

2020 Inspection Procedure 71124 Update

Micheal Smith, Health Physicist
NRR/DRA/ARCB
micheal.smith@nrc.gov

David Garmon, Health Physicist
NRR/DRA/ARCB
david.garmon@nrc.gov

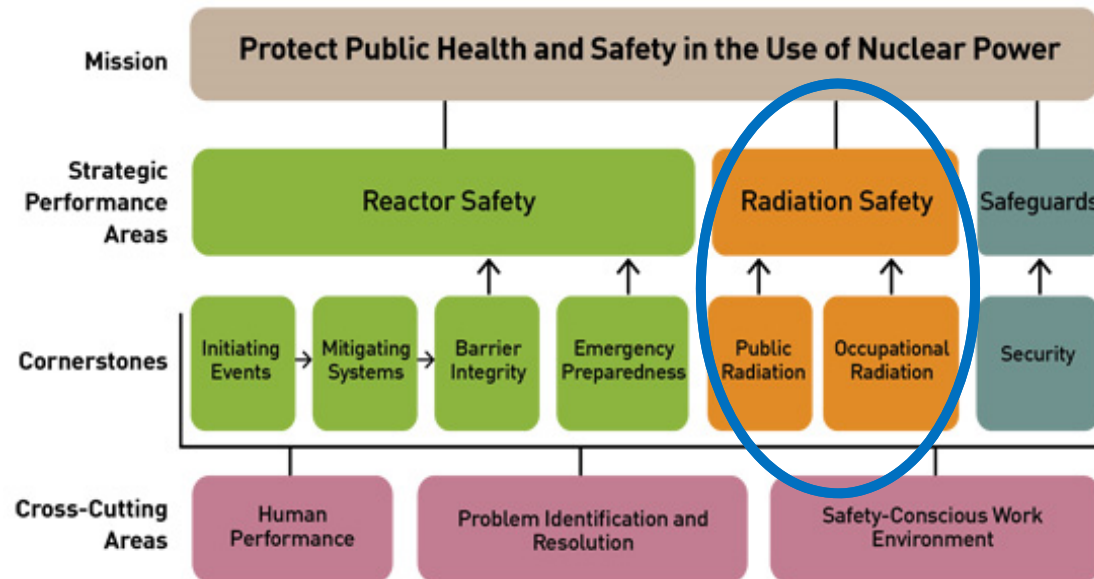
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Agenda

- Background - Radiation Safety Cornerstones Inspection Procedure
- Inspection Procedure (IP) Update Process
- IP Update Snapshot
- Focus Areas
 - ALARA
 - Instrumentation
 - Effluents and Environmental Monitoring
 - Oversight of Part 37
 - Inspection Planning
 - Procedure Formatting
- Schedule Looking Forward
- Feedback/Discussion
- Comments and input from the public

Radiation Safety Cornerstones

Reactor Oversight Framework



Baseline Inspection Procedures

IP Number	Title (%PRS/%ORS)*	Nominal Hours	Inspection Samples
71124	Radiation Safety-Public Occupational	N/A	N/A
71124.01	Radiological Hazard Assessment and Exposure Controls (0%/100%)	36 +/- 4 (annual)	6
71124.02	Occupational ALARA Planning and Controls (0%/100%)**	46 +/- 14 (biennial)	4
71124.03	In-Plant Airborne Radioactivity Control and Mitigation (0%/100%)	16 +/- 4 (biennial)	3
71124.04	Occupational Dose Assessment (0%/100%)	20 +/- 4 (biennial)	4
71124.05	Radiation Monitoring Instrumentation (20%/80%)	32 +/- 4 (biennial)	2
71124.06	Radioactive Gaseous and Liquid Effluent Treatment (100%/0%)	35 +/- 4 (biennial)	5
71124.07	Radiological Environmental Monitoring Program (100%/0%)	29 +/- 4 (biennial)	2
71124.08	Radioactive Solid Waste Processing and Radioactive Material Handling, Storage and Transportation (80%/20%)	34 +/- 4 (biennial)	5

