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June 13, 1990

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

Docket No. 50-317
License No. DPR 53

Dear Sirs:

The attached LER 89-019, Revision 01, is being sent to you as required under 10 CFR 50.73 guidelines.

Should you have any questions regarding this report, we would be pleased to discuss them with you.

Very truly yours,

R. E. Denton
Manager

PSF/bjd
Attachment

cc: Robert E. Denton
Director, Office of Management Information
and Program Control
Messrs: G. C. Creel
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NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Calvert Cliffs, Unit 1	0 5 0 0 0 3 1 7	1 OF 0 5

TITLE (4) Unimplemented Requirement to Lock the HPSI Discharge Header Isolation Valves Shut in Operation Outside the LTOP Design Basis

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)
										Calvert Cliffs, Unit 2	0 5 0 0 0 3 1 8
1 1	2 8	8 9	8 9	—	0 1 9	— 0 1	0 6	1 3	9 0		0 5 0 0 0

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	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 and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	X 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
P. S. Furio, Licensing Engineer	3 0 1 2 6 0 - 4 3 7 4

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)	X NO				

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

The Low Temperature Overpressure Protection (LTOP) system is used to provide overpressure protection for the reactor vessel at low temperatures. If the level of protection is inadequate, a rapidly propagating fracture of the reactor vessel could result. It has been determined that for a period of approximately 10 years (1979-1989) not all of the LTOP controls originally established were in place. The severity of this lapse was described to the Nuclear Regulatory Commission (NRC) staff during an enforcement conference on January 18, 1990. Appropriate corrective actions were determined and have been implemented for Unit 1. A severity level III violation was imposed by the NRC (March 6, 1990).

An LTOP system for Unit 1 has been established based on current vessel embrittlement conditions. The system description and associated Technical Specification changes are under review by the NRC staff. Methods have been established to maintain the LTOP system commitments. An LTOP system for Unit 2 is currently under review. The pressurizer manway will not be installed on Unit 2 with fuel in the vessel, until applicable LTOP issues are resolved.

DESCRIPTION OF EVENT

At 11:55 on November 28, 1989, a condition was discovered at Calvert Cliffs Units 1 and 2 which did not satisfy the Low Temperature Overpressure Protection (LTOP) design basis. The commitment which initially determined the reportability of this condition was failure to require that the High Pressure Safety Injection (HPSI) pumps discharge header isolation valves (EIIS BQ-ISV) be locked shut during water solid operations. At the time of discovery, Unit 1 was in cold shutdown with the Reactor Coolant System (RCS) partially drained, atmospheric pressure, and at 111 degrees Fahrenheit. Unit 2 was defueled, at atmospheric pressure, and at 79 degrees Fahrenheit.

In 1977 and 1978, the NRC reviewed and approved our basic LTOP system. This system was designed to provide adequate protection against overpressure transients at low temperature for the first 10 Effective Full Power Years (EFPY) of reactor operation. After a meeting with the NRC on November 27, 1989, which discussed the status of our current LTOP system, we identified the need to perform an in depth review of the licensing documentation associated with the LTOP system. During this review, we identified 38 commitments relating to the design and operation of the LTOP system. There were 6 significant commitments that were not implemented appropriately. These deviations are described below. The resolutions described below are applicable to Unit 1 only. Resolution for Unit 2 is currently being pursued.

1. Power Operated Relief Valve (PORV) Discharge Piping

   During an LTOP transient, the PORV (EIIS AB-RV) may relieve water. We had committed to analyzing the PORV piping to ensure that it would not fail when water was relieved through it. The analysis was not performed at the time. After this commitment was identified, an analysis was performed and the piping was shown to be able to withstand a liquid discharge without loss of function.

2. Emergency Core Cooling System (ECCS) Testing

   To limit the probability of a mass addition transient, we had committed to prohibit ECCS (EIIS JE) testing when the RCS was in a cold, water solid condition. Although testing had not been performed while the RCS was in a water solid condition, a prohibition was not added to the operating procedures until 1988. The current version of the operating procedures contains a caution statement which prohibits ECCS testing when in a water solid condition. The appropriate Surveillance Test Procedures will be modified to contain a similar caution statement prior to their next use.

