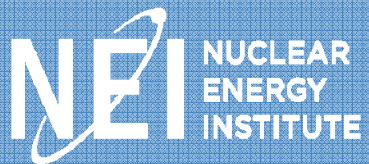


NRC Public Meeting: 2020  
Inspection Procedure 71124

Ellen Anderson  
Director, Radiation Safety

May 30, 2019





# Overview

- Industry views pertinent to the NRC review
- Industry performance relevant to the eight RP inspection procedures



# Industry performance is strong

- Industry RP program performance remains strong
  - 92% of RP findings between May 2015 and May 2019 are very low safety significant (green)
- RP programs are mature and robust; best practices, including operational experience, are widespread and freely shared.
- Technology employed in RP programs has improved since the ROP began
  - Instruments and dosimetry can detect much lower levels of radiation and exposure than ever before

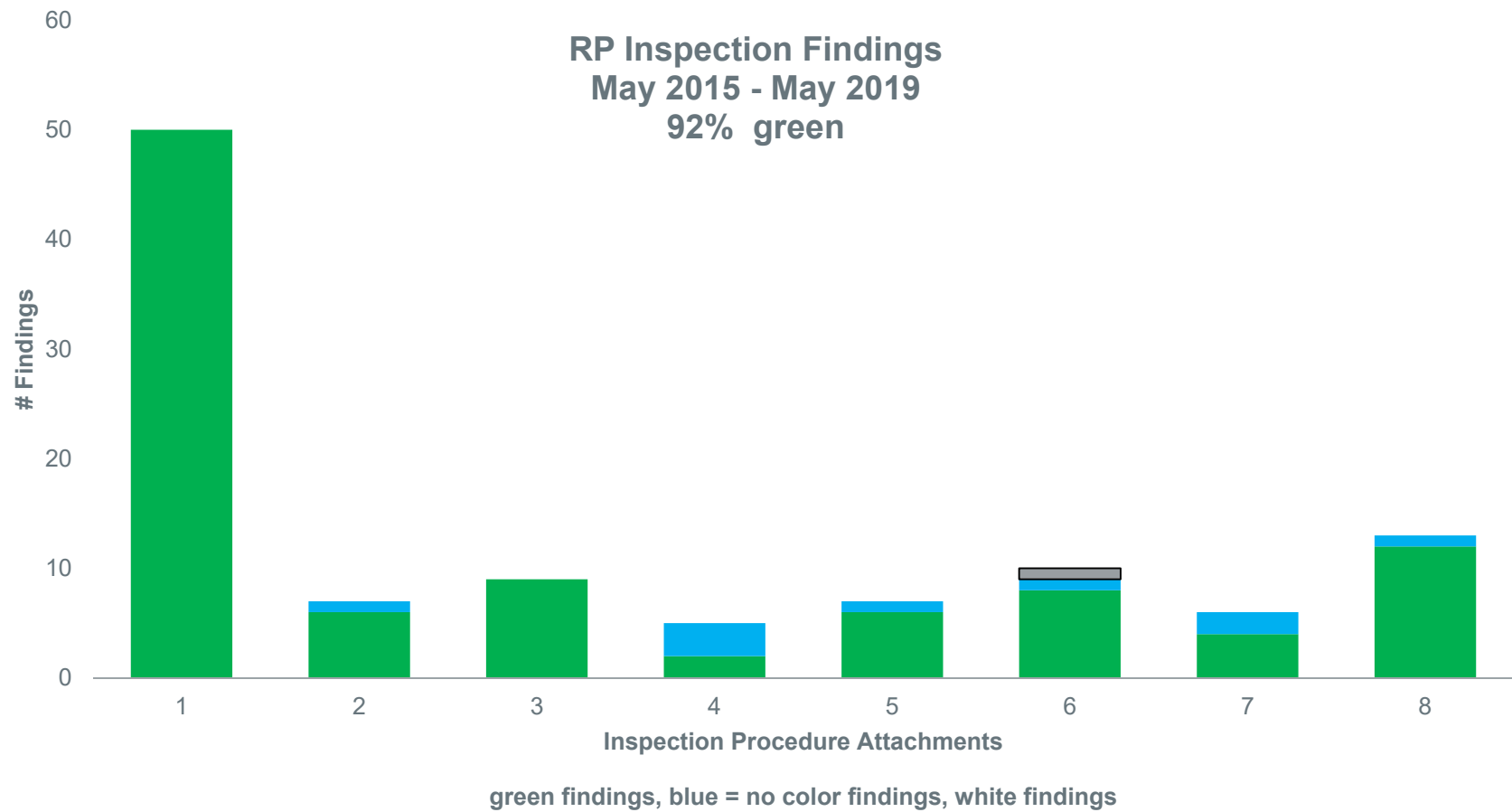


# Industry performance warrants comprehensive rethinking of RP inspections

- Inspection frequencies should be extended and inspection sample sizes should be reduced.
- NRC review should use similar approach to that used for review of Engineering inspection suite
  - Various aspects of Electronic Alarming Dosimeters (EADs) are inspected in the 4 attachments (01, 02, 04, 05);
  - RP-related PI&R is inspected multiple times: all attachments, by Sr. Resident inspectors, and the Biennial PI&R Team Inspection
- Rethink the meaning of “samples” in RP inspection procedures; current use is not a good proxy for the actual level of effort involved.



# RP Inspection Findings May 2015 - May 2019







# IP 71124.01 Radiological Hazard Assessment and Exposure Controls

- Technological innovation and industry's use of improved instrumentation have assisted station RP staff & workers in early identification of unauthorized high radiation area (HRA) entries. For example:
  - Use of on Electronic Alarming Dosimeters (EADs) and the establishment of low dose and dose-rate set points have cautioned workers about unanticipated radiological conditions due to:
    - ◆ Entry into unauthorized areas
