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SUBJECT: LER 93-010-08:on 940304,24 reportable problems identified by failure of procedures to fully implement.Cause was less than adequate barrier & controls for program changes.Corrective action:testing,procedure changes & TS changes.W/940413 ltr.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

P.O. Box 968 • 3000 George Washington Way • Richland, Washington 99352

April 13, 1994
GO2-94-080

Docket No. 50-397

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

Subject: **NUCLEAR PLANT WNP-2, OPERATING LICENSE NPF-21, SUPPLEMENT (93-010-08) TO LICENSEE EVENT REPORT NO. 93-010**

Transmitted herewith is a supplement (93-010-08) to Licensee Event Report No. 93-010 for WNP-2. This report is submitted in response to the report requirements of 10CFR50.73 and discusses the items of reportability, corrective action taken, and action taken to preclude recurrence.

The supplemental information discusses one additional reportable finding (item 24) of the Technical Specification Surveillance Improvement Project (TSSIP). These changes, as well as minor editorial changes, are indicated by revision bars in the right hand margin.

Should you have any questions or desire additional information, please call me or Herbert E. Kook at (509) 377-4278.

Sincerely,

P. R. Bemis (Mail Drop PE20)
Manager, Regulatory Programs

JVP/CDM/la
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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Washington Nuclear Plant - Unit 2	0 5 0 0 0 3 9 7	1 OF 53

TITLE (4)
TECHNICAL SPECIFICATION SURVEILLANCE IMPROVEMENT PROJECT IDENTIFICATION OF NONCONFORMING CONDITIONS

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 3	0 4	9 4	9 3	0 1 0	0 8	0 4	1 3	9 4		0 5 0 0 0
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OPERATING MODE (9)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
1	20.402(b)	20.405(C)	50.73(a)(2)(iv)	77.71(b)
POWER LEVEL (10) 0 9 7	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.D. Mackaman, Licensing Engineer	AREA CODE 5 0 9 3 7 7 - 4 4 5 1

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

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

ABSTRACT (16)

On March 4, 1993, the first condition of noncompliance with WNP-2 Technical Specifications was identified as part of a Technical Specification Surveillance Improvement Project (TSSIP). This two-year project was recommended by a Supply System Quality Action Team formed as a corrective action of LER 91-013-02. The TSSIP revises and broadens the scope of the Surveillance Procedure Verification Program completed in May 1991.

A total of 24 reportable problems identified by this process are described in this LER. All 24 items relate to failure of procedures to fully implement WNP-2 Technical Specification surveillance requirements. This LER reports the initial findings of the TSSIP surveillance procedure review process. Based upon previous experience with the Surveillance Procedure Verification Program, it is likely that additional reportable items will be identified. A supplement to this LER will be submitted on an approximate monthly basis, or as necessary, to describe future reportable items.

Immediate and further corrective actions include, but are not limited to, entering Technical Specification Action Statements, additional testing, Plant Procedure changes, Technical Specification changes, and design changes.

Abstract (Cont'd)

The root causes for these events include less than adequate barriers and controls for program changes and less than adequate test procedures, directives/requirements, and design. The general root cause has been determined to be less than adequate management control of the Surveillance Test Program.

The safety significance of each item and the whole surveillance program was evaluated and it has been concluded that this event had potential safety significance.

Plant Conditions

Power Level - 100%
Plant Mode - 1 (Power Operation)

Event Description

On March 4, 1993, the first condition of noncompliance with WNP-2 Technical Specifications was identified as part of a Technical Specification Surveillance Improvement Project (TSSIP). This is a two year project recommended by a Supply System Quality Action Team formed as a corrective action of LER 91-013-02. The TSSIP is staffed by Contract Engineers and Supply System employees, and revises and broadens the scope of the Surveillance Procedure Verification Program completed in May 1991.

The previous Surveillance Procedure Verification Program was a five week Technical Specification surveillance implementation review. This was a limited scope review that compared Technical Specification surveillance requirements with information obtainable from the Scheduled Maintenance System (SMS) data base. The surveillance procedures were reviewed for purpose, but not content or methodology. Approximately 145 discrepancies were identified during the review.

In contrast to the previous review, the TSSIP review is an in-depth technical review of the surveillance procedures to ensure they meet Technical Specification surveillance requirements. The review criteria includes proper test methodology, procedure consistency, technical accuracy, and reference bases for acceptance criteria. The goals of the project are to assure:

1. That related procedures required to be performed to satisfy Technical Specification surveillance requirements are referenced (listed) and explained in the Purpose section of the procedure.

2. That prerequisites and special conditions required to assure Technical Specification compliance are stated in the procedure.

3. That procedure acceptance criteria satisfy the Technical Specification surveillance requirements and acceptance criteria have reference bases.

4. That procedure steps associated with assuring Technical Specification acceptance criteria are met and identified.

5. That numerical values, setpoints, tolerances, calculations, graphs, figures, and tables included or referenced in the procedure are consistent with values specified in Technical Specifications.

6. That the procedure tests the entire channel, including sensor, indicators, alarms, and trip functions as applicable.

7. That the procedure performance frequency meets Technical Specification requirements.

8. That the procedure satisfies the applicable Technical Specification surveillance requirements and meets the intent of the Technical Specification Bases.

Potential deficiencies will be evaluated for validity and necessary follow-up actions.

A total of 24 reportable problems identified by this process are described in this LER. All 24 items relate to failure of procedures to fully implement WNP-2 Technical Specification surveillance requirements. This LER reports the initial findings of the TSSIP surveillance procedure review process. The project was initiated November 1, 1992, and is scheduled to continue through April 1994. Based upon previous experience with the Surveillance Procedure Verification Program, it is likely that additional reportable items will be identified. A supplement to this LER will be submitted on an approximate monthly basis, or as necessary, to describe future reportable items.

This LER is written with each item discussed as a separately numbered paragraph under the major headings of Specific Event Description, Immediate Corrective Action, Further Evaluation, Specific Further Corrective Action, and Specific Safety Significance. A general discussion of all items is found under the major headings of General Event Description, above, and General Further Corrective Actions, General Safety Significance, and Similar Events, below.

Specific Event Description

1. End-Of-Cycle Recirculation Pump Trip

Surveillance Requirement 4.3.4.2.3 requires the End-Of-Cycle (EOC) Recirculation Pump Trip (RPT) circuit breakers to be tested at least once per 60 months to demonstrate that arc suppression time is less than or equal to 83 milliseconds. Technical Specification Surveillance

(TSS) 7.4.3.4.2.3.3A, "EOC-RPT Breaker Arc Suppression Time RPT-3B/RPT-4A," and TSS 7.4.3.4.2.3.3B, "EOC-RPT Breaker Arc Suppression Time RPT-3A/RPT-4B," were used to perform this test. However, a review of these procedures discovered that they actuate Trip Coil 1 (TC-1) for EOC-RPT circuit breaker arc suppression response time testing, and not Trip Coil 2 (TC-2). TC-2 performs the actual EOC-RPT breaker trip safety function, whereas, TC-1 performs the normal and Anticipated Transient Without Scram (ATWS) RPT breaker trip functions. Since the electrical and mechanical characteristics of TC-2 could vary from that of TC-1, the test methodology is inadequate to assure the RPT breaker trip and arc suppression response time meets the surveillance requirement. Consequently, inadequate surveillance procedures caused the Plant to violate Technical Specification 4.0.3 by not satisfactorily completing the ACTION requirements within the allowed time. Technical Specifications 3.0.1 and 3.0.4 were violated when reactor power was increased to 30% without meeting the operational condition surveillance requirements, and by not entering Technical Specification Action Statement (TSAS) 3.3.4.2.e.

2. Turbine Governor Valve - Fast Closure

Surveillance Requirement 4.3.4.2.1 requires the EOC-RPT Turbine Governor Valve - Fast Closure system instrumentation to be demonstrated operable by the performance of a monthly Channel Functional Test (CFT) and a Channel Calibration (CC) every 18 months in accordance with Table 4.3.4.2.1-1.2. TSS 7.4.3.1.1.20, "RPS and EOC Recirc Pump Trip - TGV Fast Closure Channel A - CFT/CC," and TSS 7.4.3.1.1.78, "RPS and EOC Recirc Pump Trip -TGV Fast Closure Channel B - CFT/CC," were used to perform the CFT and CC. However, a review of these procedures discovered that they direct that certain safety-related function verification steps in the CFT not be performed, and marked "N/A" (Not Applicable), when reactor power is less than 30%. When these portions of the CFT were not completed, the CFT did not meet the surveillance requirements.

This also results in the CC not meeting the surveillance requirements because it takes credit for satisfactory completion of the CFT. WNP-2 Technical Specification definitions require a CC to include a CFT. Consequently, inadequate surveillance procedures caused the Plant to violate Technical Specification 4.0.3 by not satisfactorily completing the ACTION requirements within the allowed time. Technical Specifications 3.0.1 and 3.0.4 were violated when reactor power was increased to 30% without meeting the operational condition surveillance requirements, and by not entering TSAS 3.3.4.2.e.

3. Turbine Throttle Valve - Closure

Surveillance Requirement 4.3.4.2.1 requires the EOC-RPT Turbine Throttle Valve - Closure system instrumentation to be demonstrated operable by the performance of a monthly CFT in accordance with Table 4.3.4.2.1-1.1. TSS 7.4.3.8.2.1, "Monthly Turbine Valve Tests," was used to perform

this test. However, a review of the procedure discovered that it allows that certain safety-related function verification steps not be performed, and marked "N/A," if either Reactor Recirculation (RRC) pump is not in 60 Hertz operation. The RRC pumps are normally in 15 Hertz operation at a reactor power level less than 30%. When these portions of the CFT were not completed, the CFT did not meet the surveillance requirement. Consequently, an inadequate surveillance procedure caused the Plant to violate Technical Specification 4.0.3 by not satisfactorily completing the ACTION requirements within the allowed time. Technical Specifications 3.0.1 and 3.0.4 were violated when reactor power was increased to 30% without meeting the operational condition surveillance requirements, and by not entering TSAS 3.3.4.2.e.

4. EOC-RPT System Instrumentation

Surveillance Requirement 4.3.4.2.1 requires the EOC-RPT Turbine Governor Valve - Fast Closure system instrumentation to be demonstrated operable by the performance of a CC every 18 months in accordance with Table 4.3.4.2.1-1.2. The system logic is dependent on the proper operation of pressure switches MS-PS-3A, 3B, 3C, and 3D, which sense main turbine first stage pressure and enable the EOC-RPT logic at reactor power levels greater than or equal to 30%. Although these pressure switches are part of the EOC-RPT system instrumentation, no procedures were developed to meet the CC surveillance requirements. The Preventive Maintenance (PM) Program includes these pressure switches and instrument calibrations were performed at approximately 18 month intervals. However, WNP-2 Technical Specification definitions require that a CC include a CFT.

There is no assurance that acceptable CFTs were performed following each calibration. Consequently, the lack of adequate surveillance procedures caused the Plant to violate Technical Specification 4.0.3 by not satisfactorily completing the ACTION requirements within the allowed time. Technical Specifications 3.0.1 and 3.0.4 were violated when reactor power was increased to 30% without meeting the operational condition surveillance requirements, and by not entering TSAS 3.3.4.2.e.

5. IRM Negative Voltage Power Supply Not Tested

On April 14, 1993, Technical Specification Surveillance Review personnel determined that all Intermediate Range Monitors (IRMs) were inoperable. Personnel attributed the inoperability to a lack of a Logic System Functional Test (LSFT) of the negative-voltage-low IRM inoperative trip function. This trip function is provided with each IRM channel. The Reactor Manual Control System (RMCS) uses IRM inoperative trip signals to generate rod blocks, and the Reactor Protection System (RPS) uses these same inoperative trip signals to generate scrams. Technical Specification 4.3.1.2 requires "LSFTs and simulated automatic operation of all channels shall be performed at least once per 18 months." An LSFT is defined as "a test of all logic components, i.e., all relays and contacts, all trip units, solid state logic elements, etc., of a logic circuit, from

sensor through and including the actuated device, to verify operability. The LSFT may be performed by any series of sequential, overlapping, or total system steps such that the entire logic system is tested."

6. Source Range Monitor (SRM) Channel Count Rate

On May 7, 1993, during the annual Maintenance and Refueling Outage, Technical Specification Surveillance Review personnel identified that there was a high probability that Surveillance Requirement 4.9.2.c.1 for SRM channel count rate verification was not being met. No surveillance procedure existed to assure compliance. The surveillance requirement is applicable prior to control rod withdrawal in Operational Condition 5 (Mode 5), and requires that each SRM channel be demonstrated operable by verifying that the channel count rate is at least 0.7 cps, provided the signal-to-noise ratio is greater than or equal to 20. Otherwise, the count rate must be greater than or equal to 3 cps, provided the signal-to-noise ratio is greater than or equal to 2. Plant Operators have been trained that if no specific procedural requirements exist for an activity required by Technical Specifications, the activity may be documented in the Reactor Operator's Log for compliance. However, a review of typical Mode 5 Reactor Operator's Log entries for control rod withdrawals in fueled control cells found no SRM channel count rate entries prior to the rod withdrawals. Since no evidence of consistent compliance with the surveillance requirement was found, WNP-2 has violated Technical Specification 4.0.3 in the past by not satisfactorily completing the ACTION requirements within the allowed time.

