

N319. Developing Decon

Chemical decontamination has helped reduce radiation fields and exposures significantly in the last few years. New developments are still extending the usefulness of such techniques.

Chemical decontamination is a mature technology playing a major role in reducing occupational exposures. Application of the LOMI (low oxidation-state metal ion) process saved over 13,000 person-rem between the years 1986 and 1992, which represents a saving of \$132 million, assuming typical exposure costs. Most applications have been on BWR reactor water cleanup and recirculation piping system, but there have been several on PWR channel heads and heat exchangers. Radioactive waste processing and disposal has become the main impediment to more extensive use of decontamination technology. Improvements in decontamination processes, e.g., using ion-specific exchange resins, aim to reduce waste volumes.

For LOMI, two changes have already been implemented: the use of "low formate" reagent; and a reduction in the amount of picolinic acid used to maintain the dissolved metals in solution. Such improvements are economically worthwhile but limited. Alternatives to the current practices of disposing of ion exchange resins in high-integrity containers, or solidified in cement, are being developed. Electrochemical processes, such as the ELOMIX (electrochemical LOMI ion exchange) process, may revolutionize decontamination waste processing. ELOMIX reduces the waste arising from the LOMI process by continuously removing the radioactive elements solution using an electrochemical cell. ELOMIX has three main benefits:

- Smaller waste volume
- Inorganic waste form
- Regeneration of the chemical reagents

Complete reactor coolant system decontamination has not been applied to large commercial reactors in the US. However, full-system decontamination offers several important advantages: lower background fields; more effective decontamination; and reduced recontamination rates. The potential exposure savings could be, over five operating cycles, ranged from 1000 person-rem to 3500 person-rem.

For more, "Developing Decon," by C. Wood, Nuclear Engineering International, pp. 15-17, August 1994.