

EXPIRES 04/30/98

LICENSEE EVENT REPORT (LER)

(See reverse for required number of
digits/characters for each block)ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS
MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HR.
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

FACILITY NAME (1)

HOPE CREEK GENERATING STATION

DOCKET NUMBER (2)

05000-354

PAGE (3)

1 OF 4

TITLE (4)

Non-conservative safety limit minimum critical power ratio calculation methodology error discovery.

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 NAME	DOCKET NUMBER
04	16	96	96	-- 014	-- 00	05	14	96	FACILITY NAME	DOCKET NUMBER
										05000
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
1			20.2201(b) 20.2203(a)(2)(v) 50.73(a)(2)(i)(B) 50.73(a)(2)(viii)							
POWER LEVEL (10)			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

Jeff Keenan, Licensing

TELEPHONE NUMBER (Include Area Code)

609 - 339 - 5429

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NFRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NFRDS
9605200139	960514								
PDR	ADOCK	05000354							
S	PDR								

SUPPLEMENTAL REPORT EXPECTED (14)

X YES		NO		EXPECTED SUBMISSION		MONTH	DAY	YEAR
(If yes, complete EXPECTED SUBMISSION DATE) 09/30/96								

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

On April 16, 1996, Hope Creek was notified, by our nuclear fuel vendor (NFV), that generic reactor core calculations methods do not bound the current cycle reactor core. Specifically, a calculation for our GE9 fuel product Safety Limit (SL) Minimum Critical Power Ratio (MCPR) yielded an unverified value of 1.094. The NFV purports that this value is unlikely to significantly change when confirmed. As the newly calculated SL MCPR value is nonconservative with respect to the Technical Specification section 2.1.2 limits (SL MCPR shall not be less than 1.07 with two recirculation loop operation and shall not be less than 1.08 with single recirculation loop operation), this condition was reported under 10 CFR 50.72(b)(1)(ii) and is being reported per 10 CFR 50.73(a)(2)(ii)(B) as a condition that could result in conditions outside the design basis of the plant. The apparent causes of the event include less than adequate design assumptions and design review process when developing procedures and processes to determine SL MCPRs. In addition, past independent review processes were not established or were less than adequate in identification of this condition. Corrective actions include interim controls on MCPR and development of an action plan in response to the pending NFV evaluation.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION	
HOPE CREEK GENERATING STATION	05000-354				2 OF 4
		96	-- 014	-- 00	

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

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor (BWR/4)

IDENTIFICATION OF OCCURRENCE

Discovery Date: April 16, 1996

CONDITIONS PRIOR TO OCCURRENCE

Plant in OPERATIONAL CONDITION 1
Reactor at 100% of Rated Power

DESCRIPTION OF OCCURRENCE

On April 16, 1996, Hope Creek was notified, by our nuclear fuel vendor (NFV), that generic reactor core calculations methods do not bound the current cycle reactor core. Specifically, a calculation for GE9 fuel product Safety Limit (SL) Minimum Critical Power Ratio (MCPR) yielded an unverified value of approximately 1.094. The information was discussed and challenged by PSE&G; however, the NFV believes the final calculation will not render results significantly different from initially reported. As the SL MCPR value is nonconservative with respect to the Technical Specification section 2.1.2 limit (SL MCPR shall not be less than 1.07 with two recirculation loop operation or shall not be less than 1.08 with single recirculation loop operation with reactor vessel steam dome pressure greater than 785 psig and core flow greater than 10 percent of rated flow), this event was reported per 10 CFR 50.72(b)(1)(ii) and is being reported per 10 CFR 50.73(a)(2)(ii)(B) as a condition that could result in conditions outside the design basis of the plant.

