

N202. Using Divers to Inspect and Repair the Torus Proper at Peach Bottom

The torus inspection was initiated to maintain the integrity of the torus coating in the immersion region. Four divers were used to perform the work. All 16 bays of the torus were desludged by vacuuming through filter banks; inspected using a grid system, photographed, and precise measurements were taken of pitted areas. The areas were repaired underwater by first cleaning out the pitted areas, then a syringe was used to inject an epoxy coating repair material which was smoothed by hand.

Divers had to meet ANSI standards for Level 1 and Level 2 coating inspectors. All dive personnel received General Employee Training upon arrival at the site. They were required to have a sufficient quarterly exposure balance, whole-body count, and to submit a urine sample for tritium analysis. Prior to starting any diving, all people significantly involved in the job received an in-depth ALARA briefing. A torus water sample was analyzed for gross beta, gamma, and tritium activity. Results were compared to limits specified in procedure to ensure that they were not exceeded.

A station HP procedure governed this diving operation. The divers were required to wear a full set of supplemental dosimetry, which included two 200-mrem self-reading dosimeters and extremity TLD badges. They were also monitored by a teledosimetry system with a sending unit strapped on each leg and one on the chest or back depending on diver position. The divers performed underwater hot particle whole-body frisks every 30 minutes during first-pass desludging, every 60 minutes during second-pass desludging, and every 2 hours during coating inspection and repair. No hot particles were detected. Divers wore boots over their dry suits to prevent holes due to the rough surface of the torus shell. A pre-dive work area survey was performed each day to verify radiological conditions. Divers were then briefed on the work area dose rates.

As preparations for the job got underway, high heat and humidity hampered productivity until the torus vacuum breakers were propped open, which helped relieve the heat stress conditions. Temperature fell from 92° to 87° in one day. By the fifth day, the temperature leveled off at 82°. A Seamore underwater robot was used to perform the initial radiological survey. It had two water-proofed DCA AM-2 G.M. survey instrument probes attached to it in order to obtain redundant survey readings for comparison. Poor water clarity, coupled with the high heat and humidity, made it a slow process.

Some observations were made throughout the course of the job:

- Tags placed on service air, water, and telephone lines describing their purpose prevented them from being disconnected.
- The use of 10-micrometer filters for the first-pass desludge was quite effective in retaining silt which may have helped to self-shield the filters.
- The divers required dose extensions up to 2 rem in order to complete their work. In 37 days, 263 dives took place and 1,100 NCR pit repairs were made.

Taken from, "Peach Bottom Atomic Power Station, 1991 Unit 3 8th Refuel Outage, Torus Proper Underwater Coating Inspection and Repair," submitted by Glen Faden (Philadelphia Electric Company, RD 1, Box 208, Delta, PA 17314) 717/456-7014.