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MINUTES OF THE 93RD ACNW MEETING
JULY 23–25, 1997

- TABLE OF CONTENTS -

- APPENDICES -

DESIGNATED ORIGINAL

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B. John Garrick, 10/23/97

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PROPOSED MINUTES OF THE 93RD MEETING OF THE ADVISORY COMMITTEE ON NUCLEAR WASTE
JULY 23–25, 1997
SAN ANTONIO, TEXAS

I. Introduction

The Advisory Committee on Nuclear Waste (ACNW or Committee) held its 93rd meeting on July 23–25, 1997, held at the Southwest Research Institute, Center for Nuclear Waste Regulatory Analyses (CNWRA or Center), Building 189, 6220 Culebra Road, San Antonio, Texas. The purpose of this meeting was to discuss and take appropriate actions on the items listed in the attached agenda. The entire meeting was open to public attendance.

Selected portions of the meeting were transcribed, and the transcription is available in the NRC Public Document Room at the Gelman Building, 2120 L Street, NW., Washington, DC. [Copies of the transcript may be purchased from Neal R. Gross and Co., Inc., Court Reporters and Transcribers, 1323 Rhode Island Avenue, NW., Washington, DC 20005. Transcripts are also available on FedWorld from the "NRC MAIN MENU." The Direct Dial Access number for FedWorld is 800-303-9672; the local Direct Dial Access number is 703-321-3339.]

Dr. B. John Garrick (ACNW Chairman) convened the meeting at 8:30 a.m. and briefly reviewed the schedule. He stated that the meeting was being conducted in conformance with the Federal Advisory Committee Act. He also stated that no person or organization had asked to make an oral statement during the meeting. However, he did say that members of the public who were present and had something to contribute should inform the ACNW staff so that it could allocate time for the public to speak.

ACNW members Drs. George M. Hornberger and Paul W. Pomeroy were present. [For a list of other attendees, see Appendix III.]

II. **Chairman's Report** (Open)

[Richard K. Major was the Designated Federal Official for this part of the meeting.]

Dr. Garrick reported on a number of items that he believed to be of interest to the Committee, including the following:

- The Commission has appointed Dr. Raymond Wymer to the ACNW. Dr. Wymer will fill the vacancy created by the departure of Dr. William J. Hinze.

- Dr. David Morrison, former Director of the Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission (NRC), has left the NRC. Mr. Ashok Thadani has been selected to succeed Dr. Morrison.

- Mr. Robert Jolly is serving as a summer intern on the ACNW staff. Mr. Jolly is majoring in environmental science at Virginia Polytechnic Institute. He will graduate in December 1997.

- On May 21, 1997, the NRC approved a final decommissioning rule which will revise 10 CFR Part 20 to provide specific radiological criteria for the decommissioning of lands and structures at NRC- and Agreement State-licensed facilities; and which will establish a consistent regulatory basis for determining the extent to which lands and structures must be remediated before decommissioning of a site can be considered complete and the NRC or Agreement State license can be terminated. The Commission adopted a 25-mrem/year all-pathways dose limit coupled with a requirement to reduce radiological doses resulting from residual radioactivity to levels that are as low as reasonably achievable.

- Rust Federal Services of Hanford, Washington, has processed approximately 1 million gallons of high-level nuclear waste during the first 1997 run of Hanford's 242-A Evaporator. As a result, an additional 360,000 gallons of double-shell tank space has been made available for future use.

- In late May 1997, an International Nuclear Regulators Association (INRA) was established "to influence and enhance nuclear safety, from the regulatory perspective, among its members as well as worldwide." The association, which plans to meet at least annually, has eight founding members: Canada, France, Germany, Japan, Spain, Sweden, the United Kingdom, and the United States. Shirley Ann Jackson, Chairman, NRC, was elected to serve a 2-year term as INRA's first chairman.

- Recent information regarding low-level waste (LLW) Compact States included the following:

  a. California — On June 26, 1997, Senator Murkowski introduced legislation to convey land in Ward Valley to the State of California. The State of California must pay $500,100 to the U.S. Treasury and commit in writing to carry out environmental monitoring and protection measures recommended by the National Academy of Sciences and subject to NRC oversight.

  b. Texas — On June 25, 1997, the House Commerce Committee approved an interstate LLW disposal compact among Texas, Maine, and Vermont. The Senate Judiciary Committee had passed an identical bill on March 20, 1997.

  c. Ohio/Midwest Compact — On June 26, 1997, the Midwest Interstate Low-Level Radioactive Waste Commission voted to cease development of a regional disposal facility in Ohio and to revoke host State designations. Principal reasons for the cessation were the belief that there is sufficient access to existing LLW disposal facilities, and that the Commission is at a "critical point immediately prior to the commitment of considerable funds to a site selection process in Ohio."

  d. Illinois — Governor Edgar approved legislation that delays all work while a 2-year study of State and national siting issues is conducted. The target date for opening the facility is extended from 2003 to 2012.

A coalition of utilities, called the Private Fuel Storage Limited Liability Co., filed a license application for a temporary storage site for spent nuclear fuel on the Goshute Indian reservation near Salt Lake City. There is considerable opposition to this proposal in Utah.

III. Performance Assessment Capability in the NRC High-Level Waste Program (Open)

[Andrew C. Campbell was the Designated Federal Official for this part of the meeting.]

Overview, Framework, and Schedule of Activities - Dr. Keith I. McConnell (NRC)

Dr. McConnell opened the session with an overview of NRC's integrated HLW performance assessment (PA) activities. He explained that PA provides a systematic, quantitative procedure that is being used to integrate information across technical disciplines, provide feedback to the Department of Energy (DOE) on system performance, and support regulatory framework development. He added that PA will be integrated and evaluated with other Key Technical Issue (KTI) disciplines by using NRC's updated Total Performance Assessment (TPA) code (version 3.1) to evaluate key abstraction elements, and to do sensitivity studies. This will be documented in the Issue Resolution Status Report (IRSR) on abstraction and relative importance. The upgraded TPA code will be used to review and evaluate DOE results in comparison to previous Total System Performance Assessment (TSPA) results. The feedback will help DOE review the TSPA for the Viability Assessment (TSPA-VA). Dr. McConnell stated that the development of a risk-informed, performance-based (RIPB) implementing rule will use TPA activities to focus and explain regulatory criteria and establish a clear relationship between acceptance criteria and the compliance calculation. He illustrated how PA can be broken down into three tiers. The first is the total system for the repository, which includes individual dose calculations. The second tier is made up of the three subsystems and components of the subsystems. The development of RIPB regulation for Yucca Mountain is part of this tier. The third tier is made up of the key elements of the subsystem abstractions and includes development of acceptance criteria. Dr. McConnell gave an overview of HLW PA activities, priorities, and schedules for 1997–1998.

The Committee members asked about conveying the acceptance criteria to DOE, the abstraction IRSR, TPA code development, methods of ranking and evaluating the importance of KTIs using PA, policy decisions concerning the role of the biosphere, integration of KTIs, and the elimination or downgrading of work in radionuclide transport and other KTIs. The staff discussed each of these issues, noting that budget cuts have hurt the KTI work and that the staff had to eliminate some KTI work at the Center for Nuclear Waste Regulatory Analyses (CNWRA). The staff will use PA analyses to identify the key elements in repository performance and to reprioritize activities. The staff also noted that the TPA code, version 3.1, and the users manual will be available in September, when sensitivity studies will be initiated.

Discussion of Projects, Staff Expertise, and Resource to Support PA Activities

Dr. McConnell said that the allocated staff consists of a core group in NRC's PA and HLW Integration Branch and that CNWRA is assigned full time to HLW PA activities. The core group is supplemented by a broad range of engineering and geoscience disciplines in integrated PA activities. He noted that the staff is in the process of broadening its integrated PA capability by making the TPA code more usable and more accessible to KTI team members by pairing newly hired personnel with experienced senior staff, and by ensuring that new staff has broader technical and computational skills. Dr. McConnell introduced the staff leads in the effort. Mr. Tim McCartin was introduced as the PA lead, and it was noted that NRC had recently awarded him the Meritorious Science Award. Dr. Virginia Colten-Bradley was introduced as the lead for process level and system level sensitivity studies. Dr. Christiana Lui was introduced as the lead for probabiliistic risk assessment (PRA) activities.

The Committee asked about confidence building in models and programs, the impact of budget cuts, the reasonableness of the approximations in the models, the impact of design uncertainties on sensitivity studies, calibration of the TPA code with other codes, and "soft spots" in the program. The staff replied that confidence building includes building confidence in people, results, and computational aspects. Dr. Wes Patrick of the CNWRA noted that confirmatory research was lost in the budget cuts. Dr. McConnell added that the staff will still have an idea of where to proceed with completion of the sensitivity studies. He said that the DOE reference design will be evaluated and that they will have the flexibility to evaluate any changes. The NRC

staff is building a system code that can be used on a PC and at workstations to gain more immediate feedback. NRC is going to compare the TPA output with the results of the NRC's Iterative Performance Assessment Phase 2 (IPA-2) and DOE's TSPA-VA. Mr. McCartin said that the NRC staff is doing hand calculations to check the code and is looking at intermediate outputs to see if the code is believable and reasonable. Dr. Norman Eisenberg (NRC) said it is hard to verify the code overall because there are few system level codes that apply to Yucca Mountain. He added that parts of the code have been benchmarked (e.g., NEFTRAN). Mr. McCartin said that they are comparing NEFTRAN to other benchmarked codes and verifying problems that were discovered during the LLW PA modeling effort.

Dr. McConnell then discussed the following specific aspects of the staff's activities: developing importance measures — Dr. Budhi Sagar (CNWRA) and Dr. Eisenberg; working with Environmental Protection Agency (EPA) on a revised standard — Mr. McCartin and Ms. Janet Kotra; developing the IRSR on abstraction and importance — Dr. Chris Lui. He also discussed the TSPA review, the strategy for developing the NRC HLW regulation for Yucca Mountain, the KTI Annual Report, the NRC review of 10 CFR 960 revisions, the EBSPAC model development, expert elicitation activities, ICRP-46 review, participation in the BIOMASS Program, and the development of the standard review plan (SRP).

The members asked about the distribution of activities between the NRC and the CNWRA, funding for the CNWRA, and the development of acceptance criteria. Dr. McConnell replied that if funding is reduced any further, a limited number of people would still be able to do the work, but would need more time to do it. He added that the CNWRA is doing very important work for the NRC such as developing and testing the TPA code and working on the IRSRs. Ms. Margaret Federline said that acceptance criteria well be put in the SRPs and that the IRSRs provide what is currently known about an issue. She added that at the time of license application NRC will have a bottom line of what is acceptable for NRC review and acceptance.

