

RADIOLOGICAL CONTROL PROGRAM

1.0 Objective

The objective of this performance assessment is to evaluate the effectiveness of the laboratory's radiological control program as implemented at the facility. The Facility Representative or Environmental Safety, and Health Support Specialist evaluates implementation of site-wide policies, procedures, and programs with particular emphasis on implementation of the program and its critical elements at the facility. In conducting this assessment, the Facility Representative or Environmental Safety, and Health Support Specialist observes work activities, interviews personnel, performs walkdowns, and reviews documents and records.

2.0 Definitions

Concern - A determination of a programmatic breakdown or widespread problem supported by one or more findings or observations.

Finding - An individual item which does not meet requirements.

Functional Area - A discrete group of related safety and support programs.

Lines of Inquiry - Questions that guide the assessor in planning and conducting the performance assessment.

Observation - A condition or practice that does not provide or promote effective protection of the health and safety of the public or DOE's workers or the environment.

Performance Assessment - An evaluation of a program or functional area to verify laboratory line management effectiveness in ensuring the health and safety of the public and of DOE's workers and in ensuring protection of the environment.

Performance Attributes - Key elements, functions, or activities to be assessed in a particular functional area.

3.0 References

- 3.1 DOE P441.1, *Department of Energy Radiological Health and Safety Policy*
- 3.2 DOE/EH-0256T, *U.S. Department of Energy Radiological Control Manual*, Rev. 1
- 3.3 10 CFR 835, *Occupational Radiation Protection*

- 3.4 G-10 CFR 835/B1, *Implementation Guide - Radiation Protection Program*
- 3.5 G-10 CFR 835/B2, *Implementation Guide - Occupational ALARA Program*
- 3.6 G-10 CFR 835/C1, *Implementation Guide - Internal Dosimetry Program*
- 3.7 G-10 CFR 835/C2, *Implementation Guide - External Dosimetry Program*
- 3.8 G-10 CFR 835/C3, *Implementation Guide - Radiation Generating Devices*
- 3.9 G-10 CFR 835/C4, *Implementation Guide - Evaluation and Control of Fetal Exposure*
- 3.10 G-10 CFR 835/E1, *Implementation Guide - Instrument Calibration for Portable Survey Instruments*
- 3.11 G-10 CFR 835/E2, *Implementation Guide - Work Place Air Monitoring*
- 3.12 G-10 CFR 835/G1, *Implementation Guide - Posting and Labelling for Radiological Control*
- 3.13 G-10 CFR 835/H1, *Implementation Guide - Occupational Radiation Exposure Recordkeeping and Reporting*
- 3.14 G-10 CFR 835/J1, *Implementation Guide - Radiological Protection Training*

4.0 Performance Assessment Activities

The assessor reviews pertinent program documentation including policies, program documents, procedures, and training materials before beginning the assessment. Appendix A provides a suggested list of documents that the assessor may review during preparations for the assessment.

During the assessment, the assessor evaluates selected performance attributes by developing and using lines of inquiry for each performance attribute. Appendix B provides a listing of suggested performance attributes and lines of inquiry. In applying each line of inquiry, the assessor may complete diverse activities such as reviewing documents and records, interviewing facility personnel and radiological health operations support staff, observing work activities, and performing walkdowns. The assessor may choose to use existing surveillance guides in completing specific portions of the assessment.

Surveillance Guides for the Radiological Control functional area include:

- RPS 11.1 ALARA Programs
- RPS 11.2 Radiological Work Practices
- RPS 11.3 Utilization of Radiological Work Permits
- RPS 11.4 Radiological Control Barriers and Postings
- RPS 11.5 Radiological Monitoring Surveys

This assessment should emphasize the effectiveness of the laboratory's radiological controls program as implemented in a specific facility. In performing the assessment, the assessor must balance review of site-wide programs, facility-specific procedures and hazards, and implementation at the facility. The following questions provide the general framework that should be used in planning, conducting and documenting the assessment:

- Are workers provided with sufficient training to understand the range of radiological hazards they may encounter in their work?
- Are effective procedures and administrative controls established to mitigate radiological hazards?
- Is management commitment to effective implementation of the radiological control program evident?
- Does a clear commitment to maintain doses as low as reasonably achievable pervade all aspects of operations and maintenance from initial work planning to actual performance?

