ANNUAL OPERATING REPORT FOR 1978

AS REQUIRED BY THE TECHNICAL SPECIFICATIONS FOR THE

WESTINGHOUSE NUCLEAR TRAINING REACTOR

FACILITY LICENSE NO. R-119

DOCKET NO. 50-87

1. NARRATIVE SUMMARY

The Westinghouse Nuclear Training Reactor (NTR) was operated in a routine manner during 1978. Operations included training for customers and for licensed operator trainees. Required experiments were routinely performed for surveillance testing. Nine irradiations were performed, all of them gold or indium foils used for training or for power calibration surveillance testing.

No changes were made in the design of the facility related to reactor safety. The design of the dump tank bottom was changed as described in section 4, Major Maintenance.

The excess reactivity of the reactor in the normal configuration was discovered to be 9.6% delta-k/k instead of the previously reported 10.7%. The difference does not represent a change in the core itself, but rather increased accuracy in measuring the excess reactivity. The old value was based on limited, intitial data, whereas the new value is based on data accumulated over the six years of operation at the Zion site.

Some minor changes, none affecting reactor safety, were made to the procedures for conducting certain training lessons and for performing certain maintenance items.

An Emergency Plan was drafted, reviewed and issued, and the new program for requalification training of licensed operators was implemented.

Higher than usual levels of radioactivity were discovered in the moderator-shield water in November, the highest being 1.3×10^{-7} microcuries per milliliter gross activity and (on a different date) 7.4×10^{-6} microcuries

1. (Continued)

per milliliter of Cs-137 activity. No limits were exceeded, and levels were returned to normal by operation of the purification demineralizer. The cause of the abnormally high activity has not been finally determined, but is believed to be activation of impurities in the water during a period in November of unusually heavy operations, with the reactor in use 24 hours a day on weekdays.

2. ENERGY GENERATED AND HOURS OPERATIONAL

The reactor generated 33,280.1 watt-hours of energy and was operational for 1,464.8 hours.

3. INADVERTENT REACTOR TRIPS

There were 140 inadvertent reactor trips during the year. Of these, 125 were due to trainee errors, 14 were due to equipment malfunctions, and 1 was due to failure of the power supply to the NTR Facility.

4. MAJOR MAINTENANCE

The problem with the dump tank bottom reported in the annual operating report for 1977 was resolved by the installation of a new bottom. The appended chronological summary of repair activities gives details, results and references. The problem did not at any time represent a hazard to the safety of the reactor.

5. SUMMARY OF FACILITY CHANGES

No tests or experiments were conduncted under the conditions of 10CFR50.59.

6. RADIOACTIVE EFFLUENTS

No releases of radioactive effluents beyond the control of the licensee were made during 1978.

NTR Facility Manager
523-4032
3/17/78
Dump Tank Repair

NTR DUMP TANK FILE

The following is a chronological summary of the activities and results of the repair of the NTR Facility dump tank. The detailed procedures, "Repair of the W Nuclear Training Center Dump Tank-Bottom Replacement Procedure", dated December 16, 1977, revised as per Appendix C which was transmitted by the C. S. Ramos letter dated February 6, 1978, and "Weld Procedures for Bottom Replacement of the (W) Nuclear Training Center Dump Tank", dated January 12, 1978 are both on file in the NTR Facility.

Date	Activities
January 13, 1978	Commenced removing the original bottom.
16	The original bottom was removed and cleanup of the crud commenced.
18	Cleanup of the concrete pad completed and the old sump removed.
19	Preparing the concrete pad to accept the backing bars and support pins.
26	Backing bars secured and welded in place.
30	New sump installed, tubular alumina and fine media in place.
	NSD QA present for inspection.
31	Commenced welding bottom plates to backing bars.
February 2	Commenced welding the circumference of the new plates. The first of three passes was completed. The bottom became sealed at this time.
6	Completed welding bottom plate in place.
7	Reinforced original weld segments on the tank bottom where previous joint seams existed.
	NSD QA present for visual inspection.
8	Measured the distance from the 1" drain flange to the tank bottom. Distance measured at 4' 4 3/4". (See Figure 1).

Date	Activities
February 9	Completed the ultra-sonic test.[1] Commenced adding water to the reactor and dump tank.
10	Completed the "Helium bubble" test.[2] Commenced surveillance testing. Pumped out the inleakage sump. (See Figure 2).
14	Completed testing and maintenance. Fuel loaded and reactor startup completed.
27	Notified NRC Recion III, Jim Barker, of the completion of this project and the operating status of the facility.

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[1] A separate report from WNSD Inspection Service Group will be on file in the NTR Facility dump tank file.

[2] This test involved pressurizing the space between the tank bottom plate and the concrete pad. The helium pressure was held at 3 psig for 90 minutes while the two inch water level in the dump tank was observed for bubbles. No bubbles were observed.

The results of the tests and inspections mentioned above were all favorable. Therefore, in accordance with NTR Facility Procedures, section 5.2.2, the undersigned have reviewed, verified correct, and approved for operation, the dump tank bottom modification.

