NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

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

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TITLE (4)

Technical Specification Surveillance Requirement Implementation Deficiencies

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 NAME	DOCKET NUMBER
11	14	95	95	-- 033 --	14	12	23	96		05000
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9)	4	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)	0		20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)(B)		50.73(a)(2)(viii)
			20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
			20.2203(a)(2)(ii)		20.2203(a)(4)	X	50.73(a)(2)(iv)		OTHER
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
John Karrick, Hope Creek LER Coordinator	(609) 339-5298

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
D	CC	V	L200	Y						

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

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

LER 95-033-00 described two events that occurred due to identification of a Technical Specification (TS) surveillance test inadequacy. As stated in LER 95-033-01, supplements would be transmitted to document additional findings of the TSSIP team.

On November 21, 1996, two deficiencies were verified by the TSSIP team. First, was a failure to include time switches and annunciator logic in the Channel Calibration testing of the control panel instrumentation of the Containment Hydrogen Recombiner system. This resulted in a violation of the Surveillance Requirements of TS 4.6.6.1.b.1. Corrective actions include satisfactory completion of the required testing and permanent revisions to the implementation procedures. Second, was the discovery of non-conservative Rod Block Monitor (RBM) Low Power Bypass setpoints which resulted in violations of the Operability requirements of TS 3.1.4.3 and 3.3.6. The Channel Calibration procedures for the bypass setpoints allowed a calibration tolerance up to 32.79% power. The RBM system is required to be operable in Operational Condition 1 with power equal to or greater than 30%. Corrective actions include revisions to the setpoint calculation and channel calibration procedures. Both events had minimal safety significance.

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PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor (BWR/4)

Safety Auxiliaries Cooling System (SACS) - EIIS Identifier {CC}
Reactor Water Cleanup System (RWCU) - EIIS Identifier {CE}
4.16 KVAC - EIIS Identifier {EB}
Emergency Diesel Generator - EIIS Identifier {EK}
High Pressure Coolant Injection System - EIIS Identifier {BJ}
Average Power Range Monitor System - EIIS Identifier {IG}
Traversing Incore Probe - EIIS Identifier {IG}
Annunciator System - EIIS Identifier {IB}
Plant Protection System - EIIS Identifier {JC}
Containment Vacuum Relief System - EIIS Identifier {BF}
Low Voltage Power System - Class 1E - EIIS Identifier {ED}
Low Voltage Power System (600V and less) - EIIS Identifier {EC}
Medium Voltage Power System - Class 1E - EIIS Identifier {EB}
Medium Voltage Power System (601V through 35KV) - EIIS Identifier {EA}
Containment Atmosphere Control System - EIIS Identifier {VB}
Rod Block Monitoring System - EIIS Identifier {JD}

IDENTIFICATION OF OCCURRENCE

Discovery dates: 11/14/95, 12/12/95, 1/4/96, 2/26/96, 3/25/96, 3/29/96, 5/8/96, 5/10/96, 6/24/96, 6/25/96, 6/27/96, 7/8/96, 7/18/96, 7/19/96, 7/25/96, 7/26/96, 10/24/96, 11/8/96, and 11/21/96
ESF actuation date: 11/16/95
Problem Reports: 951114174, 951116123, 951212158, 960104265, 960226156, 960322230, 960326238, 960430230, 960509086, 960624084, 960625200, 960627098, 960708161, 960719224, 960718069, 960718139, 960725055, 960726084, 961015124, 961024254, 961107263, 961119241, and 961121269.

CONDITIONS PRIOR TO OCCURRENCE

For the events in this LER the plant was in various operational conditions.

DESCRIPTION OF OCCURRENCE

LER 95-033-00 described two events that occurred due to identification of a Technical Specification (TS) Surveillance Test inadequacy. This supplement rewrites the original LER to describe an additional occurrence of a TS surveillance implementation deficiency identified during the Technical Specification Surveillance Improvement Program (TSSIP) review.

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DESCRIPTION OF OCCURRENCE (Continued)

Undervoltage Relay Testing and ESF Actuation

On November 14, 1995, during the TSSIP review of TS 3.3.3, "Emergency Core Cooling System Actuation Instrumentation", it was determined that the undervoltage auxiliary relays were not adequately tested in accordance with the LOGIC SYSTEM FUNCTIONAL TEST (LSFT) requirements of TS 4.3.3.2. As a result, the vital bus undervoltage relays were declared inoperable, and the TS Action Statement was entered for the failure to perform the appropriate surveillance testing. The surveillance test was revised to address the concerns that TSSIP identified. On November 16, 1995, during the performance of the revised surveillance on the 'A' 4 kV vital bus, a bus transfer occurred at 0521. The 'A' Loss of Offsite Power (LOP) Sequencer initiated per plant design. A four-hour report was made to the NRC at 0841 in accordance with 10CFR50.72(b)(2)(ii).

RTD and T/C Channel Calibrations

On December 12, 1995, the TSSIP team determined that channel calibrations for the Reactor Water Cleanup System (RWCU) instrumentation, required by TS Table 3.3.2-1, were not being performed appropriately. Specifically, the RWCU ambient temperature instrumentation and differential temperature instrumentation channel calibrations have not included a sensor calibration as specified in TS Definition 1.4, CHANNEL CALIBRATION.

The RWCU instrumentation was not required to be operable at the time of discovery of the deficient surveillances and no TS Actions were required to be taken. However, this condition has existed since plant startup and TS Actions were not previously implemented as required by Table 3.3.2-1. Therefore, this condition is being reported under the provisions of 10CFR50.73(a)(2)(i)(B).

SACS Heat Exchanger Inlet Valve Surveillances

On January 4, 1996, the TSSIP team determined that the Safety Auxiliaries Cooling System (SACS) heat exchanger inlet valves EG-HV-2491 A&B and EG-HV-2494 A&B have not been tested in accordance with the requirements of TS surveillance requirement 4.7.1.1.b.1. This surveillance requirement specifies that at least once per 18 months, during shutdown, these valves actuate to their correct position on the appropriate test signal (i.e., a SACS pump start signal). At 1719 hours on January 4, 1996, the SACS heat exchanger inlet valves were declared inoperable and administratively controlled to ensure performance of the valves safety function until they were satisfactorily tested prior to leaving Operational Condition 4 (Cold Shutdown).

DESCRIPTION OF OCCURRENCE (Continued)

HPCI Valve Surveillances

On February 26, 1996, the TSSIP team determined that several High Pressure Coolant Injection (HPCI) system valves have not been periodically tested in accordance with TS surveillance requirement 4.5.1.c.2.b. This surveillance requirement states that, "At least once per 18 months, verify that the suction is automatically transferred from the condensate storage tank to the suppression chamber on a condensate storage tank water level-low signal and on a suppression chamber-water level high signal." Specifically, TSSIP determined that: 1) the HPCI system suppression pool suction valve (BJ-HV-F042) has not been verified to open on a suppression chamber-water level high signal; 2) the HPCI system condensate storage tank (CST) suction valve (BJ-HV-F004) has not been verified to close on a suppression chamber high water level signal; and 3) the HPCI full flow test line valve (BJ-HV-F011) has not been verified to close on a suppression chamber high water level signal. Since Hope Creek was in an Operational Condition where HPCI was not required to be operable, administrative controls were used until the valves were properly tested in accordance with the TS requirements prior to leaving Operational Condition 4 (Cold Shutdown).

Primary Containment Penetration Isolation Barrier Verification

On March 25, 1996, the TSSIP team determined that certain primary containment penetration test and drain valves were not periodically verified to be closed in accordance with the requirements of TS 4.6.1.1.b. This surveillance requirement states that, "At least once per 31 days (verify) that all primary containment penetrations not capable of being closed by OPERABLE containment automatic isolation valves and required to be closed during accident conditions are closed by valves...".

Specifically, TSSIP determined that several test and drain valves were omitted from the procedure that verifies primary containment integrity per TS 4.6.1.1.b. The valves were verified to be in their proper closed position and no additional TS actions were warranted. The procedure that verifies primary containment integrity for TS 4.6.1.1.b was revised to incorporate the excluded valves.

A review of all primary containment penetrations was completed on October 15, 1996 as a corrective action to the March 25, 1996 event. This review identified approximately 390 additional containment isolation valves, 14 hatches, and 4 blanked drain connections that had not been previously verified in accordance with TS 4.6.1.1.b. At 1228 on October 15, 1996 the Primary Containment was declared inoperable and the 24 hour delayed action provision of TS 4.0.3 was entered. An immediate verification of these components was performed and none were found out of position or missing. This verification was completed at 0229 on October 16, 1996 at which time the primary containment was declared operable and TS 4.0.3 was exited.

