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HL-1669
000317

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

PLANT HATCH - UNIT 2
NRC DOCKET 50-366
OPERATING LICENSE NPF-5
LICENSEE EVENT REPORT
LESS-THAN-ADEQUATE SAFETY EVALUATION
RESULTS IN TECHNICAL SPECIFICATIONS NONCOMPLIANCE

Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(iv), Georgia Power Company is submitting the enclosed Licensee Event Report (LER) concerning a less-than-adequate spent fuel pool storage rack design safety evaluation that resulted in a Technical Specifications noncompliance. This event occurred at Plant Hatch - Unit 2.

Sincerely,

J. T. Beckham, Jr.

SRP/sp

Enclosure: LER 50-366/1991-014

cc: (See next page.)

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cc: Georgia Power Company
Mr. H. L. Sumner, General Manager - Nuclear Plant
Mr. J. D. Heidt, Manager Engineering and Licensing - Hatch
NORMS

U.S. Nuclear Regulatory Commission, Washington, D.C.
Mr. K. Jabbour, Licensing Project Manager - Hatch

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Mr. L. D. Wert, Senior Resident Inspector - Hatch

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NRC Form 366 (6-89) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
PLANT HATCH, UNIT 2	0 5 0 0 0 3 6 6	1 OF 5

TITLE (4)
LESS THAN ADEQUATE STORAGE RACK DESIGN EVALUATION RESULTS IN TECHNICAL SPECIFICATIONS NON-COMPLIANCE

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQ NUM	REV	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
									UNIT 1	0 5 0 0 0 3 2 1
0 5	0 8	9 1	9 1	0 1 4	0 0	0 6	0 5	9 1		0 5 0 0 0

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (11)			
POWER LEVEL	0 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below)
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER	
	AREA CODE	
STEVEN B. TIPPS, MANAGER NUCLEAR SAFETY AND COMPLIANCE, HATCH	912	367-7851

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

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORT TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORT TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES(If yes, complete EXPECTED SUBMISSION DATE)	X NO		0 8	3 0	9 1

ABSTRACT (16)

On 5/8/91 at 0930 CDT, Unit 2 was in the Refueling mode with the core completely loaded when a discrepancy between Unit 2 Technical Specification (TS) 3.9.10 and the design of the High Density Fuel Storage System (HDFSS) (EIIS Code DB) racks in the Unit 2 Spent Fuel Pool was identified. TS 3.9.10 requires at least 23 ft of water be maintained over the top of irradiated fuel assemblies seated in the storage racks. However, rack design is such that 23 ft of water can be maintained only above the top of the active fuel region of assemblies seated in the racks. The top of each fuel assembly, i.e., top of the upper tie plate, is approximately 12.125 in. above the top of the active fuel (TAF).

GE was contacted to assess the safety significance of the discrepancy and provide a basis for the 23-ft requirement. GE indicated the discrepancy was not a safety concern, but was unable to document the 23-ft depth was intended to be measured with respect to TAF. Plant Hatch Corporate Support personnel analyzed the impact of this discrepancy and concluded that a safety concern did not exist.

The cause of this event is a less-than-adequate design change safety evaluation (SE) in that the SE for the HDFSS design change developed in the early 1980s did not address compliance with TS 3.9.10. On 5/20/91, LCO 2-91-424 was initiated to ensure compliance with Action Statement 3.9.10 until the TS are revised. That is, all movement of fuel assemblies and crane operations have been suspended. Proposed changes to TS 3.9.10, as well as Unit 1 TS 3.10.D, and the associated Bases will be submitted to the NRC.

Plant and System Identification

General Electric - Boiling Water Reactor
Energy Industry Identification System codes are identified in the text as (EIIS Code XX).

Description of Event

On 5/8/91 at 0930 CDT, Unit 2 was in the Refueling mode, nearing the end of a refueling outage, with core loading complete. At that time, it was determined a discrepancy existed between the wording of Unit 2 TS 3.9.10 and the design of the High Density Fuel Storage System (HDFSS) (EIIS Code DB) racks in the Unit 2 Spent Fuel Pool. This discrepancy was discovered as a result of an inquiry by Plant Hatch's NRC Senior Resident Inspector concerning compliance with Unit 2 TS 3.9.10, which requires at least 23 ft of water be maintained over the top of irradiated fuel assemblies seated in the spent fuel storage racks.

