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

Dear Sir:

Three Mile Island Nuclear Station Unit I, (TMI-1)
Operating License No. DPR-50
Docket No. 50-289
LER 90-002-00

This letter transmits Licensee Event Report (LER) No. 90-002-00 which deals with gaps in the Reactor Building sump screen. Public health and safety were not affected.

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
Vice President & Director, TMI-1

HDH/WGH/spb

Attachment

cc: R. Hernan
T. Martin
F. Young

IE22
1/1

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)
GAPS IN THE REACTOR BUILDING SUMP SCREEN

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 1	3 1	9 0	9 0	— 0 0 2 —	0 0	0 3	0 2	9 0		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9):
POWER LEVEL (10): 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
20.405(a)(1)(i)	50.36(c)(1)	X 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(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
20.405(a)(1)(iv)	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	
W. G. HEYSEK, TMI-1 LICENSING ENGINEER	7 1 7	9 4 8 - 8 1 9 1

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

CAUSE	SYSTEM	COMPONENT	MANUFAC TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC TURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

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

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

A 1983 modification created access hatches in the top of the Reactor Building sump screen cage. The work left the cage with gaps in the screen at the edges of the hatches. A recent inspection confirmed the existence and size of the gaps and identified four smaller gaps (worst case 3/4" by 6"). The gaps could allow solid material to enter the suctions of the Low and High Pressure Injection Pumps and the Reactor Building Spray Pump which take suction from the containment sump. This could potentially cause pump damage or clogging of some Reactor Building spray nozzles.

The event was reported per 10CFR50.72.b.2.iii.D.

GAPS IN REACTOR BUILDING SUMP SCREEN

I. PLANT OPERATING CONDITIONS BEFORE THE EVENT

TMI-1 was in refueling cold shutdown (0% power).

II. STATUS OF STRUCTURES, COMPONENTS OR SYSTEMS THAT WERE INOPERABLE AT THE START OF THE EVENT AND THAT CONTRIBUTED TO THE EVENT.

There were no inoperable structures, components or systems inoperable at the start of this event that contributed to the event.

III. EVENT DESCRIPTION

The Reactor Building Sump Assembly [NH/-] is made up of a curbed upper grating (12' by 15') at the lowest floor elevation in the Reactor Building and a cage assembly constructed of grating covered with wire mesh located approximately 42" below the upper grating. The cage size is 8' wide by 12' long by 4' tall. The wire mesh is tie wired to the grating of the cage with stainless steel wire. All materials are stainless steel.

There are three access doors or hatches in the cage assembly. The hatches are made up of grating covered with wire mesh. One is in the east vertical side and two others are arranged side by side on the top (horizontal) surface on the west side. The horizontal hatches are directly over DH-V6A and B [BP/ISV]. DH-V6A and B are the sump isolation valves that supply Reactor Building water to the Low Pressure Emergency Core Cooling Systems (ECCS) [BP] and the Containment Spray Systems (CSS) [BE].

On 01/05/90 TMI-1 started a cold shutdown refueling outage and during January 1990 several visual inspections of the Reactor Building Sump Screen were made. The inspections revealed the following as found conditions:

(1) Three gaps, each approximately 1" wide by 30" long at the two horizontal hatches. Post-inspection research identified gaps to be shown in photographs taken in March 1983. Two of these gaps have an opening in both the wire mesh and grating while one has the opening only in the wire mesh. The grating holes are 1-3/16" x 4".

(2) Four small gaps, where the wire mesh had been pulled up from the grating near the horizontal and vertical hatches. Dimensionally, the worst is approximately 3/4" wide by 6" long.

The open space resulting from the addition of the gap areas represents approximately 0.3% of the horizontal and vertical surface area of the wire mesh cage.

The longer gaps originated in 1983 when two horizontal hatches in a side by side arrangement were installed by Engineering Change Modification (ECM) No. 221. The purpose of ECM-221 was to allow easier access to the containment sump for the installation of blank flanges on valves DH-V6A and B. The blank flanges are installed for various refueling frequency tests. During the fabrication of the two horizontal hatches, the wire mesh and grating were cut short. This resulted in the three gaps.