7. Main Steam Isolation Valve (MSIV) Closure Trip Bypass

On June 9, 1993, with the plant in Mode 4 (Cold Shutdown), TSSIP personnel discovered a problem involving Main Steam system pressure switches MS-PS-20A, B, C, and D which provide MSIV closure trip bypass signals to the RPS. Bypass logic requires reactor pressure to be less than 1037 psig as sensed by these pressure switches and the reactor MODE switch not to be in RUN. Increasing pressure opens the switch contacts which removes the bypass; conversely, decreasing pressure closes the switch contacts, which completes the bypass logic when the reactor MODE switch is not in RUN. In accordance with Technical Specifications Table 3.3.1-1, the trip must not be bypassed at 1037 psig or greater. Contrary to Table 3.3.1-1, TSSIP personnel determined that Instrument System Test Procedures PPM 10.27.2 and PPM 10.27.25 directed cognizant personnel to verify that the pressure switches opened at 1037+/- 6 psig; thus, the switches have reclosed at a pressure greater than 1037 psig and bypassed the trip function when not permitted by the Technical Specifications.

8. Main Control Room Remote-Intake Radiation Monitor

On June 12, 1993, with the plant in Mode 4 (Cold Shutdown), TSSIP personnel discovered a problem involving main control room remote-intake radiation monitors WOA-RIS-31A(B) & 32A(B). These monitors monitor for radiation in the two divisional remote-air intakes to the main control room. Upon detection of a preset value of radiation, the monitors alarm the condition in the main control room and alert control personnel to isolate the affected intake. TSSIP personnel determined that Health Physics/Chemistry Shift Channel Checks Procedure TSS 7.1.1 was not in compliance with Technical Specification Definition 1.6, CHANNEL CHECK, in that "comparison of channel indications and/or status with other indications and/or status derived from independent instrument channels measuring the same parameter" were not being performed.

9. MSIV Closure Trip Function

Surveillance Requirement 4.3.1.1 requires the MSIV closure trip (scram) instrumentation to be demonstrated operable by the performance of a CFT quarterly in accordance with Table 4.3.1.1-1.5. TSS 7.4.3.1.1.9, "MSIV Closure Scram Functional," was used to perform this test. However, on July 9, 1993, with the plant in Mode 1 (Power Operation), TSSIP personnel determined that the procedure did not comply with Technical Specification Definition 1.7.b, CHANNEL FUNCTIONAL TEST, in that each channel was not being fully tested to ". . . verify OPERABILITY including alarm and/or trip functions."

Each MSIV closure trip instrumentation channel functions to initiate a reactor scram logic signal when the associated MSIV is not fully open (approximately 10% closed). TSS 7.4.3.1.1.9 tests this function by visually verifying that the MSIV closure trip logic relays (RPS-RLY-K3[A - H]) drop out when their associated MSIV is not fully open. This methodology does not positively (i.e., electrically) verify the relay contact status to assure the trip channel alarm and/or logic relays (RPS-RLY-K14[A - H]) function as required.

10. RPS Turbine-Throttle Valve Closure

On August 9, 1993, it was determined that Technical Specification requirement 4.3.1.1.9, Channel Functional Test (CFT) at a quarterly frequency of the RPS Turbine-Throttle Valve Closure reactor scram logic, was not being adequately met. Specifically, the procedure did not test, as required by the Technical Specification definition for a CFT, each of the relays and alarms that constitute the logic. The RPS-RLY-K10 series relays were visually verified to deenergize as a result of testing, but the relay contacts were not verified either electrically or visually to have opened and the associated alarms were not verified to have annunciated.

11. Main Steam Isolation Valve Leakage Control System Pressure Indicating Switch

On September 21, 1993, it was determined that the Main Steam Isolation Valve Leakage Control System (MSLC) Pressure Indicating Switch MSLC-PIS-60 was not being tested as part of a CFT of the MSLC pressure instrumentation. Technical Specification 4.6.1.4.d.1 requires that a CFT of the MSLC pressure and temperature instrumentation be performed monthly. MSLC-PIS-60 is part of the control logic for the outboard MSLC train which takes suction from the Main Steam system downstream of the outboard Main Steam Isolation Valves (MSIVs) and routes it to the Standby Gas Treatment (SGT) system post accident. MSLC-PIS-60 senses Main Steam pressure downstream of the MSIVs and closes the MSLC outboard depressurization valves if sensed pressure is greater than 1.4 psig and the depressurization valves have been open for greater than 50 minutes.

12. Isolation Actuation Instrumentation Response Time Testing (Finding 1)

On October 1, 1993, it was determined that the response time testing of the containment isolation valve logic was not performed in accordance with the requirements of Technical Specification 4.3.2.3. The particular components not tested are the final electro-mechanical relays for a portion of Isolation Groups 3 and 4. The containment isolation valves in Isolation Groups 3 and 4 are listed in Technical Specification Table 3.6.3-1. The existing response time testing procedures measure the system response time from the sensed parameter through two (out of a total of nine in two channels and out of a total of ten in the other two channels) relays per channel at the appropriate level of the system logic per division (see Attachment 1). In each case, these two relays that are response time tested are in parallel with, and of the same manufacturer and model type as the untested relays in each channel. In addition, the containment isolation valve response times (stroke times) were verified through testing.

13. Average Power Range Monitor Logic System Functional Testing

On October 7, 1993, it was determined that the Logic System Functional Test (LSFT) of the Average Power Range Monitor (APRM) Flow Biased Simulated Thermal Power - Upscale logic was inadequate to satisfy Technical Specification 4.3.1.1-2.b. Specifically, APRMs E and F each provide a trip signal to two separate RPS logic channels. The APRM trip logic design is based on six APRMs and eight trip channels (see Attachment 2). The testing performed included verification of actuation for one, but not both, logic channel functions for APRMs E and F.

14. Average Power Range Monitor Flow Biased Simulated Thermal Power - High

On October 7, 1993, it was determined that the Channel Check of the APRM Flow Biased Simulated Thermal Power - Upscale signals was not being performed in a manner that meets the requirements of Technical Specification 4.3.1.1-2.b. The testing did provide for a comparison of

the outputs of each of the APRMs. However, the Technical Specification contains a note which requires WNP-2 to "Measure and compare core flow to rated core flow." This comparison was not being performed.

15. Mechanical Vacuum Pump Trip and Isolation Testing

On October 26, 1993, it was determined that the Main Steam Line Radiation Monitor - High trip and isolation of the mechanical vacuum pumps had not been tested since initial startup. Technical Specification Table 3.3.2-1, note (c) associated with the MSLRMs stated "Also trips and isolates the mechanical vacuum pumps."

16. Reactor Building to Suppression Chamber Vacuum Breaker Valves

On November 4, 1993, it was determined that no surveillance procedures were available to perform a visual inspection of Reactor Building to Suppression Chamber Vacuum Breaker Valves CSP-V-5, 6 and 9 in accordance with the requirements of Technical Specification 4.6.4.2.b.2.b. A visual inspection of these valves is required to be performed every 18 months. Credit was being taken for an external inspection of the valve. It was concluded that, like Reactor Building to Suppression Chamber Check Valves CSP-V-7, 8, and 10, an internal inspection was required to satisfy the Technical Specification requirement.

17. Isolation Actuation Instrumentation Response Time Testing (Finding 2)

On November 16, 1993, it was determined that limited portions of the containment isolation actuation instrumentation logic for Isolation Groups 1, 2, 5, 6, 7, 8, and 9 had not been response time tested in accordance with the requirements of Technical Specification 4.3.2.3. A verbal notification of this condition was made at 1344 hours on November 16, 1993. Specifically, the interval not response time tested was the time from relay coil deenergization to the associated relay contact operation. The existing response time testing procedures measured the system response time from the sensed parameter to the relay coil voltage drop off, and the time between opening of a hand triggered contact and completion of mobilization of the final actuated device (valve). The testing did not measure the interval from relay coil deenergization to coil contact operation.

18. Control Room Emergency Filtration Unit HEPA Filter Inspections

During the period between October 18, 1983 and July 15, 1991, Surveillance Procedure PPM 7.4.7.2.2 was credited with the performance of Control Room Emergency Filtration Unit WMA-FU-54A and WMA-FU-54B HEPA Filter inspections in accordance with TSS Requirement 4.7.2.c.1. This procedure is the predecessor to PPMs 7.4.7.2.2A and 7.4.7.2.2B, which are the current procedures credited with performance of the TSS requirement. The surveillance requirement

includes an in-place visual inspection of the ESF atmosphere cleanup system and all associated components using the guidance in Regulatory Position C.5.a of Regulatory Guide 1.52, Revision 2. This guidance endorses the visual inspection criteria of ANSI N510-1975, Section 5.

A review of all revisions to PPM 7.4.7.2.2 was conducted by the TSSIP Group. The review concluded that Revisions 0 and 1 to the procedure did not include all aspects of the required visual inspection (see Attachment 3). Revision 0 was performed only once, on April 9, 1985, for WMA-FU-54A and WMA-FU-54B operability and was the first performance of the procedure following initial plant commercial operation. The failure to include all required visual inspection criteria in Revisions 0 and 1 was recognized after this initial performance of Revision 0. The omitted visual inspection criteria that satisfied TSS Requirement 4.7.2.c.1 was added to Revision 2 (approved June 30, 1986) and Revision 2 was used for the next performance of the procedure on October 2, 1986 (Revision 1 was never performed).

During the approximate eighteen month period between April 9, 1985 and October 2, 1986, WNP-2 was in OPERATIONAL CONDITIONS requiring the Control Room Emergency Filtration System to be OPERABLE in accordance with Technical Specification 3.7.2. Contrary to the Technical Specification requirement, the system was inoperable due to the failure to satisfy TSS Requirement 4.7.2.c.1 and the Technical Specification 3.7.2 ACTION requirements.

19. Isolation Actuation Instrumentation Response Time Testing (Finding 3)

On December 17, 1993, it was determined that certain portions of the containment isolation actuation instrumentation logic for Group 4 had not been response time tested in accordance with the Technical Specification requirements. A Technical Specification Amendment was issued on October 15, 1993 to allow continued operation until the next cold shutdown without performance of the required response time testing of the Isolation Group 4 logic. The portions of the Group 4 logic that were identified in this item are different than those identified in item 12. Specifically, the interval not response time tested was the time from sensor relay coil deenergization to final associated contact operation in the operating logic of the subject valves. This affected a portion of the Group 4 valves.

20. Response Time Testing of Emergency Core Cooling System (ECCS) Instrumentation (Finding 1)

On January 10, 1994, with the plant in Mode 1 (Power Operation), TSSIP personnel discovered a deficiency in the testing method used to satisfy Surveillance Requirement 4.3.3.3. This testing did not adequately measure the total response time of two in-series relays in the logic string for the opening of the injection valve in the Low Pressure Core Spray (LPCS) and Residual Heat Removal (RHR) B and C low pressure ECCS loops, and three in-series relays in the logic string for the injection valve in the RHR A low pressure ECCS loop.

On January 12, 1994, similar deficiencies were found in the total response time testing of the logic strings for the start of the associated pumps: one relay in the logic string to the LPCS and RHR B and C pumps, and two relays in the logic string for the RHR A pump were not included in response time testing.

21. Response Time Testing of ECCS Instrumentation (Finding 2)

On January 12, 1994, with the plant in Mode 1 (Power Operation), TSSIP personnel discovered a deficiency in the testing method used to satisfy Surveillance Requirement 4.3.3.3. This testing did not adequately measure the total response time of the actuation circuitry for the High Pressure Core Spray (HPCS) pump and discharge valve since two relays in the logic circuitry were not response time tested.

22. Service Water Valve Position Verification

On February 3, 1994, a TSSIP review determined that not all Standby Service Water (SSW) and High Pressure Core Spray Service Water (HPCSSW) valves were being verified every 31 days for correct position in accordance with TSS Requirements 4.7.1.1.a and 4.7.1.2.a. PPMs 7.4.7.1.1.1, "STANDBY SERVICE WATER LOOP A VALVE POSITION VERIFICATION," 7.4.7.1.1.2, "STANDBY SERVICE WATER LOOP B VALVE POSITION VERIFICATION," and 7.4.7.1.2A, "HPCS SERVICE WATER VALVE POSITION VERIFICATION," are credited with satisfying these requirements. However, certain safety-related equipment room cooler isolation valves, the RHR-P-2C seal water cooler isolation valves, and the Containment Atmospheric Control (CAC) scrubber and aftercooler isolation valves were not included in the surveillances.

23. HPCS Injection Valve Instrumentation

On February 16, 1994, a TSSIP review determined that plant procedures are not adequate to satisfy the LSFT requirements of TSS Requirement 4.3.3.2. PPM 7.4.3.3.2.27, "HPCS-LSFT," is credited with meeting this requirement, but the procedure was found not to be in full accordance with Technical Specification Definition 1.22, "LOGIC SYSTEM FUNCTIONAL TEST." The Technical Specification defines an LSFT as a test of all logic components of a logic circuit, from sensor through and including the actuated device, to verify OPERABILITY. This is clarified by Technical Specification Interpretation 94-01, which states: "In order to satisfy Tech Spec OPERABILITY requirements, the LSFT shall include testing of all features for which credit is taken in the WNP-2 accident mitigation design and licensing basis." Contrary to this interpretation, PPM 7.4.3.3.2.27 does not include adequate testing requirements for the Reactor Pressure Vessel (RPV) Injection Valve HPCS-V-4 accident mitigating features taken credit for in WNP-2 Loss of Coolant Accident (LOCA) analysis.

24. Reactor Core Isolation Cooling Instrumentation

On March 4, 1994, TSSIP personnel discovered a deficiency in the testing method used to satisfy the Reactor Core Isolation Cooling (RCIC) System CFT requirements of TSS Requirement 4.7.3.c. PPM 7.4.7.3.6, "RCIC 18 MONTH SURVEILLANCES," is credited with meeting this surveillance requirement. However, the procedural requirements do not adequately verify a portion of the RPV Injection Valve (RCIC-V-13) automatic open instrumentation logic.

