TABLE OF CONTENTS
12TH ACNW MEETING
JUNE 28-30, 1989

12TH ACNW - TABLE OF CONTENTS (CONT'D)

(e) Confidentiality

The Board will protect the identify of persons submitting comments and the confidentiality of such comments to the extent permitted by law.

Dated: June 7, 1989.

Robert E. Taylor,

Clerk of the Board.

[FR Doc. 89-14044 Filed 6-12-89; 8:45 am]

BILLING CODE 7400-01-M

NATIONAL CREDIT UNION ADMINISTRATION

Public Information Collection Requirement Submitted to OMB for Review

June 6, 1989.

The National Credit Union Administration has submitted the following public information collection requirements to OMB for review and clearance under the Paperwork Reduction Act of 1980, Pub. L. 96-511. Copies of the submissions may be obtained by calling the NCUA Clearance Officer listed. Comments regarding information collections should be addressed to the OMB reviewer listed and to the NCUA Clearance Officer, NCUA, Administrative Office, Room 7344, 1776 G Street, Washington, DC 20456.

OMB Number: New Collection

Form Number: NCUA 4221, 4401, 4505, 4506 and 9689

Type of Review: Approval

Title: 12 U.S.C. 1771—Conversion from Federal to State Credit Union and from State to Federal Credit Union; 12 U.S.C. 1781—Insurance of Member Accounts—Eligibility

Description: Certain information must be submitted by a credit union requesting conversion from state to federal charter or from the federal to state charter. Information is also required to determine eligibility for federal share insurance.

Respondents: Credit Union Officials.

Estimated Number of Respondents: 50

Estimated Burden Hours per Response: 4 hours.

Frequency of Response: Once per respondent.

Estimated Total Reporting Burden: 200 hours.

OMB Number: 3133-0015

Form Number: NCUA 4000, 4001, 4008, 4012 and 9580

Type of Review: Renewal

Title: Application for Federal Credit Union Charter

Description: The forms contained in this information collection constitute the application for and investigation of a new federal credit union charter. The character and fitness of charter subscribers and the economic advisability of the proposed charter must be determined.

Respondents: Federal credit union organizers.

Estimated Number of Respondents: 46

Estimated Burden Hours per Response: 75 hours.

Frequency of Response: One time.

Estimated Total Reporting Burden: 300 hours.

Clearance Officer: Wilmer A. Theard, (202) 682-9700, National Credit Union Administration, Room 7344, 1776 G Street, Washington, DC 20456.

OMB Reviewer: Gary Waxman (202) 395-7340, Office of Management and Budget, Room 3208, New Executive Office Building, Washington, DC 20503

Becky Baker,

Secretary of the NCUA Board.

[FR Doc. 89-13967 Filed 6-12-89; 8:45 am]

BILLING CODE 7535-01-M

NUCLEAR REGULATORY COMMISSION

Advisory Committee on Nuclear Waste; Meeting

The Advisory Committee on Nuclear Waste (ACNW) will hold its 12th meeting on June 28-30, 1989, 8:30 a.m.-5:00 p.m. each day, Room P-110, 7920 Norfolk Avenue, Bethesda, MD. The purpose of this meeting includes: completion of the ACNW review of the Site Characterization Analysis, a discussion of reporting mishaps in the management of low-level wastes, a status report on cementitious waste forms, a discussion of the approach to performance assessment for the high-level waste repository and status of activities, a discussion of research related to nuclear waste, and an administrative session to discuss anticipated and proposed Committee activities, future meeting agenda, and organizational matters.

Procedures for the conduct of and participation in ACNW meetings were published in the Federal Register on June 8, 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.

Dated: June 7, 1989.

John C. Hoyle,

Advisory Committee Management Officer.

[FR Doc. 89-13967 Filed 6-12-89; 8:45 am]

BILLING CODE 7590-01-M

Governors' Designees Receiving Advance Notification of Transportation of Nuclear Waste

On January 6, 1982, the Nuclear Regulatory Commission (NRC) published in the Federal Register, as final, certain amendments to 10 CFR Parts 71 and 73 (effective July 6, 1982), which require advance notification to Governors or their designees concerning transportation of certain shipments of nuclear waste and spent fuel. The advance notification covered in Part 73 is for spent nuclear reactor fuel shipments and the notification for Part 71 is for large quantity shipments of radioactive waste (and of spent nuclear reactor fuel not covered under the final amendment to 10 CFR Part 73).

The following list updates the names, addresses and telephone numbers of those individuals in each State who are responsible for receiving information on nuclear waste shipments. The list will be published annually in the Federal Register on or about June 30, to reflect any changes in information.

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

REVISION 1 - June 20,1989

TENTATIVE SCHEDULE AND OUTLINE FOR DISCUSSION 12TH ACNW MEETING JUNE 28-30, 1989 BETHESDA, MARYLAND

Wednesday June 28, 1989, Room P-110, 7920 Norfolk Avenue, Bethesda, Maryland

8:30 a.m.		1. Chairman's Comments 1.1) Opening Remarks 1.2) Items of Current Interest
8:40 a.m.	TAB 1-----	2. Review of the Site Characterization Analysis Discussions with the NRC Staff as appropriate to complete the Committee's review of the SCA 2.1 Geophysics, Seismology, Volcanism, Tectonics, Natural Resources (W. Hinze) 2.2 Materials Engineering (P.Shewmon) 2.3 Geotechnical Engineering (E. Voiland)
10:~~00~~ 35 - 10:~~15~~ 55 a.m.		*** BREAK ****
		2.4 Hydrology, Geochemistry (J. Moody) 2.5 Performance Assessment (P. Pomeroy) 2.6 Quality Assurance (E. Voiland)
12:~~00~~ 20 - 1:~~00~~ 20 p.m.		**** LUNCH ****
1:~~00~~ 20 - ~~2:30~~ 4:00 p.m.		3. Comments/Clarifications by the Department of Energy
~~2:30~~ 4:20 p.m.		4. Preparation of ACNW Report to the NRC on the Site Characterization Analysis and Site Characterization Program
~~6:00~~ 5:30 p.m.		RECESS

Thursday June 29, 1989, Room P-110, 7920 Norfolk Avenue, Bethesda, Maryland

8:30 a.m.	TAB 2A----	5. Reporting of mishaps in the management of low-level waste (particularly in reporting problems with solidification)

o Discussion with J. Greeves, DLLWMD, on methods and procedures for reporting incidents

9:~~30~~ 50 a.m. 6. Status Report on Cementitious Waste Forms

TAB 2B---- o Summary of the recent workshop on cement solidification

10:15 - 10:30 a.m. **** BREAK ****

12:~~00~~ 15 NOON **** LUNCH ****

1:~~00~~ 30 p.m. 7. Approach to Performance Assessment for the High Level Waste Repository and Status of Activities

TAB 3-----

~~3:00~~ 4:30 - 3:15 p.m. **** BREAK ****

4:00 p.m. 8. Preparation of ACNW Reports

6:00 p.m. RECESS

Friday
June 30, 1989, Room P-110, 7920 Norfolk Avenue, Bethesda, Maryland

8:30 a.m. 9. Discussion of Research Related to Nuclear Waste Management

TAB 4-----

9.1) Structural Organization and Responsibilities of Waste Management Research Activities

9.2) High-Level Waste Management Research Program and Strategy Plan

10:~~00~~ 40 - ~~10:15~~ 11:00 a.m. **** BREAK ****

9.3) LLW Research Program Plans

9.4) Center for Nuclear Waste Regulatory Analyses } Deferred to next meeting.

12:~~00~~ 05 - 1:00 p.m. **** LUNCH ****

1:00 - 2:00 p.m. 10. Administrative Session

TAB 5----- o The Committee will discuss anticipated and proposed Committee activities, future

meeting agenda, and organizational matters as appropriate.

2:00 p.m. 11. Completion of ACNW Reports

4:30 p.m. ADJOURN

Issued: 8/22/89

MINUTES OF THE THE 12TH MEETING OF THE ADVISORY COMMITTEE ON NUCLEAR WASTE
JUNE 28-30, 1989
BETHESDA, MD

The 12th meeting of the Advisory Committee on Nuclear Waste was convened by Chairman Dade W. Moeller at 8:30 a.m., Wednesday, June 28, 1989, at 7920 Norfolk Avenue, Bethesda, Maryland.

