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MINUTES OF THE 7TH ACNW MEETING
FEBRUARY 21-23, 1989

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MINUTES OF THE 7TH ACNW MEETING
FEBRUARY 21-23, 1989

The 7th meeting of the Advisory Committee on Nuclear Waste was convened by Chairman Dade W. Moeller at 1:00 p.m., on Tuesday, February 21, 1989, at 7920 Norfolk Avenue, Bethesda, Maryland.

[Note: For a list of attendees, see Appendix I, ACNW members, Drs. Dade. W. Moeller and Martin J. Steindler were present. ACNW consultants, Drs. Melvin W. Carter, William J. Hinze, Judith B. Moody, David Okrent, Donald A. Orth, and Mr. Eugene E. Voiland were also present.]

The Chairman said that the agenda for the meeting had been published. He also identified the items to be discussed. He stated that the meeting was being held in conformance with the Federal Advisory Committee Act and the Government in the Sunshine Act, Public Laws 92-463 and 94-409, respectively. He also noted that a transcript of some of the public portions of the meeting was being made, and would be available in the NRC Public Document Room at the Gelman Building, 2120 L Street, N.W., Washington, D.C.

[Note: Copies of the transcript taken at this meeting are also available for purchase from the Heritage Reporting Corporation, 1220 L Street, N.W., Washington, D.C. 20005.]

I. Chairman's Report (Open)
[Note: Mr. R. Fraley was the Designated Federal Official for this portion of the meeting.]

Dr. Moeller announced that Mr. Morton W. Libarkin, Deputy Executive Director, ACRS, will retire on March 3, 1989. Dr. Moeller expressed the Committee's appreciation for Mr. Libarkin's assistance.

II. Division of High-Level Waste Management (DHLWM) Briefing on Status of the Review of U.S. Department of Energy's Site Characterization Plan (SCP) (Open) [Note: Dr. S. J. S. Parry was the Designated Federal Official for this portion of the meeting.]

The principal presenters from the Division were Messrs. John Linehan, Robert Johnson, N. King Stablein, and Joseph Holonich.

Mr. Johnson stated that the NRC staff was in the early stages of the SCP review and was not prepared, nor was it appropriate, to present incomplete findings. Therefore, he stated that this presentation would emphasize how the review of the SCP and Study Plans was to be undertaken. He also indicated that the QA review plan, the performance assessment review strategy and a work plan for the preparation of the license application review plan will be described. Dr. Moeller questioned whether these plans were implemented by the same staff members who had developed the plans. Mr. Johnson indicated that the plans were used and applied by the same individuals who were

responsible for the plans' development. In response to a question from Dr. Moeller, Mr. Johnson stated that the SCP plan was revised since it had been used as the basis for the review of the Consultation Draft Site Characterization Plan (CDSCP). Specifically, the provision of an integration step was a major innovation in the SCP plan as a result of staff experience with the CDSCP review.

Mr. Johnson noted that the SCP review is different from the CDSCP review in terms of schedule, scope, review depth and its product, the Site Characterization Analysis (SCA). In addition, it serves as a quality assurance document for the Division. The dual purpose of the review was cited as the: (1) fulfillment of a requirement embodied in the Nuclear Waste Policy Act (NWPA) and (2) a continuation of the prelicensing consultation process with the U.S. Department of Energy (DOE). It was noted that certain portions of the SCP, such as items relating to the DOE siting guidelines, cost or occupational safety, are not being reviewed or addressed by the NRC staff. Dr. Moeller asked if these items were being explicitly reviewed by anyone else and, if so, did the NRC coordinate the overall review. Mr. Johnson stated that the NRC was only involved in their own review and he did not know of any other reviews, other than those being conducted by the state of Nevada and the utilities.

Dr. Steindler questioned the staff's concern about using radioactive sources in test activities and Mr. Johnson explained that the concern was that the radioactive sources might be lost during in situ testing. Dr. Okrent asked how a balanced emphasis between the various reviewers will be obtained. Mr. Johnson described the process of coordinating the review activities and integrating the individual reviews themselves. Dr. Okrent made the point that considered thought and analysis at the start of a project may permit you to focus your test programs on the most vital or significant technical questions. Mr. Johnson agreed and indicated that that was one of the goals of the performance allocation program.

Drs. Hinze and Moody questioned the sample retention and identification process. Mr. Holonich, NMSS, indicated that the U.S. Geological Survey (USGS) controls the procedure and that Sandia National Laboratory is maintaining the information data base. Dr. Steindler asked about the status and future capabilities of the Licensing Support System. Mr. Linehan noted that a decision has not been reached on what data collected in the past will be accepted for use.

The description of the SCP review program continued with Mr. Johnson discussing the acceptance review, which is currently in progress. This will include a determination of DOE's responsiveness to the concerns and objections raised in the NRC's comments on the CDSCP. The second stage of the SCP review is the technical review. The objectives of the technical review include deciding how DOE is going to develop the data needed to prepare the construction authorization application, if the tests to be performed will adversely affect the ability of the site to retain the waste materials and whether the tests will interfere with other tests or impair the taking of additional data.

Dr. Steindler asked how improvements in technology were allowed for in the SCP. Mr. Johnson noted that the NRC does not actually approve the SCP. The NRC objects to deficiencies in the testing program. Secondly, DOE will periodically (semiannually) revise and update the SCP. In that manner it is possible to apply new technology to the characterization program.

Dr. Stablein briefed the Committee on the status and schedule of the SCP review. The SCP was received by NRC in late December. The Governor of Nevada, the Nevada Project Office, and the local counties were informed in early January, and a notice was published in the Federal Register. The initial stage in the SCP review is the acceptance review. This consists of examining the SCP for completeness and responsiveness to the objections raised in the review of the CDSCP. The acceptance review was supposed to be completed by the end of January. However, several references and supporting documents were not received with the SCP. Consequently, the acceptance review has not yet been completed. However, the second stage, the technical review, has been initiated in expectation that the missing documentation will be received and the SCP accepted for review. Dr. Stablein indicated that the acceptance review was expected to be completed by late February, with no slippage in the scheduled SCA completion date of July 28, 1989.

The technical review is being performed by a set of seven teams organized by engineering or scientific disciplines (geology, geophysics, hydrology, performance assessment, engineering, materials, and geochemistry). The teams meet weekly to coordinate their activities and to report on their progress or difficulties. Major concerns or difficulties are aired and the overall approach is monitored. The Office of Nuclear Regulatory Research (RES) and the Center for Nuclear Waste Regulatory Analyses (CNWRA) are assisting in the review process, but their total contribution is less than 25 percent of the total effort. The technical review is scheduled to be completed in early April, giving the staff 14 weeks for the technical review.

The next phase is an eight-week period for internal QA and management review of the SCA. At the end of that time the SCA will be at the office draft stage and will include directors' comments. The draft SCA will be available in early June for formal ACNW review which needs to be completed by the end of June, if the review schedule is to be met. The staff will then prepare a final draft for Commission approval prior to transmittal to DOE by July 28. The state of Nevada and other interested parties will be performing their own reviews independently of NRC's efforts.

Dr. Moeller inquired whether the proposed schedule for the ACNW review may have slipped because of delays in the acceptance review. Dr. Stablein said that no final decision had been reached on slipping the schedule. Dr. Stablein said the decision was not finalized, but would be by the end of February. Dr. Moeller asked how the ACNW review was supposed to replace the "decision support system review." Dr. Stablein explained that an independent review team had reviewed the staff's comments on the CDSCP. He indicated that it was hoped that the ACNW review would obviate the need for an internal independent review.

Dr. Okrent discussed uncertainties at length with Dr. Stablein and Mr. Coplan. The staff indicated the uncertainties exist and will continue to exist and that it is one of the purposes of the site characterization program to reduce the uncertainties to acceptable levels. Mr. Coplan stated that performance allocation is to serve as a framework to deal with the question of uncertainty. Dr. Okrent again stressed that he did not see how the staff planned to resolve this general question and he did not find the SCP any help in resolving his concerns.

Dr. Carter asked if groups other than Nevada were actively reviewing the SCP. Dr. Stablein said that the CDSCP was commented on by the Utility Nuclear Waste Management Group and the USGS, and that they may be planning to address to SCP also.

Dr. Steindler inquired if there was an internal QA plan in effect for the SCP review. Dr. Stablein said that there was.

Dr. Stablein continued with a presentation on the NRC staff's comments on the CDSCP. He noted that there were five objections, 110 comments and 52 questions. The definition and impact of each of these categories of items had been presented earlier. Dr. Moeller questioned the intent of the study plans. Dr. Stablein stated that the study plans, in general, were intended to provide the next, more detailed, level of explanation as to how the characterization of the site is to be carried out. Dr. Stablein explained that the five study plans, only recently received, which had been required to be submitted with the SCP, were concerned with testing activities to be conducted during the construction of the Exploratory Shaft Facility (ESF). An additional document, the Design Acceptability Analysis (DAA), was also required to be submitted with the SCP. The DAA is an analysis of the Title I design program. Its purpose is to demonstrate the adequacy of the QA aspects of the ESF design. Since excavation of the ESF is due to immediately follow approval of the SCP, the NRC staff required the submission of the DAA and study plans to ensure that the work could proceed without hazard to the site.

The level of detail contained in the SCP and study plans was determined by agreement between the NRC and DOE staffs in 1986. (A copy of that agreement was requested later in the presentation and the NRC staff agreed to provide it.) Dr. Moody asked when additional study plans will be provided. Dr. Stablein said that 12 or 13 are scheduled to be received by June 1989. No other plans are scheduled at present. Dr. Steindler asked if the six-month review schedule for study plans was going to be held for the five ESF study plans. It was noted by Dr. Stablein that certain supporting documents for the study plans had not been received and consequently their review was delayed. However, the intent is to take no longer than six months and, in any case, the start work review for the study plans will be done in three months, so delays should not occur. It was noted by Dr. Parry that the coincident or associated review of the SCP and the study plans was in opposition to previously indicated intentions by the staff. That was acknowledged by Dr. Stablein but he stated that the review of the study plans will be a separate activity although the SCA may contain the results of those

reviews. Dr. Stablein and Mr. Linehan commented that the 90-day and 6-month periods proposed for the start work and in-depth reviews are outside figures that, hopefully, will not be exceeded.

Dr. Stablein then discussed the five objections and indicated that the staff's review had not progressed to the point where it was possible to state that all the objections had been resolved.

Dr. Orth asked what was the basis for the flood assumed by DOE in discussion of the fourth objection. Dr. Stablein said that he did not know. He also noted that the fifth objection, concerned with DOE's QA program, is still a matter of active and extensive interaction with DOE.

Dr. Moeller questioned the connection between the DAA and the QA program. Mr. Holonich explained that, under a properly implemented QA program, DOE should have had a design control process in place that would have listed the design requirements prior to Title I design activities. That was not done and the DAA was prepared to demonstrate that the design did take proper account of the regulatory requirements, etc.

Dr. Moody asked if the QA process was in place to cover the Title II design activities. Mr. Linehan said that the QA system was not yet fully in place and that that item was under discussion. Dr. Steindler asked if the Title I design might in fact be adequate, regardless of the lack of an authorized QA program. Mr. Linehan said no, that is not the case. He indicated that several questions had arisen about the adequacy of the ESF design and that, upon looking into the source of the questions, it was determined that no design control process was in place and that deficiency was the source of the objection. Dr. Stablein indicated that the NRC staff intended to observe DOE's QA audits to ensure the adequacy of the overall program.

Three NRC comments were briefly discussed. They were, Comment #3 on substantially complete containment, Comment #64 on seal testing and Comment #103 on performance confirmation. Mr. Richard Weller, NMSS, explained that DOE had assumed that up to 20% of the waste canisters might have failed during the containment period. The staff believes that this is inconsistent with the intent of 10 CFR Part 60.113. Dr. Steindler questioned whether the DOE response, a statement that stated in part "...allowing for recognized technological limitations and uncertainties," was any better. Mr. Weller said that it was more helpful to the staff. Dr. Moody questioned the practicality of defining or assuring a canister's lifetime of over 300 years.

Dr. Stablein said that the reason for Comment #64 was that the staff felt that it was desirable to be able to seal openings, before one made them. Comment #103 referred to the absence of a recognition by DOE that the performance confirmation program needs to be started during the site characterization phase of activities.

Mr. Holonich made a presentation on the purpose and scope of the DAA. He stated that the staff was not aware until July 1988 that DOE did not plan to

apply QA requirements to the ESF design, but only to apply them during construction. After considerable discussion, the NRC and DOE staffs agreed in November 1988 to the content of the DAA, and the DOE staff gave some preliminary results of their work on the DAA in December 1988. Dr. Moeller noted the prompt response by DOE to NRC's comments. Dr. Moody questioned how one could prove that previous activities could be shown to have been done in a manner consistent with appropriate QA practices. Mr. Holonich conceded that that could not be done. He stated though that the intent of the DAA is to demonstrate that technical quality in the current Title I design matches, or is equivalent to, that which would have been obtained under an active QA program. The DAA review plan supplements the SCP review and the staff has, and is, planning to observe DOE QA audits of the ESF design program.

Dr. Steindler noted that the DOE QA program is being implemented from the bottom up. That was acknowledged as a point of concern and that DOE was aware of those concerns. Mr. Voiland noted good QA is a formalized structure for good management.

