

WM2017 Conference Panel Report

PANEL SESSION 89: Status and Update of Decommissioning Power Reactors and Material Facilities and Issues

Co-Chairs: **Andrea Kock**, *US NRC*
Lisa Edward, *EPRI*

Panel Reporter: Rateb (Boby) Abu Eid, *US NRC*

Panelists:

1. **Christopher McKenney**, *Chief of Performance Assessment Branch, US NRC*
2. **Bill Barley**, *HBPP Site Closure Manager, Pacific Gas & Electric Co.*
3. **John Sauger**, *Zion Solutions*,
4. **Simon Carroll**, *Senior Analyst, Nuclear Decommissioning, Swedish Radiation Safety Authority, (Sweden)*

Session #89' Co-Chairs, **Ms. Andrea Kock** and **Ms. Lisa Edward**, introduced Session #89 panel members and provided a summary of the purpose of the Session. The presentations and discussion of Session #89 focused on status and update of commercial decommissioning in the U.S., and internationally, including regulatory development to enhance the process for the shut-down and decommissioning of power reactors. The Session discussed status of the NRC's rulemaking on the decommissioning transition process. It also addressed progress in the decommissioning arena and implementation aspects, as viewed by regulators and operators (implementers). The Session also provided an opportunity to discuss international key issues, particularly decommissioning cost estimates, and perspectives of international regulators, operators, and stakeholders. Approximately 50 people attended this session.

Summary of Presentations

Christopher McKenney outlined commercial decommissioning status and progress in the U.S., focusing on progress made in the past two decades after issuance of the NRC license termination rule under 10 CFR Part 20, Subpart E. In this context, he summarized decommissioning status as follows: (a) a total of 10 power reactor sites completed decommissioning; (b) 6 power reactors are currently in the active DECON decommissioning mode; (c) 14 power reactors are in SAFSTOR mode; (d) more nuclear power plant shutdowns are anticipated; and (e) 13 Complex Material Sites are in active decommissioning. He outlined key issues pertaining to transitioning from operation to decommissioning, including the current process of issuing exemptions as the phases of decommissioning progress. In this context, he indicated that the NRC's rulemaking for regulatory improvements of decommissioning power reactors is in progress; it is intended to make such transition more efficient. He noted that the Commission directed staff to complete the rulemaking by 2019, and consider the following issues in the proposed rule: (a) revise regulations to account for the expected decrease in risk after plants shutdown; (b) employ a graded approach to emergency preparedness; (c) address lessons learned from previous and current decommissioning cases; (d) address need/potential for NRC approval of the "Post-Shutdown Decommissioning Activity Report;" (e) address maintaining the three existing decommissioning options and the associated timeframes; (f) address the role of State/Local

WM2017 Conference Panel Report

governments and non-governmental stakeholders; and (g) discuss other issues deemed relevant by staff. He also discussed issuance of NRC's lessons learned report regarding decommissioning licensing and oversight activities which was issued in October 2016 (ML16085A029). He concluded that there will be continued uncertainty in the energy market due to anticipated increase in number of reactors entering into decommissioning for the next several years. He added that the staff's lessons learned report showed that experience and efficiencies have been gained with the decommissioning processes in place, and lessons learned will be applied throughout the current rulemaking process. He noted that material decommissioning facilities continued to make a notable progress.

Bill Barley presented Humboldt Bay Power Plant (HBPP) decommissioning status and update; as well as related decommissioning issues, from an operator's perspective, as applicable to power reactors and material facilities after shutdown. He went through technical details describing the unique HBPP case where the reactor vessel is located inside the drywell, below grade within the refueling building. He presented an overview of site restoration as well as an update on the status of plans for shut down of the Diablo Canyon Nuclear Power Plant (DCPP). He pointed out that Pacific Gas & Electric Company (PG&E) has announced its intention to shutdown DCPP at the end of the initial licensing period. As part of the agreement, PG&E has committed to a detailed DCPP cost estimate to decommission the site to be provided to the California Public Utilities Commission (CPUC) during the next triennial reporting cycle. He added that a PG&E decommissioning group is being formed which will provide oversight for both the Humboldt Bay remaining decommissioning work while developing the DCPP detailed cost estimates for the CPUC. At the end of his presentation he summarized the key regulatory issues from his perspective, as follows: (a) approval of the license termination plan; (b) Greater than class C storage cask packaging changes; (c) Quality Assurance (QA) plan changes; (d) emergency plan changes; (e) 10 CFR 37 issues; (f) 10 CFR 2002 HBPP waste disposal exemption requests; and (f) ground water protection initiative changes.