There are two logic relays (RCIC-RLY-K20 and RCIC-RLY-K40) that each provide an open permissive contact for the RPV injection valve. These relays monitor RCIC Turbine Trip Valve (RCIC-V-1) and RCIC Turbine Steam Supply Valve (RCIC-V-45) position. On a RCIC initiation signal due to RPV low water level, both relay contacts must be closed to automatically open the normally closed valve. The RCIC-RLY-K20 contact is closed when the turbine trip valve is in its normally open position. The RCIC-RLY-K40 contact closes when the normally closed turbine steam supply valve opens on a RCIC initiation signal.

PPM 7.4.7.3.6 contains procedural requirements to verify the RPV injection valve automatic open function by simulating a RCIC initiation and RPV injection. To accomplish this, the performer is directed to install a jumper across the RCIC-RLY-K40 contact to simulate contact closure when the turbine steam supply valve opens. However, there was no procedural direction to verify that the jumpered relay contact actually closes when the valve opens. If the relay contact were to remain open, the RCIC initiation signal to the RPV injection valve would be blocked and the valve would not automatically open.

TSS Requirement 4.7.3.c requires that the RCIC system be demonstrated operable at least once per 18 months by: "Performing a system functional test which includes simulated automatic actuation and restart and verifying that each automatic valve in the flow path actuates to its correct position." Contrary to this requirement, the RPV injection valve instrumentation logic is not adequately tested to verify that the valve will automatically open on a RCIC initiation signal.

Immediate Corrective Action

Immediate corrective actions were initiated for each item discovered during the TSSIP procedure reviews. They are enumerated below in paragraphs corresponding to the event description above:

1. End-Of-Cycle Recirculation Pump Trip

EOC-RPT System Channels A and B were declared inoperable and TSAS 3.3.4.2.e was entered at 1932 hours on March 4, 1993. Reactor power was reduced to 92% and the Minimum Critical Power Ratio (MCPR) was demonstrated to be less than the MCPR Limit at 2008 hours. Continued power operation was thereby authorized by the TSAS.

2. Turbine Governor Valve - Fast Closure

No immediate corrective action was required as Turbine Governor Valve EOC-RPT System Channels A and B were in compliance with Surveillance Requirement 4.3.4.2.1 at the time of event discovery on March 9, 1993. TSS 7.4.3.1.1.20 and TSS 7.4.3.1.1.78 were satisfactorily completed at a reactor power level greater than 30% on February 19, 1993, and February 20, 1993, respectively.

3. Turbine Throttle Valve - Closure

No immediate corrective action was required as Turbine Throttle Valve EOC-RPT System Channels A and B were in compliance with Surveillance Requirement 4.3.4.2.1 at the time of event discovery on March 9, 1993. TSS 7.4.3.8.2.1 was satisfactorily completed at a reactor power level greater than 30%, with both RRC pumps in 60 Hertz operation, on March 6, 1993.

4. EOC-RPT System Instrumentation

No immediate corrective action was required as Turbine Governor Valve EOC-RPT System Channels A and B were in compliance with Surveillance Requirement 4.3.4.2.1 at the time of event discovery on March 9, 1993. Pressure switches MS-PS-3A, 3B, 3C, and 3D were all found to have been calibrated within the last 18 months. TSS 7.4.3.1.1.20 and TSS 7.4.3.1.1.78 meet the CFT requirements when performed at a reactor power level greater than or equal to 30%. As previously stated, they were satisfactorily completed on February 19, 1993, and February 20, 1993, respectively.

5. IRM Negative Voltage Power Supply Not Tested

No immediate corrective action was required, because the IRMs were already deemed inoperable at the time Technical Specification Surveillance Review personnel discovered the IRM inoperability problem. The IRMs are normally declared inoperable in Mode 1, as associated CFT surveillances cannot be performed during this mode of operation.

6. SRM Channel Count Rate

Procedure deviations were prepared and incorporated into Fuel Handling Procedure PPM 6.3.2, "Fuel Shuffling and/or Offloading and Reloading," and Surveillance Procedure TSS 7.4.9.1, "Refuel Interlocks," to specify requirements to demonstrate adequate SRM channel count rate and signal-to-noise ratio prior to control rod withdrawal. These procedures govern activities that are imminent during the ongoing Refueling Outage, and that may require control rod withdrawal.

7. MSIV Closure Trip Bypass

No immediate corrective action was required for the MSIV closure trip bypass problem because the reactor MODE switch was in the SHUTDOWN position and reactor pressure was below 1037 psig.

8. Main Control Room Remote-Intake Radiation Monitor

No immediate corrective action was required for the main control room remote-intake monitor problem, because this problem was discovered during Mode 4 of operation, and during this mode, the remote-intake monitors are not required to be operable.

9. MSIV Closure Trip Function

No immediate corrective action was required as all four MSIV closure trip function channels were in compliance with Surveillance Requirement 4.3.1.1-1.5 at the time of event discovery on July 9, 1993. TSS 7.4.3.1.2.1, the 18 month "Reactor Protection System" LSFT, satisfies the quarterly CFT requirements when taken in conjunction with TSS 7.4.3.1.1.9. TSS 7.4.3.1.2.1 verifies that the MSIV closure trip logic relays actuate the associated annunciators. TSS 7.4.3.1.1.9 verifies that when the MSIVs are not fully open, the MSIV closure trip logic relays actuate. Together, these procedures meet the CFT requirements by the "sequential, overlapping" methodology allowed in Technical Specification Definition 1.7. Both procedures were satisfactorily completed within the last quarter, TSS 7.4.3.1.2.1 on June 18, 1993, and TSS 7.4.3.1.1.9 on June 19, 1993.

10. RPS Turbine-Throttle Valve Closure

Procedure PPM 7.4.3.1.1.9A was written to include those portions of the RPS Turbine-Throttle Valve Closure CFT testing that were not covered by other procedures. This procedure was then performed satisfactorily on August 12, 1993, as part of the plant startup.

11. Main Steam Isolation Valve Leakage Control System Pressure Indicating Switch

The channel calibration procedure for MSLC-PIS-60, which also accomplishes a CFT of the switch, was successfully performed on September 22, 1993.

12. Isolation Actuation Instrumentation Response Time Testing (Finding 1)

A verbal request for discretionary enforcement was made by the Supply System on October 1, 1993, and discretionary enforcement was granted by the Staff. A written request for discretionary enforcement and a request for a Technical Specification amendment under emergency circumstances

were submitted on October 2, 1993. A Technical Specification amendment was issued by the Staff on October 15, 1993, to allow continued operation until the Spring 1994 Refueling Outage without performance of the required response time testing of the Isolation Groups 3 and 4 logic.

13. Average Power Range Monitor Logic System Functional Testing

A review of the computer records from the last performance of the CFT for APRMs E and F was made to verify that the appropriate relays deenergized when APRMs E and F tripped upscale. PPM 7.4.3.1.1.47 (APRM E) and PPM 7.4.3.1.1.48 (APRM F) were changed to include verification of the necessary LSFT requirements. These procedures are used to perform both the LSFT and CFT testing of these APRMs. These procedures were satisfactorily performed on October 7, 1993.

14. Average Power Range Monitor Flow Biased Simulated Thermal Power - High

Plant procedure PPM 7.4.4.1.2 was revised to include a daily comparison of the expected drive flow signals to the drive flow input signal to each of the six APRMs. This procedure was then successfully performed on October 8, 1993.

15. Mechanical Vacuum Pump Trip and Isolation Testing

Plant procedures PPM 7.4.3.1.1.11 and 7.4.3.1.1.56 were changed to include testing of the mechanical vacuum pump trip and isolation. These procedures were satisfactorily performed on October 27, 1993.

16. Reactor Building to Suppression Chamber Vacuum Breaker Valves

No immediate corrective action was required. Valves CSP-V-5, 6 and 9 were disassembled during the last refueling outage in May 1993. The Work Requests associated with that work were reviewed and determined to have satisfied the requirement for a visual inspection.

17. Isolation Actuation Instrumentation Response Time Testing (Finding 2)

The response time testing of the untested portions of the isolation actuation instrumentation logic was performed using special test procedures. Technical Specification 4.0.3, which provides a 24 hour grace period for the performance of past due surveillance procedures, was entered. Testing of Isolation Group 1 was completed within the 24 hour time period allowed by Technical Specification 4.0.3. Testing of Isolation Group 6 was completed in the time period allowed by the associated Action Statement.

On November 17, 1993, the Supply System requested and received Discretionary Enforcement for a four day period to allow performance of the required response time testing for Isolation Groups 2, 5, 7, 8, and 9. Special test procedures were written and performed to satisfy the Technical Specification response time testing requirements. This testing was successfully completed within the four day Discretionary Enforcement time period.

18. Control Room Emergency Filtration Unit HEPA Filter Inspections

No immediate corrective action was required as the current WMA-FU-54A and WMA-FU-54B HEPA Filter inspections were in compliance with existing Technical Specification requirements at the time of event discovery on December 9, 1993. Revision 1 of PPM 7.4.7.2.2A and PPM 7.4.7.2.2B were reviewed by the TSSIP Group and found to include the visual inspection steps necessary to satisfy TSS Requirement 4.7.2.c.1. PPM 7.4.7.2.2A, Revision 1, was last completed on February 11, 1993 and PPM 7.4.7.2.2B, Revision 1, was last completed on February 20, 1993. The required interval for the surveillance requirement is eighteen months, with the next scheduled due date for both procedures listed as June 22, 1994. Hence, the surveillances are current and no immediate operability concern exists.

19. Isolation Actuation Instrumentation Response Time Testing (Finding 3)

As stated above, a Technical Specification Amendment was issued on October 15, 1993 to allow continued operation until the next cold shutdown without performance of the required response time testing of the Isolation Group 4 logic. The Supply System verbally notified the NRC Staff of the details of this condition on December 17, 1993. A letter detailing this condition was docketed on December 20, 1993. In order to response time test the maximum portion of the Group 4 logic that could reasonably be performed at power, special test procedures were written to test the logic identified by this item. This response time testing was successfully completed on December 18, 1993.

20. Response Time Testing of ECCS Instrumentation (Finding 1)

A verbal request for Discretionary Enforcement was approved on January 11, 1994, allowing continued plant operation with the ECCS instrumentation functional, but not in strict compliance with Technical Specification testing requirements.

21. Response Time Testing of ECCS Instrumentation (Finding 2)

The HPCS system was declared inoperable on January 12, 1994 pending performance of response time testing of the circuitry not previously tested.

22. Service Water Valve Position Verification

WNP-2 entered Limiting Conditions for Operation (LCO) 4.0.3 at 1315 hours on February 3, 1994 for failure to satisfactorily perform TSS Requirements 4.7.1.1.a and 4.7.1.2.a. The SSW and HPCSSW valves identified as requiring position verification were verified for proper position by using documentation for valve line-ups performed within the last 31 days or by physical inspection. LCO 4.0.3 was exited at 2211 hours on February 3, 1994.

23. HPCS Injection Valve Instrumentation

HPCS Level 8 instrumentation was declared inoperable at 1348 hours on February 16, 1994.

PPM 8.3.320, "ISOLATION - HPCS-V-4 LOGIC SYSTEM TEMPORARY TEST," was written and satisfactorily performed on February 17, 1994 to restore HPCS-V-4 instrumentation logic operability.

24. Reactor Core Isolation Cooling Instrumentation

The RCIC system was declared inoperable at 1010 hours on March 4, 1994, and WNP-2 entered LCO 3.7.3. The LCO allows plant operation for up to 14 days with the RCIC system inoperable, provided that the HPCS system remains operable.

Test procedure PPM 8.3.323, "RCIC INITIATION LOGIC SYSTEM FUNCTIONAL TEST OF RCIC-RLY-K40," was written to test RCIC-RLY-K40 contact actuation to demonstrate that the RPV injection valve will automatically open on a RCIC initiation signal. The procedure was satisfactorily completed at 1645 hours on March 4, 1994 to restore RCIC system operability, and WNP-2 exited LCO 3.7.3.

Further Evaluation and Corrective Action

Further Evaluation

These events are reportable under 10CFR50.73(a)(2)(i)(B) as "Any operation or condition prohibited by the plant's Technical Specifications . . .," and under 10CFR50.73(a)(2)(vii)(D) as "Any event where a single cause or condition caused . . . two independent trains or channels to become inoperable in a single system designed to . . . Mitigate the consequences of an accident."

There were no structures, components, or systems that were inoperable before the start of these events that contributed to the events.

Further evaluations were performed on each of the items discovered during the TSSIP procedure reviews. They are enumerated below in paragraphs corresponding to the event description above:

1. End-Of-Cycle Recirculation Pump Trip

In accordance with 10CFR50.72(b)(1)(ii)(B), this item was reported to the NRC Operations Center via the Emergency Notification System (ENS) at 2026 hours on March 4, 1993, as "Any event or condition during operation that . . . results in the nuclear power plant being . . . In a condition that is outside the design basis of the plant. . . ." TSS 7.4.3.4.2.3.3A and TSS 7.4.3.4.2.3.3B were developed and approved on February 19, 1992, as a corrective action of LER 91-013-02. The previous surveillance procedure did not include the RPT-4A and RPT-4B circuit breakers in EOC-RPT breaker arc suppression response time surveillance testing.

The Surveillance Procedure Verification Program reviews did not identify the need to perform the response time testing using TC-2. Consequently, the LER did not include it as a corrective action.

2. Turbine Governor Valve - Fast Closure

An investigation of TSS 7.4.3.1.1.20 and TSS 7.4.3.1.1.78 found that they were originally only the 18 month CC procedures. The monthly CFTs were conducted using TSS 7.4.3.1.1.19 and TSS 7.4.3.1.1.71. The CFT procedures met Surveillance Requirement 4.3.4.2.1 until they were revised on December 7, 1984. This revision added directions to mark certain status light and annunciator verification steps "N/A" when reactor power was less than 30%. The conditional steps were added in response to comments from the field, because the steps could not be performed as written.