Mr. Johnson then summarized the afternoon's presentation. He discussed the study plans and the three levels of review to be applied to them. It was again acknowledged that only 20% of the study plans will be subjected to an in-depth analysis and that the choice of those plans to be studied is a critical decision.

Dr. Steindler questioned Mr. Johnson on whether the staff is approving the characterization plan and the study plans. Mr. Johnson said that the staff would not approve plans, but only either raise objections or indicate that there were no objections to DOE starting work. Mr. B. Youngblood, NMSS, explained that DOE, at this time, is neither a licensee nor an applicant and that the NRC has no legal basis for forbidding activities. There was an extended discussion about no objections being authorization or de facto approval. Mr. James Wolf, Office of the General Counsel, cited Section 60.18(L) wherein the nonbinding nature of the SCA or other comments are clearly stated.

Mr. Johnson concluded the presentations by restating the staff's plans for FY 1989. Dr. Moody again noted the expense and time required to develop new performance assessment models. Dr. Okrent stressed the difficulty in demonstrating compliance with the EPA standard, which is still not finalized.

III. DOE Presentation on the Site Characterization Plan (Open)
[Note: Mr. O. S. Merrill was the Designated Federal Official for this portion of the meeting.]

A. Introduction

Mr. Edward Regnier, DOE, introduced the topic for discussion, the DOE Site Characterization Plan (SCP). He explained that the SCP was required by 10 CFR Part 60 and by the Nuclear Waste Policy Act (NWPA) of 1982. He said that the SCP describes what is currently known about the

site which will be characterized for a high-level radioactive waste repository. The SCP also provides a general plan for how data will be obtained at the site. After giving a brief history of the SCP development, he said that the objective of DOE's presentation was to provide the Committee with a general overview and explanation of the SCP. The presentations to follow would, following the overview, include a discussion of the performance allocation process, DOE's responses to NRC's five objections and five major comments on the Consultation Draft (CDSCP), the study plans (which was subsequently deleted because of insufficient time), and near-term site activities.

In response to questions by Drs. Moeller and Moody, Mr. Regnier and Dr. Stephen Brocoum, DOE, explained that the current statutory SCP is a considerably modified version of the CDSCP in response to comments received from the NRC and the U.S. Geological Survey (USGS). The state of Nevada's comments were received too late to be considered. The first update or progress report will be issued about July 15, 1989. Dr. Brocoum said subsequently in his overview that comments were also received from the Edison Electric Institute/Utility Nuclear Waste Management Group (EEI/UNWMG) but they were not explicitly addressed in the SCP.

B. Overview of the SCP

Dr. Brocoum defined site characterization as the activities conducted to gather information about the geologic conditions at the site and to evaluate the site's suitability for a repository. He also said it is a process set forth in the NWPA that leads to the license application. He discussed the objectives of the SCP, defined its organizational structure and content, discussed the various documents used in its development and said that the SCP Conceptual Design Report (issued in late 1987), Study Plans and SCP References were important SCP supporting documents.

Dr. Brocoum presented a summary Program Schedule wherein the site characterization phase actually started with the President's approval of the site on May 28, 1986 and runs until 1994 when the final Environmental Impact Statement (EIS) will be issued and DOE recommends the site to the President. DOE will submit its license application about January 1995 and NRC will review it between that time and the scheduled start of repository construction in 1998. The repository would be open to receive high-level waste in 2003.

Dr. Brocoum named the five NRC objections to the CDSCP, each of which was discussed subsequently, and discussed the development of DOE's responses to comments on the CDSCP. He said that the public comment period on the SCP extends to April 15, 1989, that commenters are encouraged to focus on issues related to the Exploratory Shaft Facility (ESF), that DOE will respond to all comments received during this period and will consider all ESF-related comments before beginning shaft

construction. Semiannual progress reports will be issued by DOE that will describe changes in the SCP, including changes made as a result of comments. He also said that the NRC is expected to issue its required Site Characterization Analysis (SCA) in August 1989.

Dr. Brocoum said that Section 8.7 of the SCP describes site decontamination and decommissioning, if it is necessary and if the site is found to be unsuitable. Dr. Steindler asked if decontamination will be required after site characterization. Mr. Blanchard, Yucca Mountain Project Office (YMPO), explained that this reference pertains only to the things one needs to do to put the site back into an environmentally acceptable condition to comply with NEPA requirements in the event that it is necessary to do so because of something resulting from site characterization.

During Dr. Brocoum's presentation, Dr. Steindler asked when in the schedule DOE will "have a handle" on the suitability of the site, and Dr. Moody reinforced that question by asking how DOE can accomplish the site characterization in about three years (i.e., as per the DOE schedule). Dr. Brocoum answered that the site characterization officially began with the issuance of the Environmental Assessment (EA) in 1986, so it has really been going on since before that time. If DOE finds anything during site characterization that would suggest that the site is unsuitable, the Nuclear Waste Policy Amendments Act of 1987 requires that they inform both NRC and Congress. They know of nothing at the present time that would suggest that the site is unsuitable. Dr. Orth asked if the SCP very specifically addresses all of the disqualifying issues that have been listed in various places, and if they are going to specifically look for the disqualifying features early on. Dr. Brocoum said that the SCP does address the "potentially adverse" conditions which DOE is going to address as soon as they can in their site characterization program.

Dr. Carter asked how important DOE considers the existing data base in terms of either quality assurance (QA), technical requirements or legal requirements. Dr. Brocoum said that DOE considers both existing and future data as important; that existing data would have to be qualified in order for it to be used. Future data will be collected under the criteria of Appendix B of Part 50.

Dr. Moody asked what DOE had been monitoring since the EA was issued in 1986, and if the results are issued periodically and are publicly available. Dr. Brocoum said everything from streams and water runoff to seismic and some ecological things have been monitored. DOE is working both to make the data available in a timely fashion and toward being able to add the data as quickly as they can into a reference information base.

Dr. Hinze asked how the data are handled. Dr. Brocoum said the participants collect, reduce and analyze the data. The project office

coordinates this process through their technical support contractor and integrates it into a report and reviews it according to a specific procedure.

Dr. Okrent asked if the ACNW had the USGS comments on the CDSCP. When he learned that they do not, he suggested that the ACNW get a copy of the USGS comments and the comments from industry, which the ACNW staff agreed to do. He continued by asking if DOE solicits from the USGS their response to DOE's responses to their comments. Dr. Brocoum said they do, and that the U.S. Department of Interior will provide formal comments on the SCP probably because the SCP is a statutory document, which will include the USGS comments.

Dr. Hinze returned to Dr. Carter's question cited above about the existing data that were taken under less than acceptable QA procedures. He asked what actions DOE is taking to ensure that these data are not going to influence the acquisition of additional data under acceptable QA procedures. Dr. Brocoum explained that they used existing data to plan their site characterization even though it was not obtained under QA requirements, but that by the time DOE completes the site characterization all the data they use for the licensing application will be quality Level 1 data.

C. Performance Allocation Process

Dr. Donald H. Alexander, DOE, started his presentation by describing Issue Resolution Strategy as the method DOE uses to achieve closure on each of the issues (questions) identified in the issue hierarchy. He indicated that performance allocation follows issue identification and is followed by data collection and analyses which, in turn, leads to issue resolution. He then discussed the performance allocation process, the licensing strategy (in which they define critical system elements), the performance measures and goals and the information needs, all of which lead to the development of a test program to obtain the needed data. He illustrated how the process is applied to the ground water travel time as required by 10 CFR 60.113.

Dr. Okrent asked if it has, in Dr. Alexander's experience, always been practical to identify the information required to resolve the issues such that you can orient data collection and analyses to the program mission in sufficient detail that you really can hope for resolution. Dr. Alexander answered that the objective of the process is to be as systematic as possible. Based on the thoroughness of the preparation of the document, response to comments, etc., DOE is identifying most of the information required to resolve the issues. Drs. Okrent, Moody, and Alexander continued to discuss this matter, particularly as it related to the high confidence that is needed for projections over the 10,000-year repository lifetime, and even longer.

Dr. Orth asked where DOE really is in terms of the total number of issues that have to be answered. Dr. Alexander said that DOE believes they have the majority of the issues currently identified and that the process they use allows sufficient flexibility such that viable and important issues, raised downstream, could be addressed. He added that there have not been any new issues added to the issue hierarchy in the last three years.

Dr. Moody raised the issue that, given the schedule that Dr. Brocoum discussed, how can DOE possibly complete all of the data collecting and interpretation needed to write the licensing document. Dr. Alexander said that DOE agrees that it is a high risk schedule that will be difficult to meet.

D. Alternative Conceptual Models (NRC Objection 1)

Mr. Jeffrey K. Kimball, DOE, discussed NRC's Objection 1 which was NRC's highest priority objection because a full range of alternative conceptual models (ACMs) was not called out in the CDSCP. This could have led to the site program favoring the collection of data to confirm the "preferred" model rather than data to determine what the "preferred" model should be. NRC said that DOE should systematically identify a full range of ACMs suggested by available preliminary evidence.

Mr. Kimball said that recommendations from an April 1988 NRC/DOE meeting on ACMs required DOE to include in Chapter 8 of the SCP a series of systematic tables, integrated across all technical disciplines, that focus on the performance objectives of 10 CFR Part 60. He said that the SCP text was modified to comply with this recommendation and that other substantive changes were made in the SCP to comply with all that NRC had recommended to satisfy NRC that their objection had been responded to adequately. Mr. Kimball described the tables, their function and their implementation, followed by citing their use in an example of post-closure tectonics. He said that the SCP text that documents DOE's emphasis on program integration includes:

1. Hypothesis testing tables.

2. Flow diagrams showing linkage between SCP issues, programs, investigation studies, and activities.

3. Schedule networks showing sequencing and primary data feeds.

He said, in summary, that DOE is addressing ACMs in that:

1. DOE explicitly addressed NRC Objection 1 in completing the Yucca Mountain SCP (with text revisions and tables).

2. The site program is flexible in that (a) key activities will occur as early as possible, (b) activities are integrated across

disciplines, (c) preliminary data will be used to guide the program and ensure continued hypothesis testing.

3. The approach taken will build confidence in the data and conclusions.

Highlights of the discussions on Mr. Kimball's presentation are given below.

Dr. Moeller asked about the relationship between the hypothesis testing table and the conceptual models. Mr. Kimball explained that the former is basically a table that lays out the alternative conceptual models for each of several areas, such as postclosure tectonics, which he then discussed as an example of the use of the table.

Dr. Hinze asked how the consideration of various sized models, various details, etc., are taken into account in the SCP. Mr. Kimball said it depends on the discipline and the problem you're trying to address. He illustrated by discussing two examples: (1) preclosure tectonics, where the question has to do with migratory ground motion, and (2) postclosure tectonics, where more emphasis is placed on the linkage between potential events and the geohydrologic conditions at the site. Each consideration has to be handled on a case-by-case basis depending upon what questions are being addressed. Dr. Hinze continued the discussion with Mr. Kimball and Mr. Blanchard on the collection of seismic data and its relationship to the exploratory shafts.

Dr. Moody asked if there was any cross-correlation of data from the underground nuclear explosions at the Nevada test site and Yucca Mountain. Mr. Blanchard said DOE has an extensive seismic monitoring network that has been in operation for some time, but that the explosions do not represent much of a ground motion hazard to the site. Drs. Moody and Hinze continued this discussion with Messrs. Kimball and Blanchard, including a discussion of Dr. Hinze's concern about the quality of the data since they were obtained under less than ideal quality assurance procedures.

Dr. Okrent asked for an explanation of the treatment of conceptual models in DOE's development of experimental programs, particularly with regard to the Szymansky model. Mr. Kimball said, regarding the Szymansky model, that there are things that can be pointed to in both the hydrologic program and the tectonics program in an effort to understand whether the linkage he hypothesized is credible. He added that there are specific examples of this in the hypothesis testing tables. The ties between these two programs means that the hydrologic modeler, in his effort to develop a code to assess how the site behaves, has to take into consideration the tectonic data and other types of data. Dr. Younker reinforced this position, saying that these matters are best understood by reference to the tables in the SCP and to the study plans that are being prepared to guide the characterization tests.

Dr. Orth asked if a specific alternative conceptual model could change any conclusions in terms of whether the site is acceptable. Mr. Kimball answered that some of the alternatives in the geohydrology program, if they are operative pervasively across the site, could significantly impact the performance of the site.

E. Quality Assurance (NRC Objection 5)

Mr. Lake Barrett, DOE, explained that this NRC objection states that data collected under conditions that do not meet NRC's quality assurance (QA) criterion may not be usable in licensing. He said that DOE's response to this objection has resulted in the formation, within DOE's Office of Civilian Radioactive Waste Management (OCRWM), of a separate office of quality assurance of which he is director; he reports directly to the OCRWM director. The responsibility of this office is to ensure that NRC QA criteria are complied with at all levels within the DOE repository program, including DOE contractors. Specifically, he said that the following actions have been taken in response to this NRC objection.

1. Section 8.6 of the SCP was revised to address the NRC comments.

2. QA plans for DOE (OCRWM and Yucca Mountain Project Office) and contractors are being revised.

3. Revised QA plans are to be reviewed by the NRC.

Mr. Barrett defined QA, discussed why one should have a QA program, and stated that an acceptable QA program will be established at OCRWM, YMPO, and by DOE's contractors, prior to DOE initiating any new site characterization activities in Nevada. The QA plan will be coordinated and integrated at all levels. He cited the 18 QA criteria they intend to meet, which are the 18 criteria in NRC's Appendix B to Part 50 -- Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants.