The HDFSS was installed in the Unit 2 Spent Fuel Pool in 1980 per approved Design Change Request (DCR) 80-101. The high density storage racks replaced the original low density racks, more than doubling the storage capacity of the Unit 2 Spent Fuel Pool. The high density storage racks rest upon a "module support system" consisting of a storage rack support base, slider pad assembly, and storage rack base plate. The new support system raised the level of the new racks approximately 9.75 in. above the Unit 2 Spent Fuel Pool floor. A fuel assembly's lower tie plate rests on and is supported by the storage rack lower closure plate and fuel support plate, thus raising the fuel assembly an additional 5.32 in. above the pool floor. Therefore, each fuel assembly stored in the HDFSS racks rests approximately 15 in. above the pool floor.

An assessment performed by plant personnel in response to the Senior Resident Inspector's inquiry revealed normal pool water level was less than 23 ft above the top of the irradiated fuel assemblies. The "top of the irradiated fuel assembly" is interpreted as the "top of the upper tie plate of a fuel bundle." Normal pool water level is about 2 in. above the bottom of the Fuel Pool Cooling and Cleanup System (EIIS Code DA) Skimmer Surge Tank intake (commonly called the skimmer or the weir). At this level, approximately 23 ft 3 in. of water are maintained above the top of the active fuel region of fuel assemblies seated in the storage racks; however, only about 22 ft 3 in. of water are maintained above the top of the upper tie plates. Raising the pool water level to its maximum height, as determined by the height of the Skimmer Surge Tank, would result in 22 ft 10 in. of water being maintained above the fuel assemblies. Unit 2 TS require 23 ft of water be maintained over the top of irradiated fuel assemblies. Therefore, the design of the HDFSS racks is such that the requirement of Unit 2 TS 3.9.10 cannot be met.

Corresponding Unit 1 TS 3.10.D requires at least 8.5 ft of water be maintained over the top of the active fuel in the Unit 1 HDFSS racks. As in the Unit 2 pool, over 23 ft of water are maintained over the top of the active fuel region of assemblies stored in the Unit 1 Spent Fuel Pool at normal water level. Therefore, Plant Hatch can and does meet the requirements of the Unit 1 TS.

Upon determination a discrepancy existed between the Unit 2 TS and the Unit 2 HDFSS design, a Deficiency Card was written as required by plant procedures. Conversations with Corporate Licensing personnel, who had discussed the discrepancy with GE, Plant Hatch's primary nuclear fuel supplier and designer of the HDFSS, indicated the discrepancy was not a safety concern. In fact, preliminary discussions with GE indicated the required 23 ft of water could be measured from the top of the active fuel, as is clearly stated in the Unit 1 TS. Therefore, it was believed the problem was in the wording of TS 3.9.10 and the intent of the TS was being met. Consequently, an LCO was not initiated at that time.

However, GE was unable to provide a clear basis for the 23-ft requirement. Regulatory Guide (RG) 1.25 (Safety Guide 25) allows use of certain decontamination factors (DFs) in dose calculations if the "minimum water depth between the top of the damaged pins and the fuel pool surface is 23 feet." GE could not locate a specific calculation performed in support of the HDFSS installation which utilized the DFs provided in RG 1.25. Therefore, it was concluded that calculations would be required to justify the current water level depth. These analyses have been completed and support the preliminary determination that the actual water depth would not result in radiological consequences in excess of those specified in 10 CFR 100.

On 5/20/91 at 1600 CDT, LCO 2-91-424 was initiated to prevent movement of fuel assemblies and crane operations with loads in the Unit 2 Spent Fuel Pool area, as required by TS 3.9.10. Additionally, it should be noted that discussions were held with NRC staff personnel, and it was concluded the spent fuel pool water depth should be measured with respect to the upper tie plate of a fuel assembly seated in the storage racks. As a result of these conversations, the appropriate TS changes were initiated to alleviate this situation.