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DESCRIPTION OF OCCURRENCE (Continued)

APRM Surveillances

On March 29, 1996, tne TSSIP team determined that the Average Power Range Monitoring (APRM) system has not been appropriately tested in accordance with the Reactor Protection System Instrumentation TS Table 4.3.1.1-1.2.a and the Control Rod Block Instrumentation TS Table 4.3.6-1.2.d. Surveillance requirement 4.3.1.1. states that, "Each reactor protection system instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations for the Operational Conditions and at the frequencies show in Table 4.3.1.1-1." TS Table 4.3.1.1-1.2.a requires that the APRM Upscale, Setdown function undergo a Channel Functional Test once per week and a Channel Calibration once every six months during Operational Conditions 2 through 5 (STARTUP through REFUELING). Surveillance requirement 4.3.6 states that, "Each of the ... control rod block trip systems and instrumentation channels shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations for the Operational Conditions and at the frequencies shown in Table 4.3.6-1." TS Table 4.3.6-1.2.d requires that the APRM Neutron Flux - Upscale, Startup function undergo a Channel Functional Test quarterly and a Channel Calibration once every six months during Operational Conditions 2 and 5.

In the review of Hope Creek's implementation of these requirements, TSSIP determined that the Channel Calibrations (which are also credited to meet the Channel Functional Test requirements when they are performed) do not satisfy the requirements for a Channel Calibration or a Channel Functional Test as defined in the TS. Specifically, the surveillance test procedure for the APRM Channel Calibrations specifies the replacement of the K18 relays with test relays (required in order to perform the calibration during Operational Condition 1, POWER OPERATION). The removed K18 relays are re-installed at the conclusion of these tests; however, the K18 relays remain untested upon completion of the APRM Channel Calibration. Since the entire channel is not tested, the APRM Channel Functional Tests and Channel Calibrations have not been performed in accordance with the TS definitions 1.4 and 1.6. Since Hope Creek discovered this deficiency in an Operational Condition (POWER OPERATION) where these APRM functions are not required to be operable, administrative controls were implemented to ensure that this instrumentation is properly tested in accordance with the TS requirements when entering the Operational Conditions where it is required.

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DESCRIPTION OF OCCURRENCE (Continued)

RWCU Isolation Actuation Instrumentation Surveillances

On 5/8/96, the TSSIP team confirmed that the Reactor Water Cleanup (RWCU) system has not been appropriately tested in accordance with Isolation Actuation Instrumentation TS Table 4.3.2.1-1.4.a. TS Table 4.3.2.1-1.4.a requires that the RWCU differential flow isolation function undergo a quarterly Channel Functional Test during Operational Conditions 1 through 3 (POWER OPERATION through HOT SHUTDOWN). Specifically, the TSSIP team determined that the loss of power to the K6 relay for the Nuclear Measurement Analysis and Control (NUMAC) leak detection instrumentation has not been tested as required by the TS during the quarterly Channel Functional Tests.

The RWCU is designed such that a loss of power to the leak detection system will cause the respective containment isolation valve to close. The NUMAC leak detection monitor loss of power circuit has been functionally tested as part of the 18 month RWCU Logic System Functional Test (LSFT), which would also satisfy the TS requirement for a Channel Functional Test. The LSFT for this RWCU isolation actuation instrumentation was last completed on 11/9/95 for one division and 4/25/96 for the other division. Therefore, at the time the deficient RWCU Channel Functional Test procedures were identified, one RWCU instrumentation division had exceeded the specified 92 day surveillance interval for the Channel Functional Test and was declared inoperable. As a result, on 5/8/96, at 1158 hours, TS Action Statement 3.3.2.1.b.1.c was entered, which requires the inoperable channel to be placed in the tripped condition (closing the associated RWCU isolation valve) within 24 hours. By 2101 hours on 5/8/96, the inoperable RWCU isolation actuation instrumentation division had been appropriately tested and was returned to service. The action statement to close the affected isolation valve was not invoked.

On 5/10/96, the TSSIP team confirmed that the RWCU system has not been appropriately tested at the frequency specified by Isolation Actuation Instrumentation TS Table 4.3.2.1-1.4.e. TS Table 4.3.2.1-1.4.e requires that each channel of the Standby Liquid Control (SLC) system initiation RWCU isolation function undergo a Channel Functional Test during Operational Conditions 1, 2 and 5# (POWER OPERATION, STARTUP and REFUELING when SLC is required to be operable) every other 92 days. Specifically, the TSSIP team determined that the interval between these Channel Functional Tests has exceeded the 92 day frequency required by the TS. At the time this deficiency was discovered, the required Channel Functional Tests had been completed within the previous 92 days for both channels and the current operability of this isolation function was not affected. However, previous testing schedules did not support the required test frequency and therefore were not performed as necessary.

DESCRIPTION OF OCCURRENCE (Continued)

TIP Isolation Actuation Instrumentation Surveillances

On June 24, 1996, the TSSIP team determined that the Primary Containment Isolation due to High Drywell Pressure signal has not been appropriately tested in accordance with Isolation Actuation Instrumentation Table 4.3.2.1-1. TS Table 4.3.2.1-1, item 1.b, requires that the High Drywell Pressure isolation function undergo a quarterly Channel Functional Test during Operational Conditions 1 through 3 (POWER OPERATION through HOT SHUTDOWN). Specifically, the TSSIP team determined that a relay contact, which is part of the channel for the High Drywell Pressure withdrawal signal to the Traversing Incore Probes (TIP), was not being tested at the correct frequency. This function was tested as part of a Channel Calibration on January 25, 1995. However, at the time that the deficient Channel Functional Test procedure was identified, the 92 day surveillance interval had been exceeded. As a result, on June 24, 1996, at 1445 hours, TS Action Statement 3.6.3 was entered. These TS actions were complied with, and, after successfully performing the required surveillance test, the TS Action Statement was exited on June 25, 1996, at 0740 hours.

On June 27, 1996, the TSSIP team determined that the TIP withdrawal function is tested via an LSFT procedure; however, the LSFT does not completely test the TIP response to a primary containment NSSSS isolation signal. Therefore, the surveillance was not being appropriately conducted as required by TS 4.3.2.2. TS 4.3.2.2 requires an LSFT to be performed on an 18 month basis. Specifically, the LSFT did not include the withdrawal function of the TIP probe upon receipt of an isolation signal while the probe was being inserted into the core. As a result, TS Action Statement 3.6.3 was entered, the penetration was isolated, and the TIP system was restricted from use.

On July 17, 1996, after completion of the surveillance on the previously untested function, the TS Action Statement for TIP was exited. On July 19, 1996, Engineering documented a concern that the surveillance test that was conducted on July 17, 1996, which had tested the TIP withdrawal logic in the automatic mode, may not have been adequate to address all of the potential circuit paths on the logic card for the TIP withdrawal function. As a result, the TIP system was again declared inoperable. The surveillance test procedure was revised and the surveillance test was completed in the manual mode on July 26, 1996. A follow up investigation has concluded that the requirements of the LSFT were not completely fulfilled during the July 17, 1996 test. Specifically, not all potential circuit paths on the TIP withdrawal logic card were tested with the TIP mode of operation in automatic. Therefore, between July 17 and July 19, 1996, the TIP withdrawal and isolation function was inappropriately considered operable. As a result, the actions required by TS were not met and operation in a TS prohibited condition occurred.

DESCRIPTION OF OCCURRENCE (Continued)

Turbine Stop Valve Closure

On June 25, 1996, the TSSIP team determined that the Main Turbine Stop Valve Closure annunciation verification was not documented in the quarterly Channel Functional Test; however, it is documented as part of the 18 month Channel Calibration procedure. The Channel Calibration was last performed on March 6 and 7, 1996. At the time that the deficient Channel Functional Test procedure was identified, the 92 day surveillance interval, plus the 25% grace period, had not been exceeded. The required portion of the surveillance was completed prior to the expiration of the grace period. However, this event is being reported due to the lack of documentation of the annunciation for past surveillances.