Discussion of Hardware Capabilities and Utilizations in PA —Dr. Michael J. Bell (NRC)

Dr. Bell discussed the NMSS's advanced computer system (ACS). He went into detail on how it evolved, the NMSS network setup, and the NMSS software applications. He noted that early

modeling codes were very labor intensive, needed mainframe computers, and involved long processes to run. He said that NMSS was moving to eventually bring modeling capability in house and was working to get all the KTI teams involved in code development and use. He discussed the evolution of TPA, version 2 to TPA, version 3.1. The revised code runs on a workstation, is user friendly, and will be used by wide range of analysts, including KTI leads, in sensitivity studies. He further said that it is anticipated that high-end PCs will take over some of the complex modeling activities related to PA. He also said that the ACS hardware and the human element of PA must proceed in tandem. The CNWRA hardware and software computing facilities were also briefly discussed. Dr. Bell discussed other agency activities involving the ACS. He added that ACS workstations are incompatible with the rest of the agency, which mostly uses PCs, and that PCs would be cheaper. He noted that the agency is looking at cutting the budget for computers and software. He commented on the need to ensure that the ACS will be funded and fully available to assist in license review. In response to a question, Dr. Bell said that the ACS server needs to be replaced and NMSS has no funds to do this. In response to a question about parallel virtual machine (PVM) processing on the ACS, Dr. Richard Codell said that NMSS had used it for some runs in the LLW PA modeling and for in-house calculations for the National Academy of Sciences recommendation on the Yucca Mountain standard. The current modeling system is mainly aimed at individual workstations. NMSS needs to modify this to operate in a parallel mode because of long run times.

Discussion of TPA 3.1 Code Architecture Including the Subsystem Abstractions - Mr. Tim McCartin (NRC) and Dr. Robert Baca (CNWRA)

Dr. Baca said that the TPA 3.1 code is a joint effort by the NRC and CNWRA. He discussed the TPA code design, and noted that a number of major improvements have been made since the IPA-2 analyses. He also said that TPA 3.1 is more user friendly. He described the TPA structure and gave specific examples of KTI contributions. He noted that abstractions are implemented through lookup tables, subroutines, and external stand alone programs. The NRC adheres to a philosophy of model abstraction rather than result abstraction. Dr. Baca described system discretization and noted that NRC uses two-dimensional (2-D) models to develop a one-dimensional (1-D) stream tube representation in the code. He then discussed TPA code outputs, which are in the form of statistical distributions of dose and cumulative release. The code also

generates intermediate outputs by scenario class, repository components, and subsystem. He discussed some assumptions in the code. The reference data set for Iterative PA, Phase 3 (IPA-3) was discussed.

The Committee asked how the model differs from DOE's model and how any difference might affect comparisons of the results. Dr. Baca replied that DOE has a 3-D code with fine discretization, but that the DOE code can't propagate uncertainty, whereas the NRC code can be used to evaluate uncertainties. DOE is relying on a detailed multidimensional model whereas NRC is looking at simpler models. Data demands for multidimensional codes are much larger than for a 1-D code. He also described complementary cumulative distribution functions (CCDFs) generated with the NRC TPA-2 code and some generated with the DOE TSPA code for the same problem. The main difference was the use of a Markovian process model in the DOE code resulting in significantly slower transport times for the DOE analyses.

Chairman Garrick asked about the degree of realism in the code. Dr. Baca described what CNWRA is doing to address this. The staff replied that it is comparing the results with some real sites (e.g., the staff has looked at the Cerro Negro volcano) and is making comparisons with other codes and results. Another member asked how the uncertainty is propagated through the analysis from process level model to PA model. The staff replied that the models don't carry through the full range of uncertainty. For example, some uncertain parameters are set to a constant if they have minor impact on output.

Mr. McCartin discussed abstractions in the TPA 3.1 code and the site information used, which including lab and analog experimental data. He noted that DOE has the burden for making the safety case in the license application and that this is an important difference from the NRC's role. The NRC approach may not be as detailed as DOE's code work because NRC wants to be able to look at a few focused aspects of DOE's application. He said that TPA 3.1 provides insights on key elements of the subsystem abstractions, the conceptual models and uncertainties, and the KTI activities. Some of the anticipated sensitivities are: unsaturated zone flow and transport, fracture/matrix interactions, the spatial distribution of flow, retardation in fractures, and different conceptual models. In response to a question, he said that research analyses indicate that shaft seals will not affect results. He said that there is little lateral diversion in the Paintbrush Tuff unit,

so the 1-D vertical model is appropriate. NRC does not intend to duplicate DOE's extensive model work, but will look at all of it. He showed a conceptual diagram to illustrate why NRC is using a 1-D abstraction of the DOE site data. NRC takes setbacks into account by the number of waste packages that are assumed to get wet. He also discussed how thermal reflux will affect flow and noted that NRC is evaluating a large flux of water coming back to waste containers. Additional assumptions include no retardation in fractures and no matrix diffusion. This is based upon natural analog studies at Pena Blanca, Mexico, that show movement of uranium into micro fractures, but not much movement into the matrix over many thousands of years. He added that the parameter values and abstractions are supplied by the KTI groups, not by the PA group. The PA leads ask questions and there is a healthy give and take with the KTI teams.

A Committee member asked about thermal effects and the unavailability of test data at the time of TSPA-VA. Mr. McCartin replied that the calculations show possible high reflux (100 mm/yr) and NRC needs to evaluate if this makes a difference in the final result. There was a discussion about the type of data needed and how to extrapolate the drift heater test results to the whole repository. Ms. Margaret Federline said that NRC sent a letter on thermohydrology to DOE, which stated that a longer period of heating and cooling was needed. A representative from DOE said that DOE changed its program to respond to NRC concerns about both the single heater test and the drift scale test.

Mr. McCartin discussed recent infiltration rate data that indicate higher water fluxes than originally considered by DOE. This results in less matrix infiltration because most of the tuff units have slower matrix permeability than the flux rate, except for the Calico Hills Vitric Unit. He said that in a pluvial period the infiltration will be two to three times higher than now. He also said that retardation in fractures and matrix diffusion are assumed to be minimal. In response to a question, he said that NRC will do some sensitivity studies on this issue.

He discussed key elements of the engineered barrier system, including the following: waste package corrosion, mechanical disruption of waste packages, the amount and chemistry of water contacting the waste forms, radionuclide dissolution rates and solubility limits, diffusion release models, and a "bathtub" model for the waste containers. The NRC staff and Committee members then discussed a number of aspects of these models, including the lack of consider-

ation of a possible reducing environment, KTI activities concerning parameter distributions, abstractions, and detailed modeling.

After the lunch break, Mr. McCartin continued the session by discussing the issue of taking credit for engineered barriers where there is little experimental information. Chairman Garrick said that it is easier to characterize engineered systems than natural systems and one should be able to quantify the role of engineered systems to contain radionuclides. He added that some options for design that the Committee has seen in the last two days point to the need for deciding which designs to implement. Mr. McCartin replied that one has to question what the engineered features will look like in thousands of years. There was also a discussion of the amount of water infiltrating into the repository. Mr. McCartin noted that 10 mm/yr is a small amount of water and a drip shield would have to shed only trace amounts of water. He also discussed container degradation from a few pits to many pits, and accelerated testing data for dissolution of spent fuel. Ms. Federline added that the objective is not to predict over long time frames. She said there needs to be agreement on what the PAs are trying to do and what tests are needed. Chairman Garrick agreed.

Mr. McCartin discussed key elements for the saturated zone flow and transport, including dilution and retardation in aquifer production zones. He showed a diagram of the 1-D flow and transport model and discussed why NRC believes that it is a reasonable abstraction for Yucca Mountain. Some of the anticipated sensitivities include minimal retardation in fractures, retardation in alluvium, long travel times, and different pumping rates. He discussed the integrated flux of water through the repository, the model calculations, and the NRC approach for dilution at a pumping well. He noted that DOE is doing more sophisticated analyses with respect to the saturated zone. However, he was uncomfortable with taking credit for hundreds of meters of dispersion in the saturated zone if fracture transport is involved.

He discussed direct releases from volcanic activity, key elements, conceptual model approaches, uncertainties, natural analogs, KTI activities, and sensitivities. He then discussed the dose calculations, including: dilution in groundwater, dilution in soil, and location and lifestyle of the critical group. He also discussed dietary factors and assumptions used in the dose model.

Finally, Mr. McCartin discussed some of the advantages of the advanced computer system, such as its storage capacity and its ability to do PVM calculations, which can't be done on PCs.

Discussion of Planned Sensitivity Studies — Dr. Virginia Colten-Bradley (NRC)

Dr. Colten-Bradley discussed sensitivity and uncertainty analyses. The objectives are to identify the parameters that most influence dose, to understand output sensitivity and uncertainty, to identify model and code biases, and to evaluate the overall system characteristics most important to performance. She discussed different approaches, including the following: Step-Wise regression analysis, the Kolmogorov-Smirnov test, scatter plots, histograms, and box plots. She described how the Kolmogorov-Smirnov test is used to identify sensitive parameters. Dr. Colten-Bradley discussed some of the significant parameters identified by the approach, such as infiltration, corrosion, retardation, and dissolution rate. In response to a question, she said that the variance on a parameter is very important because of the sensitivity of the result to its range. She also showed scatter plots and box plots of model results. Dr. Colten-Bradley then discussed subsystem sensitivity analysis, which aims to identify the most important parameter in each model using a sampling or "what if" mode. This is done by setting other module values to nominal values. The approach is being done by the KTI teams to refine the reference data set for the "base case," and to provide a basis for comparing subsystem and total system sensitivities. She discussed the results of sensitivity analyses that are used to determine parameter sensitivity and to determine model sensitivity.

The Committee asked a series of questions concerning coupled processes that affect water chemistry and the criteria for doing sensitivity studies related to coupled processes. The staff discussed what is being done in this area, such as thermo-hydrologic-chemical modeling, to see if the system model is appropriate. Chairman Garrick asked about the utility of doing sensitivity analyses in a calculation based upon very conservative assumptions. He said that one can get unrealistic results. Dr. Colten-Bradley agreed and said that the code can be used to shake out unrealistic features by looking at what drives a particular result and evaluating if it makes sense. Dr. McConnell added that, in the absence of data, the staff wants to err on the cautious side in understanding performance.

Future Activities — Dr. Norman Eisenberg (NRC)

Dr. Eisenberg discussed NRC's plans for reviewing the DOE TSPA-VA. He discussed the purpose and objectives of the TSPA-VA review, noting that the NRC has no mandate to review DOE's viability assessment. NRC wants to be able to identify vulnerabilities, to consider the basis for cost projections, to comment as requested, to evaluate lessons learned, and to use PA information in the review of repository design. He also discussed the schedule of TSPA-VA and the five system attributes of DOE's Waste Containment and Isolation Strategy (WCIS). He discussed DOE's 15 hypotheses to support the 5 WCIS system attributes. He noted the need to focus on the union of important issues for DOE and NRC. He showed a diagram of DOE's process model priorities and noted that the NRC is doing a cross check on the TSPA-VA process model areas and the TPA-3 code. He discussed the framework and activities for NRC review of TSPA-VA including key PA areas, abstractions and parameter choices, and feedback to DOE. He described and discussed 10 technical areas that may require focus of staff resources.

