

July 24, 2012

MEMORANDUM TO: Doug Weaver, Deputy Director
Division of Spent Fuel Storage and Transportation

THRU: Victor Cusumano, Acting Chief **/RA/**
Thermal and Containment Branch, SFST

FROM: Christopher S. Bajwa, Senior Mechanical Engineer, SFST **/RA/**

SUBJECT: TRIP REPORT: ASME PRESSURE VESSELS AND PIPING
CONFERENCE, JULY 15-20, 2012

On July 17th and 18th, 2012, at the American Society of Mechanical Engineers (ASME) Pressure Vessels and Piping (PVP) Division Conference in Toronto, Canada, I presented the following technical papers:

- **Spent Nuclear Fuel Transportation Package Seals in Beyond Design Basis Temperature Excursions**
 - Co-Authors: Earl Easton, Felix Gonzalez, Robert Einziger, Jiann Yang (NIST) and Ed Hnetkovsky (NIST)
- **Licensing Strategies for the Future Transportation of High Burn Up Spent Nuclear Fuel**
 - Co-Authors: Earl Easton, Matthew Gordon, and Zhian Li

The first paper was presented in Session 2.2E (OAC 4-2), entitled "Toxic Substances: Thermal Evaluation – II," while the second paper was presented in Session 3.1E (OAC 4-4) entitled "Toxic Substances: Miscellaneous Topics." Both of these sessions were sponsored by the Operations, Applications, and Components (OAC) Technical Committee of the PVP Division. These sessions featured presentations from Savannah River National Laboratory, University of Nevada, Reno, and Streamline Automation, LLC in addition to the NRC presentation.

I was a co-author on the following papers which was presented in Session 2.1E (OAC 4-1), and 4.1I (DA 16-1), respectively:

- **The MacArthur Maze Fire and Roadway Collapse: A "Worst Case Scenario" for Spent Nuclear Fuel Transportation?**
- **CFD Analyses of the TN-24P PWR Spent Fuel Storage Cask**

Overall, 17 technical papers were presented in 5 sessions, sponsored by OAC, on Toxic Substances related to Radioactive materials in the areas of Packaging Performance Evaluation, Design and Testing, and Regulations and Standards. I served as Co-Chair for Session 2.4E (OAC-4-5), entitled "Toxic Substances: Structural Evaluation-II."

As part of my PVP Division technical committee involvement, I attended the technical committee meeting for OAC in my role as the Secretary for the OAC committee, which responsibilities include the preparation of meeting minutes and updating the OAC roster. I also attended the PVP Division International Coordination Committee meetings as well as the general PVP Division training session.

This conference provided me the opportunity to interact with recognized experts in the design, fabrication, analysis, testing, and operational aspects of radioactive material packaging, as well as become more informed on the various issues that the industry and international regulatory bodies are facing today.

The conference also allowed me to broaden my understanding and knowledge of efforts to solve some of the pressing problems relating to the shipment of high burnup spent nuclear fuel, the current practices in the storage, transportation, and disposal of radioactive material, and new approaches to the analysis of spent fuel storage and transport systems. This knowledge prepares me to develop, support, and further explain NRC staff positions to our various stakeholders.

Participation by NRC staff in this year's PVP conference continued to be strong, with numerous presentations and sessions developed and chaired by NRC staff. Dr. David Rudland (RES) assumed his position as Chair of the Materials and Fabrication Committee during the conference.

Continued participation by NRC staff in ASME Code body and technical committee activities, and direct NRC support of conferences and technical meetings such as the PVP conference, will be vital in establishing the successful future of collaboration between the Regulators in the United States and other countries. It is imperative that staff have a thorough technical understanding of the bases used in establishing codes and standards. As such, NRC should seek to broaden involvement in these bodies to further the mission of ensuring the safe use of nuclear power and radioactive materials and protecting the health and safety of the public.

Next year's conference will be held in Paris, France, July 12 – 19, 2013.

Attachments: Trip Report

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Attachments: Trip Report

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TRIP REPORT

Subject:

American Society of Mechanical Engineers Pressure Vessels and Piping (PVP) Division Conference

Dates and Location of Travel:

July 15 - 20, 2012, Toronto, Canada

Author, Title, and Agency Affiliation:

Christopher S. Bajwa, Senior Mechanical Engineer, Division of Spent Fuel Storage and Transportation

Background & Purpose of Trip:

The staff participated in the 49th PVP Division conference and presenting the following papers in a technical sessions sponsored by the Applications, Operations, and Components (OAC) Technical Committee:

- **Spent Nuclear Fuel Transportation Package Seals in Beyond Design Basis Temperature Excursions**
 - Co-Authors: Earl Easton, Felix Gonzalez, Robert Einziger, Jiann Yang (NIST) and Ed Hnetkovsky (NIST)
- **Licensing Strategies for the Future Transportation of High Burn Up Spent Nuclear Fuel**
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Staff was also co-author on the following papers:

- **The MacArthur Maze Fire and Roadway Collapse: A “Worst Case Scenario” for Spent Nuclear Fuel Transportation?**
- **CFD Analyses of the TN-24P PWR Spent Fuel Storage Cask**

Discussion:

In total, 17 technical presentations were given in 5 sessions, sponsored by OAC, on Toxic Substance Packaging in the areas of Performance Evaluation, Design and Testing, and Regulations and Standards.” The final program for the PVP 2012 Conference 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, Pacific Northwest National Laboratory, Savannah River National Laboratory, and Oak Ridge National Laboratory, as well as from BAM Federal Institute for Materials Research and Testing (Germany) and Streamline, Automation, LLC.

Papers dealing with radioactive waste storage and transportation, including both structural and thermal issues, were presented. Some of the papers presented included: “Thermal Upgrading of 9977 Radioactive Material (RAM) Type B Package”, “Development and Use of a Homogenized Fuel Region Model for Thermal Analysis of a Truck Package Under Normal and Fire Accident Conditions”, “Mechanical Behaviour of High Burn-Up SNF Under Normal and

Accident Transport Conditions— Present Approaches and Perspectives”, and “Drop Analysis of Structures and Development of Impact Energy Absorber”.

This conference was beneficial for the staff as it provides a forum for experts in the fields of design, analysis, fabrication, testing, and operations of radioactive material packages to share recent work. The conference also serves to enhance the staff's technical competence on ongoing standards activities, preparing the staff for interacting with concerned citizens and participating in litigation. The full proceedings of this conference have been published and are currently available from ASME, or from the NRC staff that attended the conference.

Next year's conference will be held in Paris, France, July 12 – 19, 2013.

Attachments: 2012 PVP Conference program