Nuclear Energy Institute
2013 Industry Update

RETS-REMP and Groundwater Protection Workshop
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Today's Topics

- The Way Forward
- National Academy of Sciences Cancer study
- Changes to Radiation Protection Regulations
- License Renewal Environmental Issues
- Enhanced Inspection and Environmental Monitoring
- EPA Rulemaking - 40 CFR 190
- Decommissioning Planning rule
- Prompt Remediation potential rulemaking
- Other

Fukushima: The Way Forward

- Joint leadership model to integrate and coordinate the U.S. nuclear industry's response to ensure that lessons learned are identified and well understood, and responses are effectively coordinated and implemented throughout the industry

- Strategic Goals
- Guiding Principles
- Stakeholders & Desired Outcomes
- Leadership Model Overview

U.S. Industry Leadership in Response to Events at the Fukushima Daiichi Nuclear Power Plant

NEI NUCLEAR ENERGY INSTITUTE INPO EPRI ELECTRIC POWER RESEARCH INSTITUTE

June 8, 2011

The Way Forward – 8 Strategic Goals

1. Remain focused on safety and operational excellence at all plants in light of increased work resulting from Fukushima
2. Timelines for emergency response to preclude fuel failure following station blackout
3. U.S. nuclear industry is capable of responding effectively to any significant event in the U.S.
4. Effective integration of SAM-Gs, security response strategies, etc. to ensure facilities are capable of a system-based response to events that could impact multiple reactors at a single site
5. Margins for protection from external events are sufficient based on the latest hazards analysis and historical data
6. SFP cooling and makeup functions are fully protective during periods of high heat load in the SFP and during extended station blackout conditions
7. Primary containment protective strategies can effectively manage and mitigate post-accident conditions, including elevated pressure and hydrogen conditions
8. Accident response procedures provide steps for controlling, monitoring and assessing radiation and ingestion pathways during and following an accident together with timely communications of accurate information

Strategic Goal 8 - Objectives

1. Establish and maintain an accurate database for Fukushima onsite and offsite radiological conditions to support current and future industry activities.

2. Enhance procedures and ensure necessary equipment to protect emergency responders against extreme radiological conditions

3. Engage in and support activities addressing lessons learned related to radiological protection off-site during the post-release phase (e.g. ingestion pathway)

4. Develop tools/methods for timely collection and communication of radiological protection information.

NRC/NAS Cancer Study

- Evaluate cancer incidence & mortality around nuclear facilities
- 2 Phases:
  - Phase 1: final report issued June 18, 2012. Recommendations
    1. IF epidemiological study is performed, conduct multiple cancer study incidence and mortalities within 30 miles and record-linkage study of child cancers
    2. Perform a pilot study
    3. Ensure study has a process to involve & communicate with stakeholders
  - Phase 2 (pilot): SECY 12-0136 issued October 23, 2012
    1. Multiple cancer types in nearby populations
    2. Case control study of children born nearby
- Pilot study of 7 facilities
  - Use data on radioactive effluent release, direct exposure, and meteorology to estimate annual variations in dose as a function of distance and direction
  - 2-3 years, $2M
  - Could result in communications issue for licensees

Changes to Radiation Protection Regulations
SECY -12-0064

- Current radiation protection framework provides adequate protection to workers and the public. Recommended changes:
  - (1) Update terminology and dose calculation methodologies
  - (2) changes in estimating radiation exposure and risk
  - (3) increased alignment with international community

- Explore reductions in dose limits:
  - Effective dose limit of 2 rem/year to use updated radiation risk for cancer mortality and risks of inheritable disease - no changes planned to current occupational dose limit of 5 rem/year
  - Lens of eye from 15 rem/year to 5 or 2 rem/year – NRC soliciting input
  - Dose limit for embryo/fetus of a declared pregnant woman from 500 mrem for the entire pregnancy to 100 mrem

