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)
THREE MILE ISLAND, UNIT 1	0 5 0 0 0 2 8 9	1 OF 0 5

TITLE (4)
DEFECTIVE OTSG 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)
1 1	1 6	8 4	8 4	—	0 0 7	— 0 1					0 5 0 0 0
											0 5 0 0 0

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		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(c)(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
Susan Otto, TMI-1 Licensing Engineer	AREA CODE 7 1 7 9 4 8 - 8 3 5 5

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	A B	S G	B 0 1 5	Y							

SUPPLEMENTAL REPORT EXPECTED (14)

		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On November 16, 1984, tubes in OTSG A were identified during Eddy Current Testing (ECT) as being defective. The inspection results in the periphery of OTSG A were declared to be in category C-3 (more than 1% of inspected tubes are defective) per T.S. 4.19. ECT continued in both OTSG A and B to identify the full extent of the indications.

The root cause of this event is discussed in TDR-666, "Adequacy of TMI-1 OTSG Return to Service Safety Assessment After 1984 Technical Specification ECT Examination," which concludes the most probable and reasonable explanation for the new indications during the 1984 examination is the enhanced visibility of pre-existing indications on the threshold of detectability. TDR-666 concludes that the corrosion failure mechanism identified in 1983 is still the correct description of what the OTSGs have undergone. The precautions taken to prevent reoccurrence have been adequately observed and are effective; no new material attack has occurred.

Defective tubes were removed from service in accordance with T.S. 4.19.4.a.6. The results of the eddy current inspection have been evaluated and reported to the NRC in TDR-652, "Evaluation of the 1984 Required Technical Specification Examination of the TMI-1 OTSG."

In accordance with 10 CFR 50.59, GPUN has performed a safety evaluation to ensure that plugging up to 2000 tubes with up to 75% of plugged tubes in OTSG A would have no adverse affect on performance of the steam generators and would not involve an "Unreviewed Safety Question."

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

I. PLANT OPERATING CONDITIONS BEFORE THE EVENT

TMI-1 was in a cold shutdown condition with the Once Through Steam Generator (OTSG) upper manways removed for access to conduct routine technical specification surveillance testing of OTSG tubes. Reactor Cooling System cold leg piping (including the OTSG's) was drained.

II. STATUS OF STRUCTURES/COMPONENTS

Prior to Eddy Current Testing (ECT), both OTSG A and B were considered operable (no leakage observed during the October 1984 bubble and drip tests). Routine ECT was being conducted per Technical Specification 4.19 requirements.

During 1981, TMI-1's OTSG A and B tubes experienced intergranular stress assisted cracking (IGSAC) originating in the tube primary side, which is the inside diameter of the tube. The IGSAC was in the tubes primarily in the upper tubesheet region. As discussed in GPUN Topical Report #008, both OTSG A and B tubes have been repaired by: 1) a kinetic expansion process in the upper tubesheets, 2) and removing some tubes from service. At present, OTSG A has 1217 tubes removed from service and the OTSG B has 325 tubes removed from service. There are 15,531 tubes in each OTSG.

III. EVENT DESCRIPTION

On 11/16/84 tubes in OTSG A were identified by ECT as being defective ($\geq$40% through wall). The inspection results in the periphery of OTSG A were declared to be in category C-3 (more than 1% of the inspected tubes are defective) per T.S. 4.19 at 1715 hours on 11/16/84, and the NRC was notified by phone. In OTSG B less than 1% of the tubes in the first 3% inspection sample were identified by ECT as being defective.

III. EVENT DESCRIPTION (Cont'd.)

Further ECT continued in both OTSG A and B to identify the full extent of these indications. ECT was completed in December, 1984.