[Note: For a list of attendees, see Appendix I. ACNW members, Drs. William J. Hinze, Dade W. Moeller, Clifford V. Smith, Jr., and Martin J. Steindler were present. ACNW consultants, Drs. Judith B. Moody, David Okrent, Donald A. Orth, Paul W. Pomeroy, Paul G. Shewmon, 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)

[Mr. Raymond F. Fraley was the Designated Federal Officer for this portion of the meeting.]

Dr. Moeller made the following announcements:

- President Bush has selected Commissioner Kenneth Carr to succeed Lando Zech as the next Chairman of the Nuclear Regulatory Commission.
- Victor Stello, Jr., Executive Director for Operations, has been nominated by President Bush to be Assistant Secretary for Defense Programs within the Department of Energy.
- Guy Arlotto has been appointed Deputy Director for the Office of Nuclear Materials Safety and Safeguards (NMSS).
- There will be a farewell reception for Chairman Zech at the Bethesda Naval Officer's Club on June 29, 1989.

II. REVIEW OF THE SITE CHARACTERIZATION ANALYSIS (SCA) (Open)

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

NOTE: The format of this portion of the meeting was similar to that of the 11th ACNW meeting. Selected consultants or members reviewed specific areas of technical interest and presented their thoughts to the Committee. They also questioned individual NRC staff members for clarification of the NRC staff's position or views.

A. Geophysics, Seismology, Volcanism, Tectonics, and Natural Resources

Dr. William J. Hinze opened his remarks by referring to the existence of concern about possible "fatal flaws." He then raised a question about the number of boreholes and their relative effect on the site's total hydraulic transmissivity. The NRC staff indicated that they were unsure as to when the vertical transmissivity would be measured. The NRC staff agreed that a high bulk permeability would tend to reduce the concern about the number of boreholes. Dr. Hinze then inquired as to whether well-logging would be undertaken as the boreholes were sunk. The staff indicated that a comment on that point had been included in the SCA.

Dr. Hinze questioned as to how the data developed during the site characterization program was to be managed. Mr. John Linehan, NMSS, indicated that that matter was beyond the scope of the Site Characterization Plan (SCP).

Dr. Sidney J. S. Parry, ACNW staff, raised a question about slant drilling. Dr. Hinze indicated that such a technique was a viable approach, but that from the SCP it was not possible to determine whether the procedure was to be used. He indicated that this was indicative of the underlying uncertainty that one was left with when reading the SCP. Mr. Linehan indicated that that type of question was a part of the study plan review procedure. Dr. Hinze asked what feedback mechanism existed to ensure that such topics were adequately addressed. Mr. Linehan stated that the Department of Energy (DOE) has not made it clear how they plan to fulfill that requirement. He went on to say that the NRC staff plans to track all comments made in the SCA.

Dr. Hinze commented positively on the aptness of the comment on disqualifiers or fatal flaws made by the Edison Electric Institute. In response to a question by Dr. Hinze, Dr. Keith McConnell, NMSS, demurred at the term fatal flaw but indicated that the staff had identified areas of investigation which might have a distinct impact on the repository and its performance. He cited volcanism as an example. Mr. Linehan commented that the NRC staff was avoiding telling DOE how to run this program.

There was a general discussion on the location of the shaft with respect to faults, and it was noted that there is still an objection on the exploratory shaft facility (ESF) location. Dr. Hinze

noted that the details of the geophysical program are not in the SCP, but are to be presented in the study plans. He commented further on the failure of the geophysical studies to be carried on over a sufficiently broad geographical area. The staff commented that they had specific comments on that question. The concern about natural resources was mentioned by Dr. Moeller and there was a general discussion on the matter at the close of this portion of the session.

B. Materials Engineering

Dr. Paul Shewmon started his presentation by summarizing his impression of the SCP. In general he found the SCP to lack definitiveness as to what the actual program for materials development will be. He noted that it was not sufficient to take the position that the site characterization program was not related to materials performance itself. He believed that if one is to have assurance that the site will work then the performance of the canisters must be considered. He agreed that no obvious faults were demonstrated, but it was his position that this was not adequate. In his opinion, the SCP consists of a set of assertions about expected materials performance as opposed to a definitive plan for testing or design. He indicated general support for the staff's comments in the SCA, noting the staff's concern about demonstrating "substantially complete containment."

Mr. Richard Weller, NMSS, concurred in part with Dr. Shewmon's comments noting that the performance of the waste package need not be demonstrated until the license application is submitted in 1995. He expects DOE to publish an advanced design, including materials of construction in 1990. It was noted that a rulemaking is being considered to clarify the term "substantially complete containment."

Dr. David Okrent commented on the possibility of distortion of the original intent behind the regulations. Drs. Okrent and Shewmon discussed the viability of the general approach of canister design. It was Dr. Shewmon's general position that the performance criteria are probably attainable, but may be difficult to demonstrate in an adversarial environment, particularly if concerns about the variation in the water table become serious. Dr. Okrent again indicated his continuing concern. At the close of this segment Mr. Weller reminded the Committee that containment was specified for the waste package and the release rate limit was to be applied to the boundary of the engineered barrier system.

C. Geotechnical Engineering

Mr. Eugene Voiland discussed the three perceived functions of the exploratory shaft facility. They are: (1) to provide an

underground site to perform tests, (2) to allow the testing of the strata between the surface and the repository horizon, and (3) to be incorporated into the repository itself. It was later clarified that only the shafts and portions of the drifts would become part of the repository. The test areas themselves would not, except as ongoing test facilities. He generally supported the SCP proposals and the findings of the design acceptance analysis (DAA).

Dr. Okrent asked if there was a unique location for the testing area. Mr. Voiland indicated that five locations had been considered and that DOE had concluded that there was not much difference between them. Dr. Okrent explained that his question was related to the adequacy of any one site from which the entire repository area would be judged. He further indicated that his question applied to all media and other sites at Yucca Mountain. Mr. Voiland noted that this point was essentially the same as Dr. Hinze's concerns raised earlier. Dr. Orth raised a question as to the feasibility of sealing boreholes, etc.

Mr. Voiland expanded on the role of the shafts as part of the final repository. He discussed the degree of interaction between the test area and the repository itself. His general conclusion was that since the test area only partially affects the repository, not all aspects of 10 CFR 60 need be applied. Consequently he questioned the staff's fairly rigorous application of all design criteria to the ESF.

Mr. Joseph Bunting, NMSS, took an alternative view, indicating that the staff did not feel at liberty to selectively apply all requirements of 10 CFR 60, but that it must be applied uniformly. Dr. Dinesh Gupta, NMSS, supported that position at length. There was a general discussion on this point with Dr. Shewmon noting the practice in reactor licensing of specifying items "important to safety." It was noted that 10 CFR 60 does not specify items "important to safety" explicitly.

Dr. Okrent asked if the staff felt that it would be difficult to prepare a complementary cumulative distribution function (CCDF) for this site. Dr. Seth Coplan said that it would be difficult to prepare a CCDF for any site, not just Yucca Mountain.

Dr. Okrent reminded the staff the Advisory Committee on Reactor Safeguards first raised this point to them, and that the staff had said that it could be performed. There was further comment on this topic and Dr. Paul Pomeroy noted that he intended to raise it again. That closed this portion of the session.

D. Hydrology and Geochemistry

Dr. Judith Moody raised four general areas for discussion. They were: (1) the thermal effect or the impact of the release of heat from waste canisters on the host rock properties, (2) the number of boreholes to be drilled, (3) the range of geological studies that needs to be expanded out to distances approaching 200 miles, and (4) the need for hydrologic data to be collected both locally and regionally. The staff responded that each of these points were addressed to varying degrees in the comments portion of the SCA.

Dr. Pomeroy asked the staff if they had in their possession information from the test site boreholes, and the surrounding area. His point was did the staff have an understanding of the local and regional variability in the geologic structures? The NRC staff responded that data were not fully available, but that the available data were placed in DOE's public document room and were attainable.

Dr. Pomeroy noted the loss of drilling fluid from earlier holes and asked the staff if they had considered that event or if it was addressed in the SCP. The staff indicated that they were aware of the incident and had a dual concern. First, they had considered the possibility that the fluid might have affected the hydrologic regime, and secondly, they were examining the implications of the possible rapid movement of the fluid. Dr. Pomeroy also inquired about horizontal flow. The staff appeared to have discounted the possibility of horizontal flow as a major factor.

Dr. Moody asked about the expected borehole drilling procedure. The staff indicated that DOE is still planning to dry drill and is testing that procedure in Utah.