3. HPSI Header Isolation Valves

This is the commitment which determined the reportable nature of the LTOP system implementation deficiencies. We had committed to lock the HPSI header isolation valves shut when the RCS is in a cold, water solid condition to provide defense-in-depth for a mass addition transient. Procedures were not modified to conform to the commitment. The operating procedures have now been modified to require that the header isolation valves be shut, with their breakers tagged out, when the RCS is in a water solid condition.

4. Computer Generated Alarm

For additional operator information, we committed to have an alarm (EIIS AB-PA) below the LTOP pressure setpoint. This alarm would warn the operator that an overpressure excursion was in progress. Although this alarm function has existed since the LTOP system became functional, it was not designed exactly as described in our original documentation. The alarm is now fully operational.

5. Steaming the Steam Generators to 200 degrees Fahrenheit

To prevent an energy addition transient from overpressurizing the RCS, we committed that the RCS temperature would be close to that of the secondary side of the steam generators (EIIS AB-SG) during a cooldown. We had committed to use the steam generators to cool the RCS down to 220 degrees Fahrenheit before starting shutdown cooling. We normally use the steam generators concurrent with shutdown cooling to achieve RCS temperatures less than 220 degrees Fahrenheit. This minimizes the temperature difference between the RCS and the steam generator secondary side. It is not practical to use only the steam generators to cool the RCS to such low temperatures. Technical Specification changes have been submitted which would eliminate energy addition transients (reactor coolant pump starts) whenever the RCS temperature is significantly different (> 150 degrees Fahrenheit) from the steam generator secondary side.

6. HPSI Pump Controls

To prevent a mass addition transient that could threaten the reactor vessel integrity, we originally committed to disable the HPSI pumps (EIIS BQ-P) in stages. One HPSI pump would be taken out of service at 310 degrees Fahrenheit, the second at 220 degrees Fahrenheit, and the third at 160 degrees Fahrenheit. Technical Specification requirements (boration controls), developed since 1977, no longer allow compliance

with these controls. This conflict was not identified at the time the Technical Specifications were implemented. As a result of these constraints, we have implemented an alternative set of HPSI pump controls. We will rack out the breakers for two HPSI pump motors and place the hand switch for the third pump in pull-to-lock. This provides assurance that the HPSI pumps will not inadvertently inject water into the vessel, yet leaves a HPSI pump available to perform other functions. When a HPSI pump is used while the RCS requires LTOP, either the flow must be throttled or an adequate vent must be provided. To provide additional defense, the Technical Specifications will be changed to require the HPSI loop motor operated valves be disabled whenever LTOP is required. This prevents a safety injection actuation signal from opening the valves, thereby providing defense-in-depth-when the plant is not in a water solid condition.

ANALYSIS OF EVENT

The LTOP system is used to provide overpressure protection for the reactor vessel (EIIS AB-RPV) at low temperatures. If the level of protection is inadequate, a rapidly propagating fracture of the reactor vessel could result. It has been determined that for a period of approximately 10 years (1979-1989) not all of the LTOP controls originally established were in place. The most significant of these lapses is discussed above. It was also noted that we have had one or two PORVs out of service without opening an adequate vent while in an LTOP condition. The severity of these conditions were described to the NRC staff during an enforcement conference on January 18, 1990. The root causes of this problem included a lack of control of commitments as well as inadequate management attention. Appropriate corrective actions were determined, discussed with the NRC, and have been implemented for Unit 1. A severity level III violation was imposed by the NRC (March 6, 1990).

The LTOP system for Unit 1 has been established based on current vessel embrittlement conditions. The system description and associated Technical Specification changes are under review by the NRC staff. Methods have been established to maintain the LTOP system commitments. The LTOP system for Unit 2 is currently under development.

CORRECTIVE ACTIONS

Corrective actions for Unit 1 have been previously described to the NRC in a letter providing the LTOP system description (March 2, 1990). These actions have been implemented. The NRC is currently reviewing an associated group of Technical Specification changes.

Appropriate corrective actions for Unit 2 will be determined by a review of the original system commitments. Actions will be taken, as needed, to restore the original margin of safety approved by the NRC. Until an appropriate level of protection is assured, the pressurizer manway will not be installed on Unit 2 with fuel in the vessel.

ADDITIONAL INFORMATION

One previously identified overpressurization event has occurred, described in LER 77-05, Unit 1. This event occurred before an LTOP requirement existed.