Turbine Control Valve Fast Closure

On July 8, 1996, the TSSIP team determined that the Main Turbine Control Valve Fast Closure Trip Channel was not being tested in accordance with the requirements of TS Table 4.3.1.1-1, Reactor Protection System Instrumentation Surveillance Requirements. This TS Table requires the performance of a quarterly Channel Functional Test and an 18 month Channel Calibration of the Turbine Control Valve Fast Closure function. TS require both of these surveillances to include alarm functions. Contrary to this requirement, the contacts that actuate the Control Room annunciator for the Turbine Control Valve Fast Closure were not verified during the performance of the quarterly Channel Functional Test; however, these contacts are verified as part of the 18 month Channel Calibration procedures. The Channel Calibrations were last performed between December 4 and 8, 1995, which exceeds the 92 day surveillance interval plus the 25 % grace period allowed by TS 4.0.2. The most recent quarterly Channel Functional Test was performed on July 7, 1996. Documentation of the alarm function during this Channel Function Test was generated based on operator observation of the required alarm. This event is being reported due to the lack of documentation of the annunciation for previous surveillances.

Scram Discharge Volume Vent and Drain Valve Reactor Protection System Actuation

On July 18, 1996, the TSSIP team determined that the Reactor Protection System Instrumentation was not being tested in accordance with the requirements of TS 4.3.1.2. TS 4.3.1.2 requires the performance of an 18 month LSFT. The TS definition of an LSFT states "A LOGIC SYSTEM FUNCTIONAL TEST shall be 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." Contrary to this requirement, the relays and associated

DESCRIPTION OF OCCURRENCE (Continued)

contacts that actuate the Scram Discharge Volume (SDV) vent and drain valves following a scram signal from the Reactor Protection System Instrumentation were not individually verified during the performance of the 18 month Reactor Protection System Simulated Operation procedure; however, post maintenance testing following replacement of the majority of these relays during the last refueling outage tested and verified operability of a portion of the affected relays and associated contacts. As a result, at 1130 hours, TS Action Statement 3.3.1.b was entered and the associated instrumentation for those relays and contacts which were not tested were declared inoperable. In accordance with TS 4.0.3, "the ACTION requirements may be delayed for up to 24 hours to permit the completion of the surveillance when the allowable outage time limits of the ACTION requirements are less than 24 hours." A temporary procedure to test and verify operability of the untested portions of the SDV vent and drain valve logic was completed satisfactorily at 1910 hours on July 18, 1996. The associated instrumentation was declared operable and the LCO exited. Based upon this finding, it has been determined that the required testing was not performed in accordance with TS. This is reportable in accordance with 10CFR50.73(a)(2)(i)(B), as a condition prohibited by TS.

Scram Discharge Volume High Level Bypass Function Incomplete Logic System Functional Test:

On July 25, 1996, the TSSIP team identified to operators that the RPS Scram Discharge Volume (SDV) High Level Bypass function had not been completely tested in accordance with TS 4.3.1.2. This surveillance requirement specifies that "LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months".

Per the HCGS TS definition: "A LOGIC SYSTEM FUNCTIONAL TEST shall be 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 LOGIC SYSTEM FUNCTIONAL TEST may be performed by any series of sequential, overlapping or total system steps such that the entire logic system is tested." The portion of the SDV logic that was not tested were those contacts in the bypass logic that could have inhibited the SDV high level scram function when a bypass signal was not desirable.

This deficiency represents an incomplete LSFT and therefore a non-compliance with TS 4.3.1.2, which constitutes a condition prohibited by TS and is being reported pursuant to 10CFR50.73(a)(2)(i)(B). Upon notification of this deficiency, the SDV High Level trip function was declared inoperable and the provisions of TS 4.0.3. were entered at 1230 on July 25, 1996. Testing was satisfactorily completed at 2244 on July 25, 1996.

DESCRIPTION OF OCCURRENCE (Continued)

Incomplete 18 Month Visual Inspection of the Reactor Building to Suppression Chamber Vacuum Breaker Assemblies

On July 26, 1996, the TSSIP team identified to operators that TS Surveillance Requirement 4.6.4.2.b.2.b had not been completely fulfilled. This surveillance requirement states that both reactor building - suppression chamber vacuum breaker assemblies be demonstrated OPERABLE at least once per 18 months by visual inspection. TS 3.6.4.2 defines a vacuum breaker assembly as consisting of a vacuum breaker valve and a butterfly isolation valve. Previous procedures to fulfill this surveillance requirement included a visual inspection of the vacuum breaker valve; but not the inboard butterfly isolation valve. Failure to fulfill this surveillance requirement in the past resulted in a condition prohibited by TS and is being reported pursuant to 10CFR50.73(a)(2)(i)(B). Upon notification of this deficiency, the Reactor Building to Suppression Chamber Vacuum Breaker Assemblies were declared inoperable and the provisions of TS 4.0.3 were entered at 1030 on July 26, 1996. The inspections were completed satisfactorily at 1635 on July 26, 1996.

Class 1E Isolation Breaker Instantaneous Overcurrent Protective Device Testing

On October 24, 1996, the TSSIP team documented a deficiency in the performance of surveillance testing pursuant to TS 4.8.4.5.a. This surveillance requirement directs that each of the Class 1E isolation breaker overcurrent protective devices shown in Table 3.8.4.5-1 to be demonstrated OPERABLE at least once per 18 months and states "The instantaneous element shall be tested by injecting a current in excess of 120% of the pick-up value of the element and verifying that the circuit breaker trips instantaneously with no intentional time delay". Contrary to this requirement, previous tests of the instantaneous overcurrent devices were performed at approximately 113% of the pick-up value. As a result, at 1645 on October 24, 1996, the affected isolation breakers were declared inoperable and a 72 hour LCO was entered in accordance with TS 3.8.4.5.

The surveillance procedure, HC.MD-ST.ZZ-0006(Q), was revised, the affected isolation breakers were tested satisfactorily, and at 1712 on October 25, 1996, the LCO was exited.

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DESCRIPTION OF OCCURRENCE (Continued)

Incomplete Onsite Power Distribution System Voltage Verification

On November 8, 1996, the TSSIP team identified to Operations personnel that the Surveillance Requirements of TS 4.8.3.1 and 4.8.3.2 had not been completely fulfilled. These surveillance requirements direct that the power distribution system channels listed in the LCO be determined to be energized at least once per 7 days by verifying correct breaker/switch alignment and voltage on the busses/MCCs/panels. Although the applicable surveillance procedure did verify the correct breaker/switch alignment, it did not verify voltage on all of the specified busses/MCCs/panels. As a result, at 1100 on November 8, 1996, an LCO was entered for the Onsite Power Distribution Systems.

The surveillance procedure, OP-ST.ZZ-0001(Q), was revised, the affected busses/MCCs/panels were verified to have voltage available to them, and the LCO was exited at 1009 on November 9, 1996.

Incomplete Channel Calibration of Containment Hydrogen Recombiner Instrumentation

On November 21, 1996, the TSSIP team concluded that procedures credited for fulfilling the surveillance requirements of TS 4.6.6.1.b.1. did not include all of the required testing. TS 4.6.6.1.b.1. applies to the Containment Hydrogen Recombiner subsystem of the Containment Atmosphere Control system. This Specification requires that each Containment Hydrogen Recombiner system be demonstrated Operable at least once per 18 months by performing a Channel Calibration of all Recombiner control panel instrumentation and control circuits. Procedures HC.IC-CC.GS-0007(Q) and HC.IC-CC.GS-0008(Q) did not include a functional test of the time switches and associated annunciators for the Low Flow and Low Reaction Chamber Temperature circuits.

A review of work order and preventative maintenance (PMs) records revealed 72-month PM tasks that include the functional testing of these circuits. These tasks had been generated in January, 1996, as a result of a review of vendor PM frequencies and component work order history. The PM for the "B" Recombiner had been performed on August 30, 1996, but had not been completed for the "A" Recombiner. As a result, at 1800 on November 21, 1996, the "A" Containment Hydrogen Recombiner was declared inoperable and a 30 day LCO was entered pursuant to TS 3.6.6.1.

Testing of the time switches and associated annunciation to fulfill the TS Channel Calibration requirements was completed for the "A" Recombiner on November 24, 1996, and at 0150 the system was returned to service and the LCO exited.

