CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9703140100 DOC.DATE: 97/03/10 NOTARIZED: NO DOCKET #
FACIL:50-400 Shearon Harris Nuclear Power Plant, Unit 1, Carolina 05000400
AUTH.NAME AUTHOR AFFILIATION
VERRILLI,M. Carolina Power & Light Co.
DONAHUE,J.W. Carolina Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 97-002-00:on 970207,main FW isolation valves inoperable due to cold weather conditions.Monitored steam tunnel temp once per 12 h shift.W/970310 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 4
TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:Application for permit renewal filed. 05000400

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Serial: HNP-97-058
10CFR50.73

SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1
DOCKET NO. 50-400
LICENSE NO. NPF-63
LICENSEE EVENT REPORT 97-002-00

Sir or Madam:

In accordance with Title 10 to the Code of Federal Regulations, the enclosed Licensee Event Report is submitted. This report describes a period when the Main Feedwater Isolation Valves were determined to be inoperable due to cold weather conditions.

Sincerely,

J. W. Donahue
Director of Site Operations
Harris Plant

MV

Enclosure

c: Mr. J. B. Brady (HNP Senior NRC Resident)
Mr. L. A. Reyes (NRC Regional Administrator, Region II)
Mr. N. B. Le (NRC - NRR Project Manager)

IE22

1/1

NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

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.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Harris Nuclear Plant Unit-1	50-400	1 OF 3

TITLE (4)

Inoperable Main Feedwater Isolation Valves caused by cold weather conditions.

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
2	7	97	97	-- 002 --	00	3	10	97	FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	1
POWER LEVEL (10)	100%

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

20.2201(b)	20.2203(a)(2)(v)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)
20.2203(a)(1)	20.2203(a)(3)(i)	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)
Michael Verrilli Sr. Analyst - Licensing	(919) 362-2303

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
B	VF	FAN	J127	Y					

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 15 single-spaced typewritten lines) (16)

On February 7, 1997, with the plant operating in Mode 1 at 100% power, investigation determined that cold weather conditions resulted in the Main Feedwater Isolation Valves (MFIVs) being potentially inoperable during a period from January 17, 1997 through January 20, 1997. The MFIVs serve as containment isolation valves and are required to stroke closed in 10 seconds or less to provide feedwater isolation in the event of a main steam line break or spurious opening of a feedwater regulating valve. Based on purchase specification documents and discussions with the MFIV vendor, a minimum operating temperature of 60 degrees exists to ensure that the MFIVs will stroke in the required 10 seconds. The MFIV actuators are hydraulic to open and shut with nitrogen pressure, but even the shut sequence utilizes hydraulic oil operation. Therefore, with actuator temperature below 60 degrees the hydraulic oil may be too viscous to provide a valve stroke time of 10 seconds or less. This condition was identified when a nearby instrumentation line was found frozen and brought into question the operability of the safety-related MFIVs. (The frozen instrument line had no adverse effect on plant operation.)

This event was caused by a combination of inadequate design and improper functioning of the HVAC system that serves the Steam Tunnel (area that MFIVs are located in). The steam tunnel HVAC supply fans (S64 Fan and S65 Fan) take a suction from the outside atmosphere and exhaust directly into the area of the MFIVs. They are designed with an automatic low ambient temperature shutoff at 30 degrees, but plant process computer data indicates that the fans continued to operate with outside temperatures well below the 30 degree setpoint. Even if the fans had shutoff as designed at 30 degrees, temperatures in the area of the MFIVs would still have been well below the minimum MFIV actuator operating temperature of 60 degrees.

Corrective actions include monitoring the steam tunnel temperature locally once per 12-hour shift and the manually securing the S64 and S65 fans if necessary. Temporary heaters have also been placed in the steam tunnel for use as needed. Additional steam tunnel HVAC maintenance and/or modifications will be performed.

