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Update on NRR Radiation Protection Activities - Overview

Kevin Hsueh, Chief

Radiation Protection and Consequence Branch
Division of Risk Assessment
Office of Nuclear Reactor Regulation

2018 NEI Radiation Protection Forum
July 30, 2018

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Radiation Protection & Consequence (RP&C) Branch Responsibilities

- NRR program office for radiation protection and radiological accident consequence assessment
- Guidance development and technical reviews of licensing applications
- NRR Reactor Oversight Process (ROP) implementation for occupational & public radiation protection cornerstones

RP&C Branch

Kevin Hsueh, Chief

• Steve Garry	Sr. Health Physicist
• David Garmon	Health Physicist
• Manuel Jimenez	Health Physicist
• Micheal Smith	Health Physicist
• Jerry Dozier	Sr. Reliability & Risk Analyst
• Mark Blumberg	Sr. Reactor Engineer
• John Parillo	Sr. Reactor Engineer
• Kristy Bucholtz	Reactor Engineer
• Elijah Dickson	Physical Scientist

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NRC Regional Staff Present

- R I Ray Powell — Branch Chief
- R I Harry Anagnostopoulos — Sr. Health Physicist
- R II Wade Loo — Sr. Health Physicist
- R II Bill Pursley — Health Physicist
- R III Hironori Peterson — Branch Chief
- R III Valerie Myers — Sr. Health Physicist
- R III Peter Lee — Reactor Decommissioning Inspector

Line of NRR Management

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Office of Nuclear Reactor Regulation
Director: Brian Holian (Acting); Ho Nieh (August 2018)
Deputy Director: Laura Dudes (Acting)
Deputy Director: Michele Evans

Division of Risk Assessment
Director: Mike Franovich
Deputy Director: Russell Felts

Radiation Protection & Consequence Branch
Chief: Kevin Hsueh

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NRC Transformation Initiative

- Identify potential transformative changes to further enhance regulatory framework to respond to technology changes

- Timeline (2018)
  - Transformation team formed (Jan)
  - Outreached to stakeholders & develop Commission Paper (Feb - May)
  - SECY-18-0060 issued (May)

NRR/NRO Merger

- Ongoing efforts to plan and prepare for the merger
- Complete the merger by September 30, 2020 as directed by the Commission
- Increase cooperation and interaction with Radiation Protection and Consequence staff in NRO

Regulatory Guides

- Final RG issued this year
  - RG 8.7 on Recording & Reporting Occupational Radiation Dose Data, Rev 4
- Draft RG issued/to be issued this year
  - RG 1.8 on Qualification & Training of Personnel, Rev 4
  - RG 4.13 on Environmental Dosimetry, Rev 2
- Draft RG to be issued in 2019
  - RG 8.34 on Monitoring Criteria to Calculate Radiation Doses, Rev 1

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Rulemaking Related Activities

- Power Reactor Decommissioning (ongoing)
- Part 37 Revision (upcoming)

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Reactor Oversight Process Update

- HP Inspection Procedures
- Transportation Significance Determination Process (SDP)
- HP Positions (HPPOS)

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Accident-Range Effluent Monitors

- Accident-range gaseous effluent monitors installed after TMI
- Share information on calibration of accident-range gaseous effluent monitors
- Evaluate the need for issuing guidance or generic communications

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Focus Areas - Actions Ongoing

- Safety Mission Informed by Risk Insights
- Knowledge Management
- Continuous Improvements/Open to feedback

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Update on NRR Radiation Protection Activities – Selected Topics I

Dave Garmon, Health Physicist

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Agenda

- Inspection Procedure Update
- Significance Determination Process Update
- Health Physics Positions
- Regulatory Guides
  - RG 8.7
  - RG 1.8

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Inspection Procedure 71124.01-.08

- Administrative changes
- Amplifying guidance on inspection of sealed sources
- Reduced average hours and range for ALARA inspections (8 hour reduction over 2 years)
- Changes to high-range effluent monitoring inspection requirement and guidance

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Significance Determination Process (SDP)

- How the NRC evaluates the significance of inspection findings
- One SDP per Cornerstone
  - IMC 0609 Appendix C – Occupational
  - IMC 0609 Appendix D – Public
- Update to IMC 0609 App D available for public comment until September 21, 2018
  - ADAMS Accession No. ML18178A100
- Technical basis document, IMC 0308 App D