They were being marked "N/A" by the field performers, with an explanation in the Comments section of the procedures. It was apparently not realized that the steps being marked "N/A" in the field, and now being made conditional, were required to verify RPS relay contact functional status. They were, therefore, critical to the satisfactory completion of the CFT surveillance requirements. When the CFT and CC were incorporated into Revision 5 of TSS 7.4.3.1.1.20 and TSS 7.4.3.1.1.78 on January 27, 1988, these conditional steps were carried over.

3. Turbine Throttle Valve - Closure

An investigation of TSS 7.4.3.8.2.1 found that the Note, allowing certain throttle valve position status light verification steps to be marked "N/A," was first added to Revision 5 of the procedure on April 15, 1987. Before this time, the procedure met Surveillance Requirement 4.3.4.2.1. The reason for the revision was given that 15 Hertz RRC pump operation causes an abnormal light configuration. The Revision 10 Note further clarifies this by stating that "If either RRC pump is not

in 60 Hertz operation, the . . . [turbine throttle valve position] . . . indicating lights will be extremely dim and monitoring of their status is difficult." However, based upon a review of previous procedure performances, there was no indication that the field performers had difficulty determining the light status. Apparently, the indicating lights are difficult, but possible, to use for throttle valve position status during 15 Hertz RRC pump operation. It was apparently not realized that the steps being made conditional were required to verify RPS relay contact functional status, and therefore, critical to the satisfactory completion of the CFT surveillance requirement.

4. EOC-RPT System Instrumentation

A review of the SMS data base for pressure switches MS-PS-3A, 3B, 3C, and 3D found they were being calibrated at approximately 18 month intervals under the Preventive Maintenance (PM) Program. The pressure switch PM cards were recently revised to perform the calibrations in accordance with Plant Procedures PPM 10.27.53, "Main Turbine First Stage Pressure Switch Calibration Div 1," and PPM 10.27.54, "Main Turbine First Stage Pressure Switch Calibration Div 2." These procedures were developed and approved on March 18, 1993, to perform the pressure switch CCs every 24 months. They do not, however, reference Surveillance Requirement 4.3.4.2.1, nor do they meet the 18 Month CC surveillance interval requirement of Table 4.3.4.2.1-1.2. It is assumed that the failure to develop CC surveillance procedures for these pressure switches was due to an oversight during the initial procedure preparation process.

5. IRM Negative Voltage Power Supply Not Tested

General Electric Service Information Letter (GE SIL) 445, dated September 10, 1986, identified a blown fuse event at Monticello in which all positive and negative IRM fuses connected to the associated negative-voltage bus were blown by a power surge. After replacing the positive fuses, the IRMs appeared to be operating normally. But, because the negative-side fuses were not replaced, continued loss of the negative power supply prevented the IRMs from processing flux signals, and thus generating related IRM scram functions.

By design, the loss of the IRM's negative voltage supply was not annunciated, so the loss of the power supply, as well as the inability for the IRMs to generate scram functions remained undetected. The blown, negative-side fuses were detected later during IRM surveillance testing.

In response to this design error, the Supply System modified the IRM and SRM systems in June of 1987 to include a voltage sensing relay to detect the loss of the negative voltage supply, and upon loss of the negative voltage supply, generate IRM inoperative rod block and scram signals.

On April 14, 1993, TSSIP personnel discovered that related IRM LSFT requirements were considered, but deemed not necessary, during the design modification process. Further investigation revealed that the negative-voltage-low inoperative trips added to the SRM drawers had not been LSFT'd since their installation, either. However, these SRM inoperative trips are not required to be LSFT'd by Technical Specifications.

6. SRM Channel Count Rate

According to Surveillance Requirement 4.9.2.c, SRM channel count rate verification must be performed prior to control rod withdrawal while in Mode 5. However, the surveillance requirement was never included in any WNP-2 fuel handling and refueling activity procedures to assure compliance. This failure to include the requirement in appropriate procedures was due to an oversight during the initial procedure preparation process.

Investigation of this event also identified related issues that should be addressed, they are described below:

a. Surveillance Requirements 4.3.7.6.c and 4.9.2.c both specify the channel count rate requirements for SRM channel operability. However, the requirements are not consistent. Technical Specification Amendment No. 102 was issued on April 10, 1992, to change the SRM count rates and associated signal-to-noise ratios of Surveillance Requirement 4.9.2.c to the more conservative values recommended by GE in SIL 478. The applicability of the SIL to Surveillance Requirement 4.3.7.6.c was apparently overlooked during the Supply System's internal review of the amendment request.

b. Although Surveillance Requirement 4.9.2.c does not specifically establish a requirement for surveillance of signal-to-noise ratio, Surveillance Procedure TSS 7.4.9.2, "SRM Signal-To-Noise Ratio," was issued on May 15, 1993, to verify the signal-to-noise ratio at least once per seven days while in Mode 5. This is the SRM CFT frequency as specified in Surveillance Requirement 4.9.2.b.

c. Currently, the CC requirement of Surveillance Requirement 4.9.2.a.1 is being satisfied by Surveillance Procedure TSS 7.0.2, "Shift and Daily Instrument Checks (Mode - 5)." The procedure simply verifies that each SRM channel meets the count rate requirements of Surveillance Requirement 4.9.2.c. However, as defined by WNP-2 Technical Specifications, a CC should include a comparison of channel indications. To accomplish this, each channel count rate indication should be read, recorded, and compared against the acceptance criteria, the other channel indications and previous readings. This methodology would provide information and trendable data that could be a valuable aid in the early detection of increases in count rates, reduced signal-to-noise ratios, instrument errors, and channel failures.

7. MSIV Closure Trip Bypass

Further evaluation of the MSIV closure trip bypass problem determined that associated Instrument Master Data Sheets, as well as related Instrument System Test Procedures were not in compliance with Technical Specification Table 3.3.1-1.

8. Main Control Room Remote-Intake Radiation Monitor

With respect to the main control room remote-intake radiation monitors, it was subsequently determined that three Health Physics/Chemistry Shift Channel Check procedures needed revision or clarification to be in agreement with Technical Specification Definition 1.6.

9. MSIV Closure Trip Function

The Supply System committed to the test methodology established in Institute of Electrical and Electronic Engineers (IEEE) 338-1975, "Standard Criteria for the Periodic Testing of Nuclear Power Generating Station Class 1E Power and Protection Systems," Section 6.4, "Test Methods," for the surveillance testing program. The IEEE standard's methods for "positive and direct" relay actuation verification were not incorporated into the original version (Revision 0) of TSS 7.4.3.1.1.9, approved on February 9, 1984, due to an apparent misinterpretation of the requirements. This procedural deficiency during the initial surveillance procedure preparation process caused the failure to comply with the Technical Specification Definition 1.7.b requirement for verifying associated alarm and/or trip functions.

The 18 month LSFT procedure (TSS 7.4.3.1.2.1) and the existing CFT procedure (TSS 7.4.3.1.1.9) combine to meet the quarterly CFT requirement of Surveillance Requirement 4.3.1.1-1.5 only intermittently. This is generally only during the first quarter following each annual refueling outage based on performance of both tests near the end of each outage. Consequently, WNP-2 has not consistently met the surveillance requirement since initial plant startup.

10. RPS Turbine-Throttle Valve Closure

Through a review of previous revisions of PPM 7.4.3.8.2.1 it was determined that this procedure has been inadequate to satisfy the Technical Specification requirements for RPS Turbine-Throttle Valve Closure relay and alarm testing since initial plant startup.

11. Main Steam Isolation Valve Leakage Control System Pressure Indicating Switch

It was determined through a review of past procedure revisions that a CFT of MSLC-PIS-60 has never been performed on a monthly basis as required by the Technical Specifications. This condition has existed since initial plant startup.

12. Isolation Actuation Instrumentation Response Time Testing (Item 1)

A review of past revisions of the response time testing procedures showed that adequate response time testing of the Isolation Groups 3 and 4 logic was not being performed. This condition has existed since initial plant startup.

13. Average Power Range Monitor Logic System Functional Testing

A review of past revisions of the APRM procedures showed that the LSFT/CFT procedure did not contain adequate verification of logic system response to satisfy the Technical Specification requirements. This condition has existed since initial plant startup.

14. Average Power Range Monitor Flow Biased Simulated Thermal Power - High

A review of past plant procedure revisions showed that the daily comparison of the expected drive flow signals to the drive flow input signal to each of the six APRMs was not included. This condition has existed since initial plant startup.

15. Mechanical Vacuum Pump Trip and Isolation Testing

A review of plant procedures showed that this function had, since initial plant startup, not been tested periodically in accordance with the Technical Specification requirements.

16. Reactor Building to Suppression Chamber Vacuum Breaker Valves

A review of plant procedures showed that the visual inspection had not been performed in accordance with the Technical Specification requirements since initial plant startup.

17. Isolation Actuation Instrumentation Response Time Testing (Finding 2)

Based on a review of past revisions of plant procedures it was determined that the subject portions of the isolation actuation instrumentation for Isolation Groups 1, 2, 5, 6, 7, 8, and 9 were not included in response time tests since initial plant startup. These deficiencies were the result of not verifying proper overlap of testing performed in separate procedures. Use of separate procedures is acceptable so long as overlap of the logic, and thus response time testing of the logic, is performed.

18. Control Room Emergency Filtration Unit HEPA Filter Inspections

As discussed above, a review of the revisions to PPM 7.4.7.2.2 determined that the procedure failed to include all TSS Requirement 4.7.2.c.1 visual inspection criteria during the period between initial plant startup and approval of Revision 2 to the procedure on June 30, 1986. The deficiency was

recognized sometime between the initial performance of the procedure on April 9, 1985 and the approval of Revision 2. There is insufficient information available to determine the exact cause of the procedure deficiency or exactly when the deficiency was discovered. However, the Supply System believes the cause to be an oversight during the initial procedure preparation process.

19. Isolation Actuation Instrumentation Response Time Testing (Finding 3)

Based on a review of the past revisions of plant procedures it was determined that the identified response time testing of Isolation Group 4 components had not been performed since initial plant startup. These deficiencies were the result of not verifying proper overlap of testing performed in separate procedures. Use of separate procedures is acceptable so long as overlap of the logic, and thus response time testing of the logic, is performed.

20. Response Time Testing of ECCS Instrumentation (Finding 1)

A written request for Discretionary Enforcement was made that described the additional testing deficiencies that had been discovered on January 12, 1994. An emergency Technical Specification change was requested and verbally approved by the NRC on January 13, 1994, to permit deferral of complete response time testing until the startup following the next cold shutdown, but no later than the startup following the Spring 1994 Refueling Outage. Formal written NRC approval of this change was received on January 31, 1994.

21. Response Time Testing of ECCS Instrumentation (Finding 2)

Response time testing was performed using a temporary test procedure on January 14, 1994, within the time allowed by the associated Action Statement. The actual HPCS system response time was 22.4 seconds, compared with the Technical Specification limit of less than or equal to 27 seconds.

22. Service Water Valve Position Verification

TSS Requirement 4.7.1.1.a states (Surveillance Requirement 4.7.1.2.a contains a similar requirement for HPCSSW):

"At least the above required standby service water system subsystem(s) [serves Division 1 and Division 2 diesel generators] shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position."

TSS Requirements 4.7.1.1.a and 4.7.1.2.a were originally understood by the Supply System to include only valves that would render the service water systems inoperable. Valves that branched off the main supply and return headers were not necessarily included in PPMs 7.4.7.1.1.1, 7.4.7.1.1.2, and 7.4.7.1.2A. This was based on the language of the service water system surveillance requirements and plant practice.

The surveillance requirements are intended to assure proper SSW [HPCSSW] flow paths servicing safety-related systems or components. To provide this assurance, valves in the service water main supply and return flow paths, as well as those in branch flow paths to and from safety-related equipment, must be locked, sealed, or otherwise secured, or be verified in their correct position at least once per 31 days.

The equipment room cooler and CAC scrubber and aftercooler isolation valves have not been included in surveillance procedures to verify correct position at least once per 31 days since initial plant startup.

RHR-P-2C cannot be utilized for shutdown cooling, which is the only mode of operation where the pump seals are exposed to water hot enough to damage them. Thus, the seal water cooler is not required for this pump and is spared in place. The seal water cooler isolation valves were removed from PPM 7.4.1.1.2 in 1988 and 1991.

23. HPCS Injection Valve Instrumentation

In accordance with 10CFR50.72(b)(2)(iii)(D), this item was reported to the NRC Operations Center via the ENS at 1548 hours on February 17, 1994, as "Any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to:. . . (D) Mitigate the consequences of an accident." This notification became necessary when HPCS was declared inoperable in accordance with TSAS 3.5.1.c due to expiration of the 24 hour time limitation of TSAS 3.3.3.b.

HPCS-V-4 instrumentation logic is designed to initially auto-open the injection valve to commence injection flow into the reactor vessel following a HPCS initiation on either low reactor water level (Level 2, i.e., -50 inches) or high containment drywell pressure (1.65 psig). The injection valve auto-closes to secure RPV injection flow when high reactor water level (Level 8, i.e., +54.5 inches) is reached. If water level later drops to Level 2, the injection valve will automatically reopen to reestablish reactor vessel injection.

PPM 7.4.3.3.2.27, Section 7.5.3 is performed when reactor water level is below +54.5 inches. This section directs the performer to have a Control Room Operator open HPCS-V-4 and then verifies that it auto-closes upon receipt of a high reactor water level (Level 8) signal. This section is considered to be in accordance with the Technical Specification definition of a LSFT.