- Consider the benefits and implications for broader use of SI units in detail

Changes to Radiation Protection Regulations
SECY -12-0064

- Develop regulatory basis for revising 10 CFR Part 50, Appendix I
  - Update to current dose modeling used in ICRP 103
  - Keep numeric dose criteria
  - Potentially create a single regulatory guidance document instead of NUREG 0472/0473, RG 1.109, NUREG 0133, NUREG CR-1301
    - Supporting regulatory guides will not be changed as a direct result of this effort
    - NUREG 0543 revision influenced by 40 CFR 190 effort by EPA
  - NRC establishing project plan
    - Reinvigorate monthly or quarterly meetings with stakeholders
    - Anticipate 3 workshops
  - Impact on existing operating reactors' ODCM programs and resultant calculated offsite dose to be determined
    - Staff to perform backfit analysis
- Final rule expected ~2018-2020

License Renewal Environmental Issues

- NRC regulations require updating 10 CFR 51.53 and Generic Environmental Impact Statement (GEIS).
- Guidance documents include:
  - NUREG-1437 vols. 1 & 2
  - RG 4.2 S1
  - NUREG-1555 Supplement 1
- Final rule went to Commission in April 2012
- DC Circuit Court of Appeals rejected 2010 Waste Confidence Decision
- Final rule published in Federal Register June 20, 2013
  - Licensees to have 1 year to fully implement
- NRC workshop to be held potentially in fall 2013