C. C. Ferguson, Lead Engineer
NTR Facility

J. M. Roth, Manager
NTR Facility

JMR/sm

Rev
3/87/78

DUMP TANK REPAIR
JAN/FEB 1978

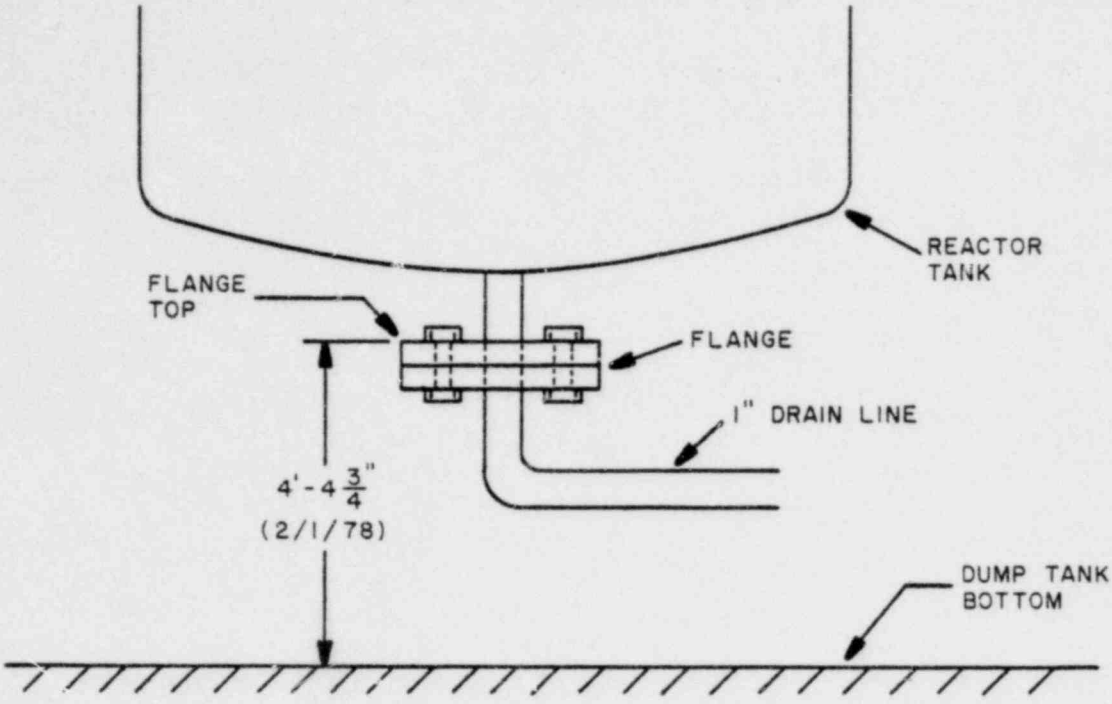

FIGURE 1

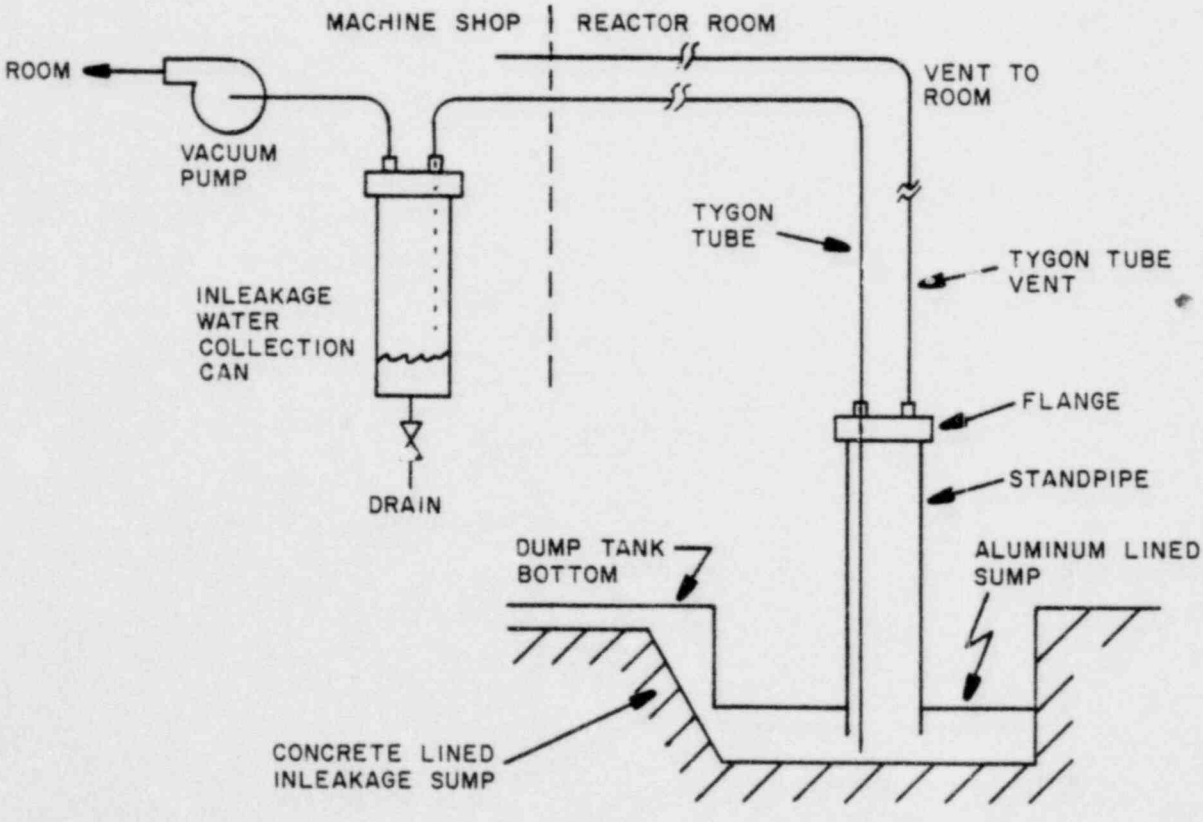

FIGURE 2