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REPLACEMENT OF RWCU PIPING WITH STATE-OF-THE-ART MATERIALS

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Project Manager:

Objectives: Describe the replacement of RWCU piping at the Perry Nuclear Power Plant and the dose savings resulted from it.

Comments: Perry Nuclear Power Plant is a 1250 mW BWR. During the Second Refueling Outage in 1990, about 300 person-rem was expended for work in areas of the drywell adjacent to the RWCU cross-tie line. This 140 feet long, 4 inch diameter carbon steel line connected the two loops of the reactor recirculation system and the RPV bottom head drain line.

To reduce the radiation field in this area, a decision was made to:

- 1) chemically decontaminate the piping using LOMI
- 2) cut the pipe into sections that would easily fit into the B25 shipping container
- 3) replace the pipe along the same routing
- 4) replace the carbon steel with stainless steel
- 5) process the replacement pipe to mitigate recontamination, ie, electropolishing and passivation

347 NG stainless steel was selected as the replacement piping material because of:

- 1) IGSCC resistant per NUREG 0313
- 2) low cobalt
- 3) no increase in ISI requirements
- 4) good weldability
- 5) good availability
- 6) corrosion resistant

Remarks/Potential for dose limitation:

ALARA actions to minimize personnel dose:

- * mock-up training
- * chemical decon
- * catch containments
- * HEPA ventilation
- * wireless communications
- * closed circuit TVs
- * The chemical decontamination skid was located in the fuel handling building away from traffic areas.
- * shielded demineralizers and filters
- * remotely operated tools
- * low dose waiting areas

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General area dose-rates were reduced by a factor of 5.2 (80.8%). A better general area DF would have been realized if the reactor recirculation system pumps and piping could have been included in the LOMI flowpath.

During the second refueling outage average shielded general area dose-rates in the drywell on the 583' and 599' elevation were 0.093 and 0.078 mR/hr. During the 1993 mid-cycle outage the average unshielded general area dose-rates were 0.064 and 0.034 mR/hr.

References: Kindred, G. W., "Replacement of RWCU Piping With State-of-the-Art Materials," *Radiation Field Control Seminar*, Electric Power Research Institute, Seattle, Washington, 1993.

Duration: from: 1990 to: 1993

Funding: N/A

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