

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)

Washington Nuclear Plant - Unit 2

DOCKET NUMBER (2)

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PAGE (3)

1 OF 6

TITLE (4)

OXYGEN CONCENTRATION IN SUPPRESSION CHAMBER WAS NOT VERIFIED PER TECHNICAL SPECIFICATION REQUIREMENTS

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 NUMBERS(S)													
0	4	0	2	9	1	0	0	5	0	1	0	4	0	1	9	3	0	5	0	0	0	0	0

OPERATING MODE (9) 1 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

POWER LEVEL (10)	1	0	0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	77.71(b)
				20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.73(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)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
				20.405(a)(1)(iv)	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
C. L. Fies, Licensing Engineer	5 0 9 3 7 7 - 4 1 4 7

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)

☐ YES (If yes, complete EXPECTED SUBMISSION DATE) X ☒ NO

ABSTRACT (16)

On April 2, 1991, a Plant Operations Engineer determined the oxygen concentration in the wetwell was not being verified to be within limits once per seven (7) days as required by the WNP-2 Plant Technical Specifications. This condition was determined as a result of an evaluation of a previous event in which the technical specification limit for oxygen concentration in the wetwell was exceeded.

The immediate corrective action was to implement a procedure deviation to include the technical specification oxygen verification requirements for the wetwell.

The root causes for failing to routinely monitor the oxygen concentration in the wetwell per the Technical Specification surveillance requirements include: 1) the procedures were less than adequate because they did not require wetwell oxygen concentration be verified to be within limits, and 2) management direction was less than adequate to ensure that all technical specification surveillance requirements are included within the Plant procedures. A contributing cause was a design deficiency in the containment monitoring system (CMS-CP-1301 and CMS-CP-1401).

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Abstract (Continued)

Corrective actions include performing a complete review of technical specification surveillance requirements against Plant procedures, require logging of Reactor Building to wetwell vacuum breaker actuations and subsequent monitoring of wetwell oxygen concentration.

The safety significance of this event is minimal because the probability of occurrence of a design basis accident requiring low wetwell oxygen concentration to maintain containment integrity coincident with wetwell oxygen concentration high enough to actually challenge containment integrity is considered low.

Plant Conditions

Power Level - 100%

Plant Mode - 1 (Power Operation)

Event Description

On April 2, 1991, a Plant Operations Engineer determined the oxygen concentration in the Primary Containment wetwell was not being verified to be within limits once per seven (7) days as required by the WNP-2 Technical Specifications. This condition was determined as a result of an evaluation of a previous event in which the technical specification limit for oxygen concentration in the wetwell was exceeded.

On March 30, 1991, at approximately 1215, with the Containment Monitor System normally lined up to monitor the Drywell, a Shift Manager (a licensed Senior Reactor Operator) temporarily realigned the system to monitor the wetwell. The recorder (CMS-O2R-1) indicated approximately 3.9 percent oxygen concentration in the wetwell. This exceeded the allowable limit of 3.5 percent in Technical Specification Section 3.6.6.2. The oxygen concentration in the drywell was within the limits at approximately 2.5 percent.

At 1225 hours on March 30, 1991, the Technical Specification Action Statement for Drywell and Suppression Chamber Oxygen Concentration, Section 3.6.6.2, was entered. At 1411 hours, PPM 7.4.11.2.1.2.1, Primary Containment Purge Sampling and Analysis, was initiated in preparation for purging primary containment to reduce the oxygen concentration in the wetwell. At 1525 hours, PPM 2.3.1, Primary Containment Venting, Purging and Inerting, was initiated to purge primary containment. At 1617 hours, the primary containment purge was completed. At 1634 hours, oxygen concentration in the wetwell was 0.6 percent and 2.5 percent in the drywell as indicated by CMS-O2R-1 and CMS-O2R-2 recorders. With the oxygen concentration in primary containment less than the allowable 3.5 percent, the Technical Specification Action Statement 3.6.6.2 was exited.