Mr. Barrett commented further on training, procedures and instructions, QA program implementation, quality verification and documentation as all being vital components of a successful QA program. He described the qualification process and discussed how OCRWM's QA program is being implemented at DOE HQ and YMPO and by all of DOE's contractors.

Some of the issues relating to the DOE QA Program were discussed as follows:

Dr. Moeller asked if DOE was reviewing their QA plans from the bottom up or from the top down. He said that a schedule ACNW was given the day before showed that the last QA program to be reviewed would be the one at DOE Headquarters. Mr. Barrett said DOE was doing it in both directions, but that it is in the qualification audit scheme that the

Headquarters will be the last audited. This does not mean, however, that the Headquarters QA program will be the last one put in place.

Dr. Steindler asked what was the main thrust in NRC's Objection No. 5. Mr. Barrett said it was that DOE did not have a QA Program in place that would be sustained in the licensing process. Dr. Steindler asked what DOE was going to do to qualify data that was already collected, but not obtained under adequate QA conditions. Mr. Barrett answered that they had data that existed before the advent of the Nuclear Waste Policy Act that clearly were not collected under a QA program. However, there are mechanisms in place, such as NUREG-1298, about qualification of data which will allow the review, peer review, and backfitting of old data so that they can be used.

Dr. Steindler also asked about a statement on one of Mr. Barrett's briefing charts which said that a QA program is mandatory for NRC licensing. Mr. Barrett agreed, stating that even though all the data is good and the program is technically excellent, if it does not meet the standards that the NRC says it should, DOE will not be successful in licensing. Dr. Steindler asked if DOE has a QA program in place, to which Mr. Barrett said it is in the development stage, but that it is not yet fully implemented.

Dr. Carter asked what type of people, and with what type of academic training or requirements, DOE is looking for to oversee their QA program. Mr. Barrett answered that what works best is a mixture of line people and QA people who are willing to learn each other's areas of expertise.

Dr. Carter asked what sort of allocation of resources go into DOE's QA program. Mr. Barrett said that the question was not easy to answer because most of the QA work is done by line people. Out of 120 people involved in QA, only 8 are QA people per se. DOE has a budget for contractor support in the QA area of about $3 million.

Dr. Moeller asked how DOE rationalizes moving ahead with activities outlined and described within the SCP when their QA program is not yet firm. Mr. Barrett explained that the QA program is now well developed and well along, whereas "firm" is a value judgment. DOE has said that they would not start new site characterization activities until they have a qualified QA program in place to support those activities. And DOE has a major effort underway to ensure that all of their activities are coordinated as well as possible.

Dr. Steindler asked what the difference is between the Nevada Nuclear Waste Site Isolation (NNWSI) QA Plan (88-9) and the Yucca Mountain Project Office QA Plan (88-1). Mr. Barrett said that the former is the base document for the entire Nevada repository project whereas 88-1 is the QA plan for the YMPO and all the project contractors. Dr. Steindler asked if there is a requirement that the NRC approve each of these

plans. Mr. Barrett said there is not, and that the NRC does not approve their plans, but accepts them if they find them to be satisfactory (or acceptable). He added that the NRC objection that the DOE QA program is not in place means to DOE that all components of the program are not being fully implemented across the board to the extent that would fully support all the licensing activities. Dr. Steindler added that the existence of a program plan is necessary but not sufficient to satisfy the NRC (or DOE or me, added Mr. Barrett).

Dr. Moeller asked if the problems that are developing under their QA program were unsuspected or if they were typical of what DOE would anticipate in their audits. Mr. Barrett responded that they are typical, anticipated problems.

Regarding the term, Quality Verification, Dr. Steindler asked if it means quality of the output or adherence to the quality plan. Mr. Barrett said that it's both, that it includes both effectiveness audits and effectiveness surveillances.

Further discussions of various aspects of the DOE QA program ensued between Drs. Steindler, Voiland, and Moody with Mr. Barrett, primarily for clarification of various aspects of the program and its relationship to the repository.

F. ESF Penetration of Calico Hills (Objection 2)

Mr. Maxwell B. Blanchard, DOE Yucca Mountain Project Office, presented a summary of NRC's Objection No. 2 which states that: (1) the need has not been established to extend, or to drift horizontally from ES-1 into the Calico Hills, and (2) potential adverse impacts on waste isolation as a result of penetrating the Calico Hills have not been demonstrated.

DOE's approach to respond to these objections was discussed by Mr. Blanchard. The principal points made were:

1. Calico Hills is the primary (natural) barrier to ground water flow and radionuclide transport. However, the ES-1 design retains the capability to extend it into Calico Hills.

2. The decision on whether to proceed with deepening ES-1 to the Calico Hills is being deferred pending completion of comparative analyses to determine what data are needed, alternate means of obtaining them, the benefits of obtaining them, and the potential risks to site performance in obtaining them.

3. The evaluation of benefits and risks will be performed to assess: (1) the need to reduce uncertainty in hydrologic and geochemical parameters, (2) the need to obtain representative data on the Calico Hills, and (3) the need to obtain sufficient data to characterize

the Calico Hills, versus the potential impacts on waste isolation of the methods used to obtain the data.

Following are the major points made as a result of the discussion of this subject:

1. In order to justify Calico Hills as a natural barrier between the repository and the water table, more information is needed which can only be obtained by drilling into that unit. It is not clear whether drilling through it into the water table will be required.

2. DOE plans to do a cost-benefit analysis to help determine whether they should extend their drilling into Calico Hills. A decision whether to drill into this formation has not yet been decided. In any event, DOE will not do so without NRC's approval.

3. Of prime concern is that by drilling into or through Calico Hills, they may be penetrating an important natural barrier and possibly opening up pathways to the accessible environment.

G. ESF Interference (NRC Objection 3)

Mr. Maxwell B. Blanchard, DOE Yucca Mountain Project Office, said NRC's Objection No. 3 was that the CDSCP does not include adequate and consistent conceptual design information on the proposed ESF. This does not allow for the evaluation of potential interference between (1) investigations and (2) construction operations and investigations. To remedy this alleged deficiency, NRC recommended that DOE: (1) include more detailed and consistent conceptual design information in the SCP, and (2) discuss the strategy to minimize potential interference between investigations.

Mr. Maxwell described the approach taken by DOE in order to be responsive to NRC's objection, including an evaluation of the ESF Title I design and the evaluation of each test activity with regard to constraints. He enumerated 15 principal constraints (in three categories -- sequencing, physical location, and construction operations) imposed on the ESF design by test activities. Each activity, in turn, was evaluated with regard to zones of influence, considering four principal mechanisms -- mechanical, thermal, hydrologic, and chemical, and coupling between mechanisms.

The zones of influence evaluated were for those between different tests, between tests and the environment, and between tests and construction activities. The conclusions regarding the potential for interference were discussed which appear to support DOE's position that, in their opinion, they have been responsive to NRC's objection and recommendations.

The main points regarding Objection No. 3 that result from the discussions during and following the presentation were:

1. DOE's original conceptual design and description of the ESF was inadequate and incomplete regarding interference between investigations and between construction operations and investigations. DOE has corrected this deficiency to a large extent with the submission of their Design Acceptability Analysis and supporting documentation.

2. The two shafts will not be drilled but will be constructed by the use of explosive blastings followed by rubble removal. DOE is also attempting to better define the zones of influence created by sinking the two shafts. DOE also believes that the changed location of ES-1 and ES-2 will help resolve the problems of interference.

H. ESF Location (NRC Objection 4)

Mr. Blanchard described NRC's Objection No. 4 regarding the proposed locations of the exploratory shafts, since their locations may make them susceptible to surface water infiltration and lateral and vertical erosion (This is true for ES-1 in particular, since its location could possibly subject it to sheet flow.). For the proposed locations, there is a possibility of: (1) potentially significant and unmitigable long-term adverse impacts on the waste isolation capability of the site, and (2) affecting DOE's ability to adequately characterize the site.

After reviewing NRC's recommendations that, prior to finalizing the shaft and ramp locations, the DOE should consider in addition to the above factors the following: (1) potential for seals to become ineffective, and (2) future changes in geomorphic processes due to tectonic events or repository-induced uplift/subsidence.

Mr. Blanchard described DOE's approach to demonstrate DOE's responsiveness to NRC's objection and recommendations. This approach includes the conduct of various detailed evaluations to ensure that site characterization and related activities are consistent with NRC's recommendations.

In addition, DOE agreed to and did expand the scope of SCP Section 8.4 to include consideration of all pertinent and related factors raised by the NRC objection. Mr. Blanchard described the contents of the pertinent parts of Section 8.4 that address the issues relevant to the ESF location discussed above, specifically the effects on hydrologic, geochemical, and mechanical conditions. He also discussed the scope of analysis of these effects on waste isolation.

Mr. Blanchard discussed the factors pertaining to the possibility of flooding at the ESF location saying that the original shaft sites that were selected in 1983 were moved in response to the NRC staff's concerns about flooding. The shaft collars at the new locations will be

significantly above the level of a probable maximum flood. And, concerning the results of impact evaluations, he said that DOE has concluded that:

1. The presence of the ESF does not preclude the ability of the site to meet its performance objectives.

2. Impacts are not expected to preclude the site from meeting the total system release requirements for the nominal case or to affect the frequency or magnitude of disruptive scenarios.

Regarding the potential for site characterization impacts on waste package containment and engineered barrier system (EBS) releases, he said that characterization activities are not expected to impact water quality or quantity, or rock-induced loads, to an extent that would adversely affect containment or releases from the EBS. He said that DOE has also concluded that the effects of site characterization activities on the prewaste-emplacement ground water travel time are not expected to be significant. He concluded with the identification of ten design features incorporated into the ESF that may contribute to performance. Some examples of the design features are:

1. The ESF site is located in an area having a low flood potential.

2. The drainage direction within the ESF is consistent with expected repository drainage.

3. Surface water impoundments inside the perimeter drift will be avoided.

The following discussions were held regarding this topic.

Dr. Moody asked if consideration has been given to the effect of all the drill holes that have been made in the past, and that will be made in the future, in terms of total isolation of the waste. For example, are another 35 drill holes that penetrate to the Calico Hills needed? Mr. Blanchard said that the answer to this question should be provided by the risk-benefit analysis when they address Objection No. 2, penetrating the Calico Hills, and they compare the existing boreholes and planned future boreholes with doing in situ tests in the Calico Hills. Dr. Moody said that she was just trying to emphasize that it is a nontrivial matter. Mr. Michael Voegele, SAIC, explained that only a very few of the boreholes have actually been drilled within the proposed repository site boundaries and that only two or three are actually within the repository block. He said that this topic is discussed in Section 8.4 of the SCP.

Dr. Hinze noted that the exploratory shafts (ES) are being put down in a critical area -- the areas you wish to study the most and as much as possible without disturbing the site. He asked about surface studies

near the ES or hole-to-hole studies that may be affected by the facility itself, i.e., by the shafts and the drifts. Mr. Blanchard explained that they plan to drill two boreholes some 40 to 60 feet away from ES-1 and ES-2 prior to the shafts being put down. They believe these will give them the most accurate information about rock and hydrologic properties that they need so they can safely move ahead and assess the impact on the site as the shafts are constructed.

Dr. Okrent asked how DOE would know if they were drilling in the right place and is it really crucial that you are in exactly the right place? Mr. Blanchard said that their current view on this matter is based on the need to have a good statistical understanding of flow paths and flow directions from the water and radionuclide standpoint. To achieve this, they have a surface-based drilling program for both geologic and hydrologic tests which has two components. One component is called the feature sampling program, which looks at anomalies. The other component is a systematic drilling program, which is oriented toward the classical statistical approach to determine the representative values for hydrologic, chemical, and mechanical properties. Both components are fed into the long-term performance calculations and run separately to give them the desired statistical understanding mentioned above. Dr. Okrent and Mr. Blanchard continued this discussion as it related to meeting EPA standards for performance allocation and confirmation and the need for an independent peer review process because there will always be a measure of uncertainty.

In response to a question asked by Dr. Steindler about whether safety margins are built into DOE's consideration of the extent of the changes in the hydrologic properties caused by drilling the exploratory shafts and drifts, Mr. Blanchard said that such changes are expected to be permanent but limited to several meters in extent in the vicinity of the shafts and drifts and that DOE does have a conservative safety factor program.

I. Representativeness and Integration of Site Characterization Data

Dr. Jean L. Younker, SAIC, listed the six areas of concern which the NRC Point Papers raised about representativeness and integration, two important areas of which were:

1. Representativeness of data to be collected to characterize site conditions and processes.

2. Integration of subsurface information with repository design.

She explained that DOE's site characterization program is designed to provide the information needed. She discussed how their planned program will obtain the needed data, and described the methods by which DOE will achieve confidence that the data base obtained through site characterization will be appropriate and adequate, in response to NRC's concerns.

Dr. Younker described DOE's overall site program and identified the major elements of their site data-collection program, which includes both surface-based and underground testing. She also described the contribution to this effort of a systematic drilling program and a feature-sampling approach.

