



**STATUS REPORT ON DEVELOPMENT OF  
NRC STAFF TECHNICAL POSITION ON USE OF  
EXPERT ELICITATION IN THE HLW PROGRAM**

**JANUARY 11, 1996**

**Contacts: Dr. Janet P. Kotra 301/415-6674  
Michael P. Lee 301/415-6677  
Dr. Norman A. Eisenberg 301/415-7285  
→ Dr. Aaron R. DeWispelare | 210/522-6072**

*Presenter*

## **OVERVIEW**

- **Need for NRC Guidance**
- **Scope**
- **Role of Expert Judgment in NRC Licensing**
- **Staff Activities**
- **Proposed Positions**
- **Sample Process**
- **Current Schedule**

**WHY DOES STAFF BELIEVE THERE IS A NEED  
FOR GUIDANCE ?**

- **Large Uncertainties in Data, Modeling, and Knowledge of Future States**
- **Expert Judgment Will be Used to Support License Application**
- **Specific Concerns with DOE Uses of Expert Elicitation**
- **Need to Address ACNW and NWTRB Concerns**
- **DOE Guidelines for Use of Formal Expert Judgment (6/1/95)**

**"It will be very important for the DOE and the NRC to achieve a common understanding on the appropriate methods for elicitation of expert judgments and on the use of such judgments in carrying out performance assessment."**

***NWTRB, December 1991***

**"...DOE should work together with the NRC in verifying that formally elicited expert judgment will be admissible in repository licensing hearings. They should also jointly address the definition of guidelines such that the probative value of this judgment is enhanced."**

***NWTRB, May 1994***

## **SCOPE OF NRC GUIDANCE**

- **Conditions Which May Warrant Formal Elicitation**
- **Elicitation Protocol**
- **Does Not Prescribe Specific Applications**
- **No Intent to Discourage Less Formal Uses of Judgment, if Properly Documented**

**ROLE OF EXPERT JUDGMENT AS INPUT TO  
NRC DECISIONS**

- **Decision Based on Fact Plus Opinion**
- **Judgments Are Being Made Routinely**
- **Judgments Used to Interpret Data, Predict Repository Performance, and Assess Uncertainties**
- **Judgments May Complement, But Not Substitute For, Reasonably Obtainable Data and Analyses**
- **10 CFR Part 60 Requires "Reasonable Assurance"**

## **PRIOR TO LICENSING**

- **DOE has Wide Latitude to Use Expert Judgment Without NRC Oversight**
- **NRC Concerned if Use Hinders High-Quality License Application**

## **REVIEW OF LICENSE APPLICATION**

- **NRC Staff Prepares Safety Evaluation Report**
- **NRC Staff Can Request Additional Information**

## **PROPOSED STAFF POSITIONS**

- 1. NRC Will Continue to Accept Judgment as Support for License Application**
- 2. But Not as a Substitute for Objective Analyses and Data**
- 3. Judgment May be Informal or Formal, Must be Documented**
- 4. Consider Formal Elicitation When:**
  - Data Not Available or Obtainable**
  - Uncertainties Large and Significant**
  - More Than One Model to Explain Data**
  - Assessing Bounding Assumptions**
- 5. Use a Consistent, Defensible Process**
- 6. Update Results**



## **SAMPLE PROCESS FOR FORMAL EXPERT ELICITATION**

- **Define Objectives**
- **Select Experts**
- **Identify Issues**
- **Assemble and Disseminate Info**
- **Provide Pre-Elicitation Training**
- **Elicit Judgments**
- **Provide Feedback**
- **Aggregate Views**
- **Document**

## **DEFINITION OF OBJECTIVES**

- **Define Explicit Objectives**
- **Objectives Guide Choice of Experts, Information Provided, and Form of Judgments**

## **CRITERIA FOR SELECTION OF EXPERTS**

- **Knowledge and Experience**
- **Demonstrated Ability to Apply Knowledge and Experience**
- **Broad Diversity of Independent Opinion and Approaches**
- **Willingness to be Identified Publicly with Judgments**

## **IDENTIFICATION OF ISSUES**

- **" Decompose" Broad Objectives into Simpler Sub-Issues**
- **Experts Define Parameters Which Influence Overall Judgments**

## **ASSEMBLY AND DISSEMINATION OF BACKGROUND INFORMATION**

- **Assembled with Input of Experts**
- **Full Range of Views Should be Represented**
- **Uniform, Balanced, and Timely Distribution**
- **Experts Should Have Equal Access to Materials**

## **PRE-ELICITATION TRAINING**

- **Elicitation Process**
- **Expression of Judgments Using Subjective Probability**
- **Uncertainty Encoding**
- **Sources of Potential Bias**

## **ELICITATION OF JUDGMENTS**

- **Each Expert\* Should be Elicited Separately**
- **Review Definitions and Assumptions from Pre-Elicitation Meetings**
- **Uniform Questioning**
- **Internal Consistency Checks of Each Expert's\* Views**
- **Individual Elicitations Should be Recorded**

\* *Or Groups of Experts*

## **POST-ELICITATION FEEDBACK**

- **Prompt Feedback of Results**
- **Need for Revision or Clarification of Individual Judgments Should be Solicited from Each Expert**
- **Rationale for Any Revisions Should be Documented**



## **AGGREGATION OF JUDGMENTS**

- **Individual Judgments Must be Preserved, Documented, and Made Available to All Parties**
- **Experts Should Comment Explicitly on Opposing Views**
- **Document Bases for Differing Views**
- **Document Impact Of Individual Judgment on Consolidated Judgment**

## **DOCUMENTATION**

- **What Was Done, Why, When, and By Whom**
- **Clear Descriptions of all Resulting Judgments and Reasoning**
- **Definitions of Issues and Terms**
- **All Assumptions and Calculations**
- **Complete References to Scientific Literature Used**
- **Information Provided Directly by Individual Experts**
- **Reasons for Rejection of Specific Data, Calculations, or Models**

## **CURRENT SCHEDULE**

- **Briefed ACNW on Draft Positions**                      **June 21-22, 1995**
- **Publish Draft STP for Public Comment**                      **January 1996**  
**(60-days)**
- **Analyze Comments and Prepare Final**                      **Spring 1996**  
**STP**
- **Brief ACNW on Final STP**                      **Late Spring 1996**
- **Publish Final STP on Expert Elicitation**                      **Summer 1996**