



# Industry Perspectives on Comprehensive Review of Radiation Safety Strategic Performance Area

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# Industry Focus Areas

- Performance Indicators (PIs) & Low-Level Data Insights
- Baseline Inspection Program & Procedures
- More-than-Minor Threshold Criteria & Licensee Credit
- Radiation Safety Significant Determination Process (SDP)

# Considerations for Radiation Safety Cornerstone Updates

## Align with Revised Radiation Protection Framework

- Updates to the ROP Radiation Safety Cornerstones should reflect any changes from the NRC's reconsideration of the Radiation Protection Framework.

## Limit Resource Inefficiencies

- Use of “new” data should rely on information already available to the NRC, avoiding additional resource demands on the industry or NRC.

## Promote Risk-Informed Oversight

- Outcomes should support a more performance-based, risk-informed oversight approach that effectively considers radiological risks.

# Refining Performance Indicators (PIs)

## Avoid Redundant Oversight Activities

- Inspection activities should not duplicate existing PIs.

## Public Radiation Safety Cornerstone PIs

- Ongoing rulemaking efforts should inform revisions to performance indicators, as appropriate.

## Occupational Radiation Safety Cornerstone PIs

- Only actual unintended exposures in LHRAs or VHRAs should trigger PI occurrences.
  - ◆ A reasonable threshold for unintended exposures should be considered for PI occurrences.

# Use Low-Level Data to Optimize Radiation Safety Inspections

- Data currently available to the NRC should be leveraged to optimize the scope of radiation safety inspections.
- Available data can be used to inform whether certain inspections continue to be appropriate or if they can be performed remotely.
- Inspection guidance should be revised to allow inspectors to adjust inspection resources and activities based on data-driven insights, and consider whether remote inspection is sufficient.
- Much of the data and insights that can inform NRC inspection samples, may be captured in a licensee's log entries (Ops, RP, OCC, etc.), and corrective action program.

# Potential Occupational Radiation Safety Low-Level Data Examples

## 1. Special Dosimetric Situations & Inaccurate Dose Assessments

- Special dosimetric situations are infrequent and should only involve detailed review if there are issues.
- Observations can be performed during outages, with data available for review during remote inspections.
- Inspection Requirement to Review: 71124.04 03.04 (Special Dosimetric Situations)

## 2. Electronic Dosimeter Alarms or Noncompliance Procedures

- Electronic dosimetry & remote monitoring are effective tools that help alert workers of unexpected conditions, enhancing awareness with real-time responses.
- In the absence of alarms, etc., this should be considered an indication that worker performance and job planning are reasonably effective and appropriate.
- Inspection Requirements to Review:
  - ◆ 71124.01 03.02 (Instructions to Workers)
  - ◆ 71124.01 03.05 (HRA and VHRA Controls)
  - ◆ 71124.01 03.06 (Rad Worker Performance and RP Technician Proficiency)

# Potential Occupational Radiation Safety Low-Level Data Examples Cont'd.

## **3. Inappropriate Use of Respiratory Protection Equipment or Engineering Controls**

- Industry acknowledges that effective respiratory protection programs are critical for both radiological control and overall industrial safety.
- Issues such as unintended intakes will indicate ineffective use of respiratory protection or engineering controls; and program related data reviews can be done remotely, if needed.
- Inspection of these technical areas should be considered if issues result in unintended exposures exceeding 100 mrem.
- Inspection Requirements to Review: IP 71124.03

## **4. Issues with Portable Instrumentation and Equipment Monitors**

- These programs are generally stable and aligned with established industry standards.
- Deviations from these standards due to major program changes may warrant inspection.
- Inspection Requirements to Review: IP 71124.05

# Potential Public Radiation Safety Low-Level Data Examples

## 1) Ineffective Shipment Preparation and Paperwork

- Ineffective shipment preparation or documentation is often first identified by the receiving facility.
- Many portions of existing shipping inspection activities can be performed remotely.
- Inspection of shipping paperwork should be limited to cases involving inaccurate survey or documentation that may have impact on the ability of first responders to respond effectively.
- RAM shipment breaches also signal deficiencies in preparation practices.
- Shipping inspection should focus on risk-significant shipments.
- Inspection Requirements to Review: IP 71124.08