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Significance Determination Process (SDP)

- Address use of incorrect packaging in radioactive material shipments
- Efforts to Risk-Inform other areas of SDP:
  - Performance deficiencies involving correctly classified excepted packages are minor (i.e. not findings)
  - Added discretion concerning accessibility of package surfaces
  - Consideration of average radiation levels across a detector probe area to risk-inform small areas of high radiation level on package surfaces
  - Treatment of breaches of <Type A packages

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Health Physics Positions (HPPOS)

- Publicly available collection HP-related positions
  - NRC Home Page > About NRC > Radiation Protection > How NRC Protects You > Health Physics Positions Based on 10 CFR Part 20
- Re-establishing program later this year (2018)
- Knowledge management tool
  - Not used to develop new staff positions
  - Only used to catalog established positions
- Leverage existing agency processes to establish staff positions (e.g., generic comms, regulatory guides, OGC no-legal objection)
  - Ensures proper vetting and protection against inadvertent backfitting

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Regulatory Guide 8.7, Rev 4

- Title: Instructions for Recording and Reporting Occupational Radiation Dose Data
- Revision 4 published May 2018
- Licensees do not have to consider prior occupational dose from another licensee in the current year when performing a prospective dose evaluation to determine the need to monitor

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Regulatory Guide 1.8, Rev 4

- Title: Qualification and Training of Personnel for Nuclear Power Plants
- Goal of endorsing ANSI/ANS 3.1, 2014 (with exceptions)
- Currently resolving comments from public comment period

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Looking Forward

- Reactor Oversight Process Monthly Meeting
  - Public venue that is suitable for discussing RP-related oversight issues
  - Concerted effort over recent years to inject RP perspective
- Future Initiatives
  - Refresh more-than-minor examples/guidance (IMC 0612 App E)
  - Update to IMC 0609 App C – Occupational SDP

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Update on NRR Radiation Protection Activities – Selected Topics II

Steve Garry, Senior Health Physicist

Radiation Protection and Consequence Branch
Division of Risk Assessment
Office of Nuclear Reactor Regulation

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Part 37 Documents

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- 10 CFR 37
- NUREG-2155; Implementation guidance
- RIS 2015-15; Exemptions
- EGM-14-001; Large components & robust structures (ML14056A151)
- Q&As on NRC website
  https://www.nrc.gov/security/byproduct/10-cfr-part-37.html

RIS 2015-15

Specific Exemptions under 10 CFR 37.11(b)

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- Licensees with an NRC-approved Part 73 security plan
  - Must provide equivalent level of protection
  - May take credit for existing Part 73 security measures
  - Part 37 Security Plan
    - Describe protection measures in PA
    - Describe process of maintaining accountability and location of material
    - Describe training to individuals responsible for protection (e.g. HPs and security)
- Outside PA
  - Meet Part 37 requirements, including need to provide continuous monitoring and detection

Part 37 Inspections

- Initial Part 37 inspections are complete
- NRC did not identify any risk-significant safety or security issues
- NRC is considering options on how to provide oversight of Part 37
  - Stand-alone inspection procedure, and/or
  - Additional sample in existing IP, and/or
  - Performance Indicator

NEI Petition on Part 37

- NEI submitted a petition for rulemaking (ML14199A570)

- NEI requested:

  1. Exempting the protected area from 10 CFR Part 37 requirements

  2. Removing ambiguity on waste exemptions

  3. Exempting Part 37 material in large components and robust structures

Potential Part 37 Rulemaking

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- SECY-17-0083 - Recommends amendment of part 30, 40, and 70 to regulate Cat 3 material transfers between licensees
- SECY-17-0025 - Integrated Rulemaking Plan for Security of Radioactive Materials
  - Staff has submitted SECY-17-0025 to Commission
  - Incorporates the NEI petition for rulemaking
- Awaiting Commission's direction

Decomm Rulemakings

- # 1 – 1988
- # 2 – 1997
- # 3 – 2011
- # 4 – 2019

1 Decomm Rulemaking

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- 1988 - 53 FR 24051
  - 50.75g record keeping
  - Cost estimating $105M plus, plus formula
  - Decomm within 60 years
  - Applications for terminating license
  - Supplements to the environmental report

2 Decomm Rulemaking

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- 1997 - 62 FR 39058
  - Radiological criteria for Decomm
    - 25 mrem/yr plus ALARA for unrestricted release
    - 100 mrem/hr plus ALARA for restricted release with institutional controls
    - Meet groundwater protection – EPA 40 CFR 141
  - Minimization of contamination (for applicants)

