using operating instrumentation. The types of instruments that are available, as well as their ranges, counting mode, sensitivity, alarm setpoints, planned use, and frequency of calibration, were described.

13. **Hazard and Accident Analysis** – Postulated accidents which have radiological consequences for the facility and co-located workers were described. Also described were hazard and accident analysis results, the methodology for assessing the accident consequences, likelihood and risk associated with each accident sequence, controls for preventing or mitigating each accident sequence, and the levels of assurance applied to the controls.

5.1.4 Verify the RCP is based on the *Waste Treatment Plant Radiological Control Manual* (WTPRCM) by selecting five specific topics from WTPRCM articles and confirming the RCP is based on those articles.

5.2 Adequacy and Effectiveness of the RCP Implementing Procedures

To determine if the Contractor has developed RCP implementing procedures addressing 10 CFR 835 and authorization basis requirements, the inspector should:

5.2.1 Select five topics from those listed in Section 5.1 above, and verify development of procedures to implement those topics.

5.2.2 Select two topics from 5.2.1 above and determine if implementing procedures provide reasonable assurance of compliance.

For example: SRD, SC 5.0-1 requires the RCP address SRD, SC 5.0-2, which requires a respiratory protection program be established incorporating nine specific items from American National Standards Institute Z-88.2-1992, *Respiratory Protection*.

The inspector should use elements of other ITPs to perform the adequacy and effectiveness review for the topic selected. For the respiratory protection example above, the inspector should use ITPs I-142, "Internal Dosimetry Assessment;" I-144, "Air Monitoring Program Assessment;" I-150, "RCP Training and Qualifications Assessment;" and I-151, "RCP Documents, Records, and Reports Assessment."

The inspector may also use the SRD Implementing Codes and Standards to verify the "shall" statements from the Implementing Codes and Standards have been addressed in the procedures. Also verify the "should" recommendations have been included or an

evaluation of "technical equivalency" has been completed as described in WTPRCM, Article 113.

5.3 Adequacy and Effectiveness of Implementation of the RCP and its Implementing Procedures to Ensure Radiological Safety

To determine if the Contractor has adequately and effectively implemented its RCP procedures, the inspector should:

5.3.1 Select at least five specific RCP procedures that are applicable during the current stage of construction or operations and verify by direct observation implementation of the procedures. If direct observation is not reasonable during the course of the inspection, records may be used to determine if the procedures were followed.

For Example: SRD SC 5.0-2 requires a respiratory protection program. The inspector might observe respirator fit testing, training, and use of the equipment to evaluate the adequacy and effectiveness of the procedures.

Note: Specific ITPs should be used to perform this inspection element; however, activities may be observed without specific ITPs, since the underlying object is to assess compliance with, and adequacy of, the RCP procedure being observed.

6.0 REFERENCES

10 CFR 835, "Occupational Radiation Protection," *Code of Federal Regulations,* as amended.

ANSI Z88.2-1992, *Respiratory Protection*, American National Standards Institute, 1992.

Integrated Safety Management Plan, BNFL-5193-ISP-01, Rev. 6, Bechtel National, Inc., 2001.

Preliminary Safety Analysis Report to Support Partial Construction Authorization; General Information, 24590-WTP-PSAR-ESH-01-001-01, Rev. E, Bechtel National, Inc., 2002.

Quality Assurance Manual, 24590-WTP-QAM-QA-01-001, Rev. 4, Bechtel National, Inc., 2003.

Radiological Control Program, 24590-WTP-PL-NS-01-001, Rev. 3, Bechtel National, Inc., 2002.

Radiation Protection Program for Design and Construction, 24590-WTP-RPP-ESH-01-001, Rev. 0, Bechtel National, Inc., 2001.

RL/REG-98-26, *Inspection Technical Procedures* (ITP), U.S. Department of Energy, Office of River Protection, 2003.

ITP I-102, "Configuration Management Assessment"

ITP I-142, "Internal Dosimetry Assessment"

ITP I-144, "Air Monitoring Program Assessment"
ITP I-150, "RCP Training and Qualifications"
ITP I-151, "RCP Documents, Records, and Reports Assessment"

Safety Requirements Document, 24590-WTP-SRD-ESH-01-001-02, Volume II, Rev. 2h, Bechtel National, Inc., 2003.

USNRC Draft Regulatory Guide 3.52, *Standard Format and Content for Health and Safety Sections of License Applications for Fuel Cycle Facilities*, NRC, 1995.

Waste Treatment Plant Radiological Control Manual, 24590-WTP-MN-ESH-01-001, Rev. 1, Bechtel National, Inc., 2002.

7.0 LIST OF TERMS

ALARA	as low as is reasonably achievable
BNI	Bechtel National, Inc.
DOE	U.S. Department of Energy
IC&S	Implementing Codes and Standards
ISMP	Integrated Safety Management Plan
ITP	Inspection Technical Procedure
NRC	U. S. Nuclear Regulatory Commission
ORP	Office of River Protection
QAM	Quality Assurance Manual
RCP	Radiological Control Program
RPM	Radiation Protection Manager
RPP	Radiation Protection Program
WTP	River Protection Project - Waste Treatment and Immobilization Plant
SC	Safety Criterion
SRD	Safety Requirements Document
WTPRCM	Waste Treatment Plant Radiological Control Manual

Attachment: None