In regard to the integration of the data collection programs, she said (1) that site characterization is designed to ensure representativeness through integration of data obtained from in situ and underground testing, surface-based drilling and other surface-based data-collection activities, and (2) that the integrated data base provides input for evaluation of conceptual models and evaluation of site performance. She concluded by saying that the adequacy and representativeness of site data will be continuously reevaluated during site characterization.

The major points of discussion of Dr. Younker's presentation follow.

Dr. Steindler expressed concern about the systematic drilling program, reflecting the NRC's concern about it as expressed in Comment No. 28 on DOE's consultation draft SCP (i.e., that it "... appears unlikely to provide the lithologic and structural information necessary to construct a reliable three-dimensional geologic model of the repository block ..."). He asked if DOE had provided some changes in the statutory SCP to satisfy NRC's comment. Dr. Younker said they had done so; that the systematic drilling program in the CDSCP was a "plan for a plan." But in the statutory SCP the plan itself had been developed a lot further in response to the NRC comment.

Dr. Moody asked how many new subsurface drill holes are planned and are they within or without the repository boundary? Dr. Younker said there were 35 planned. Mr. Blanchard added that only 9 of these are deep inside the repository area. He also referred Dr. Moody to Section 8.4.2, pages 8.4.2-37 and 8.4.2-43 of the SCP where they are illustrated and discussed.

Dr. Hinze asked if any of the drill holes are designed particularly to get at the volcanic problem. Dr. Younker said that some were and discussed the Crater Flat area to the west of the site where plans in the SCP call for the drilling of some volcanic boreholes. Dr. David Dobson, DOE, commented further on two planned studies described in the SCP that DOE plans to conduct to evaluate the possible impacts of volcanoes on the site.

Dr. Voiland asked who will be conducting the data-gathering aspect of the integration and representativeness of site characterization data program, and is DOE considering the use of a commercial company like Dames and Moore? Dr. Younker said the geologic and hydrologic work will be done by USGS and three national laboratories -- Los Alamos National Laboratory (geochemistry), Sandia National Laboratory (rock mechanics), and Lawrence Livermore National Laboratory (waste package). Regarding

commercial companies, Dr. Younker said DOE might consider this option, but Mr. Mark Frye of DOE said that they do not envision any such changes at this time.

Dr. Moody asked if DOE would not, however, have a central location where all the data generated by the above-named institutions would be received and made available to one another and other involved and interested parties? Mr. Stan Eckols, DOE, said that the Licensing Support System (LSS) would have a central computer in Las Vegas, Nevada, for this purpose. Plans are for the LSS to be available in the 1990's. Dr. Younker said that, from the Yucca Mountain Project Office's viewpoint, they would have a Site and Engineering Properties Data Base (SEPDB) which would fill this need until the LSS is available.

Mr. Voiland noted that DOE is relying very heavily on the national laboratories for their technological support, and asked if DOE would make use of the geologic capabilities of the petroleum industry which, he suspects, may have more geologic capability than you will find in any other place. Dr. Younker said that some of these kinds of organizations may be involved as subcontractors but that there are currently no large contracts with such companies. Mr. Voiland suggested that if DOE really wants to get good advice, DOE should at least try to get them.

J. Ground Water Travel Time

Dr. David Dobson, DOE Yucca Mountain Project Office, said that NRC's concerns relating to the DOE approach to assessing ground water travel time (GWTT) were: (1) procedure for defining pathways, and (2) calculational approach for determining GWTT.

In order to be responsive to these concerns, he said that DOE modified the SCP by adding text to clarify that (1) travel times for discrete features will be examined, and (2) reliance on the stochastic approach to calculation of GWTT is limited to the fastest paths.

Dr. Dobson cited 10 CFR Part 60.11(A)(2) wherein reference is made to "... the fastest path of likely radionuclide travel ..." followed by a discussion of DOE's proposed approach to calculation of GWTT. Their strategy for determining the "fastest path" includes the identification of the location of "fastest paths," which will result in site-scale modeling to produce travel time contour maps of the site, and of processes occurring along the "fastest paths," such as matrix diffusion, dispersion, and fracture properties (on both a macroscopic and microscopic scale). He described how they would go about accomplishing both of these tasks, and concluded by saying that the GWTT results would be used to develop (1) a preliminary basis for reasonable assurance that the GWTT would be greater than 1000 years, and (2) a DOE position on compliance with 10 CFR 60.113(A)(2).

The most important highlights of the discussion of ground water travel time follow:

In response to a statement made by Dr. Dobson regarding DOE's stochastic probability analysis of ground water travel time which is limited to the fastest paths, Dr. Okrent asked what would be probabilistic in that calculation? Dr. Dobson said that he would address a number of uncertainties in his briefing, e.g., uncertainties related to the values of the parameters, to the applicability of the models, and to the choice of the paths they would select.

Regarding Dr. Dobson's explanation that one of the ways to identify potential fastest paths involves the use of both spatial and vertical variability, Dr. Moeller asked if it's a geologic condition that the word "spatial" cannot apply to vertical variability. Dr. Dobson said they were actually overlapping, that spatial variability includes vertical variability.

Dr. Moody asked if the two-dimensional rather than the three-dimensional modeling would give a reasonable assessment. Dr. Dobson said they have done the former to get a preliminary feeling for the results, but that DOE is certainly not restricted to it, that they will use whatever modeling is necessary in order to obtain the needed information.

Dr. Orth asked if validation of the models is built into their program. Dr. Dobson said yes, that model validation is clearly part of their program. Dr. Steindler asked, regarding validation, what DOE is planning to do to ensure (and reassure others) that DOE has a reasonably accurate model of ground water travel time. Dr. Dobson said that, at the present time, such a plan is not in the SCP. Dr. Moody asked if it would be covered in the site study definitions. Dr. Dobson answered that the study plans, which include modeling studies, will contain information on how DOE intends to demonstrate that these models work.

## K. Performance Confirmation

Dr. Stephen J. Brocoum, DOE Headquarters, gave a summary of the NRC comments on DOE's proposed performance confirmation program. As part of these comments, NRC recommended to DOE that their discussion of performance confirmation in the SCP should be augmented to include:

1. Recognition of key parameters needed for validating the conceptual and mathematical models proposed for use in the performance assessment program.

2. Identification of those parameters for which it is necessary to initiate performance confirmation testing as early as practicable during site characterization.

3. A program for performance confirmation testing.

After discussing the correlation between phases of the performance confirmation program, NRC requirements, and phases of the repository program, Dr. Brocoum named and discussed the overall objectives of the DOE performance confirmation program and the objectives of this program during site characterization. And, in conclusion, he presented a preliminary identification of site characterization activities that may be continued as part of performance confirmation, e.g., (1) long-term monitoring of natural processes, events, or site conditions, such as a seismic network, natural infiltration, and site potentiometric level, and (2) long-duration in situ testing to characterize natural processes and to test conceptual models, such as those for percolation and bulk permeability.

Following Dr. Brocoum's discussion of in situ activities which include a heated room experiment, Dr. Carter asked how long this experiment would last. Dr. Brocoum answered, three years.

Dr. Okrent asked for a definition of "performance confirmation." Dr. Brocoum said that it is to establish that the parameters that one uses to do the performance assessment are within the bounds that were assumed for them when the performance assessment was (will be) done for the license application. Dr. Okrent added that he believes the model also needs to be both verified and validated, with which Dr. Brocoum agreed.

Dr. Okrent recommended that DOE should prepare a list of the most important, most difficult, and most crucial problems, as well as the issues of concern that DOE has yet to address, and make available for peer review. Dr. Brocoum cited, as an example, one of DOE's principal concerns -- the mechanisms of ground water flow, including the degree of fracture flow versus the degree of matrix flow, which could affect the isolation capability of the site. He added that there is no clear-cut and direct correlation between the parameters and understanding the issues of concern. Dr. Okrent said that this just makes it more important to explain to others how the DOE program is going to provide the needed information, if it can. Mr. Blanchard responded that, in Section 8.1 of the SCP, the top-level strategy identifies the critical (natural) barriers that are inherent to the site and that DOE expects the site will have to rely on for waste isolation.

## L. Substantially Complete Containment

Dr. Donald H. Alexander, DOE Headquarters, introduced this subject by stating that NRC's expressed concern on this issue was DOE's interpretation of the term, "substantially complete containment," which NRC believes is (1) inconsistent with the 10 CFR Part 60 rulemaking record and the Commission's intent, (2) inappropriate to guide the waste package testing and design program, (3) not conservative enough to meet the performance objective for substantially complete containment, and (4) lacks rationale and a scientific basis. He then cited the Part 60

requirement, DOE's interpretation of it and DOE's basis for its interpretation.

He then discussed the technological limitations and uncertainties pertaining to the waste package and its environment, followed by an outline of DOE's approach to the reduction of the uncertainties and an overview of DOE's container test program, the waste package model hierarchy and the expected waste package environment.

In summary, Dr. Alexander said that:

1. DOE will rely on the waste container as the primary containment barrier.

2. The waste package strategy will focus on testing to provide information to design waste packages to meet the objective of total containment.

3. DOE has an extensive program to minimize technological and predictive limitations.

The major highlights of the discussions pertaining to this topic follow.

In regard to substantially complete containment, Dr. Moody asked if this meant that the waste package has to have a minimum 1000-year lifetime. Dr. Alexander said that was correct and that this is their design objective for the containers. In response to a follow-on question by Dr. Moeller, Dr. Alexander said that they have a container test program that is continuing with the objectives of: (1) establishing the expected and bounding waste package environment, (2) determining the properties of the waste package materials, (3) evaluating container degradation, and (4) evaluating the waste package performance.

In response to Dr. Alexander's statement that, in the waste package performance assessment, DOE will evaluate scenarios for expected conditions, Dr. Steindler asked why not consider the bounding conditions rather than the expected conditions. Dr. Alexander said that the bounding conditions are enveloped in the set of expected conditions. He added, in summary, that DOE will rely on the container as the primary containment barrier and that their strategy is to focus on testing to provide information to design a waste package that will meet the objective of total containment.

M. Treatment of Human Interference (Intrusion)

Dr. Larry D. Rickertsen, Weston, who had discussed the development of the Complementary Cumulative Distribution Function (CCDF) during the ACNW meeting on February 22, briefly recapped what he had said then about human interference. He said that the NRC staff had commented in their point papers that all significant scenario classes should be

included in the CCDF, including the effects of human intrusion. And in cases where it is not possible to collect sufficient information about human intrusion to include it in the CCDF, another basis should be developed for including it in the CCDF, for example, through the use of bounding calculations.

Dr. Rickertsen reviewed the 10 CFR Part 60 requirements in regard to human intrusion, identified the required assumptions for assessment of human intrusion, and discussed the DOE strategy to address this issue. He said their strategy is to: (1) plan to rely on measures to discourage human intrusion, (2) plan to evaluate repository performance to conform with EPA standards, taking human intrusion into account, and (3) obtain site information needed to evaluate passive measures and the potential for human interference, each of which he further discussed in more detail.

He said that the potentially significant human interferences for Yucca Mountain are: (1) exploratory drilling, (2) ground water withdrawal, (3) mining and mine dewatering, (5) man-made surface water impoundments, and (5) extensive irrigation. DOE's human interference program, as part of their site characterization, includes investigations of the degradation of markers, the value of resources and the effects of human interference, each of which he discussed in greater detail.

He summarized DOE's position on these issues as follows:

1. A final approach to the treatment of human intrusion has not yet been defined.

2. The preliminary strategy in the SCP has been developed to focus the testing program on needed information.

3. The site information is considered sufficiently comprehensive that reasonable alternative strategies are not precluded.

The principal highlights of the discussion on this topic follow.

In regard to Dr. Rickertsen's statement that DOE does not, at this time, have a final position on this matter, Dr. Orth asked what needs to be known about the site that will enter into the formulation of DOE's final position. Dr. Rickertsen answered that natural resources are the major factor, and that the degradation of markers is also an important consideration.

Dr. Okrent asked if the EPA standard gives any guidance on what assumed rate of intrusion should be used in trying to evaluate its effects. Dr. Rickertsen said that the EPA provides guidance on this matter in an appendix to their standards, but that EPA suggests that the assumptions used should not be taken too far and that the implementing agency may or may not choose to use them.

Dr. Hinze asked who is going to make the decision regarding the unique features (and what types of studies are needed) in regard to natural resources in the Yucca Mountain area. Dr. Rickertsen replied that he believes DOE would welcome any recommendations Dr. Hinze might have. Dr. Hinze said he was thinking primarily of people such as those in the Society of Exploration Geophysicists (Dr. Moody also suggested the Society of Economic Geologists), i.e., people who are, on a day-to-day basis looking into what kind of exploration techniques should we be looking at 20 years from now.

Dr. Carter asked, regarding a repository not having any unique resource value, if that precludes the disposal of used fuel elements, which Dr. Carter suggested was an important issue that DOE should address. Dr. Rickertsen acknowledged that they were aware of that issue and that it would be taken into account. This topic was further emphasized and discussed by Drs. Carter, Hinze and Moody, and Dr. Rickertsen and Mr. Regnier, DOE. Mr. Regnier said that, although they were aware of the issue and would consider it, it was beyond their statutory charter to consider the possibility of recovery of spent fuel from the repository

N. Overview of Near-Term Milestone

Dr. Brocoum named the following three areas of near-term site characterization milestones:

1. Start surface-based testing which includes borehole drilling and Midway Valley trenching.

2. Start site preparation, which includes the access road, ESF pad and multipurpose boreholes.

3. Start ESF construction, which includes initially the shaft collar.

He presented a map which shows the locations of the repository surface facilities, the main test facility, the ESF surface facility, the planned prototype drillholes, the multipurpose boreholes, and the Midway Valley trenches.

