

LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503

FACILITY NAME (1) Nine Mile Point Unit 2	DOCKET NUMBER (2) 05000410	PAGE (3) 1 OF 6
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TITLE (4)
Failure to Adequately Perform Technical Specification Surveillance on Rod Sequence Control System Due to Procedure Inadequacy

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 NUMBER(S)
11	10	97	97	014	00	12	10	97	N/A	05000
									N/A	05000

OPERATING MODE (9) 2 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

POWER LEVEL (10) 000	<input type="checkbox"/> 20.402(b) <input type="checkbox"/> 20.405(a)(1)(i) <input type="checkbox"/> 20.405(a)(1)(ii) <input type="checkbox"/> 20.405(a)(1)(iii) <input type="checkbox"/> 20.405(a)(1)(iv) <input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 20.405(c) <input type="checkbox"/> 50.36(c)(1) <input type="checkbox"/> 50.36(c)(2) <input checked="" type="checkbox"/> 50.73(a)(2)(i) <input type="checkbox"/> 50.73(a)(2)(ii) <input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(iv) <input type="checkbox"/> 50.73(a)(2)(v) <input type="checkbox"/> 50.73(a)(2)(vii) <input type="checkbox"/> 50.73(a)(2)(viii)(A) <input type="checkbox"/> 50.73(a)(2)(viii)(B) <input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 73.71(b) <input type="checkbox"/> 73.71(c) <input type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 366A)
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LICENSEE CONTACT FOR THIS LER (12)

NAME D. P. Bosnic - Operations Manager NMP2	TELEPHONE NUMBER (315) 349-7952
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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)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

ABSTRACT (Limits to 1400 spaces, i.e., approximately fifteen single space typewritten lines) (16)

On November 10, 1997, a reactor startup was in progress at Nine Mile Point Unit 2 (NMP2). While performing the surveillance procedure to demonstrate the Rod Sequence Control System (RSCS) operability, a reactor operator raised a concern that performing the test with the Rod Worth Minimizer (RWM) also in service might not adequately demonstrate the RSCS operability. Since the RWM also enforces a rod withdrawal block, verification that the RSCS was actually initiating a rod block could not be verified using the procedure as written. The procedure was stopped, the RWM was bypassed, and the RSCS operability was successfully demonstrated.

The root cause of the event was inadequate change management in that change related documents were not developed. The appropriate steps to bypass the RWM were not added to the RSCS procedure when the RWM was modified in 1990. An inadequate technical review of the procedure in 1991 also failed to identify this error.

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The operability test procedure was revised to bypass the RWM while testing the RSCS rod block function to ensure the RSCS initiates the appropriate rod block. A review of unique system redundancies will be performed to ensure similar discrepancies do not exist. Previous corrective actions and revisions to the modification process and the procedure preparation and review process should prevent recurrence.



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TEXT CONTINUATION

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Nine Mile Point Unit 2	05000410	97	14	00	02 OF 06

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

I. DESCRIPTION OF EVENT

On November 10, 1997, a reactor startup was in progress at Nine Mile Point Unit 2 (NMP2). Technical Specification (TS) 3.1.4.2 requires that the Rod Sequence Control System (RSCS) be operable in Operational Conditions 1 and 2 when thermal power is less than or equal to 20% rated thermal power. Surveillance Requirement (SR) 4.1.4.2 provides acceptance criteria for demonstrating operability. While performing procedure N2-OSP-RMC-@004, Rod Sequence Control System Operability Test, to satisfy TS SR 4.1.4.2, a reactor operator raised a concern that performing the test with the Rod Worth Minimizer (RWM) in service made it impossible to ensure that control rod motion was being inhibited exclusively by the RSCS and not the RWM. The RWM also enforces a rod withdrawal block under the same startup conditions. The procedure was stopped and after initial investigation, the Station Shift Supervisor (SSS) authorized a temporary change to the procedure to bypass the RWM during the test to verify that the RSCS initiated a rod block. The test was then completed satisfactorily to demonstrate the RSCS operability and a Deviation/Event Report (DER) was initiated to further investigate this issue. It has been determined that the rod withdrawal block from the RWM could mask the block from the RSCS, and therefore during previous tests, the TS SR was not fully satisfied.