Cause of the Event

The cause of this event is a less-than-adequate safety evaluation for DCR 80-101. The Unit 2 HDFSS racks were installed in the Unit 2 Spent Fuel Pool in 1980 under DCR 80-101. The safety evaluation for the design change did not address compliance with Unit 2 TS 3.9.10, nor did it include the fact the installation of the new racks would result in the fuel assemblies resting a significant distance above the bottom of the pool. Also, the safety evaluation

did not include a re-analysis of the consequences of damaging the irradiated fuel assemblies stored in the new racks. This accident is the basis for the minimum water level requirement of the Unit 2 TS.

The discrepancy between the requirement of the Unit 2 TS and the design of the Unit 2 HDFSS racks was not discovered earlier because the requirement apparently had been interpreted to mean top of the active fuel region rather than top of the fuel assemblies. This interpretation is based on the wording of Unit 1 TS 3.10.D which clearly references the top of the active fuel.

Reportability Analysis and Safety Assessment

This report is required per 10 CFR 50.73(a)(2)(i) because a condition existed which was prohibited by plant TS. Specifically, water level was not maintained at least 23 ft over the top of the irradiated fuel assemblies seated in the storage racks in the Unit 2 Spent Fuel Pool, as required by Unit 2 TS 3.9.10.

The Unit 2 Spent Fuel Pool and HDFSS racks are designed to provide storage space for irradiated fuel assemblies which require shielding and cooling during storage and handling. The storage racks ensure all arrangements of fuel stored in the racks are maintained in a subcritical configuration. The racks are designed to withstand seismic loading to minimize distortion of the storage arrangement and prevent the loss of pool water. The pool itself is designed such that no single failure will result in the inability to maintain irradiated fuel submerged in water. In addition to providing cooling and shielding, the water in the Spent Fuel Pool serves to mitigate the consequences of an accident which results in the breach of the cladding of irradiated fuel stored in the pool. The water absorbs a significant amount of the iodine released from the rupture of an irradiated fuel assembly, thereby limiting the consequences of an accident to levels below those required by Standard Review Plan 15.7.4. This is the basis for the minimum water level requirement in the Unit 2 TS.

Currently, water depth covering the top of the irradiated fuel assemblies is less than that required by the Unit 2 TS. Consequently, movement of fuel assemblies and crane operations with loads in the Unit 2 Spent Fuel Pool area have been suspended per the requirements of TS 3.9.10.

Analyses that show the requirements of both 10 CFR 100 and Standard Review Plan 15.7.4 are met with water level significantly less than 23 ft above the fuel assemblies have been performed. Since Spent Fuel Pool water level is consistently maintained approximately 22+ ft above the top of the fuel bundle upper tie plates, it has been determined this event has no adverse impact on public health and safety. Because the circumstances surrounding this event involve only spent fuel storage, this analysis is applicable to all operating modes.

Corrective Actions

LCO 2-91-424 was initiated on 5/20/91 at 1600 CDT to ensure compliance with the Action Statement requirements of Unit 2 TS 3.9.10.

Since the occurrence of this event in the early 1980s, administrative controls governing the content, review, and approval of safety evaluations for DCRs have been significa.tly enhanced. The improved administrative controls should prevent recurrence of events of this nature.

Based on the results of the subject analysis, proposed changes to Unit 2 TS 3.9.10, as well as Unit 1 TS 3.10.D, and the associated Bases will be submitted to the NRC. The changes will provide consistency in the wording of the Unit 1 and Unit 2 TS and will reflect the assumptions for the fuel handling accident analysis outlined in RG 1.25 and the guidance of Standard Review Plan 15.7.4 for radiological releases resulting from a fuel handling accident. The proposed changes also consider any limitations imposed by of 10 CFR 20.

Additional Information

No failed components caused or resulted from this event.

No systems other than those mentioned in this report were affected by this event.

One previous similar event has been reported in the last 2 years in which a problem related to a design change resulted in non-compliance with TS requirements. The event was reported in LER 50-321/1989-007, dated 6/16/89. In the event, a wiring error in a newly installed TS-required recorder rendered it inoperable. The functional test for the DCR under which the new recorder was installed failed to detect the error. The recorder remained inoperable, contrary to the requirements of the Unit 1 TS, until its 6-month calibration surveillance revealed the wiring error. The corrective actions for the 1989 event would not have prevented this event, because this event, although discovered on 5/8/91, actually occurred in 1980, 9 years prior to the event reported in LER 50-321/1989-007.