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U.S. Regulatory Commission
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Washington, DC 20555

LER 354/03-007-00
HOPE CREEK GENERATING STATION – UNIT 1
FACILITY OPERATING LICENSE NO. NPF-57
DOCKET NO. 50-354

This Licensee Event Report entitled "Reactor Scram Due To Electrical Transient, Low Reactor Water Level And Loss Of Reactor Feed Pumps A and C" is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(iv)(A).

Sincerely,

James Hutton
Plant Manager – Hope Creek

Attachment

RFY

C Distribution
LER File 3.7

IE22

NRC FORM 366 (7-2001) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 7-31-2004

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Hope Creek Generating Station	05000354	1 OF 4

4. TITLE

Reactor Scram Due To Electrical Transient, Low Reactor Water Level And Loss Of Reactor Feed Pumps A and C

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
09	19	2003	2003	– 007	– 00	11	17	2003	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE	1
10. POWER LEVEL	100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)
20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)
20.2203(a)(1)	50.36(c)(1)(i)(A)	X 50.73(a)(2)(iv)(A)	73.71(a)(4)
20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)
20.2203(a)(2)(ii)	50.36(c)(2)	50.73(a)(2)(v)(B)	OTHER Specify in Abstract below or in NRC Form 366A
20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)	
20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)	
20.2203(a)(2)(v)	50.73(a)(2)(i)(B)	50.73(a)(2)(vii)	
20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)	
20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)	

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
R. Yewdall, Licensing Engineer	856-339-2469

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
B	SJ	P	W318	Yes					

14. SUPPLEMENTAL REPORT EXPECTED			15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO				

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

On September 19, 2003 at 2041 hours, Hope Creek reactor scrammed on low reactor water level following a reduction in feed water flow when two of the three reactor feed pumps tripped. The 'A' reactor feed pump turbine (RFPT) tripped when power was lost to the main and auxiliary lube oil pumps. The 'C' RFPT tripped when power was lost to the main lube oil pump and the auxiliary pump did not recover oil pressure prior to the protection logic sensing low oil pressure. The initiating event that led to loss of power was an electrical transient in the station switchyard. The electrical transient was due to an accumulation of salt on switchyard components following Hurricane Isabel. As a result of the electrical transient, the 'A' and 'C' emergency diesel generators successfully started and loaded to their 4160 volt Class 1E busses.

The cause of the reactor scram was low reactor water level which resulted from an electrical transient and the loss of two reactor feed pumps due to the failure of the RFPT lube system to maintain proper oil pressure.

There were no safety consequences associated with this event. Corrective actions included removing salt from switchyard components and modifying the procedural alignment of the RFPT lube oil pumps to improve reliability.

This event is being reported in accordance with 10CFR50.73 (a) (2) (iv) (A).

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Hope Creek Generating Station	05000354	2003	- 007 -	00	2 OF 4

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)
Systems
Feedwater {SJ/--}*
500 KV Switch Yard {MS/--}
Class 1E AC power {EB/--}

* Energy Industry Identification System {EIIS} codes and component function identifier codes appear as {SS/CCC}

IDENTIFICATION OF OCCURRENCE

Event Date: September 19, 2003
Discovery Date: September 19, 2003

CONDITIONS PRIOR TO OCCURRENCE

The plant was in OPERATIONAL CONDITION 1 (POWER), with reactor power near 100 percent at the time of occurrence. No other structures, systems or components were inoperable at the start of this event that contributed to the event. The station had successfully endured high winds, a storm surge and rough surf in the Delaware estuary resulting from Hurricane Isabel.

DESCRIPTION OF OCCURRENCE

On September 19, 2003, at approximately 2041 a reactor scram occurred at Hope Creek Generating Station. The reactor scram resulted from low reactor water level caused by a reduction in feed water flow {SJ/-} when two of the three reactor feed pumps tripped. The 'A" reactor feed pump turbine (RFPT) tripped as a result of losing power to the main and auxiliary lube oil pumps. The 'C" RFPT tripped when power was lost to the main lube oil pump and the auxiliary pump did not recover oil pressure prior to the protection logic sensing low oil pressure. The 'B' reactor feed pump was the only remaining source of feed water. The actual initiating condition was an electrical transient caused by a 500 KV phase to ground fault occurring on the line that connects the Hope Creek and Salem switchyards {MS/-}. The Salem (Units 1 and 2) and Hope Creek generating stations are in close proximity but have independent switchyards.

