NON-PUBLIC?: N
ACCESSION #: 8802240335

LICENSEE EVENT REPORT (LER)

FACILITY NAME: Three Mile Island Unit 2 PAGE: 1 of 5

DOCKET NUMBER: 05000320

TITLE: Lift of Heavy Load Over the Reactor Vessel Above the Maximum Allowable Weight
EVENT DATE: 01/06/88 LER #: 88-001-00 REPORT DATE: 02/04/88

OPERATING MODE: N POWER LEVEL: 000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
Other, Special Report

LICENSEE CONTACT FOR THIS LER:
NAME: Russell D. Wells, TMI-2 Licensing Engineer
TELEPHONE #: 717-948-8693

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT: At approximately 1520 hours on January 6, 1988, the Core Bore Machine was reinstalled on the Defueling Work Platform over the TMI-2 Reactor Vessel (see Figures 1 and 1A). However, the Drill Indexing Platform Structure (DIPS), which supports the Core Bore Machine was oriented 180 degrees from its correct position. This evolution was being performed in accordance with Unit Work Instruction (UWI) 4730-3100-87-C1544. The referenced UWI permitted a lift height of 340'-6" over a specified load path. However, due to the misorientation of the DIPS, the Core Bore Machine was transported over a load path whose lift height elevation was limited to 339' pursuant to a NRC-approved Safety Evaluation Report. Per the Action Statement of Technical Specification 3.10.1, this event report is being submitted as a Special Report pursuant to Specification 6.9.2. Upon discovery of this event on January 7, 1988, an informal critique was held to determine the cause of the event and the corrective actions required. Following the determination that the DIPS had been inversely installed, the Core Bore Machine and support structures were removed and installed in the correct position. The referenced UWI has been revised to provide guidance for verification of the proper orientation of the DIPS prior to installation of the Core Bore Machine. Additionally, this event will be discussed with Defueling Department personnel. The root cause of this event was due to a combination

of inattention to procedural detail and inadequate procedural guidance.

This LER is similar in nature to LER 87-03.

(End of Abstract)

I. PLANT OPERATING CONDITIONS BEFORE THE EVENT

The TMI-2 facility was in a long-term cold shutdown state; the defueling evolution was in progress. The reactor decay heat was being removed via loss to ambient. Throughout this event there was no affect on the Reactor Coolant System or the core.

The Core Stratification Sample Acquisition Safety Evaluation Report (SER) Revision 4, submitted via GPU Nuclear Letter 4410-86-L-0101 dated June 11, 1986, and approved by the NRC on June 19, 1986, evaluated the postulated drop of a load of 5000 lbs. onto the work platform over the TMI-2 Reactor Vessel (IEEE 805 Code-NH). Based on this evaluation, the lift height limit for the 5000 lbs. load was set at elevation 339'-0".

Due to the incorporation of an underwater tool changer, an 18" high spacer platform has been installed between the Defueling Work Platform (DWP) and the interface platform (Figures 1 and 1A). Therefore, GPU Nuclear Letter 4410-87-L-0192 dated December 31, 1987, requested NRC approval to increase the lift height limit by 18" to the 340'-6" elevation to facilitate installation and removal of the Core Bore Machine (no applicable IEEE Code). This letter limited the 5000 lbs. load path to that position of the DWP where the spacer and interface platforms are installed. The modified lift height limit was approved by the NRC on January 4, 1988.

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

N/A

III. EVENT DESCRIPTION

On January 5, 1988, preparations for installation of the Core Bore Machine on the DWP (no applicable IEEE Code) were in progress. This activity was performed in accordance with Revision 1 to UWI 4730-3100-87-C1544. The spacer platform and interface platform

were installed and correctly oriented. At approximately 1230 hours on January 5, 1988, the DWP was rotated from north to east, for leveling purposes, as shown in Figure 2A. At this point, though not procedurally required, it would have been appropriate to rotate the DWP from east to south for installation of the DIPS. This action would have ensured that subsequent installation of the core bore rig would have been from the south to the north direction over the spacer and interface platforms as required by the referenced GPU Nuclear letter of December 31, 1987.

Due to concurrent activities being performed on the DWP, it was decided to install the DIPS with the spacer platform and interface platform rotated

easterly (Figure 2A). The DIPS was installed but, unknown to defueling personnel, was oriented 180 degrees from its correct position. (NOTE: Prior experience with this evolution did not indicate the capability to inversely install the DIPS.) As a result, the indexing gear (also known as the "rack") for the DIPS was in the southerly position (Figure 2B) as opposed to the northerly position (Figure 2C) which is the correct orientation for this evolution.

The next day, during the 0700-1500 shift on January 6, 1988, the task supervisor, unaware that the DIPS was inversely installed, requested guidance from Defueling Engineering personnel as to which direction the DWP was to be rotated for installation of the underwater structure and drill rig portion of the Core Bore Machine. These components have a maximum weight of approximately 4955 lbs. and necessitate use of the increased lift height limit (i.e., 340'-6"). The task supervisor was advised, based on the
assumption that the DIPS had been installed in its correction orientation, to rotate the DWP such that the "rack" was on the east side (i.e., clockwise as shown in Figure 2C). However, since the DIPS was inversely oriented as shown in Figure 2B, at approximately 1107 hours on January 6, 1988, the DWP was rotated counterclockwise to the position shown in Figure 2D.