At NMP2, prescribed control rod withdrawal and insertion sequences are enforced automatically by two systems, the RSCS and the RWM. Operability of the RSCS is demonstrated in part during startup by fully withdrawing the first control rod in the sequence and then selecting a control rod that is not in-sequence and attempting to withdraw the rod. Observing that rod motion is blocked satisfies the test. An indicating light on the RSCS confirms that a rod block signal is being generated from the RSCS. This signal is hard-wired directly into the reactor manual control system. The test is performed similarly for plant shutdowns. Under these conditions, the RWM also enforces a similar rod block.

Investigation has revealed that the RWM was modified in August, 1990 and accepted by Operations in December 1990. This modification involved replacing the existing RWM with an improved design General Electric Nuclear Measurement Analysis and Control (NUMAC) RWM. The NUMAC RWM enforces a rod block similar to the RSCS under the same test conditions, whereas the previous RWM did not. The modification documentation did not identify this difference, nor did it identify the impact to the RSCS test procedure.

The RSCS test procedure is essentially the same today as it was in 1986. During the process of a major procedure upgrade project, the RSCS procedure was revised in January 1991 for the purpose of updating and reformatting. It was reviewed by the system engineer involved with the RWM modification at that time. The procedure required few technical changes, however, the engineer commented during the review that steps could be added to the new revision to bypass the RWM during performance of the RSCS test so that the RSCS rod block would not be masked by the RWM rod block. These steps were not incorporated.



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I. DESCRIPTION OF EVENT (cont'd)

The indication provided by the RWM of rod motion blocks under the test conditions is not annunciated and is displayed only on the RWM console by the words "insert withdraw" when these blocks are activated. Based upon interviews with experienced operations personnel, it is believed that because this is not an overt alarm and is not addressed in the RSCS test procedure, this condition was not recognized each time the test was performed since the NUMAC RWM was installed in 1990.

II. CAUSE OF EVENT

The root cause of the event was inadequate change management in that change related documents were not developed. The modification package did not identify the need to revise the RSCS test procedure to add the appropriate steps to bypass the RWM.

A contributing cause was identified in that the accuracy of the change was not verified. An opportunity to identify this issue was missed when an inadequate technical review of the RSCS test procedure was performed in 1991, when the reviewers comments were not adequately evaluated.

III. ANALYSIS OF EVENT

This event is reportable in accordance with 10CFR50.73(a)(2)(i)(B), "any operation or condition prohibited by the plant's Technical Specifications." TS 3.1.4.2 requires that the RSCS be operable in Operational Conditions 1 and 2 when thermal power is less than or equal to 20% rated thermal power. The test procedure did not adequately assure operability of the RSCS because an RWM rod block could have masked the RSCS inoperability, by not ensuring that the rod block condition was exclusively generated from the RSCS.

Control rod withdrawal sequences and patterns are selected prior to operation to achieve optimum core performance and, simultaneously, low individual rod worths. Operating procedures to accomplish such patterns are supplemented by the RSCS, which prevents rod withdrawals yielding a rod worth greater than permitted by the preselected rod withdrawal pattern. The RSCS operation reduces the consequences of the postulated rod drop accident to an acceptable level by constraining control rod movement to predetermined patterns and sequences. When thermal power is greater than 20% of rated thermal power, there is no possible rod worth which can result in peak enthalpy of greater than 280 cal/gm. Below this power level, the RSCS is required to be operable to provide adequate controls to assure that out-of-sequence rods are not withdrawn or inserted such that this limit could be exceeded.



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III. ANALYSIS OF EVENT (cont'd)

The RSCS function is supported by the redundant action of the NUMAC RWM, which is programmed to permit only the same rod patterns and sequences as prescribed for the RSCS. Thus, in addition to the procedural controls that are implemented to ensure the correct rods are selected and moved in sequence, the RWM provides redundancy to the RSCS.