APPENDIX A
SUGGESTED DOCUMENTS TO BE REVIEWED

Site-wide Radiological Control Program
Radiological Control Policy
Training materials for General Employee Radiological Training
Training materials for Radiological Workers
Radiological Control procedures
Occurrence reports relating to employee or equipment contamination
Annual ALARA Reports
Charter for Facility or Site ALARA Committee

APPENDIX B

PERFORMANCE ATTRIBUTES AND LINES OF INQUIRY

PERFORMANCE ATTRIBUTE: I. The laboratory has established appropriate management systems and processes to implement an effective Radiation Protection Program.

LINES OF INQUIRY:

1. Has senior management established and communicated to workers high performance standards regarding radiological control?
2. Is the site-wide Radiological Control Manual implemented at the facility?
3. Are roles, responsibilities, authority and accountability for implementing the Radiation Protection Program at the facility clearly defined, understood, and implemented?
4. Are sufficient financial resources committed to the Radiation Protection Program to ensure effective implementation?
5. Are staffing levels adequate for implementation of the program?
6. Does the laboratory have a radiological performance goals program with documented performance indicators?
7. Are periodic reports provided to management showing progress against radiological performance goals?
8. Do line managers periodically monitor work areas and observe personnel at work to evaluate adequacy of radiological work practices?
9. Does management encourage employees to identify radiological control deficiencies and concerns?
10. Does management respond promptly to eliminate deficiencies identified by employees?
11. Has management established a formal critique system to identify and correct conditions that led to excessive exposure of personnel, contamination of equipment or areas, or release of radioactive materials?

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PERFORMANCE ATTRIBUTES AND LINES OF INQUIRY

PERFORMANCE ATTRIBUTE: II. The laboratory maintains personnel radiation exposure well below regulatory dose limits, minimized the potential for personnel contamination and appropriately identifies areas with radiation risks.

LINES OF INQUIRY:

1. Does the laboratory ensure that employees do not exceed DOE and facility dose administrative control levels without appropriate approvals?
2. Has the laboratory implemented appropriate controls to ensure that dose limits for radiological workers are not exceeded including annual limits for whole body, lens of the eye, extremities, organs or tissue and skin, embryo/fetus, and for visitors and the public?
3. Have special occupational exposure control levels been established for individuals who have a lifetime occupational dose exceeding N rem, where N is the age of the person in years?
4. Do personnel exiting contamination areas, high contamination areas, airborne radioactivity areas, or radiological buffer areas frisk themselves or ensure that radiation protection technicians frisk them to ensure no contamination is present?
5. Are all surfaces that are contaminated posted appropriately?
6. Are areas with fixed contamination appropriately identified?
7. Have effective efforts been implemented to control exposure of personnel to airborne radioactivity?
8. Are areas containing radiological hazards, including radiological buffer, contamination, high contamination, airborne radioactivity, radioactive material, and underground radioactive material areas posted?
9. Do entrance points to areas where radiological operations are in progress identify basic entry requirements such as radiation work permits, dosimetry, and personal protective equipment?
10. Have radiation exposure guidelines been established for emergency situations involving rescue of personnel or protection of important property?

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PERFORMANCE ATTRIBUTE: III. The laboratory's radiation protection program provides for effective planning, safe completion of work, rigorous administrative controls, and evaluation of completed work.

