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• June 20, 1951

REMOVAL OF RUPTURED SLUG FROM TUBE 1174-D

Summary

The 105-D pile was shutdown at 1:28 P.M. on May 21, 1951, to permit removal of a ruptured slug from tube 1174-D. Removal was accomplished by hydraulically ejecting the charge down-stream of the ruptured piece and utilizing a hydraulic jack and a charge machine to discharge the remainder of the metal.

The tube contained regular metal, charged on October 2, 1950. The ruptured slug was a ZR type, canned on July 7, 1950, processed on truck No. 2, line G, and had been autoclaved.

Preliminary visual examination of the piece indicated that the rupture resulted from a failure of the weld.

After expending 15 hours to discharge tube 1174-D, the pile remained down to complete the routine shutdown work scheduled for May 23 - 24, 1951.

Detection

The rupture was initially indicated by the effluent water monitoring system. Investigation revealed the following:

Header 11½ in A room read full scale.

Header 11½ in X room gave no indication of abnormality.

The rear riser continuous sample advanced one minor division in a fifteen minute period.

The 107 inlet made a sharp rise of six minor divisions, and then returned to a point one minor division above normal.

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Detection (Cont'd)

The Health Instrument Division took header samples with the following results.

<u>Header No.</u>	<u>100cc Sample</u>	<u>2cc Sample</u>	<u>VGM</u>
	<u>Reg./min.</u>	<u>Reg./min.</u>	<u>c/m</u>
10 $\frac{1}{2}$	21	92	4,000
11 $\frac{1}{2}$	200	192	30,000
12 $\frac{1}{2}$	24	94	200
13 $\frac{1}{2}$	23	91	1,500

After pile shutdown, a rear face survey on header 11 $\frac{1}{2}$ revealed a 5 R/hr. reading on pigtail 1174-D. On a subsequent survey with a T.P. instrument, a reading of 38 R/hr. was observed at the junction of the outlet nozzle and the pigtail.

The tube was isolated by utilizing the special rear cap with hose attachment. Water leakage incurred while installing this cap was caught by a plastic sheet which, attached to the nozzles adjacent to 1174-D, funneled the water into a G.I. can on the elevator.

Approximately 20 minutes after isolation of the tube, the effluent flow was diverted from the north to the south 107-D basin. Samples of effluent water taken at the north basin outlet before diversion, and of the south basin inlet and outlet after changing basins, indicated that no detectable amount of product or excessive contamination were flowing into the river.

Removal

Initial efforts to discharge the tube with a charge machine were unsuccessful. A hydraulic jack was used and the charge released at 1,500 psi. Shields were placed over the catwalks, a megaphone funnel installed on tube 1174-D, and the rear dummy pattern and 14 metal pieces were ejected by 350 psi water pressure. The hydraulic jack was again employed after a second unsuccessful attempt to move the columns with a charge machine. At 1,500 psi the charge released again, and the pressure dropped to 900 psi permitting utilization of a charge machine.

Tube 1174-D was removed from the pile, but because of limited elevator time in the ensuing shutdown, the tube is to be replaced at a subsequent outage.

Data On The Charge

Tube 1174-D contained regular metal, charged on October 2, 1950. At the time of the rupture, the tube was operating at a 260 KW power level and the metal had reached 100% of current goal concentration.

The ruptured piece was the 49th from the up-stream end of the charge. Examination revealed a bulge on one side of the weld-end cap, and a rupture extending around its circumference immediately adjacent to the bulge. A further rupture of the can, starting at the bulge rupture, ran diagonally up the can for approximately one half of its length.

R.I. Aspects

Contamination was confined to established danger zones, and there was no overexposure of personnel.

Samples, taken of the storage basin after the ruptured piece was discharged, indicated that no abnormal amount of contamination was present in the overflow water. Samples of the 107 basin, discussed on the preceding page, gave similar results. Both the storage basin and the 107-D basins were returned to normal service.

Slug Disposal

The ruptured slug has been canned by the Technical Division and is currently being held in the 105-D storage basin pending shipment to 111-B.

P DIVISION

HG DeVoss:mbe

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