The heterogeneous nature of the host rock was raised in connection with the determination of the geochemical characteristics of the site. There was an extended discussion between Drs. Moody and Shewmon on this point and the necessity for accurate determination of K_ds (distribution coefficients).

E. Performance Assessment

In his opening remarks Dr. Pomeroy echoed Dr. Hinze's concern that detailed points not covered in the SCP might not be addressed in the to-be prepared study plans. He also readdressed the previously voiced concern that the data handling or utilization program is critical and has not been adequately incorporated into the SCP. Additionally, he supported the position that the focus of the studies should stress the detection of disqualifying characteristics in the early stages of the program.

He asked why the staff believed that DOE might not be able to qualify the site. Mr. Norman Eisenberg, NMSS, indicated that since DOE apparently does not plan to perform a full system performance assessment until 1993 the NRC staff had concern that DOE would not be able to detect deficiencies in the data promptly enough to permit them to adjust the characterization program to meet the 1995 license application submission date. The staff voiced additional concerns with regard to scenario analyses, human intrusion and alternative conceptual models.

Upon questioning by Dr. Pomeroy, Mr. Eisenberg repeated the staff's position that DOE may be unable to construct a complete CCDF to demonstrate compliance with the EPA standard. This is based upon the NRC staff's perception of the practicality of certain mathematical procedures that DOE proposes to use. Dr. Pomeroy agreed with Mr. Eisenberg and supported a reevaluation of the scenario analyses.

Dr. Okrent asked if the staff believed that it was possible to reduce the need for expert judgment to a minimal value by the implementation of a practical test program. Mr. Eisenberg said that he felt that it would be possible to do that, but did not indicate that DOE's program will meet that goal. Dr. Okrent asked if it is possible to develop a set of scenarios that will be complete enough to avoid serious challenges. He further asked if expert judgement was not a major portion of scenario development. Mr. Eisenberg agreed that it is impossible to assure that all scenarios are included, and that challenges may arise. Dr. Pomeroy agreed with Mr. Eisenberg but did not feel that the SCP was adequate in this area. With respect to the need for expert judgment, Mr. Eisenberg acknowledged that such judgment will be required.

In closing, Dr. Pomeroy said that he noted that the concern with performance assessment was not raised as a serious flaw in the SCP and that he felt that it should be. He also stated that performance assessment was going to increase in importance and that it is unlikely that the EPA standard is going to be changed, thus reinforcing the need for improved analyses.

F. Quality Assurance (QA)

Mr. Voiland indicated that he generally supported the staff's comments on quality assurance (QA). There was an extended discussion about DOE's failure to fill several QA management positions and/or responsibilities. It was the staff's conclusion that the absence of individual managers need not restrict the implementation of appropriate QA activities.

Mr. James Kennedy, NMSS, discussed the handling of data that had been mentioned several times during this session. He noted that a major data management system is being or has been developed. He acknowledged that it has been under preparation for some time and was not yet completed, published, or approved.

III. COMMENTS/CLARIFICATIONS BY THE DEPARTMENT OF ENERGY (DOE) (Open)

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

Mr. Ralph Stein, DOE, stated that separate presentations will be made on ESF design issues, ESF siting, and performance assessment by Messrs. Voegele, Kimball, and Alexander, respectively. He indicated that he would briefly address background and programmatic considerations, quality assurance, the ESF, and performance assessment. He described the activities of DOE leading up to the submission of the SCP, and the NRC/DOE interaction since then.

Dr. Moeller asked if the DOE program was attempting to uncover fatal flaws, or site disqualifying features, promptly. Mr. Stein answered to the effect that while the program was geared to detect serious concerns, it was not necessarily designed to focus on disqualifying the site. If fatal flaws are present, he felt they would "pop up."

Dr. Okrent asked if DOE had done enough assessment work that it could conclude that it will be able to demonstrate compliance with the various applicable standards. Mr. Stein stated that they had not yet reached that point but that they believed that the current program would enable them to do so. He referred to two documents, the Environmental Assessment (EA) and the multi-attribute utility analysis. Dr. Okrent stated that neither document provided him with confidence that the standards can be met. He continued and again repeated his dissatisfaction with the standards and suggested working with EPA to see if the standards can be met. Mr. Stein responded that the SCP was a test program description, not an analysis document.

Mr. Stein addressed quality assurance (QA). He stressed DOE's commitment to QA and stated that substantial progress had been made and that DOE would work closely with the NRC staff.

In discussing performance assessment (PA), Mr. Stein noted the development of the performance assessment plan and that PA will be used to evaluate the data obtained during site characterization. Dr. Moeller asked if documents describing the use of PA were available. Mr. Stein suggested that Mr. Alexander could provide that information. Dr. Pomeroy asked if it was a full or partial PA that Mr. Stein was referring to. Mr. Stein said that it was both and that it would be an iterative process.

In summary, Mr. Stein stated that DOE believes that they would be able to demonstrate the suitability of the site and that further evaluations and

analyses were justified at this time. In response to a question from Dr. Pomeroy, Mr. Stein included the development of a scoping PRA in that statement.

Dr. Okrent asked what were the current projections for the project cost. Mr. Stein indicated that a cost of up to $1.5 billion is projected through 1995, or submission of a license application.

Dr. Hinze commented on the use of the term "pop up." He suggested that potential "fatal flaws" or disqualifying conditions had been detected and that the DOE program should be focused on them.

Mr. Voegele of SAIC, a DOE contractor, discussed ESF design, design analysis, and test interference. He noted the staff's comments on the ESF design and indicated the programs commitment to compliance with 10 CFR 60, particularly subpart G, which refers to QA requirements. He discussed the Title I and II designs of the ESF and the actions being taken to meet Part 60 requirements during the technical assessment review. The design acceptability analysis (DAA) is a part of that review. He rebutted the prior statement by the NRC staff that the DAA is flawed because of a lack of independence of the reviewers. There was an extended discussion on this point and it is to be a topic of further discussion with the NRC staff.

Mr. Voegele discussed the Title II design of the ESF. Dr. Moody asked if Title II design had, in fact, been initiated. Mr. Voegele acknowledged that certain aspects of the design had been started. There was a discussion about the QA programs being applied to the Title II work.

The presentation on test interferences followed. Mr. Voegele commented that the plans that had been proposed were based on prior experience in the G tunnel facilities. He noted that the space allocated to testing did not impinge on the proposed repository facilities and that an additional area, equivalent to that already assigned as a test area, had also been reserved for testing.

He addressed the question of test sequencing, noting that the NRC staff was concerned that some tests would be run sequencially in the same test area. It was his position that if test delays occur that the additional reserved area would be available for subsequent testing.

A discussion on the ESF siting concerns was then led by Mr. Jeff Kimball, DOE. He began by noting that the NRC staff had voiced some concerns about faults at the site and the location of the shafts. Dr. Moeller asked if the data used to position the shafts were up-to-date and accurate. Mr. Kimball said he planned to cover that point in his presentation. He then described the decision process by which the locations of the shafts were chosen. Dr. Steindler questioned the siting changes that were made in response to the NRC staff's objections related to potential flooding. Mr. Kimball stated that insufficient weight had been placed on those criteria in making the original decision. He then continued with the discussion of the location decision process. There was detailed discussion about the nature of observable faults

at the surface of the site between Messrs. Kimball, Moeller, Hinze and Dr. Moody. Mr. Kimball stated that all analyses of potential locations included consideration of the entire site and was not limited to preselected sites. He acknowledged that the decision process had not been documented in detail and consequently could not be explained in a step-by-step manner.

Dr. Hinze questioned Mr. Kimball as to how surface-based testing was accomplished. Mr. Kimball described the various testing procedures. He then described the procedure now in progress to assess both geologic and geophysical data to make a final judgment as to the shaft's locations. In closing, Mr. Kimball described the expected procedure to be followed during the initial stages of the shaft's development, including the sinking of multipurpose boreholes.

Mr. Alexander followed with a presentation on aspects of the DOE's PA program. Specifically, he addressed the apparent incomplete presentation on PA in the SCP, the perception that only one total system PA would be conducted before 1993, and the treatment of human intrusion in the CCDF.

With respect to the PA presentation in the SCP, he stated that the SCP was not intended to detail plans other than those related to data acquisition. Consequently, although the SCP contains some 500 pages of PA strategy summaries, they are not all inclusive. Additional plans, including the PA management plan, a strategy plan and an implementation plan, which will provide the detailed integration of PA and site characterization, will be presented in supplementary reports.

