ENCLOSURE 1



# GEOLOGIC INPUT TO LICENSING DECISIONS

PRESENTED AT BWIP GEOLOGY WORKSHOP MARCH 13, 1984

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I'd like to suggest to all the parties interested in the repository siting decision process how the results of all of the geologic investigations might fit into the licensing decision and how the decision to license a repository might be made.

SLIDE #1 (attached)

The decision process is a legal proceeding of multiple co-equal parties. Many of the parties expected to participate are here today. The DOE, supported by its contractor efforts, will submit an application to construct a repository to the NRC. The NRC staff will make findings on whether there is reasonable assurance that the standards for system component performance and the overall EPA standards have been satisfied; and propose its findings to the ASLB.

Representatives of the affected states and tribes, intervener groups, industry, professional organizations and other government agencies will prepare findings on any part or all of the issues being considered. All of the written findings are presented to the ASLB and a hearing is held. A period of discovery is announced before the hearing. Discovery is an opportunity to pursue the supporting basis for any statement or inuendo in written testimony presented to the ASLB by any party. Any written or recorded material in any form that bears on a fact or issue in the case is subject to discovery. That is to say, even an internal memo or directive, including handwritten marginal notations, would have to be copied and turned over to the party that requested any and all material that led to a particular conclusion.

The NRC staff customarily is the first presenter at a hearing. It will elaborate on every finding, stating its conclusion and the detailed supporting bases as to why it did or didn't make a favorable finding.

DOE and the other parties will be heard by the board. There is much opportunity for cross examination and re-direct examination.

The ASLB will render its judgment (finding) on reasonable assurance that 10 CFR 60 regulations are met and send it to the NRC Commissioners who make the final decision.

The Atomic Licensing Appeals Board (ALAB) can be requested to get involved or it can involve itself. The Advisory Committee on Reactor Safeguards Waste Management Subcommittee (ACRS) will likely continue to act as an independent oversight committee on behalf of the Commissioners. The above adjudicatory process for repository licensing is hypothetical, but based on current facility licensing practices in the agency.

The decision process encumbers DOE and NRC with certain responsibilities:

SLIDE #2 (attached)

DOE's RESPONSIBILITIES at time of hearing, and on-going

- o Demonstrate compliance with all rules, regulations and standards; the burden of proof is on DOE and its contractors
- o Complete the Characterization of the Site
  - understand adequately the basic phenomena and process - such as tectonic movement
  - Analyze uncertainties of all relevant data, methods, models, computer codes, interpretations
  - Some performance confirmation studies may be on-going and continue through the licensing process such as seismic monitoring/tracer tests; however, all data needed to support licensing assessments must be in hand at application time
  - What DOE knows and doesn't know must be clearly stated
- o Defensible rationale backed by hard data subject to scrutiny in a court of law
  - Due consideration to alternative interpretations must be given
  - All relevant data and models must be considered
- o Supporting data and evidence must be gathered in accordance with DOE's QA program
  - Complete documentation of data is necessary

- Reliability of data used or rejected that DOE did or did not collect must be in accordance with the QA system

NRC RESPONSIBILITIES*

o Independently review and assess data and interpretations

- Independent checking of reliability, accuracy of data, models, etc.
- Independent uncertainty analysis
  - o Input to models, assumptions made, alternatives considered
- Independent performance assessment in selected areas.

o Propose findings on what DOE presents in license application

- Systematic iterative approach based on early identification of repository performance issues

* NRC cannot make up for any deficiencies in the license application, such as by generating data to fill a gap...

SLIDE #3 (attached)

THE FINDINGS TO BE MADE ARE BASED IN PART ON THESE TECHNICAL CRITERIA

o Multi-barrier approach - engineered system and geologic seeting will be relied upon to isolate waste

o Quantities to be measured or calculated

- EPA standard - no matter what is expected to affect a repository, cumulative releases to accessible environment will be below a value set for each radionuclide
- Waste package will isolate wastes for 300-1000 yrs
- Engineered system will control radionuclide releases
- Groundwater travel time along fastest pathway from disturbed zone to accessible environment.

- Favorable and potentially adverse site characteristics will be identified and considered such as: 60.122 (b)(1), siting criteria, favorable conditions, for example:

  "The nature and rates of tectonic hydrogeologic, geochemical and geomorphic processes (or any of such processes) operating within the geologic setting during the Quaternary Period, when projected, would not affect or would favorably affect the ability of the geologic repository to isolate the waste"

  60.122 (c)(11) Potentially adverse conditions, for example:

  "Structural deformation such as uplift, subsidence, folding and faulting during the Quaternary Period," and

  (c) (12) "Earthquakes which have occurred historically that if they were to be repeated could affect the site significantly."

