

# Performance Assessment: An NRC Perspective

Presentation to:  
Panel on Risk & Performance Analysis  
U.S. Nuclear Waste Technical Review Board



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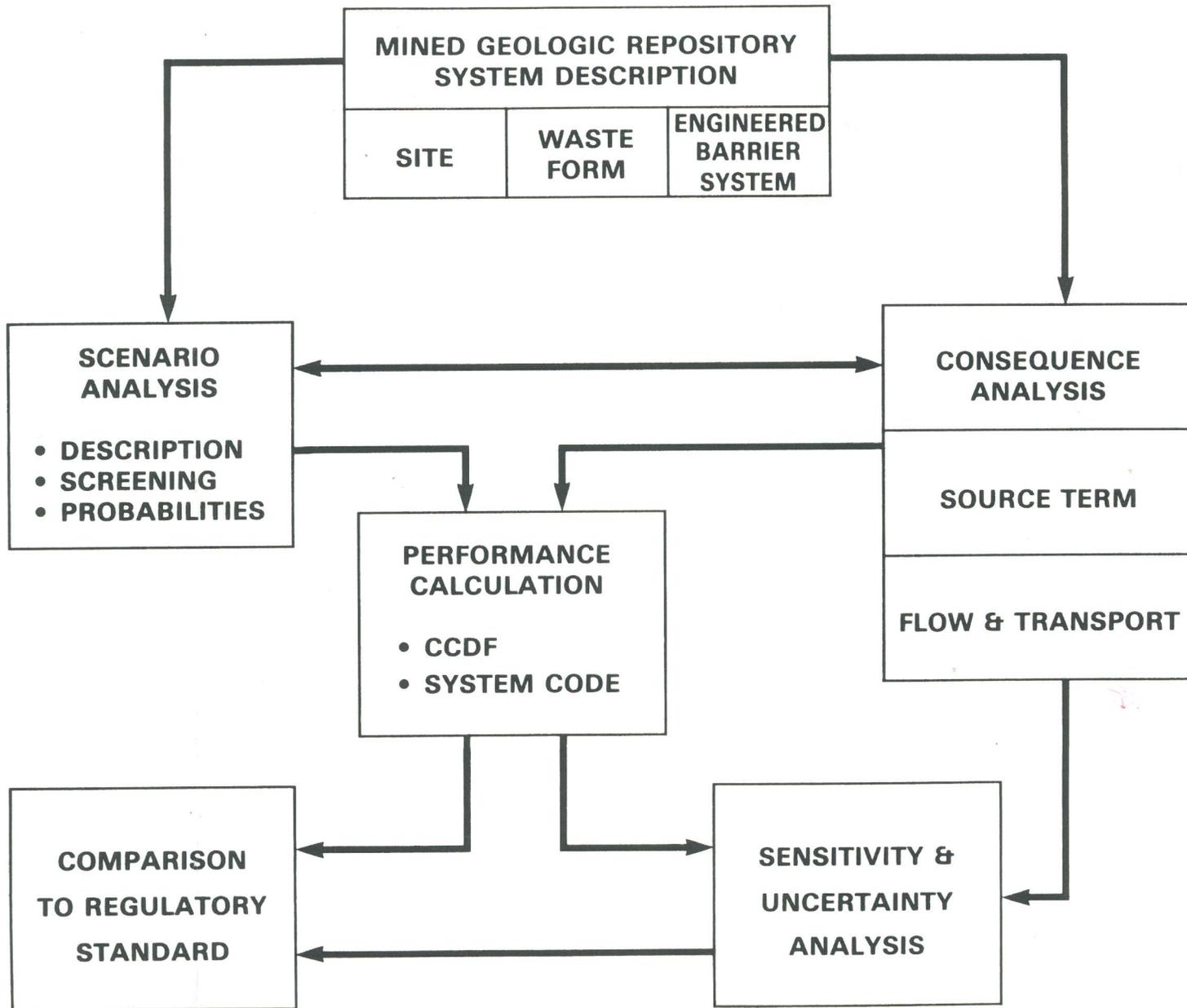
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# OVERVIEW

