

10 CFR 50.73

September 22, 2006
2130-06-20393

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555 - 0001

Oyster Creek Generating Station
Facility Operating License No. DPR-16
NRC Docket No. 50-219

Subject: Licensee Event Report 2006-002-01, Failure of MSIV Surveillance Due to Transcription Error, Revision 1

Enclosed is Licensee Event Report 2006-002-01, Failure of MSIV Surveillance Due to Transcription Error. The LER was revised to provide additional information in the Analysis of Event section. This event did not affect the health and safety of the public or plant personnel. This event did not result in a safety system functional failure. There are no new regulatory commitments made in this revised LER submittal.

If any further information or assistance is needed, please contact Rich Milos, Regulatory Assurance at 609-971-4973 or Jim Frank, Engineering, at 609-971-4114.

Sincerely,



Timothy S. Rausch, Vice President
Oyster Creek Generating Station

Enclosure: NRC Form 366, LER 2006-002-01

cc: Administrator, USNRC Region I
USNRC Project Manager, Oyster Creek
USNRC Senior Resident Inspector, Oyster Creek
File No. 06038

IE22

LICENSEE EVENT REPORT (LER)

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

Estimated burden per response to comply with this mandatory 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 and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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 information collection.

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4. TITLE
Failure of MSIV Surveillance Test Due to Transcription Error

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
06	20	2006	2006	- 002	- 01	09	22	2006	FACILITY NAME	DOCKET NUMBER
										05000
										05000

9. OPERATING MODE N	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)										
	<input type="checkbox"/>	20.2201(b)	<input type="checkbox"/>	20.2203(a)(3)(i)	<input type="checkbox"/>	50.73(a)(2)(i)(C)	<input type="checkbox"/>	50.73(a)(2)(vii)			
	<input type="checkbox"/>	20.2201(d)	<input type="checkbox"/>	20.2203(a)(3)(ii)	<input type="checkbox"/>	50.73(a)(2)(ii)(A)	<input type="checkbox"/>	50.73(a)(2)(viii)(A)			
	<input type="checkbox"/>	20.2203(a)(1)	<input type="checkbox"/>	20.2203(a)(4)	<input type="checkbox"/>	50.73(a)(2)(ii)(B)	<input type="checkbox"/>	50.73(a)(2)(viii)(B)			
	<input type="checkbox"/>	20.2203(a)(2)(i)	<input type="checkbox"/>	50.36(c)(1)(i)(A)	<input type="checkbox"/>	50.73(a)(2)(iii)	<input type="checkbox"/>	50.73(a)(2)(ix)(A)			
	10. POWER LEVEL 000	<input type="checkbox"/>	20.2203(a)(2)(ii)	<input type="checkbox"/>	50.36(c)(1)(ii)(A)	<input type="checkbox"/>	50.73(a)(2)(iv)(A)	<input type="checkbox"/>	50.73(a)(2)(x)		
		<input type="checkbox"/>	20.2203(a)(2)(iii)	<input type="checkbox"/>	50.36(c)(2)	<input type="checkbox"/>	50.73(a)(2)(v)(A)	<input type="checkbox"/>	73.71(a)(4)		
		<input type="checkbox"/>	20.2203(a)(2)(iv)	<input type="checkbox"/>	50.46(a)(3)(ii)	<input type="checkbox"/>	50.73(a)(2)(v)(B)	<input type="checkbox"/>	73.71(a)(5)		
		<input type="checkbox"/>	20.2203(a)(2)(v)	<input type="checkbox"/>	50.73(a)(2)(i)(A)	<input type="checkbox"/>	50.73(a)(2)(v)(C)	<input type="checkbox"/>	OTHER		
		<input type="checkbox"/>	20.2203(a)(2)(vi)	<input checked="" type="checkbox"/>	50.73(a)(2)(i)(B)	<input type="checkbox"/>	50.73(a)(2)(v)(D)	<input type="checkbox"/>	Specify in Abstract below or in NRC Form 366A		
<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>				

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME Jim Frank, Engineering	TELEPHONE NUMBER (Include Area Code) 609-971-4114
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
A	SB	RV	A585	N					

14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR

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

Oyster Creek performed a full closure test of main steam isolation valve NS04A (outboard MSIV on 'A' main steam line) during the 1F09 forced outage in February 2006. During this test the valve did not stroke closed in the allowable time specified in the surveillance procedure. When measured using the plant process computer (PPC), the valve stroked full closed in 2.0 seconds. The acceptance criteria for this timing test is 3.0 seconds. The failure of this surveillance test was not recognized at the time of performance and as a result the plant was started up from 1F09 with an inoperable MSIV.

During the later 1F10 forced outage in May 2006 the valve was tested again under the surveillance procedure and failed to meet the acceptance criteria for the PPC timing. The valve therefore failed the surveillance test and was adjusted and retested acceptably prior to startup in May 2006.

