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OCT 14 1982



GPU Nuclear
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Writer's Direct Dial Number:

September 16, 1982
4410-82-L-0011

Office of Inspection and Enforcement
Attn: Mr. Ronald C. Haynes, Director
Region I
US Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Dear Sir:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Licensee Event Report 82-011/01L-1

Attached please find Licensee Event Report 82-011/01L-1 concerning a potential bypass path around several of the ventilation systems filtration units at TMI-2.

This event concerns Section 3.9.12 and is considered reportable under Section 6.9.1.8(i) of the Interim Recovery Technical Specifications.

This LER is being revised as agreed at the GPU/NRC Management Conference held on July 29, 1982.

Sincerely,

B. K. Kanga
Director, TMI-2

BKK/JJB/jep

Attachments

CC: L. H. Barrett, Deputy Program Director - TMI Program Office
Dr. B. J. Snyder, Program Director - TMI Program Office
V. Stello, Deputy Executive Director
R. W. Starostecki, Director

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PDR ADDCK 05000320
S PDR

clear is a part of the General Public Utilities System

IER2

CONTROL BLOCK: _____ (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

01 | P | A | T | M | I | 2 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 4 | 1 | 1 | 1 | 1 | 01
7 8 9 14 15 25 26 30 57 CAT 58

CON'T
01 | REPORT SOURCE | L | 0 | 5 | 0 | 0 | 0 | 3 | 2 | 0 | 0 | 3 | 0 | 3 | 8 | 2 | 0 | 9 | 1 | 6 | 8 | 2 | 01
7 8 60 61 68 69 74 75 80

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

02 | As a result of an unusual event on January 8, 1982, in which significant airborne
03 | particulate contamination was generated in the Auxiliary Building (AB) and Fuel
04 | Handling Building (FHB), an apparent deficiency in the decontamination factors for the
05 | AB and FHB ventilation HEPA filters was noted. Investigation revealed that a potential
06 | bypass pathway existed around the AB, FHB, and the Reactor Building Purge exhaust
07 | ventilation filters. This event concerns Section 3.9.12 and is considered reportable
08 | under Section 6.9.1.8(i) of the Interim Recovery Technical Specifications.

09 | SYSTEM CODE | CAUSE CODE | CAUSE SUBCODE | COMPONENT CODE | COMP. SUBCODE | VALVE SUBCODE
A | A | B | P | I | P | E | X | X | A | Z
11 12 13 14 15 16
17 | LER/RO REPORT NUMBER | EVENT YEAR | SEQUENTIAL REPORT NO. | OCCURRENCE CODE | REPORT TYPE | REVISION NO.
8 | 2 | 0 | 1 | 1 | L | 1
21 22 24 26 27 28 29 30 31 32
18 | ACTION TAKEN | FUTURE ACTION | EFFECT ON PLANT | SHUTDOWN METHOD | HOURS | ATTACHMENT SUBMITTED | NPRD-4 FORM SUB. | PRIME COMP. SUPPLIER | COMPONENT MANUFACTURER
X | Z | Z | Z | 0 | 0 | 0 | U | Y | N | A | Z | 9 | 9 | 9 | 9
33 34 35 36 37 40 41 42 43 44 47

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

10 | Plant drawings and specifications call for the existence of one (1) open drain and
11 | four (4) plugged cleanouts in each of the filter cabinets. However, the cleanout
12 | plugs were missing from all the filter cabinets. Permanent carbon steel
13 | pipe plugs have been installed in the four (4) cleanouts located in each of the
14 | exhaust filter cabinets.

15 | FACILITY STATUS | % POWER | OTHER STATUS | METHOD OF DISCOVERY | DISCOVERY DESCRIPTION
X | 0 | 0 | 0 | Recovery mode | A | Incident Investigation
7 8 9 10 12 13 44 45 46 80

16 | ACTIVITY RELEASED OF RELEASE | AMOUNT OF ACTIVITY | LOCATION OF RELEASE
G | P | Cs134 & Cs137 1.5E-5Ci | Plant Vent Stack
7 8 9 10 11 44 45 80

17 | PERSONNEL EXPOSURES NUMBER | TYPE | DESCRIPTION
0 | 0 | 0 | Z | N/A
7 8 9 11 12 13 80

18 | PERSONNEL INJURIES NUMBER | DESCRIPTION
0 | 0 | 0 | N/A
7 8 9 11 12 80

19 | LOSS OF OR DAMAGE TO FACILITY TYPE | DESCRIPTION
Z | N/A
7 8 9 11 12 80

20 | PUBLICITY ISSUED DESCRIPTION
N | S | PDR ADOCK 05000320 | N/A | PDR
7 8 9 10 80

NAME OF PREPARER Steven D. Chaplin

PHONE: (717) 948-8461

LICENSEE EVENT REPORT
NARRATIVE REPORT
TMI-II
LER 82-011/03L-1
EVENT DATE - March 3, 1982

I. EXPLANATION OF OCCURRENCE

At 1515 hours on March 3, 1982, it was determined that there was sufficient probability that a reportable condition existed to warrant a prompt report. (Reference GPU letter of March 4, 1982, 4400-82-L-0040). The report concerned a potential bypass path around the filtration units of three ventilation systems at TMI-2. These systems were the Auxiliary Building (AB), the Fuel Handling Building (FHB) and the Reactor Building Purge ventilation systems.

