ACNW-0030
PDR 5-30-91

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27TH ACNW MEETING
JANUARY 23-25, 1991

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I. MEETING ATTENDEES

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A. DOCUMENTS RECEIVED FROM PRESENTERS AND ACNW STAFF

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the remaining issues in the petition through future rulemaking.

*Visiting fellows program.* The Commission has initiated a Visiting Fellows Program. The staff will provide a status report on the first nomination review process.

*Supervision.* The issue of adequate supervision as required in 10 CFR part 35, relative to the appropriate level of supervision for physicians in training to be listed on NRC licenses as physician authorized users, and for all individuals performing tasks delegated by authorized users will be addressed by the NRC staff. ACMUI members will be requested to provide comments.

*Expansion of the ACMUI.* The NRC is expanding the membership of the ACMUI to include members such as those representing patients' rights and care, the U.S. Public Health Service, the Food and Drug Administration, and the States in order to obtain balanced input on medical policy issues. The staff will provide a status report on the expansion process including a discussion of the future composition of the ACMUI.

*Agenda items for future ACMUI meetings.* The staff will provide ACMUI members with alternative topics for future meetings and will solicit input from members on items for future consideration.

Conduct of the Meeting

Barry Siegel, M.D., will chair the meeting. Dr. Siegel will conduct the meeting in a manner that will facilitate the orderly conduct of business.

The following procedures apply to public participation in the meeting.

1. Persons may submit written comments regarding the agenda items by sending a reproducible copy to Mr. Camper (see "ADDRESSES" heading). Comments must be received by January 3, 1991, to ensure consideration at the meeting. The transcript of the meeting will be kept open until January 31, 1991, for the inclusion of written comments.

2. Persons who want to make oral statements should inform Mr. Camper in writing by January 3, 1991. Statements must pertain to the topics at hand. The Chairman will rule on requests to make oral statements. Opportunity for members of the public to make oral statements, within the time available, will be based on the order in which requests are received. In general, oral statements should be limited to approximately 5 minutes. Oral statements may be supplemented by detailed written statements for the record. Rulings on who may speak, the order of presentation, and time allotments may be obtained by calling Mr. Camper at (301) 492-3417 between 9 a.m. and 5 p.m. EST on January 4, 1991.

3. At the meeting, questions from attendees other than the committee members, NRC consultants, and NRC staff will be permitted at the discretion of the Chairman.

4. The transcript, minutes of the meeting, and written comments will be available for inspection, and copying for a fee, at the NRC Public Document Room, 2120 L Street NW., lower level, Washington, DC 20555 on or about February 4, 1991.

5. Seating for the public will be on a first-come/first-served basis.

This meeting will be held in accordance with the Atomic Energy Act of 1954, as amended (primarily section 161a), the Federal Advisory Committee Act (5 U.S.C. App) and the Commission's regulations in title 10, Code of Federal Regulations, part 7.

Dated at Rockville, MD, this 13th day of December, 1990.

For the Nuclear Regulatory Commission.

John C. Hoyle,

*Advisory Committee Management Officer.*

[FR Doc. 90-29695 Filed 12-18-90; 8:45 am]

BILLING CODE 7590-01-M

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## Advisory Committee on Reactor Safeguards (ACRS), and Advisory Committee on Nuclear Waste (ACNW); Proposed Meetings

In order to provide advance information regarding proposed public meetings of the ACRS Subcommittee and meetings of the ACRS full Committee, of the ACNW, and the ACNW Working Groups the following preliminary schedule is published to reflect the current situation, taking into account additional meetings which have been scheduled and meetings which have been postponed or cancelled since the last list of proposed meetings published November 21, 1990 (55 FR 43711). Those meetings which are definitely scheduled have had, or will have, an individual notice published in the Federal Register approximately 15 days (or more) prior to the meeting. It is expected that sessions of ACRS full Committee and ACNW meetings designated by an asterisk (*) will be open in whole or in part to the public. ACRS full Committee and ACNW meetings begin at 8:30 a.m. and ACRS Subcommittee and ACNW Working Group meetings usually begin at 8:30 a.m. The time when items listed on the agenda will be discussed during ACRS full Committee and ACNW meetings and when ACRS Subcommittee meetings will start will be published prior to each meeting. Information as to whether a meeting has been firmly scheduled, cancelled, or rescheduled, or whether changes have been made in the agenda for the January 1991 ACRS and ACNW full Committee meetings can be obtained by a prepaid telephone call to the Office of the Executive Director of the Committees (telephone: 301/492-4600 (recording) or 301/492-7288, Attn: Barbara Jo White) between 7:30 a.m. and 4:15 p.m., Eastern Time.

ACRS Subcommittee Meetings

*Materials and Metallurgy,* January 9, 1991, Bethesda, MD. The Subcommittees will review and discuss the proposed resolution of Generic Safety Issue-29, "Bolting Degradation or Failures in Nuclear Power Plants."

*Auxiliary and Secondary Systems,* January 17, 1991, Bethesda, MD. The Subcommittee will discuss matters concerning fire protection and mitigation in nuclear power plants.

*TVA Plant Licensing and Restart,* January 24, 1991, Huntsville, AL. The Subcommittee will review the planned restart of Browns Ferry Unit 2.

*Defueling/Fuel Pool Storage,* January 29, 1991, Bethesda, MD. The Subcommittee will discuss the proposed standard review plan for reviewing safety analysis reports for dry metallic spent fuel storage casks.

*Reliability Assurance,* February 5, 1991, Bethesda, MD. The Subcommittee will discuss the reliability of safety-related solid state devices used in nuclear power plants.

*Joint Computers in Nuclear Power Plant Operations and Instrumentation and Control Systems,* February 6, 1991, Bethesda, MD. The Subcommittee will discuss the use of computers and solid-state control logic in nuclear power plant operations.

*Advanced Pressurized Water Reactors,* March 6, 1991 (tentative), Bethesda, MD. The Subcommittee will discuss the use of the NUPLEX 80+ Computerized Control System in the CE System 80+ standard plant.

*Improved Light Water Reactors,* Date to be determined (January/February), Bethesda, MD. The Subcommittee will review the EPRI ALWR Requirements Document (Roll-up) for the Evolutionary Designs.

*Joint Thermal Hydraulic Phenomena and Severe Accidents,* Date to be determined (February/March), Bethesda, MD. The Subcommittee will discuss the issue of computer codes and their documentation.

*Joint Plant Operations and Probabilistic Risk Assessment,* Date to be determined (March, tentative), Bethesda, MD. The Subcommittees will

begin review of the NRC staff's Action Plan to evaluate the risk from nuclear power plant shutdown operations.

*Joint Thermal Hydraulic Phenomena and Core Performance*, Date to be determined (March/April, tentative), Bethesda, MD. The Subcommittees will continue their review of the issues pertaining to BWR core power stability.

*Joint Regulatory Activities and Containment Systems*, Date to be determined, Bethesda, MD. The Subcommittees will review the proposed final revision to appendix J to 10 CFR part 50, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors," and an associated Regulatory Guide.

*Severe Accidents*, Date to be determined, Bethesda, MD. The Subcommittee will discuss elements of the Severe Accident Research Program (SARP).

*Joint Advanced Boiling Water Reactors and Advanced Pressurized Water Reactors*, Date to be determined, Bethesda, MD. The Subcommittee will perform a comparison between the Licensing Review Basis documents for the GE/ABWR and CE/Systems 80+ designs.

ACRS Full Committee Meetings

*369th ACRS Meeting*, January 10–12, 1991, Bethesda, MD. Items are tentatively scheduled.

**A. Reactor Operating Experience (Open/Closed)*—Briefing and discussion regarding lessons learned from nuclear power plant operating experience, including an event that occurred at Quad Cities Unit 2, on October 27, 1990, when the reactor scrammed automatically on "high-high" intermediate flux during the performance of a special test (turbine torsional resonance test). Portions of this session will be closed as necessary to discuss proprietary and safeguards information applicable to this plant.

**B. ACRS Bylaws (Open)—Discuss proposed revisions to the ACRS bylaws.*

*C. Final Rulemaking 10 CFR part 55, Fitness for Duty Requirements for Licensed Operators (Open)—Review and report on the NRC staff's proposed final version of the Rule related to fitness for duty requirements for licensed operators.

**D. Proposed Resolution of Generic Safety Issue-29, Bolting Degradation or Failures in Nuclear Power Plants (Open)*—Review and report on the NRC staff's proposed resolution of Generic Safety Issue-29, "Bolting Degradation or Failures in Nuclear Power Plants."

**E. Annual ACRS Report to the Congress on the NRC Safety Research Program (Open)*—Discuss the proposed annual ACRS report to the Congress on the NRC Safety Research Program and budget.

**F. Containment Design Criteria (Open)*—Discuss the proposed ACRS report to NRC on containment design criteria for future nuclear plants.

**G. Meeting with the Director of the Office of Nuclear Regulatory Research (Open/Closed)*—Discuss matters of mutual interest with the Director of the Office of Nuclear Regulatory Research. Portions of this session will be closed as required under exemption 9(B) to discuss potential elimination or curtailment of specific elements of the NRC research program. Premature disclosure of the possible curtailment or elimination of any research contract could result in an inability to retain key personnel and thereby frustrate the Commission's ability to continue/complete affected programs effectively.

**H. ACRS Subcommittee Activities (Open)*—Hear and discuss report of assigned ACRS subcommittee activities, as appropriate.

**I. Revised 10 CFR part 20 Rule (Secy-90-387) (Open)*—Briefing by the NRC staff on revised part 20 Rule governing protection against radiation to provide for a substantial increase in the overall protection of the public health and safety.

**J. Licensing and Radiation Safety Requirements for Large Irradiators (Open)*—Briefing by the NRC staff regarding radiation safety and licensing requirements for the use of licensed radioactive materials in large irradiators.

**K. ACRS Management/Administration (Open/Closed)*—Discuss anticipated subcommittee activities, items proposed for consideration by the full Committee, and qualifications of candidates for appointment to the Committee. Portions of this session will be closed as necessary to discuss information the release of which would represent a clearly unwarranted invasion of personal privacy.

**L. Miscellaneous (Open)*—Discuss matters that were not completed during previous meetings as time and availability of information permit.

*370th ACRS Meeting*, February 7–9, 1991—Agenda to be announced.

*371st ACRS Meeting*, March 7–9, 1991—Agenda to be announced.

ACNW Full Committee and Working Group Meetings

*27th ACNW Meeting*, January 23–24, 1991, Bethesda, MD. Items are tentatively scheduled:

*A. The Committee will continue discussions on 10 CFR part 60, high-level waste repository subsystem performance requirements and their conformance with the EPA high-level waste standards.

*B. The Committee will continue deliberations concerning the NRC and EPA regulations governing the disposal of mixed waste.

*C. The Committee will be briefed by Louisiana Energy Systems on their private uranium enrichment facility plans. Topics of interest include the disposal of the depleted uranium and the licensing process for the facility (tentative).

*D. The Committee will finalize preparations for its presentation at the Waste Management 1991 Symposium, Tucson, Arizona, on February 26, 1991.

*E. The Committee intends to evaluate 10 CFR part 61 as it relates to low-level waste disposal facilities that utilize methods other than shallow land burial. Questions to be addressed include whether part 61 can be applied, in its existing form, to engineered facilities, such as below and above ground vaults.

*F. The Committee will discuss anticipated and proposed Committee activities, future meeting agenda, administrative, and organizational matters as appropriate. The members will also discuss matters and specific issues which were not completed during previous meetings as time and availability of information permit.

*ACNW Working Group Meeting on the Role of Expert Judgment*, January 25, 1991, Bethesda, MD. The Working Group will discuss the role and the extent of expert judgment in the site characterization and licensing process with respect to the disposal of nuclear waste. Discussions will include the results of studies supported by the Department of Energy and the Nuclear Regulatory Commission relating to the performance assessment for high-level waste repositories. Participants will present information and results on the role of expert judgment in the regulatory decision process, the clear identification of the extent to which such judgment is issued, the minimization of reliance on such judgment, and strategies to deal with cascading effect (propagation of uncertainty) associated with the use of subjective judgment. In addition to the manner in which expert judgment is used, the discussion will also involve how such experts are identified and selected. Although the focus will be primarily directed to the assessment of performance for a high-level waste repository, use of experts in other areas may factor in discussions.

*28th ACNW Meeting*, February 20–22, 1991—Agenda to be announced.

*29th ACNW Meeting*, March 20–22, 1991—Agenda to be announced.

Dated: December 13, 1990.

John C. Hoyle,

*Advisory Committee Management Officer.*

[FR Doc. 90-29694 Filed 12-18-90; 8:45 am]

BILLING CODE 7590-01-M

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[Docket No. 50-219]

## GPU Nuclear Corp.; Consideration of Issuance of Amendment to Provisional Operating License and Opportunity for Hearing

The U.S. Nuclear Regulatory Commission (the Commission) is considering issuance of an amendment of Provisional Operating License No. DPR-16, issued to GPU Nuclear Corporation (GPUN, the licensee), for operation of the Oyster Creek Nuclear Generating Station located in Ocean County, New Jersey.

