

N294. Replacement of Separator Shroud Bolts

Due to the IGSCC (intergranular stress corrosion cracking) found on two separator shroud bolts, Chin-Shan NPS replaced those bolts during its EOC-13 outage. Hydrolyzing was adopted as the major dose reduction measure by eliminating predicted radioactive crud which already existed since reactor startup. A DF (decontamination factor) of 30 was obtained with this 5000 psi, 3 gpm decon process. The replacement cost totaled man-hours and 2.88 mMan-Sv.

The requirements for dose reduction were fully understood and prepared for by the persons delegated to carry out the task. The hydrolazer was the key to reducing this unique close-body exposure condition. Contact dose rate before decontamination was approximately 60 mSv/h, but reduced sharply to 5-6 mSv/h, and furthermore to 2mSv/h on some spots after application. The operating platform also indicated a 0.3 mSv/h reduction of the field dose rate. Related measures taken to achieve dose reduction are:

- Underwater operated hydrolyzing with proper water removed crud successfully. Based on previous experiences, the effectiveness could be enhanced with 8,000-12,000 psi, if available.
- We estimate a saving of half of the exposure time, called close-body exposure, by adjusting the platform on proper positions for chain block operation.
- Underwater TV monitored the hanging-up process, bolt knobs were rarely blocked preventing unnecessary exposure.
- Continuous tap water was applied to prevent airborne contamination from drying the bolts.
- Double PC (protective clothing) with hood kept workers clean.

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