Roger

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Mr. Roger Zavadoski
Division of Operating Reactors
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Roger:

At Commonwealth Edison's Dresden I Nuclear Power Reactor, increasing internal radioactive contamination has resulted in large exposure rates during required maintenance and inspections. This, in turn, has economic consequences, as well as creating technical problems if required maintenance inspections cannot be performed. A method of reducing occupational radiation exposure is needed. Dow Nuclear Services has been contracted by CECO to evaluate existing technology and, if necessary, develop a new technology for total decontamination of Dresden I. Following a comprehensive cleaning agent development and testing program, a final design of facilities, systems and equipment required to implement the chemical cleaning of Dresden I has been developed.

Battelle, Pacific Northwest Laboratory has been contracted by the U.S. Nuclear Regulatory Commission to evaluate the proposed procedure to be used at Dresden I with respect to minimizing occupational exposure and release of radioactive effluents to the environment. At the present time, Commonwealth Edison's final submittal to NRC concerning the Dresden I chemical cleaning is not complete. PNL is, therefore, lacking the detail needed to do an in-depth analysis of the proposed action. Through site visits, discussions with the licensees and their contractors, and review of available information, the overall impression is that Commonwealth Edison Company, Dow Nuclear Services and Catalytic Incorporated have been very thorough in examining the multifaceted aspects of this first-of-a-kind reactor decontamination. Questions arising during the review of submitted documentation were subsequently answered at site visits to the Dresden facility and the Philadelphia offices of Catalytic, Inc. During the site visits, the following areas of concern were discussed and clarified. To accomplish the chemical cleaning, approximately 110 interfaces along the primary loop will be required and will necessitate hands-on installation. The mechanical contractors employed to perform these installations will submit detailed procedures to CECO for review.

For each interface along the primary loop, a "work package" has been assembled. These packages include a complete description of the job and the work area, an estimation of the time and personnel involved, and an estimate of the radiation exposure rate at the interface. Each "work package" has been reviewed by CECO for compliance with ALARA, with existing Dresden Radiation Work Procedures and approved by the Health Physics Staff.

An extensive personnel monitoring program will be instituted during the entire operation. As each job is performed, the daily radiation dose will be recorded with a lag time of one to three days. All work will be performed according to CECO QA Procedures which have a maximum allowable exposure rate of 100 mR/h. There will also be radiation training, including training in the use of respirators for all radiation zone workers.

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During all phases of the chemical cleaning, normal plant safety procedures and equipment will continue in operation to prevent the accidental release of any radioactive material to the environment. The facility for decontamination processing uses two HEPA filters in back of a mechanical demister for air treatment prior to release. Air flow is always from low to high radioactivity regions of the building. The decontamination building has back-up ventilation systems in case of HVAC shutdown. Certain plant components utilize a nitrogen cover gas. This gas is vented through a demister, a HEPA filter and activated charcoal prior to release.

Don't think ever leaked

Research conducted by EPRI indicates that levels of TRU contaminants in the solvent are expected to be below 10 nCi/g. Samples of solvent from the Dresden Pilot Loop will be analyzed for TRU concentration. CECO routinely monitors for ^{129}I and has never been outside allowable release limits. Monitoring during pilot loop decontamination showed no increase in ^{129}I release. In fact, this period showed levels to be lower than those usually encountered.

There has been some concern that leaks during the actual chemical cleaning process could impact the environment and perhaps increase occupational exposures following the cleaning. The chance of leaks, however, has been minimized through system design. No threaded fittings will be used and the number of flanges will be kept to a minimum. Valve leaks may occur, but floor trays and absorbent materials will be placed to catch these. If a major problem does arise, the primary loop can be cooled, the solvent transferred to the decontamination building and the system flushed. Any small leaks which may occur would result in water vapor emission and a "tar" substance forming at the leak site. Most of the contaminants will be caught in the "tar". The water vapor will contain no halogens or volatile acids. The "tar" substance will not dry out or become powdery. Leaks during the pilot loop test did not result in any measurable increase in airborne activity.

Bad statement

Leaks which might occur in the decontamination facility would be contained due to building design, as no through-wall penetrations exist below 10 feet above the floor. Total liquid storage in the building would only flood to the six-foot level. Leaks or overflow in this building can occur only in areas subject to the air filtration system.

Outside rinse water tanks are surrounded by a dike which is sized to contain the liquid from one of the two tanks.

All operations in the decontamination process building are remote. Manual overrides for valves are located in shielded remote areas. All equipment is designed such that component failure should occur in a mode which will allow draining of the effected equipment. All major componets in this facility needing maintenance or possible repair are shielded from surrounding hot equipment to minimize exposure of maintenance personnel.

In general, the planned chemical cleaning at Dresden I has been well planned and thought out. It is especially pleasing to note that health physicists have been involved and will continue to be involved in the design of the facility and in the planning and review of all operational procedures.

Sincerely,

Glenn R. Hoenes
Dosimetry Technology Section

cc: Lake Barrett/NRC
Paul O'Connor/NRC