Once identified and considered, favorable and potentially adverse conditions must be evaluated and any impacts which may require compensatory measures must be presented.

SCENARIO DEVELOPMENT

DOE is required to consider scenarios which involve natural disruptive events that might affect the ability of the repository to isolate waste. This will likely involve the selection or development of regional and local tectonic models. DOE should test a variety of seismotectonic models and scenarios to help it establish how much performance will be expected from the various natural (and engineered) system components.

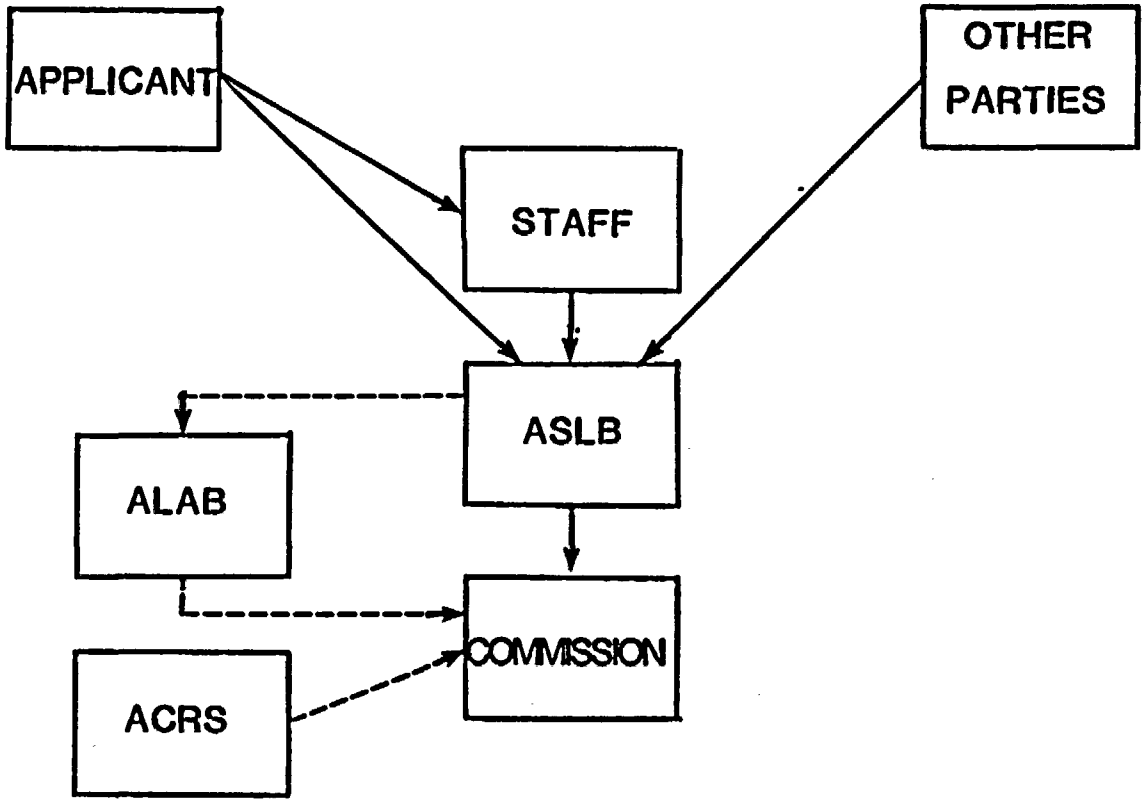
SUMMARY

DOE incorporates into its application the demonstration of compliance with all rules, regulations and standards with supporting bases and hard data established in accordance with the QA program. Due consideration is given to quantitative criteria, multiple barrier principle, favorable and potentially adverse conditions, models, alternative models, scenarios and respective attendant uncertainties. NRC staff does independent assessment and makes findings. At a hearing, the DOE application and NRC findings are examined with other parties (such as States, tribes and interveners) participating, co-equally. NRC Commissioners render a decision in the license application.