The discovery date of the failed surveillance tests was June 20, 2006.

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

Unit Condition Prior to Discovery of Event:

Oyster Creek Generating Station was in REFUEL mode when the MSIV surveillance test was performed on February 3, May 6, and May 9, 2006. The plant was in RUN mode between February 5 and May 6, 2006. There were no structures, systems, or components out of service that contributed to this event. The actual discovery date of the failed surveillance tests was June 20, 2006.

Description of Event:

The surveillance data for MSIV NS04A using the stopwatch surveillance timing method was 3.6 seconds in both 1F09 and 1F10. This stopwatch time is acceptable as compared to the minimum acceptance criteria of 3.5 seconds. The Operator performing the test step to document the PPC timed surveillance data in 1F09 incorrectly recorded the data as 13:28:19 to 13:28:22 on the test document. A review of the PPC data files shows that the times should have been 13:28:19 to 13:28:21. The result of the PPC time calculation was originally recorded as 3 seconds in the test procedure. The correct calculation based on actual PPC data should have indicated 2 seconds. The plant was started up from the 1F09 outage in February without identifying that MSIV NS04A had failed the surveillance test and was inoperable.

The PPC full closure timing for the test performed during 1F10 in May 2006 resulted in a time of 2 seconds. At this time the valve was declared inoperable, the operator was adjusted, and the valve was retested to pass the surveillance test.

Analysis of Event:

The stroke time is measured two ways in the MSIV surveillance test. The first is by stopwatch from the time the control switch is positioned to CLOSE until the closed indication light comes on. The second method is by recording the PPC message time for the valve's open indication and the valve's closed indication, and then subtracting to get valve closure time. The PPC points come from the 5 percent closed limit switch and the 95 percent closed limit switch. The data taken and methodology used for obtaining the data during the test only provided 1-second time resolution.

The surveillance data for NS04A using the stopwatch method was 3.6 seconds in both 1F09 and 1F10. The Operator performing the test step to document the PPC surveillance data in February incorrectly recorded the data as 13:28:19 to 13:28:22 on the test document. A review of the PPC files shows that the times should have been 13:28:19 to 13:28:21. The result of the time calculation was originally recorded as 3 seconds in the test procedure. The correct calculation based on actual PPC data should have indicated 2 seconds.

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The PPC surveillance data for the as-found test in 1F10 was listed as 17:31:32 to 17:31:34 and calculated to be 2 seconds. The PPC has 0.1-second time resolution data available if it is saved within 26 hours. Otherwise the permanent data storage only contains 1-second data. The PPC 0.1-second resolution data was saved for the 1F10 performance and it verified the time to be 2.7 seconds. No PPC 0.1-second data was saved for the 1F09 performance. Since the actual data recorded per the procedure for both methods were the same in 1F09 and 1F10 (3.6 seconds for switch-to-light and 2 seconds for light-to-light), it is assumed the actual PPC 0.1-second time is also essentially identical.

The Oyster Creek Technical Specification, Section 4.5.F.1, states "All automatic primary containment isolation valves shall be tested for automatic closure by an isolation signal during each REFUELING OUTAGE and the isolation time determined to be within its limit." Specifically, for the Main Steam Line isolation valves the isolation time has been specified as: ≥ 3 seconds and ≤ 10 seconds. Therefore, a full stroke time (to isolation) is the Technical Specification requirement.

The 2.7-second stroke data comes from the 5 percent closed (95% open) and 5 percent open (95% closed) limit switches and only indicates the time to travel 90 percent of full valve stroke. Since the 2.7 second stroke was measured across only 90 percent of the stroke and conservatively assuming a uniform rate of travel through the entire stroke, the following calculation can be performed to represent the time from start of movement until end of movement (i.e., full stroke): divide 2.7 seconds by 90 percent, which provides a full stroke time to close of 3.0 seconds.

$$\frac{2.7 \text{ seconds}}{90\% \text{ of full stroke}} = \frac{3.0 \text{ seconds}}{100\% \text{ of full stroke}}$$

Performing a check of the "as-left" location of the open and closed indication switches from the work order performed in 1R20 (October 2004) obtains additional margin. This shows that the actual timed stroke represents an 84 percent stroke, which would provide additional margin when calculating the minimum full stroke times. Using the same calculation method described above, the following results can be obtained:

$$\frac{2.7 \text{ seconds}}{84\% \text{ of Full Stroke}} = \frac{3.214 \text{ seconds}}{100\% \text{ of Full Stroke}}$$

The 3-second stroke time Technical Specification limit is the minimum allowable time from the beginning of valve movement until the valve is fully closed. The minimum closure time is an assumption in the Reactor Pressure Vessel (RPV) overpressure protection safety analysis. The overpressure protection system is designed to accommodate the most severe pressurization transient, which involves complete, simultaneous closure of both steam lines. Evaluations have shown that the MSIV closure event is the most severe when the MSIV position indication Reactor Protection System (RPS) input is assumed to fail (MSIVF event). This event is analyzed each refueling cycle to ensure that the primary system design pressure is not exceeded. Three seconds is the MSIV stroke time typically used for this analysis.