The principal highlights of the discussion on this topic follow.

In response to a question by Dr. Moeller regarding the purpose of the trenches for investigating faults, Dr. Brocoum said they were for the study of the possibility of faulting in the vicinity of surface facilities which are designed to withstand up to 10 centimeters of surface displacement. And Mr. Jeff Kimball said that the embedment of the building would probably extend to a depth of 30 to 40 feet.

Dr. Moody asked what the depths of the prototype boreholes would be. Dr. Brocoum said there will be two boreholes, one 7 inches in diameter,

the other 12 inches, and that each would be approximately 1100 feet deep.

IV. State of Nevada, Nuclear Waste Project Office - Technical Concerns With Yucca Mountain Site (Open)
[Note: Dr. S. J. S. Parry was the Designated Federal Official for this portion of the meeting.]

The presenters for the Nuclear Waste Project Office were: Messrs. Robert R. Loux, Executive Director, Carl A. Johnson, Administrator, and consultants to the Project Office.

A. Introduction

Mr. Loux opened the presentation with a history of the State's activities and the genesis of the Project Office. He explained that the three principal responsibilities of the office are to: (1) evaluate, analyze, and oversee DOE's program at Yucca Mountain, (2) assess social and economic impacts of the repository on the state, and (3) advise the Governor and Legislature in all matters relating to the repository. The Office consists of two divisions: technical and planning, and also performs a public information function. The Office consists of 19 professionals and support staff and has approximately 180 professionals under contract. The Office's financial support is from the Nuclear Waste Fund through DOE. Most of the contractors are located in Nevada.

B. Overview of Technical Concerns

Mr. Johnson followed with an overview of the technical concerns related to the Consultation Draft of the Site Characterization Plan (CDSCP). Dr. Moeller asked whether Nevada's efforts were directed at detecting a "fatal flaw" in the site as early as is possible. Mr. Johnson responded affirmatively and stated that he hoped that the forthcoming presentations would support that position.

Mr. Johnson described four concerns relative to site suitability. They were: (1) The Nuclear Waste Policy Act is in itself not a guarantee that the site will prove to be suitable, (2) The State believes that a number of regulatory policy issues need to be looked at. (He used 10 CFR 100, Appendix X, as an example and raised the question of data sufficiency and the finding of reasonable assurance), (3) The Office questions the feasibility of maintaining site integrity while obtaining sufficient data, and (4) The question of whether long-term projections of repository performance can be made. Dr. Okrent questioned Mr. Johnson's statement that the EPA standard was deterministic. Mr. Johnson agreed that while the standard is probabilistic in itself, that a deterministic approach would also be required. Dr. Okrent asked whether Mr. Johnson was proposing obtaining additional data to reduce uncertainty. Mr. Johnson stated that reducing uncertainty was a primary goal of the State's program.

Mr. Johnson questioned the current NRC practice of licensing portions of the waste management system separately. Dr. Okrent commented that system-wide or "cradle-to-grave" licensing was not used in any industry and was of doubtful value in this situation. Mr. Johnson said that they were not proposing that, but were concerned that a breakdown anywhere in the system could result in a backlog developing elsewhere.

In discussing the question of surface-based testing, Mr. Johnson cited a USGS report that the site was opaque to high resolution geophysical testing procedures. Dr. Hinze questioned this statement directly. Mr. Johnson acknowledged that the Office was not necessarily at the forefont of the technology, but that the statement represented their understanding.

Dr. Okrent asked whether the Office had examined the practicality of the EPA standard in and of itself, not in the context of the Yucca Mountain site. Mr. Johnson said they had not and did not plan to do so since they believed that their responsibility was to determine the suitability of the site to meet the regulations. Dr. Okrent suggested that it might be productive to compare the stringency of the EPA standard for the repository with regulations directed at more common facilities.

C. Tectonics of Yucca Mountain and Its Environs

Dr. Michael Ellis, University of Nevada, Reno, gave a presentation on tectonics. He opened his talk with a description of the tectonic characteristics of the southwestern region of the U.S., including the basin and mountain range in which Yucca Mountain is located. He described in detail the regional system of faults and finer structure, including those in the Yucca Mountain area. He showed that there was a sequence of earthquakes first in one region, then another, and so forth. He drew parallels with data in Turkey, where older data are available. While no attempt was made to directly correlate the historical data from Turkey with the limited data in the southwestern U.S., it was suggested that such correlations are not impossible.

Dr. Carter asked if it was possible to predict earthquake intensity from the models presented. In essence, Dr. Ellis said that it was not possible to predict intensity, even if one knew which model applied. Dr. Okrent asked if the patterns of faults observed in Turkey were repeated in other regional boundary areas. Dr. Ellis said that not enough data had been developed. Dr. Okrent then questioned the validity of attempting to translate the Turkish observations to southwestern U.S. Dr. Ellis indicated that the comparison was not unreasonable since the basin was known to be deforming uniformly and that recent quakes had been concentrated. Dr. Hinze commented that Dr. Ellis was not trying to transpose the Turkish experience to our case, but was merely looking at areal seismicity over a limited time span. Dr. Ellis agreed with this statement.

Dr. Ellis described in detail the extensive faulting observed in the basin and near the site. In response to a question by Dr. Moody, Dr. Ellis indicated that these data were the result of surface-based studies, including low-angle photography and some bore hole data by USGS.

Dr. Carter asked whether Dr. Ellis had any particular problems in his work. Dr. Ellis commented that it was very difficult to obtain data from DOE. Dr. Carter asked if data from the underground tests had been made available. Dr. Ellis said that he had not tried to secure that data but that his problem was in obtaining conventional data, not classified information. Dr. Moody asked Dr. Blanchard, DOE Nevada Project Office, why data were not being made available. Dr. Blanchard stated that DOE was attempting to be responsive and offered to follow up on any outstanding requests for data. Dr. Carter inquired of Dr. Blanchard whether classified information had been or could be made available, since it was being shared with the Russians. Dr. Blanchard said that the tapes of the USGS seismic monitoring stations were being shared. Dr. Ellis noted that it did not appear to be a problem with DOE, but with the USGS.

D. Active Faulting

Dr. Burton Slemmons, University of Nevada, Reno, followed with a presentation on active faulting. He presented a diagram showing faults surrounding the repository site. He stated that at least one of the bounding faults is a capable or active fault and there is the possibility of a major, as yet undiscovered, fault in the block holding the repository. Dr. Carter asked what neotectonic means. Dr. Slemmons defined it as the study of ground movement or deformation less than 1 million years in age. Dr. Slemmons proceeded to present extensive data detailing a pattern of faults in the Yucca Mountain area. He noted the Ghost Dance fault which crosses the repository site, and while it is not observable on the surface, can be mapped by subsurface testing techniques.

Dr. Slemmons gave examples of other faults related to earthquakes in Nevada. Dr. Carter noted that those events were not near the site and Dr. Slemmons agreed. Dr. Slemmons gave further details of the weathering of surface features that define faults. He supported Dr. Ellis' presentation on the episodic nature of seismic events. He noted that some 17 movements have occurred in the basin since 1869, with 15 occurring since 1900. He illustrated the interaction between volcanic events and faulting by showing that basalitic cinders had impregnated fissures associated with surface faults.

Dr. Slemmons gave several examples of hydrologic effects being seen as a result of tectonic events. None of the examples were associated with the site but were in the basin area. It was noted that little irrigation occurs in the area.

Dr. Slemmons closed with the statement that there is evidence of coupled seismic and hydrologic activity. In response to a question by Dr. Carter, he agreed that no earthquakes had be predicted for the area by prediction centers in California. He stated that this was an area of weak seismic activity. In response to Dr. Carter, he stated that Las Vegas had no special building code requirements to protect against seismic events.

Dr. Moody asked Dr. Blanchard, DOE, if any calculations had been made to determine if the added thermal load or pulse might trigger a fault movement. Dr. Blanchard stated that the effect of added thermal loading was being minimized by leaving an air space around the canisters. Additionally, the air space is intended to mitigate any impact on the canister by seismic events.

Dr. Okrent questioned Dr. Slemmons if there was any likelihood that one would be able to probabilistically predict future changes in hydrologic, tectonic or volcanic activity. Dr. Slemmons said that such predictions were potentially possible with much additional work.

Dr. Moody asked if any data related to weapons tests were available. Mr. John Bell, University of Nevada, Reno, indicated that some faults at Yucca Mountain may have been activated by weapons tests.

E. Unsaturated Zone Hydrology

Dr. Martin J. Mifflin, Mifflin & Associates, Inc., followed with a presentation on vadose (unsaturated) zone hydrology. He explained that the term vadose is more precise than unsaturated since it means a zone of variable condition. He noted that there are areas that are saturated, which vary in time and location. He stressed two questions: (1) the degree of fracturing in the rock and (2) the rate of recharge or downward flux of water passing through the site. Both factors are largely unknown at the site and rarely studied. Further no commonly accepted test methods are available to explore and answer these questions. He indicated that the unusually thick vadose zone at Yucca Mountain makes the problems even more difficult. The use of conventional water-based drilling fluids are prohibited because of possible interference with the site condition.

He stated that it is likely that fracture flow, that is, flow through cracks in the rock rather than through interconnected pores in the rock, is the preferred mechanism for water transport. If this is confirmed, then it is probable that the travel time from the surface, through the repository horizon and into the saturated zone will be relatively short. It was noted that the selection of the site was not based on the site being arid, but on the expectation that little water would reach the repository horizon. The existence of an interconnected flow path for both water and gases was mentioned. The limited amount of data released by the USGS was noted.

Dr. Mifflin described the very low matrix flow in welded tuff, but pointed out that the situation increased the chances for fracture flow, if the recharge rate exceeds the capacity of matrix flow. Data from several horizons was presented. Dr. Mifflin used the data to support his position that very rapid downward flow is likely through fractures in the rock.

Dr. Carter asked about the distribution of zeolitized and nonzeolitized rock masses. Dr. Mifflin stated that the repository block was variable and appeared to contain both types of materials. However, this observation was based upon very limited sampling. Dr. Mifflin presented some calculations that suggested that the repository site was highly fractured, but he was unable to support this contention.

In closing he stressed the need to determine the recharge rate, or downward flux of water and the degree to which fracture flow controls the movement of the water. In response to a question by Dr. Carter, Dr. Mifflin stated that very little data have been released by DOE or its contractors and that variability within the repository block is a real problem.

F. Uncertainty in Modeling and Performance Assessment

Ms. Linda L. Lehman, Lehman & Associates, Inc., made the next presentation on uncertainty in modeling and performance assessment. She stressed uncertainties and how to reduce them as a way to improve the confidence in both the models and performance assessment. She classified the source of uncertainties as, (1) process modeling, (2) input data, and (3) scenarios. She referred to Dr. Mifflin's concern of not knowing the role of fracture flow as an example of process modeling uncertainty. As an example of scenario uncertainty, she cited the unknown effect of tectonic processes on hydrology. Input data uncertainties may result from improper testing, including sampling errors or spatial or temporal variation in the samples.

Mr. Carter noted that these are generic conditions and not specific to Yucca Mountain and Ms. Lehman agreed. She also pointed out that the USGS was unable to adequately predict short time movement of contaminants and she questioned the ability to make prediction 10,000 years into the future.

Ms. Lehman stated that many hydrologic parameters were developed by inference and were not amenable to direct measurement. The uncertainty in the computed properties is compounded by the practical limitations as to the number of samples that can be obtained and the degree to which the samples represent the host rock. She stated that a major factor in developing uncertainty in data was the time allowed for their collection. She believed that this is a correctable situation. Examples were presented that suggested that it would take at least six years to produce useable geophysical data. This was based on, (1) two years or

more for the site properties to stabilize, (2) two years to run a test, and (3) over two years before the data are finally analyzed.

These time requirements were compared to the DOE proposed schedule. It was stated that given DOE's schedule, the data to be included in the construction authorization application will not be of suitable quality. Ms. Lehman asked, "at what point does the in-situ schedule go from ambitious to unrealistic."

Several examples of delays in receiving data were given, which were cited by Ms. Lehman as support for her contention that inadequate time has been allowed for the collection, verification, and interpretation of in-situ data. Dr. Steindler questioned Ms. Lehman about the DOE schedule and she responded that the schedule was borne out or supported by DOE staff statements.

Ms. Lehman recommended that NRC and DOE move to correct the limitation on testing time. This would require a determination of the data, and its reliability, needed in the construction application. This will also require that proportionate shifts in the schedule will be made when delays occur. She also supported an expanded effort in the study of fracture vs. matrix flow in the vadose zone. The test work in "G" tunnel and at the Apache Leap site in Arizona were cited as locations where the experimental activities could be expanded.

G. Geochemical Concerns

A presentation on the geochemical concerns of the proposed repository site was given by Dr. Maurice E. Morganstein, Mifflin & Associates, Inc. He stated that he was focusing on four groups of radionuclides, (1) actinides, (2) technetium, (3) possible gaseous materials such as carbon-14, iodine-129, and tritium, and (4) all other fission products.