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Upon review of the March 30, 1991, event, a Plant Operations Engineer realized the Plant procedure for Shift and Daily Instrument Checks, PPM 7.0.0, contained no requirement to routinely monitor the oxygen concentration in the wetwell. The Technical Specification Surveillance Requirement Section 4.6.6.2 states that "The oxygen concentration in the drywell and suppression chamber shall be verified to be within the limit within 24 hours after THERMAL POWER is greater than 15 percent of RATED THERMAL POWER and at least once per seven (7) days thereafter." Therefore, it was determined the technical specification surveillance requirement for oxygen monitoring of the wetwell was not being satisfied. On April 2, 1991, PPM 7.0.0 was deviated to include a requirement to monitor and verify wetwell oxygen concentration is within acceptable limits.

Immediate Corrective Actions

The immediate corrective action was to implement changes to the shift and daily instrument surveillance procedure, PPM 7.0.0, to require daily verification that oxygen concentration in the wetwell is within acceptable limits.

Further Evaluation and Corrective Action

A. Further Evaluation

1. This event is reportable per 10CFR 50.73(a)(2)(i)(B) as a condition prohibited by the Plant's Technical Specifications. Plant procedures did not require verifying the wetwell oxygen concentration is less than 3.5 percent at least once per seven (7) days. As a result, the oxygen concentration in the wetwell was not being routinely monitored and recorded as required by Technical Specification Section 4.6.6.2.
2. The Containment Monitoring System was designed to automatically sample the drywell and the wetwell. This feature has not been utilized at WNP-2 since the system was installed because of excessive maintenance needs to maintain this automatic feature. There were no other structures, components, or systems inoperable prior to the event which contributed to the event.
3. The root causes of failing to routinely monitor the oxygen concentration in the wetwell per the Technical Specification surveillance requirements include: 1) the procedures were less than adequate because they did not require wetwell oxygen concentration be verified to be within limits, and 2) management direction was less than adequate to ensure that all Technical Specification surveillance requirements are included within the Plant procedures. A contributing cause was a design deficiency of the Containment Monitoring System (CMS-CP-1301 and CMS-CP-1401). The rationale for each root cause and contributing cause is provided in the following subparagraphs, respectively.

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- a. During the Power Ascension Testing Program (PATP) of WNP-2 from December 20, 1983, to December 13, 1984, the provisions of Technical Specification 3.6.6.2 were suspended per Special Test Exceptions in Technical Specification Section 3.10.5. As a result, there were no procedural requirements to verify oxygen concentration in primary containment during the initial phases of PATP. When the Plant went into commercial operation on December 13, 1984, procedural requirements were in PPM 7.0.0 to verify oxygen concentration in primary containment.

The drywell and the wetwell are physically separated by the drywell floor. This requires separate gas sampling of each volume. However, the procedure required only one measurement, and it did not specify which one was required. Later the procedure was revised to require a drywell measurement only.

- b. A systematic overview of the technical specification surveillance requirements was completed September 6, 1989, which verified there was a Plant procedure for every technical specification requirement paragraph. However, multiple requirements within a paragraph were not reviewed for procedural compliance. Therefore, this review would not have identified omission of the technical specification requirement to verify oxygen concentration in the wetwell because the paragraph contained requirements for both the drywell and wetwell.
- c. The current Containment Monitor System control panels (CMS-CP-1301 and CMS-CP-1401) for monitoring oxygen concentration in the primary containment has an automatic sequencing feature that will continually sequence through selected sample points within the drywell and wetwell. The CMS analyzes for both H₂ and O₂ concentrations and provides output to the Division 1 and 2 recorders, CMS-O2R-1 and CMS-O2R-2, respectively. However, the software and related hardware that governs that function contain deficiencies that have precluded that feature from being selected since the system was installed in the R-1 Refueling outage in 1985 due to unacceptable maintenance requirements. Had the software been updated and hardware design deficiencies been corrected to enhance the monitors' operability and if the system would have been operated in the automatic sequencing mode, complete primary containment oxygen concentration monitoring would have taken place despite the Technical Specification surveillance omission in the Plant procedures. Also, an alarm would have actuated in the control room alerting the reactor operator to a high oxygen concentration in the wetwell of three percent, prior to reaching the Technical Specification limit of 3.5 percent.

