



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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August 9, 1996

MEMORANDUM TO: Michael J. Bell, Chief
ENGB/DWM/NMSS

THRU: Richard A. Weller, Section Leader
Engineering and Material Section
ENGB/DWM/NMSS

FROM: *Ahn*
Tae M. Ahn, Materials Engineer
Engineering and Material Section
ENGB/DWM/NMSS

SUBJECT: TRIP REPORT ON THE AMERICAN SOCIETY FOR TESTING AND MATERIALS
C.26 FUEL CYCLE MEETING, JULY 29 TO 30, 1996, BALTIMORE, MD

PURPOSE:

The purpose of this trip would: 1) update my knowledge in high-level waste (HLW), 2) be useful in my current participation in the HLW disposal program, and 3) enable me to exchange my knowledge with other participants to establish more objective views.

SUMMARY:

The American Society for Testing and Materials (ASTM) committee meeting was held in Baltimore, MD, from July 28 to August 1, 1996. I participated in two subcommittee meetings of our interests under C26 Fuel Cycle. The subcommittees were C26.07 Waste Materials and C16.13 Repository Waste Package Materials Testing. They were held together on July 29-30 (meeting agenda is attached). The following summarizes discussions had during these meetings:

- The Office of Management and Budget Circular A-119 on "Federal Participation in the Development and Use of Voluntary Standards" has become law H. R. 2196, the "Technology Transfer Improvements Act of 1995." The law directs that all Federal agencies and departments shall use technical standards that are developed or adopted by voluntary consensus standards bodies, using such technical standards as a means to carry out policy objectives or activities determined by the agencies and departments.
- The subcommittees reviewed the latest draft of ASTM C1174-91, "Standard Practice for Prediction of the Long-Term Behavior of Waste Package Materials Including Waste Forms Used in the Geologic Disposal of High-Level Nuclear Waste." This standard provides general methodologies for the prediction of the long-term behavior of waste package materials.

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- A new task force has formed to develop a guide for standardized waste package designs for interim storage. The task force will consider waste package designs for normal and accidental conditions for up to 100 years. Methods for longer term prediction, ASTM C1174-91, will be incorporated in part in this guide.
- The subcommittees are developing three guides related to interim storage and repository disposal of metallic uranium-based spent fuels. The metallic fuel has less than 10 volume percent of the total U.S. high-level waste. Nonetheless, this fuel is potentially problematic because of its pyrophoric nature. Metallic uranium is very reactive with oxygen releasing a large amount of heat. However, it has been also understood that the passive oxide formed will stop continuous oxidation. Unfortunately, recent detailed analyses do not guarantee this passivity behavior. Hydride formation may deteriorate the passive oxide, allowing a continuous oxidation.
- The Department of Energy (DOE) is currently characterizing DOE fuels such as N-reactor fuel. DOE fuels are more corroded than Light Water Reactor fuels with significant deterioration. Argonne National Laboratory scientists presented characterization methods for these fuels. We will also receive progress reports prepared by the Pacific Northwest National Laboratory.
- Several ongoing standards development efforts on waste form characterization were reviewed. These standards are on: (a) leaching and crystallization for high-level waste, and (b) leaching for class-C, mixed, and low-level waste.
- The committee is pursuing to coordinate American National Standards Institute committees and foreign standardization organizations.

The subcommittees have assigned me to work tentatively in the areas of: (a) C1174-91, Repository Disposal; (b) Interim Storage; (c) Metallic Fuel; and (d) Leaching. The expected works are mostly draft reviews. The NRC co-participant, C. Interrante of the Spent Fuel Project Office is preparing an NMSS Item of Interest about this meeting, and the item will incorporate this summary.

Attachments: As stated

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Attachment

**ASTM July Meeting
Holiday Inn - Inner Harbor
Baltimore, Maryland
July 28 - August 1, 1996**

**Meeting Agenda, July 29th and 30th, 1996
ASTM Sub-Committee C26.13, Repository Waste**

The C26.13 Sub-Committee meeting will be held on Monday, July 29th from 9:30 AM to 5:00 PM and jointly with C26.07 on Tuesday, July 30th from 8:00 AM to 5:00 PM at the Holiday Inn - Inner Harbor in Baltimore, Maryland.

