

ACNW MEETING WITH THE COMMISSION

B. John Garrick

July 21, 2004

Today's Agenda

- **Risk Insights Activities**
 - **B.J. Garrick**
- **Working Group Meetings**
 - **Biosphere Dose Calculations**
 - **M.T. Ryan**
 - **Geosphere Transport**
 - **G.M. Hornberger**

Today's Agenda (Cont'd)

- **Other Committee Activities:**
 - **NRC/CNWRA research**
 - **R.F. Weiner**
 - **West Valley Site**
 - **M.T. Ryan**
- **Closing Comments:**
 - **B.J. Garrick**

ACNW RISK INSIGHTS ACTIVITIES

B. John Garrick

Focus

- **NMSS Task Force on PRA**
- **Yucca Mountain Risk Baseline Report**

Observations

- **Radiation dose is an indicator of health and safety risk and is favored as a basis for developing risk-informed guidelines**
- **Risk-informed regulation concepts are being tested on real issues and facilities**

Observations (Cont'd.)

- **Population collective dose is limited as an indicator of risk for nuclear materials scenarios with small, long-term releases or small exposures to many people**

Recommendations

- **Risk guidelines should be linked to radiation dose rather than health effects**
- **Staff should move away from collective dose as a measure of risk**

**REVIEW OF YUCCA
MOUNTAIN HLW
RISK BASELINE REPORT**

B. John Garrick

Risk Baseline Report Review

- **2004 Risk Baseline Report**
 - **details how risk considerations are factored into KTI reviews**
 - **important element of issue resolution process**

Risk Baseline Review (Cont'd)

- **Evaluated relative to waste isolation capabilities of repository system**
- **Staff considered three categories of significance to waste isolation**
 - **high, medium, low**

Recommendations

- **Use risk insights to focus on most important KTI agreements**
 - **translate risk insights into specific guidance on prioritizing issue resolution**

WORKING GROUP MEETINGS

Michael T. Ryan

Purposes

- **Recent focus on Yucca Mountain technical issues**
- **Learn about staff and DOE activities and plans**
- **Identify technical issues that may warrant further study**
- **Offer a vehicle for public participation**

Areas Of Review

- **Previous working groups**
 - **Transportation**
 - **Performance confirmation**
 - **TSPA**
- **Recent working groups**
 - **Biosphere dose assessments**
 - **Geosphere transport**

Biosphere Dose Assessment WG

- **Goal ... focused on metabolic models and environmental pathway analysis**
- **Conducted in February 2004**
- **Panel of six invited experts**

Biosphere WG (Cont'd)

- **Discussions Focused On...**
 - **technical bases necessary for biosphere dose assessments**
 - **role of risk insights in the development of technical bases**

Biosphere WG: Observations

- **Predicted doses are small, near background levels**
- **No high-risk performance issues for the base case**
- **Several conservatisms are present**
- **Realism of calculations could be improved**

Observations (Cont'd)

- **Igneous eruption could potentially have significant effect on risk estimates**
- **Research should continue to focus on inhalation intake parameters and aerosol resuspension**

**GEOSPHERE TRANSPORT
WORKING GROUP**

George M. Hornberger

Purposes

- **Goal ... To review expected behavior of radionuclides in aquifers at Yucca Mountain**
- **Conducted in June 2004**
- **Panel of four invited experts**

Geosphere Transport: Observations

- **Most of predicted dose from a few Radionuclides**
 - **Np-237, I-129, and Tc-99**
- **Flow paths, travel times, matrix diffusion, and retardation are important considerations**

Observations (Cont'd.)

- **Highly retarded radionuclides (i.e., Pu, Am) never arrive at compliance boundary**
- **Calculated travel times for mobile radionuclides in aquifer – 100s to 1000s of years**

Observations (Cont'd.)

- **Work by NRC, DOE, and others indicates that natural system is an effective barrier**

Observations (Cont'd.)