Dr. McConnell summarized this session by stating that the goal of the day's presentations was to outline the approach the HLW PA program is taking and to demonstrate that the program is integrated across KTIs. He wanted to demonstrate that the HLW PA program has the capability, both in human resources and computational tools, to evaluate the importance to performance of NRC'S issues and subissues and to review DOE's TSPA-VA. The last goal of the day was to inform the ACNW of the schedule and timing of HLW PA activities

A question-and-answer session followed. An ACNW consultant asked if DOE is assuming 10,000- year compliance? Mr. Jack Bailey of DOE replied that in their model it takes 3,000 years before first-through wall penetration occurs and that no more than 10 packages fail before then. He also discussed other efforts to get long lifetimes in excess of 10,000 years. The Committee members asked how priorities are set, soft spots in NRC's work, (including hardware, software and science programs), and how increased funding would affect the program. One member asked if there is an appropriate distribution o f capabilities between NRC and CNWRA in the PA program?

The staff discussed limitations on resources and the quality and ability to complete work. The CNWRA lost some key people in PA and there are some soft spots, like container life and source term. If funds become available, CNWRA would increase work in some areas and would increase staff. The staff said that, given the resource limitations, the mix of NRC and CNWRA expertise is about right.

In response to a question, Dr. Eisenberg said that DOE must demonstrate a multiple barrier approach, which is mandated in the Waste Policy Act. He also discussed issues for multiple subsystem components that contribute to performance. In response to a question about evaluating TSPA-VA in terms of model processes, he replied that the DOE input parameters may have to be modified to fit with NRC models.

In response to questions about the acceptance of models and codes in court proceedings and publication in the scientific literature, the staff replied that it publicizes the code in public meetings, and that it will be available for review and comment in the near future. In response to a question about the breadth of the KTI list, Dr. McConnell replied that the list was developed by a quasi-expert judgment approach. As other issues come up, the list will be reevaluated annually. He added that they have tried to capture everything that appears to be important in the KTIs. Dr. Eisenberg said that the staff uses PA capability to probe DOE analysis not to make a case for safety. Dr. Wes Patrick (CNWRA) added that criteria studies (pre-closure and post-closure) were used to develop a list of 60 key technical uncertainties, from which a subset of 10 KTIs was developed. Chairman Garrick said that there is a need to develop tools for telling what is important among the 10 KTIs or what may not be at the forefront at the moment. Mr. John Greeves discussed the multiple responsibilities of the staff.

The work on revised 10 CFR Part 60 and the strategy for developing the rule were discussed. In response to questions concerning the TPA code and KTIs, the NRC staff replied that the simple approach in TPA 3.1 is still an improvement over TPA-2. It was noted that the code needed additional features, but funding was removed. Dr. McConnell said that some of the work from the waste package KTI was being done in other KTIs. Vice-Chairman Hornberger noted that although great strides were made, the NRC staff is making conservative assumptions and the end product is a conservative result that otheres believe to be realistic. One of the consul-

tants discussed NRC and CNWRA communication, abstraction, and the need to identify uncertainties with the engineered barrier system (EBS) and the geosphere. Another consultant commented that not enough attention was paid to chemistry in these modules, for example, the valence states of neptunium and technetium, which may cause them to move differently than conditions in the model. He added that the chemical interaction of magma with containers would possibly result in binding up the waste rather than releasing it. Dr. Whipple, an invited expert, noted that the combination of conservative and realistic assumptions results in it being hard to do sensitivity and uncertainty analyses. He gave examples of this problem from the Waste Isolation Pilot Plant PA. He also discussed staff assumptions about dispersion in a magma eruption, the difficulty of doing a PA without a standard, the need for site performance measures at long time frames, and the need to include EPA on the staff actions in the area of the biosphere and the regulation. Finally, Dr. Kaplan said he was happy to note the increased emphasis on engineered barriers.

III. **Probabilistic Performance Assessment** (Open)

[Andrew C. Campbell was the Designated Federal Official for this part of the meeting.]

Chairman Garrick delivered introductory remarks for the working group session and introduced the first speaker.

Interpretation of Performance Assessment Results for Decision Making — Dr. Stan Kaplan (invited expert) and Mr. James Lin (PLG, Inc.)

Dr. Kaplan began his talk by discussing what is meant by a simple model. The goal, he said, is to cast the results of a more complicated PA analysis into a form useful to decision makers. He discussed the decisions that have been made or that need to be made for the HLW program. Dr. Kaplan described decision theory and showed a diagram as it would apply to PA. He discussed what a decision point is and how decisions can be made on the bases of time, cost, and health effects. He said that PA is used to produce these decision curves. The inputs to PA are the models and parameters and, ultimately, the evidence base. At a decision point there are different options about how to proceed; each option has three outcomes: cost, schedule, and performance. Each of the options, he said, has a trio of probability curves that corresponds to

the outcomes. One option is to get more information and this new information changes the probability curves. Another option is to add new options—to think about the problem in new and different ways.

Dr. Kaplan discussed a slide on the DOE's PA approach, showing the relationship between data, process level models, abstraction, and the PA model. He also discussed an event tree approach with "pinch points." He compared of PRA for nuclear power plants and PA approaches for waste disposal systems. He noted the similarities in various components of a PRA and a PA and spoke to the concern with the frequency of an event in the PRA case as compared to a concern with the flux of radionuclides as a function of time in the PA case. Dr. Hornberger asked about the effect of the short time in the case of a reactor accident on the approach used in the analysis. Dr. Kaplan said that the big difference is the use (assumption) of a Poisson approach in the PRA (reactor) case. He also discussed a matrix formulation of reactor risk assessment that takes advantage of linear relationships in the system. He said that the matrix elements connect initiating events with the various system end-states for each subsystem component. He described how one can use matrix elements to understand how changes in end-states can contribute to the overall consequence. He noted that such a model is an abstraction of the underlying models. Unlike a response surface or curve-fitting abstraction, the simplified model is a summary of the underlying information.

In response to a question, he said that the concern is with the frequency of events for reactors and that magnitudes are contained in the plant state vectors. In contrast to this, the concern in the waste repository is the magnitude of some event, not necessarily its frequency. Dr. Kaplan then discussed a Green's function formulation of the problem for a waste repository. He noted that each component of the system can be cast in the form of a Green's function. A process analogous to the matrix multiplication in the reactor case could be used to analyze the consequences. If one changes a particular design component or an input value, one can see the effect on the bottom line by recalculating the Green's functions without completely redoing the fundamental models.

Chairman Garrick noted that the concept of simplification is to use a tail-end processing approach to see how proposed changes affect the result. The use of a matrix formulation and

the decomposition of results into importance-ranked contributors had a significant effect on the ability to understand and present the options to decision makers in the case of reactor PRAs. He also described some of the concerns with the use of a single performance indicator in contrast to a variety of risk indicators. Vice-Chairman Hornberger noted that the geosphere is described by a system of coupled nonlinear differential equations and asked how one might cast them in the form of a Green's function. Dr. Kaplan said that we can cast the form of the results — the output — into a functional relationship. The key point is finding out why certain things produce a particular result and then casting the various subsystem outputs into Green's functions. Drs. Kaplan and Hornberger then discussed the mathematical approach.

Chairman Garrick introduced Mr. Lin, who said that the focus of his talk would be on a top-down, scenario-based approach to PRA modeling and its possible application to PA. He described what a scenarios approach can do and cannot do in an analysis. In a top-down approach, one attempts to put more details in risk-important areas and fewer details in less- important areas. By this method, all events can be sorted according to importance ranking. Mr. Lin then compared probabilistic risk assessment and probabilistic performance assessment. He defined event scenarios and end-to-end event scenarios and their possible use in PA. He said that end-to-end scenarios provide complete paths from initial conditions through the different pinch points and other intermediate states to ultimate end-states. He said that end-to-end scenarios can be used to represent sequences of events and processes external to the repository or to represent combinations of initial or boundary conditions. He described how, with intermediate states, the end-to-end sequence is useful in presenting the information and in analyzing importance. He said that this is so because the dominant sequences and the events driving the dominant sequences can be easily identified.

Mr. Lin described possible applications of the event tree approach to the repository. He noted that one must be able to discretize the outputs and models. He described ways in which this might be done and told how it is important. He discussed scenario enumeration and representation using the event tree approach that allows one to systematically list all the possible combinations of events and states that are mutually exclusive. The goal, he said, is to collapse many realizations into a smaller number of event tree sequences by filtering out all but the most important combinations of events. He described some of the features of the event tree ap-

proach, noting that multiple states can be used to represent possible conditions of the repository and possible parameter ranges. He also discussed some other advantages of top-down scenario analyses. Mr. Lin said in summary that the top-down scenario analysis is an iterative approach, which includes the most detail in risk-important areas. He said that the physical data are used to generate the top event probabilities. The results of the top-down scenario analysis are used to determine areas of detailed modeling. It provides transparency and can be used as a tool for "what if?" analysis. Mr. Lin described a possible approach to implement a top-down scenario analysis for PA. The analysis, he said, needs to be segmented into logical pinch points, which allow one to quantify flow and transport across critical interfaces. He described how one can represent the overall repository model by event sequences, and gave some examples of initial conditions, intermediate states, and top events. He noted that there are various approaches used to reduce the number of combinations so that only the most important sequences are included in the final analysis. He said that the end-to-end scenarios can characterize all of the events and processes and can retain the transparency of those aspects. The top-down scenario analysis will generate a large number of scenarios, but computer power is available to use existing software to process a large number of scenarios and reduce these to a much smaller set. Finally, he said, this approach facilitates importance analysis by condensing the scenarios into the most significant ones in terms of their likelihood.

Chairman Garrick commented on discretization of the model into pinch points, specifying end-to-end scenarios, the dominant sequence model in reactor PRAs, and continuous versus discrete failure.

Dr. Eisenberg said that both PRAs and PAs start with scenarios and probabilities, but that the mission time of a reactor is longer than the time for an accident to occur, whereas for a repository the mission time is on same time scale as degradation and release, so these events are not mutually exclusive. Mr. Lin replied that they are mutually exclusive in terms of specific combination of states. A discussion ensued among Dr. Eisenberg, Mr. Lin, Dr. Kaplan, Dr. Whipple, Dr. Codell, and Chairman Garrick concerning events and scenarios, Green's functions, what can be learned from reactor PRAs, uncertainty, variability, and alternative sampling methods. The Chairman and a consultant discussed the ability of modeling to represent what actually can happen, quantifying uncertainty, and different levels of verification.