- What Is Performance Assessment
- NRC And DOE Roles
- NRC Licensing Review Process
- Expert Elicitation In NRC Licensing

## WHAT IS PERFORMANCE ASSESSMENT? NRC PERSPECTIVE

- Performance Assessment Is A Quantitative Analysis Of Repository Or Subsystem Performance
- In General, It Addresses Three Questions
  - What Can Go Wrong?
  - How Likely Is It To Occur?
  - What Will Be The Outcome?
- It Will Be The Primary Means For Showing Compliance With The Performance Objectives Of 10 CFR Part 60, i.e. The EPA Standards And Individual Barrier Objectives



Components of a total system performance assessment.

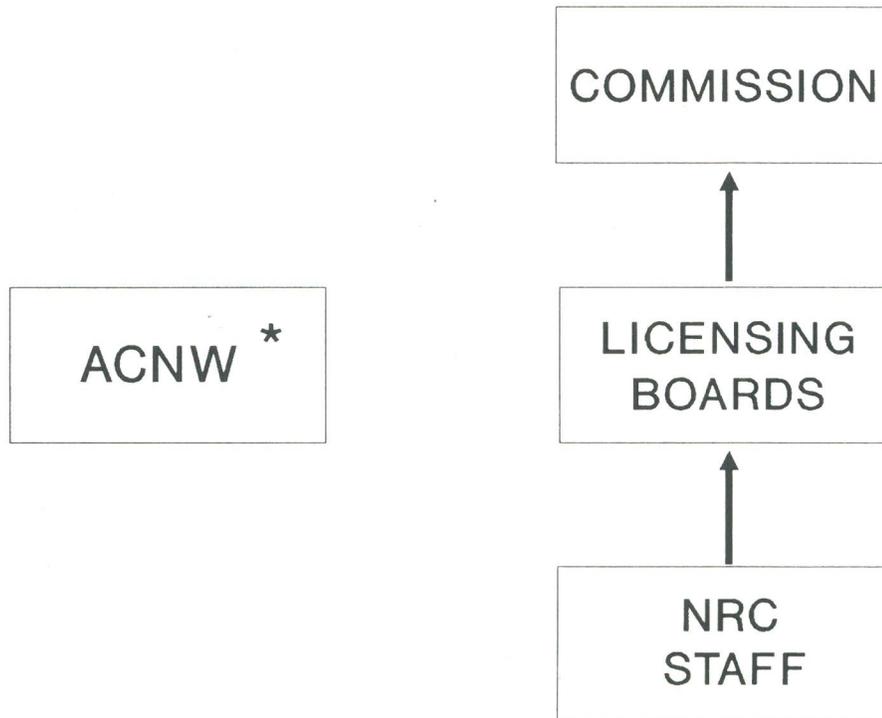
## INTEGRATION OF PERFORMANCE ASSESSMENT

- Performance Assessment Is A Systematic Analysis Involving Related Subanalyses, Several Technical Disciplines, And A Variety Of Data
- Performance Assessment Should Be Integrated
  - Across Subanalyses
  - Across Technical Disciplines
  - With Site Characterization

## NRC AND DOE ROLES IN PERFORMANCE ASSESSMENT

- DOE Must Do Performance Assessments To Show Compliance With 10 CFR Part 60 Which Implements The EPA Standards
- NRC Will Evaluate DOE's Performance Assessments In Making Its Licensing Decision

# NRC PARTICIPANTS IN THE LICENSING DECISION



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\* ACNW VIEWS WILL BE FACTORED INTO  
THE REVIEW PROCESS

## NRC DECISIONMAKING PROCESS

- The Commission Is The Legislatively Designated Decisionmaker
- The Licensing Board Makes An Initial Licensing Decision That Is Subject To Commission Review
- The NRC staff Makes A Recommendation To The Licensing Board Based On Its Independent Technical Evaluation Of The License Application