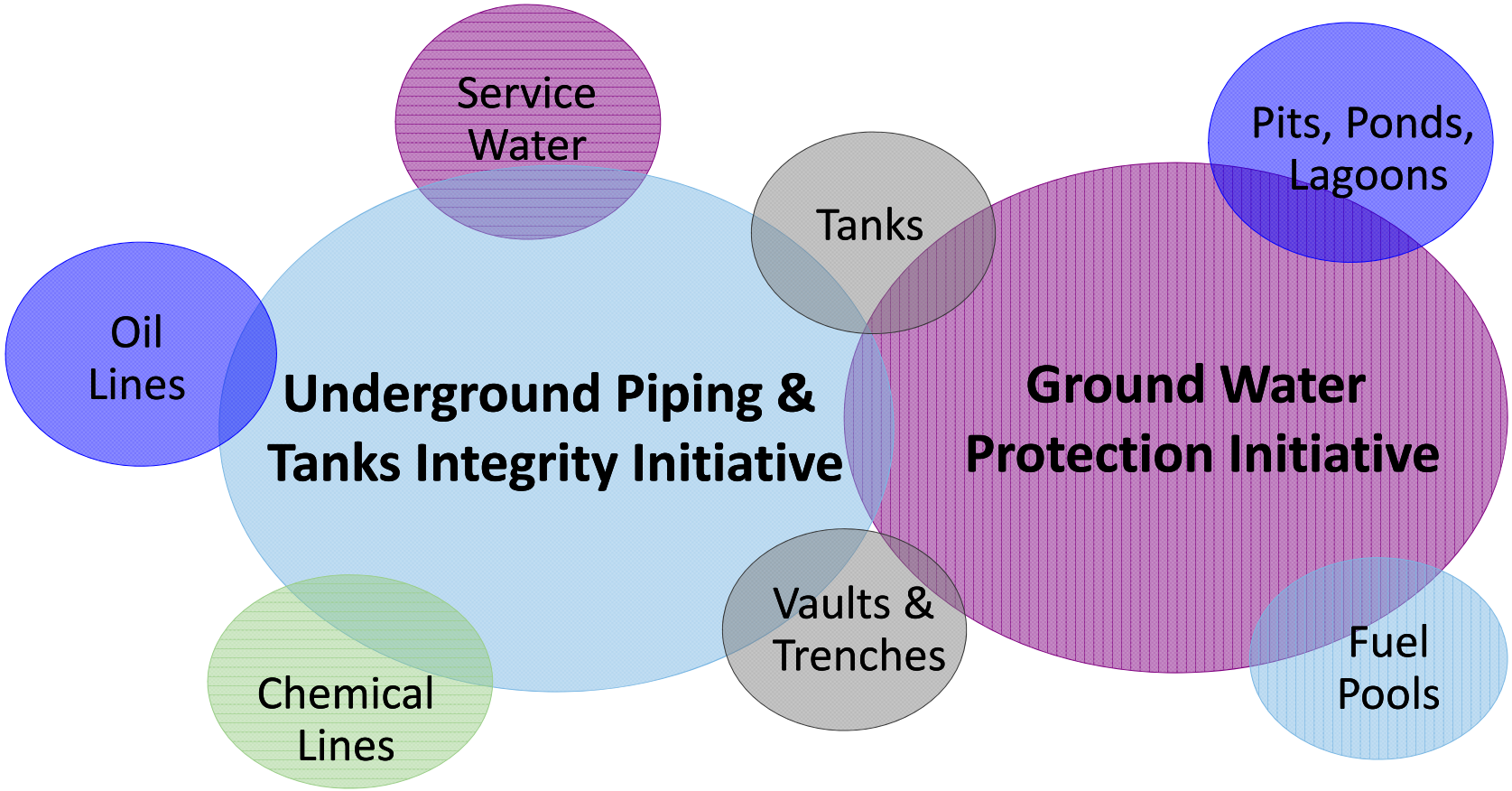
License Renewal Environmental Issues

- New generic issues
  - Impacts on geology and soil
  - Exposure of non-human species to radionuclides
  - Groundwater and soil contamination (non-radioactive)
  - Socioeconomics
  - Human health impacts from chemicals
- New site specific issues
  - Radionuclides released to groundwater
  - Water use conflicts
  - Environmental justice
  - Cumulative impacts
- Expanded scope for “new and significant”

Enhanced Inspection and Environmental Monitoring

- November 2005: Nuclear Energy Institute (NEI) formed industry task force on ground water protection
- May 2006: Nuclear Strategic Issues Advisory Committee approved the Ground Water Protection Initiative (GPI)
  - GPI became effective August 1, 2006
  - Final industry guidance (NEI 07-07) issued August 2007
  - New plants guidance (NEI 08-08) issued October 2009
- November 2009: Nuclear Strategic Issues Advisory Committee approved the Buried Piping Initiative (BPI)
  - Guidance issued as NEI 09-14 in January 2010
  - Revised to the Underground Piping and Tanks Integrity Initiative (UPTI) September 2010
  - NEI 09-14 Revision 3 issued April 2013
- December 2011: NEI 11-07 Coordination of Enhanced Inspection and Environmental Monitoring Initiatives

Initiatives – Common Ground



2012 Events

- GPI: NRC TI 2515-173 rev 1: December 2011 to December 2012
  - ≤ 4 incomplete – follow up through IP 71124.06
  - ≥5 incomplete – use TI rev 1
- Interagency workshop for Early Detection of Underground Leaks at Nuclear Facilities: February 15, 2012
- NRC "Options for Revising the Regulatory Approach to Ground Water Protection" (SECY-12-0046) March 29, 2012
- NRC and industry representatives meeting on underground piping:
  - April 4, 2012
  - December 5, 2012
- Information Notice 2012-05 "Abnormal Releases of Radioactive Material in Liquids Potentially Resulting in Groundwater Contamination" April 25, 2012

2013 Events

- NRC Waste Confidence Rule scoping period closed January 2, 2013
  - U.S. Court of Appeals vacated NRC 2010 Waste Confidence Decision and Rule on June 8, 2012
  - Consider the potential environmental effects from extended storage in spent fuel pools
- NRC and industry representatives meeting on underground piping:
  - April 25, 2013
- UPTI: NRC TI 2515-182 inspections
  - Phase 1 in progress
- NRC 10CFR 50.72 reporting – revision 3 to NUREG 1022 "Event Reporting Guidelines: 10 CFR 50.74 and 50.73" issued January 2013
  - Reporting tied to "…a plan to report" instead of "…notification … has been or will be made"
- NRC updated the list of sites with historical leaks (ML101270439): June 10, 2013