On January 8, 1982, a technician blew down a service air line into the contaminated drain system. That resulted in the generation of significant airborne particulate contamination in the Auxiliary and the Fuel Handling Buildings.

The increased airborne particulate contamination levels were measured by, among others, HPR-222 and 228 and HPR-221A and 221B which are the upstream and downstream radiation monitors for the Auxiliary Building and Fuel Handling Building exhaust filtration units respectively. The Decontamination Factors (DF's) normally expected for the Auxiliary Building and the Fuel Handling Building exhaust filtration units were not experienced during this event as evidenced by the above radiation monitors.

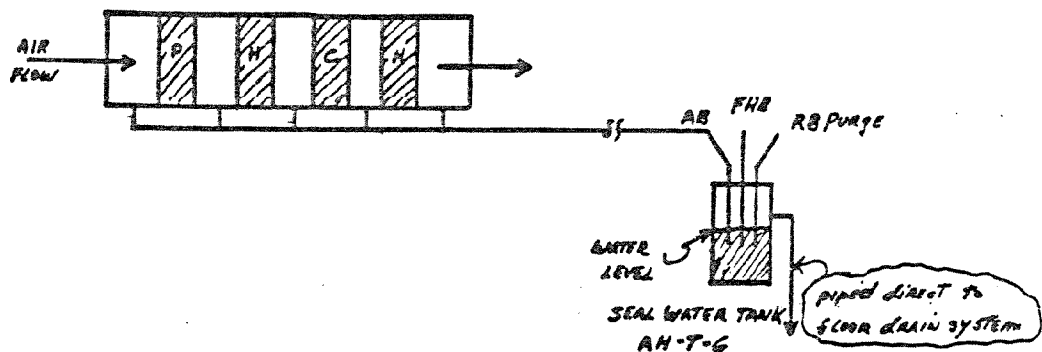
The low DF's raised the question as to the effectiveness of the HEPA filters in the filtration systems. Specifically, it suggested that either the HEPA filters were not performing their function or that they were being bypassed.

Investigation as to why the DF's were lower than expected identified three (3) potential mechanisms for the filters being either nonfunctional or bypassed.

1. One potential path identified was through the HEPA filters. However, this potential path was eliminated as the reason for the low DF's based on the following:

Both the AB and the FHB HEPA filters were DOP tested in September, 1981 with acceptable results. The AB HEPA's were scheduled for replacement in February, 1982. Before their replacement, they were DOP tested again. Again the results were acceptable. Since the February DOP test of the AB filters discounted a common mode failure of the HEPA's, there was no reason to expect that the effectiveness of the FHB HEPA's had been compromised.

2. Another potential path identified was possible bypass through the floor drain system, into the Filter Cabinet Seal Water Tank (AH-T-6) and then up through the filter cabinet underdrain to the downstream side of the filters. An investigation of the level control system was satisfactorily performed which indicated that there was sufficient water in the drain tank at the time of the January 8, 1982 occurrence to have eliminated this bypass path. This investigation included draining the tank to ensure that the level control valve operated correctly and checking the calibration on the level controller to ensure it operated within its required range.
3. The third potential path was bypass through the underdrains in each HEPA filter bank. Each of the filter cabinets in question have the basic arrangement shown below.



Each filter cabinet has one drain and four cleanouts, all of which tie into a common header. The header in turn runs to the seal water tank.

An investigation of these cleanouts subsequent to the January 8, 1982 event revealed that they had been taped instead of plugged and that the tape was either loose or missing from several of the cleanouts. This could have established a bypass path around the filters via the common header. Smear surveys taken at the drain and cleanout openings inside the downstream filter cabinet showed relatively high contamination as compared with adjacent ductwork, which indicates filter bypassing.

An overlay of the strip chart recordings from the upstream and downstream radiation monitors indicates that the upstream monitor saw the contamination levels before the downstream monitor. This indicates that case three (3) (under drain piping) was the bypass route rather than case two (2) (the seal tank) which would have given indication downstream before the ventilation system could have collected the airborne contaminants and delivered them to the upstream monitors via the ventilation ductwork.

