

LICENSEE EVENT REPORT

CONTROL BLOCK

(PLEASE PRINT ALL REQUIRED INFORMATION)

LICENSEE NAME						LICENSE NUMBER						LICENSE TYPE				EVENT TYPE				
01	I	L	O	A	D	2	00	-	00	00	00	-	00	4	1	1	1	1	01	
7	8	9				14	15						25	26					31	32

01		CON'T	CATEGORY		REPORT TYPE	REPORT SOURCE	DOCKET NUMBER				EVENT DATE				REPORT DATE											
7	8		57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
			M	I	T	L	0	5	0	-	0	2	6	5	0	8	1	7	7	5	0	2	2	7	7	5

[illegible]

02	DURING STARTUP WHILE TRANSFERRING FEEDWATER CONTROL FROM	80
03	THE LOW FLOW FEED REG VALVE TO MAIN REG VALVE, VIBRATION	80
04	INDUCED CRACK AND LEAK IN BODY OF 4" X 6" REDUCER ON	80
05	DOWNSTREAM SIDE OF LOW FLOW VALVE. RX SCRAMMED AND	80
06	FD REG STATION ISOLATED. ESTIMATED 12,500 GAL RELEASED TO	80

SYSTEM CODE				CAUSE CODE	COMPONENT CODE						COMPONENT SUPPLIER	COMPONENT MANUFACTURER				VIOLATION				
0	7			1		0	1	1	0	1	0	1	0	1	0	1	0	1		
7	8	9	10	11	12	13	14	15	16	17	43	44	45	46	47	48				

CAUSE DESCRIPTION

08 THE BREAK WAS CAUSED BY VIBRATIONS. THE CAUSE OF THE VIBRA-
7 8 9 80
09 TIONS IS SPECULATED AS BEING FLOW INDUCED DURING
7 8 9 80
10 TRANSIENTS CAUSED BY THE FEEDWATER REG VALVE
7 8 9 80

FACILITY STATUS		% POWER	OTHER STATUS	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION
11	C	12	NA	A	NA

FORM OF ACTIVITY RELEASED

CONTENT OF RELEASE

AMOUNT OF ACTIVITY

LOCATION OF RELEASE

PERSONNEL EXPOSURES

NUMBER				TYPE	DESCRIPTION
1	3				NA

PERSONNEL INJURIES

NUMBER				DESCRIPTION
1	4			NA
7	8	9	11	12
				80

OFFSITE CONSEQUENCES

[illegible]

LOSS OR DAMAGE TO FACILITY

TYPE			DESCRIPTION
16	7	8	9
			10
			NA

PUBLICITY

17 NA PDR ADDCK 050000ED PDR
7 8 9 S

ADDITIONAL FACTORS

18	EVENT DESCRIPTION (CONT'D) PLANT APPROX 2,500 GAL WENT TO
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19 OIL SEPARATOR, NEW REDUCERS PIPE AND JOINTS INSTALLED (AO-50-265/15-21)

NAME: _____

PHONE:

REPORT NUMBER: AO-50-265/75-31

REPORT DATE: August 27, 1975

OCCURRENCE DATE: August 17, 1975

FACILITY: Quad-Cities Nuclear Power Station
Cordova, IL 61242

IDENTIFICATION OF OCCURRENCE:

The Unit 2 low flow feedwater line severed at a 6" to 4" reducer on the downstream side of low flow regulating valve AO-2-643.

CONDITIONS PRIOR TO OCCURRENCE:

Unit 2 was coming up in power after an outage. At the time of the occurrence the Unit was in the run mode operating at 560 MWt and 170 MWe.

DESCRIPTION OF OCCURRENCE:

On August 17, 1975, following a reactor startup, operating personnel were dispatched to the feedwater regulating station to observe the transfer from the low flow feed regulating valve, AO-2-643, to the main feed regulating valve AO-2-642B. At 8:40PM, with both the main and low flow regulating valves partially open, a feedwater vibration alarm was received in the control room. The unit was manually scrammed because the low flow line just downstream of AO 2-643 showed indications of starting to sever. The feedwater pumps were tripped and the feedwater regulating station was isolated. Reactor vessel level was controlled with the Reactor Core Isolation Cooling system. The affected areas were immediately surveyed and roped off by Radiation Protection personnel.

Subsequent inspections revealed additional cracks in the low flow piping at the low flow riser junction to the main feedwater line and in the reducer upstream of the regulating valve.