Electric Power Research Institute (EPRI) Total System Performance Assessment (TSPA) Model - Dr. John Kessler (EPRI) and Dr. Robin McGuire (Risk Engineering, Inc.)

Dr. Kessler discussed the history of EPRI's TSPA model starting in 1990 with IMARC (Integrated Multiple Assumptions and Release Calculations) Phase 1 to the present version, IMARC Phase 3, which extends the analyses to 1 million years. EPRI's purpose for conducting a TSPA analysis was covered and it was stated that TSPA models are not intended to predict the future. The climatic model was discussed. Its key features include the greenhouse effect and 100,000-year climate cycles. Net infiltration estimates were made using three climate regimes. Some features of the deep percolation model are multi-phase flow, double porosity, and 80 percent lateral diversion. The hydrothermal process model considered thermal loads of 25 and 83 MTU/acre, as well as three heat transfer modes: a conduction-dominated mode, a convection and conduction mode, and a heat pipe mode. He discussed container corrosion and went into detail on the two container types explored. The container failure is based on a Weibull distribution, and general corrosion as well as pitting corrosion are considered. The source term model is a compartment model. It considers five processes; however, the effects of cladding and partial waste form wetting are ignored. The unsaturated zone transport model includes the following: advection and longitudinal dispersion; decay and daughter in-growth; reversible and linear sorption; and advective/diffusive exchange between fractures and matrix flow. The near-field saturated zone flow and transport model is three dimensional (3-D), considers a single geological unit, assumes uniform infiltration, and transient diffusion between fractures and matrix blocks. The biosphere dose model evaluates self-sustaining agriculture and a "conservative" individual as key components. The features, events, and processes (FEPs) in the EPRI model that were neglected are: gas releases, volcanism, seismicity, drift stability, and human intrusion. Important measures of performance to the model are location of the critical group, plume concentration, and dose to an individual.

Dr. McGuire discussed the advantages of EPRI's IMARC program. He said that all the critical geologic and engineered systems are represented. The model contains a detailed hydrologic model of the unsaturated and saturated zones, and a detailed source term model. Other advantages of the model are the ability to do abstractions at many levels and to do sensitivity studies in a way that makes it easy to extract the most sensitive features from the "base case"

analysis. The disadvantages of the EPRI model are the following: "full runs" take a long time; uncertainties are not separated from temporal or spatial randomness; it cannot indiscriminately add uncertainties in all parameters; it does not include multiple source term, container, or flow and transport models; and it must keep analysis focused on critical nuclides and failure modes. He said that the latter could also be beneficial. It was concluded that Yucca Mountain is technically suitable for HLW disposal. He said that the results show low projected dose rates for much longer than 10,000 years and peak dose rates (i.e., beyond 100,000 years) are found to be the same as in the natural background. Other beneficial features of Yucca Mountain include the following: it is in an enclosed basin, which limits groundwater flow; it is in a region that is now fairly arid and will remain so in the future (hence, groundwater in the area could never support many people); and the repository is in the unsaturated zone, "which will probably remain dry forever." The "licenseability" of the repository will depend on the details of the standard, which has not been issued yet, and the confidence of the public in the regulatory decision.

The Committee, consultants, and invited experts discussed a number of issues with Drs. Kessler and McGuire, including the model and the assumptions used in the model; differences with the approach and the results of other models for Yucca Mountain, infiltration, corrosion, and licensing; and details on running the model.

Department of Energy (DOE) Total System Performance Assessment Model for Viability Assessment (TSPA-VA) - Dr. Robert Andrews (CRWMS M&O Performance Assessment)

Dr. Andrews discussed the components of DOE's viability assessment, what TSPA is, including the different models for TSPA, and the abstraction process. He said that the uses of TSPA for decision making include prioritizing natural and engineered system information needs, determining benefits of alternative engineered barrier designs, and defining attributes in DOE's Waste Isolation and Containment Strategy (WCIS). He said that the methodology and approach tie analyses explicitly to process models and process models to observations. The probabilistic elements of TSPA-VA consist of alternative conceptual models, variability in models and parameters, uncertain parameters sampled from probability distribution functions (PDFs), and disruptive FEP probability. The development of scenarios is a systematic approach to define scenarios based on FEPs and their combination and organization. The variability is treated in

every realization of system performance, parameter uncertainty is considered within TSPA by sampling from appropriate distributions to generate CCDFs or PDFs, and alternative models are generally treated discretely. Some of the relevant total system performance measures are: peak dose in 10,000 and 100,000 years for hypothetical locations of water consumption, the time of peak annual dose, and the 95-percent confidence interval over 10,000 years and for time of peak annual dose. Planned sensitivity analyses for TSPA-VA are infiltration rate models, fracture-matrix interaction models, seepage models, waste package degradation models, cladding degradation models, EBS transport models, and disruptive effects models. The presentation of sensitivity analysis was also covered.

Dr. Andrews said tnat the TSPA model has the following advantages: confidence in process models is enhanced, the traceability of results to observations is more direct, and the focus is on obtaining "expected" performance. Other advantages of the TSPA model, he said, are: complete sampling, which allows for statistical analysis of the results, and the ability to evaluate various measures of subsystem performance. He said that the disadvantages of the TSPA model are: the confidence in TSPA is tied to process model confidence, the increased complexity of the model, and the added complexity increases the difficulty in simplifying uncertainty to a few key parameters. He said that low probability models and parameters may not be sampled and the care required to assure consistency in conceptual models and parameters account for further disadvantages. Some questions and concerns from committee members are: the distinction between process models for geosphere versus source term in TSPA-VA, the connection of scientists to PA science, and contracts being terminated before sensitivity studies are conducted. In conclusion, he said that the basic approach to TSPA analyses have been implemented in TSPA-91, -93, -95. TSPA-VA will continue this basic approach, but with significantly increased emphasis on direct inclusion of process models or more robust treatment of process models external to the TSPA model. Probabilistic elements of analyses are inherent in every realization. Although the focus of VA is on "probable behavior," sensitivity and uncertainty analyses will be important in evaluating the degree of confidence in that assessment and in identifying key and site features impacting that assessment.

Summary and Conclusions

The Committee members, consultants, and invited experts discussed with Dr. Andrews a series of issues, including the following: the connection between the TSPA and the experimental and field programs, the use of data workshops, the proposed analyses for the unsaturated zone model, disadvantages of simplification in the model, focusing on key issues, and time as a measure of performance. Among issues discussed were: deciding about design alternatives, the distinction between process models for the geosphere versus the source term in TSPA-VA, the long-term prediction of material behavior relative to long-term prediction of geologic systems, the connection of process level scientists to PA science, "probable performance" versus bounding analyses, expert judgment and elicited values, and risk determination independent of the compliance issue.

Waste Isolation Pilot Plant (WIPP) Model - Dr. Jon Helton (Sandia National Laboratory and Arizona State University)

Dr. Helton gave an overview of the conceptual and computational structure for the WIPP PA. He discussed the relationship of the WIPP PA with the requirements in Title 40, Code of Federal Regulations, Part 191 (40 CFR 191) and the guidance in 40 CFR Part 194. He said that there are three basic entities in PA for WIPP and noted that the NRC's NUREG-1150 PA and the WIPP PA are conceptually the same. He discussed the roles of complementary cumulative distribution functions (CCDFs) relative to the standard. He also discussed the problem with using probability to define both future states and parameter values. He added that three things define probability and noted that all involve future states at WIPP. These are broken into subsets of sample space for different types of accidents that can cause releases. Dr. Helton defined irreducible aleatory uncertainty. He noted that drilling for oil and potash are the only likely scenarios for disruption of the WIPP repository and these are used to define different futures at WIPP.

He discussed the type of waste and noted that 570 waste streams are intended to go to WIPP, including remotely handled and contact handled transuranic (TRU) waste. He discussed different intrusion scenarios for releases. Dr. Helton discussed the different models within the WIPP PA and described the mathematical equations for representing construction of CCDFs. He

described how this was a mathematical representation of the ordered-triplet risk representation. He also discussed the construction of CCDFs, the probabilistic characterization of parameter uncertainty, and epistemic uncertainty (reducible). He then described how an event tree approach was used in 92 WIPP PAs to produce a summary CCDF. He showed examples of (1) uncertainty analyses using CCDFs and (2) the confidence interval on a mean CCDF.

Dr. Helton was asked if each future has a probability. He described the approach for the 1992 WIPP PA and the origin of the drilling rate used in the PA. He described the EPA-provided specifications of this scenario. He was asked about conceptual model uncertainty versus parameter uncertainty and the use of parameters to represent conceptual model uncertainty. Dr. Helton described how he would use such an approach. Dr. Helton was asked how to translate the approach for an interested party that doesn't have a degree in math or when asked if he would use a different approach, for example, a deterministic calculation, Dr. Helton replied, "Yes." He was also asked about lessons learned by changing the methodology from the older approach. Dr. Helton said that the same methodology has been used since 1991. There was a discussion of passive institutional controls, and the issue of gas generation. Dr. Helton gave an overview of the WIPP '96 PA. He described the use of small sets of 50 Latin Hypercube Sampling vectors. He discussed a sensitivity study to gain an understanding of the cause of pressure uncertainty in the calculation. He said that the main driver was microbial degradation and that it became the most important assumption in the analyses. He said there also were some other effects due to wicking of brine affecting the porosity of the salt.

NRC'S Approach to Performance Assessment - Dr. Norman Eisenberg (NMSS,NRC)

Dr. Eisenberg first reviewed how PAs purpose is to integrate information and provide quantitative estimates. He discussed the Commission's PRA policy statement and how PA is used in waste management. He said that, in general, a deterministic bounding analysis is used for most applications, but for HLW is it used in a probabilistic approach. He also stated how PA supports the Division of Waste Management in the areas of decommissioning, low-level waste, and high-level waste. Dr. Eisenberg discussed the following similarities between PA and PRA: similar analytic structure, both consider likely and rare events, and both are adaptable to hazards and complexity of application. He said that some of the differences include the following: waste

systems have both natural and engineered components, waste systems continuously evolve with overlying failure scenarios, and waste systems are totally passive, whereas reactors have active redundant safety systems. Dr. Eisenberg discussed aleatory uncertainty versus epistemic uncertainty. He said that the three main uncertainties involved with the models lay in the parameters, future states, and in the modeling itself. Different approaches to PA modeling are: environmental subsystem simulation methods, logic tree techniques, and scenario-based strategies. He stated that one of the general difficulties in conventional scenario approaches is that events are not usually binary. He also said that, for highly redundant systems, occurrence of the top event by more than one failure mode is unlikely. Difficulties in the internal events involve how to represent different behaviors in various parts of the repository and how to account for dependencies of internal events on boundary conditions and forcing functions. He stated that the main problem of importance measures falls into the areas of sensitivity methods and the need to have a quantitative understanding of KTIs.