LINES OF INQUIRY:

1. Are radiological reviews performed for non-routine, complex, infrequent, or first time work activities that involve exposure or potential exposure of employees to radiation hazards?
2. Are maintenance and modifications plans and procedures reviewed to ensure incorporation of radiological requirements such as dose and/or contamination reduction?
3. Does radiological review of planned work result in implementation of engineering controls or safe work practices that reduce the potential for exposure of employees to radiation?
4. Are effective controls exercised over the use of temporary shielding?
5. Are formal technical work documents prepared to control hands-on work involving radiation hazards?
6. Is work performed in accordance with the technical work documents?
7. Are engineering controls used as the preferred method to minimize airborne radioactivity and preclude internal contamination of workers?
8. Are radiological work permits prepared to control work that may involve radiation hazards?
9. Are pre-job briefings conducted to discuss radiation hazards and plans to mitigate the hazards?
10. Do personnel exposed to radiation hazards use appropriate personal protective equipment?
11. Have personnel performing work in radiation areas received required training and is the training current?
12. Are appropriate precautions taken to minimize the potential for spreading contamination?

13. Do personnel perform whole body frisks when leaving areas that could lead to contamination?
14. Are communication devices in place or available to allow prompt HPT/RCT response to assist a contaminated person?
15. Is work performed such that exposure to radiation is maintained as low as reasonably achievable?
16. Are post-job reviews performed to identify lessons learned that may help to reduce future exposures to radiation?

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PERFORMANCE ATTRIBUTE: IV. An effective program with appropriate administrative controls has been established for handling, processing, storing, and shipping radioactive materials, including wastes.

LINES OF INQUIRY:

1. Are materials in contamination, high contamination, and airborne radioactivity areas treated as contaminated?
2. Does the laboratory have a program including appropriate procedures to cope with possible losses of radioactive or contaminated materials?
3. Are radioactive materials appropriately labelled, packaged, and stored?
4. Is a program or procedure in place to control packaging for radioactive or contaminated materials?
5. Are radioactive material storage areas adequately maintained?
6. Have effective administrative controls been developed and implemented for release of materials from contamination, high contamination, or airborne radioactivity areas?
7. Has an effective program been established to control receipt, inventory, storage, transfer, disposal, and periodic integrity testing of sealed radioactive sources?
8. Has the laboratory implemented actions to minimize the generation of radioactive wastes and the potential for spread of contamination?
9. Have technical and administrative controls been established to minimize the quantities of mixed wastes?
10. Has a water management program been implemented to identify, trend, and eliminate sources of radioactive liquid waste and liquid mixed wastes?
11. Are discharges of radioactive liquids controlled and monitored to ensure that applicable limits are not exceeded?
12. Have engineering controls been used to limit airborne releases of radioactivity and is a routine maintenance and surveillance program implemented to ensure the integrity of the engineering controls?

13. Is personal protective equipment stored, cleaned, and surveyed so as to minimize the potential for contaminating personnel?
14. Do laundering operations for clothing and equipment minimize generation of waste and the potential for contaminating personnel?
15. Does the laboratory have an ongoing program to decontaminate tools, equipment, and areas thereby reducing the potential for personnel contamination?
16. Are vacuum cleaners and portable air handling equipment used in contamination, high contamination, or airborne radioactivity areas used in accordance with an established program and appropriate administrative controls?

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PERFORMANCE ATTRIBUTES AND LINES OF INQUIRY

PERFORMANCE ATTRIBUTE: V. The laboratory's site-wide radiological health support operations group implements effective programs for dosimetry, respiratory protection, and routine radiological surveys at the facility.

LINES OF INQUIRY:

1. Is dosimetry issued to appropriate personnel at the facility?
2. Is appropriate control maintained over wearing dosimetry, processing dosimetry, and maintaining dosimetry at the facility or on site?
3. Are dose assessments performed to estimate dose for each instance of a lost, damaged, or contaminated dosimeter?
4. Are supplemental dosimeters issued and used in accordance with applicable administrative controls?
5. Are area monitoring dosimeters placed, read, and results used to monitor radiation levels in routinely occupied areas?
6. Has an effective internal dosimetry program been implemented to monitor doses due to uptake of radioactive materials?
7. Are bioassay results available on a timely basis and are personnel promptly notified of any indications of uptake requiring further investigation?
8. Are preliminary assessments of any uptakes that are detected completed before the employee is allowed to return to work?
9. Are respirators issued only to personnel who are trained, fitted, and medically qualified for use of the respirator?
10. Are positive controls maintained over the issuance, use, and return of respirators?
11. Have adequate provisions been made at the facility for handling radiologically contaminated personnel including injured personnel?
12. Is radiological monitoring of radiation exposure levels, contamination, and airborne radioactivity conducted routinely to evaluate radiation risks at the facility?