John Sauger started his presentation by showing a vivid video of Zion NPP demolition and decommissioning including removal of large components. He described Energy Solution's (ES) experience in decommissioning of utilities in the U.S. and its extensive safety program to minimize dose exposure to workers, and to strictly apply the safety culture and ALARA concepts in decommissioning activities. He briefly described advanced technologies used in decommissioning such as use of diamond wire in cutting pipes for unit #2 which lowered potential dose exposure to workers by 80%, and innovative approach to dismantling of major reactor components. He also added that demolition costs were reduced substantially particularly through proper management and use of less manpower resource. He added that a significant challenge to industry is the decommissioning option to choose between DECON (prompt), or SAFTOR (e.g.; complete decommissioning before 60 years after shutdown).

Simon Carroll presented international perspectives regarding the accelerated shutdown of nuclear power plants in member states of the Organization for Economic Cooperation and Development/Nuclear Energy Agency (OECD/NEA). He emphasized, that though the current situation presents a challenge to decommissioning projects; it could also provide opportunities for learning, adaptation, innovations, and efficiency improvements for projects executions.

WM2017 Conference Panel Report

He summarized the OECD/NEA role in decommissioning and coordination within its 31 member states and with the European Commission (EC), as well as with other international organizations such as the International Atomic Energy Agency (AEA). Subsequently, he summarized the key role of the OECD/NEA “Working Party on Decommissioning and Dismantling (WPDD) and its function under the current WPDD five task groups. **Mr. Carroll** presented some cost-estimate reports issued by NEA during 2012 – 2016. He summarized current status and activities of the “Decommissioning Cost Estimates, DCE, Task Group,” in addressing uncertainties in decommissioning cost estimates and described the ongoing activities under the joint “IAEA/NEA Undertaking.” He also presented an outline of the main conclusions of the WPDD/DCE - International Conference on Financing of Decommissioning (ICFD), which was held in Sweden in 2016, with the main themes: financing systems; decommissioning costing; and risk management. **Mr. Carroll** concluded that international collaborations to gather and share actual data on decommissioning cost estimates are essential to reduce uncertainties in decommissioning cost estimates of NPPs.

Questions and Answer & Conclusions

A great deal of discussion and comments were made regarding the status of NRC’s rulemaking for regulatory improvements of decommissioning power reactors. For example, a question was raised about the status of the SAFSTOR decommissioning option and the 60-yr period before the license termination. Another question regarding flexibility in allowing a transient transfer of the license to a special decommissioning contractor and the associated conditions; another questions about incorporation of lessons learned from decommissioning in the ongoing rulemaking. NRC staff responded that staff appreciates stake holders remarks and comments; however, staff is currently awaiting Commission direction for consideration of these aspects and other issues in the final rule. A member of the audience made remarks regarding establishing fully automated system for decommissioning licensing review to enhance efficiency. A commentator made remark that the current catastrophic events assumed in emergency plan for assessing risk to ISFSI is unrealistic. In addition, a remark was made that the current regulations do not allow for relief from certain aspects of the emergency plans which require high cost security and safety implications. A question was raised regarding how the draft rule would change the current regulatory structure and regulatory reviews. A comment was made that the NRC can help in developing a standardized process for closure regarding associated hazardous materials with the State and other Federal authorities. Subsequently, a lively discussion followed regarding role and involvement of State authorities after shutdown and during decommissioning. Finally, a few questions were raised regarding use of advanced technologies in decommissioning particularly remote and robotic technologies. It was indicated that WM2018 will allocate a special Session to address this topic in more detail.

In summary, Session 89 was well attended, well organized, comprehensive, and covered several aspects regarding status of decommissioning in the U.S., and issues related to the USNRC “Advanced Notice of Proposed Rulemaking for Regulatory Improvements of Decommissioning of Power Reactors.” The panel members’ presentations and the discussion showed good illustrations of regulatory perspective as well as perspectives of operator (e.g.; implementers) and stakeholders.

WM2017 Conference Panel Report

The discussion at the end of the Session was quite useful particularly the remarks made on the ongoing regulatory development to improve decommissioning. In brief, the Session provided an opportunity for addressing potential future actions and recommendations from different perspectives to demonstrate compliance with regulatory requirements and enhance efficiency in execution of decommissioning projects. The international perspective in the last presentation regarding NPP decommissioning; stress test, and decommissioning cost estimates added valuable complimentary information to the Session.