Section 7.5.2 of the procedure is performed when reactor water level is at or above +54.5 inches. This section does not verify that HPCS-V-4 auto-closes upon receipt of a high reactor water level (Level 8) signal. Instead, the relay (HPCS-RLY-K13) that initiates the RPV injection valve auto-closure is only verified to energize. This is performed by verifying that the relay contacts close to illuminate the high reactor water level (Level 8) seal-in indicator light. However, the indicator light contacts are not the same contacts that initiate the RPV injection valve auto-closure. Consequently, there is no "positive and direct" assurance that the RPV injection valve will auto-close. As previously discussed, the Supply System committed to the test methodology established in IEEE 338-1975 for the surveillance testing program. The IEEE standard's methods for "positive and direct" relay actuation verification were included in Revision 0 of PPM 7.4.3.3.2.27. These methods were not incorporated into Section 7.5.2, which was added to Revision 1 of the procedure in 1985 prior to initial performance of the procedure (Revision 0 was never performed). It was not recognized that the procedure change required a change to Technical Specifications.

As previously described, HPCS-V-4 instrumentation logic is designed to automatically reopen the injection valve to reestablish reactor vessel injection if reactor water level drops to the low level (Level 2) actuation limit. This logic is separate from that which initially opens the RPV injection valve on a HPCS actuation, but is not verified in any WNP-2 surveillance procedures. This condition has existed since initial plant startup.

Based on the above evaluation, PPM 7.4.3.3.2.27 does not test all logic components of the logic circuit, from sensor through and including the actuated device, to verify HPCS-V-4 related RPV level instrumentation OPERABILITY. WNP-2 has been in OPERATIONAL CONDITIONS since initial plant startup that required HPCS system RPV level instrumentation to be OPERABLE in accordance with Technical Specification 3.3.3. Contrary to this requirement, HPCS-V-4 related RPV level instrumentation has been technically inoperable due to the failure of PPM 7.4.3.3.2.27 to satisfy TSS Requirement 4.3.3.2 and Table 3.3.3-1.C.1.c ACTION requirements.

24. Reactor Core Isolation Cooling Instrumentation

A review of past revisions of PPM 7.4.7.3.6 showed that verification of RCIC-RLY-K40 contact actuation has not been included in the procedure since initial plant startup.

General Root Cause

Five general root causes were identified by the Surveillance Procedure Verification Program in 1991, and remain valid for this review. They are described below:

1. Procedures Less Than Adequate (LTA) - Surveillance procedures developed during the startup period that do not fully implement the requirements.

2. Change Management LTA - Procedure revisions, procedure deviations or plant changes that introduced errors into the Technical Specification Surveillance Program.

3. Directives/Requirements LTA - Technical Specifications were accepted at the time of startup that could not be complied with because of hardware restraints. These issues were recognized at the time, but were not adequately documented or resolved.

4. Design LTA - Technical Specification surveillance requirements did not correctly reflect plant design.

5. Programmatic Controls LTA - Plant Procedures did not provide adequate control of the Surveillance Testing Program.

Specific Root Cause

Root causes were determined for each item discovered during the TSSIP procedure reviews. They are enumerated below in paragraphs corresponding to the event description above:

1. End-Of-Cycle Recirculation Pump Trip

   The root cause for the failure to properly test the EOC-RPT circuit breaker trip response time was Procedures LTA.

2. Turbine Governor Valve - Fast Closure

   The root cause for the failure of the CFT and CC to meet the surveillance requirements was Change Management LTA.

3. Turbine Throttle Valve - Closure

   The root cause for the failure of the CFT to meet the surveillance requirement was Change Management LTA.

4. EOC-RPT System Instrumentation

   The root cause for the lack of CFT and CC surveillance procedures for the EOC-RPT related main turbine pressure switches was Procedures LTA.

5. IRM Negative Voltage Power Supply Not Tested

The root cause for the IRM and SRM negative-voltage-low inoperative trip functions not being LSFT'd was Change Management LTA; during the design change process, cognizant personnel considered surveillance testing of the IRM's negative-voltage-low inoperative trips, but deemed the testing unnecessary. Additionally, applicable revisions to the FSAR were not identified during the design change process.

6. SRM Channel Count Rate

The root cause for the lack of procedural requirements to meet Surveillance Requirement 4.9.2.c.1 was Procedures LTA.

7. MSIV Closure Trip Bypass

The root cause for the MSIV closure trip bypass problem was Procedures LTA.

8. Main Control Room Remote-Intake Monitor

The root cause for the main control room remote-intake radiation monitor problem was Procedures LTA.

9. MSIV Closure Trip Function

The root cause for the failure to consistently meet Surveillance Requirement 4.3.1.1-1.5 was Procedures LTA.

10. RPS Turbine-Throttle Valve Closure

The root cause for the inadequate CFT of the RPS Turbine-Throttle Valve was Procedures LTA in that plant procedures did not include testing of the necessary relays and alarms.

11. Main Steam Isolation Valve Leakage Control System Pressure Indicating Switch

The root cause for the failure to perform a monthly CFT on MSLC-PIS-60 was Procedures LTA in that no procedure was developed and scheduled to satisfy this Technical Specification requirement.

12. Isolation Actuation Instrumentation Response Time Testing (Finding 1)

The root cause for the failure to adequately response time test the Isolation Group 3 and 4 logic was Procedures LTA in that the response time testing procedures did not include testing of the necessary components.

13. Average Power Range Monitor Logic System Functional Testing

The root cause for the inadequate LSFT of the APRMs was Procedures LTA in that the procedures did not provide verification of the function of the necessary components.

14. Average Power Range Monitor Flow Biased Simulated Thermal Power - High

The root cause for the inadequate APRM testing relative to comparing core flow to rated core flow was Procedures LTA in that this comparison was not included.

15. Mechanical Vacuum Pump Trip and Isolation Testing

The root cause for not testing the mechanical vacuum pump trip and isolation on MSLRM - High was Procedures LTA in that no procedures were written to satisfy the requirements of this note in the Technical Specifications.

16. Reactor Building to Suppression Chamber Vacuum Breaker Valves

The root cause for not performing a visual inspection of valves CSP-V-5, 6, and 9 was Procedures LTA in that no procedures were written to satisfy this Technical Specification requirement.

17. Isolation Actuation Instrumentation Response Time Testing (Finding 2)

The root cause for not response time testing limited portions of the logic for Isolation Groups 1, 2, 5, 6, 7, 8, and 9 was Procedures LTA in that the available procedures did not provide overlap testing of components.

18. Control Room Emergency Filtration Unit HEPA Filter Inspections

The root cause for the failure of PPM 7.4.7.2.2 to include all TSS Requirement 4.7.2.c.1 visual inspection criteria was Procedures LTA in that required inspection criteria was omitted due to an oversight during the initial procedure preparation process.

19. Isolation Actuation Instrumentation Response Time Testing (Finding 3)

The root cause for not response time testing limited portions of the logic for Isolation Group 4 was Procedures LTA in that the available procedures did not provide overlap testing of components.

20. Response Time Testing of ECCS Instrumentation (Finding 1)

The root cause for the failure to test the ECCS instrumentation response times properly was Procedures LTA.

21. Response Time Testing of ECCS Instrumentation (Finding 2)

The root cause for the failure to test the ECCS instrumentation response times properly was Procedures LTA.

22. Service Water Valve Position Verification

The root cause for not including certain safety-related equipment room cooler and CAC scrubber and aftercooler isolation valves in surveillance procedures that verify correct position at least once per 31 days was a misunderstanding that resulted in Procedures LTA.

The root cause for removing the RHR-P-2C seal water cooler isolation valves from PPM 7.4.1.1.2 without a Technical Specification change or the valves being locked, sealed, or otherwise secured was a misunderstanding that resulted in Change Management LTA.

23. HPCS Injection Valve Instrumentation

The root cause for the incorporation of a procedure change which does not meet Technical Specification requirements was Change Management LTA.

The root cause for not including required HPCS-V-4 instrumentation logic functions in surveillance procedures was Procedures LTA.

24. Reactor Core Isolation Cooling Instrumentation

The root cause for the failure to adequately verify RCIC-RLY-K40 contact actuation was Procedures LTA.

General Further Corrective Action

Following the completion of the Surveillance Procedure Verification Program in 1991, the Supply System recognized that the high number of specific items of Technical Specification noncompliance was indicative of a broader programmatic issue. The five general root causes were reviewed to determine Technical Specification Surveillance Testing Program corrective actions. The results of the review are as follows:

For the Procedures LTA and Change Management LTA root causes, the following two actions were taken:

1. PPM 1.2.6, "PPM Evaluation Program," was revised on September 9, 1992, to strengthen the Technical Specification surveillance procedure verification process.

2. PPM 10.1.5, "Scheduled Maintenance System (SMS)," was revised on January 11, 1993, to include specific signoffs for SMS changes to Technical Specification surveillance requirements.

3. Revision of appropriate plant procedures was completed on July 12, 1993, to assign central "ownership" of the Surveillance Testing Program within the Technical Staff Department. Future surveillance procedures, and noneditorial changes and revisions to the existing surveillance procedures will receive a Technical Specification compliance review by the TSSIP staff.

   The TSSIP is already underway to methodically review surveillance procedures by applicable Technical Specification. Procedures received prior to their scheduled review date will be screened for significant problems, but will not receive a detailed review until scheduled by the TSSIP staff.

For the Programmatic Controls LTA root cause, the WNP-2 Technical Specification Surveillance Testing Program was reviewed by a Quality Action Team (QAT), the Supply System formal problem solving process. The QAT completed their review and presented their findings and recommendations to Plant Management on April 17, 1992. The TSSIP, which discovered the items reported in this LER, is one of the QAT recommended actions being implemented.

There were no programmatic corrective actions applicable to the Directives/Requirements LTA and Design LTA root causes since the problems occurred before Plant startup, while under administrative controls that are no longer in effect. These root causes will be addressed on an individual basis by specific corrective actions.

Specific Further Corrective Action

1. End-Of-Cycle Recirculation Pump Trip

   TSS 7.4.3.4.2.3.3A and TSS 7.4.3.4.2.3.3B have been revised to test the RPT-3A, 3B, 4A, and 4B breaker trip time response using TC-2.

2. Turbine Governor Valve - Fast Closure

TSS 7.4.3.1.1.20 and TSS 7.4.3.1.1.78 have been revised to meet the CFT and CC surveillance requirements of Table 4.3.4.2.1-1.2 when reactor power is less than 30%, as well as, greater than or equal to 30%.

3. Turbine Throttle Valve - Closure

TSS 7.4.3.8.2.1 has been revised to meet the CFT surveillance requirement of Table 4.3.4.2.1-1.1 when reactor power is less than 30%, as well as, greater than or equal to 30%.

4. EOC-RPT System Instrumentation

Procedures have been revised or developed to meet the CFT and CC surveillance requirements of Table 4.3.4.2.1-1.2 for pressure switches MS-PS-3A, 3B, 3C, and 3D.

5. IRM Negative Voltage Power Supply Not Tested

a. On May 2, 1993, RPS Surveillance Procedure TSS 7.4.3.1.2.1 was changed to LSFT the voltage sensing relay that initiates the negative-voltage-low IRM inoperative trip. The relay functioned as designed.

b. The applicable surveillances have been revised to LSFT the negative-voltage-low SRM inoperative trip. This was completed before the RPS Shorting Links were removed.

c. An FSAR change notice was prepared on June 30, 1993, to reflect the negative-voltage-low inoperative trip as being part of the IRM and SRM trip circuitry.

d. The generic implications of inadequate change management are addressed through performance of the TSSIP review and current programmatic controls on Technical Specification surveillance revisions.

6. SRM Channel Count Rate

a. Surveillance Procedure TSS 7.4.9.2, "SRM Signal-To-Noise Ratio," was issued on May 15, 1993, to verify the signal-to-noise ratio at least once per 7 days while in Mode 5.

b. A Technical Specification Change Request was initiated on September 2, 1992, to make Surveillance Requirement 4.3.7.6.c consistent with GE SIL 478.

c. A change to the Technical Specification Bases for 3/4.3.7.6 and 3/4.9.2 was initiated on July 23, 1993, documenting a signal-to-noise ratio measurement frequency that satisfies SRM surveillance requirements.

d. A Mode 5 SRM Channel Check surveillance procedure was developed on July 30, 1993, that records and compares SRM channel indications in accordance with the requirements defined in Technical Specifications. Also, consistent procedural compliance methodology was verified for Modes 1, 2, 3 and 4.

e. A review of applicable plant operating and surveillance procedures was completed on July 30, 1993, to assure adequate procedural compliance with Surveillance Requirement 4.3.7.6.c in Modes 2, 3, and 4.

7. MSIV Closure Trip Bypass

a. On June 14, 1993, an instrument setpoint change request was approved to change the MSIV closure trip bypass setpoint to comply with Technical Specification Table 3.3.1-1.

b. Instrument System Test Procedures PPM 10.27.2 and PPM 10.27.25 were deviated to achieve compliance with Table 3.3.1-1 on June 15, 1993.

c. Maintenance Work Request AP4166 was performed to recalibrate the pressure switches on June 15, 1993.

8. Main Control Room Remote-Intake Radiation Monitor

a. On June 14, 1993, the Chemistry Supervisor issued Standing Order #80 which directs cognizant personnel to "compare the readings from WOA-RIS-31A to WOA-RIS-31B and the readings from WOA-RIS-32A to WOA-RIS-32B." Results of these readings are being documented on Health Physics/Chemistry Shift Channel Check Procedure TSS 7.1.1.

b. Health Physics/Chemistry Shift Channel Check Procedure TSS 7.1.1 was changed to incorporate Standing Order #80 on July 14, 1993.

9. MSIV Closure Trip Function

TSS 7.4.3.1.1.9 was revised, and performed on September 9, 1993, to comply with Technical Specification Definition 1.7.b and the quarterly testing frequency of Surveillance Requirement 4.3.1.1-1.5.

