Summary of Panel Session #4
"Capturing, Memorializing and Incorporating Decommissioning Lessons Learned"
Waste Management Conference 2006

Decommissioning is generally understood to be the activities undertaken to remove radioactive material from a nuclear facility so that the site can be released from most, or all, regulatory control and returned to a beneficial reuse. This may include release of the facility with or without restrictions on future site use, and may include varying degrees of continued oversight by the responsible regulatory authority. In the mid-1990s, it became apparent that decommissioning a nuclear facility did not constitute a separate set of actions conducted after the "life" of the facility had ended, but rather, was an integral stage in the total life-cycle of the facility. Planning for decommissioning is now recognized by regulators and the nuclear industry as an activity that must be factored into the design and operation of all nuclear facilities.

Decommissioning or dismantlement prior to license termination has been successfully completed at a variety of sites throughout the world and, in the process, numerous lessons have been learned about how to, and more importantly, how not to successfully complete the decommissioning of a nuclear facility. Because decommissioning is typically undertaken only once in a facility "life," it is important to identify these experiences and lessons, incorporate them into ongoing decommissioning projects and factor them into the design and operation of new facilities so that future decommissioning projects can be conducted in a safe, timely and effective manner.

The focus of this panel was to provide an overview of issues and solutions from decommissioning nuclear facilities, as well as describe measures that owners and regulatory authorities are taking to ensure that these issues and solutions are being considered at currently operating facilities. The panel also discussed strategies for ensuring that lessons learned are identified, recorded and factored into future decommissioning projects and into the design of new facilities.

Panelists included: David Culberson, Chairman, Fuel Cycle Facilities Forum, (USA); Sean Bushart, Program Manager for Low-Level Waste, Radiation Protection and Decommissioning, Electric Power Research Institute (EPRI), (USA); Paul Woollam, Chief Decommissioning Strategist, British Nuclear Group, (United Kingdom); Thomas LaGuardia, President, TLG Services, (USA); Andreas Loeb, Senior Project Manager, RWE NUKEM GmbH, (Germany) (substituting for Mr. Hartmut Runge, also of RWE NUKEM GmbH); and Daniel M. Gillen, Deputy Director for Decommissioning, Division of Waste Management and Environmental Protection, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission (NRC), (USA). The Panel was co-chaired by Larry W. Camper, Director, Division of Waste Management and Environmental Protection, NRC, (USA) and Detlef Schmidt, Consultant, Nuclear Projects Consultancy, (Germany).

Larry W. Camper and Detlef Schmidt kicked off the panel with overviews of the intent of and focus of the panel. Each panelist provided the audience with a summary of lessons

learned and the activities they were undertaking to ensure that the lessons were factored into ongoing projects and future facility designs. Lessons learned are summarized below:

- Many decommissioning activities can be accomplished under a facility's existing operating license
- A licensee's perception of "finality" can affect the decommissioning process
- Regulatory flexibility in addressing source term removal, interim cleanup, and partial site release can improve the cleanup process
- Efficiencies can be gained through interaction during development, approval, and implementation of the Final Status Survey
- Inconsistencies between State and Federal requirements can become significant issues late in the process, causing confusion, unnecessary delays, and added cost
- To build public confidence in new nuclear capacity, we need reactors designed for decommissioning and radioactive waste disposal capability/options
- Gas-cooled reactors, like those in the United Kingdom, are harder to decommission due to the types and much larger amounts of waste generated during decommissioning activities
- Open and transparent stakeholder involvement in the decommissioning and waste disposal process is critical to success
- While simple proven techniques are preferable, they are sometimes converted into research and development projects, thus increasing the project costs
- Testing and validation of decommissioning and decontamination (D&D) equipment prior to its use can reduce problems
- Waste disposal management is often agreed upon too late in the project
- Organizational and knowledge management issues are often ignored until it is too late to correct problems or knowledge gaps
- Facilities and components need to be designed with decommissioning and dismantlement in mind
- Characterization, planning, and cost estimate are essential, with characterization being the most essential element
- Cost estimate should be a living document

- Involve regulatory agencies during the early stages of decommissioning
- Operations/key personnel must be involved in the process
- Observe strict radiological and industrial safety
- Follow a rigorous program
- Use required procedures and approvals
- Safety is an integral part of all activities
- Use D&D expertise of consultants
- Decommissioning projects are living processes
- Expect the unexpected – PLAN, PLAN, PLAN !
- Early and frequent communications between all parties is critical
- Coordination of confirmatory surveys is important to prevent delays
- Realistic exposure scenarios must be adequately justified to be accepted
- Formal submittals must be consistent with discussions between regulators and the licensees

The NRC and EPRI currently have efforts underway to identify and preserve decommissioning lessons learned. NRC is working cooperatively with the nuclear industry on approaches to identify and preserve decommissioning lessons learned. Management options are currently being considered, but the final approach has not yet been decided upon. NRC lessons learned can be found at the following web link: *http://www.nrc.gov/what-we-do/regulatory/decommissioniong/lessons-learned.html*. EPRI has developed several decommissioning experience reports which are available to EPRI members.

It was concluded by the panel that the issue of decommissioning knowledge management is critical to the continued expansion of nuclear power. Decommissioning experience will be developed in Europe and Asia over the next several years that will be invaluable to the decommissioning of the next wave of nuclear plants in the United States. Industry and regulators will need to work cooperatively to ensure that the information is preserved and included in the design and operation of all new nuclear facilities, as well as on-going decommissioning projects.