Dr. Okrent asked if PAs had been performed. Mr. Alexander said no, but said the schedule for such PAs was to be presented later. He then described the various plans, their functions and the approximate schedule. He indicated that partial PAs were now in progress. Dr. Okrent asked if this were so, where were the directions and procedures needed for such activities? Mr. Alexander responded that the PAs would be data limited, but he did not directly respond to Dr. Okrent's specific question.

Dr. Pomeroy questioned the proposed comprehensive assessment of Title II design in FY 1989. Mr. Alexander acknowledged that work was not yet under way but probably will be in FY 1990. He then went on to discuss additional assessments or analyses that are presently planned or under way. He indicated that CCDFs can be developed, in response to questions by Dr. Okrent.

The general discussion that followed between Mr. Alexander and the members and consultants covered the details related to the development of a PA, including the inclusion of human intrusion in the CCDF. Mr. Alexander stated that DOE had identified the information required to evaluate human scenarios, but they did not know yet how to assign probabilities to such scenarios. He acknowledged, in response to Dr. Steindler's questions, that the data requirements were not summarized in a document.

In closing Mr. Alexander presented various representations of CCDFs. Dr. Okrent questioned the underlying logic to these pictorials. Dr. Shewmon asked over what time frame the analyses are to be developed. Mr. Alexander said that a basic assumption was that site markers would prevent intrusion for perhaps 1,000 years.

Mr. Alexander again indicated that he believes that DOE is in a position to successfully perform a PA by following the program set out in the SCP. Mr. Stein thanked the Committee for allowing DOE to make their presentations and supported Mr. Alexander's statements.

Dr. Moeller announced that the Committee would go into executive session to prepare a letter of comment to the Commission. The meeting was recessed by the Chairman at 5:30 p.m.

The meeting was reconvened by Chairman Dade W. Moeller at 8:30 a.m., Thursday, June 29, 1989, at 7920 Norfolk Avenue, Bethesda, Maryland.

IV. REPORTING OF MISHAPS IN THE MANAGEMENT OF LOW-LEVEL WASTE (LLW) (Open)

[Dr. Sidney J. S. Parry was the Designated Federal Officer for this portion of the meeting.]

The presentation was introduced by Dr. John Greeves, Acting Director of the Division of Low-Level Waste Management and Decommissioning (LLWM), NMSS. The two broad topics were the reporting of LLW management or processing mishaps and cement-based waste forms. The detailed presentation on the reporting of mishaps was made by Messrs. Person and Lohaus.

Mr. Leroy Person, NMSS/LLWM, reviewed the suggestion from the ACNW meeting of October 27, 1988, that consideration be given to requiring the reporting of mishaps that might occur during the processing and/or handling of LLW. The NRC staff determined that there were three classes of information that were needed. They were: failure of high integrity containers (HICs), misuse of HICs, and the production of unstable or off-specification solidified waste forms. The staff noted that there were essentially four reasons that such items were not commonly reported. Among them were: the requirements that a reportable event involve a financial loss of $200,000, and exposure of 25 rem, or the loss of plant operation for a day. Mr. Person noted that LLW mishaps do not normally, if ever, exceed any of these limits.

Dr. Steindler questioned if there were no technical specifications on LLW processing at nuclear power plants. Mr. Person said that the process control plans (PCP) were incorporated in the technical specifications, but that there was consideration being given to removing the PCPs from the technical specifications. Dr. Michael Tokar, NMSS/LLTB, explained that NRR is moving toward having only primary system items or accidents in the technical specifications. Dr. Steindler expressed his concern that LLW events are not being picked up, although he acknowledged that the risks are only moderate or small.

Mr. Person noted that acquisition of field performance information on materials approved in topical reports or PCPs, or now under study or previously grandfathered, would assist the staff considerably. Additionally, it would provide supporting evidence as to the nature of the source term to be used in the performance analysis of burial sites. It was stated that there are no absolute requirements that topical reports on waste forms or HICs must be submitted. That is, it is possible for a waste generator or vendor to perform the tests specified in Part 61 and have the data examined by an NRC inspector without submission to the technical staff. The staff believes that this is an impractical option, because of the limited time available to inspectors.

The alternative mechanisms for obtaining performance information were reviewed. They included: (1) a rulemaking requiring reporting, (2) an Information Notice requesting reporting, and (3) modification to existing and future topical reports or PCPs to require such reporting. The pros and cons of these alternatives were reviewed by the staff and their conclusion was that a separate rulemaking was most desirable, but could not be immediately implemented. Mr. Person indicated, however, that an Information Notice was likely to be released as an interim step.

The ratio of volumes and total activities of Class B and C wastes were reviewed to get an idea of the coverage of the total inventory. The volume ratios are approximately 95 to 4 to 1 for A, B and C wastes, respectively. The ratio for curies is not accurately known, but might approximate 10 to 40 to 50, respectively.

The necessity for compatibility of any new requirements with the requirements imposed by the Agreement States was stressed by Mr. Person on several occasions. Mr. Keith McDaniel, NMSS/LLTB, indicated that the states in which LLW burial sites were currently operating were providing good information and were very cooperative.

Mr. Voiland described the practical aspects of LLW disposal, as a former waste generator. He asked what fraction of the C waste constitutes a problem. Dr. Tokar indicated that that was the entire point of the discussion, that is, we do not know if there is a significant problem. Consequently, the NRC staff is considering conducting an ongoing survey.

Dr. Greeves discussed the problems of prioritization and resource allocation and explained his rationale for the decision to defer rulemaking.

Dr. Steindler asked for a review of the process for approving PCPs and topical reports. Dr. Greeves obliged with a generalized description of the processes. Dr. Steindler asked how an off-specification solidified mass of waste would be detected. Dr. Tokar indicated that that point was a key factor in his presentation, which followed immediately.

V. STATUS REPORT ON CEMENTITIOUS WASTE FORMS (Open)

[Dr. Sidney J. S. Parry was the Designated Federal Officer for this portion of the meeting.]

Dr. Steindler asked if the principal criterion of performance for LLW forms was strength. Dr. Greeves and Mr. Surmeier answered "yes" because it was their belief that structural stability of the waste forms was necessary to prevent slumping of backfilled LLW burial trenches. They stated that such slumping permits water to collect in the trenches, in contact with the waste. They also acknowledged that there was also concern about LLW form leachability.

Dr. Tokar opened the formal presentation. He summarized some of the Division's previous presentations to the Committee relative to LLW forms and/or high integrity containers (HICs). This included a description of the topical report system and the Division's activities assisting the West Valley Demonstration Project. He described the results of the recent workshop on cement solidification and stabilization and presented samples of cemented simulated wastes which showed both satisfactory and unsatisfactory solidification characteristics. Dr. Shewmon asked if the binder was principally Portland cement or whether it contained a polymerization agent. Dr. Tokar identified the binder as Portland cement.

After a break, Dr. Tokar reviewed actual field mishaps and correlated them with the observed effects from his samples. Dr. Moody inquired as to the source of the requirement for waste form stability to last 300 years. Mr. Paul Lohaus explained the rationale behind the development of 10 CFR 61. Dr. Tokar then explained that Part 61 did not direct the licensees how the criteria that had been set were to be met, only the goals themselves. He explained that most of the tests were based upon ATSM standard tests.

Dr. Shewmon asked what fraction of the waste form was actually waste and what was binder. It was noted that the regulatory limit of 60 psi represented the static load of approximately a 60-foot burial depth at Hanford for example. This is in spite of the capability of some cements to attain strength of 5000 to 6000 psi. Dr. Tokar reviewed the staff's actions during the development of Part 61 which resulted in a large number of topical reports on waste forms being submitted for staff review. He noted that no cement bonded waste form had been deemed satisfactory and that several topical reports had been withdrawn. Dr. Shewmon's original question was not directly responded to.

Dr. Smith asked if the staff was resource limited in reviewing topical reports. The general response was "no." Dr. Moody asked if any cement formulation was expected to meet the criteria. Dr. Tokar said that given the experience at West Valley, that he expected that cement compositions would be approved, eventually. Mr. Voiland asked if polymers or bitumen were being used. Dr. Tokar said "yes" they were.

Dr. Tokar discussed the grandfathered waste forms, principally cement, and the absence of NRC approval on other waste forms that are accepted by the subject Agreement State. He noted that the West Valley formulation involved high nitrate wastes, not resins, and doubted if the formulation would work with resins.