13. Are results from radiation and contamination surveys used for evaluating exposure, ALARA planning, and contamination control?
14. Are area radiation monitors installed, calibrated, and tested in areas that may be subject to unexpected increases in radiation dose rates?
15. Is airborne radioactivity monitoring provided in the facility where airborne radioactivity levels can fluctuate or where early detection of airborne radioactivity is vital to protection of personnel?
16. Are instruments used to detect radiation, complete radiation surveys, or perform contamination surveys routinely calibrated to ensure reliable performance?
17. Has the facility effectively addressed instruments that were found to be out of calibration?

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PERFORMANCE ATTRIBUTES AND LINES OF INQUIRY

PERFORMANCE ATTRIBUTE: VI. Radiological workers, radiological control personnel, radiological control technicians, managers, and technical support personnel receive appropriate training on radiological hazards, safe work practices, and programmatic requirements.

LINES OF INQUIRY:

1. Do personnel at the facility who may be exposed to radiological hazards receive General Employee Radiological Training every two years?
2. Do radiological workers receive Radiological Worker I and II re-training every two years and refresher training during alternate years?
3. Are written examinations administered to demonstrate understanding of radiation safety concepts and satisfactory completion of theoretical and classroom materials?
4. Does General Employee Radiological Training and Radiological Worker I and II re-training address the facility's unique radiological hazards and lessons learned from operations?
5. Do Radiological Control Technicians meet qualification standards from DOE standardized courses with appropriate site-specific additions?
6. Do oral examination boards determine the qualification of Radiological Control Technicians through discussions of normal operations and response to upset and emergency conditions?
7. Is a formal instructor qualification program established for personnel who routinely conduct training on radiological hazards?
8. Do visitors to the facility who enter the Controlled Area receive a radiological safety orientation?
9. Has a continuing training program including re-qualification through written examinations and additional oral examination boards been established for Radiological Control Technicians?
10. Have line managers who supervise or provide oversight of Radiological Control Programs been trained in the principles of the DOE Radiological Control Manual?

11. Have technical support personnel, planners, and other radiological control personnel received appropriate training to perform their responsibilities?
12. Have emergency response personnel received special training on radiological hazards they are likely to encounter?

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PERFORMANCE ATTRIBUTE: VII. A records management program has been implemented and sufficient records are maintained to document the effectiveness of the Radiological Control Program.

LINES OF INQUIRY:

1. Has an overall radiological records management program been established to ensure effective control of records during preparation, review, approval, distribution, use, storage, retrieval, and archiving for all key radiological records?
2. Are radiological records accurate, legible, and free from alterations using opaque substances such as correction fluid or tape?
3. Are records maintained for facility employees documenting previous work history and exposure to radiation, doses received while at the facility, and records of radiological incidents or occurrences involving the employee?
4. Are training and qualification records maintained for employees who have received General Employee Radiation Training, Radiological Workers, Radiological Control Technicians, managers, technical support personnel, planners, and other radiological control personnel?
5. Are records retained documenting training and qualifications for instructors?
6. Are records of radiological safety orientations for visitors and doses received maintained?
7. Do radiological control program records include policy statements, procedures, radiological work permits, and results of post-job reviews?
8. Are records of ALARA program results including plans, goals, periodic reports and activities of the facility ALARA committee maintained?
9. Are records of radiological and contamination surveys maintained and are they sufficient to be meaningful?
10. Are records maintained on calibration and testing of radiation monitoring and survey devices?

11. Are records stored to ensure safety from fires, hostile environments, moisture, etc. and are they under sufficient control to ensure their integrity, retrievability and security?
12. Are annual reports on doses received sent to radiological workers or other personnel assigned dosimetry?