SLIDE #1
1

GEOLOGIC INPUT TO LICENSING DECISIONS

PHILIP S JUSTUS 3/13/84




# HLW DECISION PROCESS

SLIDE #1

SLIDE #2

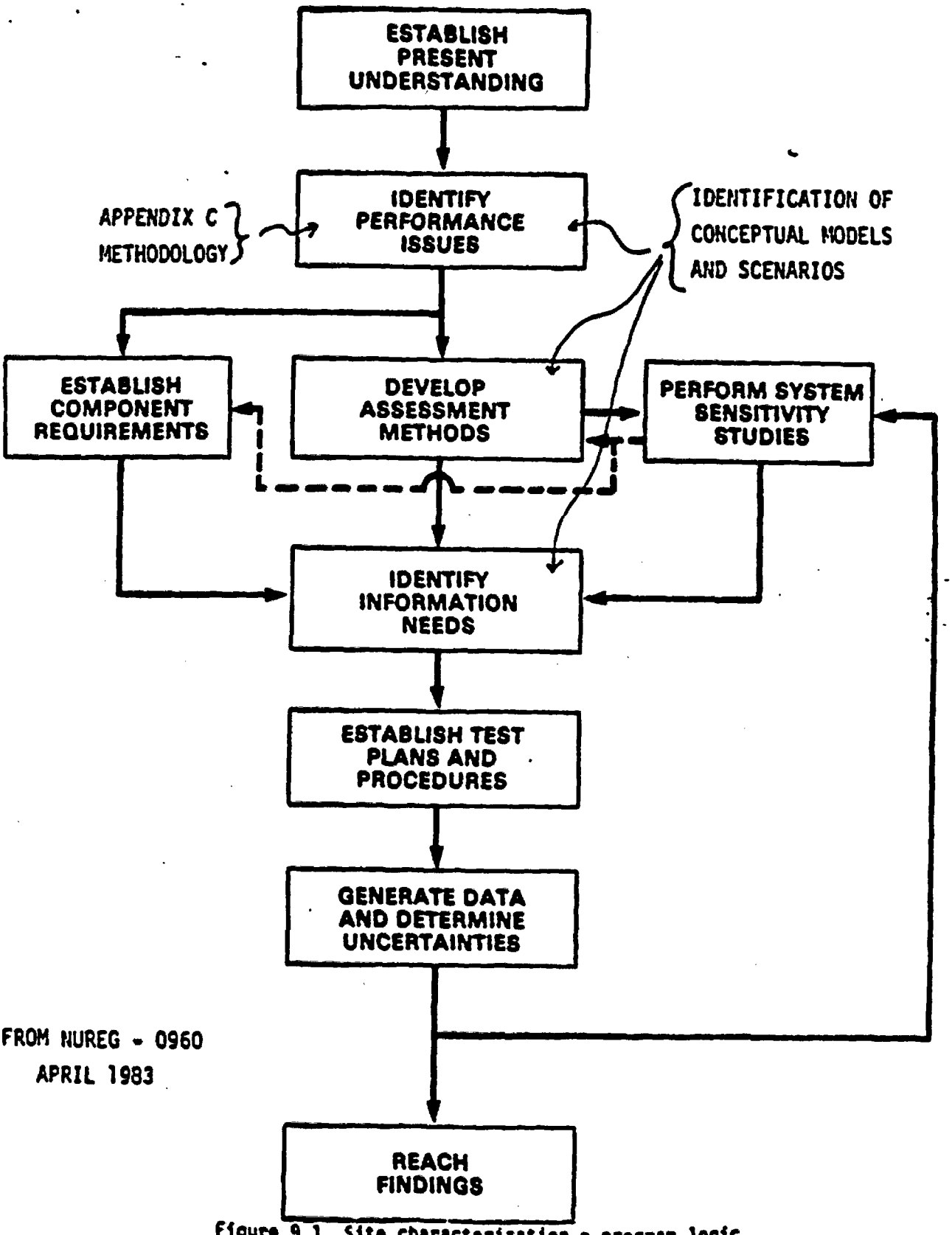



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Figure 9.1 Site characterization - program logic

NRC

## TECHNICAL CRITERIA

- MULTI-BARRIER APPROACH
- NUMERICAL PERFORMANCE OBJECTIVES
  - EPA STANDARD -- OVERALL SYSTEM
  - WASTE PACKAGE LIFETIME
  - ENGINEERED SYSTEM RELEASES
  - MINIMUM GROUNDWATER TRAVEL TIME
- QUALITATIVE SITING AND DESIGN CRITERIA

SLIDE #5