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U.S. Nuclear Regulatory Commission
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Reference: License No. DPR-3 (Docket No. 50-29)

Subject: Licensee Event Report (LER) 2000-02

This letter forwards Licensee Event Report 2000-02, titled "Fuel Movement Exceeds Travel Height Restriction".

We trust this information is satisfactory; however, if you have any questions, please contact us.

Very truly yours,

YANKEE ATOMIC ELECTRIC COMPANY

Merrill J. Atkins
Regulatory Affairs Manager

c: Mr. Phillip Ray, Project Manager
Decommissioning Section
Project Directorate IV and Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Mr. R. Bellamy, Chief
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NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98
ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND 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.

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Yankee Nuclear Power Station	50-029	1 of 4

TITLE (4)

Fuel Movement Exceeds Travel Height Restriction

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
03	15	2000	2000	02		04	15	2000	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	NA	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
			20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)
POWER LEVEL (10)	000		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)
J. A. Kay, Principal Licensing Engineer	(413)424-5261

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

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) **(16)**

Yankee Nuclear Power Station was permanently shutdown in February 1992 and is currently being decommissioned. In the early 1980s, spent fuel storage capacity was increased by adding an upper tier of fuel storage racks. During preparation to conduct spent fuel inspections in the Spent Fuel Pool, it was discovered that past practice used in moving spent fuel from the lower tier racks to the upper tier racks was contrary to the design basis as described in the FSAR. The FSAR states that "the racks are designed to maintain proper spacing and structural integrity after being impacted by a fuel assembly dropped onto any location from a height of six inches above the top of the racks." The plant procedures for moving fuel assemblies had established a precaution to restrict travel height for moving fuel over lower tier racks. The maximum fuel assembly travel height over "ungrated" SFP racks is six (6) inches above the plane of the top of the rack. Past practice, however, permitted spent fuel movement over the lower tier racks to heights higher than 6 inches to enable movement up and over installed grating for storage in the upper tier racks. This resulted in lifting fuel approximately 13 inches above the racks, which is outside the design basis. As such, this LER is submitted in accordance with 10CFR50.73(a)(2)(ii)(B) as a condition outside the design basis of the plant. No fuel handling evolutions were in progress at the time of discovery of this issue.

BACKGROUND INFORMATION

Yankee Nuclear Power Station was permanently shutdown in February 1992 and is currently being decommissioned. During the review and planning for the upcoming fuel inspection campaign, questions arose as to the technical and licensing basis for travel height restrictions for handling fuel assemblies within the Spent Fuel Pool. In particular, there was uncertainty as to the assumptions used in the analysis of the fuel assembly drop accidents when transferring fuel between lower and upper tier racks. No fuel handling evolutions were in progress at the time of discovery of this issue.

EVENT DESCRIPTION

During preparation to conduct spent fuel inspections in the Spent Fuel Pool, it was discovered that past practice used in moving spent fuel to the upper tier racks was contrary to the design basis as described in the FSAR. The FSAR (Section 246.1) states that "the racks are designed to maintain proper spacing and structural integrity after being impacted by a fuel assembly dropped onto any location from a height of six inches above the top of the racks." Moving an assembly from lower tier to the upper tier racks required the installation of gratings over lower tier racks that preclude deformation of the racks in the event of an assembly drop. Installed gratings extend approximately twelve (12) inches above the top of the lower racks. The plant procedures (OP- 4226 & 7107) for moving both dummy and spent fuel assemblies had established a precaution to restrict travel height for moving fuel over lower tier racks. The maximum fuel assembly travel height over "ungrated" SFP racks is six (6) inches above the plane of the top of the rack. Past practice, however, permitted spent fuel movement over the lower tier racks to heights greater than 6 inches to clear the installed grating for storage in the upper tier racks. This resulted in lifting fuel approximately 13 inches above the racks, which is outside the design basis.