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DESCRIPTION OF OCCURRENCE (Continued)

Non-Conservative Rod Block Monitor Low Power Bypass Setpoints

During TSSIP review of Channel Calibration procedures HC.IC-CC.SE-0019(Q) and HC.IC-CC.SE-0020(Q) for the Nuclear Instrumentation System, it was concluded on November 21, 1996, that the Rod Block Monitoring (RBM) System Low Power Bypass setpoints were non-conservative. These calibration procedures specify a setpoint of 30% of Rated Thermal Power (RTP) but allow an acceptable calibration tolerance of up to 32.79% to account for instrument accuracy. The Applicability Statement for TS 3.1.4.3 requires both RBM channels to be Operable in Operational Condition 1, when thermal power is greater than or equal to 30% of Rated Thermal Power. In addition, TS 3.3.6, Control Rod Block Instrumentation, requires the control rod block instrumentation channels shown in Table 3.3.6-1 to be operable with their trip setpoints set consistent with the values shown in the trip setpoint column of Table 3.3.6-2. For the RBM, the Upscale, Inoperative, and Downscale trips are the listed trip functions. The Applicable Operational Conditions column of Table 3.3.6-1 for these RBM trip functions also requires these functions to be operable in Operational Condition 1 with thermal power greater than or equal to 30% of RTP.

The low power bypass logic for the RBM consists of both a trip and a reset value that is recorded during the channel calibration. The trip setpoint is the value at which the RBM first becomes bypassed when reducing power. The reset value is the power level at which the RBM becomes un-bypassed when increasing power. A review of previous calibration data indicates that the trip setpoint was correctly set at powers less than or equal to 30%. However, the reset value, which incorporates an approximate 2.5% dead band or hysterisis, had typically been set at an average of 32.5% for both channels. Therefore, during previous plant startups, the RBM remained in a bypassed state up to the reset value which was in excess of that allowed by TS.

The "B" RBM has been determined to presently have a bypass reset value of 32.49% based on recent calibration data. The "A" RBM reset value is assumed to be at 32.50% based on an average of previous calibrations. At the time of discovery of this deficiency, the plant was in Operational Condition 1 at 100% power. Both channels of RBM are considered operable at power levels above 33%. A tracking LCO has been entered to ensure the appropriate TS actions are taken in the event of a reactor downpower prior to revising the low power bypass setpoint calculation and re-calibrating the RBM channels.

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ANALYSIS OF OCCURRENCE

As a Corrective Action from LER 95-017, a Technical Specification Surveillance Improvement Program (TSSIP) had been initiated. The charter of this project is to compare the TS surveillance requirements (with the exception of the Technical Specification 4.0.5 requirements) to the established surveillance procedures to verify that all requirements are met.

Undervoltage Relay Testing and ESF Actuation

During TSSIP review of TS 3.3.3, "Emergency Core Cooling System Actuation Instrumentation", it was determined that individual contacts, and their configuration, from the undervoltage auxiliary relays and the degraded voltage relays were not tested in accordance with the LSFT requirements of TS 4.3.3.2. These contacts are for the load shedding of major 4.16 kV loads of the vital bus, incoming feeder breaker trips and lock outs, diesel generator start permits, and input to the load sequencer. The LSFT is required to be performed at least once per 18 months.

On November 15, 1995 both the degraded voltage and the bus undervoltage surveillance procedures were revised to incorporate the contacts and wiring that needed to be tested to satisfy the TS surveillance testing.

While testing the 'A' Vital Bus (10A401), a bus transfer occurred when the technician inadvertently touched an adjacent terminal. The bus transfer performed as designed. The 'A' Loss of Offsite Power (LOP) Sequencer initiated per plant design. The affected systems performed as expected. Testing was terminated and subsequently was successfully completed.

ANALYSIS OF OCCURRENCE (Continued)

RTD and T/C Channel Calibrations

In December 1995, the TSSIP reviewed the implementing procedures for surveillance requirements associated with the RWCU system. The suction line (reactor coolant pressure boundary portion) of the RWCU system contains two motor operated isolation valves that automatically close in response to, among other signals, RWCU equipment compartment high ambient temperature and high differential temperature across the RWCU equipment compartment ventilation ducts. The event concerned the channel calibrations performed for these signals.

In the past, channel calibrations for instrument channels having resistance temperature detector (RTD) or thermocouple (T/C) sensors have been completed by performing an in-place qualitative assessment of sensor behavior and normal calibration of the remaining adjustable devices in the channel. This test methodology is consistent with standard industry practice and has been considered to satisfy the surveillance requirements.

However, the TSSIP team determined that these surveillance procedures were inconsistent with the literal requirements specified in TS 1.4, CHANNEL CALIBRATION, which requires calibration of the sensor regardless of whether the channel has an RTD or T/C sensor. Unlike other nuclear plant TS, there is no qualifying TS Table notes in the Hope Creek TS to exempt RTDs and T/Cs from the sensor calibration requirements.

The qualifying note was added to other plant's TS since calibration of RTDs and T/Cs cannot usually be performed in place. Removal and subsequent re-installation of the sensors introduces a potential for an undetectable failure and alarm considerations that outweighs the benefits of the sensor calibration. In lieu of sensor calibration, an in-place qualitative assessment of sensor behavior is performed. This position was adopted in NUREG-1433, "Improved Standard Technical Specifications for General Electric BWR/4 Plants."

Failure to appropriately perform the surveillances for the RWCU instrumentation requires entry into the TS Action Statement specified in Table 3.3.2-1. Since this did not occur, this event is reportable under the provisions of 10CFR50.73(a)(2)(i)(B).

ANALYSIS OF OCCURRENCE (Continued)

Additional review performed by the TSSIP identified that this condition exists for all of the RTD and T/C sensors for instrumentation listed in TS Table 4.3.2.1-1, Isolation Actuation Instrumentation Surveillance Requirements, Table 4.3.7.4-1, Remote Shutdown Monitoring Instrumentation Surveillance Requirements and Table 4.3.7.5-1, Accident Monitoring Instrumentation Surveillance Requirements. The affected instrumentation was not required to be operable at the time of discovery of the deficient surveillances and no TS Actions were required to be taken. However, this condition has also existed since plant startup and TS Actions were not previously implemented. This condition is also being reported under the provisions of 10CFR50.73(a)(2)(i)(B).

SACS Heat Exchanger Inlet Valve Surveillances

In January 1996, the TSSIP team determined that TS surveillance requirement 4.7.1.1.b.1 has not been performed for the SACS heat exchanger inlet valves. The SACS is designed to provide cooling water to the engineered safety feature equipment, including the residual heat removal heat exchangers, during normal operation, normal plant shutdown, loss of offsite power and loss of coolant accident conditions. Failure to demonstrate that the SACS heat exchanger inlet valve actuates to the open position upon its associated pump start signal at the specified TS frequency and Operational Condition requires entry into the SACS Action Statement for LCO 3.7.1.1, "with both SACS subsystems inoperable, immediately initiate measures to place the unit in at least Hot Shutdown within the next 12 hours." Since this did not occur, this event is reportable under the provisions of 10CFR50.73(a)(2)(i)(B).

HPCI Valve Surveillances

On February 26, 1996, TSSIP determined that TS surveillance requirement 4.5.1.c.2.b had not been performed for several HPCI valves. Failure of the surveillance test procedures to require verification of the automatic alignment of the subject HPCI valves has existed since initial plant startup. HPCI is designed to provide make-up during a small break Loss of Coolant Accident (LOCA). HPCI may be used for reactor vessel inventory or pressure control whenever the reactor vessel is pressurized and isolated from the feedwater and/or main steam system. The HPCI pump normally draws water from the CST and discharges to the core spray and feedwater system piping. A full flow test line (back to the CST) is provided on the HPCI pump discharge line to allow testing of the system during normal plant operations without injecting water into the reactor vessel.

ANALYSIS OF OCCURRENCE (Continued)

Surveillance test procedures have not required verification of the automatic actuation capability of the subject HPCI valves. Failure to perform these surveillances in accordance with the frequency specified in the TS requires actions to be taken to enter at least Hot Shutdown within 12 hours after the allowed outage time expires. Since these actions were not taken, a condition prohibited by the TS occurred, which is reportable under the provisions of 50.73(a)(2)(i)(B).

Primary Containment Penetration Isolation Barrier Verification

On March 25, 1996, TSSIP determined that TS surveillance requirement 4.6.1.1.b had not been performed for several primary containment penetration test and drain valves. Failure of the surveillance test procedure to verify all primary containment penetration valves has existed since initial plant start-up. Since the surveillance test procedures did not require verification of all the primary containment penetration valves, the missed TS surveillance is reportable under the provisions 10CFR50.73(a)(2)(i)(B).

