



2012 National Engineers Week Banquet

Keynote Address Information

Revisiting Insights from Three Mile Island Unit 2 in View of the Events at Fukushima Daiichi

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Abstract:

The earthquake that interrupted off-site power and the subsequent tsunami that attacked the Fukushima Daiichi plant on March 11, 2011, resulted in a large scale and long duration light water reactor accident. Available data from plant instrumentation are incomplete to fully characterize the events that occurred and the final state of fuel within Units 1, 2, or 3 of this plant. More than 30 years ago, a severe accident with fuel melting occurred at the Three Mile Island Unit 2 (TMI-2) pressurized water reactor. Data from TMI-2 plant instrumentation were also incomplete to characterize accident progression and the final state of fuel within the reactor vessel. This uncertainty was significantly reduced by examinations and evaluations of samples obtained from within the TMI-2 reactor vessel. Because available data suggest that significant amounts of fuel heated to temperatures near melting, the events at Fukushima Daiichi offer a similar opportunity to increase our understanding about boiling water reactor accident progression. During the presentation, videos emphasizing various aspects of the TMI-2 accident and post-accident examinations will be shown. In particular, the presentation features videos taken of debris, the vessel lower head, and internal structures in the TMI-2 vessel. Benefits gained from such evaluations are identified to illustrate the importance of learning as much as possible from such events.

Biographical Information:

With nearly 30 years of experience in reactor safety and high temperature testing, Dr. Joy L. Rempe is a Laboratory Fellow and Group Leader at the Idaho National Laboratory (INL) where she leads in-pile instrumentation development efforts for INL's Advanced Test Reactor National Scientific User Facility and for the U.S. Department of Energy (US DOE) Fuel Cycle Research and Development program. She also serves as a member of several advisory groups reviewing the US DOE's programs, and she provides assistance to industry and regulators on severe accident issues. Dr. Rempe has received US Nuclear Regulatory Commission (US NRC) and Organization for Economic Cooperation and Development (OECD) recognition awards for achievements accomplished in the Three Mile Island Unit -2 Vessel Investigation Project; and in 2011, she was awarded a US DOE Secretarial Honors Award for her contributions in the US response to the events at Fukushima. She holds a BS degree in Nuclear Engineering from the University of Missouri – Rolla and MS and PhD degrees in Nuclear Engineering from the Massachusetts Institute of Technology. Dr. Rempe has authored or co-authored 45 archival peer reviewed journal publications and over 80 peer-reviewed conference papers on reactor safety, severe accident phenomena, high temperature testing, and in-pile instrumentation. She is an inventor/co-inventor on two patents with an additional patent pending. In 2009, she was elected to the ANS Board of Directors; and in 2010, she was selected to serve on the US NRC's Advisory Committee on Reactor Safeguards.

