



CONNECTICUT YANKEE ATOMIC POWER COMPANY

HADDAM NECK PLANT

362 INJUN HOLLOW ROAD • EAST HAMPTON, CT 06424-3099

September 13, 1994

Re: 10CFR50.73(a)(2)(ii)

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

Reference: Facility Operating License No. DPR-61
Docket No. 50-213
Reportable Occurrence LER 50-213/94-022-00

Gentlemen:

This letter forwards the Licensee Event Report 94-022-00, required to be submitted, pursuant to the requirements of the Haddam Neck Plant's Technical Specifications.

Very truly yours,

Jere J. LaPlatney
Vice President

JJP/ea

Attachment: LER 50-213/94-022-00

cc: Mr. Thomas T. Martin
Regional Administrator, Region I
475 Allendale Road
King of Prussia, PA 19406

William Raymond
Sr. Resident Inspector
Haddam Neck

190059

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Haddam Neck	DOCKET NUMBER (2) 0 5 0 0 0 2 1 3	PAGE (3) 1 OF 04
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TITLE (4)
Error Found in Large Break LOCA Analysis

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	8	17	9	4	9	4	0	2	2	0	0
0	8	1	7	9	4	9	4	0	2	2	0
0	0	0	9	1	3	9	4	0	5	0	0
0	5	0	0	0	0	0	5	0	0	0	0

OPERATING MODE (9) 1

POWER LEVEL (10) 0.310

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

20.402(b)	20.406(c)	50.73(e)(2)(iv)	73.71(b)
20.406(e)(1)(i)	50.36(c)(1)	50.73(e)(2)(v)	73.71(c)
20.406(e)(1)(ii)	50.36(c)(2)	50.73(e)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.406(e)(1)(iii)	50.73(e)(2)(i)	50.73(e)(2)(viii)(A)	
20.406(e)(1)(iv)	X 50.73(e)(2)(ii)	50.73(e)(2)(viii)(B)	
20.406(e)(1)(v)	50.73(e)(2)(iii)	50.73(e)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
J. Stoddard, Reactor Engineer	2 0 3 2 6 7 1 - 2 5 5 1 6

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

ABSTRACT

On August 17, 1994, at 2015 hours, with the plant in Mode 1 at 30 percent power (during a plant chemistry hold), an engineering analysis indicated that the peak cladding temperature during a large break loss of coolant accident (LBLOCA) could, for the analysis of record LBLOCA case (102% power, maximum allowable operating limits), exceed the 2200 degree F limit. This analysis was performed with an updated evaluation model that accounted for previously identified errors. The cause of this event can be attributed to the incorporation of previous identified error corrections and the use of tighter convergence criteria. Corrective action consisted of performing a supplemental analysis with a reduction in the allowable F Delta H from 1.60 to 1.44 and taking credit for the accrued burnup during cycle operation to effectively lower the initial stored energy. The results of the additional case yielded an acceptable peak cladding temperature < 2200 degrees F. An evaluation of past operation has shown that the plant operated with sufficient margin to the operating limits such that 2200 degrees F would not have been exceeded during a LBLOCA.

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		94	022	00	02	OF	04

TEXT (If more space is required, use additional NRC Form 388A's) (17)

BACKGROUND INFORMATION

The Large Break Loss of Coolant Accident is being re-evaluated as a result of the change in fuel supplier and fuel design for the next cycle of operation (Cycle 19). Along with the change in the fuel design for Cycle 19, the core (EIIS Code: AC) operating limits were being revised to support the transition to and eventual operation of 24 month fuel cycles. During the evaluation, several input parameters associated with the new fuel design and new core operating limits were changed. These changes resulted in the peak cladding temperature exceeding the 2200 degree F limit. Through the evaluation of results, the impact of error corrections implemented, since the analysis of record, was identified and the timestep controls within the code had to be changed. The vendor has concluded that the computer code updates are consistent with the currently approved and licensed evaluation model for Haddam Neck.

The effect of these code changes and finer timestep intervals resulted in a more limiting Emergency Core Cooling System (ECCS) (EIIS Code: BQ) flow distribution during the refill portion of the transient, relative to the Haddam Neck analysis of record. Specifically, most of the water injected into the upper plenum drains through the peripheral assemblies during the refill period of the transient. This results in less pooling above the upper core plate and reduced top-down cooling of the interior assemblies. After the new flow characteristics were understood, it was determined that the previous analysis, valid for Cycles 17 and 18, had to be reanalyzed.

EVENT DESCRIPTION

On August 17, 1994, at 2015 hours, with the plant in Mode 1 at 30 percent power (during a plant chemistry hold), an engineering analysis indicated that the peak cladding temperature during a large break loss of coolant accident (LBLOCA) could, for the analysis of record LBLOCA case (102% power, maximum allowable operating limits), exceed the 2200 degree F limit. This analysis was performed with an evaluation model that accounted for previously identified errors.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

CAUSE OF THE EVENT

The cause of this event can be attributed to the incorporation of previous identified error corrections and the use of tighter convergence criteria.

SAFETY ASSESSMENT

This event is reportable under 10CFR50.73(a)(2)(ii)(B) since there were no administrative restrictions that would have prevented the plant from operating in a condition that was outside the design basis of the plant. A change or error correction resulted in a calculated ECCS performance that does not conform to the criteria of 10CFR50.46(b).

A supplemental analysis was performed with a reduction in the allowable F Delta H from 1.60 to 1.44 and taking credit for the accrued burnup during cycle operation to effectively lower the initial stored energy. The results of the additional case yielded an acceptable peak cladding temperature < 2200 degrees F. The lower F Delta H limit has been incorporated into the Technical Report Supporting Cycle Operation, and will be verified by routine power distribution surveillances.

The maximum allowable linear heat generation rate (LHGR) for cycles 17 and 18 is 14.5 kW/ft. An evaluation was performed that identified that maximum achievable linear heat rate for Cycles 17 and 18 was 13.0 kW/ft. This was determined by reviewing the fuel cycle design and core operating limits. An analysis using the maximum achievable linear heat rate along with the maximum allowable radial peaking factor of 1.60 and fuel burnup, consistent with the limiting time in life for cycle 18, demonstrated that the peak clad temperature would not have been above the 2200 degrees F limit specified in 10CFR50.46. The limiting time in life burnup for cycle 17 would be similar to cycle 18. Therefore, since the core never operated above 13.0 kW/ft, and operated within the radial peaking factor and axial offset limits, there is no safety significance to this event.

CORRECTIVE ACTION

The initial corrective action was to reduce the radial peaking factor in the Technical Report Supporting Cycle Operation (TRSCO) to the value (1.44) that yields acceptable LOCA results. Additionally, the error corrections to the evaluation model have been validated. The long term corrective action for Cycle 19 and

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TEXT (if more space is required, use additional NRC Form 366A's) (17)

all future cycles will be to establish revised operating limits (axial offset, F Delta H and LHGR) to ensure that the 2200 degree F peak cladding temperature limit will not be exceeded.

ADDITIONAL INFORMATION

None.

PREVIOUS SIMILAR EVENTS

LER 94-010-00, Neutron Source/Detector Geometry Yields Non-Conservative Analysis