

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGION IV

Report No. 50-313/50-368/80-08

Docket Nos. 50-313
50-368

Licensee: Arkansas Power and Light Company
Post Office Box 551
Little Rock, Arkansas 72203

Facility Name: Arkansas Nuclear One (ANO), Units 1 and 2

Location: Russellville, Arkansas

Investigation Conducted: May 10-12, 1980

Inspector: Lorenzo Wilborn 6/16/80
Lorenzo Wilborn, Radiation Specialist Date

Approved by: Glen D. Brown 6/18/80
Glen D. Brown, Chief, Fuel Facility and Date
Material Safety Branch

Investigation Summary:

Investigation on May 10-12, 1980 (Report No. 50-313/50-368/80-08)

Areas Inspected: Special, announced investigation of radiological conditions and environmental impact associated with a reported incident in which a seal on one of four reactor coolant pumps in Unit One failed causing several thousand gallons of water to flood the floor of the reactor building. The investigation involved seventeen (17) inspector-hours by one NRC inspector.

Results: No items of noncompliance or deviations were identified.

REASON FOR INVESTIGATION

Region IV received a telephone call from a licensee representative on May 10, 1980, reporting that an incident had occurred at Unit One of Arkansas Nuclear One (ANO) in which a seal on one of four reactor coolant pumps failed causing several thousand gallons of water to flood the floor of the reactor building. A Region IV Radiation Specialist was dispatched to the site on May 10, 1980, to evaluate the radiological hazards and environmental impact associated with the incident and to assess the proposed clean up procedures to ensure that the incident did not and will not pose a radiological threat to the public health and safety.

SCOPE OF THE INVESTIGATION

During the period May 10-12, 1980, a Region IV Radiation Specialist interviewed the licensee's Management, Health Physics and Radiochemistry personnel, evaluated the radiological hazards and environmental impact associated with the incident, and reviewed the proposed clean up procedures.

CONCLUSIONS

The Unit One reactor remained stable throughout the incident, there was no detectable outside release of radioactivity and the incident did not result in a threat to the public health and safety.

The incident did not cause any observable adverse effects on the operation of Unit 2 of ANO.

DETAILS1. Persons ContactedPrincipal Licensee Employees

*Harvey Miller, Manager of Engineering and Technical Support
 Finley Foster, Manager of Operations and Maintenance
 David Snelling, Supervisor of Technical Support
 Gary Fiser, Radiochemistry Supervisor
 Richard Hackman, Radiochemist
 Steve Gallagher, Radiochemist
 Diana Arnold, Radiochemist

Other

*William Johnson, NRC Resident Inspector

*Denotes those attending exit interview on May 12, 1980.

2. Investigative Findings

At approximately 1:45 a.m. on May 10, 1980, while operating at approximately 86 per cent full power, the "C" reactor coolant pump (RCP) seal on Unit One of ANO failed resulting in excessive Reactor Coolant System (RCS) leakage to the reactor building sump. A power reduction was immediately initiated manually to bring the turbine offline. The turbine was taken offline approximately one hour after the seal failure initiated this transient. The "C" RCP was secured after the turbine was taken offline and before manually tripping the reactor. The standby High Pressure Injection (HPI) pumps were manually started to maintain proper pressure level and RCS pressure. RCS cooldown was started following the reactor trip. The standby HPI pump was secured approximately fourteen minutes after being placed in service. Throughout the incident, the margin to saturation was maintained at greater than 47 degrees Fahrenheit. Area radiation monitors (RAM) indicated the following dose rates at approximately 7:15 a.m.:

Incore Instrumentation	2 R/hr
Fuel Handling	.8 R/hr
Equipment Hatch	.7 R/hr
Personnel Hatch	.4 R/hr

The following is a complete readout of activities inside the reactor building at approximately 7:15 a.m.:

Iodine	282 MPC
Iodine Particulate	92 MPC

Rubidium - 88	1307 MPC
Gross Gas	181 MPC
Other	57 MPC

At approximately 8:00 a.m., a reactor operator and a health physics technician entered the reactor building to isolate the Core Flood tanks to further facilitate depressurization and cooldown and to take a reactor building air sample. The following radiation readings were observed using a teletector:

Equipment Hatch (357 ft. level)	700-800 mR/hr
Personnel Hatch	400-500 mR/hr
Above Grating (357 ft. level)	1 R/hr

The individuals entering the reactor building were wearing full anti-contamination clothing, forced air respirators and five TLD badges each. They observed approximately eighteen inches of water (40,000 - 45,000 gallons) in the reactor building. They were inside the reactor building approximately four and one-half minutes. The TLD results were as follows:

Reactor Operator	44 mRem whole body
H. P. Technician	53 mRem whole body

Urine samples were collected from each individual on May 10, 1980 and the results were as follows:

<u>Individual</u>	<u>Time Counted</u>	<u>Isotope</u>	<u>μCi/ml</u>
Reactor Operator	2:00 p.m.	H-3	<9.38E-07
	4:00 p.m.	H-3	<9.17E-07
	6:00 p.m.	H-3	<9.70E-07
	8:00 p.m.	H-3	<9.39E-07
H.P. Technician	3:30 p.m.	H-3	<9.36E-07
	7:00 p.m.	H-3	<9.30E-07

Whole body counts were negligible on both the reactor operator and the health physics technician.

The total activity of the air inside the reactor building per the air sample was calculated to be 3090.5 curies (2732 curies XE-133). The methods of air sample collection preparation and evaluation were reviewed and discussed and found to be acceptable. Another reactor building air sample was collected through penetrations at approximately 8:00 a.m., May 11, 1980. This samples' results were extremely low, investigation as to why revealed that a valve along the penetration line was not opened during the time the sample was collected.

Another reactor building air sample was collected through penetrations at approximately 4:00 p.m., May 11, 1980. Again the results were low (approximately 800 curies) compared to the initial air sample but higher than the most recent one. This sample was deemed to not be representative because the reactor building was under negative pressure. Therefore, in order to collect a representative reactor building air sample, another entry was necessary. At approximately noon on May 12, 1980, two members of the ANO staff, a health physics technician and a radiochemist, entered the reactor building to obtain additional samples of air and water. These members were inside the reactor building for approximately fifteen minutes.

Area radiation monitors indicated the following dose rates at approximately 11:30 a.m.:

Incore Instrumentation	600 mR/hr
Fuel Handling	70 mR/hr
Equipment Hatch	60 mR/hr
Personnel Hatch	30 mR/hr

Radiation exposures for these members had not been determined at my departure, however, it was estimated that the whole body exposures would be approximately 15-20 mRem each. Whole body counts and urine analysis will purportedly be conducted for each of these members. The total activity of the air inside the reactor building per this sample was calculated to be 2840 curies, which correlates with the first such sample in reflecting the decay of radioactive materials that had already taken place since the incident occurred on May 10, 1980. The total activity of the water inside the reactor building per the water sample was calculated to be approximately 6 curies.

The proposed clean-up operations (purging air and decontaminating water and equipment) at Unit One of ANO will neither pose any threat to public health and safety nor adversely impact on the environment if performed as planned for this is the normal procedure used during routine shutdown of the unit when maintenance and modifications are performed. Review of the calculations for these proposed releases are even lower than some of the previous maintenance operations releases which were within design objectives and the operating license technical specification limits.

3. Exit Interview

The NRC inspector met with licensee management (denoted in paragraph 1) at the conclusion of the investigation on May 12, 1980. The inspector summarized the purpose and scope of the investigation, and discussed the findings.