

Quick Look Report

Travel Dates: August 4 - 10, 2007

Location: (1) Paris, France; (2) Saclay, France; and (3) Karlsruhe, Germany

Organization/Committee: (1) Ecole National Supérieure De Chimie; (2) Commissariat à l'énergie Atomique (CEA); and (3) European Commission, Institute for Transuranium Elements (ITU)

Desired Outcome:

Staff met with other technical experts in Alloy 22 corrosion studies and assessments of spent nuclear fuel (SNF) performance including high burnup. The meetings were primarily to discuss research and availability of results. Corrosion resistance of Alloy 22 container and slow degradation of SNF are important attributes to the robust waste package (WP). The WP serves as a barrier for high-level waste (HLW) isolation at the potential Yucca Mountain (YM) HLW repository. Information obtained will be used in staff's preparation to review the Department of Energy's license application for the potential HLW repository at YM.

Results Achieved:

Our understanding of the Alloy 22 corrosion was discussed with French experts, who supported our understanding in the areas of long-term passivity and localized corrosion. Discussions also covered (1) anodic sulfur segregation at the interface of passive film and base metal and (2) conformance of chromium rich passive film. Additional information was provided on silica effects in passivity and the validity of the critical potential for localized corrosion.

Our assessments of SNF performance at the potential HLW repository at YM were well supported by French and European Commission (in Germany) experts. Uncertainties associated with the performance of high burnup SNF was extensively discussed. New data were provided on: (1) instant release fraction of radionuclides, dissolution kinetics, and characteristics of the rim structure, for the long-term post-closure HLW isolation; and (2) release fraction of radionuclides during pre-closure operations. Regular information exchanges including potential staff exchange were also discussed with European Commission ITU staff.

Summary of Trip:

Staff met with other technical experts in Alloy 22 corrosion studies and assessments of SNF performance including high burnup. The meetings were primarily to discuss research and availability of results. Corrosion resistance of Alloy 22 container and slow degradation of SNF are important attributes to a robust WP. Staff also discussed risk-significant issues associated with these attributes with the experts. Regular information exchanges including potential staff exchange were also discussed with European Commission workers.

Information obtained will be used in staff's preparation to review the Department of Energy's license application for the potential HLW repository at YM.

Next Steps:

Regular information exchanges including potential staff exchange will continue to be discussed between European Commission ITU and NRC/HLWRS. This activities may involve the Office of Nuclear Material Safety and Safeguards, and the Office of Nuclear Regulatory Research.

Policy Issues or Other Items of Commission Interest Raised:

No policy issues were raised at the meetings. There are no other items of commission interest raised. Therefore, no Foreign Travel Report is planned.