There was a general discussion of the grandfathering action taken by the staff and how it might be phased out as the currently active sites are closed down and the new sites opened up. The current and proposed release limits were also discussed.

Dr. Tokar commented on the recently held workshop on cement-based LLW forms. He then returned to Dr. Shewmon's question as to the waste concentration, but did not give a numerical answer. There was an extended discussion between Drs. Steindler and Tokar on the relative importance of the strength and leachability criteria. It was noted that an insoluble powder would provide protection to the public, but fail the Part 61 criterion on strength.

Mr. Voiland asked about archival specimens. Dr. Tokar indicated that the staff thought that the retention of such specimens was desirable. Upon questioning by Dr. Pomeroy, the staff acknowledged that no such specimens are now being retained.

Dr. Tokar discussed the workshop further and indicated that a report on it was scheduled for release in August. There was a discussion on the use of overpacks, engineered structures and preformed containers at the new sites. In closing, Dr. Greeves indicated his plan to present to the Committee the Division's future plans during the next day's presentation.

VI. PERFORMANCE ASSESSMENT FOR HIGH-LEVEL RADIOACTIVE WASTE REPOSITORY (Open)

[Mr. Richard K. Major was the Designated Federal Officer for this portion of the meeting.]

Mr. Ronald Ballard, NMSS, introduced two information briefings related to performance assessment. The first topic dealt with anticipated and unanticipated processes and events (APEs and UPEs). The staff is beginning rulemaking on this topic. It is through the APEs and UPEs selection process that scenarios are chosen for performance assessment of the high-level waste repository.

The second presentation related to performance assessment modeling. This presentation described work which has been under way at Sandia National Laboratories for several years and is in the final stages of completion. This work is modifying earlier models of groundwater flow and radionuclide transport that had been done for salt and basalt repositories. The models are being converted for use with tuff which is found at Yucca Mountain.

Mr. Ballard stressed the fact that performance assessment capability is being brought in-house, to the NRC staff. This technology is also being transferred to the Center for Nuclear Waste Regulatory Analyses.

A. Anticipated Processes and Events and Unanticipated Processes and Events (APEs and UPEs) and Their Role in Performance Assessment - John Trapp, DHLWM

Performance assessment are investigations, analyses, and evaluations needed to demonstrate compliance with the performance objectives of 10 CFR 60 and the EPA standard and includes both the preclosure and postclosure phase of the repository. When discussing APEs and UPEs, the subject deals only with the postclosure phase of the repository. APEs and UPEs are basically the starting point for categorizing what information is needed in the various major postclosure analyses.

Various performance objectives must be met assuming anticipated processes and events. These include: groundwater protection, individual protection, substantially complete containment, and release rate objectives. The 10,000 year containment requirement must be met assuming APEs and UPEs.

The philosophy behind the rulemaking was discussed. APEs and UPEs are external to the engineered barrier system, however, they will interact with the engineered barrier system and this interaction must be taken into account. Processes and events which occur in the engineered barrier system as a result of interaction of waste components or occur as a result of a more basic cause (an APE or UPE causing corrosion, for example) would not be an APE or UPE.

For naturally occurring APEs, anticipated processes are best projections of processes based on the quaternary record. Anticipated events are normally repeats of quaternary events.

For naturally occurring UPEs, unanticipated processes are extremes of projections based upon the quaternary record, and consideration of pre-quaternary record for cyclic phenomena. Unanticipated events are events which could occur via unanticipated processes at any credible location.

UPEs need not be considered in the design of the engineered barrier, but they must be considered when trying to meet the EPA standard. For example, volcanism at the site must be shown to have a sufficiently low probability. This will require a good grasp of the phenomena.

Dr. Steindler questioned how possible it is to develop a good enough grasp of the subject of volcanism at the site to make an adequate case that it is a low probability event, within budget

and time constraints? The staff deferred a direct answer, but noted it is a fundamental question, they too are concerned about. This concern is reflected in the SCA for Yucca Mountain.

Human-induced processes can be either anticipated processes and events or unanticipated processes and events. Controls are assumed to function (e.g., site markers), therefore, no anticipated processes and events are assumed to be initiated within the controlled area. Likely and ongoing human-induced processes and events, such as effects from atmospheric pollution, weapons testing, and groundwater pumpage are considered anticipated processes and events.

Mr. Trapp stated the conclusions of his presentation. No matter what standard is used to evaluate postclosure performance, it will be necessary to make projections of future happenings. It will also be necessary to estimate the likelihood of the projections and also estimate the consequences. The rulemaking on APEs and UPEs will provide the initial guidance as to what external processes and events must be included in the analyses. The rulemaking will not prescribe how to do the various analyses, or how to judge the acceptability of the site. That guidance will be provided in subsequent rulemakings and staff positions.

B. Development of a Methodology for Performance Assessment of Nuclear Waste Isolation in Alternative Geologic Media - John Randall, RES

When the NRC staff reviews a performance assessment they will check to see that: it identifies all significance processes and events which could affect the repository; it evaluates the likelihood of each process or event and the effects of each on the release of radionuclides to the environment; and, to extent practicable, it combines these estimates into an overall probability distribution displaying the likelihood that the amount of radioactive material released to the environment will exceed specified values.

In the Sandia work, groundwater and radionuclide transport is modeled from the edge of the thermally undisturbed zone to the accessible environment. The model is now being modified to apply to unsaturated, fractured tuff of the kind found at Yucca Mountain. The flow and transport modeling will accommodate both matrix and fracture flow as well as combinations of the two. A new code is being developed for isothermal, coupled fracture and/or matrix flow. (Existing codes can be used to model flow in the saturated zone.) Models must also be modified to more accurately reflect radioactive decay chains.

The scenario screening results have led to three major concerns. The first scenario, faulting in or near the repository, can create

increased permeability along existing faults or new pathways for transport.

The second scenario assumes the emplacement of an igneous body in or near the repository which could contribute to package degradation and increase radionuclide mobility. An eruption could result in the direct release of radionuclides.

The third scenario being considered is climate changes that increase the amounts of water in the area. This could lead to a rise in the water table and shorter travel paths through the unsaturated zone. Increased pressure due to rapid recharge of water would increase the transient velocity of the radionuclides.

The Committee raised concerns about adequately transferring the technology from National Laboratories, where previous work has been done, to the CNWRA. Much experience could be lost.

The meeting was recessed by the Chairman at 5:50 p.m.

VII. RESEARCH RELATED TO NUCLEAR WASTE MANAGEMENT (Open)

[Dr. Sidney J. S. Parry was the Designated Federal Officer for this portion of the meeting.]

The meeting was reconvened by Chairman Dade W. Moeller at 8:30 a.m., Friday, June 30, 1989, at 7920 Norfolk Avenue, Bethesda, Maryland.

Mr. Melvin Silberberg, RES, introduced the subjects to be discussed during the briefing. He reviewed the mission and goals of the Waste Management Research Branch, Division of Engineering, Office of Nuclear Regulatory Research.

A. NRC Organization and Responsibilities

In response to a question from Dr. Smith, Mr. Silberberg described the difference between research and technical assistance. Research activities require long-term experimental data gathering, and long-term development of methodologies and analytical procedures in support of general regulatory functions, whereas technical assistance activities require short-term analyses and methodologies developed within the office of NMSS for specific regulatory purposes.

Mr. Silberberg described the function of the Waste Management Coordinating Committee. The Committee members, Division Directors and Branch Chiefs, meet each month to discuss day-to-day problems, developing issues, schedules, and management questions. He noted that the Technical Assistants to the Commissioners are not normally involved with the Committee, except when special subjects may

require meetings on an ad hoc basis. In addition to the monthly meetings, the Branch and Section Chiefs meet each week to coordinate activities, such as rulemakings and regulatory guide development.

Mr. Silberberg stated that NRC can devote a core staff of approximately six to eight professionals from both offices to high-level waste performance assessment with assistance from contractors. Up to one hundred percent of their time can be assigned to this activity, depending on shifting some of their present program management responsibilities over the next two years. Dr. Okrent observed that, even with six to eight people full time, the staff will not be able to cover all of the discrete sciences involved. He noted that it is generally useful to have more than one person knowledgeable in discrete areas so as to get different shades of opinion.

Dr. Okrent asked whether the staff has any analyses that will help them decide what will be the more difficult issues for Yucca Mountain? Mr. Silberberg replied that the review of the SCP, just completed, has been used as a qualitative focal point for looking at the more difficult issues. Mr. Ballard, NMSS, added that a performance assessment model will be initiated by the end of the year, and as data are generated by DOE, the model will be refined.