The Committee, consultants, and invited experts discussed importance measures for reactors and natural features. It was stated that the importance to performance of a parameter or model is the change it makes in system performance if it is removed. The group also discussed consequences, the role of geology and each component of the system and what the role of each barrier should be.

Chairman Garrick noted that the goal of the session was to gain a better understanding of results of PA and how to increase confidence in PA. Dr. Hinze asked about analogous modeling procedures used in petroleum exploration. Dr. Kaplan discussed simplified models and said that he is not talking about changing the current approach, but rather putting the results in a form to evaluate design changes. There was a general discussion of realistic and bounding analysis difficulties, different measures of performance, how rules set up for site selection are being used to make design decisions, developing measures to help know where the analyses are sound and where they are poor, and the issue of expert elicitation.

Chairman Garrick said that his concern is to have methods for quantifying different lines of defense. He added that one will never be able to characterize a natural system with sufficient confidence to be able to say that the waste is contained and that there is a need to rely on the

engineered systems. Dr. Ray Wymer, ACNW invited expert, asked if the models are robust enough to deal with defense HLW canisters and problems that may be unique to this waste form (e.g., a high actinide content).

It was suggested that a Penn State mining economist may provide some information on how uncertainty is used in the minerals exploration business. Mr. Stan Echols, Winston & Strawn, said that the burden of proof changes from DOE with the licnese application (LA) submittal to NRC when the safety evaluation report is developed. NRC, he said, also carries the burden of supporting its models and conclusions. He noted that in licensing hearings the NRC has been challenged in the past and has successfully defended the use of its models. Other agencies, he said, have not fared as well. Dr. Abe Van Luik (DOE) said that he is not sure that DOE can't already provide the type of information that PRA can provide from their existing models. There was also a discussion of the analysis of different end-states, the issue of data and data handling by classical and Bayesian methods, the intermediate outputs of the TPA code, and the natural tension in PA between simple explanations and precise models. Ms. Judy Treichel, (Nevada Nuclear Waste Projects) commented on public expectations. She said, "I don't accept the argument that Congress is the public or is its direct representative." She said that the discussions over the previous four days showed that there had been a lot of change since the Nuclear Waste Policy Act. She added that the decision makers have no clear handle on public expectations and that the public is an important client. Chairman Garrick responded, "I don't think there's any mistake about it that we all realize that the ultimate decision maker here is the public."

IV. Tour of the Center for Nuclear Waste Regulatory Analyses (Open)

[L. Deering was the Designated Federal Official for this part of the meeting.]

On July 25th, the Committee toured the Center and observed several ongoing experiments related to the HLW program. Center participants included English Pearcy, Ron Green, and Gustavo Cragnolino. The Committee first viewed, and heard a brief description of, two new experiments on thermohydrology, being performed in support of the key technical issue (KTI),

Thermal Effects on Flow. The first experiment is designed to observe and measure the refluxing of water through fractured porous media. Making use of an existing apparatus, the experiment involves placing a heat source in a simulated drift opening and introducing water above the opening. The results will be used to test conceptual models of gravity-driven refluxing of water. A second experiment involved assessing moisture removal due to ventilation. The results will be used to asses the extent of dryout and the rate of moisture removal from a scaled laboratory model of the repository. The third experiment viewed was the faulting pull-apart basin experiment, which is being performed under KTI Structural Deformation and Seismicity. The analog sandbox experiment simulates the activity of pull-apart deformation to investigate the mechanics of faulting. The resulting fault geometries are compared to those near Yucca Mountain, and seismic risksare inferred. The last experiments viewed involved tests of long-term pitting corrosion and galvanic corrosion. These tests are being conducted under KTI Container Life and Source Term. Both tests involve use of electrochemcial corrosion cells to test whether mechanistic models for corrosion can be used in container life estimates.

The ACNW returned to the meeting room to prepare a letter report on igneous activity, while those remaining on the tour visited the Center's computer laboratory to view a demonstration of various earth science-related software.

V. Executive Session (Open)

[Richard Major was the Designated Federal Official for this part of the meeting.]

A. Future Meeting Agenda (Open)

Appendix IV summarizes the proposed items endorsed by the Committee for the 94th ACNW Meeting, September 23-25, 1997, in Las Vegas, Nevada.

B. Future Committee Activities (Open)

The ACNW will not meet in August 1997. Topics for the 94th ACNW meeting and details of the Yucca Mountain site tour were discussed.

between the general hazard communication requirements and the Federal hazard communication standard have not been shown to pose a burden on commerce. In addition, the substantive requirements of Proposition 65 may be met by compliance with the general Federal and State hazard communication requirements, thus not posing any additional burden on employers. Finally, based on the evidence in this record, neither financial burdens associated with voluntary settlement of Proposition 65 cases nor the burden of litigating cases has been shown to create an undue burden on interstate commerce within the meaning of the product clause.

(4) The California standard is required by compelling local conditions. The voters of California have a legitimate and compelling local interest in determining how their right to hazard information can best be protected.

(5) The California standard also complies with the remaining requirements of Section 18 of the Act. Cal/OSHA, as the designated State agency, is responsible for the effective administration of the plan throughout the State. This designation meets the requirements of Section 18(c)(1). The State also has adequately trained personnel for the enforcement of the standard, pursuant to Section 18(c)(4). Finally, both the administrative system available under the general California standard and the judicial enforcement available under Proposition 65's supplemental enforcement mechanism adequately protect the rights of employers and employees.

OSHA, accordingly, approves the California Hazard Communication Standard, including its incorporation of Proposition 65, subject to the stated conditions. Finally, as noted at the outset of this decision, OSHA has no authority to address Proposition 65's consumer and environmental applications, and this decision does not affect those applications.

V. Location of Supplement for Inspection and Copying

A copy of the California Hazard Communication standard may be inspected and copied during normal business hours at the following locations: Office of the Regional Administrator, OSHA, 71 Stevenson Street, Suite 415, San Francisco, California 94105; and California Division of Occupational Safety and Health, Department of Industrial Relations, 45 Fremont Street, Room 2200, San Francisco, California 94105; Office of the Director, Federal-State Operations, OSHA, U.S. Department of Labor, Room N-3700, 200 Constitution Avenue, NW, Washington, DC 20210.

Authority: Sec. 18, 84 Stat. 1608 (29 U.S.C. 667); 29 CFR part 1902, Secretary of Labor's Order No. 1-90 (55 FR 9033).

Signed in Washington, D.C., this 2nd day of June, 1997.

Greg Watchman,

Acting Assistant Secretary.

[FR Doc. 97-14723 Filed 6-5-97; 8:45 am]

BILLING CODE 4510-26-P

NUCLEAR REGULATORY COMMISSION

Advisory Committee on Nuclear Waste; Notice of Meeting

The Advisory Committee on Nuclear Waste (ACNW) will hold its 93rd meeting on July 23-25, 1997, in Building 189—Auditorium, Southwest Research Institute, Center for Nuclear Waste Regulatory Analyses (CNWRA), 6220 Culebra Road, San Antonio, Texas.

The entire meeting will be open to public attendance.

The schedule for this meeting is as follows:

Wednesday, July 23, 1997—8:30 a.m. until 6:00 p.m.

Thursday, July 24, 1997—8:30 a.m. until 6:00 p.m.

Friday, July 25, 1997—8:30 a.m. until 12:00 noon

A. A full day's session will be devoted to reviewing the performance assessment (PA) capability of the NRC and CNWRA staffs. This review will include discussions of both high- and low-level waste PA, as well as, the use of PA in site decommissioning management plan remediation efforts. The session will also focus on the use of PA in calculating the consequences of igneous activity on a high-level waste repository, on the use of PA in the prioritization process, and on PA integration into the overall regulatory process.

Representatives from the NRC and CNWRA will participate.

B. A full day's session will be devoted to reviewing the use of probabilistic performance assessment approaches for waste management. The transition to risk-informed, performance based regulation will form part of the discussion. Representatives from the NRC, CNWRA, DOE, and the nuclear industry will participate.

C. The ACNW will hear a description of science and engineering experiments currently in progress at the CNWRA.

D. *Preparation of ACNW Reports*—The Committee will discuss potential reports, including igneous activity related to the proposed Yucca Mountain Repository, and other topics discussed during the meeting as the need arises.

E. *Committee Activities/Future Agenda*—The Committee will consider topics proposed for future consideration by the full Committee and Working Groups. The Committee will discuss ACNW-related activities of individual members.

F. *Miscellaneous*—The Committee will discuss miscellaneous matters related to the conduct of Committee activities and organizational activities and complete discussion of matters and specific issues that were not completed during previous meetings, as time and availability of information permit.

Procedures for the conduct of and participation in ACNW meetings were published in the **Federal Register** on October 8, 1996 (61 FR 52814). In accordance with these procedures, oral or written statements may be presented by members of the public, electronic recordings will be permitted only during those portions of the meeting that are open to the public, and questions may be asked only by members of the Committee, its consultants, and staff. Persons desiring to make oral statements should notify the Chief, Nuclear Waste Branch, Mr. Richard K. Major, as far in advance as practicable so that appropriate arrangements can be made to schedule the necessary time during the meeting for such statements. Use of still, motion picture, and television cameras during this meeting will be limited to selected portions of the meeting as determined by the ACNW Chairman. Information regarding the time to be set aside for this purpose may be obtained by contacting the Chief, Nuclear Waste Branch, prior to the meeting. In view of the possibility that the schedule for ACNW meetings may be adjusted by the Chairman as necessary to facilitate the conduct of the meeting, persons planning to attend should notify Mr. Major as to their particular needs.

Further information regarding topics to be discussed, whether the meeting has been cancelled or rescheduled, the Chairman's ruling on requests for the opportunity to present oral statements and the time allotted therefor can be obtained by contacting Mr. Richard K. Major, Chief, Nuclear Waste Branch (telephone 301-415-7366), between 8:00 A.M. and 5:00 P.M. EDT. The CNWRA contact in San Antonio is Ms. Bonnie Caudle (telephone 210-522-5157).

ACNW meeting notices, meeting transcripts, and letter reports are now available on FedWorld from the "NRC MAIN MENU." Direct Dial Access

number to FedWorld is (800) 303–9672; the local direct dial number is 703–321–3339.

Dated: June 2, 1997.

Andrew L. Bates,

Advisory Committee Management Office.

[FR Doc. 97–14809 Filed 6–5–97; 8:45 am]

BILLING CODE 7990–01–P

NUCLEAR REGULATORY COMMISSION

Advisory Committee on Reactor Safeguards Joint Meeting of the ACRS Subcommittees on Materials and Metallurgy and on Severe Accidents

Postponed

A joint meeting of the ACRS Subcommittees on Materials and Metallurgy and on Severe Accidents scheduled to be held on June 10, 1997, Room T–2B3, 11545 Rockville Pike, Rockville, Maryland, has been postponed due to the unavailability of documents. Notice of this meeting was published in the **Federal Register** on Friday, May 9, 1997 (62 FR 25677). Rescheduling of this meeting will be announced in a future **Federal Register** notice.