Underground Piping and Tanks Integrity Initiative

- Revision 3 to NEI 09-14 issued in April 2013

  Provides reasonable assurance of structural and leakage integrity of all piping and tanks outside plant buildings that could potentially be a source of undetected leakage into the soil or groundwater

  1. Establish procedures and oversight
  2. Perform prioritization
  3. Develop condition assessment plan
  4. Complete condition assessment of components containing licensed material
  5. Establish asset management plan

- Working group reports status of UPTI implementation to Nuclear Strategic Issues Advisory Committee every 6 months

- Operating experience is shared through industry database

EPA Rulemaking - 40 CFR 190

- Existing radiation protection standards for nuclear plants established January 13, 1977
  - Dose standard for uranium fuel cycle (mrem/yr) : 25 whole body, 75 thyroid, 25 organ
  - Annual isotopic limits/Gw: ^{85}Kr 50,000 curies; ^{129}I 5 mCi; ^{239}Pu & alpha 0.5 mCi
- EPA considering revision to:
  - explicitly establish ground water protection standard
  - potentially update to reflect more recent dose methodology
  - recognize other technologies
- NEI met with EPA on May 22, 2013 to provide an overview of GPI & UPTI - will continue to advocate on behalf of industry

Decommissioning Planning Rule

- Decommissioning Planning Rule (DPR) changes:
  1. requires licensees and applicants to conduct operations in a manner to minimize contamination, but does not mandate any design changes to operating facilities;
  2. includes consideration of the subsurface in the radiological surveys and container inspections to meet 10 CFR 20.1501(a);
  3. establishes a threshold for when residual activity becomes "significant" residual radioactivity; and
  4. requires licensees to retain 10 CFR 20.1501 (a) survey records important to decommissioning.
- Final rule became effective December 17, 2012
  - Reporting requirements under 10 CFR 50.82(a)(8)(v) and (vii) effective March 31, 2013
  - Final guidance for surveys & monitoring published December 27, 2012

Decommissioning Planning Rule

- Regulatory Guide 4.22 issued December 27, 2012
  - Explicitly requires subsurface monitoring and container inspections
  - Nuclear power plants can rely on implementation of NEI 07-07
  - On-site ground water monitoring records retained under 10 CFR 50.75(g)
  - Materials licensees referred to screening levels in NUREG-1757 "Consolidated Decommissioning Guidance" volume 1 or derived concentration guidelines approved for other licensees or 25 mrem/year plus ALARA
- Enforcement Guidance Memorandum 12-002 "Dispositioning Violations of Nuclear Regulatory Commission's Requirements Implementing the Decommissioning Planning Rule" December 20, 2012
- Temporary Instruction 2600/017 "Review of the Implementation of the Decommissioning Planning Rule" February 25, 2013
- Inspection Procedure 71124.06 "Radioactive Gaseous and Liquid Radwaste Treatment" revised June 6, 2013
  - 01.05 To evaluate changes in the implementation of ground water protection initiative since last inspection to identify changes that may have decreased effectiveness and scope.

Prompt Remediation Rulemaking

- SECY-11-0019 "Senior Management Review of Overall Regulatory Approach to Groundwater Protection: February 2011
  - Directed staff to evaluate potential rulemaking for prompt remediation
- Initial draft Technical Basis published on July 18, 2011
  - Industry comments submitted September 16, 2011
- SRM-SECY-12-0046 "Options for Revising the Regulatory Approach to Ground Water Protection" May 24, 2012
- Proposed rule "Consideration of Rulemaking to Address Prompt Remediation of Residual Radioactivity During Operations" published June 3, 2013
  - Webinar held on June 4, 2013
  - Preferred approach: 10 CFR 20 App B Table 2
  - Industry's position is that the proposed rulemaking is <u>not</u> justified on the basis of risk or the prevention of future legacy sites.
  - Comments due August 2, 2013

Other Items of Interest

- Cumulative impacts of regulatory actions
- Economic consequences due to significant contamination of the environment
- Industry indicator for ground water protection programs
- ANSI/HPS N13.37 “Environmental Dosimetry” standard being revised

QUESTIONS