The root cause of the three gaps at the horizontal hatches were deficiencies in ECM-221. ECM-221 was classified "Not Important To Safety" and "QC No" and was approved 02/17/81. The ECM consisted of a cover sheet, a GPU Service Corporation Drawing showing how the grating and wire mesh were to be modified and a bill of material list for stainless steel structural parts to support the hatches. The GPU Service Corporation Drawing showed that two hatches (side by side) were to be added by field cutting the existing grating and wire mesh. The field cuts in the wire mesh and grating were cut short of the opening and this resulted in the three longer gaps. The ECM package provided no acceptance criteria for the as left condition of the grating or wire mesh nor did it specify any periodic inspection requirements. Today this work would be classified "Nuclear Safety Related" and "QC - Yes".

The lack of proper administrative controls for ECM-221 is considered an isolated occurrence. Present administrative controls would prevent this occurrence since program improvements have increased modification controls substantially since 1981.

The four short gaps appeared to be caused by normal wear and tear during the hatch removal (the hatch catches on the sides or pulls/rolls the wire mesh as it is slid over it, cutting some of the tie wire that holds the wire mesh to the cage grating). When the wire mesh was pulled up is unknown, though it probably occurred when sump entries were made to install and remove blank flanges on DH-V6A/B and/or during entries to clean the sump each refueling outage.

The gaps were not previously identified because a formal refueling interval inspection of the sump screen had not been established.

IV. COMPONENT FAILURE DATA

No component failures were associated with this event.

V. AUTOMATIC OR MANUAL INITIATED SAFETY SYSTEM RESPONSES

There were no safety initiated demands of the Reactor Building Sump during the occurrence of this event.

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

A. Safety Function of Reactor Building Sump

During a loss of coolant accident (LOCA) and after the Borated Water Storage Tank (BWST) [BP/TK] is exhausted, the containment sump provides for the collection of reactor coolant and chemically reactive spray solutions; thus, the sump serves as water source to effect long term recirculation for the functions of Decay Heat Removal, Low Pressure Emergency Core Cooling (ECC) and Containment Atmosphere Cleanup. The sump water source, related pump inlets and piping between the sources are important safety components. The vertical sections of the sump cage provide the screened open flow area to the sump outlets. For TMI-1, the Reactor Building Sump supplies water to pumps DH-P1A and B and BS-P1A and B. DH-P1A/B are TMI-1's Low Pressure Emergency Core Cooling (ECC) and Decay Heat Removal Pumps [BP/P]. BS-P1A and B are the Reactor Building Spray Pumps [BE/P]. Both DH-P1A/B and BS-P1A/B can take suction from the BWST or the Reactor Building Sump. The purpose of vertical wire mesh on the Reactor Building sump assembly is to prevent the entry of debris, thereby protecting these pumps from damage due to entrained solid material during LOCA conditions. The wire mesh also prevents the blockage of system piping and Reactor Building spray nozzles by debris.

B. Discussion of Safety Consequences and Implications

The gaps have a small potential to cause a common mode failure of DH-P1A/B and BS-P1A/B due to entrained solid material in the pump casing and system piping. Also, there is the potential to plug the 3/8" diameter Reactor Building Spray nozzles. It is not practical to quantify the potential to cause a common mode failure of these systems because of the uncertainties involved such as density, quantity and size of debris and how much debris would actually flow through the gaps. In addition, exactly how the debris would act in the piping and pump is unknown. There is some small but finite potential to fail these

ECCS components. Therefore, this event is considered reportable under 10CFR50.73(a)(2)(v)(D) which states "Any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to (d) mitigate the consequences of an accident". Additionally, a four (4) hour report pursuant to 10CFR50.72(b)(2)(iii) was made to the NRC via the Emergency Notification System.

VII. PREVIOUS EVENTS OF A SIMILAR NATURE

None at TMI-1.

VIII. CORRECTIVE ACTION PLANNED

Applicable plant procedure(s) have been revised to require a refueling interval inspection of the Reactor Building Sump. The inspection verifies the following:

(1) No unacceptable gaps in the wire mesh or hatches.

(2) No loose screen fasteners.

(3) No structural distress (bent hatch, etc.) or corrosion of the wire mesh or upper or lower grating assemblies.

Prior to startup from the present refueling outage, all unacceptable gaps and standing wire mesh will be repaired. An inspection per the applicable plant procedure(s) will be performed and will document the results of the inspection on a refueling interval frequency.