*PRS = Public Radiation Safety Cornerstone; ORS = Occupational Radiation Safety Cornerstone

**Staff has proposed retiring this procedure (with transfer of some of its contents) as part of the ROP Enhancement effort

Inspection Procedure (IP) Revision Process

- Identify which IPs need to be revised based on:
 - Inspection experience
 - Stakeholder feedback
 - Programmatic reviews
- Develop revised procedures through internal collaboration
- Provide external stakeholders an opportunity to preview significant changes (July 23, 2019 public meeting)
- Finalize IPs
- Train staff, as necessary
- Issue final IP

Independence

Clarity

Openness

Reliability

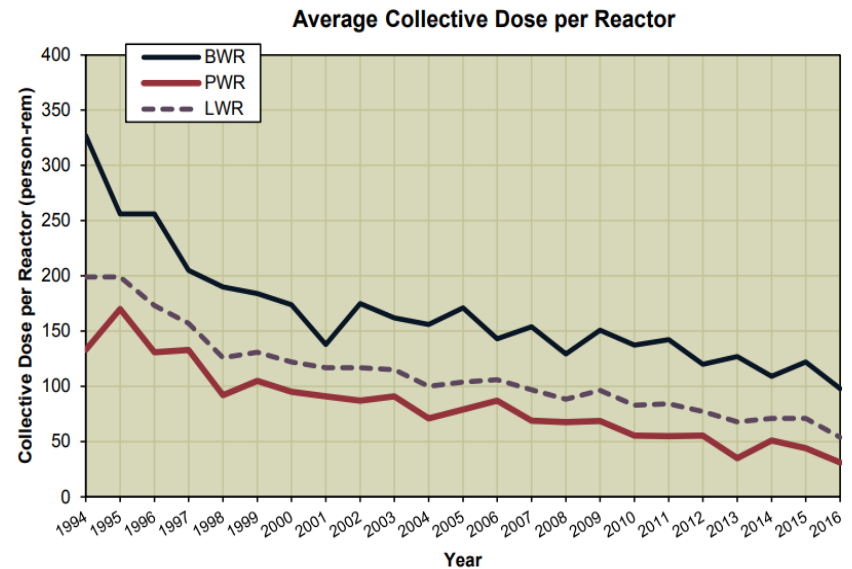
Efficiency

IP 71124 Update – Snapshot

Focus Areas	Proposed Action
ALARA Inspections	Retire dedicated inspection procedure; however, continue performance-based inspection during other inspection efforts *Pending Commission decision
Instrumentation Inspections	No changes
Effluent and Environmental Inspections	Shifting frequency from biennial to triennial; however, maintaining scope, Clarifying intent of groundwater protection program inspections
Oversight of Part 37	Including Part 37 oversight within existing radioactive material control and transportation inspection effort
Inspection Planning	Considering applicability of situational inspections to radiation safety procedures (similar to adverse weather inspections)
Inspection Procedure Format	Procedures will be reformatted to more clearly communicate inspection activities with public and to support streamlining inspection reports

ALARA Considerations

- Persistent downward trend in collective radiation exposure (CRE) per reactor
- CRE is used to facilitate risk-informed oversight
 - A measure of the challenges a program faces
 - Dose limits apply to individual doses not collective doses
- Industry performance as reflected through a combination of inspection outcomes and CRE
- Staff position that baseline inspections in the ALARA area can be reduced from a risk-informed, performance-based perspective