Most of the ECT indications were in peripheral tubes, on the primary side (which is the inside diameter of the tubes), of limited circumferential extent, and were not through wall. Generally, the ECT indications were predominantly found in the 46 inch free span between the bottom face of the upper tubesheet and the 15th tube support plate. By letter 5211-85-2010 dated January 14, 1985, GPUN transmitted TDR-638 "Evaluation of Eddy Current Indications Detected During the 1984 Tech. Spec Inspection." Subsequently, by letter 5211-85-2073 dated April 11, 1985 GPUN submitted our final report, TDR-666, "Adequacy of TMI-1 OTSG Return to Service Safety Assessment After 1984 Technical Specification ECT Examination," which reiterates the TDR-638 conclusion that the most probable and reasonable explanation for the new indications during the 1984 examination is the enhanced visibility of pre-existing indications on the threshold of detectability. TDR-666 concludes that the corrosion failure mechanism identified in 1983 is still the correct description of what the OTSGs have undergone. The precautions taken to prevent reoccurrence have been adequately observed and are effective; no new material attack has occurred.

IV. COMPONENT FAILURE DATA

Component Name: Once Through Steam Generator

Component System: Reactor Coolant System

Component Manufacturer: Babcock and Wilcox

Reportable to NPRDS: Y

Method of Discovery: Eddy Current Testing

V. AUTOMATIC OR MANUALLY INITIATED SAFETY SYSTEM RESPONSE

Not applicable to this event.

VI. ASSESSMENT OF THE SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

TMI-1 was in a cold shutdown condition. Tube leakage tests completed in October, 1984, several weeks prior to this event, indicated no detectable tube leakage. Therefore, no safety consequences have occurred.

VII. PREVIOUS EVENTS OF A SIMILAR NATURE

As stated in Section II, IGSA cracking in OTSG tubes at TMI-1 had previously been detected in Eddy Current tests conducted in 1981 and 1982 which required tubes to be repaired or removed from service.

VIII. CORRECTIVE ACTIONS PLANNED

Defective tubes were removed from service in accordance with the Technical Specification 4.19.4.a.6, as summarized in GPUN letter 5211-85-2071 dated April 18, 1985. The results of the eddy current inspection have been evaluated and reported to NRC in TDR-652, "Evaluation of the 1984 Required Technical Specification Examination of the TMI-1 OTSG," submitted by GPUN letter 5211-85-2073. As discussed with F. Young of NRC on April 10, 1985, this satisfies the T.S. 4.19.5 requirements for reporting results of OTSG inservice inspections.

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

TR-008, Rev. 3 "Assessment of TMI-1 Plant Safety for Return to Service After Steam Generator Repair," described the results of analyses performed to determine if the steam generators could be operated safely with up to 1500 tubes removed from service. In accordance with 10 CFR 50.59, GPUN has performed a safety evaluation to ensure that plugging of up to 2000 tubes with up to 75% of the plugged tubes in OTSG A would have no adverse effect on performance of the steam generators. Our evaluation has established that this modification does not involve an "Unreviewed Safety Question" as defined in 10 CFR 50.59.

GPU Nuclear

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Writer's Direct Dial Number:

May 31, 1985
5211-85-2064

Office of Nuclear Reactor Regulation
Attn: J. F. Stolz, Chief
Operating Reactor Branch No. 4
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Stolz:

Three Mile Island Nuclear Station Unit 1 (TMI-1)
Operating License No. DPR-50
Docket No. 50-289
LER 84-007-01

This letter transmits Licensee Event Report (LER) No. LER 84-007-01. LER 84-007-00 submitted December 17, 1984 dealt with defective Once Through Steam Generator Tubes. As corrective action, defective tubes have been removed from service by plugging. LER 84-007-01 summarizes information previously submitted, including our assessment of the root cause of the event. Public health and safety were unaffected.

This LER is being submitted pursuant to 10 CFR 50.73, using the required NRC forms (attached). NRC form 366 contains an abstract which provides a brief description of the event. For a complete understanding of the event, refer to the text of the report which appears on Form 366A.

Sincerely,

H. D. Hukill
Director, TMI-1

SK:dls:1835f
Attachment

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