Analysis described in Section 15.4 of the Updated Safety Analysis Report (USAR) describes that even in the unlikely event where the RWM and the RSCS fail to block the continuous withdrawal of an out-of-sequence control rod, the licensing basis criterion for fuel failure is still satisfied.

When this procedural deficiency was identified, operability of the RSCS was successfully demonstrated, indicating that the RSCS would have provided the required rod block and therefore, performed its design function. A review of past work orders since 1990 indicated that only two work orders were issued against the RSCS. Neither work order affected the operability of the RSCS. Thus, no maintenance had been performed on the RSCS that would have inhibited its ability to send a rod block signal to the reactor manual control system. It is reasonable to conclude that the rod block indicating light on the RSCS, which has always been used to verify operability, was a valid indication that the RSCS was generating the appropriate rod block and that this hard-wired signal was being sensed by the reactor manual control system. Consequently, it is reasonable to conclude that the RSCS was functional throughout this period. Based on the procedural controls to ensure the correct rod sequence, the redundancy of the RWM, and the verification that the RSCS was performing per its design, this condition did not pose a threat to the health and safety of the public or NMP2 plant personnel.

IV. CORRECTIVE ACTIONS

The RSCS operability test procedure has been revised to add steps to bypass the RWM while performing the appropriate steps of the procedure and to return the RWM to service at the completion of the test. The operability test procedure for the RWM was reviewed to ensure that a similar deviation did not exist. No discrepancies were noted.

NMP2 will determine if there are any other systems which may have unique redundancies similar to that of the RSCS and the RWM where actual plant configuration is used to prove functionality/operability during testing. An independent technical review will be performed of the operations surveillance test procedures for any systems identified, to ensure that similar discrepancies do not exist. This action will be completed by March 15, 1998.



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IV. CORRECTIVE ACTIONS (cont'd)

Additional improvements to the modification process have been made which will also minimize the possibility of this type of event occurring in the future. Specifically, enhancements were made to ensure that the appropriate reviews address the accuracy of and changes to technical procedures as a result of modifications.

In addition, since the deficiencies which initiated this event occurred prior to 1994, previously implemented actions to address instances of inadequate managerial methods, relative to technical procedure preparation and review, are also applicable to this event. Specifically, a corrective action described in LER 94-003:

An inadequate technical review has been recognized in the past as being one of the major reasons for violating specific requirements. Niagara Mohawk has upgraded specific programs whose purpose is not only to ensure that adequate procedures are written, but also to ensure the review of these procedures is carried out in a manner that should eliminate events such as these. These include, but are not limited to, the following procedurally controlled programs:

- NIP-SEV-01, Applicability Reviews and Safety Evaluations
- NIP-PRO-03, Preparation and Review of Technical Procedures
- PWM-PRO-0105, Technical Procedure Verification and Validation

These new procedural requirements, as well as new expectations regarding the general level of detail of these reviews, will provide added assurance that procedures are technically accurate and adequate. Procedure NIP-PRO-03 specifically requires procedure reviewer comments to be compiled and resolved prior to issuing the procedure revision. Therefore, no further corrective or preventive actions are required at this time.

V. ADDITIONAL INFORMATION

A. Failed components: none.

B. Previous similar events:

NMP2 has had a number of instances where inadequate procedure preparation or review caused missed or inadequately performed surveillance tests. As a result of previous events, enhancements were made to the procedure preparation, review, and issue process with the implementation of Nuclear Division Interface Procedure, NIP-PRO-03, "Preparation and Review of Technical Procedures." This event and those discussed in LERs 94-05, 96-01, 96-02, 96-07, 97-01 and various



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V. **ADDITIONAL INFORMATION** (cont'd)

others, involved problems with past-practice identified by personnel involved in procedure review activities. Since this event occurred prior to the corrective actions taken for these similar events, it could not have been prevented by these corrective actions.

C. Identification of components referred to in this LER:

COMPONENT	IEEE 803 EHS FUNCTION	IEEE 805 SYSTEM ID
RSCS	N/A	JD



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