ALARA Inspections – Proposal

Pending Commission approval

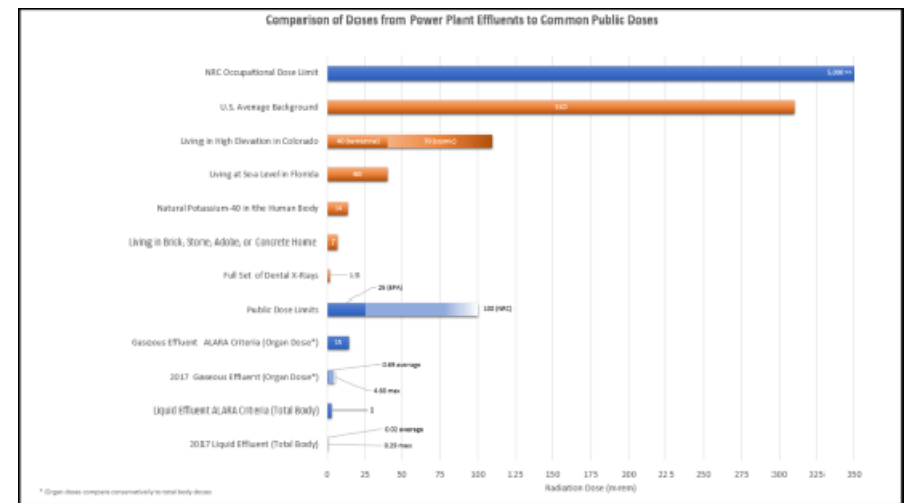
- ALARA planning and controls remains an inspectable area per IMC 0308
- Proposal to retire focused baseline inspection procedure
 - Focuses finite inspection resources in a risk-informed manner
 - Leverages other inspection efforts for performance-based inspection of ALARA
- New approach will emphasize performance
 - Observations of radiation workers
 - Evaluation of licensee planning associated with significant radiological work
 - Evaluation of licensee assessments of discrepancies between planned and actual doses

Instrumentation – Considerations and Proposal

- Considerations
 - Advancements in technology and instrument design have improved radiation detection capability albeit with some added complexity
 - Radiation detection instrumentation is fundamental to radiation protection
 - NRC uses licensee data for oversight
 - Inspections and event response
 - Measurements serve as the basis for risk-informed decisions in oversight and enforcement
- Proposal
 - No change recommended at this time

Effluent and Environmental Monitoring - Considerations

- Nuclear power plant effluents contribute a negligible amount to overall public dose
- Since the advent of the ROP, nuclear power plant effluents have decreased
- NRC inspections verify adequacy of licensee processes in tracking effluents and environmental monitoring
- Licensees report outcomes to NRC annually (posted to our web site)
- Performance Indicator tracks effluent performance



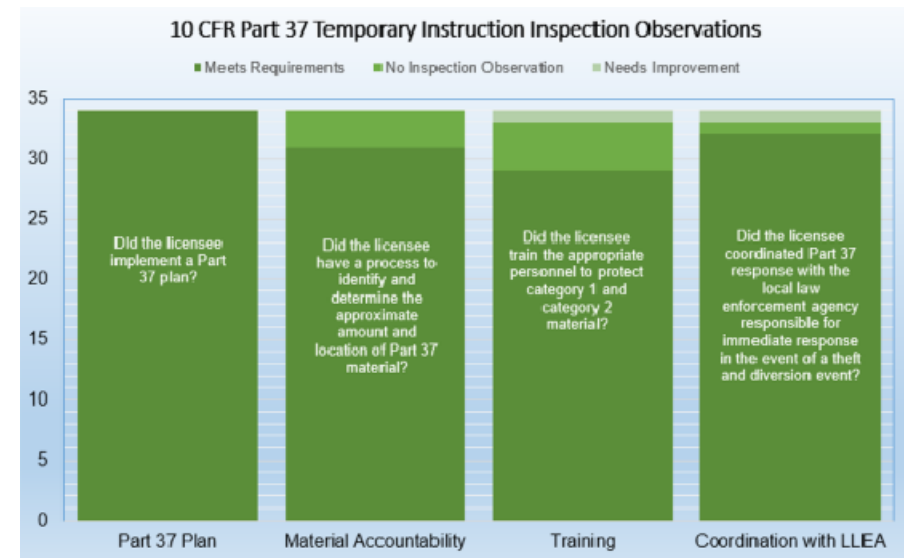
Effluent and Environmental Inspections - Proposal

- Shift inspections of effluents and environmental monitoring from biennial to triennial while maintaining the scope of these inspections the same
- Clarify intent of groundwater protection initiative (GPI) inspections
 - Per Commission direction NRC staff is to monitor GPI implementation at licensees and document incomplete or discontinued elements of the program

