ENERGY NORTHWEST

P.O. Box 968 ■ Richland, Washington 99352-0968

February 25, 2003
GO2-03-034

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

Dear Sir or Madam:

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397**
LICENSEE EVENT REPORT NO. 2002-005-00

Transmitted herewith is Licensee Event Report No. 2002-005-00 for Columbia Generating Station. This report is submitted pursuant to 10 CFR 50.73(a)(2)(i)(B). The enclosed report discusses items of reportability and corrective actions taken.

Should you have any questions or desire additional information regarding this matter, please call Ms. CL Perino at (509) 377-2075.

Respectfully,

DK Atkinson
Vice President, Technical Services
Mail Drop PE08

Attachment

cc: EW Merschoff – NRC RIV
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NRC FORM 366 (1-2001) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 6-30-2001

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LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Columbia Generating Station	50-397	1 OF 5

TITLE (4)

Main Steam Leakage Control Fan potentially inoperable during a design basis accident due to undersized thermal overloads.

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
12	28	2002	2002	- 005 -	00	02	25	2003	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)							
POWER LEVEL (10)	100%		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)		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
			20 2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)		Specify in Abstract below or in NRC Form 366A
			20 2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)		
			20 2203(a)(2)(v)	X	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)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Pamela K. Ankrum	(509) 377-4513

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
D	SB	FAN	B515	Y	D	SB	MSTR	I005	Y
D	SB	MO	W120	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 December 23, 2002, with the plant in Mode 1 at 100% power, the Main Steam Isolation Valve Leakage Control Fan 1 (MSLC-FN-1) tripped off during its monthly surveillance after approximately 45 minutes of operation. Operators reset the thermal overload (TOL) relays and the fan re-started. The fan tripped a second time after approximately 50 minutes of operation. Upon investigation, it was determined that the TOL relays for the fan motor were undersized for the application. On December 29, 2002, new properly sized TOLs were installed and the system was returned to an operable status.

The root cause for the undersized TOL relays was a lack of programmatic instructions to ensure communication between organizations. A new motor was installed in 1991 and the nameplate load on the new motor was higher than the original motor. There was no direction to verify or update the governing electrical drawing E528. A contributing cause appears to be a wrong assumption that the difference in the full load amps between the new and original motor required no further actions.

The corrective action for this event is already in place. Current plant procedures establish a limitation on use for motors, and direct the E528 drawing to be revised when new motor attributes are different from the motor being replaced. Additional recommendations have been made to improve the motor limitation on use and to perform a partial review of electrical drawing E528 to ensure drawing fidelity.

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

DESCRIPTION OF EVENT

On December 23, 2002 at approximately 13:25, with the plant in Mode 1 at 100% power, the Main Steam Isolation Valve Leakage Control Fan 1 (MSLC-FN-1) tripped off during its monthly surveillance run after approximately 45 minutes of operation. Operators reset the thermal overload (TOL) relays and the fan re-started. The fan tripped a second time after approximately 50 minutes of operation. The fan was logged into the plant database as inoperable and a work request to investigate the problem was initiated. The surveillance was repeated on December 27, 2002 to evaluate the problem. MSLC-FN-1 tripped again after approximately 50 minutes. On December 28, 2002, the TOLs were replaced with equivalent TOLs, the fan was retested, and successfully ran for two hours. Upon investigation, it was determined on December 28, 2002 that the TOL relays for the fan motor were undersized for this application. On December 29, 2002, properly sized TOLs were installed and tested, and the system was returned to an operable status.

There were no other structures, systems, or components that were inoperable at the start of the event that contributed to the event.

Although the fan was declared inoperable on December 23, 2002, repair of the problem appeared to be feasible well within the allowable technical specification limit of 30 days. At that time, there was no indication that this inoperability was a historical problem that should be considered reportable. The undersized TOLs were discovered on December 28, 2002, indicating that the MSLC-FN-1 was likely inoperable for much longer, and this problem was determined to be reportable from the point of discovery. Therefore, this LER is being submitted within 60 days of December 28, 2002. The MSLC-FN-1 was out of service for approximately one day from the point of discovery of the undersized thermal overloads until it was returned to operable status.