DESIGNATION OF APPARENT CAUSE OF OCCURRENCE:

Equipment Failure -

The cause of this occurrence is designated as equipment failure. The equipment failure was due to vibrations at the feedwater regulating station during the transfer from the low flow valve to the main feed regulating valve. The initial cause of the cracking is attributed to the operational vibrations that occur at the regulating station. The cause of the vibrations has been under study by various organizations; alternative equipment and system configurations are being designed and procured to accomplish a solution to the vibration problem.

ANALYSIS OF OCCURRENCE:

At no time during this occurrence was the safe operation of the reactor threatened. All reactor parameters responded satisfactorily. There was neither excessive exposure to plant personnel nor contamination released to the environs at the time of this occurrence. The total amount of water released in the plant as a result of the occurrence has been estimated at 12,500 gallons; approximately 8,500 gallons came from the severed line, and approximately 4,000 gallons came from the service water deluge system. It is estimated that 2,500 gallons of the feedwater, with an activity of 1.9×10^{-2} uCi/ml, flowed to the Unit 2 oil separator.

Initial estimates were that only a few hundred gallons had reached the separator by flowing under the building trackway door. It was later confirmed that the main route for the water to the separator was through floor drains from the mezzanine level of the turbine building to the storm sewer system. The volume of water that flowed from the building was contained in the oil separator. This water was later discharged from the site on a batch control basis. The maximum activity as sampled in the oil separator was 4.17×10^{-3} uCi/ml. The batch releases were controlled such that the activity at the release point in the discharge bay was less than the Technical Specification limit of 1.0×10^{-7} uCi/ml.

The remaining volume of water was contained in the Unit 2 turbine building and was processed through the radwaste systems. Plant contamination as a result of this occurrence was considered low level.

The health and safety of the public was not affected by this occurrence.

CORRECTIVE ACTION:

The following immediate corrective actions were taken:

1. Four snubbers were added to the feedwater regulating station piping to restrict the motion of the 6" low flow line to mitigate the consequences of potential future vibration transients.
2. New 4x6 reducers were installed on both sides of the low flow regulating valve to replace the cracked reducers. The lower carbon content of the new reducers (.23% actual) compared to that of the old reducers (.32% actual), should provide greater ductility with less susceptibility to cracking.
3. The cracks in the low flow piping at the connection to the main feedwater line were weld repaired. The header pipe was sleeved with 8" schedule 160 pipe to eliminate mechanical stresses from line vibration.
4. All new welds were blended into the base metal to reduce stresses and were magnetic particle inspected and radiographed.

The corrective actions to be taken in the future include procurement and installation of a "drag valve" to replace one of the main feedwater regulating valves. This valve should provide more adequate flow control over a wider range of flow conditions and serve to reduce flow induced vibrations at the regulating station. Also being planned is to repipe the low flow control valve line to provide a less rigorous path as another measure to reduce the flow induced vibrations. These actions are scheduled to take place during refueling outages in 1976.

The floor drains that flow to the storm sewer system have been capped to prevent any future flows of contaminated water to the oil separators.

FAILURE DATA:

The low flow feedwater line had previously failed on June 10, 1974, when the low flow regulating valve A0-2-643 ruptured. This rupture was also believed to have been partly caused by vibration encountered during normal service. Since that time, procedures have been established to dispatch operating personnel to the feedwater regulating station while the low flow valve is being transferred, to observe vibrations in the piping. The future corrective actions should eliminate vibrations at the regulating station and prevent future occurrences of this type.



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NJK-75-436

August 27, 1975

Director of Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Reference: Quad-Cities Nuclear Power Station
Docket No. 50-265, DPR-30, Unit 2
Appendix A, Sections 1.0.A.5, 6.6.B.1.a

Enclosed please find Abnormal Occurrence Report No. 50-265/75-31 for Quad-Cities Nuclear Power Station. This occurrence was previously reported to Region III, Office of Inspection and Enforcement by telephone on August 17, 1975 and to you and Region III, Office of Inspection and Enforcement by telecopy on August 18, 1975.

This report is submitted to you in accordance with the requirements of Technical Specification 6.6.B.1.a.

Very truly yours,

COMMONWEALTH EDISON COMPANY
QUAD-CITIES NUCLEAR POWER STATION

N.J. Kalivianakis
Station Superintendent

NJK/PRF/vmb

cc: Region III, Office of Inspection and Enforcement
G.A. Abrell



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