NRC will continue inspections of radiological effluents and environmental monitoring in a risk-informed, performance-based manner

Part 37 - Considerations

- Part 37 protects against high consequence, low likelihood events
 - Loss of category 1 or 2 material through theft or diversion
- Observations from 34 site inspections
- Inspection hours
 - 9 hours (median)
 - Dependent on licensee preparedness
- Issues
 - Key control/custody
 - RP and security interface requires investment



Category 1 and category 2 material is secure at U.S. nuclear power plants

Part 37 - Proposal

- Risk-informed, performance-based approach includes limited inspection
- Inspection guidance includes:
 - Consideration of category 1 and 2 material during inspections
 - Consideration of personnel granted unescorted access to category 1 and 2 material versus list of trained personnel
 - Review of licensee's annual access control program review
 - Review of licensee's annual security program review
 - Review of shipping documentation describing preplanning and coordination
 - Consideration of license verification requirements prior to shipping material

Part 37 – Associated Activities

- Mechanisms for dispositioning performance deficiencies under the ROP
 - More-than-Minor guidance
 - Significance Determination Process
- Inspector Training
- Rulemaking Effort

Inspection Planning

- Guidance in IP 71124
 - Emphasize long-term nature of inspection planning and risk-informing when to disposition issues
 - Guidance on when inspection requirements should be completed (outage, non-outage); however, inspectors ultimately have discretion on when to complete inspections
 - Exploring application of situational inspection construct similar to IP 71111.01

Updated Requirement Language Example

IP 71124.08 Rad Waste System Walkdown

02.02 Radioactive Waste System Walk-down (1 Sample)

- a. Select 1-3 liquid or solid radioactive waste processing systems. Walk down accessible portions of systems to verify that the current system configuration and operation agree with the descriptions in the FSAR, Offsite Dose Calculation Manual (ODCM), process control program (PCP) and, if applicable, vendor manuals, diagrams and procedures.
- b. If applicable, select radioactive waste processing equipment that is not operational, or abandoned in place, or both, and verify that the licensee has established administrative, or physical controls, or both, to ensure that the equipment will not contribute to an unmonitored release path, or affect operating systems, or be a source of unnecessary personnel exposure.
- c. Review the adequacy and impact on radiation doses (public and occupational) of any changes made to the radioactive waste processing systems since the last inspection. Verify that changes from what is described in the FSAR were reviewed and documented as required, and, if applicable, that the licensee has reviewed the safety significance of systems and equipment abandoned in place.

If the licensee uses a vendor to perform onsite waste handling or processing, verify that any changes in the system configuration were made in accordance with vendor manuals, diagrams and procedures.

- d. Select 1-3 processes for transferring radioactive waste resin and/or sludge discharges into shipping/disposal containers. Verify that the waste stream mixing, sampling procedures, and methodology for waste concentration averaging are consistent with the PCP, and provide representative samples of the waste product for the purposes of waste classification
- e. For those systems that provide tank recirculation, verify that the tank recirculation procedure provides sufficient mixing.

03.02 Radioactive Waste System Walk-Down Sample

Walkdown accessible portions of a radioactive waste system and verify that the selected system is correctly configured and able to perform its intended function.