The amendment would revise Technical Specification Table 4.1.1 to include surveillance intervals which are correct for analog instruments and to extend a digital surveillance interval based on switch performance data. The existing intervals describe acceptable time limits for the previous digital switch sensors which have been replaced.

Prior to issuance of the proposed license amendment, the Commission will have made findings required by the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations.

By January 18, 1991, the licensee may file a request for a hearing with respect to issuance of the amendment to the subject facility operating license and any person whose interest may be affected by this proceeding and who wishes to participate as a party in the proceeding must file a written request for a hearing and a petition for leave to intervene. Requests for a hearing and petitions for leave to intervene shall be filed in accordance with the Commission's "Rules of Practice for Domestic Licensing Proceedings" in 10 CFR part 2. Interested persons should consult a current copy of 10 CFR 2.714 which is available at the Commission's Public Document Room, the Gelman Building, 2120 L Street, NW., Washington, DC 20555 and at the Local Public Document Room located at Ocean County Library, Reference Department, 101 Washington Street, Toms River, New Jersey 08753. If a request for a hearing or petition for leave to intervene in filed by the above date, the Commission or an Atomic Safety and Licensing Board, designated by the Commission or by the Chairman of the Atomic Safety and Licensing Board Panel, will rule on the request and/or petition; and the Secretary or the designated Atomic Safety and Licensing Board will issue a notice of hearing or an appropriate order.

As required by 10 CFR 2.714, a petition for leave to intervene shall set forth with particularity the interest of the petitioner in the proceeding, and how that interest may be affected by the results of the proceeding. The petition should specifically explain the reasons why intervention should be permitted with particular reference to the following factors: (1) The nature of the petitioner's right under the Act to be made a party to the proceeding; (2) the nature and extent of the petitioner's property, financial, or other interest in the proceeding; and (3) the possible effect of any order which may be entered in the proceeding on the petitioner's interest. The petition should also identify the specific aspect(s) of the subject matter of the proceeding as to which petitioner wishes to intervene. Any person who has filed a petition for leave to intervene or who has been admitted as a party may amend the petition without requesting leave of the Board up to fifteen (15) days prior to the first prehearing conference scheduled in the proceeding, but such an amended petition must satisfy the specificity requirements described above.

Not later than fifteen (15) days prior to the first prehearing conference scheduled in the proceeding, a petitioner shall file a supplement to the petition to intervene which must include a list of the contentions which are sought to be litigated in the matter. Each contention must consist of a specific statement of the issue of law or fact to be raised or controverted. In addition, the petitioner shall provide a brief explanation of the bases of the contention and a concise statement of the alleged facts or expert opinion which support the contention and on which the petitioner intends to rely in proving the contention at the hearing. The petitioner must also provide references to those specific sources and documents of which the petitioner is aware and on which the petitioner intends to rely to establish those facts or expert opinion. Petitioner must provide sufficient information to show that a genuine dispute exists with the applicant on a material issue of law or fact. Contentions shall be limited to matters within the scope of the amendment under consideration. The contention must be one which, if proven, would entitle the petitioner to relief. A petitioner who fails to file such a supplement which satisfies these requirements with respect to at least one contention will not be permitted to participate as a party.

Those permitted to intervene become parties to the proceeding, subject to any limitations in the order granting leave to intervene, and have the opportunity to participate fully in the conduct of the hearing, including the opportunity to present evidence and cross-examine witnesses.

A request for a hearing or a petition for leave to intervene must be filed with the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Services Branch, or may be delivered to the Commission's Public Document Room, the Gelman Building, 2120 L Street, NW., Washington, DC 20555, by the above date. Where petitions are filed during the last ten (10) days of the notice period, it is requested that the petitioner promptly so inform the Commission by a toll-free telephone call to Western Union at 1-(800) 325-6000 (in Missouri 1-(800) 342-6700). The Western Union operator should be given Datagram Identification Number 3737 and the following message addressed to John F. Stolz: Petitioner's name and telephone number; date petition was mailed; plant name; and publication date and page number of this Federal Register notice. A copy of the petition should also be sent to the Office of the General Counsel, U.S. Nuclear Regulatory Commission, Washington, DC 20555, and to Ernest L. Blake, Jr., Esquire, Shaw, Pittman, Potts and Trowbridge, 2300 N Street, NW., Washington, DC 20037, attorney for the licensee.

Nontimely filings of petitions for leave to intervene, amended petitions, supplemental petitions and/or requests for hearing will not be entertained absent a determination by the Commission, the presiding officer or the presiding Atomic Safety and Licensing Board that the petition and/or request should be granted based upon a balancing of the factors specified in 10 CFR 2.714(a)(1) (i)–(v) and 2.714(d).

If a request for a hearing is received, the Commission's staff may issue the amendment after it completes its technical review and prior to the completion of any required hearing if it publishes a further notice for public comment of its proposed finding of no significant hazards consideration in accordance with 10 CFR 50.91 and 50.92.

For further details with respect to this action, see the application for amendment dated November 19, 1990, which is available for public inspection at the Commission's Public Document

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

January 11, 1991

SCHEDULE AND OUTLINE FOR DISCUSSION
27TH ACNW MEETING
JANUARY 23-24, 1990

Wednesday, January 23, 1991, Room P-110, 7920 Norfolk Avenue, Bethesda, Maryland

| | | |
|---|---|---|
| 1) | 8:30 - 8:45 a.m.<br>TAB 1-------- | Opening Remarks by ACNW Chairman (Open)<br>1.1) Opening Remarks (DWM/RKM)<br>1.2) Items of Current interests (DWM/RKM) |
| 2) | 8:45 a.m. 55<br>8:45 - 9:~~20~~ a.m.<br>9:~~20~~ 55 - ~~10:15~~ 11:10 a.m.<br>TAB 2-------- | Regulation of Mixed Wastes (Open) (DWM/HJL)<br>2.1) Discussion with R. LaShier, EPA<br>2.2) Discussion with Dr. J. Walker, NIH |
| | 11:10 ~~10:15~~ - 11:15 ~~10:30~~ a.m. | **** BREAK **** |
| | 11:15 ~~10:30~~ - 12:00 noon ~~11:15 a.m.~~ | 2.3) Discussion with Dr. J. Kreiger, NEN |
| | 1:00 ~~11:15~~ - 2:00 p.m. ~~12:00 NOON~~ | 2.4) Discussion with Dr. J. Cooper, LLNL |
| | 12:00 - 1:00 p.m. | ***** LUNCH **** |
| | 2:00 ~~1:00~~ - 3:05 ~~1:45~~ P.M. | 2.5) Discussion with Dr. C. A. Langton ~~D. L. McIntosh~~, SRL |
| | 3:25 ~~1:45~~ - 4:15 ~~2:30~~ p.m. | 2.6) Discussion with Dr. F. E. Kosinski, ORNL |
| | 3:05 ~~2:30~~ 4:15 - 3:25 ~~2:45~~ 4:25 p.m. | **** BREAKS **** |
| 3) | 4:25 ~~2:45~~ - 5:40 ~~3:45~~ p.m.<br>TAB 3-------- | ACNW Description of the Top Three Priorities for Waste (DWM/CEA)<br>3.1) Discuss and Prepare a report to the Commission on the top three priorities for waste with a brief description of each.<br>3.2) Other ACNW Priorities |
| 4) | 5:40 ~~3:45~~ - 6:15 ~~4:45~~ p.m.<br>TAB 4-------- | Discussion and Approval of Paper for ACNW Presentation at the Waste Management '91 Symposium, Tucson, Arizona, February 26, 1991 (Open) (DWM/HJL) |

[ = Portion of the meeting transcribed

5) 4:45 - 6:00 p.m. <u>Preparation of ACNW Reports</u>
Discuss proposed ACNW reports regarding:
5.1) Mixed Wastes
5.2) Top Three Priorities

~~6:00~~ 6:15 p.m. **** RECESS ****

<u>Thursday, January 24, 1991, Room P-110, 7920 Norfolk Avenue, Bethesda, Maryland</u>

6) 8:30 - ~~11:00 a.m.~~ 12:00 noon
TAB 6---------
<u>Conformity of Guidance on Low-Level Waste Disposal Facilities with the Requirements of 10 CFR Part 61</u> (DWM/GNG)
6.1) Comport Review (J. Greeves)
6.2) Prototype License Application Safety Analysis Report
6.3) Road Map
6.4) 10 CFR 61 as it relates to facilities other than shallow land burial
6.5) Revise Part 61 - Leaching Resistance

~~11:00~~ 10:25 - ~~11:15~~ 10:45 a.m. **** BREAK ****

7) ~~11:15~~ 1:05 - ~~11:30 a.m.~~ 1:15 p.m.
TAB 7--------
<u>Trip Report of Recent Visit to the Barnwell Low-Level Waste Site</u> (WJH/PWP/HJL)

8) ~~11:30~~ 1:15 - ~~12:00 NOON~~ 2:10
TAB 8---------
<u>A Study on the Treatment of Human Intrusion for a HLW Repository</u> - Analogy to other scenarios in nuclear power plant licensing (DWM/S.Mays)

12:00 - 1:00 p.m. LUNCH

9) ~~1:00~~ 5:40 - 2:00 p.m.
TAB 9---------
<u>Anticipated ACNW Activities</u> (Open)
9.1) The Committee will discuss anticipated and proposed Committee activities, future meeting agenda, and organizational matters as appropriate (DWM/RKM)
9.1.1) Set February agenda
9.1.2) Responding to recent SRM
9.1.3) Visit the Center

10) 2:~~00~~ 10 - ~~6:00~~ 7:00 p.m. <u>Preparation of ACNW Reports</u> (Open)

TAB 10--------

10.1) Discuss proposed ACNW reports regarding:

- 10.1.1) Mixed Wastes (DWM/HJL)
- 10.1.2) Top 3 Priorities (DWM/CEA)
- 10.1.3) Collective Dose Criteria (DWM/GNG)
- 10.1.4) Individual Dose & Risk Limit Criteria (DWM/GNG)
- 10.1.5) C-14 Considerations for HLW Repository (MJS/HJL)
- 10.1.6) Part 60 Subsystem Performance Criteria (DWM/CEA)
- 10.1.7) Comments on the Stringency of EPA HLW Stds. (MJS/CEA)
- 10.1.8) Response to SRM: Revise Part 61 - Attention to Leaching Resistance of Waste Form (MJS/HJL)

~~6:00~~ 7:00 p.m. ~~ADJOURN~~ Recessed

<u>Friday, January 25, 1991, Room P-110, 7920 Norfolk Avenue, Bethesda, Md</u>

10) 12:20 - 1:20 p.m. <u>Preparation of ACNW Reports</u> (Open)

Continuation of 10.1)

CERTIFIED

Issued: March 26, 1991

MINUTES OF THE 27TH MEETING OF THE
ADVISORY COMMITTEE ON NUCLEAR WASTE
JANUARY 23-25, 1991
BETHESDA, MARYLAND

The 27th meeting of the Advisory Committee on Nuclear Waste was held on Wednesday, Thursday and Friday, January 23-25, 1991, at 7920 Norfolk Avenue, Bethesda, Maryland.

[Note: For a list of attendees, see Appendix I. ACNW members, Drs. William J. Hinze, Dade W. Moeller, Paul W. Pomeroy, and Martin J. Steindler were present. ACNW consultant, Dr. Donald Orth, was present.]

Dr. Dade W. Moeller, Committee Chairman, convened the meeting at 8:30 a.m. and briefly reviewed the schedule for the meeting. He stated that the meeting was being held in conformance with the Federal Advisory Committee Act, Public Law 92-463. He announced that a transcript of some of the open 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 may be purchased from Ann Riley & Associates, Ltd., 1612 K Street, N.W., Washington, D.C. 20006.]

## I. CHAIRMAN'S REPORT (Open)

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

Dr. Moeller identified a number of items that he believed to be of interest to the Committee, including:

- Mr. Robert Browning, Director of Division of High-Level Waste Management (HLWM), Office of Nuclear Material Safety and Safeguards (NMSS), will retire on February 3, 1991. Mr. B. Joe Youngblood has been appointed to succeed Mr. Browning as Director.

- The Division of Low-Level Waste Management and Decommissioning (LLWM) has been reorganized. The three Division Branches are now the Uranium Recovery Branch (Mr. John Surmeier, Chief), Decommissioning and Regulatory Issues Branch (Mr. John Austin, Chief), and Low-Level Waste Management Branch (Mr. Paul Lohaus, Chief).

- The Office for Analysis and Evaluation of Operational Data (AEOD) is developing criteria for the reporting of events associated with radioactive waste management and disposal. The Committee can expect to be called upon to provide advice on the developed criteria.

