

August 26, 2004

MEMORANDUM TO: M. Wayne Hodges, Director  
Technical Review Directorate

THRU: Jack Guttman, Chief /RA/  
Technical Review Section B

FROM: Christopher S. Bajwa, Thermal Engineer  
Spent Fuel Project Office, NMSS

SUBJECT: TRIP REPORT: ASME PRESSURE VESSELS AND PIPING  
CONFERENCE, JULY 25 - 30, 2004

On July 27, 2004, I presented a technical paper at the American Society of Mechanical Engineers (ASME) Pressure Vessels and Piping (PVP) Conference in San Diego, California. The presentation summarized portions of the work that the staff has completed to date on the Baltimore tunnel fire event, as well as reiterated the staff's conclusions that there would be no release of radioactive material to the environment for the two cask designs discussed, had those designs been exposed to a fire similar to the fire that occurred in Baltimore.

Thirty-one papers were presented over nine sessions under the subject of "Transportation, Storage, and Disposal of Radioactive Materials." I served as a Vice-Chair and a Chair, respectively, for two of the nine sessions. I also attended the Fifth International Symposium on Computational Technologies for Fluid/Thermal/Stress Systems with Industrial Applications - CFD Fundamentals - II. Finally, I attended a Computational Fluid Dynamics (CFD) tutorial for ANSYS-CFX5. In addition to the technical sessions, I attended a portion of the PVP Division Committee meeting for the Operations, Applications, and Components (OAC) Technical Committee, and the majority of the PVP Division Codes and Standards Technical Committee as the OAC liaison.

This conference enabled me to interact with experts in the design, fabrication, analysis, testing, and operations aspects of radioactive material packages, as well as become more informed on the various issues that the industry and regulatory bodies are facing today. This provided me with a better appreciation of the challenges facing users of packages in the day-to-day storage and transportation of radioactive materials. In addition, further insight was gained into the current issues facing the long-term disposal of radioactive waste at the proposed Yucca Mountain facility.

Based on lessons learned from the Private Fuel Storage licensing hearings, it is imperative that staff have a thorough technical understanding of the bases used in establishing codes and standards. The ASME PVP conference provided an excellent opportunity to broaden my understanding and knowledge of code development and more specifically, the current practices in the storage, transportation, and disposal of radioactive material, which serves to prepare me for supporting staff positions before the public and the Atomic Safety Licensing Board (ASLB).

Attachments: Trip Report

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On July 27, 2004, I made a presentation at the American Society of Mechanical Engineers (ASME) Pressure Vessels and Piping (PVP) Conference in San Diego, California, entitled "Thermal Response of Various Spent Nuclear Fuel Transportation Cask Designs to the 2001 Baltimore Tunnel Fire Event." The presentation summarized portions of the work that the staff has completed to date on the Baltimore tunnel fire event, as well as reiterated the staff's conclusions that there would be no release of radioactive material to the environment for the two cask designs discussed, had those designs been exposed to a fire similar to the fire that occurred in Baltimore.

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<b>NAME:</b>	CBajwa		JGuttman				
<b>DATE:</b>	08/25/04		08/26/04				

**Subject:**

ASME Pressure Vessels and Piping (PVP) Conference

**Dates of Travel:**

July 25-30, 2004, San Diego, CA

**Author, Title, and Agency Affiliation:**

Christopher S. Bajwa, Thermal Engineer, Spent Fuel Project Office

**Background & Purpose of Trip:**

The staff made a technical presentation at the ASME Pressure Vessel and Piping Conference in the session entitled, "Transportation, Storage, and Disposal of Radioactive Materials IV: Thermodynamic Issues" (OAC-01D). The presentation entitled, "Thermal Response of Various Spent Nuclear Fuel Transportation Cask Designs to the 2001 Baltimore Tunnel Fire Event," summarized portions of the analyses completed by the staff to date on the effects of the 2001 Baltimore tunnel fire on two NRC certified spent fuel transportation cask designs.

The presentation provided details of the staff's analysis of two transportation casks exposed to a 7-hour tunnel fire scenario, caused by the burning of 28,600 gallons of liquid Tripropylene, which was the fuel source of the Baltimore tunnel fire. The results demonstrated that both cask designs would endure the fire with no resulting leaks of radioactivity to the environment.

**Discussion:**

Thirty-one papers were presented as part of the Transportation, Storage and Disposal of Radioactive Materials sessions for the Operations, Applications, and Components (OAC) Technical Committee. Sessions were held on a wide range of topics including Gas Generation Issues, Corrosion Issues, Thermal Issues, and Operational Issues. A copy of the final program with the Transportation, Storage, and Disposal of Radioactive Material sessions highlighted is attached.

Representatives from private industry, universities, international regulatory agencies, and Department of Energy (DOE) laboratories participated in the conference. Presentations were provided by staff from Lawrence Livermore National Laboratory, Idaho National Laboratories, Institut de Radioprotection et de Sûreté Nucléaire, Savannah River National Laboratories, Duratek Federal Services, BWXT Y-12 National Security Complex, Pacific Northwest National Laboratories, and the University of Nevada Reno, as well as the University of Tulsa.

Papers dealing with radioactive waste storage, transportation, and security issues, including both structural and thermal issues, were presented. Some of the papers included: "Behavior of Nuclear Material Casks Under Explosive Loading," "ES-3100: A New Generation Shipping Container for Bulk Highly Enriched Uranium and Other Fissile Materials," "Validation of the Stress Corrosion Cracking Model for High Level Radioactive Waste Packages," "Drop Test Results for the Combustion Engineering Model No. ABB 2901 Fuel Pellet Shipping Package," "Dynamic Analysis of Radioactive Material Package with Clamp Ring Closure," "CAFE-3D A Fast Running Computational Tool for Analysis of Radioactive Material Packages in Fire

Environments,” and “Spent Nuclear Fuel Structural Response When Subjected to an Impact Accident.”

The presentation given by NRC staff generated a lively question and answer session to discuss technical issues related to the staff’s analysis, the regulatory aspects of the staff’s findings, and to respond to interested public groups on the staff’s conclusions.

This conference was beneficial for the staff as it provides a forum for experts in the fields of design, analysis, fabrication, testing, and security of radioactive material packaging to share their latest work. The conference also serves to enhance the staff’s technical competence on standards and other issues related to ongoing regulatory activities, preparing the staff for interacting with concerned citizens and participating in litigation. The proceedings of these sessions have been published and are currently available from ASME.

Attachment: Excerpts from PVP Final Program