Dr. Orth questioned the role of Sandia National Laboratories as a contractor to NRC. Mr. Silberberg stated that the Sandia National Laboratories' contract will be phased out during fiscal year 1990 as the Center for Nuclear Waste Regulatory Analyses (CNWRA) is phased in. Considerable attention is being given at CNWRA to ensure a smooth transition and to hiring the right mix of professional disciplines for the research and technical assistance programs. The right mix includes a core at the working level and the scientific leadership level. He observed that hydrogeologists are the most difficult to find and hire. CNWRA is relying on hydrogeology support from a University of Arizona team. He noted that CNWRA will have a staff of approximately 25 people, of which approximately four will be involved in performance assessment. Mr. Browning stated that the NRC staff, in conjunction with the CNWRA staff, will have the capability for understanding and managing the program. Further, he observed that NRC should not become dependent on any single contractor, not even a Federally Funded Research and Development Center.

Mr. Silberberg informed the Committee that, from time to time, NRC invites contractors in to conduct workshops of one to three days on specific methodologies, codes, or models. Most recently, a special workshop on the cement form issue was held. RES provides additional assistance by supporting NMSS reviews, such as the SEP and Branch Technical Positions. He observed that the coordination

that now exists between the two groups is by far the best in his experience.

Mr. Silberberg described the function and activities of the Waste Management Review Group (WMRG). WMRG meets at least twice a year to advise the Directors of NMSS and Research on new starts in technical assistance and research programs. WMRG also has a subgroup, the Center Review Group, that is responsible for CNWRA oversight.

Mr. Silberberg described the function and activities of another research oversight group, the Nuclear Safety Research Review Committee (NSRRC). In 1986, a National Academy of Sciences panel recommended that the Office of Research should have an independent oversight committee to advise on all matters of overall management importance. Established in 1988, NSRRC has several subcommittees looking at specific RES programs, such as waste management research. Dr. Neal Todreas, Massachusetts Institute of Technology, is Chairman of the Committee.

Mr. Silberberg mentioned other research program planning resources, such as the Five-Year Plan that is updated annually, and the periodic reports from the Advisory Committee on Nuclear Waste.

Mr. Silberberg concluded with a review of RES interaction with other government agencies, such as the Environmental Protection Agency, the Department of Energy, the U.S. Geological Survey, and the National Oceanic and Atmospheric Administration. In addition, RES interacts with foreign and international organizations through informal exchanges at technical meetings and through the development of formal bilateral agreements, for example, with the Swedish Inspectorate for Nuclear Power. He noted INTRAVAL, an international validation effort, and Alligator Rivers, an Australian national analog program, as further examples of RES involvement with foreign projects.

Mr. Voiland asked whether RES uses a formal planning strategy, such as management by objectives, event tree analyses, or other decision-making processes. Mr. Silberberg replied that RES relies more on the regulatory objectives, as stated in Parts 60 and 61, and user needs.

Dr. Steindler asked what interaction does RES have with USGS? Mr. Silberberg stated that RES does not have any research contracts with USGS. Mr. Thomas Nicholson, RES, mentioned that members of the RES staff are members of two federal committees. The committee under the direction of the Office of Water Data Coordination implements Executive Order 867. This committee has subcommittees on groundwater and hydrology. Both subcommittees meet on a bimonthly basis. Mr. Browning observed that, in regard to the

high-level waste program, USGS is one of about eight major contractors supporting DOE in its investigation of the Nevada site.

B. High-Level Waste Research Program Plan

Mr. Jacob Philip, RES, briefed the Committee on the high-level waste (HLW) research program plan. He identified several facets of the high-level waste issues at the Yucca Mountain site, such as climatic changes, fracture flow, matrix flow, near field geochemistry, and shaft and borehole seals. He stated that the HLW research plan is based on 10 CFR 60, incorporates user needs, and supports NMSS in rulemaking and technical position activities.

He noted that there are no scientific or engineering methods now that can give the NRC staff the confidence that there can be controlled release or substantially complete containment from 300 to 1,000 years. One of the most important HLW research program priorities is the reduction of performance assessment uncertainties. In addition, the staff wants to know how good are the model validations, i.e. are the validations conservative enough? Another priority is the performance of the engineered barrier system.

Dr. Shewmon expressed interest in knowing who will be carrying out the HLW research being describe. Messrs. Philip and Silberberg responded that the Office of Research will be responsible with partial support from CNWRA and other contractors. The specific projects have not been tasked out to the contractors, yet. Further, it was noted that all the physical research is being conducted by contractors.

Dr. Moody interjected that, with limited resources, choosing what specific research problems to work on, will be critical, especially in the areas of geology and tectonics. Mr. Philip agreed. He referred the Committee to NUREG-1245, a report that details the NRC research needs in the areas of geology and tectonics.

Dr. Hinze observed that the most important part of research is the ability to define the problem, and it is not clear that the HLW research program is doing just that.

Dr. Steindler called into question the expanded definition of HLW found in RES documentation that includes irradiated reactor components. Mr. Silberberg stated that the definition is addressing spent fuel, including cladding and components, not reactor components per se.

Dr. Steindler asked what RES is doing to ensure that the data will be available for NMSS in time to be useful. He recommended that

the research plan be more explicit on the scheduling and what mechanisms will be used to meet those schedules. He concluded that RES seems to be very optimistic in some of the project schedules. Dr. Hinze added that a good example of this timing and scheduling problem is in the geology area. Mr. Silberberg agreed with Dr. Hinze's observations, reassured the Committee that RES will reexamine this issue with the goal of having a major portion of the research completed by 1992. Further, Mr. Silberberg cautioned that a good fraction of the research would not necessarily be completed by 1995, particularly the confirmatory and validation efforts.

Mr. Philip described their general approach to research. RES will determine the highest uncertainties related to performance assessments, will perform laboratory studies to understand the processes and mechanisms, will perform field studies, and will look at natural analogs.

Dr. Okrent asked whether RES is going to conduct an early performance assessment of Yucca Mountain, early enough to guide what NRC should place the most emphasis on. Mr. Ballard replied that RES/NMSS does indeed have a joint effort planned. Although DOE has not started gathering the data, it is the intention of RES/NMSS to factor these data into the Sandia performance assessment methodology.

Mr. Philip concluded his briefing with a description of the hydrology research program. From performance assessments and technical investigations, RES will identify uncertainties for assessing flow and transport in unsaturated fractured tuff. RES will sponsor laboratory experiments to understand liquid and vapor flow using tracers. Work is currently being conducted at the University of Arizona on the calibration of instruments, the characterization of hydrologic properties, and the collection of data for modeling.

In response to a question from Dr. Orth related to quality assurance (QA), Mr. Nicholson noted that all contractors are required to have an internal QA program. It is reviewed annually by NRC. The program is independently audited by someone not working on the program. If there are any deficiencies with this approach, he would appreciate being told of them.

Dr. Steindler reminded the staff that QA does not seem to be mentioned in the HLW research plan. Further, Dr. Steindler wanted to know if RES will implement QA Level I for the experimental work that will be done at CNWRA. Mr. Silberberg certified that CNWRA will submit a draft QA plan for review and discussion of the QA level. Mr. Browning stated that the policy level is quite clear -- for equal work, equal QA.

C. Low-Level Research Program Plan

Ms. Janet Lambert, RES, briefed the Committee on the regulatory framework and environment of the low-level waste (LLW) research program plan. NRC must work within the regulatory framework of 10 CFR Part 61, and must consider the timing of upcoming LLW licensing actions. NRC also provides technical support to agreement states for their LLW disposal programs.

The objectives of the LLW research plan are: 1) to provide the regulatory support requested by LLWMD in a user needs letter dated June 1988, 2) to provide a long-term strategy for conducting research, 3) to establish schedules and milestones consistent with regulatory needs, and 4) to provide a planning framework for an integrated stable program.

Ms. Lambert described in detail the linkage between 10 CFR Part 61 and the LLW research program plan. The overall performance objective is that shallow land disposal must ensure that the siting, design, operation and closure be conducted in a manner that does not endanger the general population or workers at the site or the inadvertent intruder after closure. There are five major categories in the plan where it is believed that further research is necessary. They are LLW management and treatment, failure mechanisms and radionuclide releases, site characterization and monitoring, performance assessment, and decommissioning. A comparison of the areas identified by RES and those identified by the LLWMD user needs letter was discussed.