The design basis for fuel movement restrictions was first established during modifications to increase fuel storage capacity of the lower racks. These modifications replaced the existing spent fuel storage racks with anodized aluminum fixed-poison (Boral) curtain racks having a reduced center-to-center spacing. Design basis information was provided in Technical Specification Proposed Change # 131, submitted in September 25, 1975. From this submittal, the following was stated:

> "An additional design basis which will be met is the requirement that the spent fuel racks as installed be able to maintain proper spacing and structural integrity after being impacted by a spent fuel assembly dropped onto any location from a height of 6 inches above the top of the racks."

The NRC's SER associated with this change (License Amendment #33, dated December 29, 1976) did not restate this commitment explicitly. The SER does, however, state that "dropping a fuel assembly from above the top of the racks will not result in deformation of the racks and the fuel will be sufficiently above that stored in the racks so that the reactivity increase due to an assembly lying across the racks will be negligible."

Additional modifications and improvements were subsequently made to the spent fuel pool to further increase fuel storage capacity by adding an upper tier of racks. These modifications replaced and installed additional lower tier fuel racks, installed a new stainless steel pool liner, installed structural support modifications, and installed new upper tier racks (including grating installed between the lower and upper tier racks). This information was described in Technical Specification changes associated with Proposed Change # 158 (including supplements) submitted between 1978 and 1982. License Amendment # 75, which culminated these changes, established an additional height restriction when moving spent fuel over a "grated" lower tier spent fuel rack. The grating was a provision of the change in recognition that putting fuel on the upper tier would involve lifting fuel assemblies higher than presently allowed.[1]

> "The grating will be supported on the lower beams of the second tier support structure. The grating and support structure are designed to resist the impact of a fuel assembly dropped from 11 feet above the existing spent fuel racks. The analysis permits plastic deformation but limits distortion to prevent contact with the racks. This grating will be placed in the pool prior to placing any racks on the second tier."

The practice of moving spent fuel assemblies in accordance with OP-7107 required an implied movement of the assembly higher than 6 inches to move it up and over the lower tier grating. While a precaution in the procedure clearly stated the 6-inch height restriction, the procedure was silent on the steps and pathway necessary to move the assembly up the additional 7 inches and over the grating and preserve the 6-inch travel height restriction. Since it was literally impossible to move the assembly over a partially grated fuel rack without lifting the assembly higher than the 6-inch limitation, the practice was to move the assembly higher in a path directly over vacant fuel storage cells in order to move it up and over the grating. It is believed, however, the practice never moved the fuel assembly above the 6-inch restriction when directly over a location with stored fuel.

A Condition Report (CR) (CR 00-44) has been initiated. This condition is reportable as an LER in accordance with 10CFR50.73(a)(2)(ii)(B) – a condition that was outside the design basis of the plant.

The NRC regional site inspector was notified of this occurrence on 3/22/00.

CAUSE OF EVENT

The cause of this event is the failure to adequately incorporate design basis information into plant procedures to specify the steps and pathway necessary to move the assembly up the additional 7 inches and over the grating and preserve the 6-inch travel height restriction.

[1] YAEC letter to USNRC, "Proposed Change #158, Rev. 1 to Supplement No. 3, dated August 18, 1980.

SAFETY ASSESSMENT

No fuel handling evolutions were in progress at the time of discovery of this issue.

CORRECTIVE ACTION

In preparation for the spent fuel inspection campaign, the following corrective action plan was developed and implemented (including engineering evaluations and procedure changes to OP-4226 and OP-7107):

- Before moving any fuel to the upper tier racks, install the grating over the entire east bay lower tier racks to create a safe load path to the upper tier storage racks,
- Perform all spent fuel and component moves in compliance with the 6-inch travel height; requiring all fuel removed from the lower tier racks to be moved to a location where there are no racks with stored spent fuel (north end of pool) and then lifted to a height sufficient to move the spent fuel over grating to the upper tier,
- Establish a safe zone within the lower tier racks by emptying the center bay racks of fuel to permit fuel inspections (including installation of inspection equipment) and movement of assemblies between lower and upper tier racks.

ADDITIONAL INFORMATION

None.

PREVIOUS SIMILAR EVENTS

None.