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MINECK, D.L. Iowa Electric Light & Power Co.
RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: Environ Tech Spec Violation Rept 80-3: on 800312, contaminated water released into Cedar River. Caused by leakage of two condenser tubes into circulating water sys. Procedures will be modified to isolate condenser when necessary.

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Iowa Electric Light and Power Company

March 21, 1980

DAEC - 80 - 158

Mr. Harold Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
1717 H. Street NW
Washington, D. C. 20545

Re: Duane Arnold Energy Center

Subject: Environmental Technical Specification
Violation Report 80-3

File: A-117

Dear Mr. Denton:

This report is submitted in accordance with the requirements of Appendix B to Operating License DPR-49, Specification 3.3.1.B.2.

Problem

On March 12, 1980 contaminated water which had leaked into a main condenser water box was pumped into the circulating water system without first being sampled and analyzed. Water was later released to the Cedar River from the circulating water system. Technical Specifications Appendix B, Section 3.3.1.B.2 requires liquid effluents be sampled and analyzed prior to release to unrestricted areas.

Investigation

For several days preceding 3-11-80 the main condenser water boxes had been drained and open to permit condenser tube cleaning. On 3-11-80 the reactor cavity was drained which filled the main condenser hot well. The water level in the condenser rose to above the upper most row of condenser tubes at approximately 1800 hours. On the morning of 3-12-80 the water boxes were pumped by the use of portable submersible pumps and the installed water box drain pump 1P-7. The water was pumped to the circulating water system. This was a routine action which had been accomplished on a regular basis to drain water which accumulated from condenser tube cleaning operations. At approximately 1030 hours on 3-12-80 low levels of contamination were found

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on anticontamination clothing of personnel who had been working in the condenser water boxes. An immediate investigation was begun by health physics personnel to determine the source of contamination. A visual inspection found two condenser tubes in the upper most tube row of condenser 7A which appeared to be leaking. At 1100 hours a gross count on a glove smear verified the leak was cavity water. At 1120 hours the control room was notified of the leak and the shift supervising engineer directed that all further pumping from the condenser water boxes to the circulating water system be terminated. At 1130 hours the two leaking tubes were plugged. At this point operations personnel assumed incorrectly that the contaminated water had already been released to the Cedar River. In reality the water was still contained in the circulating water system.

Based on an estimate of the observed leak rate and knowing the time interval involved it was determined that approximately 540 gallons of contaminated water had leaked to the water box and subsequently been pumped to the circulating water system. At approximately 1500 hours a hot well water sample was taken and an analysis begun. The analysis indicated the radioactivity concentration in the water was $4.90 \times E-4$ $\mu\text{ci/ml}$. The 540 gallons containing this activity was diluted by the 823,200 gallons of water contained in the circulating water system thus reducing the radioactivity concentration to $3.21 \times E-7$ $\mu\text{ci/ml}$ (calculated).

At approximately 1900 hours on 3-12-80 and again at 0100 hours on 3-13-80 the circulating water system became filled due to continuous well water addition and MOV-1998 was opened to allow some circulating water to be rejected to the Cedar River. This was done because, as noted above, operations personnel believed the contaminated water had already been released. Calculations later determined that with the additional dilution factor of well water addition the radioactivity concentration of the water released to the Cedar River was $2.08 \times E-8$ $\mu\text{ci/ml}$. Comparing this concentration with the maximum permissible concentrations (MPC) listed in 10CFR20 Appendix B, Table II, Column 2 it can be demonstrated that the concentration of radionuclides in the released water was less than MPC for any single nuclide and for the mixture. In order to confirm that no significant release occurred, the strip chart from radiation recorder RR 1997 was reviewed for the periods during which the releases occurred. RR 1997 and its associated radiation monitor RM 1997 monitored the flow path through which the circulating water was released before well water dilution. No change in the monitor reading had occurred. RM 1997 has an efficiency of $5.07 \times E-7$ $\mu\text{ci/cc/cps}$.

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As a result of the above calculations and observations, it has been determined that this event had no adverse affect on the health and safety of the public.

Corrective Action

In order to preclude recurrence a procedure will be developed which will require that in situations in which the circulating water system is shutdown and the condenser steam side is flooded to above the condenser tubes, the condenser will be isolated and will remain isolated until a sample of water box water is taken and analyzed.

This report has been reviewed and approved by the DAEC Operations Committee and Safety Committee.



D. L. Mineck
Chief Engineer
Duane Arnold Energy Center

DLM/JVS/n

cc: Mr. J. Keppler