Additionally a review was made of the TMI-2 semi-annual release reports issued since 1978. This review indicated that particulate and iodine releases from TMI-2 were much less than that permitted by the Station Technical Specification. Therefore if a bypass did exist during this time period it did not cause the station to exceed its normal operational limits.

This event concerns Section 3.9.12 and is considered reportable under Section 6.9.1.8(i) of the Interim Recovery Technical Specifications.

II. CAUSE OF THE OCCURRENCE

Plant drawings and specifications call for the existence of one (1) open drain and four (4) plugged cleanouts in each of the filter cabinets. However, the existing plant equipment had four (4) unplugged cleanouts in addition to the open drain. The four (4) cleanouts and associated plugs apparently were never installed.

III. CIRCUMSTANCES SURROUNDING THE OCCURRENCE

At the time of the occurrence, the Unit 2 facility was in a long term cold shutdown state. The reactor decay heat was being removed via loss to ambient. Throughout the event there was no effect on the Reactor Coolant System or the core.

IV. CORRECTIVE ACTION TAKEN OR TO BE TAKEN

In order to prevent HEPA filter bypass permanent carbon steel plugs have been installed in the four (4) cleanouts located in each of the exhaust filter cabinets. The central floor drain of each exhaust filter cabinet has been left unplugged to allow for drainage of the filter cabinet in the event of an actuation of the cabinet's fire protection system.

In order to correct administrative problems noted as a result of this event several actions are being or will be taken.

- 1) Following the reorganization of the TMI-2 Division of GPU Nuclear Corporation, a new set of administrative procedures will commence to be implemented. A goal of implementing 80% of those procedures which are presently drafted by the end of 1982 has been established. These procedures among other things will establish a cognizant engineer concept at TMI-2. This will give a single individual overall cognizance of a system including any maintenance, modifications and procedures affecting that system.

These procedures will also coordinate the various event reporting mechanisms in use at TMI-2 and will include a documented review for reportability of these events. These procedures, in particular, will provide a better method to discover similar situations so that action can be taken to correct potential problems.

- 2) An audit of previously completed maintenance work packages is being performed to assess the adequacy of the corrective action taken to close out these work packages. This audit is being performed to determine if a situation similar to that noted in Inspection Report 50-320/82-04, in that a maintenance/repair was performed with a discrepancy between engineering specified action and that actually taken, is a generic problem and to recommend appropriate followup action. In the future, engineering review of the documentation of completed maintenance work will be made a procedural requirement as stated in paragraph IV (1) above. This will provide engineering an opportunity to review completed maintenance for appropriate disposition of requested repairs.
- 3) The contract for outside vendors will be modified to include requirements for a signed off check sheet that provides reports to GPU at the completion of their work and will be forwarded to the document control center. This will ensure that all of these records will be available in one location.

Further investigation to determine when this tape was put over the cleanouts instead of pipe plugs did not pinpoint the exact time period but a reasonable assumption is that the plugs were never installed.

In order to determine the potential quantitative effects of this bypassed path on the exhaust filter efficiencies, a calculation was performed using the following assumptions:

- a) Worst case differential pressure across the filter cabinet of 6 inches of water
- b) The bypass path is an ideal 4 inch diameter pipe
- c) Friction losses caused by 2 inch pipe feeds to the 4 inch drain pipe and pipe elbows are disregarded
- d) Flow is considered to be from first drain/cleanout to the last drain/cleanout.

Based on these assumptions the following bounding bypass flows were determined:

- a) Auxiliary Building Air Cleanup System - 2.2%
- b) Fuel Handling Building Air Cleanup System - 4.2%
- c) Reactor Building Purge System - 2.7%

Because of this bypass flow the Submerged Demineralizer System (SDS) cask drop analysis was reevaluated to determine if this bypass would significantly affect offsite exposures. In the event of such a postulated accident this particular scenario was chosen because it was considered to be the most limiting SDS accident scenario which could be affected by the HEPA filter bypass and because NRC approval of the SDS is probably the most significant recovery activity to date which could be affected by this potential bypass flowpath.

Using the PEIS, and SDS SER assumption that 12 Ci of mostly cesium is released to the Fuel Handling building the amount of release from the Fuel Handling Building would increase to approximately 0.5 Ci (based on 4.2% bypass flow) from the previously calculated 0.012 Ci.

The resultant increase in dose estimates for the maximum exposed individual from this accident would be approximately 3.4×10^{-2} mrem total body, 1.5×10^{-1} mrem Bone and 1.2×10^{-1} mrem Liver. However these estimates are still less than the Dose Estimates calculated for a hypothetical HEPA Filter Failure Accident during SDS operations and thus of minor safety significance in this situation.