ANALYSIS OF OCCURRENCE

The fuel cladding integrity SL is set such that no fuel damage is calculated to occur if the limit is maintained. The MCPR is defined as the smallest ratio of power in the assembly which is calculated by application of the critical power correlation to cause some point in the assembly to experience boiling transition. This is then divided by the actual assembly operating power which may exist in the core. MCPR greater than the SL MCPR specified in Technical Specification section 2.1.2 represents a conservative margin relative to the conditions required to maintain fuel cladding integrity. The fuel cladding SL is established with a margin to the conditions which could produce the onset of transition boiling, MCPR of 1.0. The condition of MCPR of less than 1.0 would represent a significant departure from the condition intended by design for planned operation. The SL MCPR is

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
HOPE CREEK GENERATING STATION	05000-354	YEAR	SEQUENTIAL NUMBER	REVISION	3 OF 4
		96	-- 014	-- 00	

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

ANALYSIS OF OCCURRENCE (Continued)

determined using a statistical model that combines all of the uncertainties in operating parameters and in the procedures used to calculate critical power (Reference Technical Specification Bases section 2.1.2). Calculation of the SL MCPR's is defined in General Electric Standard Application for Reactor Fuel (GESTAR II), NEDE-24011-P-A. The required inputs to the statistical model are the uncertainties listed in Technical Specification Bases Table B2.1.2-1.

The generic GE9 SL MCPR was calculated using licensing basis conditions stated in GESTAR-II and standard NFV procedures. For this analysis, a large equilibrium core operating in 18 month cycles is selected. The analysis is performed at the cycle exposure corresponding to maximum hot excess reactivity, with the flattest possible (i.e. most conservative) power distribution. For these core designs, the peak hot excess reactivity point in the cycle typically represents the point of minimum CPR margin.

In the course of using the new process for plant specific SL MCPR, a discovery was made that the above procedure used for determination of generic SL MCPR may not always yield the most conservative result. When the approved licensing basis conditions and uncertainties are used with the core specific loading and rod patterns selected, the preliminary results yielded a SL MCPR of 1.094 for both middle of cycle (point of peak hot excess reactivity) and end of cycle conditions.

APPARENT CAUSE OF THE OCCURRENCE

The apparent causes of the event include less than adequate design assumptions and design review process when developing procedures and processes to determine SL MCPRs by the NFV. In addition, independent review processes, by the NFV and the utility were either not established or less than adequate in the identification of this condition.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION	
HOPE CREEK GENERATING STATION	05000-354				4 OF 4
		96	-- 014	-- 00	

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

ASSESSMENT OF SAFETY CONSEQUENCES

The NFV preliminary evaluation, using nominal conditions and realistic estimates of power uncertainty, indicate that there is no substantial safety hazard involved. Specifically, SL MCPRs calculated under closer to actual conditions are bounded by the generic SL MCPR. Based on the evidence to date, the NFV believes that there is no safety consequence involved.

In addition, the operating limit MCPR, as discussed in Hope Creek Safety Evaluation Report (SER) section 4.4.3, is cycle specific. The current MCPR value is 1.26 and is controlled by the Core Operational Limits Report (COLR). The COLR is referenced in the Technical Specifications. The actual operational history for fuel cycle 7 was reviewed. The minimum actual MCPR was at least 1.55 at all times. This value is markedly above the interim established administrative limit of 1.29, which is in turn above the minimum operating CPR limits established for accident analysis section initial transient conditions. The interim established operational MCPR limit bounds initial accident analysis conditions, therefore the newly calculated SL MCPR of 1.094 is maintained and has minimal safety consequence.

PREVIOUS OCCURRENCES

A review of previous LERs revealed no events involving safety limit MCPR or concerns with NFV developed documents or calculations.

CORRECTIVE ACTIONS

- 1) MCPR is being controlled at an interim value that bounds initial accident analysis conditions until this matter is resolved. This value is conservative with respect to the NFV calculated MCPR of 1.094 and Technical Specification section 2.1.2 limits.
- 2) When the NFV evaluation is completed, PSE&G will review the report and establish an appropriate action plan, including an internal review of PSE&G NFV evaluation programs, to address the SL MCPR issue. This action plan is to be developed by July 31, 1996.
- 3) This LER will be supplemented, as appropriate, by September 30, 1996.