- The NRC staff held a meeting with the U.S. Environmental Protection Agency (EPA) on December 20, 1990, to discuss their plans for re-issuance of the remanded high-level radioactive waste (HLW) standards. EPA indicated that they were considering a number of substantive changes to the remanded rule. The NRC staff indicated that 10 CFR Part 60 would be changed to conform to the EPA standards on a parallel schedule. EPA indicated that their target date for issuance of the revised draft standards for public comment is March 1991.

- Dr. King Stablein, NMSS, attended a meeting in Lucerne, Switzerland, in October, 1990, that was organized by Organization for Economic Cooperation and Development (OECD). Among the topics discussed was gas generation and gas release from radioactive waste repositories.

- The U.S. Department of Energy (DOE) has requested rulemaking on a specific dose criterion for design basis accidents involving a HLW repository. It is likely that the Committee will become involved in this item.

- The Nuclear Waste Technical Review Board (NWTRB) has responded to DOE regarding their work on the exploratory shaft facility (ESF) alternatives. There will be a meeting between NWTRB and DOE on February 12-13, 1991, in Atlanta, Georgia. It would be well to have either a member or ACNW staff present at this meeting.

- The NRC Nuclear Safety Research Review Committee (NSRRC) has recently issued a report on NRC's research strategy. This report states that ACNW and NSRRC provide "oversight" to programs of the Center for Nuclear Waste Regulatory Analyses (CNWRA), however CNWRA should also have "external peer review."

- Significant efforts are underway or planned to remediate sites under the EPA Superfund Program, the DOE Site Restoration Program, and the NRC Site Decommissioning Program. DOE and EPA recently met to discuss analytic models that will be used to characterize the source, fate and effects of hazardous chemicals and radionuclides identified at these sites.

- SECY-90-391 and SECY-90-421 contain information on the development of decommissioning criteria for the Fort St. Vrain Nuclear Generating Station as a prematurely shutdown plant. At the same time, EPA announced that they will be developing "Criteria and Guidance for the Cleanup of Transuranic Wastes and Other Radionuclides at Federal Agencies."

- The NRC announced (SECY-91-007) that it will be able to participate on only a limited basis in the Radioactive Waste Safety Standards (RADWASS) Program of the International Atomic Energy Agency (IAEA).

- The NRC Commissioners have set their schedule for the remainder of calendar year 1991. The Committee has been invited to meet with them in March, July and November.

- Mr. Thomas J. Kennedy, Executive Director, Association of State and Territorial Solid Waste Management Officials, has transmitted to Dr. Moeller a copy of a letter sent by that organization to Chairman Carr on the NRC's below regulatory concern (BRC) policy. Mr. Kennedy has requested that ACNW invite representatives from his group to meet with the Committee to learn about the issues they have raised.

## II. REGULATION OF MIXED WASTES (Open)

[Mr. Howard J. Larson was the Designated Federal Official for this portion of the meeting.]

Dr. Moeller, Chairman of the Working Group on Mixed Wastes, stated that this session was a follow-on to the working group meeting held on December 13, 1990. The members of the Committee suggested a number of general issues that they would like to see addressed by the presenters. Dr. Steindler was interested in the underlying regulatory basis for EPA's mixed waste disposal policy, while Dr. Hinze was particularly interested in the proposed mixed waste profile/survey.

### A. Briefing by Representatives of the U.S. Environmental Protection Agency (EPA)

The first speaker, Mr. Richard LaShier, EPA, announced that his presentation would focus on waste characterization and testing. He introduced Ms. Jean Hankins and Mr. Alex McBride, both from the Characteristics and Assessment Division, Office of Solid Waste, EPA.

Ms. Hankins described the Resource Conservation and Recovery Act (RCRA) testing program noting that the first determination to be made by EPA is whether a waste is subject to RCRA regulations. It does not matter whether a waste is on the EPA list or whether it exhibits a "characteristic" of hazardous waste -- the waste falls under RCRA regulations. There are no specific guidelines as to how a waste is examined to determine a characteristic. Occasionally the waste producer will know the process or the waste characteristics well enough to be able to immediately classify it as hazardous.

In response to a question from Dr. Steindler, it was pointed out that wastes are generally listed by process origin rather than by chemical constituent. Mr. McBride pointed out that for listed wastes one is "guilty by definition" with the recourse being the delisting procedure.

The next determination to be made is whether the waste is prohibited from going to a Subtitle C Facility. If the waste is considered "prohibited," then it must be treated by a system that is controlled by an approved waste analysis plan (WAP). The specified testing frequency will be determined when the WAP is negotiated. The waste is either treated according to the technology specified (e.g., incineration or stabilization) or by a treatment standard (e.g., reduction of the concentration to a specified level or neutralization) in the treatment facility.

If the waste is listed and the treatment is effective, it goes to a Subtitle C Facility. If the waste is hazardous because of a characteristic and the treatment is effective, then it would not be regulated under Subtitle C and need not go to such a facility.

Dr. Steindler questioned the final disposition when a treatment standard calls for incineration and the testing of the resultant ash was below levels in the standard. Mr. McBride responded that the ash would still have to go to a Subtitle C disposal facility because "that is the way Congress wrote the law. It does not get out of the system." EPA is investigating the establishment of the minimum standards below which wastes would not be hazardous.

Mr. McBride noted that EPA's rationale for requiring such treatment can be found in the Hazardous and Solid Waste Amendments (HSWA) of 1984 that require EPA to set

treatment standards for all hazardous wastes. It was premised on the likelihood that even Subtitle C facilities would leak and therefore, the waste must be pretreated. Mr. LaShier added that the whole thrust of the HSWA amendments was based upon a certain skepticism about the effectiveness of land disposal for hazardous wastes.

Mr. LaShier pointed out that, even after the owner-operator is discharged from permitting liability under RCRA, it is not necessarily assumed that the materials are no longer hazardous. The perception is that by treating the materials to be below the standards (or immobilizing them) makes the land disposal facility itself less of a long-term public consideration.

Dr. Steindler asked about the criteria for treatment and was told that the toxicity characteristic leaching procedure (TCLP) is the test for the leachability of inorganics. Essentially, the standard is derived by applying the best demonstrated available technology (BDAT) to the waste and then performing the tests with the resultant becoming the standard. Insofar as radioactive risk evaluations (short- and long-term), it has been only recently that standards have taken into account the properties of radioactive materials and its effect upon the BDAT standard.

Mr. McBride pointed out that there are processes in place for obtaining variances from treatment standards. Both treatability variances and "no migration" petitions can be utilized for special wastes.

Ms. Hankins described the procedures for the 25 new toxicity characteristic (TC) standards, indicating that, since there are no treatment standards, one either treats or disposes (in a Subtitle C Facility) those wastes. If the treatment is effective, the waste would not be regulated under Subtitle C. The cases for which EPA methods of testing are required were noted (e.g., testing for toxic characteristics, evaluating against another characteristic, determining the presence of a free liquid, and providing supporting documents for a permit for an incineration facility trial burns). There is a degree of flexibility in using RCRA methods that were the state-of-the-art at the time of their development. Insofar as the applicability of the methods to radioactive materials analyses, the EPA does not have a plan in effect at this time to address that usage.

In response to Dr. Orth's question, Mr. LaShier noted that there are ~5700 facilities currently subject to the RCRA permitting process, of which ~90 percent of the land disposal facilities are permitted for closure. There are treatment standards for virtually all hazardous wastes with the exception of newly listed wastes and those wastes that exhibit a new toxicity characteristic.

Mr. LaShier discussed the corrective action program, noting that it, too, was derived from the 1984 HWSA. Prior to 1984, RCRA corrective action was limited to detecting, monitoring and correcting releases to groundwater at permitted or interim status facilities. After 1984, the corrective action program was significantly extended to surface water, air and contaminated media such as soils, not only at permitted units but also to all solid waste management units at a permitted facility. HWSA also provided agencies with the authorization to compel compliance. This applies to disposal sites that have been closed for years, however, a significant limitation to such a broad application is that the facility must be seeking a RCRA permit - of any type - storage, treatment or disposal.

The four phases of the RCRA facility assessment (RFA) process were described. It was noted that the process goes from the simple to the more complex. The overall EPA philosophy is that source reduction or elimination is much more important than the treatment of contaminated groundwater.

Dr. Hinze queried whether testing for radioactive materials in mixed wastes is routinely performed or required, and was told that while not routinely performed, it was dependent upon the knowledge of the facility's past history. Thus far, most experience has been with the Superfund facilities where NRC and EPA have a continuing dialogue.

Mr. LaShier noted that currently only six states are authorized by EPA to be responsible for their corrective action program. However, EPA does have an oversight inspection authority.

Dr. Hinze questioned corrective action responsibilities and was told that the politics of the process will probably determine who ultimately bears the responsibility.

Currently six facilities claim that they can commercially treat mixed wastes. Another four facilities are engaged in brokering and providing incineration for scintillation fluids and other ignitables. Two others claim a broader assortment of treatment processes. There are no permitted land disposal facilities. In response to a question from Dr. Steindler who noted that, with no permitted mixed waste land disposal facilities there is a real problem existing currently, Mr. LaShier pointed out that the solution to that problem is not EPA's concern nor did they cause the problem. The problem of facility development is mired in politics and in site characterization. The EPA presentation concluded after some discussion on hypothetical solutions to the problems associated with the testing of mixed wastes.

B. Briefing by Representatives of National Institutes of Health (NIH)

Dr. William Walker, Radiation Safety Officer, NIH, was the next presenter. Dr. Walker stated that NIH is probably the largest biomedical research facility in the world. NIH has ~2,500 laboratories that are capable of producing mixed wastes. Approximately 70 to 80 percent of all NIH research involves radioactive materials. There are ~66,000 radioactive waste pickups per year, most of which are multiply tagged, dependent upon the constituents (chemical, biological, radioactive). The cost of their disposal per year at NIH is ~$7.5 million. If one considers that NIH represents one percent of the costs then the annual cost for handling radioactive and mixed wastes in the U.S. for biomedical research would be ~$1 billion. Dr. Walker noted that the number of mixed waste pickups per month seems to be increasing primarily due to NIH now more closely defining what should be classified as mixed wastes.

Dr. Moeller asked why low pH solutions could not simply be neutralized and then no longer be considered mixed waste. Mr. Edward Rau, NIH waste manager, pointed out that many solutions contain trace amounts of other hazardous constituents, which means the resultant neutralized solution could still not be classified as non-RCRA waste. Furthermore, occasionally a waste will no longer fit into RCRA rules but still would be banned because of local sanitary sewer discharge limits. Additionally, the mere fact that some wastes are purely medical waste sometimes further restricts disposal. Such a restriction is due to non-Federal laws.

NIH has an on-going educational program on waste minimization that has proven to be more effective in cost-control than treatment processes. Mr. Rau observed that NIH uses or stores ~625,000 discreet chemical compounds. While NIH has made a commitment to proper mixed waste management, many other facilities are effectively ignoring the mixed waste problem due to the resources required to properly handle it. In response to a question, it was noted that the amount of carbon-14 in scintillation fluids disposed of per year was estimated to be in the millicurie to less than one curie range.

Dr. Walker noted that the NIH classification of its hazardous materials is broader than EPA's since many of the receiving states and disposal facilities specify in their permits that they will accept no carcinogens or toxic material. Therefore, such wastes, de facto, are mixed. The biomedical research community has multi-hazardous wastes, that, in addition to chemicals and radioactive materials, contain biohazardous or biologically oriented materials. Such materials, while usually susceptible to adequate treatment, raise a question of aesthetics, i.e., blood, needles, and other items of similar ilk. NIH believes that due to a lack of cooperation among the various Federal agencies, handling and disposal of hazardous and mixed wastes is further complexed. He noted that during a recent visit to NIH, EPA personnel would not enter their mixed wastes facility because of the presence of radioactive materials (which was minimal). It was also observed that, while NRC publishes much guidance, there is little insofar as mixed wastes.

Dr. Walker suggested that EPA and NRC jointly eliminate conflicting requirements. He suggested a weighting system for disposal methods, the minimization of redundancy in permitting and documentation and the need for a multi-hazardous waste definition.

Dr. Walter indicated that real versus perceived risks must be recognized. EPA should facilitate and expedite delisting procedures and should have a new manifest policy, as well as a new labeling system. The latter is currently misleading to emergency response teams. Dr. Walker noted that EPA's analysis procedures not only lead to ALARA violations but also increase the cost for RCRA analyses up to $1500 per sample. He regretted the failure of the recent NRC below regulatory concern (BRC) policy to be accepted. He believed that 90 percent of

NIH's materials would fall under the BRC limits and therefore would not be classed as mixed. Such a finding would have been significant. He believed that perhaps there was too much fanfare associated with the BRC policy promulgation and that this tended to make many people believe that it was an attempt on the part of the NRC to "put one across on the public." He also provided examples of some NIH educational materials intended to help the approximately 8,000 NIH employees working with radioactive substances to be better qualified to handle these wastes.

In response to Dr. Hinze' query as to whether there was any uniqueness in NIH's problems, Dr. Walker responded that NIH's individual waste streams are not unique except for number and size.