MSLC-FN-1 had passed its surveillance testing between the time the motor was replaced in May 1991 until December 23, 2002. However, it is considered to have been inoperable from May 1991 until December 29, 2002 because, with the undersized TOLs, there is no justification to support that MSLC-FN-1 could have operated continuously for 180 days as assumed in the design basis of the plant. Since the fan has been inoperable since the motor was replaced in 1991, and the fan is required to be restored to an operable status within 30 days by the Technical Specifications, a condition prohibited by the Technical Specifications existed. Therefore, this event is reportable to the NRC in accordance with 10 CFR 50.73(a)(2)(i)(B).

The MSLC-FN-1 had been replaced in 1991 with a similar motor. The motors were identical except the full load amperage for the new motor was 2.4 amps instead of the original 2.1 amps. The TOL relays were not evaluated or replaced at the time the motor was replaced.

IMMEDIATE CORRECTIVE ACTIONS

On December 23, 2002, a work request was initiated to investigate the tripping of the TOL relays for MSLC-FN-1 and the problem was entered into Energy Northwest's corrective action program. The surveillance was repeated on December 27, 2002 to evaluate the problem. On December 28, 2002, the TOLs were replaced with equivalent TOLs and retested successfully. Station personnel calculated the correct TOL size per Energy Northwest Engineering Standards Manual, General Fuse Selection Criteria and the Electrical Protection of 460 VAC and 125-250 VDC Motors (EES-5), and discovered the G30T26 size TOL was undersized for the motor application. On December 29, new properly sized TOLs were installed and tested, and the system was declared operable.

The outboard fan, MSLC-FN-2, was inspected to determine if it had a similar problem. It was found that this fan motor had been replaced with the refurbished MSLC-FN-1 motor and the motor was as originally designed. The TOL relays were correctly sized as installed; therefore, MSLC-FN-2 was determined to be operable.

A root cause analysis was initiated to determine the cause of the failure.

FURTHER EVALUATION

The purpose of the MSLC System is to control and minimize the release of fission products, which could leak past closed MSIVs following a Loss of Coolant Accident (LOCA). MSLC-FN-1, part of the Inboard MSLC system, draws on the main steam lines between the closed inboard MSIVs and the outboard MSIVs and discharges to the Standby Gas Treatment (SGT) System for processing prior to release to the environment.

The fan motor (MSLC-M-FN/1) is a continuous duty Westinghouse Model TBFC/213T, 1.5HP, 460VAC, 3-phase motor (Class 1E). Three fuses and three TOL heaters for the three thermal overload relays (one on each phase line) protect the motor from damage due to electrical shorts or prolonged overcurrent conditions. The components involved in system inoperability include the following:

1. System SB, Component FAN, Manufacturer B515
2. System SB, Component MO, Manufacturer W120
3. System SB, Component MSTR, Manufacturer I005

No other components were adversely affected by the undersized TOLs and all other components in the MSLC system functioned properly and as expected. The undersized TOLs and their relays were expected to trip at or near the running current for the installed MSLC-FN-1 motor.

The MSLC-FN-1 passed its surveillance testing between the time the motor was replaced in May 1991 until December 23, 2002. However, it is considered to have been inoperable from May 1991 until December 29, 2002 because the TOLs were undersized, and small perturbations in the electrical system could have caused the motor to unnecessarily trip.

CAUSE OF THE EVENT

A root cause analysis was performed to determine the cause of the MSLC-FN-1 failure. The root cause for the undersized TOL relay heaters was a lack of programmatic instructions to ensure communication between organizations. A new motor was installed in 1991 and the nameplate load on the new motor was higher than the original motor. There was no direction that the Motor Control Center (MCC) Equipment Overload Summary drawing E528 would need to be revised. A contributing cause appears to be a wrong assumption that the difference in the full load amps required no further actions.

The root cause analysis considered additional contributors to the failure, such as the possibility of high ambient temperatures, increased electrical resistance, prolonged degraded voltage and motor load as potential causes. However, each of these potential contributors were eliminated as contributors to the failure.