He discussed the possible gases first, and stated that hot water in contact with the zeolites may pick up sodium and consequently affect the zeolites absorption capacity. Dr. Okrent questioned Dr. Morganstein as to the quantities and concentrations of water and sodium to which he was referring. Dr. Morganstein was unable to respond. He cited the lack of information from DOE as the principal limiting factor. Dr. Carter asked about the degree of solubility of borosilicate glass. Dr. Moody explained that borosilicate glass is much more soluble than natural silicate glass. Dr. Orth questioned the concern about gases since it was not certain that any gases that contain radionuclides would be present. Dr. Moody asked what additional information was available on the J-13 water. Dr. Morganstein acknowledged that he had data on the variability of the composition and properties of the vadose or saturated zone waters. He believes that they will be different.

Dr. Morganstein stated that actinides do not seem to respond to sorption as a major mechanism for retardation. Dr. Steindler asked how he

reached that conclusion. Dr. Morganstein said that actinides do not actually sorb, but that they may precipitate. Both Drs. Steindler and Carter disagreed and Dr. Morganstein acknowledged that his statement might not be strictly accurate.

Dr. Morganstein postulated that sorption of the other radionuclides (other than actinides and gases) can be significant under idealized conditions in the structures underlying the repository block. He also said that DOE's data supported the possibility of vapor phase transport.

H. Volcanic Risk Studies

Dr. Eugene I. Smith, University of Nevada, Las Vegas, followed with a discussion on the risks to the site related to volcanic activity. He presented a series of maps of Nevada showing the general southward movement of volcanic activity over the last 36 million years. It was indicated that the Yucca Mountain site is in a belt of relatively recent volcanic activity. The structure of cinder cones was described as were lava flows.

He raised three questions: (1) where will volcanism occur, (2) will volcanism be controlled by existing geologic structures, and (3) will future eruptions occur at sites of past eruptions. In response to the second question, he stated, and gave examples, that volcanic intrusions tend to avoid pre-existing faulted areas. He also stated that areas of volcanism may remain active for 100,000 years.

Dr. Steindler asked how one could show that an eruption had not gone through a fault that had been destroyed. Dr. Smith noted that volcanic intrusions are core or plug shaped where faults are linear structures. Consequently, if an intrusion went through a fault, the outer ends of the fault would remain, unaffected by the intrusion. Dr. Hinze inquired as to the source of the lava. Dr. Smith said that they were from the mantle, 30 to 50 kilometers from the surface. Dr. Carter asked how long a volcano had to be inactive for it to be rated as inactive. Dr. Smith said that there was no fixed criteria or time span.

Mr. Voiland asked if there were symptoms of impending volcanic action that were discernable. Dr. Smith said that there were no sure periods of time before a volcanic event that one could have warning of an impending event. Dr. Orth noted that the most recent events occurred at the ends of the belt and Dr. Smith agreed that that was the case.

I. Climate Change Concerns

Dr. Mifflin returned to give a presentation on climate changes. He stated that there were two major concerns about climate changes. The first is that if the climate became more humid or wet the performance of the repository would be materially affected. Secondly, the present climate is not representative of past conditions. Several examples of

the latter point were given. These included evidence of extensive lakes in the basin, in general, and in the Yucca Mountain area up to 8000 years ago. This is supported by studies of packrat middens and related phenomena. He stated that surface alterations of natural glasses supported the view that extensive ponds had been in the area. Some questions to this position were raised by Drs. Steindler and Moody, but Dr. Mifflin supported his contention by referencing samples of altered glass found underground but above the repository horizon.

Dr. Mifflin closed with the statement that while details may be questioned, changes in the climate may cause disproportionate changes in the vadose zone.

J. Mineral Resource Potential

Dr. Lawrence T. Larson, University of Nevada, Reno, discussed the potential for finding mineral resources at the Yucca Mountain site that would make intrusion more likely. The current status of active mines in adjacent areas was reviewed. It was noted that both the Nevada Test Site and the nearby bombing range acted as buffers to exploration and that little was known of the potential for commercial mineral development in the immediate area.

Dr. Larson stated that recent nearby developments gave rise to expectations that valuable ores finds might be made. He pointed out that favorable signs included alterations in the rocks related to mineral hydrologic and thermal intrusions. In response to a question by Dr. Moody, he stated that the existing regional mines were either surface or near surface facilities.

He stated that he would characterize the site as one in which a high degree of exploration activity could be expected, unless the site was physically protected.

K. Summary - Technical Concerns

Mr. Carl Johnson summarized the presentations. He stated that it was their contention that southern Nevada is geologically, tectonically, and geohydrologically active. The site has not been determined to be a suitable site for the repository and that it was questionable whether suitability could be demonstrated.

Dr. Moeller asked if Mr. Johnson felt that the site could or should be disqualified at this time. Mr. Johnson said that sufficient data did not exist to take that position. He took the position that much more could be done by surface-based studies than had been done. It was his belief that an exploratory shaft should be confirmatory, not a primary data source.

Dr. Okrent raised a question about the preparation of an environmental impact statement for mining operations. Mr. Johnson said that he was unfamiliar with the details of that activity but would investigate it and respond.

V. Proposed Rule on the Disposal of Greater Than Class C (GTCC) Waste (Open)

[Note: Dr. S. J. S. Parry was the Designated Federal Official for this portion of the meeting.]

The principal presenters for the NRC staff were Mr. Melvin Silberberg and Dr. Clark Prichard, RES, and Dr. Daniel Fehringer and Regis Boyle, NMSS, and James Wolf, OGC.

Dr. Prichard gave background information relating to the rulemaking. He explained the GTCC waste consisted of many materials, but the principal components were irradiated reactor internals, high activity resins, and sealed sources. The expected total volume of this material is less than 5000 cubic meters, based on DOE figures up to the year 2020. It was explained that DOE was assigned the responsibility for disposing of this waste by the Low-Level Waste Policy Amendments Act. This rulemaking merely codifies that responsibility and requires DOE to dispose of this material in the HLW geologic repository or in some other NRC-licensed facility.

Dr. Okrent asked if the reactor internals would require compaction or other volume reduction action prior to disposal. Dr. Fehringer acknowledged that some compaction might be required. It was noted in response to a question by Dr. Steindler that in Europe this material is referred to as intermediate waste.

Dr. Prichard stated that 38 comment letters were received in response to the publication of the proposed rule. DOE was the most strongly opposed. States were concerned that they might be forced to take such wastes. It was explained that, while states could elect to take such wastes, they could not be forced to do so.

Regardless of which route DOE chooses, additional regulatory action will be required. Part of DOE's objections was related to the fact that the criteria for disposal were unspecified for either the repository or another technique. Consequently, DOE felt that they had no basis for making a decision. It was further noted that all this waste is of commercial origin and that the radionuclides of concern have half-lives of sufficient length that short-time storage will not notably reduce the hazard.

Dr. Moeller asked if DOE decides to use an alternative disposal facility, rather than the geologic repository, what would the staff do? Dr. Prichard responded that the activity would be licensed under Part 61 and that new amendments would be provided if required. He indicated that a study by the Office of Technology Assessment indicated that it was no more expensive to use the geologic repository than to develop a special one for GTCC. In any

case, the producers are to be billed for the disposal actions although no mechanism for cost recovery has yet been set up.

Dr. Moeller asked Dr. Prichard what the staff required from the Committee. Dr. Prichard said they would appreciate the Committee's opinion on the draft final rule and any suggestions.

Mr. E. Regier, DOE, explained that DOE's concerns were focussed on the apparent preference for geologic disposal by the NRC staff and the lack of performance criteria by which DOE can make a reasonably informed decision.

## VI. Executive Session (Open/Closed)

### A. Reports, Letters, and Memoranda

The Committee completed a report on the Final Rulemaking on 10 CFR Part 61 Relative to Disposal of "Greater-Than-Class-C" Low-Level Radioactive Wastes (Appendix IV)

### B. Other Committee Conclusions

#### 1. Quality Assurance (QA)

Dr. Moeller summarized the ACNW discussion on this topic by stating that the information presented to the ACNW indicates that the QA activities being implemented by DOE in support of the high-level waste (HLW) repository program may account for 15% to 20% of the cost of many data gathering operations. The Committee agreed to monitor the situation (including possible participation in one or more QA audits), and offer suggestions, as appropriate.

#### 2. Conceptual Models

Dr. Moeller summarized the ACNW discussion on this topic by stating that, although the desire of the NRC staff to develop an independent capability for evaluating DOE's conceptual models for the proposed HLW repository is commendable, this capability should be based on the application of existing models, modified as necessary, as contrasted to the development of new models. The development of completely new models is extremely complex, lengthy, and expensive. The same is true for the development of codes for joining submodels to permit the evaluation of complete systems. He stated that an attempt to undertake such activities would appear to be beyond the resources of the NRC staff.

Dr. Moeller concluded that, although it appears that DOE has expanded its horizons to include alternate conceptual models (in response to NRC's expression of concern), additional details are

needed before judgments can be made on the adequacy of these changes.

3. Scoping Study

The Committee noted that one of the major needs, both on the part of DOE and the NRC in determining the suitability of the Yucca Mountain Site, is an identification of, and minimum qualifications for, the key factors and/or parameters that will govern the performance of the repository. One approach that could be useful in identifying such factors would be the preparation of a limited "scoping study" Probabilistic Risk Assessment (PRA) for the proposed Yucca Mountain Facility.

So far as the Committee can ascertain, no such study has been conducted to date. Because such a study would also help define the uncertainties associated with the performance of the repository, the ACNW may want to consider recommending that consideration be given to the preparation of such a scoping PRA. The Committee noted that prime responsibility for the effort could be borne by DOE. Outcomes could include clarification of the roles of events such as volcanism in the safe operation of the repository and identification of some of the key barriers to the successful operation of the proposed Yucca Mountain Facility.

4. Petitions for Disposal of Radioactive Waste Streams Below Regulatory Concern

The Committee discussed whether it wishes to participate in the expedited handling by the NRC staff of petitions for the disposal of radioactive waste streams below regulatory concern. The Committee agreed to discuss the procedures by which such requests are considered/processed. This matter is scheduled for the April ACNW meeting.

5. Proposed Deletion of Section 20.205 from the Proposed Revision of 10 CFR Part 20 (Open)

The Committee discussed the comments by Mr. Charles M. Vaughan, GE Company, to Chairman Zech concerning the ACNW letter report. The Committee agreed not to respond at this time since ACNW comments have not been requested.

6. Areas of Future ACNW Activity (Open)

Dr. Steindler recommended that the ACNW select several specific topics for in-depth study, preferably in the high-level waste area. He identified 7 candidate subjects and suggested that

NMSS might be consulted for additional candidate subjects. A subgroup meeting will be scheduled to pursue this matter.

It was also agreed that one or more subcommittees would be established to conduct in-depth studies of specific areas, but not until a fourth ACNW member has been appointed.

The Committee reconfirmed its interest in visiting the West Valley Demonstration Project sometime in August or September 1989.

The Committee discussed the invitation for an ACNW representative to participate in a meeting on Long-Term Safety of a Final Repository for Radioactive Waste to be held in Bonn, W. Germany on April 27-28, 1989. Mr. Fraley was directed to notify ACRS, EDO, and GPA/IP that, because of pressure from other business, ACNW would prefer not to send a representative.

The Committee discussed a draft final rulemaking on the centralization of material control and accounting licensing and inspection activities for non-reactor facilities (10 CFR Parts 70 and 74). The Committee agreed to take no action.

7. ACNW Bylaws (Open)

The Committee approved the revised ACNW Bylaws. Mr. Fraley was requested to distribute the approved ACNW Bylaws to the NRC staff, OGC, and the Technical Assistants to the Commissioners, with an opportunity for interaction where interfaces are involved.

8. Future ACNW Membership (Closed)

The Committee discussed potential nominees for ACNW membership and potential consultants for the Committee. A draft press release for recruiting potential ACNW members was reviewed and approved. The Committee approved the submission of the names of two candidates to the Commission for consideration.

9. Publication Approval

The Committee approved Dr. Moeller's request to submit a paper to the Health Physics Society Newsletter for publication. The paper describes the history and activities of the Advisory Committee on Nuclear Waste.

C. Future Activities

The Committee agreed to the tentative future agenda as shown in Appendix A.

The meeting adjourned at 3:45 p.m. on February 23, 1989.

APPENDIX A

FUTURE AGENDA

8th ACNW Meeting on March 22-23, 1989

Update on the Site Characterization Plan (Open) Estimated time: 2 hrs. - The Committee will be briefed on the status of the NRC review of the SCP. The Committee will discuss whether the data that the state of Nevada has requested can be obtained in a realistic time period.

Mixed Waste (Open) Estimated time: 1.5 hrs. - The Committee will be briefed on the issues involved in the disposal of wastes that contain both hazardous and radioactive constituents.

Post Closure Seals (Open) Estimated time: 1 hr. - The Committee will be briefed on the technical position on post closure seals in unsaturated media.

Center for Nuclear Waste Regulatory Analyses (Open) Estimated time: 3.5 hrs. - The Committee will be briefed on the latest activities at the Center for Nuclear Waste Regulatory Analyses.