As a corrective action from the March 25, 1996 discovery, a review was completed of all Primary Containment Isolation Barriers which resulted in the numerous additional components that were reported on October 15, 1996.

Prior to implementation of this follow up review, there was no accurate list of which components needed to be verified to satisfy TS 4.6.1.1.b. During this review, interpretations varied regarding which components within extended containment boundaries required verification per TS 4.6.1.1.b. These differences resulted in several different revisions to this list and delayed completion of the project. A revised position document provided by the TSSIP team clarified the differences in interpretations with conservative guidance to include a second isolation barrier within extended containment boundaries.

APRM Surveillances

On March 29, 1996, TSSIP determined that Channel Functional Tests and Channel Calibrations for the APRM Reactor Protection System and Control Rod Block Instrumentation functions have not been performed in accordance with the TS definitions 1.4 and 1.6. This condition has existed since initial plant startup whenever an APRM Channel Calibration was performed. The APRMs monitor and record average core power between 0 and 125% of rated power and initiate protective actions should core power exceed specified setpoints. The APRMs provide reference core power signals and rod motion permissive signals to the Rod Block Monitor and the Reactor Manual Control

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ANALYSIS OF OCCURRENCE (Continued)

System. They also generate a scram signal in response to average neutron flux increases from abnormal operating transients. Since the APRMs have not been properly tested, the APRM channels could not be considered operable in Operational Conditions 2 through 5. When the Reactor Mode Switch has been in the STARTUP, SHUTDOWN or REFUELING positions, it was possible to have an undetected circuit failure where the K18 relay contacts remain closed regardless of Reactor Mode Switch position. In this situation, the APRM setdown setpoints would not be placed in effect; however, the probability of this type of failure occurring is very low since the Reactor Mode Switch contacts and K18 relays have been tested during performance of weekly surveillance testing and the K18 relay contacts open when the relay is de-energized (the fail safe position). With the K18 relay contacts closed, the flow biased trip would be in effect.

During the TSSIP investigation of this issue, deficiencies in the operating procedures were identified relative to scheduling of the APRM Channel Functional Tests. TSSIP determined that Hope Creek does not have sufficient procedural controls in-place to ensure that APRM Channel Functional Tests are completed within seven days prior to entry into other Operational Conditions from Operational Condition 1. This may have resulted in Operational Condition changes (plant scrams in particular) being made without the provisions of TS 3.0.4 and/or 4.0.4 being satisfied for the APRMs. This condition has also been determined to exist for the Intermediate Range Monitors (IRMs) and Source Range Monitors (SRMs). Since Hope Creek discovered this deficiency in an Operational Condition (POWER OPERATION) where the IRM and SRM functions are not required to be operable, guidance was provided to the operators to ensure that this instrumentation is properly tested in accordance with the TS requirements when entering the Operational Condition where it is required. Failure to perform these required surveillances would have required (among other actions) that the Reactor Mode Switch be locked in the Shutdown position within 1 hour after leaving Operational Condition 1. On April 10, 1996, guidance was provided to the operating shift crews to ensure that the appropriate TS actions are taken for this instrumentation until the required surveillances are completed. Subsequent Channel Functional Tests for this instrumentation have demonstrated its operability in Operational Conditions 2 through 5, but may not have been performed within the time specified in the TS relative to Operational Condition changes.

ANALYSIS OF OCCURRENCE (Continued)

RWCU Isolation Actuation Instrumentation Surveillances

On 5/8/96, TSSIP determined that Channel Functional Tests for the RWCU isolation actuation instrumentation had not been performed in accordance with the TS Definition 1.6. In addition, on 5/10/96, TSSIP determined that the Standby Liquid Control (SLC) system initiation RWCU isolation function has not been tested at the frequency specified in the TS. Failure to perform these surveillances in accordance with the TS requires actions to close the affected RWCU isolation valves and declare the RWCU inoperable after the allowed outage time expires. Since these actions were not taken, a condition prohibited by the TS occurred, which is reportable under the provisions of 50.73(a)(2)(i)(B)

TIP Isolation Actuation Instrumentation Surveillances

On June 24, 1996, TSSIP determined that the Channel Functional Test for the Primary Containment Isolation due to High Drywell Pressure signal had not been appropriately tested. Failure to properly perform this testing resulted in a condition prohibited by TS and is being reported pursuant to 10CFR50.73(a)(2)(i)(B).

On June 27, 1996, TSSIP determined that the TIP withdrawal function was not completely tested. On July 17, 1996 the withdrawal and isolation function was tested with the TIP system in the automatic mode of operation and the LCO was exited. The adequacy of this test was later questioned through follow up reviews by the system manager and by an NRC inspector. As a result, on July 19, 1996, the TIP isolation function was again declared inoperable and TS LCO 3.3.2 entered. The TIP isolation function was subsequently satisfactorily re-tested in the manual mode on July 26, 1996.

Since that time, a follow up investigation has concluded that testing the TIP withdrawal logic in the manual mode in the forward direction is the optimum test method. The testing performed in the automatic mode on July 17, 1996 did not assure operability of the TIP withdrawal and isolation function because not all portions of the logic up to and including the actuating device was tested. Therefore, the restoration of the TIP withdrawal and isolation function to an operable status on July 17, 1996, was inappropriate. As a result, the actions required by TS were not met and operation in a TS prohibited condition occurred.

Turbine Stop Valve Closure

On June 25, 1996, TSSIP determined that the Main Turbine Stop Valve Closure annunciation was not documented in the quarterly Channel Functional Test. The surveillance was not overdue at the time that this discrepancy was discovered. However, this event is being reported due to the lack of documentation of the annunciation for past surveillances.

ANALYSIS OF OCCURRENCE (Continued)

Turbine Control Valve Fast Closure

On July 8, 1996, TSSIP determined that the Main Turbine Control Valve Fast Closure annunciation was not documented for the quarterly Channel Functional Test. Documentation of the alarm function during the most recent Channel Function Test was generated based on operator observation. Therefore, the alarm function is considered to be operable. This issue is being reported under the provisions of 50.73(a)(2)(i)(B) as a condition prohibited by the TS due to the lack of documentation for previous surveillances.

Scram Discharge Volume Vent and Drain Valve Reactor Protection System Actuation

On July 18, 1996, TSSIP determined that the LSFTs for the Reactor Protection System Instrumentation functions have not been performed in accordance with the TS definition of an LSFT. The logic for the SDV vent and drain valves contains twenty (20) contacts and four (4) relays. There are four (4) contacts in each of the four (4) Reactor Protection System subsystems arranged in a one-out-of-two-taken-twice logic pattern. Each of the four (4) subsystems actuates a relay, which changes the state of a contact in a one-out-of-two-taken-twice logic pattern that controls the position of the SDV vent and drain valves. The Reactor Protection System Simulated Operation procedure, used to satisfy the requirements of the LSFT, verifies the functionality of the SDV vent and drain valves but did not test each individual relay and contact to verify operability of the redundant logic paths.

The redundant logic paths for the automatic closure of the SDV vent and drain valves in response to a Reactor Protection System Instrumentation scram signal were not adequately tested. This condition has existed since initial plant startup whenever a Reactor Protection System Instrumentation LSFT was performed. Failure to perform these surveillances resulted in a condition prohibited by TS and is being reported pursuant to 10CFR50.73(a)(2)(i)(B).

Scram Discharge Volume High Level Bypass Function Incomplete Logic System Functional Test

The HCGS TS definition of an LSFT includes the requirement for testing of all relays and contacts of a logic circuit. For bypass functions, Generic Letter 96-01 and its related workshop summary documents state that contacts in the logic circuit whose failure could affect the safety function are required to be tested. Previously performed SDV High Level Channel Calibration testing ensured that the bypass function was not inhibiting the scram function, but due to the configuration of this logic, credit could not be taken for verifying each of the contacts in the bypass logic.

ANALYSIS OF OCCURRENCE (Continued)

Incomplete 18 Month Visual Inspection of the Reactor Building to Suppression Chamber Vacuum Breaker Assemblies

TS Surveillance Requirement 4.6.4.2.b.2 states that both reactor building-suppression chamber vacuum breaker assemblies be demonstrated OPERABLE at least once per 18 months by visual inspection. TS 3.6.4.2 defines a vacuum breaker assembly as consisting of a vacuum breaker valve and a butterfly isolation valve. Previous procedures to fulfill this surveillance requirement included a visual inspection of the vacuum breaker valve; but not the inboard butterfly isolation valve.