The NIH staff have had discussions with representatives from DOE regarding the latter undertaking mixed waste stream research. NIH is in the process of identifying the large volume parts of their waste stream, believing that if they could more closely identify a dozen waste streams it could eliminate perhaps 90 percent of their mixed waste problem.

Dr. Pomeroy asked who actually regulates medical pathological waste? Dr. Walker responded that no single agency is responsible at the Federal level. Therefore the disposal site operators at the Federal level make their own determination as to an acceptable level -- which is frequently none. Mr. Rau interjected that almost every entity at the state and local level regulates medical wastes.

In response to Dr. Steindler's question, Mr. Rau and Dr. Walker noted that not only does delisting require a considerable amount of time but because of the number of different waste streams and, therefore, the different delisting strategies, delisting is impractical for the majority of NIH's materials.

Dr. Walker believed that each waste stream should be redefined in terms of mixed wastes insofar as the amounts of radioactive materials or chemicals contained therein. In addition to the need for the definitions to be more precise, dual regulation should be eliminated. Dr. Walker agreed to provide NIH's written perspective on the general questions as to the need for, and problems associated with, dual regulation.

C. Briefing by Representatives of New England Nuclear (NEN)

The next speaker was Dr. Jean Kreiger, duPont-Merck (New England Nuclear). Dr. Kreiger noted that for many years her company has been attempting to minimize waste. She discussed several interesting technical innovations. However, when these technical approaches were applied to mixed wastes, the current dual regulations resulted in problems that could not be resolved.

Compounds manufactured at NEN are used by 70-80 percent of the researchers at NIH. Furthermore, 10 of the last 15 Nobel prizes in medicine and physiology could not have been awarded because the work would not have been done if not for the availability of labeled (radioactive) compounds. NEN employs over 100 chemists and has a catalogue of some 900 compounds that are labeled with radionuclides. Since the compounds and the processes in many cases involve organic soluble compounds, the radioactive and hazardous chemical substances are essentially one and the same. The typical solvents in NEN's mixed wastes are all RCRA "characteristic" waste. Most of the liquid scintillation cocktails are disposed of under the de minimis regulation.

Dr. Kreiger discussed NEN's various compounds and waste streams, noting some of their extraction processes and waste minimization and extraction techniques. Although NEN's range of concentrations span six orders of magnitude, the majority of the radioactive material is contained in a relatively small volume. She noted the difference between the as-generated and as-stored volumes, e.g., at NEN a 30 gallon polyethylene container of generated wastes is placed in a 55 gallon drum for storage.

NEN has identified and is pursuing four strategies for reducing waste volumes:

1. Precycling - analyzing the manufacturing process in such a way as to eliminate material before it enters the process (for example, minimizing the use of hazardous solvents).

2. Recycling - isolating the radioactive material, performing an isotopic separation and reinsertion of the material into the waste stream.

3. Segregation - removing the aqueous portion of the waste stream and thereby reducing its volume.

4. Process improvement - by stabilizing the compounds, process improvement should improve the yields and consequently require less frequent manufacturing and less waste generation.

NEN is committed to reduce their mixed waste volume by 10 percent/year. Insofar as treatment of waste, the philosophy on mixed wastes is to make it either non-radioactive or non-hazardous.

Of the previous strategies, reduction at the source and waste treatment appear to be the most effective. While segregation has been an important force for the past 10 years, its impact in the future is expected to lessen.

Various oxidation processes have been utilized, such as microwave pyrolysis, combustion, electrolytic destruction and super critical water oxidation. The latter appears to be the most attractive. However, in order to test this approach, a RCRA treatment facility license must be obtained. This is a difficult process in the Commonwealth of Massachusetts.

Dr. Kreiger stated that, at a recent American Nuclear Society conference, one estimate of the cost for obtaining a permit, taking into consideration public hearings and the political process, was $5 to $10 million. Such a cost when coupled with the technical risk is too high for most organizations to pursue. No treatment option studied can then be undertaken. This creates frustration because, while a technical approach might appear environmentally sound, it cannot be pursued.

At NEN, the principal impact of dual regulation is the associated cost. Assuming the Nebraska mixed waste disposal figure of $10-15,000/ft$^3$, and with 5000 ft$^3$ stored at NEN, Dr. Kreiger believes, if these are typical, then the resultant charges could lead to the demise of the labeled chemicals industry. Only a finite amount of the cost can be passed on to the customer. She noted that about 1 percent of the NEN research budget is used to purchase radioisotopes. If costs cannot be passed on, they must be absorbed and activities, such as research, may suffer.

Dr. Kreiger pointed out that NEN, led by a strong group of engineers backed by the resources of E. I. duPont, will successfully comply with the current regulations. However, there are smaller industrial, medical and university groups that have neither the resources nor the experience and will, of necessity, be forced to cut back on research.

Dr. Steindler asked for quantification of this last point. Dr. Kreiger noted that the industry is very diffuse - tens of thousands of customers represented by 12 to 15 professional societies, who, in addition to being not too well organized, have diffused interests.

She also noted that NEN has one major competitor and that if their waste disposal cost is less due to differences in regulation, then a competitive disadvantage results. Dr. Kreiger preferred regulation by only NRC, particularly since the radiological hazards at NEN far exceed the chemical hazards. If disposal capacity is not available then treatment capacity (perhaps a national treatment capacity) needs to be developed. Dr. Kreiger noted that, in addition to the other technical issues previously discussed, the radiochemical compounds produced by NEN have a significant impact on national health and welfare.

In response to Dr. Pomeroy's question as to the impact of BRC on NEN's waste stream, Dr. Kreiger replied that the BRC policy would have little impact since what was considered a low concentration at NEN was high by any other user's standard.

Dr. Kreiger reiterated that the economics of the RCRA permitting process represent an unacceptable risk.

D. Briefing by Representative of Lawrence Livermore National Laboratory (LLNL)

After the lunch recess, Dr. John Cooper, LLNL, addressed the Committee. He described a process initiated last year by LLNL as an alternative to waste incineration. It is a liquid-phase closed-system process for waste oxidation utilizing molten salts.

Leading up to this system was an eight year development of a two-stage rotary kiln incinerator. There were several principal objections raised against this project that ultimately resulted in its termination. The objections were, large gas throughput requirements (100:1), very high operating temperature generation of large amounts of acidic gases, and the potential volatization of actinides.

The alternative process also addresses two other problems with incineration: the continuous nature of the operation and the fact that an incinerator system will process, at any one time, anywhere from 100 Kg to several tons of levitated radioactive particulate matter. Any kind of containment failure would distribute that material. The new process has no routine emissions and at most, contains at any one time 10 grams of particulate matter.

Dr. Cooper observed that containment in the molten salt process is chemical, by the complexing of the individual particulate matter.

Dr. Cooper noted that approximately 577 tons of mixed wastes per year would be processed by the facility. The output would be ~150 tons of sodium chloride and ~10 to 15 tons of mixed material. This would result in a net reduction of mixed wastes by a factor of about 50.

Dr. Hinze asked about the stage of the molten salt incinerator development and was told by Dr. Cooper that the critical parts of the process have been established. What has not been done is the closed system operation. (The original Rockwell technology was an open air-breathing system.)

Currently, LLNL is storing its mixed wastes at an on-site storage facility. Two of the currently available one ton/day systems would be enough to treat LLNL's stored waste inventory. The technology also appears applicable to the Rocky Flats inventory. This system is expected to be brought to an operating stage within four years.

Dr. Cooper described the development of the process and provided a summary of destruction efficiencies. He noted that some demonstrations were done under EPA sponsorship and monitoring and easily passed TSCA requirements. The 900° centigrade operating temperature posed a potential problem but current work is in progress to lower the temperature to 700° centigrade. This lower temperature provides many options insofar as materials of construction, reduction of corrosion, etc. LLNL studies indicate that the remaining ash and char would not be a mixed waste but could be buried as a low-level radioactive waste (LLW) provided the organic fraction was destroyed in accordance with RCRA requirements.

Dr. Cooper discussed the molten salt process in detail, including the various process steps and removal stages. The per unit cost, based upon a 1982 inflated cost analysis, is ~$6.50/Kg of waste (including disposal).

Dr. Hinze questioned the process limitations. Dr. Cooper responded that the process becomes extremely uneconomic when the majority of the waste is non-combustible. He also noted that most of the experimental results on the behavior of actinides came from Rockwell's 1976-78 bench scale experiments.

E. Briefing by Representative of Savannah River Laboratory (SRL)

Dr. Chris Langton, principal scientist at the Savannah River Laboratory (SRL) was the next speaker. She noted that in addition to DOE's requirements SRL is regulated by both EPA and the South Carolina Department of Health and Environmental Control (DHEC).

While SRL is technically out of compliance, since it has a plan (the Federal Facilities Compliance Agreement) to come into compliance with RCRA through a National Capacity Exclusion, SRL may generate wastes until May 1992. At that time they will require a case-by-case extension, which, if granted, will extend their authority to generate these wastes until May 1994. The other alternative (other than the case-by-case extension) is to update the Federal Facilities Compliance Agreement. Either alternative must be in place by 1992.

Dr. Langton described SRL's storage facilities and the types of material permitted to be stored in each. TRU waste is to be sent to the Waste Isolation Pilot Plant (WIPP). She noted that the high-level waste tanks are interesting because, although they have interim status as an RCRA storage facility, DHEC is asking for SRL to change that status to a waste treatment facility. This may imply that aging of the waste can constitute treatment. Dr. Langton noted that such a determination is possible if the waste water treatment is closely coupled, through totally enclosed plumbing, to the facility.

SRL uses a variety of treatment systems such as incinerators, vitrifiers and stabilization and cement solidification processes. Another facility is being proposed for miscellaneous mixed wastes generated anywhere on the Savannah River Plant (SRP) acreage. In this proposed facility, lead and mercury will be recovered, transuranics will be oxidized, and for those wastes requiring it, the capability to encapsulate will be provided. Dr. Moeller questioned the use of encapsulation and was told that that is the specified technology for radioactive lead solids.

Two RCRA facilities are being planned at SRP. The concrete RCRA vaults, expected to be constructed in 1994, will have double liners and double leachate collection systems. The hazardous mixed waste disposal facility is estimated to cost $46 million. Approval is expected in 1992, permit issuance is scheduled for 1994, and construction is expected to be completed in 1996.

The reasoning behind a concrete vault vis-a-vis a landfill for RCRA waste was questioned by Dr. Steindler. Dr. Langton noted that the DOE Record of Decision for the site was that a concrete vault "would significantly reduce the mobility of the waste ions into the environment." The mixed wastes vault was placed above ground principally so that the outside could be inspected and maintained more easily.

In order to reduce the volume of waste generated, SRL is looking at alternative materials, materials substitution, reuse and recycling of lead and mercury, oxidation of carriers and process modifications. Typical examples were provided for each of these volume reduction methods.

Currently, SRL is planning to use a rotary kiln incinerator that has an 8 to 1 average volume reduction. If there is difficulty in obtaining a permit for this facility, then a supercritical water oxidation system is being considered. Machinery development for this process is being done off-site. SRL is looking at electro-chemical oxidation that would be used for low-level alpha and TRU wastes, including rubber gloves, Kim-wipes and shoe covers. Advanced melter designs (Penberthy melter, microwave melting, et. al.) are being researched but thus far none looks as promising as the electrochemical or high temperature water oxidation. Dr. Langton also discussed several EPA interpretations regarding proposed solutions to particular hazardous wastes, several of which had to do with amalgams of mercury (which are generally considered by EPA to be a satisfactory waste product).

One area specifically noted as being one where relief could be helpful was the handling of materials that are highly radioactive. SRL would like to place them in shielded containers and then put them in their disposal facility. For low-level alpha and nuclear fuels, waste oxidation would perhaps be an acceptable treatment. This process could concentrate the waste which could then be sent to WIPP. The need for a waste water treatment station by all treatment facilities was noted, as were the problems associated with handling and assaying wastes.

At the conclusion of this presentation, Dr. Orth questioned whether ALARA was being considered in these evaluations.

After some discussion it was decided that the answer is that ALARA was not directly considered as only the SRP site dose limits were controlling. For example, if the waste handling must be remote in order to remain within the dose limits, then the proposed design would reflect such handling.

Of the total wastes generated at SRP, only a few percent would be considered mixed.

Dr. Langton noted that although the proposed Butler building-type storage facility was similar to the joint guidance design, it was essentially an SRL design. The permit issued by the South Carolina DHEC states only waste generated at SRP can be handled there.

F. Briefing by Representatives of Oak Ridge National Laboratory (ORNL)

Drs. F. E. Kosinski (formerly with ORNL, now at the Waste Policy Institute, Virginia Polytechnic Institute) and John Napier, ORNL, discussed the waste generation, reduction and minimization program at DOE's Oak Ridge National Laboratory facilities.