The primary containment oxygen monitoring system used prior to the current system had a feature to automatically select between the drywell and wetwell. However, the automatic feature was not used.

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4. As part of the Residual Heat Removal (RHR) System operability surveillance, the suppression pool sprays for RHR Loop B were initiated at approximately 10:25 hours on March 29, 1991. The sprays were terminated at approximately 11:31 hours on March 29, 1991. During the period the sprays were operating, the reactor operators acknowledged an annunciator indicating the Reactor Building to Suppression Chamber vacuum breakers, CSP-V-6 and CSP-V-8, were open. The vacuum breakers open at 0.5 psid. The operators indicated the vacuum breakers were open only a short time. Opening of these valves would have provided the source of oxygen necessary to increase the oxygen concentration in the wetwell. This is the most likely source of oxygen.

Reactor operators have indicated that the vacuum breakers have opened during previous testing of the suppression pool sprays.

B. Further Corrective Action

1. The Supply System has hired an outside contractor to review the Technical Specification surveillance requirements against Plant procedures. This effort is currently underway and will be completed in an expeditious manner.
2. Plant Procedure 7.0.0, Shift and Daily Instrument Checks, has been revised. The CMS is operated with one division continuously monitoring the drywell and other division monitoring the wetwell. Once each day the channel monitoring the wetwell is selected to the drywell for the required channel check. Likewise, on a daily basis the channel normally monitoring the drywell is selected to wetwell.
3. Plant procedures were revised to require the reactor operator to log all Reactor Building to wetwell vacuum breaker actuations and specifically monitor wetwell oxygen concentration following an actuation.

Safety Significance

The safety significance of this condition is minimal from the standpoint that no accident condition actually existed that required the wetwell oxygen concentration to be less than 3.5 percent. The probability of occurrence of a design basis accident requiring low wetwell oxygen concentration to maintain containment integrity coincident with wetwell oxygen concentration high enough to actually challenge containment integrity is low.

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Similar Events

There have been several WNP-2 LERs associated with Technical Specification violations. The most recent similar event was reported in LER 90-007, "Noncompliance with Technical Specification Requirements to Sample for Water in the Diesel Generator Fuel," reported that there was no Plant procedure requirement to check for water in the Diesel Generator Fuel Oil Day Tanks (DO-TK-3A, DO-TK-3B, and DO-TK-3C). The corrective action from LER 90-007 indicated that reverification of the adequacy of our procedural compliance with Technical Specification requirements will occur as part of the Technical Specification Improvement Program (TSIP). Implementation of the TSIP Program has been delayed which is the reason for implementing a new corrective action (See Corrective Action No. 2 of this LER).

EIIS Information

Text Reference

EIIS Reference

	<u>System</u>	<u>Component</u>
Wetwell	NH	
Drywell	NH	
Containment Monitoring System Control Panels (CMS-CP-1301 and CMS-CP-1401)	IK	MCBD
Containment Monitoring System Recorders (CMS-02R-1 and CMS-02R-2)	IK	AR
Diesel Generator Fuel Oil Day Tanks (DO-TK-3A, -3B, and -3C)	DC	TK
Residual Heat Removal System	BO	
Suppression Pool Vacuum Breakers (CSP-V-6 and CSP-V-8)	BF	RV
Suppression Pool Sprays	BO	
Seismic Recorder Transmitter (SEIS-RSRT-1)	IN	VIT