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R-423

PROJECTED COST BENEFIT FOR FULL SYSTEM CHEMICAL DECONTAMINATION PROJECTS

Keywords: CONTAMINATION REMOVAL; DECONTAMINATION; FULL SYSTEM DECONTAMINATION; DECONTAMINATION FACTORS; COST BENEFIT STUDY; DOSE; DOSE RATE; DECOMMISSIONING; ECONOMICS

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Objectives: To evaluate the cost benefit impact of performing a full system chemical decontamination under various realistic assumptions, including various recontamination rates, dollar per person-rem values, costs of the decontamination, and decontamination factors. The first PWR chemical decontamination in the United States was completed in early 1995 at a cost of $32M, including the research and development costs and a number of first time expenses. Estimates are that the next Full System Decontamination (FSD) will cost a utility between $8M and $13M. For the decontamination to be beneficial to the utility it should pay for itself in reduced critical path time and/or reduced radiation exposure to the workers. Theoretical as well as actual recontamination rates have been determined from various sources. These recontamination rates have been utilized to determine the long-term resultant decontamination factor and therefore the savings in person-rem exposure that can be achieved over time.

Comments: The following parameters were assumed for this work:

* Decontamination factors were allowed to vary in three steps, from 5.0 to 7.5 to 10.0
* Cost of a person-rem was assumed to be either $10,000 or $15,000
* Average person-rem expended annually per plant was 200 to 300
* Cost of a critical path hour was assumed as $15,000
* Cost of the FS decontamination project was assumed as $7.5M or $10M or $12.5M
* Recontamination rates were derived theoretically and compared with those obtained from various sources

Potential for dose limitation: Assuming the cost of an FSD of $12.5M, $12.5K per person-rem, and the plant average annual collective dose of 250 person-rem, various initial decontamination factors (DF) were used. Net savings raged from a loss of $1.7M for an initial DF of 5 to a saving of $1.5M for an initial DF 0f 10. Further analysis showed that the return on investment is fairly sensitive to the assumed dollar per person-rem cost. The initial decontamination factor (DF) for breakeven of costs and savings were also evaluated. If the FSD cost was below $10M then there would be a net saving with an initial DF as low as 5. If the FSD cost were $12.5 then an initial DF of at least 8 would be required for breakeven.

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References: Remark, J.F., "Projected Cost Benefit for Future Full System Chemical Decontamination Projects," Proceedings, EPRI Radiation Field Control and Chemical Decontamination Seminar, Tampa, Florida, November 1995, available from EPRI Distribution Center, P.O. Box 23205, Pleasant Hill, CA 94523, Phone: (501)934-4212.

Duration: from: 1994 to: 1995

Funding: N/A

Status: Complete

Last Update: May 7, 1996