On September 18 and 19, 2003 the site was impacted by Hurricane Isabel. The storm passed a considerable distance to the south and west of the site but resulted in high winds, and a storm surge of the Delaware estuary.

Strong winds with gusts in excess of 60 mph and rough surf caused switchyard components to become coated with salt. Rain accompanying Isabel had stopped prior to the strongest winds thus leaving the salt spray to dry on switchyard components.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Hope Creek Generating Station	05000354	2003	- 007 -	00	3 OF 4

DESCRIPTION OF OCCURRENCE (continued)

The Salem – Hope Creek tie line tripped as a direct result of the salt on switchyard components that provided a low resistance pathway to ground. This initiated a trip and isolation of HC 500 KV Bus Section 2. All of the relaying, breakers and their vital bus equipment operated as designed. The normal power feed to the 'A' & 'C' 4160 volt Class 1E bus {EB/-} was lost and the fast transfer to the alternate feed was unsuccessful because a momentary dip in the alternate sources. The dip in the alternate feed voltage was caused by the initial 500 KV system fault. The 'A' and 'C' emergency diesel generators (EDGs) started and all connected loads sequenced as designed.

As a result of the loss of the 'A' & 'C' Busses, power to the 'A' and 'C' RFPT main lube oil pumps and 'A' RFPT auxiliary oil pump lost power. As a result the 'A' RFPT tripped due to Low-Low Lube Oil Pressure. The 'C' RFPT auxiliary lube oil pump which is powered from an alternate bus started on low oil pressure, but was unable to recover lube oil pressure. As a result the 'C' RFPT tripped due to Low-Low Lube Oil Pressure. The standby pumps are designed to recover pressure in the event of a loss of the operating lube oil pump.

Once feed water supply from 'A' and 'C' reactor feed pumps was lost, a reactor scram on low reactor vessel water level followed. All station equipment performed as expected during the shutdown.

In addition, the 'A' reactor recirculation pump tripped due to loss of power. The recirculation pump trip was not a contributor to the event.

CAUSE OF OCCURRENCE

The cause of the electrical transient was the combination of accumulation of salt and atmospheric moisture that resulted in a flash-over of a 500 KV insulator.

The cause of the 'C' Reactor Feed Pump Turbine (RFPT) auxiliary lube oil pump not restoring pressure prior to the RFPT trip was a combination of:

1. The RFP oil system 'keep filled' line is undersized (and may have been clogged), thereby allowing for a void in the standby pump discharge piping, and

2. The actual setpoint of the low control header pressure start of the auxiliary oil pump was ~76 psig, 10 psi lower than design setpoint of ~86 psig, and

3. One or more valves in the oil system leaked by or acted erratically during the transient. This is a potential failure mode that has not been proved or disproved.

The sequence of event leading to the reactor scram started with the electrical transient in the Hope Creek switchyard, however without the loss of the second RFP the plant would not have been expected to scram as a result of the event.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Hope Creek Generating Station	05000354	2003	- 007 -	00	4 OF 4

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

PREVIOUS OCCURRENCES

A review of LERs for the previous two years was performed. No previous occurrences involving a reactor SCRAM initiated by the events described in this LER (e.g., loss of two RFPTs) were identified.

SAFETY CONSEQUENCES AND IMPLICATIONS

Although the transient resulted in respective emergency diesel generators powering the 'A' & 'C' Class 1E busses and an automatic reactor scram on low water level, there were no safety consequences associated with this event.

This event does not constitute a Safety System Functional Failure (SSFF) as defined in NEI 99-02.

CORRECTIVE ACTION

The corrective actions to address the electrical transient was a thorough cleaning of the switchyard components. Further actions are being considered as part of the corrective action program.

Corrective actions to address the reactor scram resulting from the reactor feed pump turbine (RFPT) trip include:

1. All RFPTs will be operated with both the main and auxiliary pumps in service until permanent corrective actions are evaluated and implemented.

2. The low control header pressure start of the 'C' RFPT auxiliary oil pump has been re-adjusted to ~86 psig.

3. Further investigation will be performed during HC Refueling Outage 12 to confirm or refute the possibility that valve leak by or erratic behavior contributed to the event. Corrective actions will be implemented based on results of the investigation.

COMMITMENTS

The corrective actions cited in the LER are voluntary enhancements and do not constitute commitments.