For further information contact: Mr. Noel F. Dudley, cognizant ACRS staff engineer (telephone 301/415–6888) between 7:30 a.m. and 4:15 p.m. (EDT).

Dated: June 2, 1997.

Sam Duraiswamy,

Chief, Nuclear Reactors Branch.

[FR Doc. 97–14808 Filed 6–5–97; 8:45 am]

BILLING CODE 7990–01–P

OFFICE OF PERSONNEL MANAGEMENT

The National Partnership Council

AGENCY: Office of Personnel Management.

ACTION: Notice of meeting.

TIME AND DATE: 1:00 p.m., June 11, 1997.

PLACE: U.S. Office of Personnel Management, Executive Conference Room 5A06A, Theodore Roosevelt Building, 1900 E Street, N.W., Washington, DC 20415–0001. The conference room is located on the fifth floor.

STATUS: This meeting will be open to the public. Seating will be available on a first-come, first-served basis. Individuals with special access needs wishing to attend should contact OPM at the number shown below to obtain appropriate accommodations.

MATTERS TO BE CONSIDERED: A panel of agency and union representatives will discuss challenges to labor-management partnerships and suggest ways the National Partnership Council (Council) may enhance efforts to build and sustain partnerships in the Federal labor-management relations community. The Council will discuss the work plan for the Council's Partnership Facilitation Project. Members will review a questionnaire instrument that will be used to gather additional information on potential participants in the Partnership Facilitation Project. Other agenda items include staff updates on the 1997 National Partnership Award Announcement, a briefing on the National Performance Review/Office of Personnal Management sponsored survey on reinvention results, and a discussion of the National Skills Standards Board.

CONTACT PERSON FOR MORE INFORMATION: Michael Cushing, Director, Center for Partnership and Labor-Management Relations, Office of Personnel Management, Theodore Roosevelt Building, 1900 E Street, NW., Room 7H28, Washington, DC 20415–0001, (202) 606–2930.

SUPPLEMENTARY INFORMATION: We invite interested persons and organizations to submit written comments. Mail or deliver your comments to Michael Cushing at the address shown above. To be considered at the June 11 meeting, written comments should be received by June 9.

Office of Personnel Management.

James B. King,

Director.

[FR Doc. 97–15006 Filed 6–5–97; 8:45 am]

BILLING CODE 6325–01–U

SECURITIES AND EXCHANGE COMMISSION

[Release No. 35–26722]

Filings Under the Public Utility Holding Company Act of 1935, as Amended ("Act")

May 30, 1997.

Notice is hereby given that the following filing(s) has/have been made with the Commission pursuant to provisions of the Act and rules promulgated thereunder. All interested persons are referred to the application(s) and/or declaration(s) for complete statements of the proposed transaction(s) summarized below. The application(s) and/or declaration(s) and any amendments thereto is/are available for public inspection through the Commission's Office of Public Reference.

Interested persons wishing to comment or request a hearing on the application(s) and/or declaration(s) should submit their views in writing by June 23, 1997, to the Secretary, Securities and Exchange Commission, Washington, D.C. 20549, and serve a copy on the relevant applicant(s) and/or declarant(s) at the address(es) specified below. Proof of service (by affidavit or, in case of an attorney at law, by certificate) should be filed with the request. Any request for hearing shall identify specifically the issues of fact or law that are disputed. A person who so requests will be notified of any hearing, if ordered, and will receive a copy of any notice or order issued in the matter. After said date, the application(s) and/or declaration(s), as filed or as amended, may be granted and/or permitted to become effective.

Southwestern Electric Power Company, et al. (70–5741)

Southwestern Electric Power Company ("SWEPCO"), 428 Travis Street, Shreveport, Louisiana 71156–0001, Public Service Company of Oklahoma ("PSO"), 212 East Sixth Street, Tulsa, Oklahoma 74119–1212, and Central Power and Light Company ("CPL"), 539 North Carancahua Street, Corpus Christi, Texas 78401–2802 (collectively, "Applicants"), all wholly-owned electric utility subsidiaries of Central and South West Corporation, a registered holding company, have filed a post-effective amendment under sections 6(a), 7, 9(a), 10 and 13(b) of the Act, and rules 54, 90 and 91 thereunder. The original application-declaration was filed under sections 6(a), 7, 9(a), and 13(b) of the Act, and rules 90 and 91 thereunder.

Pursuant to prior Commission orders dated April 6, 1976 and August 9, 1976 (HCAR Nos. 19468 and 19643), SWEPCO was authorized to acquire, finance, construct and operate a unit train repair facility ("Repair Facility") near Alliance, Nebraska. The Repair Facility is used for the maintenance and repair of railroad cars for the transportation of coal to SWEPCO's coal-fired electricity generation plants.

Pursuant to another Commission order dated February 22, 1979 (HCAR No. 20927), SWEPCO and PSO were authorized to enter into a Rail Car Maintenance Facility Agreement ("Facility Agreement"), which provides for PSO's participation in the cost, use and option to purchase a portion of the Repair Facility. The Facility Agreement provides for: (1) The payment by each company of the direct labor and

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON NUCLEAR WASTE
WASHINGTON, D.C. 20555

Revised: July 14, 1997

SCHEDULE AND OUTLINE FOR DISCUSSION
93rd ACNW MEETING
JULY 23-25, 1997

PERFORMANCE ASSESSMENT CAPABILITY IN THE NRC HIGH-LEVEL WASTE PROGRAM

Wednesday, July 23, 1997, CNWRA, Southwest Research Institute, 6220 Culebra Road, San Antonio, Texas - Building 189

1) 8:30 - 8:45 A.M. 8:30-8:45
Opening Remarks by the ACNW Chairman (Open)
1.1) Opening Statement (BJG/ACC)
1.2) Items of current interest

2) 8:45 - 9:15 A.M. 8:45-9:15
Overview, Framework, and Schedule of TPA Activities (Open)
(McConnell)
2.1) Integration of TPA, TSPA Reviews, Rulemaking, Issue Resolution

3) 9:15 - 9:45 A.M. 9:15-9:55
Discussion of projects, staff expertise, and resource to support PA activities (Open)
(McConnell)
3.1) PA & I Section Responsibilities and Priorities
3.2) Staff Assignments
3.3) Integration (i.e., programmatic structure, work with other KTIs)

4) 9:45 - 10:15 A.M. 9:55-10:20
Discussion of Hardware Capabilities and Utilizations in PA (Open)
(Bell)

10:15 - 10:30 A.M. * * * BREAK * * * 10:20-10:35

5) 10:30 - 12:00 NOON Detailed discussion of TPA 3.1 Code Architecture including discussion of the subsystem abstractions (Open)

10:35 - 12:10

(McCartin/Baca)

Introduction - McCartin

5.1) Improvements and changes from phase 2 Code - Baca

5.2) System Architecture - Baca

5.3) Code Development Schedule - Baca

5.4) Base Case Development - Baca

5.5) Individual Subsystem Abstraction Descriptions - McCartin

- Engineered Barrier
- UZ Flow and Transport
- SZ Flow and Transport
- Direct Release
- Dose Calculation

12:00 - 1:00 P.M. * * * LUNCH * * *

12:10 - 1:15

1:00 - 2:00 P.M. Continue discussion Identified in item 5 (Open)

1:15 - 2:00

6) 2:00 - 3:00 P.M. Discussion of planned sensitivity studies (Open)

2:00 - 2:45

(Colten-Bradley/Lui/McCartin plus KTI Leads

6.1) Subsystem Sensitivity Studies

6.2) System Level Sensitivity Studies/Relative Importance of Issues IRSR

3:00 - 3:15 P.M. * * * BREAK * * *

3:00 - 3:05

7) 3:15 - 3:45 P.M. Future Activities (Open)

3:05 - 3:50

(Eisenberg)

7.1) TSPA-VA Review

8) 3:45 - 4:15 P.M. Closing Summary (Open)

(McConnell/Bell)

9) 4:15 - 4:30 P.M. ACNW Committee discussion (Open)

4:35

10) 4:30 - 5:30 P.M. Preparation of ACNW Reports (Open)

5:00 - 6:00

- Igneous Activity
- Defense-In-Depth

BREAK 4:50 - 5:00

RECESS

AGENDA FOR THE WORKING GROUP ON PROBABILISTIC PERFORMANCE ASSESSMENT

Thursday, July 24, 1997, CNWRA, Southwest Research Institute, San Antonio, Texas - Building 189

11) 8:30 - 8:45 A.M. Introductory Remarks by ACNW Chairman (Open)
8:30 - 8:45

12) 8:45 - 10:00 A.M. Interpretation of Performance Assessment Results for Decision Making (Open)
8:45 - 10:10
(S. Kaplan, & J. Lin)
- An Outside View
- What is meant by a "simple" model?
- Conceptual framework
- Topdown event scenarios
- Evidence based approach
- Advantages and soft spots in the approach

10:00 - 10:15 A.M. * * *BREAK* * *
10:10 - 10:25

13) 10:15 - 11:15 A.M. EPRI's TSPA Model (Open)
10:25 - 1:35
(R. McGuire & J. Kessler, EPRI)
- Purposes of IMARC program - How is the model intended to be used in decision making?
- Conceptual Framework in the IMARC code - Logic tree approach
- How are scenarios defined and used in the approach?
- How are initial states, end states, and top events considered?
- What are the appropriate importance measures?
- Repository performance measures and insights for Yucca Mountain
- Advantages and soft spots in the approach

14) 11:15 - 12:30 P.M. DOE's TSPA-VA Model (Open)
12:35 - 1:45
(R. Andrews & A. Van Luik, DOE)
- How is the TSPA model intended to be used in decision making?
- Conceptual framework of the TSPA model, including probabilistic elements
- How are scenarios defined and used in the approach?
- How are initial states, end states, and top events considered?
- What are the appropriate importance measures?

- Repository performance measures and insights of total system performance
- Advantages and soft spots in the approach

12:30 - 1:30 P.M. * * *LUNCH* * * 11:35 - 12:35

15) 1:30 - 2:30 P.M. 1:50 - 3:38

<u>WIPP Model</u> (Open)
(J. Helton, SNL/AZ State)
- Purpose of WIPP Model - How is the model intended to be used in decision making?
- Conceptual Framework in the WIPP PA Model
- How are scenarios defined and used in the approach?
- How are initial states, end states, and top events considered?
- What are the appropriate importance measures?
- Repository performance measures and insights for WIPP
- Advantages and soft spots in the approach

16) 2:30 - 3:30 P.M. 3:40 - 4:15

<u>NRC's Performance Assessment Approaches for Waste Management</u> (Open)
(N. Eisenberg, NRC)
- Status of risk-informed, performance-based approaches in DWM
- Approaches to modeling waste facility performance (emphasis on uncertainties)
- Difficulties in applying conventional scenario analysis approaches in waste management
- Some concepts for defining and applying importance measures for passive systems
- Advantages and soft spots in the approach

3:30 - 3:45 P.M. * * * BREAK* * * 3:10 - 3:20

17) 3:45 - 4:15 P.M.

