GPU NUCLEAR

June 11, 1999
1920-99-20308

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

Dear Sir:

Subject: Three Mile Island Nuclear Station, Unit 1 (TMI-1)
Operating License No. DPR-50-
Docket No. 50-289
LER 99-005-00: Open Flood Path Between Turbine Building and Control Building

This letter transmits Licensee Event Report (LER) number 99-05-00 concerning a condition which was evaluated and determined to be reportable on May 14, 1999.

This LER is being submitted pursuant to 10 CFR 50.73, using the required NRC forms (attached). NRC Form 366 contains an abstract that provides a brief description of the evaluation condition, refer to the text of the report provided on Form 366A.

This condition did not adversely affect the health and safety of the public. For additional information regarding the LER contact V. Lewis Killpack, Jr., of the TMI Nuclear Safety & Licensing Section at (717) 948-8196.

Sincerely,

James W. Langenbach
Vice President and Director, TMI

VLK

cc: TMI Senior Resident Inspector
Administrator, Region I
TMI-1 Senior Project Manager
File No. 99062

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NRC FORM 366 (6-1998) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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TITLE (4)

Open Flood Path Between Turbine Building and Control Building

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 NAME	DOCKET NUMBER
										05000
05	14	99	99	-- 005 --	00	06	14	99	FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)			
POWER LEVEL (10)	100	20.2201(b)	20.2203(a)(2)(v)	50.73(a)(2)(i)	50.73(a)(2)(viii)
		20.2203(a)(1)	20.2203(a)(3)(i)	X 50.73(a)(2)(ii)	50.73(a)(2)(x)
		20.2203(a)(2)(i)	20.2203(a)(3)(ii)	50.73(a)(2)(iii)	73.71
		20.2203(a)(2)(ii)	20.2203(a)(4)	50.73(a)(2)(iv)	OTHER
		20.2203(a)(2)(iii)	50.36(c)(1)	50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A
		20.2203(a)(2)(iv)	50.36(c)(2)	50.73(a)(2)(vii)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
V. Lewis Killpack, Jr., Nuclear Safety and Licensing	(717) 948-8196

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
C10Cd	N/A	DRN	N/A	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 15 single-spaced typewritten lines) (16)

On 5/13/99 engineering was evaluating whether or not adequate periodic surveillance was being performed on ' ' flood protection provisions. Specifically, the accessibility of the backwater check valve in the Turbine Building Corrosive Waste Sump was being investigated. The investigation found that two modifications made in 1983 and 1990 to the Secondary Sample Lab Drain System added drains without adequately considering flood protection concerns. In the event of Probable Maximum Flood the installation of these drains could introduce water into the Control/Fuel Handling and Auxiliary buildings. As a result of the inadequate review of the modifications, the Flood Procedure (1202-32) did not address related operator actions, such as plugging the lines in the event of a flood.

The root cause of the failure to recognize that the modifications affected the flood protection required by the FSAR was a misapplication or interpretation of design inputs (Risk and consequences with changes not adequately reviewed or assessed) [Code C10Cd]. Immediate corrective actions were to revise the flood procedures to require operators to plug the related Turbine Building floor drains and sump nozzle in the event of a flood. Also an engineering evaluation was initiated to provide guidance for repairing the inoperative corrosive waste sump backwater check valve and for plugging of the floor drains that have no function during normal operation.

There were no adverse safety consequences from this event, and the event did not affect the health and safety of the public.

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TEXT *(If more space is required, use additional copies of NRC Form 366A)* (17)

I. Plant Operating Conditions Before Event:

Three Mile Island Nuclear Generating Station, Unit 1 was operating at 100% steady state power prior to and during the event described in this Licensee Event Report.

II. Status of Structures, Components, or Systems that were Inoperable at the Start of the Event and that Contributed to the Event:

None.