## 2) Rad Material Control Events

- Inadequate control of radioactive material (RAM) is often indicated by personnel and portal monitors before the material exits the restricted area.
- Inspections may be warranted in cases involving contamination control events, such as multiple Level 3 Personnel Contamination Events (PCEs) where dose is assigned.
- Inspection Requirements to Review: IP 71124.08



# Potential Public Radiation Safety Low-Level Data Examples

## 3) Environmental (REMP) & Effluent (RETS) Programs

- Walkdowns of effluent radiation monitors and REMP sampling sites remain important, but should be scheduled outside of outages, or aligned with calibration of safety significant monitors.
- Much of REMP and RETS program inspection scope can be completed remotely, since these inspections involve a lot of data and document reviews.
- Voluntary Groundwater Protection Initiative Reports can help inform whether groundwater program inspections are warranted.
- Data Sources
  - ◆ Several missed environmental or effluent samples
  - ◆ Significant calculation errors
  - ◆ Extended periods when required effluent/REMP equipment is out of service without compensatory measures during releases
  - ◆ Anomalous environmental dosimetry results
  - ◆ Several abnormal releases
- Inspection Requirements to Review: IPs 71124.06 & 71124.07

# Inspection Procedure Insights

- Update Inspection Procedure 71124 Attachments to support a more risk-informed performance-based approach to radiation safety inspections. Key considerations being:
  - Aligning inspection resource allocations with licensee performance across radiation safety inspections areas.
  - Identifying inspection requirements that are reasonable for remote inspection.
  - Reconsidering inspection requirements based on risk-significance, strong licensee performance, and available low-level data.
- Re-evaluate inspection frequencies and resources based on:
  - Industry performance trends
  - Understanding of radiation risks
  - Appropriateness of remote inspections and available low-level data
- Develop a standardized, risk-informed outage inspection procedure. This will:
  - Enhance inspection predictability and efficiency
  - Promote consistency across NRC regions

# Alternative Structures for Radiation Safety Inspection Procedures

## Example 1: Outage, Onsite, & Remote

- Outage Inspection
- Onsite Programs and Observations
- Offsite (*Remote*) Programs and Data Review

## Example 2: Outage & Cornerstone Grouping

- Outage Inspection
- Occupational Radiation Safety Inspections\*
- Public Radiation Safety Inspections\*

\*Mix of onsite and remote inspections

# Reevaluating More-than-Minor (MTM) Thresholds

- Reassess MTM examples in IMC 0612, Appendix E to ensure alignment with a risk-informed approach that reflects radiological and program risk-significance.
- Consider reasonable consequence thresholds (*e.g.*, *100 mrem*) where appropriate that are reflective of a programmatic barrier being ineffective.
- Provide appropriate credit for industry's use of electronic dosimetry, including consideration of defining that indications from electronic dosimetry are licensee-identified instead of self-revealing.
- Improve clarity and predictability of MTM determinations to promote consistent dispositioning of issues.

# Refining Radiation Safety Significance Determination Processes (SDPs)

- Reassess the SDPs as needed, to align with any outcomes of the NRC's ongoing wholesale rulemaking effort.
- Ensure the SDP outcomes appropriately reflect risk significance and consistency.
- Reevaluate the need for the ALARA work planning and controls portion of the Occupational Radiation Safety SDP.
  - Significantly ineffective work controls are already demonstrated by actual or substantial potential for overexposures, which the SDP currently reflects with appropriate risk significance.
- Consider further clarifying criteria for dispositioning findings involving:
  - Substantial potential for overexposure
  - Compromised ability to assess dose

# Conclusions

- This effort presents a valuable opportunity to modernize the Radiation Safety Cornerstones to better reflect current risk-informed thinking, and 25 years of operational experience.
- Risk-informed enhancements to inspection procedures and significance determination processes can improve regulatory efficiency while maintaining robust protection of workers, the public, and the environment.
- Increased use of existing data and remote inspection practices can help optimize resource allocation for both the NRC and licensees without reducing safety.
- Opportunities exist to align oversight efforts with demonstrated licensee performance, focusing regulatory attention where it yields the greatest safety benefit.

# Thank You!