<u>Summary and Conclusions: Transition to Risk-Informed Performance-Based Regulation in Waste Management Programs at NRC - Insights gained from the Working Group</u>
<u>(Panel Discussion)</u> (Open)

18) 4:15 - 5:00 P.M. 6:15 - 6:55

<u>Committee Activities/Future Agenda</u>
- Set Agenda for 94th ACNW
- Review items for out months
- Future Working Group Topics/Dates
- Reconcile EDO Responses to Committee Reports

19) 5:00 - 6:00 P.M.

<u>Complete preparation of ACNW reports</u>

Tour of CNWRA - 5:00 - 6:10

Adjourn

Friday, July 25, 1997, CNWRA, Southwest Research Institute, 6220 Culebra Road, San Antonio, Texas - Building 189

20) 8:30 - 8:35 A.M. Opening Remarks by ACNW Chairman (Open)

21) 8:35 - 9:30 A.M. Discussion of Science and Engineering experiments, currently underway at the CNWRA (Open)
(Pomeroy/Deering)

22) 9:30 - 11:00 A.M. Tour Laboratories at the CNWRA (Open)

23) 11:00 A.M. **ADJOURN** (leave CNWRA by car for San Antonio Airport)

APPENDIX III: MEETING ATTENDEES

93RD ACNW MEETING
JULY 23-25, 1997

ACNW MEMBERS	1st Day	2nd Day
Dr. Paul W. Pomeroy	X	X
Dr. George W. Hornberger	X	X
Dr. B. John Garrick	X	X

ACNW Consultant:

Dr. William J. Hinze and Dr. Martin J. Steindler

Invited Experts:

Drs. Stanley Kaplan, James Lin, Chris Whipple, and Raymond Wymer

ACNW STAFF	1st Day	2nd Day
Dr. Andrew Campbel l	X	X
Ms. Lynn G. Deering	X	X
Mr. Howard J. Larson	X	X
Mr. Richard K. Major	X	X
Dr. John T. Larkins	X	X
Dr. Richard P. Savio	X	X
Ms. Lillie M. Gaskins	X	X
Mr. Robert Jolly	X	X

ATTENDEES FROM THE NUCLEAR REGULATORY COMMISSION

July 23, 1997

T. McCartin	NRC
K. McConnell	NRC
R. Codell	NRC
M. Bell	NRC
R. Johnson	NRC
C. Lui	NRC
V. Colten-Bradley	NRC
N. Eisenberg	NRC
R. Codell	NRC

July 24, 1997

T. McCartin	NRC
R. Johnson	NRC
C. Lui	NRC
M. Lee	NRC
V. Colten-Bradley	NRC
N. Eisenberg	NRC
K. McConnell	NRC
R. Johnson	NRC
R. Codell	NRC

ATTENDEES FROM OTHER AGENCIES AND GENERAL PUBLIC

July 23, 1997

R. McGuire	Risk Engineering Inc.
A. Chowdhury	CNWRA
C. Whipple	ICF Keiser
R. Wallace	USGS/HQ
F. Rodgers	DOE
P. Montazer	Nye County
R. Andersen	NEI
P. Mackin	CNWRA
K. Ashe	M&O
D. Bullen	NWTRB
P. Nelson	NWTRB
D. Fehringer	NWTRB
J. Wong	NWTRB
A. Armstrong	CNWRA
C. Newbury	DOE
C. Hanlon	DOE
A. Gil	DOE/YMP
J. Rosenthal	YMP/GOLDER

ATTENDEES FROM OTHER AGENCIES AND GENERAL PUBLIC (CONT'D)

July 23, 1997 (Cont'd)

S. Echols	Winston & Strawn
J. Bailey	M&O/TRW
S. Frishman	State of NV
J. Treichel	NV/NWTF
A. Haghi	M&O/Duke
B. Sagar	CNWRA
S. Mohantz	CNWRA
B. Baca	CNWRA

July 24, 1997

H. Dockery	SNL
R. Wallace	USGS/HQ
F. Rodgers	DOE
A. Gil	DOE/YMP
C. Newbury	DOE/YMP
K. Ashe	M&O
B. Andrews	M&O
J. Kessler	EPRI
S. Frishman	NV NWPO
J. Treichel	NV NWTF
L. Lehman	State of NV
C. Hanlon	DOE
J. Rosenthal	YMP/GOLDER
S. Mohantz	CNWRA
A. Chowdhury	CNWRA
J. Bailey	M&O
J. Wong	NWTRB
D. Fehringer	NWTRB
A. Haghi	M&O
R. McGuire	Risk Eng.

APPENDIX IV: FUTURE AGENDA

The Committee agreed to consider the following during the 94th ACNW Meeting, September 23-25, 1997:

- Viability Assessment - The Committee will discuss the status of the Viability Assessment, including design options, total systems performance assessment, cost estimates, and schedule. The Committee may also hear an update on the progress of the Preliminary Integrated Safety Assessment.

- Enhanced Site Characterization - The Committee will discuss the progress of the enhanced site characterization program, including the status of Cl^{36} sampling, and description of the east-west drift. Addition topics may include the Amargosa Valley population survey, waste retrievability, and DOE's interim High-Level Waste Disposal Standard.

- Public Comments - The Committee will hear comments from members of the public, representatives from the State of Nevada and affected local counties, and Tribal Nations on concerns related to nuclear waste disposal.

- Committee Activities/Future Agenda - The Committee will consider topics proposed for future consideration by the full Committee and Working Groups. The Committee will discuss ACNW-related activities of individual members.

- Miscellaneous - The Committee will discuss miscellaneous matters related to the conduct of Committee activities and organizational activities and complete discussion of matters and specific issues that were not completed during previous meetings, as time and availability of information permit.

APPENDIX V
LIST OF DOCUMENTS PROVIDED TO THE COMMITTEE

[Note: Some documents listed below may have been provided or prepared for Committee use only. These documents must be reviewed prior to release to the public.]

MEETING HANDOUTS

AGENDA ITEM NO.	DOCUMENTS
2-4	**Overview, Framework, and Schedule for Total Performance Assessment Activities**

1. Overview, Framework, and Schedule of NRC's High-Level Waste Performance Assessment Activities presented by Keith I. McConnell and Michael J. Bell, Division of Waste Management, NMSS, dated July 23, 1997 **[Viewgraphs]**

2. Tentative Schedules for Major TPA-Related Tasks, presented by Keith I. McConnel, Division of Waste Management, NMSS, undated [Viewgraphs]

3. Letter from Michael J. Bell, Acting Chief, Performance Assessment and High-Level Waste Integration Branch, NMSS, to Dr. Stephan J. Brocoum, Assistant Manager for Licenisng, Yucca Mountain Site Characterization Office, Office of Civilian Radioactive Waste Management, DOE, Subject: Volcanism and the Use of Expert Elicitation in Yucca Mountain, Nevada, Site Characterization Programs, dated June 25, 1997 **[Handout]**

4. Letter from Newton K. Stablein, Acting Chief,Engineering and Geosciences Branch, Division of Waste Management, NMSS, to Dr. Stephan J. Brocoum, Assistant Manager for Licenisng, Yucca Mountain Site Characterization Office, Office of Civilian Radioactive Waste Management, DOE, Subject: Issue Resolution Status Report on Methods to Evaluate Climate Change and Associated Effects at Yucca Mountain (Key Technical Issue: Unsaturated and Saturated and Saturated Flow Under Isothermal Conditions), dated June 30, 1997 **[Handout]**

5	**Detailed Discussion of TPA 3.1 Code Architecture, Including Discussion of the Subsystem Abstractions**

5. Overview of TPA 3.1 Code, presented by Robert G. Baca, Performance Assessment, Center for Nuclear Waste Regulatory Analyses, dated July 23, 1997 **[Viewgraphs]**

6. Abstractions in TPA 3.1 Code, presented by Tim McCartin, Division of Waste Management, NMSS, dated July 23, 1997 **[Viewgraphs]**

MEETING HANDOUTS (CONT'D)

AGENDA ITEM NO.	DOCUMENTS
6	**Discussion of Planned Sensitivity Studies**
	7. Sensitivity and Uncertainty Analyses of the TPA 3.1 Code, presented by Virginia A. Colten-Bradley, Division of Waste Management, NMSS, dated July 23, 1997 **[Viewgraphs]**
7	**Future Activities**
	8. Plans for the DOE TSPA-VA and Implications for Further Developments of NRC's Review Capability, Including the TPA Code, presented by Norman A. Eisenberg, Division of Waste Management, NMSS **[Viewgraphs]**
8	**Closing Summary**
	9. Summary, presented by Tim McConnel and Michael, Division of Waste Management, NMSS, undated **[Viewgraph]**
12	**Interpretation of Performance Assessment Results for Decision Making**
	10. Comments and Interpretations on the Idea of a Simplified Model (SPAM) for Repository Decision Making, presented by Stan Kaplan, ACNW invited expert, dated July 24, 1997 **[Viewgraphs]**
	11. Top-Down Scenario Analysis, presented by James C. Lin, ACNW invited expert, dated July 24, 1997 **[Viewgraphs]**
13	**Electric Power Institute's TSPA Model**
	12. Yucca Mountain Total System Performance Assessment: EPRI "Phase 3" Report, presented by John Kessler, EPRI, and Robin McGuire, Risk Engineering, Inc., Inc., dated July 24, 1997 **[Viewgraphs]**
14	**DOE'S TSPA-VA Model**
	13. TSPA-VA Model, presented by Robert W. Andrews, DOE, dated July 24, 1997 **[Viewgraphs]**

MEETING HANDOUTS (CONT'D)

AGENDA ITEM NO.	DOCUMENTS
15	**Waste Isolation Pilot Plant (WIPP) Model**
	14. Conceptual and Computational Structure of the 1996 Performance Assessment for the Waste Isolation Pilot Plant, presented by J. C. Helton, Sandia National Laboratory, undated **[Viewgraphs]**
16	**NRC's Performance Assessment Approaches for Waste Management**
	15. NRC'sApproaches for Performance Assessment, presented by Norman A. Eisenberg, Division of Waste Management, NMSS, dated July 24, 1997 **[Viewgraphs]**

MEETING NOTEBOOK CONTENTS

TAB NUMBER **DOCUMENTS**

1. Schedule and Outline for Discussion, 93rd ACNW Meeting, July 23-25, 1997, Revised July 14, 1997
2. 93rd ACNW Meeting Logistics, San Antonio, TX

Opening Remarks by ACNW Chairman

3. Introductory Statement by the ACNW Chairman, undated
4. Items of Current Interest, undated
5. Introductory Statement by the ACNW Chairman, Second Day, undated
6. Introductory Statement by the ACNW Chairman, Third Day, undated