Years ago DOE generated extremely small amounts of what would be considered mixed wastes. However, with the presence of RCRA-regulated solvents in the workplace, the volume has increased significantly. Within the past 18 months, there has been a major expansion of technical support within DOE for waste minimization at production plants. This effort is integrated within DOE's Environmental Management and Defense Program offices and has as its objective the reduction of waste volume by ~80 percent. As DOE proceeded with this program, they realized that regulatory issues could be a major roadblock to new technology development. One recommendation is that BRC (or its equivalent) be applied to both the nuclear as well as the RCRA constituents of the waste.

Dr. Kosinski discussed several mixed waste reduction success stories. The first was the elimination of 700,000 pounds/year of tetrachloroethylene emissions, as well as all associated solid and liquid wastes, at the Y-12 plant. Another example was the elimination of RCRA-regulated solvents for the ORNL highly enriched uranium (HEU) facility. This resulted in the elimination of most all mixed wastes from that facility. Similar efforts are underway for the depleted uranium operations. It is expected that 90 percent or more of the mixed wastes created by the mixing of radioactive material with RCRA-regulated solvents will be obviated.

Dr. Kosinski noted that in 1990 the U.S. District Court in Denver ruled against DOE regarding the recycling of nuclear material at Rocky Flats, stating that all substances mixed with RCRA hazardous waste cannot be incinerated or put through any unlicensed recycle process. It will therefore become more difficult to recycle materials when the recycle operations are perceived as treatment operations requiring permits. DOE therefore needs a de minimis (or BRC) level of waste wherein the level of chemical (or radioactive) waste is so low in regards to the total hazard that the material can be classified as one or the other (hazardous or radioactive) and need not be classified as mixed. For mixed wastes, the DOE end target is to produce zero.

Dr. Napier discussed waste generation at ORNL, noting that ~two million $ft^3$ of industrial trash generated at the Y-12 plant, disposed in a state permitted shallow land burial. The volume of mixed wastes generation at Y-12 is ~30,000 $ft^3$/year. ORNL has ~100,000 Kg (200 drums) of mixed wastes stored, Y-12 has ~11,000 drums and K-25 ~80,000 drums. Most of the K-25 and Y-12 material is depleted uranium with concentrations ranging from 50 to 500 ppm. At K-25 most of the solid waste is from clean-out of the ponds while most of the Y-12 material is resultant residue from water treatment. It is anticipated that in a few years mixed wastes will be generated at one percent of the current rate. An incinerator for mixed wastes has been in the permit cycle for almost 10 years, but only a permit to burn PCB wastes has been received. Excluding all of the PCB's, there are ~180,000 gallons of waste organics awaiting incineration. Analytical costs for samples run as high as $4500 each with no agreement yet on the number of samples required. An effort is underway to delist the sludges which will continue to be stored until delisted.

A number of years ago DOE notified the State of Tennessee that anything <32 pCi/gm of uranium would not be considered to be radioactive. No response to that notification has been received from the state, although the City of Oak Ridge received a letter from the state stating that anything <32 pCi/gm of uranium was radioactive.

In response to Dr. Moeller's query regarding the basis of the 32 pCi, Dr. Napier explained that the pathway analysis scenario's end result was <4 mrem/year. The pathway analysis assumed each 12 cubic yard dumpster full of dirt was at <50 ppm, on top of which four feet of dirt was placed. A house was then built, a well was drilled and tenants remained there for 72 years.

Another problem presented was the de minimis number for waste oil below which it can be shipped off-site to an incinerator.

A local example of conflicting dual regulations was cited where the city fire department required a solid container and the criticality analysts required holes to prevent criticality.

Insofar as typical costs, Dr. Napier pointed out that waste costs last year at Y-12 were >$40 million, the new waste facility will cost >$200 million and monitoring the 600 plus wells at Oak Ridge costs >$10 million/annually.

Dr. Steindler questioned at what point 32 pCi (~50 ppm U) becomes a chemical poison rather than a radiological hazard. Dr. Napier noted U at that level is not water soluble and therefore should (a) not be a groundwater problem, and (b) the facility of possible concern is 10 miles away and has a 70 ppm limit.

All new facilities at Oak Ridge will be constructed as RCRA facilities. It was noted that only waste generated in the State of Tennessee could be handled at the Oak Ridge facilities.

Water discharges and sludges from treatment plants are expected to become more of a problem in the future since in many municipalities the sludges fit the mixed waste definition.

EPA has given the state of Tennessee the right to regulate RCRA facilities. Since DOE and Oak Ridge have provided money to the state for compliance monitoring, the state is now intending to hire ~70 people to perform monitoring and compliance verifications.

Dr. Moeller questioned the K-25 plant shutdown and what activities were in process there. Dr. Napier noted 2500 people are still working there performing cleanup, maintenance and guard work. Additionally the engineering group and facility sewage and water treatment plants are in operation. The environmental research organization was also recently moved to the K-25 area. This concluded the briefing by the invited speakers.

The Committee prepared and discussed the contents of a draft report for Chairman Carr and a draft memorandum for Mr. Robert Bernero. The Committee will continue to work on these during the next full Committee meeting.

III. CONFORMITY OF GUIDANCE ON LOW-LEVEL WASTE DISPOSAL FACILITIES WITH THE REQUIREMENTS OF 10 CFR PART 61 (Open)

[Note: Mr. Richard Major was the Designated Federal Official for this portion of the meeting.]

The Committee heard a presentation on the status of the LLWM comport effort by Mr. John Greeves, Deputy Director of the Division of Low-Level Waste Management and Decommissioning. Mr. Greeves began his briefing with a slide presentation on the reorganization of the LLWM division. A new branch -- The Uranium Recovery Branch -- was created, and the Technical Branch was terminated with staff being reapportioned among the existing three branches. He described the reorganization as a reorientation into a more programmatic configuration. The Decommissioning and Regulatory Issues Branch remained essentially unchanged, and covers mixed-wastes and decommissioning activities. The former Low-Level Waste Management Branch was divided into two separate branches. One remains the Low-Level Management Branch under Mr. Paul Lohaus; the other is the Uranium Recovery Branch under Mr. John Surmeier. Mr. Greeves went on to briefly describe the sub-branch structure.

Mr. Greeves pointed out that the first three items on the agenda -- 6.1) Comport Review; 6.2) Prototype License Application Safety Analysis Report (PLASAR) and 6.3) Road Map -- were items that Greeves would address directly in his presentation. The fourth and fifth items -- 6.4) 10 CFR Part 61 as it relates to facilities other than shallow land burial, and 6.5) Revise Part 61 - Leaching Resistance -- were being handled separately from the comport effort. He would address these items in an informal discussion.

Mr. Greeves recounted the background regarding the comport issue, beginning with the Commission's March 1990 Staff Requirements Memorandum (SRM). The basic charge was to review NRC's guidance in light of the requirements in 10 CFR Part 61. The Commission requested NMSS, in conjunction with the Office of the General Counsel, to review the following:

1. Did the NRC guidance reflect the regulatory requirements? Agreement States were interpreting guidance as mandatory.

2. PLASAR documents - two DOE mock applications were evaluated by the NRC staff and documented in the PLASARs.

3. Road Map - documentation that identifies all existing guidance documents that an applicant should consider in its application.

4. Identification of guidance areas were more restrictive than the requirements and had to be so.

Mr. Greeves pointed out that the impact to the NRC staff from the review of the four areas extended beyond the standard format and content (SF&C) review plan, and sensitized staff to these issues in other areas.

Mr. Greeves briefly reviewed the Low-Level Waste Policy Amendments Act (LLWPAA) of 1985 and its provisions affecting NRC activities. It required NRC staff to issue certain guidance, and it established a 12-month period to identify alternatives for shallow land burial (NUREG-1241 addressed these alternatives). The NRC staff published the Standard Format and Content (SF&C) Guide and the Standard Review Plan (SRP) in January 1987. These were revised on January 1988 to include information on engineered alternatives such as earth-mounded concrete bunkers and below ground vaults.

Late in 1989, NRC staff received questions on the use of guidance documents from outside parties, such as the California Radioactive Materials Management Forum and the Texas Low-Level Waste Disposal Authority. The NRC utilized a multi-office approach to review the guidance; NMSS, OGC and GPA all combined to review the existing guidance. After the NRC review was completed, NRC worked with the state's regulatory authority in Texas, Pennsylvania and California. Arrangements were made for participation by the developers of the low-level waste facility in each state; in some cases representatives of citizen groups asked to be invited and were included. In the case of California, face-to-face meetings were not feasible so teleconferences were held to discuss the guidance with the regulatory authority as well as the developer, U.S. Ecology.

As a further measure, an effort was made to discuss the existing guidance with the developers of the PLASAR. Although this was done with Rogers and Associates, the EBASCO team had previously broken up. The Technical Branch of the LLWM Division held a one-day workshop on the SRP at the All Agreement States Meeting in June 1990, which provided feedback to the staff.

Mr. Greeves discussed the application for a LLW disposal facility in Nebraska. The NRC staff agreed to provide state officials a two-day intensive discussion on using the SRP. This was a learning experience for the NRC staff, as well.

Mr. Greeves went on to review the structure of the review plans. The general structure for both (SRP and SF&C) is:

- Chapter 1 - general information about the applicant
- Chapter 2 - addresses the site
- Chapter 3 - addresses the design
- Chapter 4-8 - address subjects such as safety assessment and operational activities
- Chapter 9 - addresses quality assurance

- Chapter 10 - addresses financial assurance

This organization follows that of the reactor regulation arena under NUREG-0800. Each chapter addresses which staff expertise is responsible for the review, what it is they each review, how they are to perform the review and what the criteria for acceptance are. In this last area, Mr. Greeves acknowledged that the NRC staff had made mistakes in the past. But as an overall conclusion of this review process, the NRC staff believed that the SRP is not "broken;" however, some areas needed revision. One area was inappropriate referencing to other requirements. This consisted of referencing 10 CFR Part 50 (meteorology and climatology), 10 CFR Parts 50 and 100 (geology and seismology), and 10 CFR Part 20 (releases of radioactive materials) incorrectly as regulatory requirements. These had to be removed from the regulatory requirements section. The other area dealt with quality control for the waste form and Part 61 referenced "quality assurance." Upon reflection, Part 20.311 and Part 61.12(j) were changed to refer to "quality control."

Dr. Hinze questioned the usefulness of Part 100 as guidance for the LLW situation, and asked whether the staff was considering providing new guidance. Mr. Greeves indicated that in the revision of the SRP, such new guidance would be considered; he also welcomed any suggestions by the Committee in this regard.

Dr. Moeller was curious about the issue of leach resistance of the waste form not being raised in the context of the comport review. Mr. Greeves indicated that he would address that late in the discussion. Dr. Moeller also indicated a concern with the use of "requirements" in situations prior to the licensing phase, both in high-level waste (HLW) as well as in LLW. Mr. Greeves responded by indicating that the Commission had already sensitized the staff on the use of the term. Dr. Moeller also asked Mr. Greeves to clarify whether Mr. Greeves had said that 10 CFR Part 20 was going to be revised as a result of this review effort. Mr. Greeves indicated that no such change was envisioned as part of this review.

Mr. Greeves resumed with his briefing with the NRC staff review of the PLASAR experience. With feedback from the states, the staff saw improvements for the PLASAR exercise; examples include:

1. The PLASAR document was too general in the area of facility operations in terms of what is in the SRP.

2. The safety assessment chapter (infiltration, source term activity) did not reflect the most recent information collected under a Sandia contract for technical assistance.

3. The information in the occupational radiation protection chapters was insufficient.

As a result of this reevaluation, the staff is working with Oak Ridge National Laboratory (ORNL) to revise the documentation.

Dr. Moeller asked whether the PLASAR was for a shallow land burial option. Mr. Greeves reiterated that the two PLASAR documents covered two options: earth mounded concrete bunker and above ground vault. Dr. Hinze questioned whether the PLASAR review should have bypassed siting considerations, because of the fictitious nature of the prototype sites. Mr. Greeves indicated that there were limited resources to be dedicated to the comport review; the feedback from the states highlighted a focus on the engineering rather than the siting. Dr. Tokar, NMSS/LLWM, underscored the engineering focus on the PLASAR reviews; he also remarked that it would not have been productive to concentrate on a siting review of a nonexistent site. Mr. Kane, NMSS/LLWM, indicated that, although siting information was used in the PLASAR reviews, no evaluation of the adequacy or acceptability was performed on the siting data.

Dr. Pomeroy asked whether a "level of detail" evaluation of the siting information might not be appropriate. Mr. Greeves acknowledge that there might be some value in doing that, but that focusing on whether a fictitious site had been properly characterized did not appear to be as promising as the evaluation in other areas.

Mr. Greeves moved on to the topic of state comments. Although the initial feedback was positive, improvements were requested in some areas:

1. The SRP suffered from multiple-author syndrome; i.e., the level of detail varied from section to section, depending on the primary authors.