At approximately 1520 hours, the underwater structure and drill rig were installed on the DIPS from the southerly to northerly direction at a lift height elevation of approximately 340'6". However, due to the misorientation of the DWP, this load path was over the "unprotected" portion of the DWP (see Figure 1) which is limited

to a height of 339' pursuant to the NRC-approved SER for Core Stratification Sample Acquisition. Thus, the event date of this report is January 6, 1988.

This event was discovered at approximately 1400 hours on January 7, 1988 when it was observed that the electrical panel for the Core Bore Machine could not be properly installed due to the misorientation of the DIPS. An informal critique of this event was conducted to determine the cause of the event and the required corrective actions. Following the determination that the DIPS had been inversely installed, the Core Bore Machine and associated support structures were removed and oriented to their corrected position. A formal critique of this event was conducted on January 8, 1988.

Per the Action Statement of TMI-2 Technical Specification 3.10.1, "Crane Operations - Containment Building," this event is being submitted as a Special Report pursuant to Technical Specification 6.9.2. Based on the analysis in Section VIII of this report, this event did not pose the potential to adversely affect the health and safety of the public. The details of this event are described below.

This event is similar in nature to Licensee Event Report 87-03 concerning the lifting of a heavy load over the Reactor Vessel above the maximum allowable limit.

IV. ROOT CAUSE OF THE EVENT

The root cause of this event was personnel error based on the following:

o The evolution described in this event was performed in accordance with UWI 4730-3100-87-C1544, Revision 1, which is bulky (i.e., approximately 145 pages). Page 3 of Attachment 4 to this UWI provides a diagram of the orientation of the DWP for the installation of the underwater structure and drill rig portions of the Core Bore Machine which require the use of the increased lift height limit. However, the Task Supervisor did not refer to this attachment in determining which direction to rotate the DWP for installation of the Core Bore Machine. Instead, the Task Supervisor utilized the "rack" on the DIPS as the point of reference when guidance was requested as to the direction to rotate the DWP.

o Though Attachment 4 to the UWI provided a diagram of the proper orientation of the DWP, the procedural steps did not provide specific reference to the attachment prior to installation of the underwater structure drill rig. Additionally, the referenced UWI did not contain any guidance for personnel stationed on the DWP to verify the position of DIPS with respect to the interface platform.

V. CORRECTIVE ACTIONS

Immediate

o Upon discovery of this event on January 7, 1988, an informal critique was conducted to determine the cause of the event and the required corrective actions. Following the determination that the DIPS had been inversely installed, the Core Bore Machine and its associated support structures were removed and installed in their correct position. A formal critical of this event was conducted on January 8, 1988.

o The referenced UWI was revised as follows:

- Guidance has been provided to verify the correct alignment of the DIPS and the interface platform. This is accomplished by verifying that the pads on the bottom of the DIPS are aligned with the pads on the interface platform.

- The steps of the UWI which relate to installation or removal of the underwater structure and drill rig assemblies have been revised to provide specific reference to the orientation of the DWP as described in Page 3 of Attachment 4 to the UWI.

Long-Term

This event will be discussed with Defueling Department personnel to stress the importance of proper procedural guidance and attention to procedural detail.

VI. COMPONENT FAILURE DATA

N/A

VII. AUTOMATIC OR MANUALLY INITIATED SAFETY SYSTEM RESPONSES

N/A

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

The underwater structure and drill rig, which have a maximum weight of approximately 4955 lbs., were transported by the Polar Crane Auxiliary Hoist which has a maximum capacity of five (5) tons. The rigging capacity, maximum of 2.5 tons, also exceeded the weight of the transported load. Thus, the potential for a load drop during this event was highly unlikely.

GPU Nuclear performed an engineering analysis of the safety consequences of a drop of the subject load at its maximum height over the Reactor Vessel (i.e., 340'-6"). The Shielded Work Platform, which is positioned over the Reactor Vessel, is supported by a structure made of steel beams. The results of the engineering analysis of the potential load drop indicate that the Shielded Work Platform and its supporting steel beams would have suffered deformation but it is highly unlikely that a total collapse of this structure would have occurred.

Therefore, based on the above analysis, GPU Nuclear has determined that this event did not pose a potential public health and safety concern.

ATTACHMENT # 1 TO ANO # 8802240335 PAGE: 1 of 3

FIGURE 1
LER 88-01
4410-88-L-0010

FIGURE OMITTED - NOT KEYABLE (DRAWING)

ATTACHEMENT # 1 TO ANO # 8802240335 PAGE: 2 of 3

FIGURE 1A
LER 88-01
4410-88-L-0010

FIGURE OMITTED - NOT KEYABLE (DRAWING)

ATTACHMENT # 1 TO ANO # 8802240335 PAGE: 3 of 3

FIGURE 2

LER 88-01
4410-88-L-0010

FIGURE OMITTED - NOT KEYABLE (DRAWING)

ATTACHMENT # 2 TO ANO # 8802240335 PAGE: 1 of 1

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February 4, 1988
4410-88-L-0010/0252P

US Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Dear Sirs:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Special Report 88-01

Attached is Special Report 88-01 concerning the lift of a heavy load over the Reactor Vessel on January 6, 1988, which exceeded the maximum allowable lifting height.

This event is being submitted as a Special Report per the Action Statement of TMI-2 Technical Specification 3.10.1.

Sincerely,
/s/ F R Standerfer
F. R. Standerfer
Director, TMI-2
RDW/emf

Attachment
cc: TMI-1, NRC Regional Inspector - R. J. Conte
Regional Administrator, Region 1, NRC - W. T. Russell

Director, TMI-2 Cleanup Project Directorate, NRC - Dr. W. D. Travers

*** END OF DOCUMENT ***