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U.S.A.

H-198

PERSONNEL RADIATION EXPOSURE REDUCTION DURING REMOTE STUD HANDLING AT INDIAN POINT 2

Keywords: REMOTE SYSTEMS; REMOTE STUD HANDLING; DOSE REDUCTION; INDIAN POINT 2; REACTOR VESSEL STUDS

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Objectives: Describe the usage of the remote study handling system during the February 1993 refueling outage at Indian Point 2.

Comments: The automated stud handling system employs a transport segment system to remove and install reactor vessel studs, nuts, and washers. The transport segment is a precision fabrication which sits on the reactor vessel covering 1/4 of the bolt circle. A track assembly on the top of the transport segment guides 2 automated stud turning robots. These two robots are connected to a central control panel which is located on the refueling deck.

Using a special lifting beam, the first transport segment along with the two automated stud turning robots is positioned on the reactor vessel head. Two operators are located in the cavity to align the transportation segment on the head. Once the transportation segment is properly positioned the stud removal process is initiated from the remote control panel on the refueling deck. The operators in the cavity detach the lifting beam assembly from the transportation segment and then move to a lower dose area during the stud removal sequence.

Remarks/Potential for dose limitation: Using the remotely operated stud system during refuel 11/12, which started in 2/1993, studs were removed in 6.5 hours with a total exposure of 498 mRem. Stud insertion was completed in 6.5 hours with 1045 mRem exposure.

Total outage exposure results using the remote stud handling system:

OUTAGE	MAN HOURS	DOSE RATE FIELD	CRITICAL PATH	EXPOSURE
1991	160.5	250 mRem/Hr	26.75 Hr	6.258 Rem
1993	65.00	250 mRem/Hr	13.00 Hr	1.543 Rem
% savings				
1993 vs 1991	59.6%	N/A	51.41%	75.35

References: Bishop, D., "Personnel Radiation Exposure Reduction During Remote Stud Handling at Indian Point 2," 1993 *Radiation Exposure Management Seminar*, Westinghouse, Pittsburgh, Pennsylvania, 1993.

Duration: from: 1993 to: 1993

Funding: N/A

Status: Completed

Last Update: December 15, 1993