Specific Guidance

- a. If applicable, select radioactive waste processing equipment that is not operational, or abandoned in place and evaluate licensee controls to ensure that the equipment will not contribute to an unmonitored release path, affect operating systems, or be a source of unnecessary personnel exposure. Potential administrative controls include drainage and isolation of the system from other systems.
- b. Review the adequacy and impact on radiation doses (public and occupational) of any changes made to the radioactive waste processing systems since the last inspection. Consider if changes from what is described in the FSAR were reviewed and documented as required, and, if applicable, that the licensee has reviewed the safety significance of systems and equipment abandoned in place.
- c. Consider if the waste stream mixing, sampling procedures, and methodology for waste concentration averaging are consistent with the PCP, and provide representative samples of the waste product for the purposes of waste classification
- d. For those systems that provide tank recirculation, inspect if the tank recirculation procedure provides sufficient mixing. Generally, a minimum of three volumes of mixing is provided. See ASTM D3370-10, "Standard Practices for Sampling Water from Closed Conduits" section 11.4 for tank recirculation information and section 12.2 for sample line flushing.
- e. The licensee's PCP should correctly describe the current methods and procedures for dewatering and waste stabilization. The PCP should be included in the ODCM or other documents maintained by the plant. Consider the removal of freestanding liquid. If the licensee uses a vendor to perform dewatering and waste stabilization, inspect the methods and procedures to assure compliance with vendor manuals, diagrams and procedures.

Proposed Baseline Inspection Procedures

Changes in red

IP Number	Title (%PRS/%ORS)*	Nominal Hours	Minimum Inspection Samples	Inspection Requirements	Revised Minimum Inspection Samples
71124	Radiation Safety-Public Occupational	N/A	N/A	N/A	N/A
71124.01	Radiological Hazard Assessment and Exposure Controls (0%/100%)	36 +/- 4 (annual)	6	6	10
71124.02	Occupational ALARA Planning and Controls (0%/100%)**	0	N/A	N/A	0
71124.03	In-Plant Airborne Radioactivity Control and Mitigation (0%/100%)	16 +/- 4 (biennial)	3	4	4
71124.04	Occupational Dose Assessment (0%/100%)	20 +/- 4 (biennial)	4	4	4
71124.05	Radiation Monitoring Instrumentation (20%/80%)	32 +/- 4 (biennial)	2	2	15
71124.06	Radioactive Gaseous and Liquid Effluent Treatment (100%/0%)	35 +/- 4 (triennial)	5	5	11
71124.07	Radiological Environmental Monitoring Program (100%/0%)	29 +/- 4 (triennial)	2	3	3
71124.08	Radioactive Solid Waste Processing and Radioactive Material Handling, Storage and Transportation (80%/20%)	34 +/- 4 (biennial)	5	5	8

*PRS = Public Radiation Safety Cornerstone; ORS = Occupational Radiation Safety Cornerstone

**Staff has proposed retiring this procedure (with transfer of some of its contents) as part of the ROP Enhancement effort

Looking Forward

- **IP 71124 Procedure Revision**
 - Commission Notification (October 2019)
 - Final Procedures Published (December 2019)

- **ROP Enhancement SECY (June 2019)**
 - Currently under consideration by Commission

Discussion/Feedback

Questions/Comments?

Micheal Smith, Health Physicist
NRR/DRA/ARCB
micheal.smith@nrc.gov
(301) 415 – 3673

David Garmon, Health Physicist
NRR/DRA/ARCB
david.garmon@nrc.gov
(301) 415 – 3512

71124.01 RADIOLOGICAL HAZARD ASSESSMENT AND EXPOSURE CONTROLS

03.01 Radiological Hazard Assessment

Verify that the licensee is identifying the magnitude and extent of radiation levels, concentrations and quantities of radioactive materials, and has adequately assessed the radiological hazards.

03.02 Instructions to Workers Sample

Verify that workers are instructed in plant-related radiological hazards and the radiation protection requirements intended to protect workers from those hazards.

03.03 Contamination and Radioactive Material Control

Verify the licensee controls radioactive material and prevents the spread of contamination.

03.04 Radiological Hazards Control and Work Coverage Sample

Verify the license controls radiological hazards during radiological work.

03.05 High Radiation Area and Very High Radiation Area Controls Sample

Verify the licensee controls HRAs and VHRA's per applicable requirements.

03.06 Radiation Worker Performance and Radiation Protection Technician Proficiency Sample

Verify adequate radiation worker and radiation protection technician performance with respect to radiation protection requirements.

71154.03 IN-PLANT AIRBORNE RADIOACTIVITY CONTROL AND MITIGATION

03.01 Permanent Ventilation Systems Sample

Verify permanently installed ventilation systems used to mitigate the potential for airborne radioactivity are correctly configured to perform their intended function.