Licensing Support System (Open) Estimated time: 1.5 hrs. - The Committee will be briefed on the development of the Licensing Support System for the High-Level Waste Repository.

Committee Activities (Open) Estimated time: 1.5 hrs. - The Committee will discuss anticipated and proposed Committee activities, future meeting agenda, and organizational matters, as appropriate. Discussions will also include critical issues related to the high-level waste repository.

MOU Concerning Performance Assessment and Status of Activities (Open) Estimated time: 2 hrs

9th ACNW Meeting on April 26-28, 1989 (tentative)

Meeting with the Commission (Open) Estimated time: 1.5 hrs. - The Committee will meet with the Commission to discuss a variety of topics, such as:

- Meeting with DOE/NRC/state of Nevada on CDSCP and SCP Review Plan
- West Valley Demonstration Project
- Division of High-Level Waste Management FY89 Program
- Deletion of Sect. 20.205 from the proposed revision of 10 CFR Part 20
- Greater-Than-Class-C radioactive waste
- Other items identified by the Commission

Update on the Site Characterization Plan (Open) - The Committee will be briefed on the status of the NRC review of the SCP.

Petitions for Disposal of Radioactive Waste Streams Below Regulatory Concern (Open) - The Committee will discuss the procedures and schedule proposed by the NRC staff for the expeditious handling of petitions.

Waste Confidence Rulemaking (Open) - The Committee will meet with the NRC staff to discuss the waste confidence rulemaking.

Committee Activities (Open) - The Committee will discuss anticipated and proposed Committee activities, future meeting agenda, and organizational matters, as appropriate.

## APPENDICES

I. MEETING ATTENDEES

II. FUTURE AGENDA

III. OTHER DOCUMENTS RECEIVED

VI. ACNW LETTERS REPORTS

APPENDIX I - ATTENDEES

7TH ACNW MEETING
FEBRUARY 21-23, 1989

ACNW Member Attendees:

| | 1st Day | 2nd Day | 3rd Day |
|---|---|---|---|
| Dr. Dade W. Moeller | ✓ | ✓ | ✓ |
| Dr. Martin J. Steindler | ✓ | ✓ | ✓ |

ACNW Consultants:

| | | | |
|---|---|---|---|
| Dr. Melvin W. Carter | ✓ | ✓ | ✓ |
| Dr. William J. Hinze | ✓ | ✓ | ✓ |
| Dr. Judith B. Moody | ✓ | ✓ | ✓ |
| Dr. David Okrent | ✓ | ✓ | ✓ |
| Dr. Donald A. Orth | ✓ | ✓ | ✓ |
| Mr. Eugene E. Voiland | ✓ | ✓ | |

## APPENDIX I - ATTENDEES (CONT'D)

NRC STAFF

B. Youngblood
J. Linehan
R. Johnson
J. Holonich
R. Weller
S. Coplan
G. Lear
K. Olive
J. Kotra
J. Menninger
J. Wolf
K. Chang
P. Justus
K. Stablein
K. McConnell
R. Browning
J. Pearring
T. Combs
A. Ibrahim
N. Eisenberg
F. Combs
M. Blackford
J. Trapp
G. Roles
C. Maupin
M. Silberberg
R. Boyle
R. Kornesiewicz
D. Gupta
T. Nicholson
R. Ballard
M. Nataraja
J. Peshel
E. Booy
P. Brooks
R. Werner
F. Ross
D. Cheny
C. Prichard
L. Kovach

DOE STAFF

M. Blanchard
J. Kimball
M. Frei
D. Dobson
E. Regnier
D. Alexander
S. Echols
S. Brocoum

CONTRACTORS and PUBLIC

D. Fenster
A. Kimmens
M. Hamkins
R. Gamble
T. Timmons
J. Bartlett
F. Kellan
A. Scott Dana
P. Krishna
S. Spector
D. Groelsema
M. Rohe
E. Holstein
S. Sharron
D. Tillson
J. Younker
B. Slemmons
J. Bell
M. Voegele
L. Rickertsen
C. Johnson
P. Berger
M. Ellis
R. Schweickert
E. Smith
L. Larson
R. Loux
M. Murphy
M. Morgenstein
L. Lehman

APPENDIX II

FUTURE AGENDA

8th ACNW Meeting on March 23, 1989

Update on the Site Characterization Study Plans (Open) - The Committee will be briefed on the status of the Site Characterization Study Plans.

Committee Activities (Open/Closed) - The Committee will discuss anticipated and proposed Committee activities, future meeting agenda, and organizational matters, as appropriate. Discussions will also include critical issues related to the high-level waste repository, such as, the schedule for the SCP/SCA review.

MOU Concerning Performance Assessment and Status of Activities (Open)

9th ACNW Meeting on April 26-28, 1989 (tentative)

Meeting with the Commission (Open) - The Committee will meet with the Commission to discuss a variety of topics, such as:

- Meeting with DOE/NRC/state of Nevada on CDSCP and SCP Review Plan
- West Valley Demonstration Project
- Division of High-Level Waste Management FY89 Program
- Deletion of Sect. 20.205 from the proposed revision of 10 CFR Part 20
- Greater-Than-Class-C radioactive waste
- Other items identified by the Commission

Mixed Waste (Open) - The Committee will be briefed on the issues involved in the disposal of wastes that contain both hazardous and radioactive constituents.

Post Closure Seals (Open) - The Committee will be briefed on the technical position on post closure seals in unsaturated media.

Center for Nuclear Waste Regulatory Analyses (Open) - The Committee will be briefed on the latest activities at the Center for Nuclear Waste Regulatory Analyses.

Licensing Support System (Open) - The Committee will be briefed on the development of the Licensing Support System for the High-Level Waste Repository.

Update on the Site Characterization Plan (Open) - The Committee will be briefed on the status of the NRC review of the SCP.

Petitions for Disposal of Radioactive Waste Streams Below Regulatory Concern (Open) - The Committee will discuss the procedures and schedule proposed by the NRC staff for the expeditious handling of petitions.

Waste Confidence Rulemaking (Open) - The Committee will meet with the NRC staff to discuss the waste confidence rulemaking.

Committee Activities (Open/Closed) - The Committee will discuss anticipated and proposed Committee activities, future meeting agenda, and organizational matters, as appropriate.

## APPENDIX III - OTHER DOCUMENTS RECEIVED

### A. Meeting Handouts from ACNW Staff and Presenters

II. Status of the Review of the Site Characterization Plan

1. SCP Review Plan, SCP Review Activities and Schedule, and Other Review Plans, dated February 21, 1989, by R. L. Johnson and K. Stablein, DHLWM

2. NRC Staff Review of the DOE Consultation Draft Site Characterization Plan (CDSCP) for the Yucca Mountain Stie, February 21, 1989, by K. Stablein, HLWM

3. Summary of the Design Acceptability Analysis, February 21, 1989, by J. Holonich, DHLWM

III. DOE Presentation on the Site Characterication Plan (Items 5-19 are viewgraphs)

4. Memorandum for Major from Lear, February 16, 1989, re Possible Questions for DOE Briefing on SCP (ACNW Meeting Handout #2)

5. Introduction by E. Regnier, OCRWM, February 22, 1989

6. Overview of the Site Charcterization Plan by S. Brocoum, February 22, 1989

7. Performance Allocation Process by D. Alexander, OCRWM, February 22, 1989

8. Alternate Conceptual Models (NRC Objection 1) by J. Kimball, OCRWM, February 22, 1989

9. Quality Assurance (NRC Objection 5) by L. Barrett, OCRWM, February 22, 1989

10. ESF Penetration of Calico Hills (Objection 2) by M. Blanchard, OCRWM, February 22, 1989

11. Field & Lab Data Collected, QA-I, undated

12. ESF Interference (NRC Objection 3) by M. Blanchard, OCRWM, February 22, 1989

13. ESF Location (Objection 4) by M. Blanchard, OCRWM, February 22, 1989

14. Representativeness and Integration of Site Charcterization Data by J. Younker, SAIC, February 22, 1989

15. Ground Water Travel Time by D. Dobson, YMPO, February 22, 1989

16. Performance Confirmation by S. Brocoum, OCRWM, February 22, 1989

17. Substantially Complete Containment by D. Alexander, OCRWM, February 22, 1989

18. Treatment of Human Interference by L. Rickertsen, OCRWM, Weston Technical Support Team, February 22, 1989

19. Overview Near Term Milestone by S. Brocoum, OCRWM, February 22, 1989

20. Letter for Stein from Linehan, January 19, 1989, re DOE's Site and Engineering Properties Data Base (SEPDB) and Local Records Center (LRC)

IV. State of Nevada Comments on Consultation Draft Site Charcterization Plan (Items 22-34 are viewgraphs)

21. Agenda on State of Nevada's Technical Concern with the Proposed Nuclear Waste Repository at Yucca Mountain

22. Introduction by R. Loux, NANP, February 23, 1989

23. Overview of Technical Concerns about Proposed Yucca Mountain Nuclear Waste Repository by C. Johnson, NANP, February 23, 1989

24. Resume of Michael A. Ellis, undated

25. Tectonics of Yucca Mountain and Its Environs by M. Ellis, UNR, February 23, 1989

26. Active Faulting by D. Slemmons, undated

27. Resume of D. Burton Slemmons, undated

28. Vadose (Unsaturated) Zone Hydrologic Concerns of the Proposed Nuclear Waste Repository by M. Mifflin, Feburary 23, 1989

29. Uncertainty in Modeling and Performance Assessment by L. Lehman, February 24, 1989

30. Geochemical Concerns of the Proposed Nuclear Waste Repository by M. Morgenstein, Mifflin & Associates, February 23, 1989

31. Volcanic Risk Studies by E. Smith, UNLV, February 23, 1989

32. Climate Change Concerns of the Proposed Nuclear Waste Repository by M. Morgenstein, Mifflin and Associates, February 23, 1989

33. Mineral Resource Potential by L. Larson, UNR, February 23, 1989

34. Summary - Technical Concerns by C. Johnson, NANP, February 23, 1989

V. Greater-Than-Class C Wastes

35. Part 61 Amendments Rulemaking by C. Prichard, RES, February 23, 1989

VI. Administrative Session

36. Memorandum for Smith and Steindler from Moeller, February 12, 1989, re GE Letter on Proposed Deletion of Section 20.205 from the Proposed Revision of 10 CFR Part 20, "Standards for Protection Against Radiation," with attachment (ACNW Meeting Handout #1)

37. Draft #2 of "The Advisory Committee on Nuclear Waste, NRC," February 18, 1989 (ACNW Meeting Handout #1)

38. Status Report for Draft Technical Position (TP) on Postclosure Seals in an Unsaturated Medium, February 21, 1989 (ACNW Meeting Handout #3)

39. Status Report on Petitions for Disposal of Radioactive Waste Streams Below Regulatory Concern, February 22, 1989, with attachments (ACNW Meeting Handout #4)

40. Letter for Stein, OCRWM, from Linehan, NRC, January 19, 1989, re DOE's Technical Data Base Not To Be Sorted in the Licensing Support System (LSS) (ACNW Meeting Handout #5)

APPENDIX III (CONT'D)

B. Meeting Notebook Contents Listed by Tab Number

TAB

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1. Agenda for February 21, 1989 ACNW Meeting

2. Status Report on SCP Review, February 8, 1989, with attachments, a portion of the SCP Overview and SCP Review Plan Summary

3. Memorandum for Stello from Fraley, May 11, 1988, re NRC Staff Comments on Consultation Draft Site Characterization Plan, with attachment (Report dated May 5, 1988, of the Meeting of the ACRS Subcommittee on Waste Management on April 28, 1988)

3

4. Status Report on Overview of the Department of Energy's Site Characterization Plan, February 15, 1989, with attachments

   a. OCRWM Bulletin, Special Issue on Site Characterization, DOE/RW-0201, December 1988

   b. DOE's Response to NRC Point Papers on SCP/CD, December 1988

5. Memorandum for ACNW Members from Merrill, February 10, 1989, re Summary of NRC's Objections #2, 3 and 4 on the Exploratory Shafts and DOE's Responses to the Objections, with attachments

6. DOE's Responses to NRC's Comments and Questions on Other Significant Issues, December 1988

7. Site Characterization Study Plans, December 1988

4

8. Planned Agenda for the Presentation by Nevada Agency for Nuclear Projects, February 23, 1989

9. Status Report on the Comments and Interactions of the State of Nevada, February 8, 1989, with attachments

10. Review and Comment on the U.S. Department of Energy Site Characterization Plan Conceptual Design Report by H.P. Thompson, October 1988, NWPO-TR-009-88

11. Letter for Zech from Loux, Nevada Agency for Nuclear Projects, January 18, 1989, re Regulatory Strategy and Schedules for the High-Level Waste Repository Program/SECY-88-285

12. Letter for Governor Miller, Nevada, from Thompson, January 24, 1989, re Site Characterization Plan

APPENDIX III, NOTEBOOK CONTENTS, 7TH ACNW MEETING

TAB

13. Letter for Loux, Nevada Nuclear Waste Project Office, from Browning January 5, 1989, re Site Characterization Plan, with attachment

14. State of Nevada Comments on the U.S. Department of Energy Consultation Draft Site Characterization Plant, September 1988, Volume I

5

15. Status Report on Greater Than Class "C" (GTCC) Rulemaking, February 8, 1989, with attachments

16. Draft #1 letter for Zech from Moeller, February 7, 1989, re Final Rulemaking Part 61 Disposal of Greater Than Class C Low-Level Waste

17. Memorandum for Parry from Prichard, January 24, 1989, re Rulemaking on Disposal of Greater-Than-Class-C LLW, with attachment

    a. Notice of Proposed Rulemaking (53 FR 17709)
    b. Draft Federal Register Notice

18. Draft Analysis of Public Comments on Part 61 Amendments, September 9, 1988

6

19. Future Agenda for ACNW Meetins, February 23, 1989

20. Letter for Fraley et al from Steindler, February 7, 1989, re ACNW Bylaws, with attachment

21. Memorandum for Moeller from Fraley, February 14, 1989, re Composition and Personnel Needs of the ACNW, with attachment

22. Draft #2 Press Release, January 19, 1989, re NRC Invites Public to Submit Nominations for Advisory Committee on Nuclear Waste

23. Letter for Zech from Vaughan, GE Nuclear Energy, February 8, 1989, re Comments on the Proposed Deletion of Section 20.205 from the Proposed Revision of 10 CFR Part 20, "Standards for Protection Against Radiation" (SECY-88-315), with attachments

# APPENDIX IV - ACNW LETTER REPORTS/MEMORANDA

The letter/memorandum listed below were issued as result of the 7th ACNW meeting and is attached.