    - ◆ Changed radiological conditions
- Workers responded to set point alarms from these non-regulatory, ALARA tools by immediately leaving the areas and reporting to RP.
- Worker response to this technology has resulted in minimal radiation exposure.
- 47% of the overall findings for the 4-year period



# Inspection Planning

- Burdensome
  - Onerous document requests
    - ◆ To reduce licensee burden, consider requesting only risk significant items
  - Grouping of several inspection areas using a team inspection approach
  - Time-consuming and distraction to RP staff to support inspections – especially during outages
  
- Feedback from RP Managers:
  - Region I: Roy Miller, PSEG
  - Region II: Steve Taylor, Southern Nuclear
  - Region III: Willie Harris, Exelon
  - Region IV: Johann Geyer, Ameren



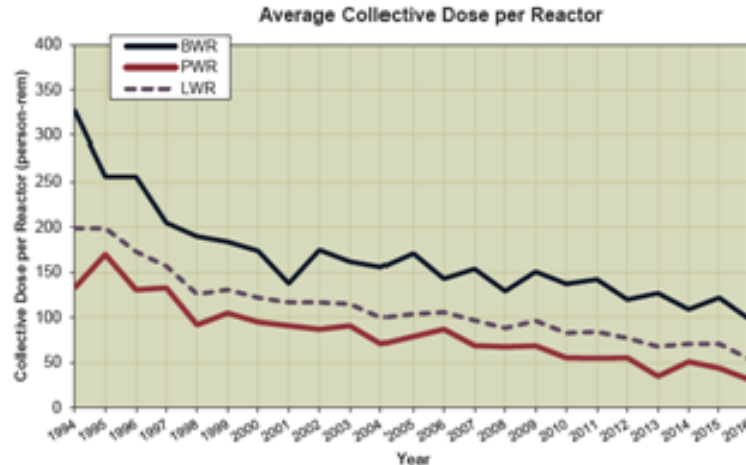
# Conclusions

- Most findings are already captured in licensees' corrective action programs.
- NRC should use this unique moment to comprehensively, holistically review the RP inspection suite.
  - Do this right. Take the time to do a quality review.
- A properly reformed RP inspection suite should help:
  - Leverage licensees' strong RP program performance and advances in technology to optimize RP oversight;
  - Reduce the burden on NRC and licensees for inspection planning and preparation;
  - Reduce the impacts on licensees during outages; and
  - Focus NRC resources on the most risk significant aspects during the most risk significant period of time.



# IP 71124.02 Occupational ALARA Planning and Controls

- Trends in collective radiation dose, as shown in NUREG-0713, continue to demonstrate strong and effective ALARA performance and philosophies



- ALARA program controls are defined in licensee procedures.
- Inspections of industry ALARA programs resulted in six green or low-safety significant finding and one no-color finding.
- 7% of the overall findings for the 4-year period.