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

EVENT DESCRIPTION:
On February 7, 1997, with the plant operating in Mode 1 at 100% power, investigation determined that technical specification 4.6.3 had been violated. Specifically, cold weather conditions resulted in the Main Feedwater Isolation Valves (MFIVs) being potentially inoperable during a period from January 17, 1997 through January 20, 1997. The MFIVs serve as containment isolation valves and are required to stroke closed in 10 seconds or less to provide feedwater isolation in the event of a main steam line break or spurious opening of a feedwater regulating valve. This isolation function will prevent excessive Reactor Coolant System cooldown and/or Containment over pressurization.

Based on purchase specification documents and discussions with the MFIV vendor, a minimum operating temperature of 60 degrees exists to ensure that the MFIVs will stroke in the required 10 seconds. The MFIV actuators are hydraulic to open and shut with nitrogen pressure, but even the shut sequence utilizes hydraulic oil operation. Therefore, with actuator temperature below 60 degrees the hydraulic oil may be too viscous to provide a valve stroke time of 10 seconds or less.

This condition was identified when a nearby instrumentation line for the "C" main feedwater bypass line flow transmitter was found frozen and brought into question the operability of the safety-related MFIVs. (The frozen flow transmitter instrument line had no adverse affect on plant operation.) Investigation into this condition revealed deficiencies in the design and operation of the HVAC system that serves the steam tunnel area where the MFIVs are located. The steam tunnel HVAC supply fans (S64 Fan and S65 Fan) take a suction from the outside atmosphere and exhaust directly into the area of the MFIVs. They are designed with an automatic low ambient temperature shutoff at 30 degrees, but archived plant process computer data indicates that the S65 fan continued to operate with outside temperatures well below the 30 degree setpoint.

The "C" MFIV actuator is positioned directly in the exhaust path of one of the S65 Fan duct openings and is approximately 10 feet above the area where the flow transmitter line was found frozen. A review of data taken since the event shows that temperatures in the area of the MFIV actuators run approximately 15 to 20 degrees greater than the location of the frozen instrument line. Based on this, using a simplistic engineering approach, the temperature of all three MFIV actuators would have been below the 60 degree minimum operating limit and were therefore potentially inoperable (incapable of performing containment isolation function in 10 seconds).

CAUSE:
This event was caused by a combination of inadequate design and improper functioning of the steam tunnel HVAC system. The steam tunnel HVAC supply fans (S64 Fan and S65 Fan) take a suction from the outside atmosphere and exhaust directly into the area of the MFIVs. They are designed with an automatic low ambient temperature shutoff at 30 degrees, but plant process computer data indicates that the fans continued to operate with outside temperatures well below the 30 degree setpoint. Even if the fans had shutoff as designed at 30 degrees, temperatures in the area of the MFIVs would still have been well below the minimum MFIV actuator operating temperature of 60 degrees.

SAFETY SIGNIFICANCE:
There were no adverse safety consequences associated with this event. This is based on engineering review and probabilistic safety analysis performed for Harris Plant LER #96-006, (submitted April 24, 1996) which determined that the failure of a MFIV to perform its containment isolation function was non-safety significant. The potential consequences of a MFIV failing to close are over-filling the affected Steam Generator and subsequent over-cooling of the Reactor Coolant System. This would be mitigated by plant design features (tripping of the main feedwater pumps or automatic closure of the feedwater regulating valves), or by operator intervention to control the main feedwater system.

This is being reported per 10CFR50.73.a.2.i.B as a violation of Technical Specifications.

PREVIOUS SIMILAR EVENTS:
There have been no other previous reports submitted related to MFIVs being rendered inoperable due to cold weather conditions. LER 96-006 (referenced above) was submitted due to a MFIV valve stem failure that occurred during surveillance testing.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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

CORRECTIVE ACTIONS COMPLETED:

1. When outside atmosphere ambient temperature is less than 65 degrees, steam tunnel temperatures are being locally monitored once per shift by Operations personnel.

2. Temporary heaters have been placed in the steam tunnel to be used as needed for temperature control.

CORRECTIVE ACTIONS PLANNED:

Additional investigation and troubleshooting will be performed on the steam tunnel HVAC system to ensure proper operation and that adequate temperatures are maintained during cold weather conditions. These planned actions will be completed by October 1, 1997.