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J.W. Wells 10-6-92

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July 18, 1951

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REMOVAL OF RUPTURED SLUG
FROM TUBE NO. 2169-B

SUMMARY

The 105-B Pipe was shut down at 2:51 A.M. on July 18, 1951 to permit removal of a ruptured uranium slug from tube No. 2169-B. The rupture was detected from effluent water monitor evidence and a survey of rear face pigtailes. Removal was accomplished with the pneumatic charging machine using only normal pushing force.

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HW-21728

July 25, 1951

DETECTION

At 12:15 A.M. on July 18, 1951, the differential activity recorder in B sample room gave a slight indication of increasing activity on header 21 $\frac{1}{2}$, near side. Special water samples taken at 12:20 A.M. and at 12:45 A.M. failed to supply conclusive evidence that a rupture existed. At 1:30 A.M. samples were again taken when definite indications were noted on the continuous water monitor sample from the near riser and the 107 inlet water activity monitors. This set of samples yielded readings of 35,000 c/m for cross header 21 $\frac{1}{2}$, 6,000 c/m for cross header 19 $\frac{1}{2}$ and 9,000 c/m for cross header 23 $\frac{1}{2}$. Based on this evidence, the Pile was shut down at 2:51 A.M. by means of the #2 scram button. No abnormal increases in pressure drop or temperature rise were detected on tubes on this header. Confirmation of a slug rupture was obtained by a radiation survey of the pigtail which revealed readings in excess of 5R on tube 2169-B.

ISOLATION

The special nozzle cap was installed to drain the effluent water from 2169-B to the crib outside the 103-B building. River contamination was minimized by diverting the Pile effluent water to the empty 107 North Basin and pumping of the South 107 Basin to the special crib. Subsequent sampling of the North Basin indicated that no contamination was added to this basin.

REMOVAL

No effort was made to discharge the tube until 7:00 A.M. During this interval the special discharge equipment was procured and the slug was maintained at a minimum temperature. The tube was discharged by means of the pneumatic charging machine. The charge was displaced with solid aluminum dummy plugs and was discharged directly into the basin. The dummy plugs were then discharged and the tube swabbed repeatedly until no decrease in the contamination level of successive swabs was detected.

The rear pigtail and nozzle were replaced. Due to the high exposure level, it was necessary to cut the thermocouple line and a new thermocouple was successfully spliced to the old line as replacement. The tube was then recharged with regular metal and returned to service.

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HW-21728

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July 25, 1951

PERTINENT DATA ON THE CHARGE

Tube 2169-B was charged with regular metal on February 7, 1951. The tube was operating at a 341 K.W. power level and had reached 64% of current goal concentration.

A flux comparison of the pieces from the tube indicated that the ruptured slug was the 48th downstream piece in the loading pattern.

H. I. ASPECTS

Contamination was contained within the discharge area during the entire course of the work. There were no serious cases of personnel contamination and no cases of over limit exposures.

Samples of storage basin water revealed only normal activity levels and flow was restored before resumption of Pile operation. The North retention basin was released for normal service and preliminary results indicate the South basin can be released for normal service.

SLUG EXAMINATION AND DISPOSAL

Examination of the ruptured slug revealed that the cap had been completely removed from the slug, apparently due to the pressure of the corrosion products formed beneath the end cap. The majority of the corrosion was localized near the center of the slug. The ruptured slug was an M. R. type, canned December 27, 1950, processed on truck No. 3, line G, and had been autoclaved.

The slug was placed in a water tight can and it and the cap are being held in the storage basin pending removal to J11-2.

LOST TIME

The Pile was shut down at 2:51 P.M. on July 18, 1951, and operation was resumed at 3:38 A.M. on July 19, 1951. The elapsed downtime of 25.8 hours was the minimum possible outage under prevailing Pile conditions. The production loss has been estimated at 476 M.W.D.

J. T. Baker
Ops Division

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12/18/92