## IP 71124.03 In-Plant Airborne Radioactivity Control and Mitigation

- In the 4-year period, NRC identified nine low-safety significance (green) findings:
  - Licensees failed to maintain or adequately follow station procedures.
  - 8% of the overall findings for the 4-year period.



## IP 71124.04 Occupational Dose Assessment

- In the 4-year period, NRC identified two low-safety significance (green) & three no-color findings:
  - Licensees failed to follow station procedures.
  - 5% of the overall findings for the 4-year period.



# IP 71124.05 Radiation Monitoring Instrumentation

- Technological innovation and industry's use of improved instrumentation have assisted station RP staff in the accurate detection of radiation and radioactive material:
  - New instrument designs have eliminated moving parts and other similar factors that were prone to failure, converting to digital components that are rugged and reliable.
  - New instrument employ self-diagnostics software to continuously assess instrument performance and take appropriate actions to ensure measurement quality, including placing itself out of service.
  - Mature industry procedures and practices have resulted in sustained program excellence, experiencing very low instrument failure rates (0.27%, EPRI 0421207).
- In the 4-year period, NRC identified seven findings: six low-safety significance (green) and one no-color finding for instrument calibration issues.
- 7% of the overall findings for the 4-year period.

# IP 71124.06 Radioactive Gaseous and Liquid Effluent Treatment

- As a result of improved radioactive effluent control programs, the amount of activity of gaseous & liquid radioactive effluents has steadily decreased over time. In the last decade:
  - noble gas effluent radioactivity from PWRs has decreased by a factor of ten and BWRs have decreased by a factor of five; and
  - mixed fission and activation product radioactivity in liquid effluents has also decreased nearly ten times at BWRs and one-half at PWRs.

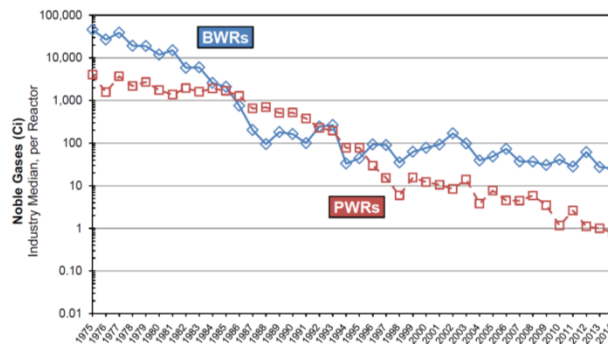


Figure 3.15 Long-Term Trend in Noble Gases in Gaseous Effluents

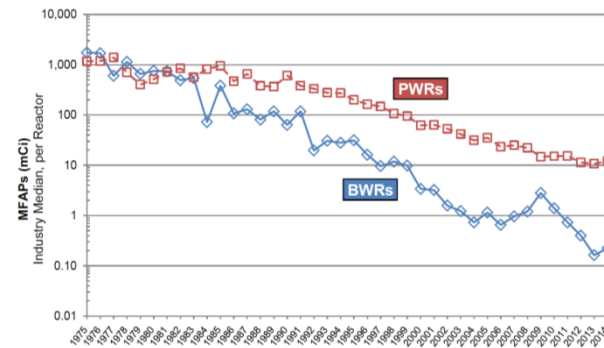


Figure 3.16 Long-Term Trend in MFAPs in Liquid Effluents

- In the 4-year period, there were eight very low safety significant (green) findings; one no-color and one low-to-moderate safety significant (white) finding for a legacy instrument issue.
- 9% of the overall findings for the 4-year period.



## IP 71124.07 Radiological Environmental Monitoring Program

- In the 4-year period, NRC identified six findings:
  - 4 low-safety significant (green) findings and
  - 2 no-color findings.
- All findings were station procedure non-compliances.
- 5% of the overall findings for the 4-year period.





## IP 71124.08 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

- In the 4-year period, NRC identified thirteen findings:
  - 12 low-safety significant (green) findings and
  - 1 no-color finding.
- All findings were diverse in cause and did not jeopardize public health and safety.
- 12% of the overall findings for the 4-year period.