The Committee completed a report on the Final Rulemaking on 10 CFR Pary 61 Relative to Disposal of "Greater-Than-Class-C" Low-Level Radioactive Wastes

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

February 24, 1989

The Honorable Lando W. Zech, Jr.
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Chairman Zech:

SUBJECT: FINAL RULEMAKING ON 10 CFR PART 61 RELATIVE TO DISPOSAL OF GREATER-THAN-CLASS-C LOW-LEVEL RADIOACTIVE WASTES

During its seventh meeting, February 21-23, 1989, the Advisory Committee on Nuclear Waste (ACNW) met with members of the Office of Nuclear Regulatory Research to discuss the proposed amendment to 10 CFR Part 61 relative to final rulemaking for disposal of greater-than-Class-C low-level radioactive wastes. A representative from the U.S. Department of Energy (DOE) participated in this meeting.

The NRC staff discussed the proposed rule (referenced), public comments on the rule, and the draft final rule. On the basis of these discussions, we recommend that the NRC staff:

(1) Explicitly state that DOE can exercise a range of options in selecting methods for disposing of such wastes in NRC-licensed facilities; and

(2) Specify the performance requirements for the waste package in order to assist DOE in selecting an appropriate option.

Subject to these qualifications, we agree with the rule as proposed.

Sincerely,

Dade W. Moeller

Dade W. Moeller
Chairman

Reference:
Nuclear Regulatory Commission, Proposed Rule, 10 CFR Part 61, "Disposal of Radioactive Wastes," published in the Federal Register, Vol. 53, No. 96, Wednesday, May 18, 1988

*Agencies and Persons Consulted*

The NRC staff has reviewed the licensee's request that supports the proposed amendment. The NRC staff did not consult other agencies or persons.

Finding of No Significant Impact

The Commission has determined not to prepare an environmental impact statement for the proposed amendment.

Based upon the foregoing environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment.

For further details with respect to this action, see the application for amendment dated November 11, 1988, which is available for public inspection at the Commission's Public Document Room, 2120 L Street NW., Washington, DC 20555, and at the General Library, University of California, P.O. Box 19557, Irvine, California 92713.

Dated at Rockville, Maryland, this 31st day of January, 1989.

For the Nuclear Regulatory Commission.

George W. Knighton,

*Director, Project Directorate V Division of Reactor Projects—III, IV, V and Special Projects Office of Nuclear Reactor Regulation.*

[FR Doc. 89-3084 Filed 2-8-89; 8:45 am]

BILLING CODE 7590-01-M

## Advisory Committee on Nuclear Waste; Meeting

The Advisory Committee on Nuclear Waste (ACNW) will hold a meeting on February 21-23, 1989, Room P-110, 7920 Norfolk Avenue, Bethesda, MD. Portions of this meeting may be closed to discuss information the release of which would represent a clearly unwarranted invasion of personal privacy 5 U.S.C. 552b(c)(6). Notice of this meeting was published in the Federal Register on January 26, 1989 (54 FR 3877).

*Tuesday, February 21, 1989—1:00 p.m.–5:00 p.m. (Open)*

Comments by ACNW Chairman regarding items of current interest.

NRC Staff (DHLWM) Presentation on Current Status of the Review of the Site Characterization Plan (SCP) and related topics.

*Wednesday, February 22, 1989—8:30 a.m.–5:00 p.m. (Open)*

Presentation by the Department of Energy (DOE) on the Site Characterization Plan (SCP) and related topics.

Executive Session—Preparation of ACNW Reports.

*Thursday, February 23, 1989—8:30 a.m.–4:30 p.m. (Open)*

State of Nevada (Nevada Nuclear Waste Projects Office) Technical Comments on Consultation Draft Site Characterization Plan (CDSCP).

NRC Staff (RES) Presentation on Proposed Rule on Disposal of Greater than Class C Radioactive Waste.

Administrative Session—Future Agenda, By-Laws and New Members, etc.

Executive Session—Complete Preparation of ACNW Reports.

Procedures for the conduct of and participation in ACNW meetings were published in the Federal Register on June 6, 1988 (53 FR 20699). In accordance with these procedures, oral or written statements may be presented by members of the public, recordings will be permitted only during those portions of the meeting when a transcript is being kept, and questions may be asked only by members of the Committee, its consultants, and Staff. The Office of the ACRS is providing Staff support for the ACNW. Persons desiring to make oral statements should notify the Executive Director of the Office of the ACRS as far in advance as practicable so that appropriate arrangements can be made to allow the necessary time during the meeting for such statements. Use of still, motion picture and television cameras during this meeting may 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 a prepaid telephone call to the Executive Director of the Office of the ACRS, Mr. Raymond F. Fraley (telephone 301/492-4516), 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 check with the ACRS Executive Director if such rescheduling would result in major inconvenience.

Date: February 2, 1989.

John C. Hoyle,

*Advisory Committee Management Officer.*

[FR Doc. 89-3085 Filed 2-8-89; 8:45 am]

BILLING CODE 7590-01-M

[Docket Nos. 50-603-CP/OL and 50-604-CP]

## All Chemical Isotope Enrichment, Inc. (AIChemIE Facility-1 CPDF) and AIChemIE Facility-2 Oliver Springs; Assignment of Atomic Safety and Licensing Appeal Board

Notice is hereby given that, in accordance with the authority conferred by 10 CFR 2.787(a), the Chairman of the Atomic Safety and Licensing Appeal Panel has assigned the following panel members to serve as the Atomic Safety and Licensing Appeal Board for this construction permit proceeding:

Thomas S. Moore, Chairman
Christine N. Kohl
Howard A. Wilber

Eleanor E. Higgins,

*Secretary to the Appeal Board.*

Dated: February 3, 1989.

[FR Doc. 89-3086 Filed 2-8-89; 8:45 am]

BILLING CODE 7590-01-M

[Docket No. 50-461]

## Illinois Power Co., et al.; Issuance of Amendment to Facility Operating License

The United States Nuclear Regulatory Commission (the Commission) has issued Amendment No. 18 to Facility Operating License No. NPF-62 issued to the Illinois Power Company [1] (IP), Soyland Power Cooperative, Inc. and Western Illinois Power Cooperative, Inc., (the licensees), for operation of the Clinton Power Station, Unit 1, located in DeWitt County, Illinois.

The amendment consists of proposed changes to the Technical Specifications (TS) related to four issues. The first proposed change would allow the Clinton Power Station (CPS) to perform its first reactor refueling, in which new types of reactor fuel will be utilized, and to proceed with subsequent reactor operation with the reloaded core.

The reload for Cycle 2 is generally a normal reload with no unusual core features or characteristics. Proposed TS changes related to Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) and Linear Heat Generation Rate (LHGR) limits for the new fuel, MAPLHGR and Minimum Critical Power Ration (MCPR) limits for all of the fuel using Cycle 2 core and transient parameters.

The second proposed change would permit CPS operation in the maximum extended operating domain (MEOD) with (a) up to 50°F reduction in feedwater temperature and (b) elimination of APRM setdown.

The MEOD includes expansion of the normal power/flow map into new regions. One region, which involves operation at rated power at lower than rated core flow rates, is called the

[1] Illinois Power Company is authorized to act as agent for Soyland Power Cooperative, Inc. and Western Illinois Power Cooperative, Inc. and has exclusive responsibility and control over the physical construction, operation and maintainance of the facility.

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

REVISION I - 2/16/89

# SCHEDULE AND OUTLINE FOR DISCUSSION
# 7TH ACNW MEETING
# FEBRUARY 21-23, 1989
# BETHESDA, MARYLAND

Tuesday,

February 21, 1989, Room P-110, 7920 Norfolk Avenue, Bethesda, Md.

| | |
|---|---|
| (1) 1:00 - 1:~~10~~ 05 p.m. | Chairman's Comments<br><br>1.1) Opening Remarks<br>1.2) Items of current interest |
| (2) 1:~~10~~ 05 p.m.<br>TAB 2------ | NRC Staff (DHLWM) Presentation on Current Status of the Review of the Site Characterization Plan (SCP) (J.Parry) |
| 1:10 p.m | A. SCP Acceptance Review - King Stablein (20 Min.) |
| 1:~~30~~ 05 p.m. | B. SCP Review Plan and Schedule - R. Johnson K. Stablein (1 Hr.) |
| 2:~~30~~ 55 - 3:10 p.m. | ****** BREAK ****** |
| ~~2:40~~ 3:10 p.m. | C. NRC's CDSCP Concerns - K. Stablein (1½ Hrs.)<br><br>- Objections<br><br>- Major regulatory Comments |
| 4:~~10~~ 00 p.m | D. Design Acceptability Analysis (Status)<br><br>- J. Hononich (30 Min.) |
| 4:~~40~~ 30 p.m. | C. Overview of other HLW Review Plans (QA Review Plan, Study Plan Review Plan, Performance Assessment Review Strategy)<br><br>- R. Johnson (20 Min.) |

5:00 p.m. ADJOURN

[ Sessions transcribed

Wednesday
February 22, 1989, Room P-110, 7920 Norfolk Avenue, Bethesda, Md.

(3) 8:30 a.m. TAB 3------ Presentation by the Department of Energy (DOE) on the Site Characterization Plan (SCP) (O. Merrill)

A. Overview of the SCP (3/4 Hr.)

1. Purpose
2. Organization
3. Issue Resolution Strategy
4. Performance Allocation Process
5. Areas where regulatory guidance would be helpful
6. Plans for updates

9:15 a.m.

B. Summary of Responses to Major NRC Concerns in Point Papers on SCP/CD (4 Hrs.)

1. Discussion of Objections
   - Alternative Conceptual Models
   - ESF Design Issues
     i. depth of ES-1
     ii. ESF Investigation Interference
     iii. location of ESFs
   - Quality Assurance

10:30 ~~a.m.~~ 10:45 ****** BREAK ******

2. Other Significant Issues
   - Substantially Complete Containment
   - Consideration of Human Instrusion in CCDF

12:~~00~~ 20 NOON ****** LUNCH ******

1:~~00~~ 20 p.m.

- Ground Water Travel Time
- Performance Confirmation
- Representativeness and Integration

~~2:30 p.m.~~

C. Study Plans (Dropped) (30 Min.)

- Relationship to SCP
- Status of Development

4:50
~~3:00~~ p.m.

D. Overview of Near-Term Actions (15 Min.)

3:~~15~~ 22 - 3:~~30~~ 35 p.m. ****** BREAK ******

(4) ~~3:30~~ - ~~5:00~~ 5:00 6:00 p.m. Executive Session
Preparation of ACNW Reports

5:00 p.m. ADJOURN

Thursday
February 23, 1989, Room P-110, 7920 Norfolk Avenue, Bethesda, Md.

(4) 8:30 a.m.-12:00 NOON
TAB 4-----
State of Nevada (Nevada Nuclear Waste Projects Office) Technical Comments on Consultation Draft Site Characterization Plan (CDSCP) (J. Parry)

10:~~30~~ 40-10:50 a.m. ****** BREAK ******

A. Objections to CD SCP

B. Additional Comments based on the SCP

~~12:00 NOON~~ 1:20-2:20 p.m. ****** LUNCH ******

(5) ~~1:00~~ 2:20 - ~~2:30~~ 3:10 p.m.
TAB 5-----
NRC Staff (RES) Presentation on Proposed Rule on Disposal of Greater than Class C Radioactive Waste (J. Parry)

~~2:30 - 2:45 p.m.~~ ****** No BREAK ******

(6) ~~2:45~~ 3:10 - 3:~~15~~ 45 p.m.
TAB 6-----
Administrative Session

- Future Agenda
- By-Laws
- ACNW Composition and Personnel
- Press Release Regarding New Members
- Comments from GE Nuclear Energy RE ACNW Position or Elimination of Section 20.205 from the Proposed Revision to 10 CFR Part 20

~~3:15-4:30~~ p.m. Executive Session
Complete Preparation of ACNW Reports

~~4:30~~ 3:45 p.m. ADJOURN