NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Oyster Creek, Unit 1	0 5 0 0 0 2 1 9	1 OF 0 4

TITLE (4)
Degradation of Neutron Monitoring Instrument Dry Tubes

EVENT DATE (5)			LER NUMBER (6)					REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR		SEQUENTIAL NUMBER		REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
												0 5 0 0 0
0 3	2 6	8 4	8 4	–	0 0 8	–	0 0	0 6	0 8	8 4		0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
N		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
0 0		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	X 50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
Hari S. Sharma	6 0 9 9 7 1 – 1 4 6 3 8

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	
X		D E L T	G 0 8 0	N							

SUPPLEMENTAL REPORT EXPECTED (14)

		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X YES (If yes, complete EXPECTED SUBMISSION DATE)	NO		1 0	3 0	8 4

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

While performing Local Power Range Monitor (LPRM) replacement work during the current refueling/maintenance outage, operators visually noticed that the dry tube associated with Intermediate Range Monitor (IRM) 12 appeared to be bent near the upper core grid. An underwater TV camera inspection performed on the dry tube in February 1984, showed a significant amount of cracking in the top portion of the tube. A more detailed inspection conducted by the Quality Assurance Department revealed that a total of seven (7) IRM and one (1) Source Range Monitor (SRM) dry tubes were cracked.

The videotapes of this inspection were submitted to the vendor and our Technical Functions Division for analysis. Based on their recommendations, it was decided that all twelve (12) dry tube assemblies (8 IRMs and 4 SRMs) will be replaced prior to reactor startup.

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DATE OF OCCURRENCE

Considering that these tubes have resided in the reactor core for the past 14 years, no definite time frame for the onset of this occurrence can be determined in the absence of a full metallurgical analysis of the damaged parts. Videotaping of the inspection of all dry tubes was completed on March 26, 1984.

IDENTIFICATION OF OCCURRENCE

Inspection of the dry tubes showed clear evidence of cracking which could have resulted in a potential breach of the primary coolant pressure boundary (although in this case, all cracks were above the pressure boundary).

This event is considered to be a reportable event as defined in 10 CFR 50.73 a(2)(ii). This event was determined to be reportable on May 10, 1984.

DESCRIPTION OF OCCURRENCE

A review of the videotapes revealed that seven (7) IRM and one (1) SRM dry tubes were cracked seriously enough to be considered fractured. There are a total of eight (8) IRM and four (4) SRM tubes in the vessel. The cracks were found in the thin wall tube surrounding the compression spring which facilitates installation, location, and removal of the dry tubes by ensuring engagement of an upper plunger with a pocket in the intersection of top guide plates. This is a non-pressure retaining portion of the dry tube and all cracks were in the vicinity of non-stress relieved welds. The two most severe cracks occurred in the uppermost pressure boundary welds which prevent reactor coolant from intruding into the tube housing the neutron detector. No major indications were observed in the adaptor, the shaft, the guide plug, the primary pressure boundary or any other portion of the tube.

APPARENT CAUSE OF OCCURRENCE

Although the exact cause of this failure cannot be determined at this time, the following factor(s) could have contributed to this occurrence:

1) Flow induced vibration/damage from running the recirculation or shutdown cooling pumps when fuel has been removed from around the dry tubes.

2) Radiation enhanced embrittlement of stainless steel.

3) Stress corrosion cracking of the weld sensitized metal. The welds produced during fabrication of the dry tubes are not in a stress-relieved or solution-annealed condition.

ANALYSIS OF OCCURRENCE and SAFETY ASSESSMENT

The following analysis is presented:

1) The fractured dry tubes have severely reduced ability to return to straightness if deflected and, therefore pose a risk during fuel handling. This is sufficient reason to remove these units immediately.

2) The clearances around the dry tubes in the loaded core are sufficiently close to preclude large loose parts migration. Small loose parts constitute a minimal risk.

3) Cracks propagating into the pressure boundary would confront compressive stresses that would arrest their growth.

4) Cracking is likely to become more extensive with time.

5) There is a distinct possibility of tube failure during normal operation and consequent channel damage with the potential for fuel clad damage.

6) The dry tubes can continue to function even with a maximum offset of the dry tubes following a 360° through wall crack because the two pieces will be held in functional alignment by support from adjacent fuel channels. Also the support provided by fuel assemblies will prevent adverse safety consequences from loose pieces in the event a dry tube becomes completely severed.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

SAFETY ASSESSMENT

The cracks found in the SRM/IRM dry tubes did not breach the primary coolant pressure boundary nor did they cause their associated neutron detectors to lose function. With the plant in its current REFUEL mode the safety consequence is minimal. With the reactor at power there is a potential for a tube break at the pressure boundary causing a small break LOCA within the drywell. The detection indications would be an increase in containment temperature, pressure, identified and unidentified leak rates. A manual plant shutdown would commence prior to exceeding the Technical Specification limits for leak rate. If a worse case tube break occurred, the leak would pass approximately 60 gpm which is within makeup capabilities given feedwater or control rod drive pump availability. If manual actions are not taken, an automatic scram would result from high drywell pressure within 30 minutes after break initiation. Utilizing manual or automatic action, or a combination of both, available systems would mitigate the consequences of the postulated small break LOCA within the plant's design basis.

CORRECTIVE ACTION

The corrective course of action is to replace all twelve (12) dry tubes prior to plant startup. Preparations are presently underway to commence this work.

GPU Nuclear

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Writer's Direct Dial Number:

June 8, 1984

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Dear Sir:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Licensee Event Report

This letter forwards one (1) copy of Licensee Event Report (LER) No. 84-008.

Very truly yours,

Peter B. Fiedler
Vice President and Director
Oyster Creek

PBF:dam
Enclosures

cc: Dr. Thomas E. Murley, Administrator
Region I
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NRC Resident Inspector
Oyster Creek Nuclear Generating Station
Forked River, NJ 08731

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