03.02 Temporary Ventilation Systems

Verify that a temporary ventilation system used to mitigate the potential for airborne radioactivity is correctly configured to perform its intended function.

03.03 Use of Respiratory Protection Devices Sample

Verify that the licensee's use of respiratory protection devices to limit the intake of radioactive material meets the requirements of an adequate respiratory protection program.

03.04 Self-Contained Breathing Apparatus for Emergency Use Sample

Verify that personnel who are required to use SCBAs are properly fitted, trained and qualified in their use and that the licensee has the capability to properly stock and maintain the SCBAs.

71124.04 OCCUPATIONAL DOSE ASSESSMENT

03.01 Source Term Characterization Sample

Verify the licensee has adequately characterized the types and energies of radiation being monitored, to include the proper application of scaling factor techniques, when characterizing radioactive source terms.

03.02 External Dosimetry Sample

Verify the licensee processes, stores and uses external dosimetry such that assigned occupational doses are representative of actual plant exposures.

03.03 Internal Dosimetry Sample

Evaluate the adequacy of the licensee's internal dose assessments actual internal exposures.

03.04 Special Dosimetric Situations Sample

For the following special situations evaluate how the licensee assigns occupational doses: skin exposures, exposures to the lens of the eye, declared pregnant workers, application of effective dose equivalent for external exposure methodologies, and neutron exposures.

71124.05 RADIATION MONITORING INSTRUMENTATION

03.01 Walkdowns and Observations Sample

Verify, using walkdowns and observations, that radiation detection instrumentation in use, or available for use, can fulfill its intended function.

03.02 Calibration and Testing Program Sample

Verify that the calibration and testing of a radiation monitoring instrument is adequate.

71124.06 RADIOACTIVE GASEOUS AND LIQUID EFFLUENT TREATMENT

03.01 Walk Downs and Observations Sample

Walk down selected effluent monitoring, ventilation and discharge systems to verify that the current system configurations, flow paths and operation are consistent with the descriptions in the FSAR, ODCM, and site procedures.

03.02 Calibration and Testing Program Sample

Verify effluent monitoring and flow measurement instrumentation are appropriately calibrated and/or tested and that monitor alarm set points are established consistent with applicable procedures.

03.03 Sampling and Analyses Sample

Verify representative samples are obtained and that, if applicable, compensatory sampling is done consistent with the ODCM.

03.04 Dose Calculations Sample

Evaluate licensee calculations of doses resulting from effluent activities and confirm that projected doses to members of the public are within 10 CFR Part 50, Appendix I numerical guides.

03.05 Abnormal Discharges Sample

Verify that abnormal gaseous and liquid discharges, which occurred since the last inspection, were evaluated for the impact to the public.

71124.07 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

03.01 Environmental Monitoring Equipment and Sampling Sample

Verify licensee environmental monitoring equipment is properly located, calibrated and maintained and observe the collection of environmental samples.

03.02 Radiological Environmental Monitoring Program Sample

Verify that the radiological environmental monitoring program is being implemented consistent with the regulations and ODCM.

03.03 Groundwater Protection Initiative Implementation Sample

Document incomplete or discontinued elements of the licensee's Groundwater Protection Initiative program [C1].

71124.08 RADIOACTIVE SOLID WASTE PROCESSING AND RADIOACTIVE MATERIAL HANDLING, STORAGE, AND TRANSPORTATION

03.01 Radioactive Material Storage and Control Sample

Verify radioactive materials in storage are controlled, labelled and secured against unauthorized removal.

03.02 Radioactive Waste System Walk-Down Sample

Walkdown accessible portions of a radioactive waste system and verify that the selected system is correctly configured and able to perform its intended function.

03.03 Waste Characterization and Classification Sample

Verify the licensee characterizes and classifies radioactive waste.