- **Additional information could reduce uncertainty**
 - **groundwater discharge**
 - **matrix diffusion**
 - **sorption coefficients**
 - **water chemistry**

Observations (Cont'd.)

- **Even modest N_p retardation in alluvium delays arrival at compliance point past 10,000 years**

**CENTER FOR NUCLEAR
WASTE REGULATORY
ANALYSES
PROGRAMS/NRC
RESEARCH PROGRAMS**

Ruth F. Weiner

Current Activities

- **Review of Selected CNWRA Programs**
 - **March 4, 2004 , letter report**
 - **Review of RES Radionuclide Transport Research**
 - **May 5, 2004, letter report**

CNWRA Programs

- **ACNW Review Focused on:**
 - **igneous activity**
 - **spent fuel/water interactions**
 - **corrosion studies**
 - **post-closure drift stability**
 - **pre-closure Safety Analysis (PCSA) Tool**

CNWRA Programs (Cont'd)

- **ACNW Provided Comments on:**

- **inhalation models for exposure to volcanic ash**
- **use of uranium dioxide in dissolution studies (in progress)**

CNWRA Programs (Cont'd)

- drift stability**
- improvements and transparency of the Center's PCSA tool**

PCSA Tool

- **Review of the PCSA Tool Showed:**
 - adequate modeling flexibility**
 - appropriate modeling of accident scenarios**
 - transparency**
 - traceability**

Conclusions

- **Evaluated CNWRA work is addressing issues of importance to NRC**
- **Evaluated CNWRA work continues to be of high quality**

WEST VALLEY SITE

Michael T. Ryan

Complex Site

- **Land Surrounding WVDP**
 - **unrestricted use**
- **Parts of WVDP**
 - **restricted use**
- **Burial Sites**
 - **long-term license**
- **Vitrified HLW**
 - **awaiting geologic repository**

DOE Performance Assessment Approaches

- **To be Used to Demonstrate Compliance with LTR**
 - deterministic, bounding, and probabilistic analyses are planned**

NRC Staff's Independent Performance Assessment

- **Probabilistic in Nature**
- **Uses Realistic Assumptions**
- **ACNW Strongly Encourages Staff's Approach**

ACNW Next Steps

- **Meet with DOE and NYSERDA as EIS and PA Plans Mature**
- **Periodic Meetings with Involved stakeholders**
- **Report on Progress to the Commission**

CLOSING COMMENTS

B. John Garrick

ACNW Action Plan

- **Undertake reviews of Commission-approved topics**
- **Action Plan to be updated to reflect approved topics**

Action Plan (Cont'd)

- **Working with NMSS Management on process improvements**
- **Work with staff to identify predecisional topics for Commission approval**

Future Activities

- **Working Group Meetings**
 - **goal of one per quarter**
 - **future subject areas...**
 - **Igneous activity (September 2004)**
 - **Health physics/radiation biology (December 2004)**

Future Activities (cont'd)

- **West Valley performance assessment (CY 2005)**
- **Support Commission adjudicatory technical staff**

ABBREVIATIONS

ACNW	Advisory Committee on Nuclear Waste
Am, Np, Pu	Americium, Neptunium, Plutonium
CNWRA	Center for Nuclear Waste Regulatory Analyses
DOE	U.S. Department of Energy
EIS	Environmental Impact Statement

ABBREVIATIONS (Cont'd)

HLW	High-level nuclear waste
KTI	Key technical issue
LTR	License Termination Rule
NMSS	Office of Nuclear Material Safety and Safeguards
NYSERDA	N.Y. State Energy Research Development Authority

ABBREVIATIONS (Cont'd)

PA	Performance assessment
PCSA	Pre-closure safety analysis
PRA	Probabilistic risk assessment
RES	NRC Office of Nuclear Regulatory Research
TSPA	Total system performance assessment

ABBREVIATIONS (Cont'd)

WG Working group

WVDP West Valley
Demonstration Project