10. RPS Turbine-Throttle Valve Closure

As stated in the immediate corrective action section above, procedure PPM 7.4.3.1.1.9A was written to include those portions of the CFT testing that were not covered by other procedures.

11. Main Steam Isolation Valve Leakage Control System Pressure Indicating Switch

A new procedure, PPM 7.4.6.1.4.18, was written to support both the CFT and Channel Calibration testing of MSLC-PIS-60. This procedure was approved by the Plant Operations Committee November 3, 1993. Periodic performance of this procedure has been scheduled through the Scheduled Maintenance System (SMS).

12. Isolation Actuation Instrumentation Response Time Testing (Finding 1)

The response time testing of the Isolation Groups 3 and 4 logic will be performed at the first Cold Shutdown condition no later than startup from the Spring 1994 Refueling Outage.

13. Average Power Range Monitor Logic System Functional Testing

As stated in the immediate corrective action section above, the CFT procedures for APRMs E and F were changed to include the required testing.

14. Average Power Range Monitor Flow Biased Simulated Thermal Power - High

As stated in the immediate corrective action section above, PPM 7.4.4.1.2 was changed to include the required Channel Check comparison of the expected drive flow signals to the drive flow input signal to each of the six APRMs.

15. Mechanical Vacuum Pump Trip and Isolation Testing

As stated in the immediate corrective action section above, procedures were changed to test the mechanical vacuum pump trip and isolation.

16. Reactor Building to Suppression Chamber Vacuum Breaker Valves

Surveillance procedures will be developed to satisfy the visual inspection requirements for valves CSP-V-5, 6, and 9. These procedures will be available for use during the Spring 1994 Refueling Outage to satisfy the Technical Specification visual inspection requirement.

17. Isolation Actuation Instrumentation Response Time Testing (Finding 2)

The required overlap testing will be included in the appropriate plant surveillance procedures prior to their use for the next required surveillance response time testing of the subject Isolation Groups 1, 2, 5, 6, 7, 8, and 9 logic.

18. Control Room Emergency Filtration Unit HEPA Filter Inspections

As discussed in the event description section above, PPM 7.4.7.2.2 was revised on June 30, 1986 to include all TSS 4.7.2.c.1 visual inspection criteria.

19. Isolation Actuation Instrumentation Response Time Testing (Finding 3)

The required overlap testing will be included in the appropriate plant surveillance procedures prior to their use for the next required surveillance response time testing of the subject Isolation Group 4 logic.

20. Response Time Testing of ECCS Instrumentation (Finding 1)

The procedures used to perform the LPCS and RHR instrumentation response time testing have been revised to meet the Technical Specification surveillance requirements. Complete response time testing of this instrumentation will be performed before startup from the next cold shutdown.

21. Response Time Testing of ECCS Instrumentation (Finding 2)

The procedures used to perform the HPCS instrumentation response time testing will be revised to meet the Technical Specification surveillance requirements before the next test, scheduled for the Spring 1994 Refueling Outage.

22. Service Water Valve Position Verification

PPMs 7.4.7.1.1.1, 7.4.7.1.1.2, and 7.4.7.1.2A have been changed to satisfy TSS Requirements 4.7.1.1.a and 4.7.1.2.a.

23. HPCS Injection Valve Instrumentation

PPM 7.4.3.3.2.27 will be changed by May 25, 1994 to satisfy TSS Requirement 4.3.3.2 and Table 3.3.3-1.C.1.c.

24. Reactor Core Isolation Cooling Instrumentation

Proper verification of RCIC-RLY-K40 contact actuation will be included in PPM 7.4.7.3.6 by June 15, 1994.

General Safety Significance

The Supply System regards the programmatic aspects of these items as an important issue that had potential safety significance. The General Corrective Actions listed above are defined to prevent recurrence of Technical Specification noncompliance problems in the future.

Specific Safety Significance

The Safety Significance was determined for each of the items discovered during the TSSIP procedure reviews. They are enumerated below in paragraphs corresponding to the event description above:

1. End-Of-Cycle Recirculation Pump Trip

A review of circuit breaker test procedures found that EOC-RPT breaker testing is inadequate to assure the RPT breaker trip and arc suppression response time meets the surveillance requirement. Breaker testing is performed by actuating TC-1. No procedures were found in the SMS data base that verify the characteristics of TC-2, which performs the EOC-RPT breaker trip safety function. The characteristics of TC-2 are assumed to be similar to TC-1 based upon previous operation of the EOC-RPT breaker trips during actual events. However, the breaker arc suppression response times using TC-2 have not been accurately measured to ensure they are within the plant design basis.

Consequently, this event was determined to have had potential safety significance since a delayed response time could have resulted in a delayed power reduction. Both EOC-RPT system channels were declared inoperable and the Plant remained in an LCO until corrective actions for this item were completed. See "Specific Further Corrective Actions" section for completed actions.

2. Turbine Governor Valve - Fast Closure

The EOC-RPT Turbine Governor Valve - Fast Closure system instrumentation CFTs are performed monthly and satisfy Surveillance Requirement 4.3.4.2.1 when at a reactor power level greater than or equal to 30%. The EOC-RPT safety function is automatically bypassed at a reactor power level of less than 30%. Worst case, the longest period of operation in a noncompliance condition was 30 days. This fact, combined with the testing that was performed and the redundancy of the associated instrumentation, provides a high degree of confidence that the system could perform its safety function. Accordingly, this event was determined to have had no safety significance.

3. Turbine Throttle Valve - Closure

The EOC-RPT Turbine Throttle Valve - Closure system instrumentation CFT is performed monthly and satisfies Surveillance Requirement 4.3.4.2.1 when both RRC pumps are in 60 Hertz operation. The RRC pumps are normally in 60 Hertz operation at a reactor power level greater than or equal to 30%. The EOC-RPT safety function is automatically bypassed at a reactor power level of less than 30%. Worst case, the longest period of operation in a noncompliance condition was 30 days. This fact, combined with the testing that was performed and the redundancy of the associated instrumentation, provides a high degree of confidence that the system could perform its safety function. Accordingly, this event was determined to have had no safety significance.

4. EOC-RPT System Instrumentation

Pressure switches MS-PS-3A, 3B, 3C, and 3D were being calibrated approximately every 18 months by the PM Program to assure proper setpoint. The EOC-RPT Turbine Governor Valve - Fast Closure system instrumentation CFTs are performed monthly and satisfy Surveillance Requirement 4.3.4.2.1 when performed at a reactor power level greater than or equal to 30%. The pressure switches do not have an EOC-RPT safety function at a reactor power level of less than 30%, but serve only as an automatic logic bypass. Worst case, the longest period of operation in a Technical Specification noncompliance condition was 30 days. This fact, combined with the testing that was performed and the redundancy of the associated instrumentation, provides a high degree of confidence that the system could perform its safety function. Accordingly, this event was determined to have had no safety significance.

5. IRM Negative Voltage Power Supply Not Tested

Plant Modification Request (PMR) 02-86-0204 added negative-voltage-low inoperative trips to each IRM and SRM chassis. Operability testing conducted during the design change process demonstrated that installed trips functioned as designed. The Supply System has no knowledge that these IRM trips have been inoperable, other than from a lack of LSFT testing, since the time of the modification. Since the testing performed indicates that the IRMs have been capable of performing their intended safety function, there is no safety significance associated with this event.

6. SRM Channel Count Rate

The Surveillance Requirement 4.9.2.c.1 SRM channel count rate verification noncompliance applied only to the "Prior to control rod withdrawal . . ." frequency. Plant Operators at WNP-2 performed the count rate verifications while in Mode 5 at eight hour shift intervals in accordance with Surveillance Procedure TSS 7.0.2. As a result, the longest period of noncompliance with the surveillance requirement was approximately eight hours. In addition, the SRM count rate

verification information, and the instrument calibration and test data do not show a high incidence of failure. Thus, the short intervals of noncompliance, the repetitive SRM channel verifications and testing that were performed, and the associated instrument channel redundancy combine to provide a high degree of confidence that the system could perform its safety function. Accordingly, this event was determined to have had no safety significance.

7. MSIV Closure Trip Bypass

Setting the MSIV closure-trip-bypass pressure switch setpoint slightly higher than 1037 psig would have resulted in a very brief delay of the reactor scram on MSIV closure. However, this trip is redundant to the reactor high pressure trip of 1037 psig, which cannot be bypassed by the reactor MODE switch. Additional protection is provided by the Main Steam Safety Relief Valves (MSRVs), which provide electrical and mechanical overpressure relief of the reactor pressure vessel. Therefore, the safety significance associated with this event is negligible.

8. Main Control Room Remote-Intake Radiation Monitor

The main control room remote-intake radiation monitors were deemed to be technically inoperable due to less than adequate channel check procedures. However, there was no reason to believe that these monitors were unable to perform associated functions; therefore, the safety significance associated with this event is negligible.

9. MSIV Closure Trip Function

The safety function of MSIV closure trip logic relays are for their contacts to open when the associated MSIV is not fully open. TSS 7.4.3.1.1.9 tests these relays every quarter to assure that they drop out. TSS 7.4.3.1.2.1 performs an LSFT at least annually to positively verify the relay contacts open to perform their trip and alarm functions. In addition, based on an equipment history review, there is no evidence of an incidence where these relays failed to drop out during testing or an identified condition where the contacts failed to open when the relay dropped out. This fact, combined with the testing that was performed and the redundancy of the associated instrumentation, provides a high degree of confidence that the system could perform its safety function. Accordingly, this event was determined to have had no safety significance.

10. RPS Turbine-Throttle Valve Closure

The RPS trip on Turbine-Throttle Valve Closure is designed to limit the reactor power transient on a turbine trip event. The testing that was performed verified that the subject relays deenergized on demand. Testing performed after this problem was found verified that the associated relay contacts opened as required when the relays deenergized. Since relay contact failure to open generally

continues until corrected, this verification testing provided evidence that the relays are and were capable of performing their intended safety function. Based on a review of the available evidence, the RPS trip on Turbine-Throttle Valve Closure was always capable of performing its intended safety function. Failure of this trip to function would result in a RPS trip on either APRM high neutron flux or Reactor Steam Dome Pressure - High. Therefore, this event is deemed to have had minimal safety significance.

11. Main Steam Isolation Valve Leakage Control System Pressure Indicating Switch

The MSLC system is only required to operate post LOCA. MSLC-PIS-60 is calibrated, including a CFT, on an annual basis. The pressure in the Main Steam lines downstream of the outboard MSIVs must be less than 41 psig before the system can be manually placed in service. There is no automatic start of the system. Finally, if the pressure switch fails to function as designed, the MSLC outboard depressurization line remains open for an indeterminate period of time. This line discharges into a normally unoccupied area in the Reactor Building and the effluent is processed by the Standby Gas Treatment (SGT) system. If depressurization of the Main Steam lines did occur but MSLC-PIS-60 did not sense this, the MSLC system would continue to draw a small vacuum on the Main Steam lines and to process the effluent through SGT, even though the depressurization line remained open. Therefore, failure to perform a CFT on a monthly basis is deemed to have had no safety significance since the consequences of failure are that MSLC would continue to allow the Main Steam line effluent to discharge into the Reactor Building which would then be processed through SGT, instead of MSLC discharging directly into SGT. SGT is designed to process both Reactor Building atmosphere and direct influents. Area Radiation Monitors would provide sufficient warning to plant personnel relative to potential high radiation conditions if the depressurization line remained open.

12. Isolation Actuation Instrumentation Response Time Testing (Finding 1)

A detailed evaluation was made of the impact of not having performed response time testing of the identified relays in the Isolation Groups 3 and 4 logic. The results of this evaluation were documented in the request for discretionary enforcement and the Technical Specification Amendment requests submitted on October 2, 1993. As stated above, the existing response time testing procedures measure the system response time from the sensed parameter through two (out of a total of nine in two channels and out of ten in the other two channels) relays per channel at the appropriate level of the system logic per division. In each case, these two relays that are response time tested are in parallel with, and of the same manufacturer and model type as the untested relays in each channel.

Each of the 19 relays, including those that were and those that were not response time tested, is functionally tested on at least an annual basis as part of the logic system functional test. Response time testing history for logic strings using the model of relay in question has confirmed the reliability and repeatability of these relays. There is no observed failure mode that has caused deterioration of the dropout time of these relays. Industry experience is that failure to function is the expected failure mode for these relays. Finally, the response time of the untested relays (approximately 110 milliseconds dropout time) is a small fraction of the Technical Specification required total time from initiation signal to valve closure (5 seconds or greater).

A failure to isolate the Group 3 and 4 containment isolation valves affected by this testing deficiency within the time frame specified in the Technical Specifications would result in the potential for release from the primary to the secondary containment. The valves in this group that communicate directly with the containment atmosphere are normally closed valves. The remaining valves are part of a closed system either inside or outside containment. A system failure would have to occur, concurrent with a LOCA, for a release to occur. In either case, the release would be to the secondary containment where the release would be processed through SGT.

Based on the successful functional testing that is performed for these relays on an annual basis, the history of consistent response time performance of the relays that were response time tested, the relatively small contribution the untested relays make to the total loop response times, and the insignificant effect on effluent release that a small increase in response time would induce, this event had minimal safety significance.

13. Average Power Range Monitor Logic System Functional Testing

The APRM E upscale trip deenergizes relays RPS-RLY-K12E and G. APRM F upscale deenergizes relays RPS-RLY-K12F and H. As shown by testing performed both before (as verified through the computer history of the most recent CFT results) and after this problem was discovered, the relays functioned as designed during testing but were not verified as part of previous testing. These same four relays are verified to function as part of the testing of the Intermediate Range Monitor (IRM) logic. The function of the APRMs was verified every three months during the CFT. Only deenergization of the two redundant relays went unverified.