2. The SRP was redundant; e.g., monitoring was addressed in five different areas.

3. The basis for findings (10 CFR Part 61.23) was too succinct to be useful in defending a finding.

Mr. Greeves indicated that the remaining areas of concern as expressed by the states were similar; he also pointed out that the NRC had contracted with Sandia to produce documentation and workshops in PA.

Dr. Hinze asked whether most states would do their own PA or contract it out? Mr. Greeves understood that contractors would be used to some extent, due to the states' resource limitations. Dr.

Hinze was interested in whether the states had experienced people in PA, who would be doing the application reviews. From the few states contacted, Mr. Greeves indicated that they had staff or contractors with the necessary PA experience. However, when certain complicated issues arise, the states would be able to request assistance from the NRC staff.

Mr. Greeves moved on to the conclusions of the comport review. He reiterated the point that the SRP was not broken, and that inadequate areas were being addressed. The staff's review of the PLASAR resulted in no significant inconsistencies. He also indicated that a road map exists in the form of the SF&C and the SRP with the NUREGs, TPs and other guidance documents that the SRP referred to. He also characterized the QA "guidance" as being a more restrictive criterion that should be considered in revising 10 CFR Part 61.

Mr. Greeves addressed the following recommendations from the comport review:

1. Quickly correct comport item (sanitize requirements from guidance and notify the states of changes).

2. Insert QA into Part 61 (to be done by June 1991).

3. Revise the SRP (with input from PLASAR review) by September 1991.

Mr. Greeves went on to review the SRM from the Commission, and he specified that the SRP revision report will include a road map. He reviewed the revision to the beginning of the SRP to describe Part 61 and the linkage of the rule to the individual sections of the SRP. Mr. Greeves presented a hierarchical pyramidal structure starting at the pinnacle with the overall goals (public health and safety goals). This was then followed by regulations, which in the case of Part 61, are comprised of performance objectives followed by detailed technical requirements. The understanding is that if you cannot demonstrate compliance with the performance objective, then there is a fallback position to use the technical requirements. The next level consists of the SF&C, SRP, NUREGs, etc. The foundation of the structure is the licensee submitted information. Mr. Greeves indicated that a wiring diagram tying the performance objectives to the detailed technical requirements is also being considered for this SRP revision.

Finally, Mr. Greeves summarized the staff's activities in response to the Commission SRM. This dealt with a comport review of the Environmental SRP (NUREG-1300). The Office of Nuclear Regulatory Research (RES) is reviewing NUREG-1300 to evaluate conformance with 10 CFR Part 51. This should be completed in five or six months.

Having finished items 6.1 through 6.3 on the agenda, Mr. Greeves moved on to facilities other than shallow land burial. Specifically, he focused on "above ground vaults." (AGVs). The basic point is the legal interpretation of the phase "into the subsurface." The NRC legal analyses concludes that Part 61 does not address a free-standing structure on the surface. Some of the states' regulations permit an AGV. Working with the Office of the General Counsel (OGC) and RES, the NMSS staff is moving forward with the change to Part 61 to permit such options, as well as with the change to insert the QA criteria. Some discussion followed to clean up the roles of LLWM, OGC, and RES in the rulemaking effort for revising Part 61. Mr. Greeves does not expect any other changes to Part 61 for the present. RES estimates completion of the rule change by June 1991. In response to Dr. Hinze, Mr. Greeves indicated that the basis for this rule change is procedural and not technical.

Mr. Greeves pointed out that Agreement States have to adopt regulations compatible to NRC's 10 CFR Part 61 in order to become Agreement States for LLW. In some cases they establish regulations covering other engineered options besides shallow land burial.

Dr. Hinze began a line of questioning on the adequacy of AGVs and below ground structures for disposal and isolation of LLW. Mr. Greeves indicated that the staff had evaluated five alternative methods of disposal in 1987, one of which was AGV. Dr. Tokar indicated that all five were viable strategies, although the earth-covered options (such as the earth mounded concrete bunkers) had the advantage of an additional barrier. The ensuing guidance was weighted to the preferable earth-covered option. Dr. Tokar observed that the states were not very interested in the AGV options at that time. Dr. Tokar believed that inserting AGV into the 10 CFR 61 regulation might be a sufficient remedy. Mr. Greeves indicated that resource limitations factored into the choice to focus guidance on earth-mounded situations.

Dr. Steindler questioned whether the states had sufficient flexibilities to include such alternatives explicitly in their regulations. Mr. Greeves responded that states had the flexibility to do so, except in Category 1 areas of 10 CFR Part 61, such as the definitions and the waste classification system. Mr. Greeves indicated that there was no coupling of inclusion of the AGV alternative with any earthen cover requirement.

Dr. Moeller asked whether any comparison had been made for Part 61 facilities to EPA-permitted chemical waste facilities with respect to protection of public health and safety. Mr. Greeves replied that it was not done. Mr. Tokar pointed out that at a special 1987 meeting in Boston, performance assessment (PA) calculations had been made based on certain input assumptions. Under these scenarios, the facilities satisfied Part 61. But in particular,

AGVs resulted in a dose ten times greater than the soil covered alternative, because of the effect of surface water transport. Dr. Tokar offered to provide the report to the Committee.

The discussion turned back to the road map. Some confusion led to Mr. Greeves summarizing the road map as an opening chapter with wiring diagrams with directions to chapters of the SRP and SF&C documents that would list references and information on the licensing review process. The Committee suggested inclusion of the enabling legislation, as well as a bibliography of appropriate NUREGs and other documentation.

Dr. Pomeroy asked whether, through this comport review process, the staff had established adequately clear channels of communication with the states. Mr. Greeves assessed that the level of feedback from the states was appropriate. He went on to describe the dry run working sessions with Nebraska. Mr. Greeves envisioned other such opportunities to go out to the states for licensing program assistance. He also recounted other opportunities for communication such as professional meetings, annual DOE LLW meetings, and Office of Governmental Affairs/State Programs training sessions, etc. Mr. Greeves indicated that he believed that the present level of interaction with the states is adequate.

Dr. Moeller asked about the DOE Low-Level Waste Meeting in New Orleans scheduled for November 1991. Mr. Greeves indicated that he would send the Committee a flyer on it. Mr. Greeves went on to describe the 50-50 distribution of topics on technical as well as on policy issues.

Dr. Pomeroy raised the possibility of using the Center (Center for Nuclear Waste Regulatory Analyses) to review for regulatory inconsistencies in LLW, even though its mission is strictly HLW. Mr. Greeves indicated that this was considered, but that balancing the usefulness against taking the Center's attention away from the HLW program resulted in a decision to forgo this approach. Instead ORNL was contracted for assistance.

The meeting resumed after a short break, and Mr. Greeves opened with a few comments on the topic of leaching resistance of the LLW form. He remarked that there was not a great deal of information available on the subject, but that it was a sufficiently important concern to investigate. Mr. Greeves believes that Part 61 performance objectives and requirements are adequate in this regard, but the subject does bear additional study by RES.

Dr. Tokar discussed the technical position (TP) revision in this subject, and he thought that the concern was not so much resistance to leaching as much as whether the regulations should explicitly require radionuclide containment as in 10 CFR Part 60 HLW

standards. Dr. Tokar is not in favor of such an explicit regulation, but thought there was merit in studying the problem and addressing it by technologies to mitigate or contain the radioactive components similar to chemical stability agents to discourage leaching. He also pointed out that there might be some merit in establishing limits for LLW sites with respect to the amount of long-lived radioactive contaminated material that could be disposed of; i.e., limiting the source term. He also indicated that the staff needed to determine the feasibility of chemical stability, and if so, would it be practical to accomplish?

Dr. Steindler pointed out the fundamental difference between the LLW regulation and other waste regulations. For example, the HLW regulation in Part 60 was a risked-based, multi-barrier system which addressed the two fundamental requirements of limiting the offsite dose (25 mrem/yr and ALARA) and of protecting groundwater. He noted that Part 61 corresponded to a limited risk-based, essentially non-barrier assurance for LLW disposal and management. Dr. Steindler indicated that the means by which the staff achieves the ALARA/25 mrem principle and groundwater protection is secondary to incorporating into 10 CFR 61 the recognition by NRC that package containment and waste isolation and containment must be accomplished. He indicated that the consideration of other engineered alternatives provides even more reason to consider a multiple-barrier approach. He took issue with volume restrictions for radioactive materials (to limit the potential source term) as a practical or dependable strategy.

Dr. Tokar commented that he was not trying to suggest prescriptive requirements for the regulation itself, but that the staff had not yet decided whether the implementation guidance should be configured as a prescriptive mechanism; such as using specific Toxic Characteristic Leaching Procedures (TCLPs). Dr. Tokar explained that his understanding of the intent of Part 61 was a full-system approach where each of the components added to the whole, not as a system of redundancies. To try to recast Part 61 as was done in Part 50 for power plants and Part 60 for HLW would be a fundamental change to the regulation, and should not be considered lightly or done quickly. Dr. Steindler pointed out that the nested fashion of the multiple-barrier, defense-in-depth HLW approach provides some mitigation of the large uncertainties relevant to all radioactive waste disposal strategies.

Mr. Greeves described his perception of the Commission's interest at the time of promulgation of Part 61. He listed:

1. The Commission wanted to get away from specific criteria e.g., the 50 psi number.

2. The Commission showed a preference for overall performance objectives.

3. Multiple barriers for Class C LLW appeared to be a preference.

Mr. Greeves also pointed out that the direction being taken at present seems to use multiple-barrier strategies anyway. He also pointed out that EPA was considering LLW regulations, and that so far, the direction EPA was taking was less specific than NRC's approach with regard to groundwater protection. If such regulations are published, 10 CFR 61 will need to conform.

Dr. Moeller brought up the conflict between 10 CFR 61 and EPA's hazardous waste regulations. He proposed an acknowledgment of groundwater protection as a goal to be added to Part 61 as a means of avoiding problems such as dual regulation. Some discussion followed on the 25 mrem/yr and 4 mrem/yr dose limits for LLW. Ms. Kitty Dragonette, OCM, indicated that in the proposed LLW rule, 4 mrem/yr was the limit for groundwater, but EPA recommended that NRC delete it for the final rule. The 25 mrem/yr applies to a person at the boundary from all pathways; the 4 mrem/yr EPA Clean Water ACt requirement applies to man-made radionuclides in tap water. Ms. Dragonette also pointed out that the Part 61 performance objectives and the NEPA requirements (10 CFR Part 51) provide sufficient basis to require groundwater protection as well as for other pathways, in any specific licensing decision. She also pointed out that the multiple-barrier or component approach was intrinsic to Part 61, but each component did not provide 100% protection levels, as is the case for HLW. She also cautioned that HLW is more uniform than LLW, which had to be reflected in the LLW regulation.

Dr. Steindler indicated that some states and foreign countries use cement containment, so that the LLW variability becomes less of a problem.

Ms. Dragonette pointed out that the licensee could not just repeat the Part 61 performance objectives in their license application; they would need to demonstrate how their design, operation and engineering complied with the performance objectives. In other words, the licensee's performance assessment (PA) would have to specifically show how the objectives were met in specific detail.

Dr. Tokar pointed out that radioactive materials do decay and, because this mechanism of reduction is not available to toxic materials controlled by EPA as hazardous waste, one might expect to see some differences between NRC and EPA in this area.

Dr. Hinze asked what RES needed to do. Dr. Tokar responded by proposing a user need letter regarding chemically stable waste forms or chemical environmental barriers as mechanisms to contain, or at least mitigate somewhat the entry of these materials into the

accessible environment. This kind of information could assist in the decision to specify strategies for the specific implementation of performance objectives.

Dr. Steindler asked how the staff was going to decide whether to change Part 61. Mr. Greeves speculated on the kinds of things that would support rulemakings to change the regulation:

1. If EPA promulgates LLW regulations, Part 61 would need to conform.

2. If RES comes back with proven technologies that would result in a generic ALARA across the board, Part 61 would be revisited.

Dr. Tokar added another possibility. If state-or region-specific situations developed; where inventory restrictions were needed to comply with Part 61, this could raise the specter of multiple facilities instead of just one. Such a situation is sufficiently unattractive that a rule change might be in order.

Dr. Moeller raised the topic of the Committee's recommendation to the Commission. He asked whether a recommendation to add to Part 61 a groundwater protection goal or a goal of retarding radionuclide migration off-site would present a problem to the staff. He also indicated that specifics could be addressed in supporting guidance. Mr. Greeves had no problem with that individually, but indicated that the present regulation would need to be examined by OGC to determine whether that goal is not already in Part 61.

The final topic discussed was the disruption that changing Part 61, or EPA issuing LLW regulations, could cause to the states' progress in meeting the intent of the LLWPAA. Dr. Moeller pointed out that such action could lead to uncertainty which could stifle development of LLW disposal facilities. Dr. Moeller indicated that this could actually increase risks, because of extended storage or illegal disposals.

<u>Summary Points of the Briefing</u>

1. 10 CFR Part 61 was going to be changed to:

   a) Include QA criteria deemed necessary (by June 1991).
   b) Permit other LLW disposal alternatives, such as ABVs and engineered concrete bunkers (by June 1991).