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A review of a similar issue at Quad Cities (documented within NER QC-06-0646) indicates that MSIV stroke time can change (slows when its cold) by as much as 0.3 seconds between testing while the valve is cold vs. testing while the valve is hot. Cold, for purposes of this testing has been interpreted as less than 115°F, for instance during final testing of the MSIV toward the end of a refueling outage, when the valve has cooled. In the case of this specific valve, NS04A, it is an outboard valve located in the Trunnion Room. MSIV testing during 1F09 was performed at the front end of the Outage. The room temperature was confirmed to be greater than 126°F on 1/29/06 via the CORA database (Operator Round Data). By the end of the outage, (02/05/06), while the temperature had dropped to 105°F, by the day of the test, 02/03/06, the room and the valve could still be considered "essentially hot", that is at or about 115°F. With this consideration, no additional temperature correction is needed. The temperature at which the valve can be considered "essentially hot" was established by testing and documented within a technical evaluation performed for the Quad Cities NER (NER QC-06-046, EC# 0036062). Another 0.1 seconds of speed increase has been attributed to steam assist when closing. The tested valve did not have steam to assist it in closing, so this increase will need to be considered. Conservatively assuming the valve cooled somewhat and subtracting another 0.1 seconds from the valve stroke time, the margin provided by the actual position of the limit switches, 0.214 seconds, there is still sufficient margin to ensure operability. This provides sufficient margin for the valve stroke time to be considered successful in meeting its Technical Specification requirement.

In the event that the valve temperatures were as high as projected (since there was no temperature element installed on the actuator), the 3.0-second acceptance criteria may not have been met. In that case, a review was performed of an OC Cycle 19 Technical Evaluation, "Evaluation of OC Mid-Cycle As Found MSIV Stroke Times" relative to data obtained during the 1F09 Outage. The Cycle 19 evaluation assumed an actual average MSIV closure time (full open to full closed by stopwatch of the fastest MSIV in each steam line assuming a 1.3 second delay between control switch actuation and actual start of valve closure) of 2.6 seconds, which is 0.4 seconds faster than the 3.0 second assumption in the safety analysis. A similar review of the 1F09 data yields an actual average MSIV closure time of 2.85 seconds, which is 0.15 seconds faster than the analysis basis of 3.0 seconds.

The Cycle 19 evaluation estimated that the 0.4 seconds reduction in the MSIV closure time relative to the analysis basis would result in only a minor increase in peak reactor vessel pressure (<10 psig). This was within the available margin of 55 psig for the Cycle 19 Over-pressurization Analysis. For Cycle 20 the Over-pressurization Analysis peak pressure is 1335 psig, which yields a 40 psig margin to the vessel pressure limit (1375 psig). The minor increase in peak reactor vessel pressure expected for a 0.15 second reduction in MSIV closure time is well within the available margin for Cycle 20.

The Cycle 19 evaluation concluded that OC operation with the reduced MSIV closure time was acceptable. The 1F09 MSIV closure time is bounded by the Cycle 19 data, and sufficient margins are maintained relative to the reactor vessel pressure limit. Therefore, it can be concluded that OC has operated within the established safety analysis basis throughout operating Cycle 20.

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

Cause of Event:

The cause of Oyster Creek Generating Station starting up from an outage and running with an MSIV inoperable is a transcription error during the performance of the PPC timing section of the surveillance test in February 2006.

Corrective Actions:

The full closure MSIV surveillance timing procedure is being revised to require the operator to print out a PPC alarm summary to determine the closing time from the PPC. This revision will remove the possibility of future transcription errors during the performance of this surveillance.

The surveillance procedure is also being revised to provide guidance to keep the full closure time of the MSIVs toward the middle of the 3 to 10 second technical specification full closure time range. This revision will prevent future surveillance test failures as a result of the valves being maintained near the top or bottom band of the acceptance criteria.

Additional Information:

A. Failed Components:

Main steam isolation valve NS04A (plant component ID V-1-9) was determined to be inoperable per surveillance test acceptance criteria.

B. Previous Similar Events:

Oyster Creek Nuclear Generating Station has previously failed MSIV full closure surveillance tests. Of these previous failures all were identified in a timely manner and work performed to restore the respective valve's operability. No previous events at Oyster Creek have involved unknowingly starting the plant up with an MSIV inoperable.

C. Identification of Components Referred to in this Licensee Event Report:

Components	IEEE 805 System ID	IEEE 803A Function
Main Steam Isolation Valve (MSIV)	EIIS: SB	EIIC: RV
Plant Process Computer (PPC)	EIIS: ID	EIIC: CPU
Reactor Protection System (RPS)	EIIS: JC	EIIC: XC-RCT