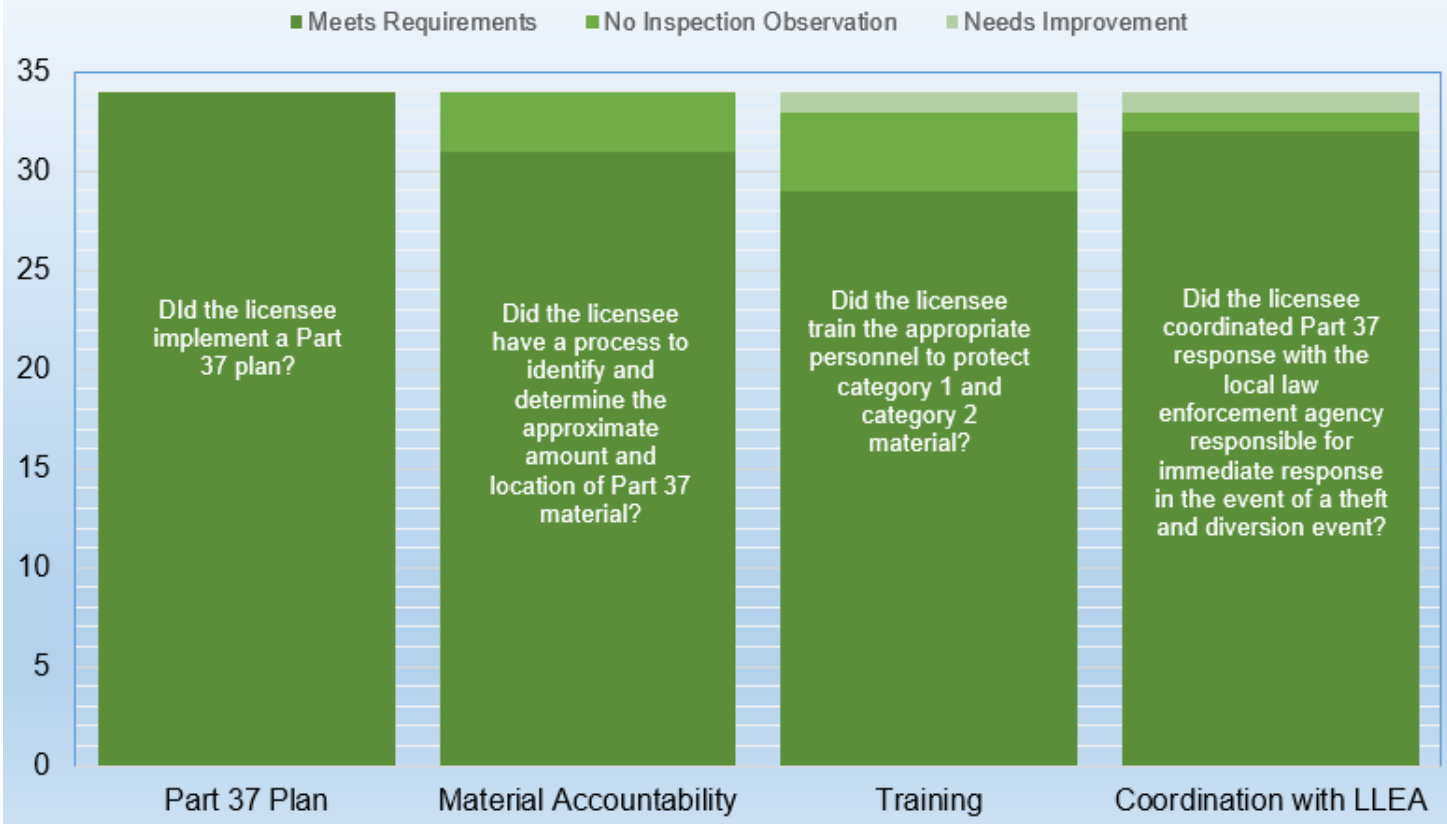
03.04 Shipment Preparation Sample

Verify a shipment containing radioactive material is prepared according to requirements.