2. LLW guidance would be revised to:

   a) Excise "requirements" not supported by the regulations in 10 CFR Part 61.

b) Revise the SRP with input from the PLASAR reviews and from states (by September 1991).
c) The SRP would be revised to include regulatory diagrams to provide a road map to available guidances.

3. Further research in retardation strategies similar to chemical stability agents is being considered.

4. Explicit standards for radionuclide containment are not envisioned for 10 CFR Part 61, nor is any change to address the need for ground water protection (beyond that already addressed in the rule) being considered.

5. Except for Category 1 areas (definitions, waste classification systems, etc.), states could include other alternatives for LLW site licensing, besides shallow land burial.

## IV. TRIP REPORT OF RECENT VISIT TO THE BARNWELL LOW-LEVEL WASTE SITE (Open)

[Note: Mr. Howard J. Larson was the Designated Federal Official for this portion of the meeting.]

Drs. Pomeroy and Hinze briefed the Committee on their recent visit to the Chem-Nuclear low-level waste facility at Barnwell, South Carolina, and Chem-Nuclear's Environmental Laboratory.

Dr. Pomeroy observed that Barnwell seems to be a well managed facility. Dr. Pomeroy recommended that the Committee be briefed on NRC's oversight and monitoring of existing low-level waste disposal facilities through the Agreement State Program. Focus should be on the coordination between NRC headquarters, the NRC regional offices, and the cognizant state authorities. Dr. Moeller recommended that this issue be placed on the list of topics for future meetings.

## V. TREATMENT OF HUMAN INTRUSION FOR A HLW REPOSITORY (Open)

[Note: Mr. Richard Major was the Designated Federal Official for this portion of the meeting.]

Mr. Steven Mays, ACRS/ACNW Fellow, summarized his draft report that was requested as a follow-up item from the 26th ACNW meeting held on December 11-12, 1990. This report was requested to provide some perspective to handling the potential for human intrusion (HI) at a high-level radioactive waste (HLW) repository in the context of the EPA standards in 40 CFR Part 191.

Dr. Moeller complimented Mr. Mays on his effort to date on the draft report, and he mentioned that he had discussed some revisions earlier with Mr. Mays. Mr. Mays indicated that he had made some changes to the report that were not reflected in the version of the report in the Committee's notebook.

Mr. Mays discussed his approach of comparing the HLW human intrusion problem with NRC's approach of dealing with sabotage at nuclear power plants. Mr. Mays referred to "acts of commission," in a probabilistic risk assessment as forming a subset of the kinds of potential activities spanned by the human intrusion concept. Mr. Mays compared the elements of probabilistic risk assessment (PRA) with those elements of performance assessment (PA) for a HLW repository. In the end, both PA and PRA result in similar results: the PRA produces a "risk" curve, and the PA produces a complementary cumulative distribution function (CCDF).

However, Mr. Mays pointed out that significant differences existed between the two approaches, specifically with respect to the human acts of commission that bypass the engineered features to limit the likelihood of releases of radioactive materials into the environment. Furthermore, he pointed out that EPA's regulations prescribe that HI be included in a quantitative analysis of performance assessment, and also specify how the effects of HI were to be calculated. Mr. Mays indicated that such specific frequency stipulations were not imposed for any other aspects of the repository's PA. Current PRA practice excludes acts of commission from the quantitative analysis.

In contrast, Mr. Mays indicated that NRC used a deterministic approach, as opposed to the EPA's probabilistic approach to power plant security. The NRC's evaluations are supported by qualitative use of probabilistic analysis. Qualitative analysis leads to identification of locations, whose failure -- singly or in combination -- due to sabotage would lead to radioactive releases. Probabilistic techniques (fault tree models) are used by the NRC staff to assess the adequacy of licensee security plan submittals.

Dr. Steindler inquired whether the EPA concerned itself with potential HI under other regulatory areas, such as solid waste landfills. NRC staff indicted that it might be useful to survey other agencies in this regard.

Dr. Hinze inquired whether any relevant literature from other countries had been reviewed. Mr. Mays responded that he had understood that he was to narrow the focus to EPA's HLW regulatory environment. Dr. Moeller and Mr. Howard Larson, ACNW staff, cited the Paris Symposium Report on HI, and Dr. Moeller suggested the International Commission on Radiological Protection (ICRP) Report No. 46 [Radiation Protection Principles for the Disposal of Solid

Radioactive Waste] as suggested references for further review of how HI is treated on the international arena. Dr. Hinze recommended that Mr. Mays perform a more extensive literature search in the subject.

Dr. Hinze noted that the quantitative constraints on HI evaluation were relegated to an appendix; and should thus be viewed more as guidance towards a worst-case scenario. Mr. Mays pointed out that by specifying two specific drilling rates depending on site characteristics, it would be difficult to defend anything else. Furthermore, Mr. Mays pointed out that all parties conducting PAs to date have used EPA's frequencies without modification. Dr. Hinze recalled that Mr. Floyd Galpin, EPA, had characterized the frequencies as only being guidance. Dr. Moeller proposed highlighting this problem in a letter (to EPA) being drafted on the subject of regulatory stringency.

Dr. Hinze pursued his inquiry on the critical differences between the HLW HI and the power plant sabotage scenarios. He pointed out that there were statistics (not just EPA's) on drilling that might be useful to quantify frequencies and areal placement. He also remarked that it would be difficult to compare the relationship between natural resource potential and exploratory drilling to the situation of sabotage.

Mr. Mays acknowledged this last point, however he was skeptical on the applicability of the statistical data on drilling to scenarios involving the 10,000 year performance period in the EPA standards. Mr. Mays indicated that he was not comfortable with any numerical estimate that could be used as part of a quantitative analysis. He also was skeptical of trying to specify all the possibilities of sabotage along with the associated frequencies or potential probabilities for each option.

Dr. Hinze indicated that he was not suggesting that, but rather that there were correlations between population density and frequency of drill holes, for example. He suggested that a quantitative analysis could be used to eliminate potential repository sites where resource development potential or even sabotage could compromise the engineered repository barrier system.

Dr. Moeller suggested that the HI potential be separately treated from the quantitative PA for a HLW repository. He believed that if the draft report could successfully describe NRC's approach to sabotage, then there should be no further obligation to address HI quantitatively in the PA.

Dr. Steindler commented on the difficulty of dealing with HI effects given the 10,000-year domain of consideration. He speculated on how EPA could perceive HI as a constant potential or threat and on how EPA factored it into their regulation. Mr. Mays

thought that EPA should follow the same deterministic approach as did the NRC, which would include elicitation of experts to assist in identifying, screening and designing for scenarios. Furthermore, the licensing requirements for the repository should address the repository design to survive an expected threat of HI Mr. Mays recommended that the regulation should identify the institutional passive or active controls to minimize the impacts from HI.

Dr. Steindler remarked that there is no option to consider Mr. May's recommendation. The performance requirements extend too far in time to rely on active responses to HI or its impacts. Because of the regulatory limitations, a number of overly prescriptive design features are imposed in order to comply with the EPA standards.

Mr. Mays still thought that it was preferable to establish active controls for whatever period of time possible in conjunction with passive controls. Dr. Steindler asked for clarification on passive controls with respect to the repository. Mr. Mays referred to the "defense-in-depth" concept in nuclear power plant construction. Dr. Steindler was concerned that in revising the approach to allow for mitigating credit for active/passive institutional controls, it would completely turn over the entire HLW regulation. Mr. Mays indicated that EPA should specify active and passive controls rather than require quantitative analyses to handle HI impacts.

The discussion returned to ICRP Publication 46, paragraph 101, that supports passive means to reduce the potential for HI. In addition to signs and markers to discourage inadvertent intrusion, preserving the knowledge of the repository's existence, location and characteristics is identified as the most straight forward means to reduce the probability of HI.

Dr. Pomeroy recommended that the Committee review the draft report more closely, in light of the present discussion. Dr. Moeller agreed. Mr. Fraley described the mechanism of having to provide the report to the Commission, in order to transmit it formally. Dr. Hinze and Dr. Moeller discussed means of accelerating the process to provide the report to EPA in time to be factored into the revised EPA regulations (presently in remand). Dr. Moeller suggested sending the draft report with disclaimers to the Chairman, but pointing out the urgency of transmitting the information to EPA in preliminary draft form. Dr. Hinze pointed out that the memorandum to the Chairman should indicate that the Committee still had ongoing considerations. Dr. Moeller agreed. Dr. Steindler recommended that the last four sentences should either be revised or removed, because EPA claims that they are already performing those activities therein described.

Mr. Mays remarked that there is no probability that drilling is the HI event of merit. Dr. Steindler remarked that the inability to solve the HI problem may indicate inadequacy in other areas, as well. Mr. Mays pointed out that HI scenarios result in lack of compliance with the standards; without addressing the HI issue quantitatively in the PA, compliance is possible. Dr. Steindler was concerned that reliance on passive controls could lead to canister designs of three feet thick tungsten to resist modern drilling.

Mr. Fraley recommended that EPA should model HI as NRC has with sabotage. He went on to say that NRC or DOE should be demonstrating that the repository will perform properly. He indicated that EPA's responsibility was to promulgate "generally applicable" standards for release, and that they should delete implementation regimes such as specifying drilling frequencies.

It was agreed that the last paragraph on page five (5) was to be deleted and that the Committee would review the draft report more closely.

VI. CONFORMING 10 CFR PART 60, HIGH-LEVEL WASTE REPOSITORY SUBSYSTEM PERFORMANCE REQUIREMENTS, WITH THE EPA HIGH-LEVEL WASTE STANDARDS (Open)

The Committee was provided with a draft report regarding Comments on Subsystem Requirements. The members agreed to review the draft report and submit their comments prior to the next full Committee meeting.

VII. WASTE MANAGEMENT '91 SYMPOSIUM (Open)

The Committee discussed and revised a draft paper to be presented at the Waste Management '91 Symposium in Tucson, Arizona, by Dr. Moeller. Members were requested to provide comments to Mr. Howard Larson prior to the next meeting.

VI. EXECUTIVE SESSION (Open)

A. REPORTS AND LETTER

- Stringency of U.S. Environmental Protection Agency High-Level Radioactive Waste Repository Standards (Report to Chairman Carr, dated January 29, 1991.)

  This report provides a more detailed basis for the statements, made in several previous ACNW reports,

that the standards developed by EPA for a high-level radioactive waste (HLW) repository are overly stringent.

- Guidance on Limits on Doses and Risks to Individual Members of the Population (Report to Chairman Carr, dated January 29, 1991.)

  This report provides additional clarification for the recommendation, made in several previous ACNW reports, that EPA consider incorporating some guidance related to limits on doses and risks to individual members of the general population into its high-level radioactive waste repository standards.

- Priority Issues on Radioactive Waste Management (Report to Chairman Carr, dated January 29, 1991.)

  This report identifies the technical issues that the Committee believes deserve priority attention for the immediate future. The major issues include standards and criteria for a high-level radioactive waste repository, site characterization of the HLW repository, and performance assessments for both the HLW repository and LLW disposal facilities.

- Letter to Mr. Thomas J. Kennedy, Executive Director, Association of State and Territorial Solid Waste Management Officials (Letter to Thomas Kelly from Dade Moeller, dated January 29, 1991.)

  This letter acknowledges the members' interest in learning more about the Association of State and Territorial Solid Waste Management Officials' position on the NRC policy on "Below Regulatory Concern."

B. ACNW Future Activities (Open)

- The Committee discussed future Committee interactions with the Nuclear Waste Technical Review Board (NWTRB). Dr. Moeller will contact the Chairman of the NWTRB to discuss the possibility of coordinated sessions on items of mutual interest to both Committees.

- The Committee agreed to invite the low-level waste coordinator from Massachusetts to brief the Committee on the development of the state's strategic plan for low-level waste disposal. A briefing is planned for the near future.

- The Committee reaffirmed its commitment to visit the Center for Nuclear Waste Regulatory Analyses in San Antonio, Texas, for an update on the Center's activities.

- The Committee discussed the annual NRC report on radioactive materials released from nuclear power plants (NUREG/CR-2907). Concern was expressed on the uniformity in monitoring and reporting releases. The Committee expressed interest in having a briefing on this subject at a later date.

- The members agreed to the proposed dates for prescheduled meetings with the Commissioners:

  March 22, 1991
  June 20, 1991
  October 24, 1991

- The Committee agreed to reschedule the next full Committee meeting to the new date of February 21-22, 1991.

C. Future Agenda

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

The 27th ACNW meeting was adjourned at 1:20 p.m. on Friday, January 25, 1990.