## NRC STAFF REVIEW INFORMATION USED

- To Evaluate The Information Contained In A License Application, The Staff Relies On Its Own Knowledge and Seeks Out A Wide Range Of Information
  - Staff Contractors And Consultants
  - Technical Literature
  - Discussions With Other Knowledgeable Parties

## NRC STAFF REVIEW EVALUATION OF INFORMATION

- With The Wide Range Of Sources Considered, Conflicting Views May Arise
- The Staff Evaluates Conflicting Views Through Examination Of The Supporting Analyses; For Each Analysis, The Staff Considers:
  - Quality and Completeness Of Data
  - Reasonableness Of Assumptions
  - Soundness Of Reasoning
- The Staff May Do Independent Analyses As Part Of Its Evaluation

## NRC STAFF REVIEW STAFF POSITION

- The Staff Position Will Be Sufficiently Conservative That Any Adverse Consequences Would Not Be Likely To Be Underestimated; The Key Issue Is Whether There Is "Reasonable Assurance ... [Of No] ... Unreasonable Risk To Public Health And Safety."

## LICENSING BOARD DECISION LICENSING HEARINGS

- The Licensing Board Makes Its Decision On The Basis Of A Hearing Record
- Hearings Are Conducted In An Adjudicatory Format; They Involve Several Parties And Focus On Specific Issues
- The Parties Would Include The DOE, The Staff, The State And Other Affected Parties
- The Board Uses The Full Range Of Information Presented, i.e. Testimony Presented By Expert Witnesses For The Various Parties
- The Burden Of Proof Rests With DOE

## LICENSING BOARD DECISION EVALUATION OF TESTIMONY

- The Board Evaluates Conflicting Testimony By Considering
  - Quality And Completeness Of Data
  - Reasonableness Of Assumptions
  - Soundness Of ReasoningThat Are Relied On By Each Expert
- The Board Bases Its Decision On A Composite Of Testimony In The Hearing Record

## LICENSING BOARD DECISION INITIAL DECISION

- The Decision Will Be Sufficiently Conservative To Assure That Adverse Consequences Would Not Be Likely To Be Underestimated; Again, Key Issue Is Whether There Is "Reasonable Assurance ... [Of No] ... Unreasonable Risk To Public Health And Safety."
- The Board's Decision Is An Initial Decision That Is Subject To Commission Review

## EXPERT ELICITATION IN NRC LICENSING EXPERT JUDGEMENT IN LICENSING

- In Support Of Its License Application, DOE Must Show That The Technical Criteria Of 10 CFR 60 Will Be Met. Such Support Must Undergo Staff And Licensing Board Review
- Many Of DOE's Supporting Analyses Will Rely On Expert Judgment To A Significant Degree
- Such Use Of Expert Judgment Would Not Be New To NRC; What Would Be New Is The Potential Use Of Expert Elicitation
  - As A Substitute For Obtaining More Objective Information
  - For Combining Differing Views

## EXPERT ELICITATION IN NRC LICENSING

### USE OF EXPERT ELICITATION

- Where More Objective Information Is Not Otherwise Obtainable And Expert Judgment Is An Important Input, Expert Elicitation May Be A Useful Means For
  - Clearly Defining The Problem
  - Establishing A Documented Basis
  - Sampling The State Of Knowledge;

However, An Assertion By DOE That Any Specific Elicitation Represents The State Of Knowledge Would Be Critically Scrutinized By The Staff

- Judgements About Lower Level, Less Aggregated Issues Would Be More Readily Evaluated
- Algorithms For Combining Expert Opinions, As Opposed To Evaluating Each Opinion On Its Own Merits, Would Be Viewed With Skepticism By The Staff