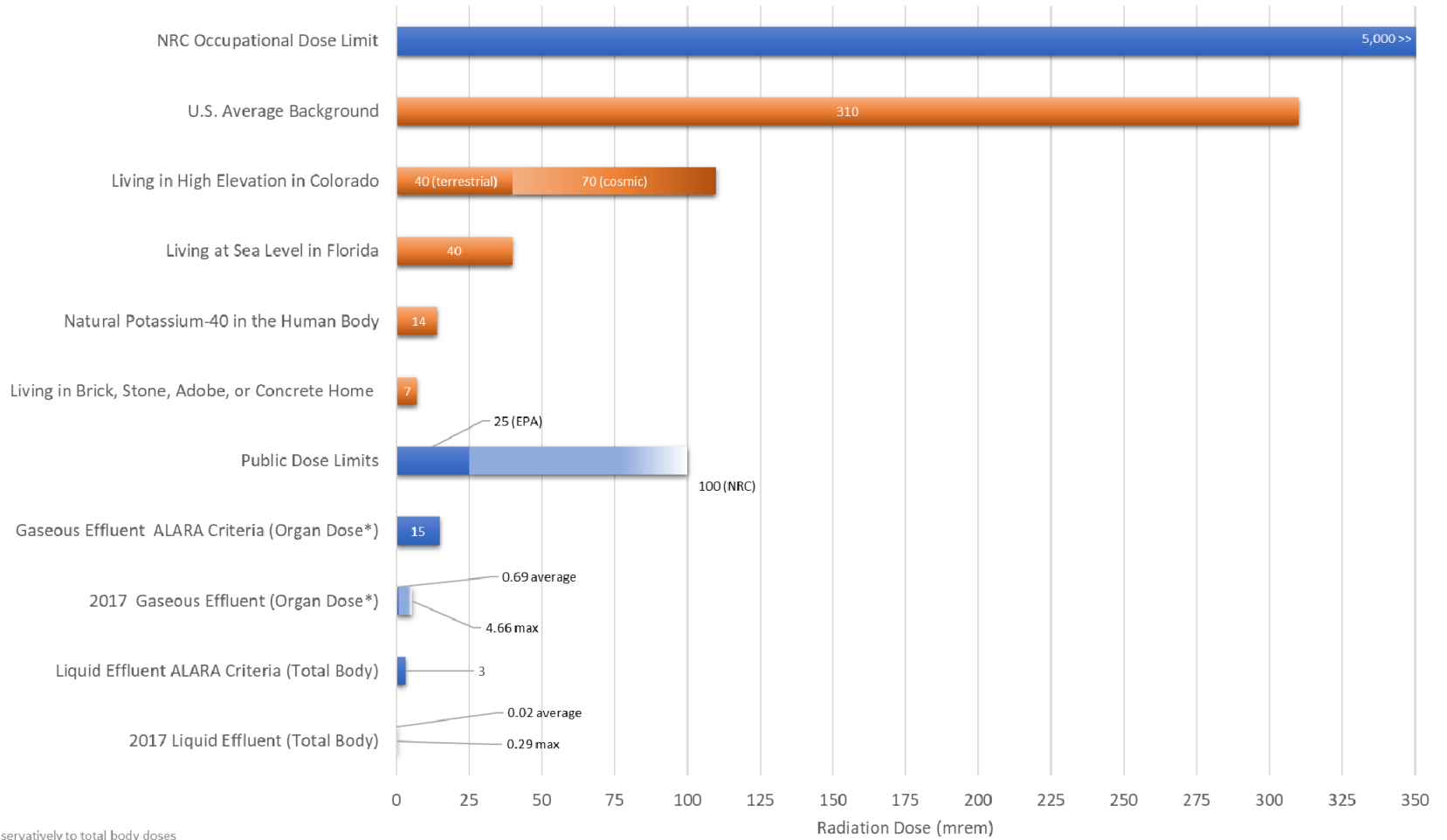
03.05 Shipping Records Sample

Verify adequacy of non-excepted package shipments through record review.

10 CFR Part 37 Temporary Instruction Inspection Observations



Comparison of Doses from Power Plant Effluents to Common Public Doses



* Organ doses compare conservatively to total body doses