Class 1E Isolation Breaker Instantaneous Overcurrent Protective Device Testing

TS 4.8.4.5.a requires each of the Class 1E isolation breaker overcurrent protective devices shown in Table 3.8.4.5-1 to be demonstrated OPERABLE at least once per 18 months and states "The instantaneous element shall be tested by injecting a current in excess of 120% of the pick-up value of the element and verifying that the circuit breaker trips instantaneously with no intentional time delay". Contrary to this requirement, previous tests of the instantaneous overcurrent devices was performed at approximately 113% of the pick-up value. The value of 113% is consistent with vendor (General Electric) recommendations which had been incorporated into surveillance test procedure HC.MD-ST.ZZ-0006(Q). The procedure history for this test indicates that this discrepancy between the TS value and the procedure has existed since initial plant startup.

Incomplete Onsite Power Distribution System Voltage Verification

TS 4.8.3.1 and 4.8.3.2 require that the power distribution system channels, listed in the LCO, be determined to be energized at least once per 7 days by verifying correct breaker/switch alignment and voltage on the busses/MCCs/panels. These surveillances verify that the Onsite Power Distribution Systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence of the electrical busses are maintained, and that voltage is available to each required bus. The verification of voltage availability on the busses ensures that power is readily available for motive and control functions for critical system loads connected to these busses.

Although the applicable surveillance procedure did verify the correct breaker/switch alignment, it did not verify voltage on all of the specified busses/MCCs/panels. The surveillance procedure, OP-ST.ZZ-0001(Q), was revised and the affected busses/MCCs/panels were verified to have voltage available to them. The procedure history for this surveillance indicates that this discrepancy has existed since initial plant startup.

ANALYSIS OF OCCURRENCE (Continued)

Incomplete Channel Calibration of Containment Hydrogen Recombiner Instrumentation

The TS definition of a Channel Calibration and the TS 4.6.6.1.b.1. Surveillance Requirement indicate that the time switches and annunciation circuitry should have been included in this test procedure. A review of the previous revisions to implementation procedures, HC.IC-CC.GS-0007(Q) and 0008(Q), verified that these circuits were never included in the procedures.

At the time of discovery, the 18 month Surveillance Requirement of TS 4.6.6.1.b.1. for the "B" Recombiner had been completed through the PM activity completed on August 30,1996. This ensured Operability of the "B" Recombiner and avoided an entry into TS 3.0.3. The TS Action Statement for the "A" Recombiner was entered on November 21, 1996 and the surveillance testing was successfully completed on November 24, 1996.

Non-Conservative Rod Block Monitor Low Power Bypass Setpoints

The low power bypass logic for the RBM consists of both a trip and a reset value that is recorded during the channel calibration. The trip setpoint is the value at which the RBM first becomes bypassed when reducing power. A review of previous calibration data indicates that the trip setpoint was correctly set at powers less than or equal to 30%. The reset value, which incorporates an approximate 2.5% dead band or hysterisis, had been set at an average of 32.5% for both channels. Therefore, during previous plant startups, the RBM remained in a bypassed state up to the reset point which was in excess of that allowed by TS.

The setpoint calculation (SC-SE-0017) and the Channel calibration procedures were originally developed from the GE design documents for the RBM system. These GE documents had listed the RBM Low Power Bypass setpoint as a nominal setpoint of 30% of RTP. However, this was in reference to the trip setpoint not the reset value. Additionally, there was no "allowable value" listed nor was there other data provided to account for accuracy, calibration, drift, or the dead band for the bypass setpoint. Revision 0 of the setpoint calculation dated February 5, 1986, incorporated the 30% nominal setpoint, which was then referenced in the initial development of the channel calibration procedures. Based on the preceding, this procedural deficiency has existed since initial plant startup.

APPARENT CAUSE OF OCCURRENCE

The apparent cause of these TSSIP identified missed/deficient surveillance tests is ineffective procedures/inadequate review of the surveillance activities intended to satisfy Hope Creek's TS during the near-term operating license stage in the 1980s.

The cause of the bus transfer was a test lead coming into contact with a terminal while the technician was attaching test equipment to a relay. Contributing factors were the decision to perform the test while the bus was energized and inadequate job planning in that the effects of conducting the test in an energized cubicle that was not designed for test leads were not completely analyzed.

The apparent causes for the inadequate revision to the TIP withdrawal and isolation surveillance on July 17, 1996 were: (1) poor judgment to proceed with an On-the-Spot-Procedure-Change (OTSC) to conduct the test with the TIP system in the automatic mode without fully understanding why the TIP probe would not move forward in the manual mode and (2) the OTSC that was performed was inappropriate in that it constituted a change of intent and should not have been allowed. A contributing factor was incomplete vendor information available regarding the operational details of the TIP drawer.

The apparent cause for the non-conservative RBM Low Power Bypass setpoints was the failure to recognize that the nominal setpoint had a TS application which required a lower setting to account for the calibration tolerances and hysterisis associated with the reset value. This failure occurred during the initial setpoint calculation and Channel Calibration procedure development.

SAFETY SIGNIFICANCE

Undervoltage Relay Testing

Although the undervoltage and degraded voltage relays were declared inoperable due to nonperformance of a surveillance requirement, reasonable assurance existed that the Emergency Diesel Generators would start and energize the bus on a loss of power coincident with a Loss of Cooling Accident, and that all required ESF loads would sequence on the vital bus. This assurance is based on previous successful past performances of the integrated Emergency Diesel Generator test. Additionally, performance of testing on the 'A' and 'C' vital busses demonstrated compliance with the LSFT requirements, and showed all required relays and contacts to be operational.

SAFETY SIGNIFICANCE (Continued)

ESF Actuation During Testing of Undervoltage Relays

Due to the risks associated with the performance of this surveillance test (i.e., loss of the bus), Operations evaluated each load on the associated bus and provided recommendations regarding the use of redundant equipment to minimize the impact to plant operations. Therefore, the safety significance associated with this event was minimal.

RTD and T/C Channel Calibrations

Performance of in-place qualitative assessments of RTD and T/C sensor behavior in lieu of sensor calibrations has been determined to be an acceptable method for demonstrating the operability of the isolation function. This method has been accepted by the NRC and described in NUREG 1433 for this instrumentation. Therefore, there is no safety significance of the failure to perform sensor calibrations as specified in the existing TS Definition 1.4 for the RTD and T/C sensors.

SACS Heat Exchanger Inlet Valve Surveillances

There was minimal safety significance for the inadequate SACS heat exchanger inlet valve surveillance test procedures. The basis for this minimal impact is: 1) the normal position of the heat exchanger inlet valves is open; 2) the SACS operating procedure directs the operator to verify that the valve opens following a pump start; 3) the valves fail as-is, which ensures a suction flow path for pumps previously in service in the event of a design basis accident; and 4) indications available in the control room make the operator aware of a logic malfunction (causing the valve to not open as required), such that compensatory actions can be initiated.

HPCI Valve Surveillances

The normal positions for the subject HPCI valves enable HPCI to function upon an initiation signal without these valves changing position. The position of these valves is verified twice daily. The capability for the HPCI system to automatically take suction from the suppression chamber on a suppression chamber-water level high signal has also been demonstrated within the past 18 months. LERs 95-014-00 and 95-020-01 were written to document two ESF actuations where the HPCI suction realigned to the suppression chamber from the CST on a suppression chamber-water level high signal. In addition, surveillance testing satisfying the requirements of TS 4.5.1.c.2.b has been completed and demonstrated the capability of the subject valves to automatically actuate on a suppression chamber-water level high signal. Since the operability of the HPCI system was not

SAFETY SIGNIFICANCE (Continued)

affected with the subject valves in an off-normal position, there were no adverse safety consequences associated with this event.

Primary Containment Penetration Isolation Barrier Verification

The normal position for the subject primary containment penetration test and drain valves is the closed position with the downstream piping isolated closed with a secured pipe cap. Positioning of plant components, including valves, is controlled by various administrative means. It is unlikely that these valves or components could be mispositioned without noticing the related indications. All the valves have been field verified to be in the correct closed position. Since the valves were verified to be in the correct positions and administrative means were in place to control valve positioning, a past valve mispositioning error is unlikely. Therefore, the safety significance of this event is minimal.

The additional components identified in the October 15, 1996 list were found to be correctly positioned.

