# Overview of the U. S. Nuclear Waste Regulatory Framework and the Role of the Advisory Committee on Nuclear Waste

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# US Nuclear Regulatory Commission

- NRC develops and implements regulations
- 10 CFR Part 63 - HLW Yucca Mountain
- 10 CFR Part 61 - LLW (States must be compatible)
- 10 CFR Part 20, Sub-Part E, License Termination Rule (Decommissioning)
- 10 CFR Part 40 - Uranium Mill Tailings

# US Environmental Protection Agency

- Develops generally applicable environmental standards for HLW, transuranic waste, LLW, and other nuclear materials
- Waste Isolation Pilot Plant – WIPP
  - Land Withdrawal Act
  - 40 CFR Part 194 (WIPP Compliance Criteria)

# US Department of Energy

- Developmental role
  - WIPP
  - Proposed HLW Repository at Yucca Mountain
  - Assist Agreement States
  - Defense programs

- Dual Developmental and Regulatory Roles (with State and EPA oversight)
  - DOE Operating Facilities
  - DOE LLW Disposal Facilities
  - Cleanup and Remediation at DOE Sites (e.g., Hanford, Savannah River, INEEL)

# Advisory Committees, Review Boards, Panels

- Advisory Committee on Nuclear Waste (reports to the Commission)
- Advisory Committee on Reactor Safeguards (reports to the Commission)
- Nuclear Waste Technical Review Board (reports to Congress and the Secretary of Energy)

# Advisory Committees, Review Boards, Panels

- Defense Nuclear Facilities Safety Board (reports to Congress)
- The Academies – National Research Council: Board on Radioactive Waste Management (reports to Congress)

# ACNW Charter

- The ACNW reports to and advises the Commission on nuclear waste management.
- The ACNW reviews transportation, storage and disposal of HLW and LLW, interim storage of spent nuclear fuel, materials safety, decommissioning, licensing documents, rules, regulatory guidance, and other issues as requested by the Commission.

# ACNW Mission

- Provide independent and timely advice on nuclear materials and waste management issues to support the NRC in conducting an efficient regulatory program that enables the Nation to use nuclear materials in a safe manner for civilian purposes.

# ACNW Vision

- The ACNW strives to provide advice and recommend solutions that are forward looking, based on reasonable use of available science and technology, capable of being implemented, and reflect the need to balance risk, benefit, and cost to society to ensure the safe use of nuclear materials.

# ACNW Performance Goals

- Help NRC respond to external change in nuclear regulation
- Support NRC in employing sound science to resolve safety issues
- Advise NRC on how to increase reliance on risk as a basis for decisionmaking
- Support NRC's openness goal
- Improve the effectiveness and efficiency of NRC and ACNW operations

# Risk-Informed, Performance-Based Regulations

In 1999, NRC Chairman Jackson issued a policy paper that described how risk-informed and performance-based concepts should apply to NRC's regulatory work. Risk assessments consider what can go wrong, how likely is it, and what are the consequences. Risk insights from these assessments highlight the contributors to risk and their significance.

# ACNW 1st Tier Priorities for 2005

- Decommissioning
  - Institutional controls; realistic scenarios; intentional mixing, onsite disposal
  - West Valley Demonstration Project and other complex sites
- Waste Incidental to Reprocessing
  - Support development of risk-informed Standard Review Plan
- Disposition of Solid Materials
  - Rulemaking expected in 2005-2006

# ACNW 1st Tier Priorities for 2005 (continued)

- Health Physics
  - BEIR VII and ICRP foundation documents
- Yucca Mountain high-level waste repository
  - Pre-licensing technical reviews
- Risk-Informing Regulatory Activities
  - Focus on realism, transparency, consistency, and identification of uncertainties

# ACNW 2nd Tier Priorities for 2005

- Transportation of Radioactive Materials
  - Review Approach to Package Performance Study
- Proposed Private Fuel Storage Facility (Utah)
- Waste Management Research Program
  - NRC's Office of Research
  - Center for Nuclear Waste Regulatory Analyses

# ACNW 2nd Tier Priorities for 2005 (continued)

- Fuel Cycle Facilities: Review Technical and Safety Licensing Issues
  - Uranium enrichment plants
  - Mixed-oxide fuel fabrication facility
- Low-Level Radioactive Waste
  - Risk-inform 10 CFR Part 61
  - Low-level waste processing, storage, and disposal issues

# Recent ACNW Reviews 2004 to present

- Working Group on the 2005 ICRP Draft Recommendations
- Intentional Mixing of Contaminated Soils
- Package Performance Study – Demonstration Test

# Recent ACNW Reviews 2004 to present (continued)

- Experimental Program on Spent Nuclear Fuel Dissolution
- Decommissioning the West Valley Site
- NRC's Radionuclide Transport Waste Safety Research Program

# Recent ACNW Reviews 2004 to present (continued)

- Observations from ACNW Meeting in Nevada (September 2004)
- Yucca Mountain
  - Working Group on Igneous Activity
  - Working Group on Geosphere Transport
  - Working Group on Biosphere Dose Calculations
  - Risk Insights Baseline Report
  - Instability of Emplacement Drifts

# Review of 2005 Draft ICRP Recommendations

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# Review of 2005 Draft ICRP Recommendations

- ICRP characterizes current update as a “simplification and elaboration” of its previous recommendations
- Foundation documents that contain the scientific bases are not yet available, preventing a complete review

# Review of 2005 Draft ICRP Recommendations (cont.)

- ICRP goal of simplifying its terminology has not been achieved; ambiguities still exist
- Schedule has been delayed
- Revised draft consultation paper anticipated in late 2005 or 2006

# Review of 2005 Draft ICRP Recommendations (cont.)

- It is questionable whether ICRP's recommendations for optimization are really improvements
- Draft recommendations would confound and complicate the use of existing ALARA principles

# Recommendations to the Commission from ACNW

- The Commission should continue to defer action on ICRP's recommendations until BEIR VII is published and evaluated
- NRC staff should stay cognizant of ICRP's activities until more details are forthcoming about technical bases for the recommendations

# Recommendations (cont.)

- Commission should consider adopting the following technical improvements:
  - New radiation weighting factors for neutrons and protons
  - New tissue-weighting factors
  - Recent methods and models to assess internal radiation exposures

# Unanimous Conclusions from ACNW's Expert Panel

- **There would be no significant improvement in protecting worker and public health and safety by adopting ICRP's 2005 draft recommendations**