3 Decomm Rulemaking

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- 2011 – Decomm Planning Rule
  - Operating facilities to minimize the introduction of contamination into the site including soil and groundwater (10 CFR 20.1406(c))
  - Requires sub-surface (groundwater) site surveys
  - Report decommissioning costs estimates for decommissioning and spent fuel management
  - RG 4.22 on Decomm Planning

4 Decommissioning Rulemaking

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- NRC has received several requests for license amendments and regulatory exemptions
- Six power reactors shut down since 2012
- Twelve additional reactors may shut down between 2018-2025
- NRC staff issued a Lessons Learned Report (ML16085A029)
- Proposing rulemaking for shutdown reactors

Issues Addressed

- Emergency preparedness
- Physical security
- Cyber security
- Drug and alcohol testing
- Certified fuel handler definition and elimination of the shift technical advisor
- Decommissioning funding assurance
- Offsite and onsite financial protection requirements and indemnity agreements
- Environmental considerations
- Record retention requirements
- Low-level waste transportation
- Spent fuel management planning
- Application of the backfit rule
- Foreign ownership, control, or domination
- Clarification of the scope of the license termination plan requirement

Decomm Rule Path Forward

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- A proposed **draft** rule has been sent to Commission (ML18012A019)
  - Awaiting Commission approval to publish **draft** rule
    - Public meeting will be held after Proposed Rule and Draft Regulatory Guidance are issued for public comment
- Final Rule/Final Regulatory Guidance
    - Draft the proposed final rule
    - Public meeting will be held
- Send proposed final rule to the Commission in Fall 2019

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Accident-Range Gaseous Effluent Monitoring Calibration & Time-Dependent Instrument Response Factors

- Information session at 1 pm
- Sharing information on calibration guidance

Basic Issue

(most detectors)

- Effluent monitors were initially calibrated to low-energy gammas from Xe-133
- During emergencies, a high-energy mix of noble gases could be released
- Calibrations based only on low-energy gammas from Xe-133 are not representative of a mix of noble gases
- Effluent monitor response factors should be based on a mix of noble gases

Inspections

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- NRC inspectors are performing inspections based on current inspection procedures

- NRC is evaluating:
  - the safety significance of overly-conservative effluent monitor response factors
  - the need for a generic communication; e.g.,
    - Information Notice, Regulatory Issue Summary, Bulletin

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Draft RG 4.13 - Environmental Dosimetry

- To be issued soon for public comment
- NRC endorsement of ANSI/HPS N13.37, Environmental Dosimetry
- Provides an NRC approved method of determining facility-related direct radiation dose
- Can be used in the demonstration of compliance with 10 CFR 20.1302 and 40 CFR 190

RG 4.13, Rev. 2
Direct Radiation Monitoring

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- 10 CFR 20.1301(e) - EPA's 40 CFR 190 dose limit is 25 mrem whole body dose (not 100 mrem TEDE)
- 10 CFR 20.1302 Demonstrating compliance with public dose limits
  - Specific requirement to perform "surveys" in controlled areas and unrestricted areas
  - "Surveys" include the "calculations of levels of radiation"
  - ANSI N13.37 provides acceptable data analysis method
  - Ring-averaging MAY NOT be an adequate evaluation

Performance Specifications

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- Old RG 4.13, **Rev. 1**
  - **Reproducibility criteria - 3%**

- New draft RG 4.13, Rev. 2
  - **Reproducibility - 7.5%**

Environmental Dosimetry Data Analysis Method

- 2 step analysis process
  - Is there a detectable increase **> 3σ?** **(yes/no)?**
  - If so, how much facility-related dose?
    - Subtract dosimeter reading from average baseline
    - Do not subtract dosimeter reading from **(bkg + 3σ)**
- Good dosimetry systems can achieve MDDs at:

  ~ 5 mrem/qtr, and ~ 10 mrem/yr

Draft RG 8.34, Monitoring & Calculating Dose

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- Issues under consideration:
  - Revised TEDE definition and new term EDEX
  - Prospective evaluations & the need to monitor
  - Monitoring likely & unlikely exposures
  - Assessing dose when dosimetry results are inconsistent with electronic dosimetry or surveys
  - Determining and using effective DACs

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Questions