Monday AM/PM

- Introductions: Members/Visitors All
- Review/Approval of Atlanta Meeting Minutes Gary Smith
- Announcements from C26 Executive and Long-Range Planning Subcommittee meeting, Sunday, July 28th. Gary Smith
- Review Latest Draft of C 1174 - 91 "Standard Practice for Prediction of the Long-Term Behavior of Waste Package Materials Including Waste Forms Used in the Geologic Disposal of High-Level Nuclear Waste." Draft not available for pre-meeting mailing; will be sent via e-mail before meeting. Chuck Interrante
- Presentation on the French experimental AFNOR X 30-407 Norma, "Methodology for Long Term Behavior Studies," primarily devoted to hazardous waste forms, derived from experience on long-term behavior studies of nuclear waste glasses. Draft attached. Dr.'s Gin & Gordon
- Review Incorporated Changes to C 1285 - 94 titled "Standard Test Methods for Determining Chemical Durability of Nuclear Waste Glasses: The Product Consistency Test (PCT)" Carol Jantzen
- Status and Presentation from Task Group Working on a "forward reaction rate" constant standard. Literature review report addressing the measurement of the forward dissolution rate is attached. Bill Ebert
- Presentation on developing standardized test methods to address the waste form radionuclide release criteria for repository disposal as required by the Office of Civilian Radioactive Waste Management (RW). Abstract attached. David Chamberlain
- Membership/Administrative Items Gary Smith
- Non-Agenda Items All

Tuesday AM

- Status and Presentation from Task Group Working on Draft Standards for Passivation and Characterization of Spent Nuclear Fuel. Three draft standards titled "Standard Guide for Demonstrating Conformance to Acceptance Criteria for Metallic Uranium-Based Spent Nuclear Fuels for Emplacement in a Geologic Repository", "Standard Guide for the Characterization of Metallic Spent Nuclear Fuel for Extended Interim Storage Prior to Emplacement in a Geologic Repository" and "Defining Passivation Requirements for Metallic Spent Nuclear Fuel for Extended Interim Storage Prior to Geologic Disposal" are attached. Tom Thornton

Tuesday AM (cont.)

- A discussion on possibly writing ASTM standards to address HLW and spent fuel acceptance criteria for on-site Monitored Retrievable Storage/Interim Spent Fuel Storage Installation (MRS/ISFSI) storage. The discussion will address aspects as they relate to HLW, DOE-owned metallic spent fuel, and commercial LWR oxide-based spent fuel. See attached executive summary from NWTRB report titled "Disposal and Storage of Spent Nuclear Fuel - Finding the Right Balance" for some background information.

Chuck Interrante/Tom Thornton

Tuesday PM

- Status and Presentation from Task Group Working on C 1220-92 "Test Method for Static Leaching of Monolithic Waste Forms for Disposal of Radioactive Waste" will be presented in the C26.07 subcommittee meeting.

Bill Ebert et al.

Agenda for ASTM C26.07 Subcommittee Meeting

Tuesday PM

- Introductions
- Review Minutes of Atlanta (Enclosed) Blauvelt
- Review Latest Draft of DOE M-100 Waste Container Standard Specification Blauvelt
- Review Latest Draft of "Terminology Relating to Mixed (Radioactive/Hazardous) Waste." Greenman
- Review Ballot of the Splitting Tensile Strength Standard Test Method All
- Status of the BNL Report on Mixed Waste Form Performance and ASTM Test Methods Blauvelt
- Resolution of Negatives on the "Guide to Characterization of Radioactive Waste" Pickett
- MCC-1 (ASTM C 1174 - 91) Revision Strategy Ebert, et al.
- Review of Draft Guide Regarding Characterization Needs for Mixed Low Level Waste for Vitrification Jantzen
- Application of ASTM Standards to
 - Privatization of Low Level Waste Treatment
 - DNFSB 94-2All
- In Situ Mixed Waste Remediation Standard Luey/Smith
- Liaison Activities with COGEMA et al. Grisez/Blauvelt
- Other Proposed Activities
- Membership/Administrative Items
- Non-Agenda Items/Adjourn