III. Background:

UFSAR Section 2.6.5.i states that all potential flood leak paths are sealed. Therefore, a free flow path from the Turbine Building into the Control Building through the drain system is a condition outside the design basis of the plant. The turbine building drains [DRN]* design, from initial construction, would have adequately protected against floodwaters back flowing into the Secondary Sample Lab in the Control Building. The UFSAR Section 2.6 indicates that the maximum probable flood elevation is 309'-0". The tops of the sample lab sinks are at 309'-1" elevation and no sample lab floor drains were initially tied in to the Turbine Building drain system. The backwater check valve [V]* in the Corrosive waste sump served merely to prevent very corrosive fluids in the sump from traveling into and damaging the drain headers and had no flood protection function.

However, in 1983 a modification (T1-IS-412375-001) added a totally new above-floor drain header to direct sample equipment drains to the Turbine Building Sump. The installation specification and safety determination did not address flood protection requirements. An additional modification in 1990 (CMR 90-11) tied additional floor drains to the under-floor drain header to the Corrosive Waste Sump. Thus introducing another floodwater path to the control building.

Licensee Event Report 98-007 issued on August 14, 1998 that involved missing backwater check valve internals associated with the River Water Screen House Floor Drains, resulted in a corrective action to walk down and identify any additional site building drains that may need to be formally established in the flood protection procedures and periodically inspected. Specifically, the backwater check valve in the Turbine Building Corrosive Waste Sump was being investigated. As a result of this review, the backwater check valve was found to be inoperable, and the above-mentioned modifications that violated the flood protection commitment in the UFSAR were discovered. A review of the TMI Emergency Procedure 1202-32, "Flood" indicated that no provision was included to require operator action related to these potential flood paths in the event of a flood.

V. Event Description:

The Three Mile Island Nuclear Generating Station, Unit 1 maximum probable flood level is 309' above sea level. At a flood level of over 306' elevation, flooding could result from unexpected back-flow of water through a 4" pipe from the Turbine Building into the Secondary Sample Lab, and from there into the Control/Fuel Handling, and Auxiliary Building lower levels. Additional flow would exist through the 2" above-floor drain header, which would continue unless multiple openings in that header were sealed by operator action. The total back-flow at the 309' elevation, if no operator action were taken, is estimated at less than 300 gpm. The need for operator action probably would not become apparent until a flood emergency existed. Normally flood waters rise slowly and there would be considerable time available after the water reached the 306' elevation to recognize the flooding problem, and to plug the floor openings in the Secondary Sample Lab. As a result there would have been very minor flow for a number of hours.

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The floor drains are accessible for plugging. The plugging action required would be rather easily accomplished, but would be an unplanned operator burden during an emergency and the provisions of UFSAR 2.6.5.i are clearly violated.

Timeline of Events

The following is an abbreviated timeline of events specific to the deficient condition:

1983 Modification (T1-IS-412375-001) to add a new above-floor drain header to direct sample equipment drains to the Turbine building Sump. This created an open 2" flow path through the Control Building wall at approximately 306'-6" elevation

1990 Modification (CMR 90-111) tied additional floor drains into the under-floor drain header to the Corrosive Waste Sump in the Turbine Building. This created an open 4" flow path through the Control Building wall at approximately 306' elevation.

5/13/99 Corrective Action Program report No. T1999-0417 issued to document open flow path between Turbine Building and Control Building.

5/13/99 Plant Review Group met to determine if the condition was reportable to the NRC. Determined that additional investigation needed.

5/13/99 Work Request #795348 submitted to inspect the backwater check valve and repair as necessary. Valve to be given a tag number, and included in annual inspections.

5/14/99 Engineering inspection and design review conducted in response to identification of the potential for a non-conforming condition.

5/14/99 Plant Review Group met and determined that the nonconformance is reportable to the NRC.

V. Extent of Condition:

In order to determine the extent of this condition (for a corrective action in support of Licensee Event Report 98-007), Engineering performed a walk-down of all other site buildings to identify additional floor drains that should be included in the flood protection procedures and should be periodically inspected. Deficient conditions were identified.

VI. Component Data:

Not applicable.