2-8 Performance Assessment Capability in the NRC High-Level Waste Program
[NOTE: See Appendix V-A]

7. Table of Contents
8. Status Report
9. Outline of Proceedings of the ACNW Working Group Meeting on May 16, 1994, to review NRC Capabilities in Computer Modeling and PA for the High-Level Waste Program; the Concernts of Committee Members During the Working Group Meeitng; and Key Issues of IPA Phase 2
10. Letter dated May 27, 1997, from Martin J. Steindler, Chairman, ACNW, to Ivan Selin, Chairman, NRC, Subject: Review of the High-Level Radioactive Waste Performance Assessment Capability of the NRC Staff
11. Executive Summary from "NRC Iterative Performance Assessment Phase 2," NUREG-1464, dated October 1995
12. "NRC High-Level Radioactive Waste Program Annual Progress Report: Fiscal Year 1996," NUREG/CR-6513, No. 1, published January 1997
13. Letter dated July 10, 1996, from John H. Austin, Chief, Performance Assessment and HLW Integration Branch, Division of Waste Management, NMSS, to Mr. Ronald A. Milner, Director for Program Management and Integration, Office of Civilian Radioactive Waste Management, DOE, Subject: Transmittal of the Results of the U. S. Nuclear Regulatory Commission Audit Review of the U. S. Department of Energy's 1995 Total System Performance Assessment
14. Letter dated November 5, 1996, from John H. Austin, Chief, Performance Assessment and HLW Integration Branch, Division of Waste Management, NMSS, to Mr. Ronald A. Milner, Director for Program Management and Integration, Office of Civilian Radioactive Waste Management, DOE, Subject: Transmittal of the Center for Nuclear Waste Regulatory Analyses Detailed Report Related to the Audit Review of the U.S. Department of Energy's 1996 Total System Performance Assessment

MEETING NOTEBOOK CONTENTS (CONT'D)

TAB NUMBER	DOCUMENTS
2-8	**Performance Assessment Capability in the NRC High-Level Waste Program** (Cont'd) **[NOTE: See Appendix V-A]**
	15. Highlights of the U.S. Department of Energy's Updated Waste Containment and Isolation Strategy for the Yucca Mountain Site, DOE Concurrence Draft, July 1996
	16. Viewgraphs for Total System Performance Assessment (TPA) Code, Version 3, presented to NRC staff on April 9 and 10, 1997
10	**Preparation of ACNW Reports**
	17. Letter to The Honorable Shirley Ann Jackson, Chairman, NRC, Subject: Comments on the NRC Progtam to Predict Risk from Igneous Activity at the Proposed High-Level Waste Repository at Yucca Mountain, Nevada, Draft 6b dated 7/9/97, (2 versions) **[Prepared for Internal Committee Use]**
	18. Facsimile dated June 6, 1997, from Martin J. Steindler, ACNW Consultant, to William J. Hinze, ACNW Member, re transmits comments on Draft 6b to Igneous Activity letter to Shirley Ann Jackson, Chairman, NRC
	19. E-mail dated June 17, 1997, from George M. Hornberger, ACNW Member, to Lynn Deering, ACNW Staff, Subject: Volcanic Ash Plumes in Amargosa Valley
	20. E-mail dated June 1, 1997, from George M. Hornberger, ACNW Member, to William J. Hinze, ACNW Member, Subject: Igneous Activity Comments
	21. Memorandum dated June 9, 1997, from L. Deering, Senior Staff Scientist, ACNW, to ACNW Members, Subject: Transmittal of Latest Version of Igneous Activity Letter for Comment, with Enclosure
	22 Status Report, 10 CFR Subsystem Requirements, San Antonio Meeting
Working Group Session on Probabilistic Performance Assessment **See Appendix V-B**	
	23. Status Report
11-16	See Appendix V-B Attachments 2-19

MEETING NOTEBOOK CONTENTS (CONT'D)

TAB NUMBER	DOCUMENTS
18	**Committee Activities/Future Agenda**
24.	Table of Contents
25.	Set Agenda for 94th ACNW Meeting, September 23-25, 1997, Las Vegas, NV
26.	Set Agenda for Out Months through December 1997
27.	Discussion of Outside Meetings by Members and Staff
28.	Reconcile EDO's Response to Recent ACNW Reports: Reference Biosphere and Critical Group Issues, and Low-Level Waste Time of Compliance
29.	EDO's List of Future Meeting Topics
30.	CRWMS/M&O Meeting List
31.	One Year Calenda of Events
21	**Center for Nuclear Waste Regulatory Analyses (CNWRA) Tour**
32.	Status Report

APPENDIX V-A

Status Report

PERFORMANCE ASSESSMENT CAPABILITY IN THE NRC HIGH-LEVEL WASTE PROGRAM

93rd ACNW Meeting
July 23, 1997
8:45 A.M. - 4:30 P.M.

ATTACHMENT

1. Status Report

2. Outline of proceedings of the ACNW working group meeting on May 16, 1994 to review NRC capabilities in computer modeling and PA for the High-Level Waste Program; the concerns of committee members during the working group meeting; and key issues of IPA Phase 2.

3. Letter dated May 27, 1994, from ACNW Chairman Martin J. Steindler to Chairman Ivan Selin, subject: "Review of the High-Level Radioactive Waste Performance Assessment Capability of the NRC Staff."

4. October 1995, Executive Summary from: "NRC Iterative Performance Assessment Phase 2," NUREG-1464, (supplied previously to members).

5. B. Saga (ed), "NRC High-Level Radioactive Waste Program Annual Progress Report Fiscal Year 1996," NUREG/CR-6513, No. 1, November 1996 (draft). {Note: Only the Executive Summary and Chapter 1 are provided in the notebook. The entire document was supplied previously to members.}

6. Letter dated July 10, 1996 from John Austin, Performance Assessment and HLW Integration Branch, DWM/NMSS/NRC, to Ronald Milner, Director for Program Management and Integration, OCRWM/DOE, Subject: "Transmittal of the Results of the U.S. Nuclear Regulatory Commission Audit Review of the U.S. Department of Energy's 1995 Total System Performance Assessment."

7. Letter dated November 5, 1996 from John Austin, Chief of Performance Assessment and HLW Integration Branch, DWM/NMSS/NRC, to Ronald Milner, Director for Program Management and Integration, OCRWM/DOE, Subject: "Transmittal of the Results of the U.S. Nuclear Regulatory Commission Audit Review of the U.S. Department of Energy's Total System Performance Assessment."

8. Draft document dated July 1996, "Highlights of the U.S. Department of Energy's Updated Waste Containment and Isolation Strategy for the Yucca Mountain Site."

9. Overheads for Total system Performance Assessment (TPA) Code, Version 3, Presented to NRC staff on April 9 & 10, 1997.

Status Report

AGENDA FOR THE WORKING GROUP ON PROBABILISTIC PERFORMANCE ASSESSMENT

93rd ACNW Meeting
July 24, 1997
8:45 A.M. - 4:15 P.M.

ATTACHMENTS

1. Status Report

TAB-11

2. Memo dated April 1, 1994 from Richard Major to Margaret Federline, Subject: "Background Material for Dr. John Garrick's Visit on April 19, 1994. Attachment to Memo: Technical Note on Quantitative Performance Assessment of Nuclear Waste Facilities prepared by PLG in January 1994.

3. A. Memo dated April 4, 1995 from Lynn Deering, Senior Staff Scientist NRC, to ACNW Members, Subject: Transmittal of Material for Meeting on Simplified Performance Assessment (SPAM), April 19, 1995. Memo From B. John Garrick, ACNW Member, to ACNW Members and Staff, Subject: "NRC's need for a SPAM." Paper by B. John Garrick, Stan Kaplan, PLG, Inc. Subject: "Assessment of Risk, As Applied to the Performance Assessment to Nuclear Waste Repositories."
   B. Draft minutes from meeting on Simplified Performance Assessment (SPAM), April 19, 1995.

4. View graphs on "Environmental Risk assessment at Sandia National Lab - Methods," by Paul Davis, Ken Sorenson, and Mert Fewell, dated July 2, 1997.

TAB-12

5. Paper by B. John Garrick and Stanley Kaplan. Subject: "On the Quantitative Definition of Risk."

6. Paper by B. John Garrick and Stanley Kaplan. Subject: "On the Use of a Bayesian Reasoning in Safety and Reliability Decisions."

7. Paper by Stan Kaplan. Subject: "Expert Information vs. Expert Opinions. Another Approach to the Problem of Eliciting/Combining Expert Knowledge in PRA."

TAB-13

8. Summary of Key Issues of EPRI TSPA Phase 3, section 9, Site Evaluation Model, by Robin McGuire from EPRI Report on TSPA Phase 2.

9. Executive Summary from report by John Kessler, Robin McGuire, et. al., "Yucca Mountain Total System Performance Assessment, Phase 3," EPRI Report TR-107191, December, 1996 (previously supplied to members).

TAB-14

10. Report by TRW, M&O for Yucca Mountain Site Characterization Project, "Total System Performance Assessment - 1995: An Evaluation of the Potential Yucca Mountain Repository," November 1995.

11. "First Interim Report by Total Systems Performance Assessment - Viability Assessment (TSPA-VA) Peer Review Panel," dated June 20 , 1997

TAB-15

12. Excerpts from report by Committee on Waste Isolation Pilot Plant, Board of Radioactive Waste Management, National Research Council, "The Waste Isolation Pilot Plant: A Potential Solution for the Disposal of Transuranic Waste," National Academy Press, 1996.

13. Paper by Anderson, Helton, et. al., "Conceptual and Computational Structure of the 1996 Performance Assessment for the Waste Isolation Pilot Plant," to appear in ESREL'97.

14. Paper by Helton, Anderson, et. al., "Uncertainty and Sensitivity analysis in the 1996 Performance Assessment for the Waste Isolation Pilot Plant," to appear in ESREL'97.

15. Paper by Helton, Anderson, et. al., "Uncertainty and Sensitivity analysis results obtained n the 1992 Performance Assessment for the Waste Isolation Pilot Plant," in Reliability Engineering and Systems Safety, 51, pp. 53-100, 1996.

TAB-16

16. Draft pre-decisional memo dated January 17, 1997 by John Austin, subject: "Position Paper on Risk Assessment in NMSS,"

17. View graphs by Norm Eisenberg on "Differences and Similarities between Performance Assessment and Probabilistic Risk Analysis," dated June 25 1996.

18. View graphs by Norm Eisenberg on "Introductory Materials for Sensitivity, Uncertainty, and Importance Analysis and Some Notions for Importance Analysis," dated April 10, 1997.

19. Report by Bonano and Baca, "Review of Scenario Selection Approaches for Performance Assessment of High-Level Waste Repositories and Related Issues," NUREG/CR-6351, August 1995.