Dr. Edward O'Donnell, RES, gave a detailed description of the technical uncertainties and a number of research needs associated with LLW disposal, such as concrete waste forms, long-term climatic changes, postclosure ecologic changes, natural intrusion barriers (vegetation), and disposal site covers. He invited the Committee to visit an experimental site at Beltsville, Maryland, where cover design experiments are being conducted. Dr. O'Donnell discussed the research being conducted on the durability of concrete, uncertainty in the source term, and composition of the source term.

Utilizing viewgraphs, Dr. O'Donnell itemized the program elements (listed below) found in Chapters 3, 4, and Appendix B and gave research examples for each:

Waste Characterization
Test Methods
Decommissioning
Waste Form Performance
Radionuclide Releases
Long-Term HIC Performance

Long-Term Concrete Performance
Long-Term Cover Performance
Site Characterization
Monitoring
Pathway Model Evaluation
Source Term
Radionuclide Transport

The discussion turned to clay permeability, the Clayton till, and clay fracturing in the saturated media. Relevant research at various locations in the U.S. and Canada was discussed.

Dr. Steindler observed that the research interests of RES are very extensive. It would be well to identify the limits of what is reasonable, that is, a delineation should be made as to where the real uncertainties that are important to the licensing process really are. He also observed that remediation in case of an incidence does not seem to be in the draft plan or the user's needs letter. Mr. Nicholson replied that research has been conducted on mitigative action by Pacific Northwest Laboratory.

Mr. Silberberg noted, upon questioning, that the HLW research program budget is twice as large as the LLW research program in FY 1988. A budget cut is expected in FY 1990, but HLW research will unlikely be touched -- the same thing cannot be said for the LLW research.

Dr. O'Donnell concluded the briefing with a discussion of the staff's interfaces with other organizations, such as the Host States Technical Coordinating Committee.

The briefing on the activities of CNWRA was deferred to a future meeting because of insufficient time.

VIII. EXECUTIVE SESSION (Open)

A. Reports, Letters, and Memoranda

1. ACNW Review of NRC Comments on DOE Site Characterization Plan (Letter to Chairman Carr dated July 3, 1989).

The Committee concluded its discussions with the ACNW Consultants, NRC Staff, and representatives of DOE on the NRC draft SCA and other issues. As a result of the review, the Committee offered specific recommendations concerning the SCP and/or the SCA. The more significant comments deal with:

a. the absence in the SCP of statements addressing the systematic and early identification and evaluation of

potentially disqualifying features at the Yucca Mountain Site;

b. the apparent lack of sufficient attention to the limitations and uncertainties in the Yucca Mountain data bases, and the associated difficulties in demonstrating that the repository will comply with the Environmental Protection Agency (EPA) standard (40 CFR Part 191, "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes"); and

c. delays by DOE in implementing satisfactory quality assurance (QA) programs.

2. Reporting Incidents Involving the Management and Disposal of Low-Level Radioactive Wastes (Letter to Chairman Carr dated July 5, 1989).

The Committee recommended that the NRC staff should expand its approach to the collection of useful information on LLW management incidents by including exploration of a range of options, e.g., the possible development of cooperative reporting programs with the Nuclear Management and Resources Council and/or the Institute of Nuclear Power Operations. One item of concern to the ACNW was the apparent resource limitations within the NRC Division of Low-Level Waste Management and Decommissioning (DLLWMD) to address both this problem and revision of the associated technical position on waste form. Because of the importance of this subject, the Committee recommended that steps be taken to provide sufficient resources to address this problem in an expeditious manner.

B. Future Agenda (Open)

Dr. Moeller announced that he will visit the Agriculture Research Laboratory, Beltsville, Maryland, and will meet with the Commissioners' Technical Assistants on July 6, 1989, to discuss matters of mutual interest.

Dr. Moeller noted that he has been asked to meet with the Commission on July 11, 1989, to discuss the Committee report on the NRC comments on the DOE Site Characterization Plan. Other members expressed no concern with having Dr. Moeller represent the full Committee at this meeting.

Dr. Moeller noted the following meetings that might be of interest to the Committee and its consultants/staff:

- DOE Annual Low-Level Waste Management Conference, August 21-25, 1989, Pittsburgh PA

- LLW Forum Quarterly Meetings to be held October 5-6, 1989 in Portland, ME and January 24-26, 1990 in San Francisco, CA

- Waste Management '90, February 25-March 1, 1990, Tucson AZ

Dr. Moeller proposed that NMSS Branch Technical Positions be scheduled for ACNW consideration as they are developed. He requested that a list of BTPs be obtained so that they can be scheduled, as appropriate.

[Following this meeting, it was agreed to work toward a visit to West Valley, NY, during October 1989, and to visit CNWRA, San Antonio, TX, during November 1989.]

Appendix II is the tentative agenda that was proposed to the Committee.

The 12th ACNW meeting was adjourned on June 30, 1989, at 3:40 p.m.

APPENDICES

I. MEETING ATTENDEES

II. FUTURE AGENDA

III. OTHER DOCUMENTS RECEIVED

IV. ACNW LETTER REPORTS/MEMORANDA

APPENDIX I - ATTENDEES

12TH ACNW MEETING
JUNE 28-30, 1989

	1st Day	2nd Day	3rd Day
ACNW MEMBERS:			
Dr. William J. Hinze	✓	✓	✓
Dr. Dade W. Moeller	✓	✓	✓
Dr. Clifford V. Smith, Jr.		✓	✓
Dr. Martin J. Steindler	✓(p.m.)	✓	✓
ACNW CONSULTANTS:			
Dr. Judith B. Moody	✓	✓	✓
Dr. Donald A. Orth	✓	✓	✓
Dr. David Okrent	✓	✓	✓
Dr. Paul W. Pomeroy	✓	✓	
Dr. Paul G. Shewmon	✓	✓	✓
Mr. Eugene E. Voiland	✓	✓	✓

APPENDIX I - ATTENDEES (CONT'D)

NRC AND CONTRACTORS

J. Linehan
S. Fortuna
D. Gupta
J. Conway
M. Natarja
J. Trapp
S. Bilhorn
K. McConnell
J. Youngblood
J. Kotra
J. Peshel
R. Bevan
R. Virgilio
J. Bunting
J. Pohle
N. Eisenberg
A. Ibrahim
R. Ballard
S. Coplan
J. Surmeier
P. Lohaus
K. McDaniel
M. Tokar
L. Brown
C. Prichard
J. Austin
J. Randall
R. J. Starmer
M. Silberberg
P. Reed
M. Haisfield
E. O'Donnell
R. Wesmier - CNWRA
P. LaPlante - CNWRA
R. Adler - CNWRA

STATE OF NEVADA

L. Lehman

DOE AND CONTRACTORS

E. Regnier
S. Rossi
J. Kimball
B. Gamble - Weston
H. Bermanis - Weston
A. Kimmins - Weston
M. Voegele - SAIC/DOE-YMP
D. Alexander
P. Austin - SAIC
S. Brocoum
S. Echols
P. Berger - Energetics
M. Frei
D. Shelor
E. Benz - Weston
R. Jackson - Weston
R. Stein
M. Lugo - Weston
R. Barth
R. Lahoti
C. Bradley
D. Michlewicz - Weston
C. Quan
R. Palabrica - Weston
C. Dell - Weston

U.S. GEOLOGICAL SURVEY

R. Wallace, Jr.

U.S. ENVIRONMENTAL PROTECTION AGENCY

P. Bunton
D. Egan

APPENDIX I - 12TH ACNW MINUTES

PUBLIC

J. Zeszutek - Battelle
A. Muir - ICF
K. Unnerstall - Newman & Holtzinger
P. Krishna - Battelle
M. Conover - Bechtel
E. Holstein - Nye
L. Fairobent - NUMARC
J. Latenser - NIRS
S. R. Raygun - PG&E

APPENDIX II
FUTURE AGENDA

ACNW Meeting on July 26-27, 1989 (CANCELLED)

13th ACNW Meeting on September 13-15, 1989 (tentative agenda)

Center for Nuclear Waste Regulatory Analyses (Open) - The Committee will be briefed on the activities of CNWRA, including recent CNWRA reports on regulatory uncertainty.

Naturally Occurring and Accelerator-Produced Radioactive Materials (NARM) (Open) - The Committee will be briefed on SECY-89-167.