## APPENDIX I: MEETING ATTENDEES

27TH ACNW MEETING
JANUARY 23-25, 1991

| ACNW MEMBERS | 1st Day | 2nd Day | 3rd Day |
|---|---|---|---|
| Dr. William J. Hinze | X | X | X |
| Dr. Dade W. Moeller | X | X | X |
| Dr. Martin J. Steindler | X | X | X |
| Dr. Paul W. Pomeroy | X | X | X |

| CONSULTANTS | | | |
|---|---|---|---|
| Dr. David Okrent | | | |
| Dr. Donald Orth | X | X | |
| Mr. Eugene Voiland | | | |

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Ronald Uleck
Ronald Ballard
John Greeves

FULL TEXT ASCII SCAN

## OTHER AGENCIES AND GENERAL PUBLIC

| | |
|---|---|
| Connie Macaluso | Department of Energy |
| G. W. Roles | |
| Kim Barrett | Bechtel/Licensing |
| Glen Bradley | EG&G Idaho |
| Jeanne Krieger | duPont - Merck |
| Peter Stevens | USGS - Reston |
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| Wayne Stone | R. F. Weston |
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| Alec McBride | Environmental Protection Agency |
| Susan Jones | Environmental Protection Agency |
| Rich LaShier | Environmental Protection Agency |
| Gus Kosinski | Viginia Polytechnic Institute |
| Paul M. Krishna | Battelle |
| William J. Walker | National Institutes of Health |
| Edward H. Rau | National Institutes of Health |
| Maureen Conley | Radioactive Exchange |
| Christine Key | Baltimore Gas & Electric |
| D. H. Groelsema | NUG Inc. |
| John F. Cooper | Laurence Livermore National Lab |
| Kathleen Hart | Nuclear Waste News |
| E. Fotopoulos | SERCH Licensing, Bechtel |
| Andy Muir | ICF Technology |
| David Siefren | ERM |
| Stan Echols | Winston & Strawn |
| R. J. Tomonto | Florida Power & Light |
| Pat Warc | Bureau of National Affairs |
| Dorothy Michaels | |
| Nyssa Tussing | Mayhi, Brown & Platt |
| Rex Brown | Decision Science |
| John Napier | Oak Ridge National Laboratory |
| Ricardo Palabrica | Weston/UE&C |
| V. Lewis Killpack | Weston/UE&C |
| Warner North | Decision Focus, Inc. |

## APPENDIX II. FUTURE AGENDA

28th ACNW Committee Meeting February 21-22, 1991 (Tentative Agenda)

Substantially Complete Containment Concept - The Committee will be briefed by the NRC staff and the Center for Nuclear Waste Regulatory Analyses staff on a technical feasibility study on the "substantially complete containment" concept. This briefing is for information only.

Expert Judgment - The Committee will discuss the insights gained from a recent ACNW Working Group meeting on how expert judgment can be used in conducting performance assessments used in the licensing of high-level waste and low-level waste repositories.

Subsystem Performance Requirements - The Committee will continue discussions on the conformance of the 10 CFR Part 60, high-level waste repository subsystem performance requirements with the EPA high-level waste standards.

Revisions to 10 CFR Part 20 - The Committee will be briefed on recent revisions to 10 CFR Part 20, "Standards for Protection Against Radiation." The focus will be on changes that effect requirements for waste disposal.

Annual Report on Radioactive Materials Released from Nuclear Power Plants - The Committee will be briefed by the NRC staff regarding the NRC staff report "Annual Report on Radioactive Materials Released from Nuclear Power Plants," (NUREG/CR-2907).

Carbon-14 Release and Migration - The Committee will continue its discussions on potential carbon-14 release and migration relative to a high-level waste repository.

Leaching Resistance of Waste Form - The Committee will respond to a recent Staff Requirements Memorandum (SRM) concerning revising Part 61 with regards to leaching resistance of the LLW form.

Human Intrusion - The Committee will continue its discussion of a report on human intrusion at a HLW repository and the lessons learned from the treatment of similar scenarios in nuclear power plant licensing.

Committee Activities - The Committee will discuss anticipated and proposed Committee activities, future meeting agenda, and organizational matters, as appropriate. The members will also discuss matters and specific issues that were not completed during previous meetings as time and availability of information permit.

**Working Group Meetings** (Dates to be determined)

Geologic Dating - The Working Group will review and discuss the problems and limitations associated with the various Quaternary dating methods to be used in site characterization of a HLW repository.

Integration of Geophysics into Site Characterization of a High-Level Waste Repository - The Working Group will focus on what geophysical testing can do to aid in the resolution of issues associated with potentially adverse conditions and will include a discussion of the DOE "white paper" on geophysical studies, NRC Site Characterization Analysis comments on the DOE geophysical testing program, geologic information needed for site characterization, and what specific geophysical methods may be most applicable.

Long-Term Climate Change - The Working Group will review and discuss potential long-range climate changes and their impact on performance assessments and ultimately on the suitability of the proposed HLW repository.

## APPENDIX III. DOCUMENTS RECEIVED

### A. Documents Received from Presenters and ACNW Staff

| AGENDA ITEM NO. | | DOCUMENTS |
|---|---|---|
| 1 | 1. | Memorandum to Dade Moeller from Martin Steindler, dated January 20, 1991, re Comments on ACNW Priorities for the Near Future [Predecisional Draft] |
| | 1a. | Items of Possible Interest to ACNW Members, dated January 23, 1991, prepared by Dade Moeller [Draft #1] |
| 2 | 2. | Graph entitled "NIH Mixed Waste Production, January 1986 through December 1990", undated |
| | 3. | The NIH Record, September 18, 1990, Vol. XLII, No. 19 |
| | 4. | Draft Article Entitled, "The Mixed Waste Crisis", for Wasteline (NIH) |
| | 5. | Article Entitled, "Boxes for Burning", Wasteline (NIH), August 1990 |
| | 6. | Health Physics Society Position Statement, Comments on the NRC Policy Statement on the Exemption of Very Low-Level Radioactive Materials, Wastes, and Practices (BRC), from HPS Newsletter, February 1991 |
| | 7. | Briefing on Mixed Wastes, dated January 23, 1991, EPA [Viewgraphs] |
| | 8. | Mixed Waste - A Generator's Perspective, by Jeanne Krieger, duPont Medical Products [Viewgraphs] |
| | 9. | Hazardous and Mixed Waste Treatment at Savannah River Site, by C. A. Langton, undated [Viewgraphs] |
| | 9a. | Hazardous Waste/Mixed Waste Disposal Facility - Recommended Treatments and Related Waste Management Issues, WSRC-RP-90-1143, November 16, 1990 |
| 6 | 10. | Conformity of Guidance on Low-Level Waste Disposal Facilities with the Requirements of 10 CFR Part 61, dated January 24, 1991, by John Greeves, NMSS [Viewgraphs] |
| 8 | 11. | Comparison of Probabilistic Techniques for Regulating Nuclear Power Plant Protection Against Sabotage and High-Level Waste Repository Protection Against Human Intrusion, dated January 1991, by Steven Mays [ACNW Meeting Handout No. 8] [Official Use Only] |
| | 12. | Comparison of Probabilistic Techniques for Regulating Nuclear Power Plant Protection Against Sabotage and High-Level Waste Repository Protection Against Human Intrusion, dated January 24, 1991, by Steven Mays [Viewgraphs] |

B. Meeting Notebook Contents Listed by Tab Number

| TAB | | CONTENTS |
|---|---|---|
| 1 | 1. | Introductory Statement by ACNW Chairman for 27th Meeting, dated January 23, 1991 |
| | 2. | Items of Current Interest, undated |
| | 3. | Introductory Statement by ACNW Chairman for 27th Meeting, dated January 24, 1991 |
| 2 | 4. | Status Report on Working Group Session on Regulation of Mixed Wastes, dated January 23, 1991 |
| | 5. | Schedule and Outline for Mixed Waste Working Group Session |
| | 6. | Draft #5 ACNW Letter Report to Chairman Carr, dated December 14, 1990, re Regulation of Mixed Wastes [Official Use Only] |
| | 7. | Partial Transcript of ACNW Meeting with NRC Commission on December 11, 1990, Pgs. 59-63 |
| | 8. | Letter to William Reilly, Administrator, EPA, from Chairman Kenneth Carr, dated June 21, 1990, re Resolution of EPA and NRC Interface Issues, with attachment |
| | 9. | Federal Register Notice; Friday, September 23, 1988, 37045-37048, "Clarification of Interim Status Qualification Requirements for the Hazardous Components of Radioactive Mixed Wastes" |
| | 10. | Figure 6 and Table 15, Illinois Department of Nuclear Safety, October, 1990, "1989 Annual Survey Report" |
| | 11. | Memorandum to (Attached List) from Robert Bernero, NMSS, dated December 28, 1990, re EPA Guidance on the Land Disposal Restrictions Effects on the Storage and Disposal of Mixed Waste, with attachment |
| | 12. | Appendix 3, "Mixed Waste Management" (from proposed Revision 3 to ANSI Standard 55.1, Solid Radioactive Waste Processing System for Light Water Cooled Reactor Plants) |
| | 13. | Articles from Nuclear Waste News, November 8, 1990 and January 3, 1991 |
| 3 | 14. | Status Report on ACNW Top Three Priorities for Waste, dated January 23, 1991 |
| | 15. | Memorandum for Raymond Fraley from Chairman Kenneth Carr, dated December 10, 1990, re COMKC-90-17 - |

Terms of Appointment for ACNW Members

16. Draft ACNW Letter Report for Chairman Carr, dated January 10, 1991, re Priority Issues on Radioactive Waste Management
17. Memorandum for Richard Major from Dade Moeller, dated January 3, 1991, re Priorities on Low-Level Radioactive Waste
18. Note for Dade Moeller from Charlotte Abrams, undated, re Priorities
19. Letter for Dade Moeller from Paul Pomeroy, dated January 2, 1991, re Priority Issues on Radioactive Waste Management
20. Note for Charlotte Abrams from Bill Hinze, dated January 3, 1991, re First Quarter 1991 High Priority Activities

4 21. Status Report on ACNW Presentation at the Waste Management '91 Symposium, Tucson, Arizona, February 26, 1991, undated
22. Waste Management '91 Agenda for Session IX, Tuesday, February 26, 1991
23. Draft of Proposed Paper, dated January 10, 1991

6 24. Status Report on Conformity of Guidance on Low-Level Waste Disposal Facilities with the Requirements of 10 CFR Part 61, undated
25. Memorandum for ACNW Members from Howard Larson, dated October 16, 1990, re SECY-90-331, "Conformity of Guidance on Low-Level Waste Disposal Facilities with the Requirements of 10 CFR Part 61", with attachment
26. Memorandum for ACNW Members from Charlotte Abrams, dated October 10, 1990, re Briefing on Conformity of Guidance on Low-Level Waste Disposal Facilities with the Requirements of 10 CFR Part 61, with attachments
27. SECY-90-331 [see item 25]
28. Memorandum for Dade Moeller from Samuel Chilk, dated December 31, 1990, re Staff Requirements - Periodic Meeting with ACNW, December 13, 1990

7 29. Status Report on Trip to Barnwell, South Carolina, dated January 23, 1991
30. Letter for William House, Chem-Nuclear Systems, from Paul Lohaus, NMSS, dated December 19, 1990, re Special Nuclear Materials License, with attachment

8 31. Status Report on Human Intrusion for a HLW Repository, undated
32. Memorandum for ACNW Members from Steve Mays, dated

January 15, 1991, re Human Intrusion Versus Sabotage, with attachment [Official Use Only]

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33. Agenda Topics for Next Four Months, February - March 1991
34. Working Group Meeting Topics, undated
35. Tentative 1991 Dates for Meetings with Commission, undated
36. Other Unscheduled Topics, undated

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37. Draft ACNW Letter Report for Chairman Carr, dated January 10, 1991, re Priority Issues on Radioactive Waste Management [Official Use Only]
38. Draft #5 ACNW Letter Report for Chairman Carr, dated December 14, 1990, re Regulation of Mixed Wastes [Official Use Only]
39. Draft ACNW Letter Report for Chairman Carr, dated January 10, 1991, re Comments on Subsystem Requirements -- Title 10, CFR, Part 60.113 [Official Use Only]
40. Draft ACNW Letter Report for Chairman Carr, dated January 7, 1991, re Guidance on Calculation of Collective Doses
41. Memorandum for Richard Major from Dade Moeller, dated January 9, 1991, re Draft of Proposed ACNW Letter on Individual Dose and Risk Limits, with attachment [Official Use Only]
42. Draft Memorandum for Dade Moeller from Martin Steindler, dated December 12, 1990, re Summary of Working Group Meeting on Carbon-14 [Official Use Only]
43. Draft ACNW Letter Report for Chairman Carr, dated December 10, 1991, re Stringency of EPA HLW Repository Standards [Official Use Only]
44. Memorandum for Dade Moeller from Samuel Chilk, dated December 31, 1991, re Staff Requirements - Periodic Meeting with ACNW, December 13, 1990
45. Draft Memorandum for Dade Moeller from Martin Steindler, dated December 12, 1990, re Outline of Topics on the Technical Position on Low-Level Waste Form [Official Use Only]