As shown in Attachment 2, the APRM RPS scram logic is "one out of two taken twice" for each RPS Trip system (A and B). Both trip systems must trip to complete a reactor scram. As shown on Attachment 2, three of the four APRM upscale inputs for each Trip System were tested in accordance with the Technical Specification requirements. These three inputs for each Trip System will cause a reactor scram.

Since: 1) the APRMs were verified to function properly at a three month test interval; 2) the subject two relays were verified to function at least yearly as part of IRM testing; 3) the relays functioned when tested; and 4) failure of the APRM inputs not functionally tested as part of the Logic System Functional Test on a 18-month frequency would not by themselves impact the ability of RPS to perform its intended safety function, failure to test each of the APRM inputs and relay deenergization every 18 months had minimal safety significance.

14. Average Power Range Monitor Flow Biased Simulated Thermal Power - High

Each APRM receives a flow input signal based on a summation of the recirculation loop flows. There are four recirculation flow summer circuits. Each flow summer circuit continuously compares the unit output to the output of one of the other three flow units. If a flow mismatch of greater than 10% occurs, a control rod withdrawal block and associated alarm are received. This continuous comparison by the flow summer units is comparable to the daily Channel Check required by the Technical Specifications.

The flow signal inputs to the APRMs are calibrated on a weekly basis in accordance with Technical Specification 4.3.1.1-2.b. This calibration provides assurance that the flow signal input to the APRMs is accurate. The combination of the continuous flow unit comparator circuitry and the weekly calibration of the flow signal input to the APRMs results in minimal safety significance in not having performed a Channel Check of the APRM flow signal inputs on a daily basis.

15. Mechanical Vacuum Pump Trip and Isolation Testing

The MSLRM - High trip and isolation of the mechanical vacuum pumps was installed to limit the release of radiation from the main condenser to the environment. This function is credited for the design basis control rod drop accident. A redundant automatic isolation of the mechanical vacuum pump lines is provided by the radiation monitors on the vacuum pump exhaust lines. In addition, the MSLRMs provide an annunciator function. Operator action, as directed by the annunciator response procedure, would be to verify the mechanical vacuum pump trip and isolation.

Since the trip and isolation functions performed properly when tested on October 27, 1993, a redundant trip/isolation signal is available, and since the equipment would be isolated by an operator shortly after the automatic isolation signal, should the automatic isolation fail to occur, the offsite dose consequences of this event would be expected to be insignificant and this event is deemed to have had minimal safety significance.

16. Reactor Building - Suppression Chamber Vacuum Breakers

Valves CSP-V-5, 6, and 9 are 24 inch diameter butterfly valves. These valves are in series with 24 inch check valves CSP-V-7, 8, and 10. The check valves were visually inspected in accordance with the Technical Specification requirements. These valves and the in series check valves were periodically leak tested in accordance with the 10CFR50, Appendix J test program. Valves CSP-V-5, 6, and 9 were also cycled through one complete cycle on a monthly basis in accordance with Technical Specification requirement 4.6.4.2.b.1.a. Based on the testing performed, it is concluded that valves CSP-V-5, 6, and 9 were capable of performing their intended safety function. This event had no safety significance.

17. Isolation Actuation Instrumentation Response Time Testing (Finding 2)

The affected relays, which do not have a time-delay feature, are electro-mechanical plunger-type (Agastat) or plate-type (HFA and HMA) with no dash pot or other dampening of the armature. Degradation of these types of relays is typically evidenced by failure to function, rather than by degraded response times.

The subject relays are verified to function on a periodic basis. The logic channels to the relays are tested on a quarterly basis as part of the CFT. However, the CFT does not test each relay individually. A LSFT is performed on a refueling outage basis and verifies proper operation of the subject relays. Response time testing of the subject model relays in other response time tests demonstrates reliable and repeatable performance of these model relays. This testing also demonstrated that the response time was small enough that the total logic response time would be within the Technical Specifications.

The need to perform response time testing is discussed in the plant Technical Specification Bases, which states:

> "Except for the MSIVs, the safety analysis does not address individual sensor response times or the response times of the logic systems to which the sensors are connected.... It follows that checking the valve speeds and the 13-second time for emergency power establishment will establish the response time for the isolation functions. However, to enhance overall system reliability and to monitor instrument channel response time trends, the isolation actuation instrumentation response time shall be measured and recorded as a part of the ISOLATION SYSTEM RESPONSE TIME."

The portions of the isolation logic not previously response time tested were successfully tested. The combination of periodic functional testing of the subject relays, response time testing of similar relays, and industry and plant experience with these models of relays provides reasonable assurance that the relays were capable of performing their intended safety function. This event is deemed to have had no safety significance.

18. Control Room Emergency Filtration Unit HEPA Filter Inspections

Although the April 9, 1985 performance of PPM 7.4.7.2.2, Revision 0, did not include all aspects of the WMA-FU-54A and WMA-FU-54B HEPA Filter visual inspection as specified in TSS Requirement 4.7.2.c.1, the procedure did include an in-place functional test that demonstrated filter unit integrity and proper system operation. As previously stated, the October 2, 1986 performance of Revision 2 to the procedure included additional visual inspection steps that satisfied the surveillance requirement. During the performance of Revision 2, no visual inspection discrepancies were identified for either WMA-FU-54A or WMA-FU-54B. Except for the addition of carbon adsorber, no filtration unit maintenance was performed during the eighteen month period between the Revision 0 and Revision 2 inspections. Therefore, if Revision 0 had included the visual inspection steps required to satisfy TSS Requirement 4.7.2.c.1, no visual inspection discrepancies would have been identified. Accordingly, this event was determined to have had no safety significance.

19. Isolation Actuation Instrumentation Response Time Testing (Finding 3)

The affected relays, which do not have a time-delay feature, are electro-mechanical plunger-type (Agastat and Potter-Brumfield) or plate-type (HFA) with no dash pot or other dampening of the armature. Degradation of these types of relays is typically evidenced by failure to function, rather than by degraded response times.

Each of the subject relays is functionally tested on at least an annual basis as part of the LSFT and response time testing of the relays and contacts was successfully completed on December 18, 1993. Response time testing history for logic strings using the models of relays in question has confirmed the reliability and repeatability of these relays. There is no observed failure mode that has caused deterioration of the dropout time of these relays. Industry experience is that failure to function is the expected failure mode for these relays. Finally, the response time of the untested relays (approximately 110 milliseconds dropout time) is a small fraction of the Technical Specification required total time from initiation signal to valve closure (5 seconds or greater).

A failure to isolate the Group 4 containment isolation valves affected by this testing deficiency within the time frame specified in the Technical Specifications would result in the potential for release from the primary to the secondary containment. The valves in this group that interface

directly with the containment atmosphere are normally closed valves. The remaining valves are part of a closed system either inside or outside containment. A system failure would have to occur, concurrent with a LOCA, for a release to occur. In either case, the release would be to the secondary containment where the release would be processed through SGT.

Therefore, for the reasons stated above this event is deemed to have had no safety significance.

20. Response Time Testing of ECCS Instrumentation (Finding 1)

The relays that were not included in the response time testing are functionally tested during annual refueling outages. This functional testing provides periodic assurance that each circuit, including relays and contacts, will operate as required to perform its safety function. These relays are expected to have a response time of less than 0.5 seconds. The observed margins to the Technical Specification limits for the tested portions of the circuits ranged from 11 to 20.6 seconds. The additional time delay expected from the relays would result in a margin of at least 10 seconds. Due to the periodic functional testing performed on the relays and their small expected impact on the margin to Technical Specification limits, this event had no safety significance.

21. Response Time Testing of ECCS Instrumentation (Finding 2)

The relays that were not included in the response time testing are functionally tested during annual refueling outages. This functional testing provides periodic assurance that each circuit, including relays and contacts, will operate as required to perform its safety function. When these relays were tested on January 14, 1994, their combined response time was 100 milliseconds. Since the total HPCS response time of 22.4 seconds was within the Technical Specification limit of less than or equal to 27 seconds, this event had no safety significance.

22. Service Water Valve Position Verification

All of the safety-related equipment room coolers that are serviced by SSW and HPCSSW contain flow switches in the cooler flow path. These flow switches provide Control Room alarms in the event of a low flow condition. Thus, if the cooler isolation valves identified as requiring position verification had been improperly positioned, the resulting low flow alarm condition would have been addressed in accordance with the appropriate alarm response procedure.

Seal water cooling from the SW system is only required for the RHR pumps utilized for shutdown cooling because it is the only mode of operation where the pump seals are exposed to water hot enough to damage them. Since RHR-P-2C cannot be used in the shutdown cooling mode by design, cooling from the SW system is not required. Thus, the RHR-P-2C seal water cooler and the

associated isolation valves identified as requiring position verification do not perform an active safety function. Hence, the improper positioning of the pump seal water cooler isolation valves would not impact plant safety.

The CAC scrubber and aftercooler isolation valves are verified to be in their correct positions following each annual refueling outage in accordance with PPMs 2.3.3A, "CONTAINMENT ATMOSPHERIC CONTROL (DIV 1)," and 2.3.3B, "CONTAINMENT ATMOSPHERIC CONTROL (DIV 2)." In addition, the scrubber valves are verified for correct position at least quarterly in accordance with PPM 7.4.0.5.14, "CAC VALVE OPERABILITY," and SW flow is verified through the aftercooler valves at least every six months in accordance with PPMs 7.4.6.6.1.1, "CAC-HR-1A PREHEATER OPERABILITY TEST," and 7.4.6.6.1.2, "CAC-HR-1B PREHEATER OPERABILITY TEST." Furthermore, these valves are checked periodically for proper position by the System Engineer during system walkdowns. Based on the valve position and flow verifications that were performed and the system redundancy, there is a high degree of confidence that the CAC system would have performed its safety function.

Therefore, for the reasons stated above this event is deemed to have had minimal safety significance.

23. HPCS Injection Valve Instrumentation

HPCS is a part of the Emergency Core Cooling System (ECCS). Its purpose is to supply water to the reactor vessel over a wide range of accident conditions. For small-break LOCAs that do not result in rapid reactor depressurization, the system is designed to maintain reactor water level. For large breaks, the system provides core spray cooling. The ECCS has built in redundancy that is comprised of HPCS, LPCS, Automatic Depressurization System (ADS), and the RHR - Low Pressure Coolant Injection (LPCI) Mode. Failure of HPCS is bounded by the ECCS single failure analysis.

The conditions reported in this item did not result in an actual failure of HPCS during an event where it was required to operate. In addition, performance of PPM 8.3.320 verified that the HPCS-V-4 instrumentation logic, not previously tested, would have performed as designed if called upon. Therefore, based on the HPCS instrumentation testing that was performed and the redundancy of the ECCS, there is a high degree of confidence that the ECCS would have performed its safety function. Accordingly, this event is deemed to have had minimal safety significance.

24. Reactor Core Isolation Cooling Instrumentation

RCIC-RLY-K40 has been installed in the plant since initial plant startup with no failures or obvious degradation. On March 4, 1994, PPM 8.3.323 demonstrated that the relay would actuate to permit the RPV injection valve to automatically open on a RCIC initiation signal. Since the relay does not have a history of failures and continues to operate properly, there is a high degree of confidence that the relay would have performed its safety function when required. Accordingly, this event was determined to have had minimal safety significance.

Similar Events

LER 91-013 reported a total of 12 items of noncompliance with WNP-2 Technical Specifications. Following final submittal of the LER in August 1991, four additional LERs were submitted reporting similar events of noncompliance with Technical Specifications. LER 91-031 reported that IRM Control Rod Block Upscale and Downscale Trip surveillance procedures did not meet the CC surveillance requirements as defined by Technical Specifications. LER 92-004 reported that scram discharge volume scram and control rod block level instrumentation procedures did not meet the CFT surveillance requirements as defined by Technical Specifications. LER 92-035 reported that the scram discharge volume vent and drain valves surveillance procedure did not accurately measure stroke time as required by Technical Specifications. LER 92-040 reported that the monthly High Pressure Core Spray (HPCS) diesel generator surveillance procedure did not measure start and load times as required by Technical Specifications.

The TSSIP was initiated to ensure compliance with WNP-2 Technical Specifications through improvement of the Technical Specification Surveillance Testing Program. This LER reports items relating to previous program deficiencies, and is a direct result of the TSSIP implementation.