VII. Identification of Root Cause:

The root cause of the modifications that were performed without regard to flooding potential was "Risk and consequences with changes not adequately reviewed or assessed" [Code C10Cd]. Due to the length of time since these modifications were performed, insight into the less than adequate human performance was limited. However, Engineering's modification and safety evaluation programs have been significantly strengthened over the years since these events including increased emphasis on maintaining plant configuration consistent with the UFSAR description. Also, operation action to plug the flood

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paths through the drains would become obvious during a maximum probable flood and could be easily accomplished with the drain plugs that are readily available.

VIII. Assessment of Safety Consequences:

Had sufficient flooding of the Susquehanna River occurred to bring the water level above the top of the protective dike around the island, water intrusion into the Turbine Building could have occurred. If the flood exceeded 306' elevation, the water could have started flowing through the floor drains into the Control, Fuel Handling, and Auxiliary Buildings. If left uncontrolled, this water could have eventually affected the operability of the Nuclear Safety Related electrical equipment in the lower levels of these buildings. The total back-flow at the 309' elevation, if no operator action were taken, is estimated at less than 300 gpm.

However the rate of the rise of floodwaters and the relatively low rate of intrusion through the floor drains would give the operators ample time to plug the floor drains. The floor drains are very accessible for plugging and drain plugs are readily available. Although not compliant, one may reasonable conclude that there would not likely be any adverse safety consequences from this event, and that the event would not likely affect the health and safety of the public.

IX. Previous events of a similar nature:

TMI-1 Licensee Event Report 98-007-00, dated 8/14/98, discusses the inoperable Intake Screen and Pump House Floor Drain Check Valves Due to Lack of appropriate configuration controls. It was the corrective actions from this event to determine the "extent of condition" which ultimately resulted in the identification of the bypassed flood protection devices discussed in this report.

X. Corrective Actions:

A. Actions Taken:

1. The Flood procedure (1202-32) was immediately revised to provide the necessary guidance for operator response actions, to plug the related Turbine Building floor drains, and sump nozzle.

2. Unrelated to this event, the checklist for Design Verification (EP-009T) has recently been upgraded to assure that flood issues would be noted, if design verification is performed.

3. The turbine, auxiliary, control, fuel handling, ISPH, and intermediate buildings, and the air intake and borated water storage tank tunnels were walked down to identify any additional drain cross-connections. Also a review of the drain drawings was conducted to assure that there are no other inadvertent Turbine Building Drain cross-connections to the control, fuel handling, intermediate, and auxiliary buildings.

B. Actions Planned:

1. By August 31, 1999 a revision will be made to procedure EMP-002 to assure that flooding is adequately evaluated in the design process.

2. By August 31, 1999 the Corrosive Waste Sump Backwater Check Valve will be added to the scope of annual Preventative Maintenance inspections to assure long term operability by Maintenance.

3. By August 31, 1999 Operations will add the Turbine Building drain plugs to the scope of Operator Surveillance (OP-S-62), to periodically verify that they are still available and in good condition.

4. By August 31, 1999 a comprehensive walk-down will be performed of all flood protected structures and exterior walls to ensure that all openings below 309' El. (Probable Maximum Flood) are sealed.

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5. By December 1, 1999 a review will be conducted of previous modifications to the Drain Systems to help to assure that other modifications did not result in issues related to Flood Emergency Procedure 1202-32.

6. By August 31, 1999 an evaluation will be prepared to provide guidance for plugging of the floor drains that have no function during normal operation, and for repairing the inoperative Corrosive Waste Sump Backwater Check Valve. This evaluation will also provide guidance for changes to the Flood procedure, to give Flood response guidance related to plugging the turbine building drains that normally must remain operable. The evaluation will consider whether or not the plugging of open drains in response to a flood is appropriate, and if further system modifications are desirable.

7. By December 1, 1999 the Corrosive Waste Sump Backwater Check Valve will be repaired to make it operable

* The Energy Industry Identification System (EIIS), System Identification (SI) and Component Function Identification (CFI) Codes are included in brackets, [SI/CFI] where applicable, as required by 10 CFR 50.73 (b)(2)(ii)(F).