Prototype License Application (Open) - The Committee will be briefed on the prototype license application for low-level waste facilities.

Status of Greater-Than-Class-C Wastes (Open) - The Committee will be briefed by representatives of DOE on GTCC Wastes.

Nuclear Waste Technology Meeting (Open) - The Committee will be briefed by ACNW consultant on the Nuclear Waste Technology Meeting recently held in Las Vegas, NV.

Scoping Study PRA for Yucca Mountain (Open) - The Committee will be briefed by NRC staff, RES, and representatives from Sandia National Laboratory, on the development of a scoping study PRA for Yucca Mountain.

Data Availability (Open) - The committee will invite representatives of DOE and USGS to discuss problems related to delays in obtaining and making data available to enable closure of key issues.

Tectonic Models (Open) - The Committee will be briefed on the Branch Technical Position on tectonic models.

Environmental Monitoring (Open) - The Committee will be briefed on the Branch Technical Position on environmental monitoring.

Pathfinder Reactor (Open) - The Committee will be briefed on the review of the Pathfinder Reactor Dismantlement Plan.

Concrete Bunker Prototype (Open) - The Committee will be briefed on the review of DOE's earth-mounded concrete bunker prototype license application SAR.

Mixed Wastes (Open) - The Committee will be briefed on the EPA criteria for treatment, storage and disposal of mixed radioactive and hazardous wastes.

International Programs on Waste Disposal (Open) - The Committee will meet with Mr. Harold Denton to discuss international programs on waste disposal.

APPENDIX II - 12TH ACNW MINUTES

Meeting with Director of Office of Nuclear Reactor Regulation (NRR) (Open) - The Committee will be briefed by NRR on the licensing program for LLW handling systems, fuel compaction, decontamination and decommissioning. The Committee will discuss any crossover issues with representatives of NMSS and the EDO.

Selection of Nominating Committee - The Chairman will appoint the nominating committee for selection of the 1989 ACNW officers

Status of NRC/DOE Interactions on DOE Quality Assurance (Open)

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

14th ACNW Meeting on October 11-13, 1989 (tentative agenda)

Retrievability Demonstration (Open) - The Committee will be briefed on the Technical Position on demonstration of retrievability during site characterization:

- Licensing LLW handling systems
- Fuel compaction
- Decontamination and decommissioning
- Onsite dry cask storage

Earthquake Hazards (Open) - The Committee will be briefed on the Branch Technical Position on earthquake hazards.

Waste Package/Engineered Barrier System Testing (Open) - The Committee will be briefed on the Branch Technical Position on waste package/engineered barrier system testing.

EPA Low Level Waste Standards (Open) - The Committee will be briefed on radionuclide release standards for LLW disposal sites.

Nomination of ACNW Officers (Open/Closed) - The Nominating Committee will present its suggested slate of officers for 1989.

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

15th ACNW Meeting on December 27-29, 1989 (tentative agenda)

American Society for Testing Materials (Open) - The Committee will be briefed on the radioactive waste activities of ASTM.

APPENDIX II - 12TH ACNW MINUTES

Election of ACNW Officers (Open) - The Committee will vote to select its officers for 1989.

Committee Activities (Open) - 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. Review of the Site Characterization Analysis

1. Review of the ESF Title I Design Acceptability Analysis (DAA), undated, by E. Voiland

2. Quality Assurance Review, undated, by E. Voiland

3. Exploratory Shaft Facility Title I Design Review, undated, by E. Voiland

III. SCP Clarification by the Department of Energy

4. Viewgraphs on DOE Site Characterization Plan by Ralph Stein, June 28, 1989

5. Viewgraphs on DOE Exploratory Shaft Design Issues, by Michael Voegele, June 28, 1989

6. Viewgraphs on DOE Exploratory Shaft Facility Location Issues, by Jeffrey Kimball, June 28, 1989

7. Viewgraphs on DOE Performance Assessment, by Donald Alexander, June 28, 1989

III. Reporting Mishaps in the Management of Low-Level Waste

8. Viewgraph on LLWM Review of Selected Regulations, page 12, undated (Predecisional Information)

VI. Performance Assessment for HLW Repository

9. Viewgraphs on Anticipated Porcesses and Events and Unanticipated Processes and Events and Their Role in Performance Assessment, by John Trapp, June 29, 1989

10. Viewgraphs on HLW Performance Assessment Research at Sandia National Laboratories, by John Randall, June 29, 1989

VII. Research Related to Nuclear Waste Management

11. Viewgraphs on Waste Management Research Structural Organization and Responsibilities, by Melvin Silberberg, June 30, 1989

12. Viewgraphs on HLW Research Plan, by Jacob Philip, June 30, 1989

13. Viewgraphs on LLW Research Program Plan Regulatory Framework, by Janet Lambert, June 30, 1989

14. Viewgraphs on LLW Research Program Plan, by Edward O'Donnel, June 30, 1989

B. Meeting Notebook Contents Listed by Tab Number

TAB

1

1. Status Report on the Review of the Site Characterization Analysis
2. Memorandum for Moeller from Bernero, dated June 27, 1989, re Transmittal of Draft of SCA Section 2, with enclosure
3. Letter for Gertz, DOE, from Kearney, Edison Electric Institute, dated June 1, 1989, re Comments on Department of Energy Site Characterization Plan for Yucca Mountain Site, with enclosure

2A

4. Status Report on Reporting of LLW Processing Mishaps
5. Memorandum for ACNW Members from Parry, dated May 3, 1989, re SECY-89-116, Reporting LLW Mishaps, with enclosure 6. Memorandum for Major from Parry, dated May 12, 1989, re Meeting Report - LLW Mishap Reporting SECY-89-116 - TAs and LLW Division, May 4, 1989, with enclosure 7. Viewgraphs for Division of Low Level Waste Presentation, undated

2B

8. Status Report on Cementitious Waste Forms 9. Memorandum for Moeller from Stella, dated June 6, 1989, re Workshop on Cement Stabilization of Low Level Nuclear Wastes, with enclosures 10. Paper entitled Introduction to Cement Workshop by Michael Tokar, undated

3

11. Change in agenda item 7, Performance Assessment, June 27, 1989
12. Status Report on Approach to Performance Assessment for the High Level Waste Repository and Status of Activities, dated June 22, 1989
13. Memorandum for Thompson and Beckjord from Browning, and Arlotto, dated September 1, 1989, re Memorandum of Understanding on HLW Performance Assessment Activities by the NRC Staff, with enclosures
14. Memorandum for Ballard and Silberberg from Eisenberg, dated February 1, 1989, re Transmittal of the Detailed Program Plans for Tasks 1, 2, and 3 of the MOU on HLW Performance Assessment Activities, with enclosure

APPENDIX III, NOTEBOOK CONTENTS, 12TH ACNW MEETING

TAB

4

15. Status Report on Nuclear Waste Management Research Program
16. Memorandum for Major from Parry, dated April 12, 1989, re Commission Briefing - Status of Center for Nuclear Waste Regulatory Analysis - April 6, 1989, with enclosure
17. Note for Parry from Silberberg, dated June 26, 1989, re Pre-Decisional Draft HLW Management Research Plan, with enclosure

5

18. Memorandum for ACNW Members from Major, dated June 21, 1989, re ACNW Future Schedule, with enclosure
19. Memorandum for Fraley from Blaha, dated June 5, 1989, re Proposed Agenda Items for the ACRS and ACNW, with enclosure
20. 1990 Calender with ACRS meeting dates (tentative)

APPENDIX IV - ACNW LETTER REPORTS/MEMORANDA

The letters/memorandum listed below were issued as result of the 12th ACNW meeting and are attached.

1. ACNW Review of NRC Comments on DOE Site Characterization Plan (Letter to you dated July 3, 1989)

   The Committee concluded its discussions with the ACNW Consultants, NRC Staff, and representatives of DOE on the NRC draft SCA and other issues. Specific SCA modules discussed were:

   Geology/Geophysics
   Materials Engineering/Waste Package
   Geotechnical Engineering
   Hydrology/Geochemistry
   Performance Assessment
   Quality Assurance

2. Reporting Incidents Involving the Management and Disposal of Low-Level Radioactive Wastes (Letter to you dated July 5, 1989)

   The Committee was briefed by the NRC staff on the management of solidified wastes and high integrity containers (HICs), e.g. the misuse of HICs, production of unstable cement products, and the failure of HICs. Three approaches to rulemaking were described. The Committee prepared a report on reporting of incidents and abnormal events.