EIIS Information

Text Reference	EIIS Reference System	EIIS Reference Component
Reactor Protection System (RPS)	JC	---
Reactor Recirculation (RRC) Pump	AD	P
RRC Circuit Breaker RPT-3A, 3B, 4A, 4B	AD	BKR
Turbine Governor Valve	TA	V
Turbine Throttle Valve	TA	V
Main Turbine	TA	TRB
Main Steam (MS) Pressure Switch 3A, 3B, 3C, 3D	SB	PS

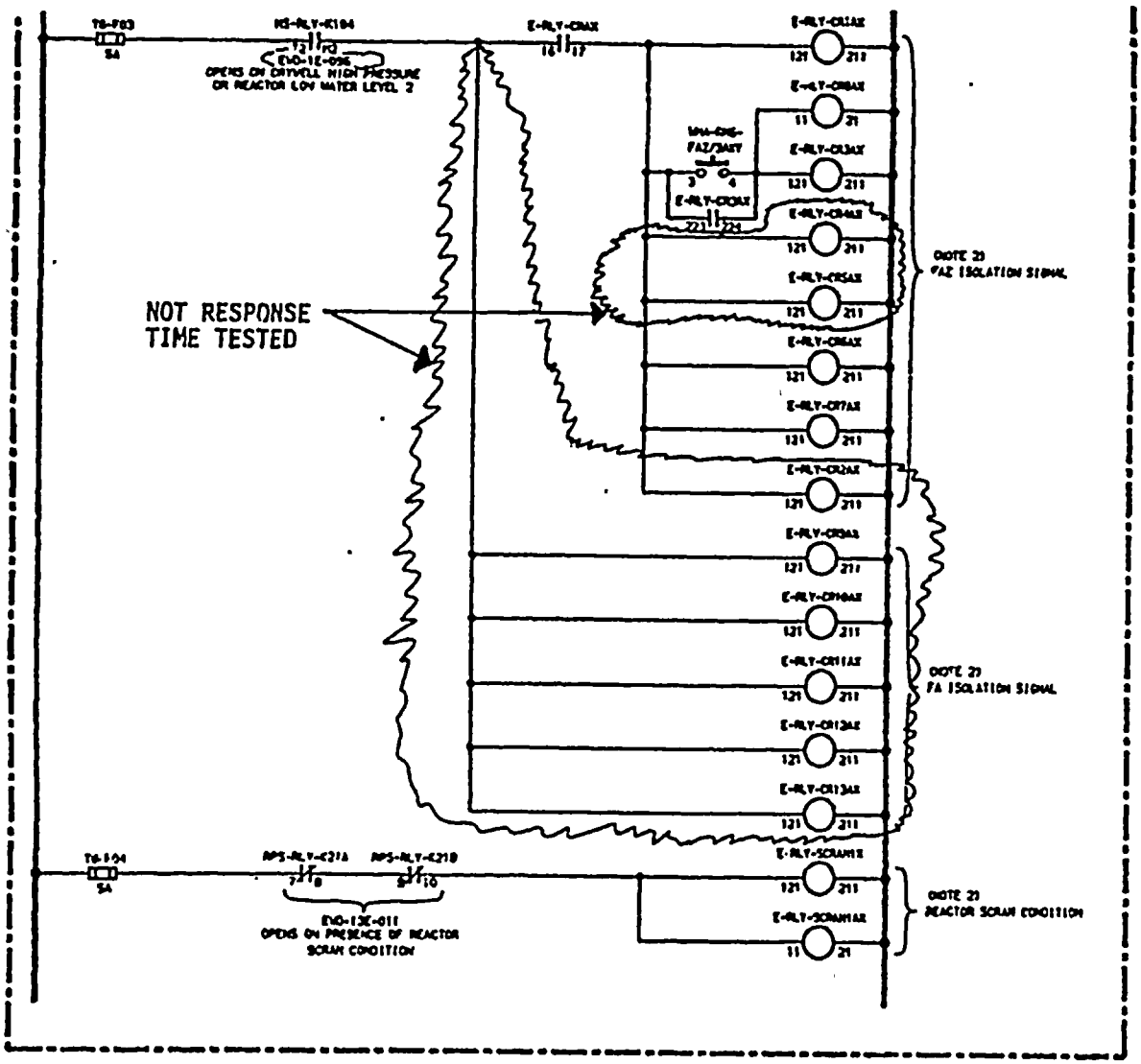
EIIS Information

Text Reference	EIIS Reference System	EIIS Reference Component
Intermediate Range Monitoring System (IRM)	IG	---
Source Range Monitoring System (SRM)	IG	---
Main Steam Isolation Valve (MSIV)	SB	V
Remote-Intake Radiation Monitor	IL	RE
Main Steam System (MS)	SB	---
MS-PS-32A (B,C,D)	SB	PS
WOA-RIS-31A(B), 32A(B)	VH	RIS
Main Steam Safety Relief Valves (MSRV)	MS	V
RPS-RLY-K3[A-H]	JC	RLY
RPS-RLY-K14[A-H]	JC	RLY
RPS-RLY-K10	JC	RLY
Main Steam Isolation Valve Leakage Control System (MSLC)	SB	---
Pressure Indicating Switch MSLC-PIS-60	SB	PIS
Standby Gas Treatment (SGT)	BH	---
MSLC Outboard Depressurization Valves	SB	ISV
Isolation Groups 1,2,3,4,5,6,7,8&9	BD	---
Average Power Range Monitor (APRM) Flow Biased Simulated Thermal Power - Upscale Logic	IG	DET
APRMs E and F	IG	DET
APRM Flow Biased Simulated Thermal Power - Upscale	IG	--
Main Steam Line Radiation Monitor (MSLRM)	IL	MON
Main Condenser	SD	COND
Mechanical Vacuum Pump	SH	P
Reactor Building to Suppression Chamber Vacuum Breakers (CSP-V-5,6&9)	BF	VACB
Isolation Instrumentation Logic Relays	JM	RLY
Control Room Emergency Filtration Units WMA-FU-54A & B	VI	AHU
HEPA Filters	VI	FLT
Standby Service Water (SSW) Valves	BI	V
High Pressure Core Spray Service Water (HPCSSW)	BI	V
Containment Atmospheric Control (CAC) System	BB	---
Residual Heat Removal (RHR) Pump (RHR-P-2C)	BO	P

EIIS Information

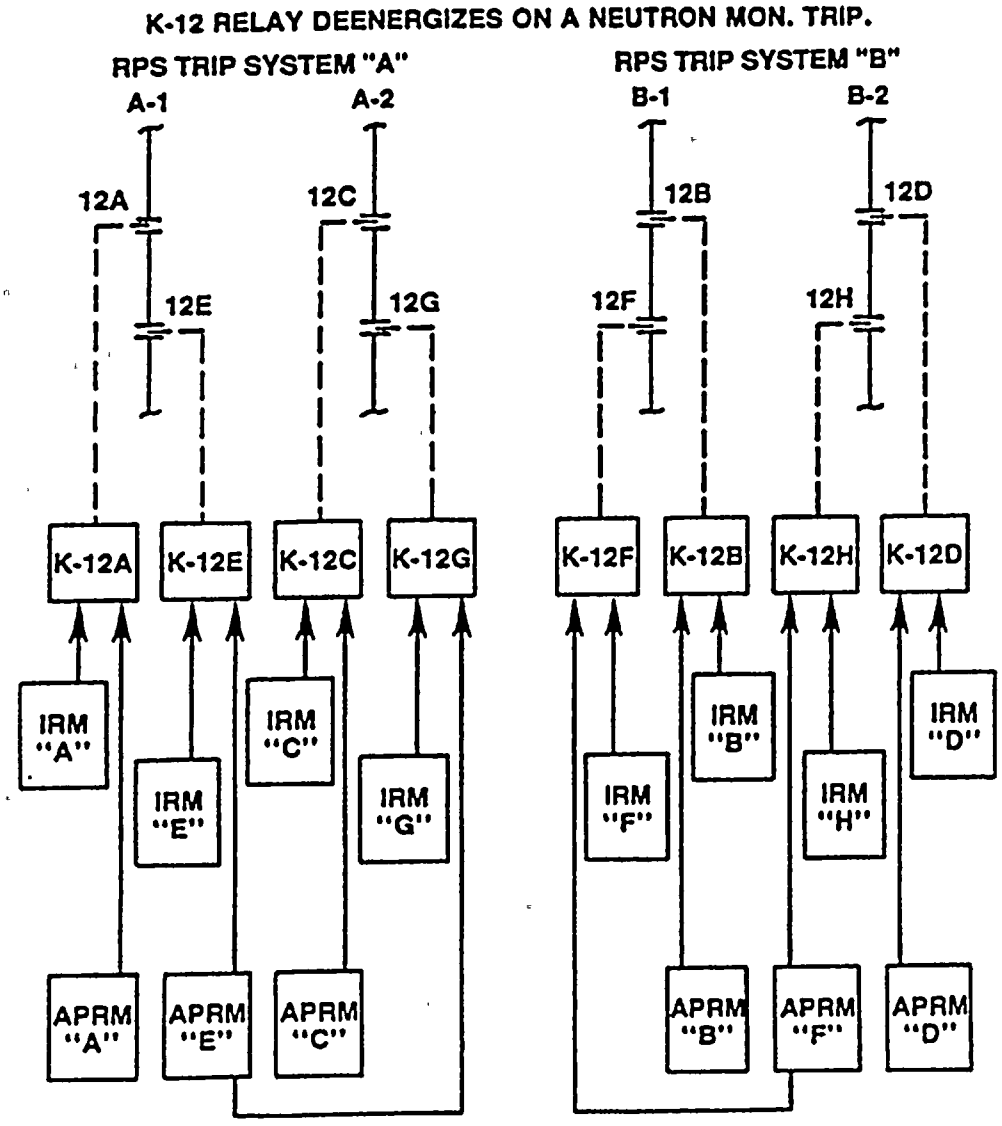
Text Reference	EIIS Reference System	EIIS Reference Component
High Pressure Core Spray (HPCS) Relay (HPCS-RLY-K13)	BG	RLY
HPCS-V-4	BG	20
Equipment Room Coolers	VA/VI/ MK	CLR
Reactor Core Isolation Cooling (RCIC) System	BN	---
Reactor Pressure Vessel Injection Valve (RCIC-V-13)	BN	V
RCIC Turbine Trip Valve (RCIC-V-1)	BN	V
RCIC Turbine Steam Supply Valve (RCIC-V-45)	BN	V
RCIC-RLY-K20 and K40	BN	RLY

ATTACHMENT 1



EXCERPT FROM DRAWING EWD-108E-001
"MISC EQPT SYS RELAY CABINET E-CP-RC/1 ISOLATION CONTROL RELAYS"

ATTACHMENT 2



SIMPLIFIED APRM/IRM RPS TRIP LOGIC

ATTACHMENT 3
ANSI N510 VISUAL INSPECTION REQUIREMENTS

ANSI N510-1975(1980)	PPM 7.4.7.2.2 Rev 0		
	Yes	No	N/A*
Mounting Frames:			
1. Continuous seal weld between members of frame and between frame and housing	X		
2. Structural rigidity		X	
3. Squareness of members, flatness and condition of component seating surfaces		X	
4. Damage to frames		X	
Filter Clamping Devices:			
1. Proper adjustment	X		
2. Sufficient number of devices to produce 50 to 80% compression	X		
3. Individual clamping of filter (adsorber) cells		X	
4. Proper condition of clamping devices		X	
5. Adequate clearances between filter (adsorber) elements to tighten clamping devices on all sides		X	
6. Full penetration in welds and freedom from crack of clamping devices		X	
HEPA Filters:			
1. Damage to filter media, case, case corners, on both faces of filters	X		
2. Damage to or improper seating of gaskets		X	
3. Burns of media or case from cutting or welding on both faces of filters	X		
4. Excessive dirt loading		X	

* Not applicable to WMA-FU-54A/B or need to be inspected only during initial acceptance test and/or after any system modification or repair.

ATTACHMENT 3
ANSI N510 VISUAL INSPECTION REQUIREMENTS

ANSI N510-1975(1980)	PPM 7.4.7.2.2 Rev 0		
	Yes	No	N/A*
Prefilters:			
1. Damage to media, case, or gaskets		X	
2. Excessive dirt loading		X	
Adsorbers:			
1. Damage to cells, including burns from welding or cutting operations in housing		X	
2. Individual clamping		X	
3. Condition of clamping devices		X	
Adsorbers: (continued)			
4. Condition of gaskets		X	
Lighting:			
1. Adequate for visual inspection of housing and components		X	
2. All lights lit (replace if out)		X	
3. Penetration of mounting frame by power or control conduits	X		
4. Vapor-tight globe, guard to protect globe from physical damage		X	
Housing:			
1. Adequate space for personnel and equipment for maintenance, testing			X
2. Reasonable access to housing			X

* Not applicable to WMA-FU-54A/B or need to be inspected only during initial acceptance test and/or after any system modification or repair.

ATTACHMENT 3
ANSI N510 VISUAL INSPECTION REQUIREMENTS

ANSI N510-1975(1980)		PPM 7.4.7.2.2 Rev 0		
		Yes	No	N/A*
3.	Space adjacent to housing amenable to isolation as a contamination zone, adequate space for temporary storage of clean and contaminated filters during filter change			X
4.	Doors of rigid construction with adequate seal between door and casing and opening outward on negative-pressure housing		X	
5.	Adequate latches on doors, with provision for opening from inside and outside of housing and provision for locking. Adequate sills		X	
6.	Adequate structural rigidity to resist undue flexure -reinforcing members on outside preferably			X
7.	Access to upper tiers with permanent service platform at approximately 6-foot level			X
8.	Adequate clearances for access between banks of components with door on each side of each bank			X
9.	No back-to-back installation components			X
10.	Proper location of tracer injection and sample points			X
11.	Adequate guards on fans located inside housing			X
12.	Housekeeping in and around housing		X	
Housing: (continued)				
13.	Condition of flexible connection between housing and fan external to housing			X
14.	Fan-shaft seal			X

* Not applicable to WMA-FU-54A/B or need to be inspected only during initial acceptance test and/or after any system modification or repair.

ATTACHMENT 3
ANSI N510 VISUAL INSPECTION REQUIREMENTS

ANSI N510-1975(1980)		PPM 7.4.7.2.2 Rev 0		
		Yes	No	N/A*
15.	Adequate dampers to prevent intake of air from adjacent housing or plenum during test, and to prevent bypassing of system			X
16.	Freedom from corridors, plenums, electrical conduits, connections, plumbing drains or other conditions that could result in bypassing of the system			X
Dampers:				
1.	Damage to or distortion of frame or blades		X	
2.	Bent shafts, pivot pins, or operator linkages		X	
3.	Missing seats or blade edging		X	
4.	Condition of resilient seats or edging		X	
Recheck:				
1.	Test equipment has been removed	X		
2.	All openings have been sealed	X		
3.	No damage to components from the test operation		X	

* Not applicable to WMA-FU-54A/B or need to be inspected only during initial acceptance test and/or after any system modification or repair.