2-6-79

CONF-790923--3(Summ)

CONFERENCE ON DECONTAMINATION AND

DECOMMISSIONING OF NUCLEAR FACILITIES

Sun Valley, Idaho

September 16-19, 1979

OMRE AND HALLAM

Decontamination and Decommissioning Projects at the Idaho National Engineering Laboratory

R. H. Meservey

EG&G Idaho, Inc.
P.O. Box 1625
Idaho Falls, ID USA

DISCLAIMER

SUMMARY

OMRE and HALLAM

DECONTAMINATION AND DECOMMISSIONING PROJECTS AT THE IDAHO NATIONAL ENGINEERING LABORATORY

A brief history of Decontamination and Decommissioning (D&D) experience at the Idaho National Engineering Laboratory will be presented as an introduction to the status of current projects. Details will then be presented on a project to remove sodium from some major components of the Hallam reactor and on the Organic Moderated Reactor Experiment (OMRE) decommissioning project. Cost, schedule, waste volume, and other technical data from these projects will be presented. In addition, a brief summary of the future INEL D&D program will be presented.

HALLAM

The Hallam Project involved the removal of low-level (<15 mR/hr) contaminated sodium from a number of major reactor components. These components included heat exchangers, pumps, evaporators, air eliminators, and superheaters from the sodium cooled reactor that operated at the Hallam Nuclear Power Facility. These components contained sodium in amounts ranging from about 60 kgm at the heat exchanger tube sheet to a film residue on the pump impellers. Following dismantling of the reactor, the components were stored for several years under a protective purge of nitrogen gas.

The objective of the Hallam D&D project was to react the sodium remaining in the components and convert it to a stable form of caustic solution. The caustic was then neutralized with acid and water and recirculated through the component to allow adequate time for complete reaction of the sodium. Following neutralization, the components were

drained and rinsed and all fluids were disposed of in liquid waste ponds.

A system which generated humid nitrogen for reacting the sodium was designed and built. This, with the rest of the processing system, provided control of the steam/sodium reaction, neutralization and draining of caustic, flushing with water, and filtering off-gases from the process.

Performance of the sodium processing system was good although some sodium remained in certain components. The project was completed in one year at a cost of about $450,000. Three disposal methods were involved: disposal of radioactively contaminated items, disposal of components which were not radioactiviely contaminated and free of sodium, and disposal of those noncontaminated items containing residual amounts of sodium.

OMRE

The Organic Moderated Reactor Experiment (OMRE) facility was designed to investigate and develop organic coolant technology and was operated at the INEL from 1957 until 1963. Following final reactor shutdown, the nuclear fuel and reactor vessel internals were removed and the organic coolant was drained from all systems. The facility remained in this deactivated condition until D&D was started in October 1977.

Decommissioning of the OMRE facility involved removing the reactor and all support systems, buildings, roads, fences, etc. All evidence of the facility will be removed and the area graded and seeded with native grass. although most contaminated areas in the OMRE facility had radiation fields of less than 1 mR/hr, the reactor vessel itself contained fields in excess of 350 R/hr. Thus, a wide range of radiological conditions existed in this decommissioning effort. In addition to the radiation fields, the facility contained

residual organic coolant in some of the piping, and xylene in the fuel wash system. All piping was covered with asbestos. Each of these materials presented safety related problems and each required special precautions.

Actual costs for removing the OMRE facility and restoring the area to its natural state will be about $500,000. Due to shutdowns during the winter months, the project was spread over a two year time span.

FUTURE D&D

In addition to the decommissioning projects discussed above, a long range plan for decommissioning Idaho National Engineering Laboratory (INEL) facilities has been prepared. Project management plans and safety evaluations are also being prepared for next year's D&D projects. These include a boiling water reactor facility, a liquid waste evaporation system, parts of a pool type reactor, and two aircraft nuclear propulsion reactors which are located on railroad flatcars. Present plans also call for the preparation of a D&D Handbook which summarizes D&D techniques, costs, etc., and for a small amount of development work in support of future D&D projects. Development areas receiving emphasis during the coming year include: sodium and NaK processing, facility characterization, soil decontamination, and remote cutting and handling techniques.