ASSESSMENT OF SAFETY CONSEQUENCES

There were minimal safety consequences associated with MSLC-FN-1 being inoperable because redundant equipment was capable of performing the safety function of the MSLC system. The TOLs and fuses for MSLC-FN-2, the outboard fan to MSLC-FN-1, were found to be sized correctly for the installed motor. Therefore, this fan's electrical protection was as designed and this fan was operable. A review was conducted to determine the dates and length of time MSLC-FN-2 was out of service over the past 5 years. This review concluded that all of the out of service times for MSLC-FN-2 over the last five years have been less than the Technical Specification Limiting Conditions for Operation (LCO) limit of 7 days for having two MSLC components out of service while in modes 1, 2 or 3.

ACTIONS TO PREVENT RECURRENCE

The main corrective action to preclude recurrence of this event is the application of limitations on use (LOU) for motors installed at Columbia Generating Station. The LOU is part of a process that governs the use of procured items. The motor LOU requires the user to update controlling drawing E528 prior to motor replacement. This action had been implemented for this and similar motors in 1991, but not before this motor had been tested and released for installation. However, evidence exists that this barrier has broken down recently and the following actions will be taken to improve the barrier:

1. Clarify LOUs for motors - A cross-disciplinary team will evaluate and develop appropriate recommendations to enhance the effectiveness of the LOU.
2. Review/audit drawing E528 – Safety related motors that have been replaced within the last ten years will be evaluated to determine if nameplate data matches the controlling electrical drawing E528.
3. Update Planner Policy - Review and revise, if necessary, the expectation that planners document all LOUs. Communicate the policy to all planners.

4. Evaluate Planner Training – Perform a task analysis to evaluate the need to add LOU training to the maintenance planner initial and refresher training and qualification plans.
5. Evaluate Craft Training - Evaluate the need to train all craft personnel on the importance of LOUs.
6. Add additional instruction regarding verification of electrical drawing E528 to the procedures that would normally be used during the testing of new motors.

PREVIOUS SIMILAR EVENTS

The site Problem Evaluation Request (PER) database and Institute of Nuclear Power Operations (INPO) database were searched for problems relating to thermal overloads. The search revealed two events (LER 89-044 and 92-005) from WNP-2 (now known as Columbia Generating Station).

1. LER 89-044 identified 6 undersized TOLs in the high pressure core spray (HPCS) system. The root cause was identified as inadequate design selection with a contributing cause of personnel accountability not clearly defined, inadequate procedures, unclear specifications and an inadequate review of the selection. The corrective actions were to clarify the procedure for selecting TOLs and review TOL size in two other safety related motor control centers. These actions occurred prior to the MSLC-FN-1 motor replacement and had no impact on the fan motor installation process.

2. LER 92-005 identified the condition where the overloads were not sized to account for under-voltage conditions. The root cause was identified as misapplication of design inputs. The corrective action was to review and replace undersized Class 1E motor TOLs as specified in BDC 91-0226-0. It was this design change that installed the undersized TOLs for MSLC-M-FN/1 based on erroneous drawing information.

Two relevant Energy Northwest PERs were identified. PERs 202-0111 and 201-0014 discuss discrepancies between field data and drawing E528 and a failure to meet EES-5 standards. PER 201-0014 identifies conflicting data on drawing E528 as compared to the master data sheet for a valve motor operator. PER 202-0111 identified that a planner had insufficient information from the LOU to perform the task correctly.

Thirty-five work orders were reviewed to evaluate the application of LOUs. Although some work orders were missing LOUs, these LOUs were typically restrictions and information that did not involve the craft. None of the missed LOUs represented a challenge to equipment functionality or operability.

The conclusion from the search is that, although thermal overload sizing has been documented in the past, there were no events that would have driven Columbia Generating Station to evaluate its LOU process or offer another solution that would have prevented this event or precluded recurrence of this specific type of event. From the review of plant PERs, there does not appear to be a widespread problem with TOL sizing at Columbia Generating Station.