APRM Surveillances

As stated previously, the APRM channels were not previously demonstrated as operable in Operational Conditions 2 through 5. When the plant was in these conditions, it was possible to have an undetected failure where the K18 relay contacts remain closed regardless of Reactor Mode Switch position. In this situation, the APRM setdown setpoints would not be placed in effect; however, the Reactor Mode Switch contacts and K18 relays have been tested during performance of weekly surveillance testing and the K18 relay contacts open when the relay is de-energized (the fail safe position). In addition, the IRMs would have been able to provide signals to the Reactor Manual Control System to block rod motion and to the Reactor Protection System to initiate a scram during postulated conditions. Therefore, the safety significance of this event is minimal.

RWCU Isolation Actuation Instrumentation Surveillances

The subject RWCU isolation functions have been tested in accordance with the TS requirements and were found to be operable. Although previous surveillance tests did not appropriately demonstrate operability of the RWCU isolation functions for loss of power to the leakage detection monitor or SLC initiation, the RWCU was capable of being isolated from redundant diverse isolation signals (i.e., reactor vessel low water level and manual initiation). In addition, the successful completion of surveillance tests for these functions has demonstrated the continued capability for the RWCU system to isolate as designed. Therefore, the safety significance of this event is minimal.

SAFETY SIGNIFICANCE (Continued)

TIP Isolation Actuation Instrumentation Surveillances

The Primary Containment Isolation and the withdrawal function of the TIP probe due to High Drywell Pressure signals have been tested in accordance with the TS requirements and were found to be operable. Previous surveillance tests did not appropriately demonstrate operability of all TIP isolation functions. The successful completion of the surveillance tests have demonstrated the continued capability for the TIP system to operate as designed. Therefore, there is no safety significance associated with this event.

During the July 17 to July 19, 1996 period when the TIP withdrawal and isolation function was inappropriately considered operable, the TIP ball valves remained closed (normal position) and the redundant isolation shear valves remained operable. Therefore, the containment isolation function was maintained and there was no safety significance associated with this condition.

Turbine Stop Valve Closure Annunciation

The Turbine Stop Valve Closure Annunciation function has been tested in accordance with the TS requirements and was found to be operable. The successful completion of the surveillance tests for this function has demonstrated the continued capability of the Turbine Stop Valve Closure signal to annunciate as designed. There is no safety significance associated with this event.

Turbine Control Valve Fast Closure Annunciation

The Turbine Control Valve Fast Closure Channel Functional Test has been completed in accordance with the TS requirements and was found to be operable. The successful completion of the surveillance tests for this function has demonstrated the continued capability of the Turbine Control Valve Fast Closure signal to annunciate as designed. There is no safety significance associated with this event.

Scram Discharge Volume Vent and Drain Valve Reactor Protection System Actuation

The Reactor Protection System Instrumentation LSFT procedure was inadequate in that it did not test each relay and contact associated with the actuation of the SDV vent and drain valves. However, actual performance of the surveillance testing on the untested relays and contacts demonstrated compliance with the LSFT requirements, and proved the required relays and contacts to be operable. Therefore, there was no safety significance to the event.

SAFETY SIGNIFICANCE (Continued)

Scram Discharge Volume High Level Bypass Function Incomplete Logic System Functional Test:

The purpose of the SDV Bypass logic is to allow for draining and venting the SDV after a reactor scram. With the reactor mode switch in SHUTDOWN or REFUEL and the bypass switch in BYPASS, the SDV vent and drain valves open providing the draining necessary to reset the scram signal.

When the subject contacts were tested in response to this event, the results were satisfactory. Prior to this event, verification that the SDV high level trip function was not bypassed has been performed by the successful completion of the SDV channel calibration tests, most recently performed between May 1 and May 31, 1996. The channel calibration tests did not include all of the contacts required by the LSFT, but did provide reasonable assurance that the trip function was not bypassed.

There were no potential safety consequences associated with this event.

Incomplete 18 Month Visual Inspection of the Reactor Building to Suppression Chamber Vacuum Breaker Assemblies

The butterfly isolation valves function to provide primary containment isolation and operate in conjunction with the vacuum breaker (check) valves to limit containment external to internal differential pressure to within 3.0 psi during post-LOCA containment depressurization.

Subsequent implementation of the Surveillance Requirement for the butterfly isolation valves performed on July 26, 1996, was satisfactory. Additionally, previous successful performance of the remaining surveillance requirements of TS 4.6.4.2.b provided assurance of the ability of the isolation valves to have performed their intended safety functions during previous periods of operation.

There were no potential safety consequences associated with this event.

SAFETY SIGNIFICANCE (Continued)

Class 1E Isolation Breaker Instantaneous Overcurrent Protective Device Testing

The isolation breakers applicable to TS 3.8.4.5 are those that are tripped (load shed) by a LOCA signal. The 113% value at which these breakers were previously tested indicates that the protective devices would have tripped prior to reaching the TS required value of greater than 120%. This condition was conservative considering the overcurrent protective device and load shed functions of the affected breakers. Therefore, this event had minimal safety significance.

Incomplete Onsite Power Distribution System Voltage Verification

The surveillance test has been completed in accordance with the TS requirements and all busses/MCCs/panels were found to be operable. The successful completion of the surveillance test has demonstrated the continued capability of the Onsite Power Distribution System to operate as designed. Prior to this discovery, had there been a loss of or degraded voltage condition on the unverified busses/MCCs/panels, other indications exist that could have alerted operators to that condition. Therefore, this event had minimal safety significance.

Incomplete Channel Calibration of Containment Hydrogen Recombiner Instrumentation

The purpose of the Containment Hydrogen Recombiner System is to control and reduce containment hydrogen and oxygen concentrations during post-LOCA conditions. The time switches and annunciation circuits are associated with system Low Flow and Low Reaction Chamber Temperature. The time switches provide a time delay to allow for system stabilization during startup and warmup without unnecessary alarms. The annunciators are provided to the operator as indications of possible abnormal system operation. Once tested, the as-found conditions of both time switches and annunciator circuits were satisfactory. A review of the work order history of these components also showed no signs poor performance. A failure of the annunciators could have delayed or masked indications of abnormal system operation but would not have directly prevented the system from performing its intended function. Therefore, this event had minimal safety significance.

SAFETY SIGNIFICANCE (Continued)

Non-Conservative Rod Block Monitor Low Power Bypass Setpoints

The RBM provides protection for the fuel against boiling transition during the Rod Withdrawal Error (RWE) event at various power and flow conditions. The full power setpoint is determined from RWE analyses at rated conditions. Protection at off rated conditions is also provided by the RBM, but is enhanced by added MCPR protection at reduced flow conditions by the modification of the Operating Limit MCPR (OLMCPR) via the K_f curve noted in the Technical Specifications and the Core Operating Limits Report. GE has determined that the reduction in power, combined with the modification of the OLMCPR, is sufficient to conclude that MCPR analyses are not required and have not been performed for the RWE below the rated load line. The 30% RBM setpoint only serves to ensure operability of the RBM prior to reaching the rated load line, where it is assumed in the HCGS UFSAR safety analyses. The variation in the setpoint due to calibration errors (as described in this LER) has no safety significance and does not challenge any of the safety analysis bases contained in the HCGS UFSAR.

PREVIOUS OCCURRENCES

Failure to follow TS surveillance requirements has been documented in LERs 95-003-00 and supplements, 95-017-00, 95-034-00 and 95-035-00. LER 95-03-00 documented an event where operators performed a surveillance in an operational condition other than that specified by the TS, LER 95-017-00 documented an event where the emergency bus undervoltage logic circuitry was improperly tested, LER 95-034-00 documented a failure to perform Rod Sequence Control System surveillances when required and LER 95-035-00 documented the failure to perform Reactor Mode Switch, Source Range Monitor and Suppression Chamber Level surveillances properly.
In response to LER 95-017-00, the General Manager - Hope Creek Operations chartered the TSSIP to investigate, define, and resolve weaknesses in the TS Surveillance Program. The events described in this LER were identified as a result of implementation of this corrective action.

Research into the RBM Low Power Bypass setpoint event discovered a previous identical event at the Vermont Yankee facility which was reported in LER 217/94-01 dated February 3, 1994. This event was provided in an NRC Daily Plant Status (PS) Report as part of the Operating Experience Feedback (OEF) process. Due to the lack of information in the PS report and what was formerly a high threshold for assigning actions from NRC Plant Status reports, no action was assigned to review the event for applicability to the Hope Creek Station. This represents a missed opportunity to have corrected the RBM bypass setpoint deficiency prior to the TSSIP review effort. Since that time, several program improvements, including a lower threshold for assigning actions from the screening of Plant Status reports, have been made to the OEF program as documented in Hope Creek LERs 95-016, 95-017, and 95-022.

CORRECTIVE ACTIONS

The TSSIP review will continue and will be completed by December 31, 1996.

Undervoltage Relay Testing and ESF Actuation

The implementing procedures for testing the bus undervoltage auxiliary contacts have been revised to defeat the undervoltage trip function during the performance of the test. The TSSIP group independently reviewed the procedures to ensure satisfactory compliance. This was completed prior to performance of the test procedures.

Logic System Functional Testing was performed on the 'B' and 'D' vital busses to demonstrate operability of the undervoltage and degraded voltage relays to satisfy requirements of Surveillance Requirement 4.3.3.1.

The Technical Specification Matrix will be updated to reflect new procedures to comply with the LSFT requirement. This will be performed as the TSSIP identifies issues and will be completed by December 31, 1996.

Position papers were prepared to outline the proper test methodology and acceptance criteria for performance of technical specification surveillances, such as LSFT and Channel Functional Test requirements.

Introductory training on the TSSIP position papers for LSFTs and CFTs will be conducted for licensed operators, system managers, procedure writers, and applicable Station Qualified Reviewers by December 31, 1996.

Guidance was provided to the relay and controls technicians regarding the selection and use of M&TE (specifically M&TE with alligator clips).

The Controls Pre-Job Brief Checklist has been revised to ensure the proper use of M&TE.

The procedures used to conduct the LSFT surveillance have been revised to specify the specific alligator clip to be used.

A design change to install test points outside these cubicles will be implemented by the end of the next refueling outage (RFO7).

RTD and T/C Channel Calibrations

The TS definition of CHANNEL CALIBRATION was revised, prior to entry into Operational Condition 3 following the sixth refueling outage, to permit in-place qualitative assessments of RTD and T/C sensors.

CORRECTIVE ACTIONS (Continued)

SACS Heat Exchanger Inlet Valve Surveillances

The SACS heat exchanger inlet valves have been administratively controlled to ensure performance of the valves' safety function. These valves were appropriately tested to satisfy the requirements of TS 4.7.1.1.b.1.

Permanent procedure revisions to appropriately test the SACS valves in accordance with the requirements of TS 4.7.1.1.b.1 have been completed.

HPCI Valve Surveillances

The HPCI surveillance test procedure has been revised to appropriately test the subject HPCI valves and ensure operability of HPCI.

The subject HPCI valves have been properly tested and the requirements of TS 4.5.1.c.2.b have been satisfied.

Primary Containment Penetration Isolation Barrier Verification

The primary containment penetration test and drain valves were added to the surveillance procedure that verifies TS 4.6.1.1.b.

A review of all primary containment penetrations was completed to ensure all appropriate TS 4.6.1.1.b components are identified. This review was completed on October 15, 1996 and the surveillance procedure was revised to include the required components.

APRM Surveillances

Administrative controls were placed in effect for the APRMs on March 29, 1996, to ensure that the instrumentation is appropriately tested prior to entering an Operational Condition where it is required.

On April 10, 1996, guidance was provided to operating shift crews to ensure that the appropriate TS actions are taken for the APRM, IRM and SRM instrumentation until the required surveillances are completed.

Surveillance test procedures for the quarterly and semi-annual APRM Channel Calibrations have been revised to ensure that they are performed in accordance with the TS definitions.

Operations procedures have been revised to incorporate the April 10, 1996, guidance on the performance of APRM, SRM and IRM surveillances.

CORRECTIVE ACTIONS (Continued)

RWCU Isolation Actuation Instrumentation Surveillances

RWCU isolation actuation instrumentation Channel Function Test procedure revisions, which appropriately test RWCU isolation functions, have been completed.

Recurring tasks have been revised to ensure that the RWCU isolation actuation instrumentation is tested at the frequency specified in the TS.

TIP Isolation Actuation Instrumentation Surveillances

The portions of the Channel Functional Tests for the Primary Containment Isolation due to High Drywell Pressure that had not been performed at the correct frequency were completed satisfactorily.

The Functional Test procedure for the Primary Containment Isolation due to High Drywell Pressure signal has been revised.

The surveillance procedure for the TIP probe withdrawal was revised.

The LSFT for the TIP probe withdrawal and isolation function was tested satisfactorily in the manual mode on July 26, 1996.

A review was completed of the implementation of the OTSC process. This review determined that the process was adequate and that knowledge errors regarding the complexity of this particular circuitry resulted in the unawareness that the OTSC was a change of intent. The needed vendor information that contributed to the event was captured in the revision to the surveillance procedure and a Design Change Package has been issued to update the vendor manuals.

Turbine Stop Valve Closure

The surveillance tests for the contacts were completed satisfactorily.

The Channel Functional Test procedure has been revised.

Turbine Control Valve Fast Closure

The Channel Functional Test was completed satisfactorily on July 7, 1996.

The Channel Functional Test procedure was revised on July 31, 1996.

CORRECTIVE ACTIONS (Continued)

Scram Discharge Volume Vent and Drain Valve Reactor Protection System Actuation

Satisfactory testing of the untested SDV vent and drain valve relays and associated contacts was completed on July 18, 1996.

The Reactor Protection System Instrumentation Simulated Operation procedure will be revised by June 1, 1997 to meet the requirement of surveillance requirement 4.3.1.2.

Scram Discharge Volume High Level Bypass Function Incomplete Logic System Functional Test

The untested portions of the SDV Bypass logic were tested satisfactorily on July 25, 1996.

Surveillance test procedure HC.OP-ST.SF-0001(Q) will be revised to include testing of the previously omitted portions of the SDV Bypass logic. This procedure revision will be implemented by June 19, 1997.

Incomplete 18 Month Visual Inspection of the Reactor Building to Suppression Chamber Vacuum Breaker Assemblies

The required visual inspections were satisfactorily completed on July 26, 1996.

Hope Creek procedure HC.MD-ST.GS-0002(Q) has been revised to include the visual inspection requirements for butterfly isolation valves 1GSHV-5029 and 1GSHV-5031 per TS Surveillance Requirement 4.6.4.2.b.2.b.

Class 1E Isolation Breaker Instantaneous Overcurrent Protective Device Testing

Hope Creek procedure HC.MD-ST.ZZ-0006(Q) was revised to incorporate the requirements of TS 4.8.4.5.a and the affected breakers were satisfactorily tested on October 25, 1996.

Incomplete Onsite Power Distribution System Voltage Verification

Hope Creek procedure OP-ST.ZZ-0001(Q) was revised to incorporate the requirements of TS 4.8.3.1 and 4.8.3.2. The revised surveillance test was performed satisfactorily on November 9, 1996. This test included voltage measurements of those busses/MCCs/panels whose voltages could not be verified by other means.

CORRECTIVE ACTIONS (Continued)

Incomplete Channel Calibration of Containment Hydrogen Recombiner Instrumentation

The "A" Containment Hydrogen Recombiner time switch and annunciator circuits were satisfactorily tested to fulfill the Channel Calibration requirements of TS 4.6.6.1.b.1 on November 24, 1996.

Permanent revisions to procedures HC.IC-CC.GS-0007(Q) and HC.IC-CC.GS-0008(Q) to include the time switches and annunciator functions will be completed by June 10, 1997; prior to the next scheduled 18 month Channel Calibration.

Non-Conservative Rod Block Monitor Low Power Bypass Setpoints

A design change package will be completed which will revise the RBM bypass setpoint calculation (SC-SE-0017) to ensure that with the hysterisis and calibration tolerances considered, the maximum reset values will be less than or equal to 30% of RTP. This design change will drive the required revisions to Channel Calibration procedures, HC.IC-CC.SE-0019(Q) and HC.IC-CC.SE-0020(Q) as well as other procedures that may be impacted. The design change request has been issued and this design change will be completed prior to the next scheduled RBM Channel Calibration (March 1997) and prior to exceeding 30% power during the next plant startup.

A tracking LCO has been issued to ensure appropriate TS Action Statements are followed in the event of a downpower prior to implementation of the design change. The RBM Channel Calibrations have been added to the forced outage schedule to ensure the RBM bypass setpoints are conservatively revised prior to performing the next plant startup.