

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)
Catawba Nuclear Station Unit 2

DOCKET NUMBER (2)
05000414

PAGE (3)
1 of 12

TITLE (4)
Error During Tagout Causes De-Energization of Vital Bus and Actuation of Low Temperature Overpressure Protection

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 (5)
9	06	1998	1998	- 004	- 00	10	06	1998		50-

OPERATING MODE (9) 5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR		Check one or more of the following (11)	
POWER LEVEL (10) 000	20.402(b)	20.405(a)(1)(i)	20.405(a)(1)(ii)	20.405(a)(1)(iii)
	20.405(a)(1)(iv)	20.405(a)(1)(v)	50.36(c)(1)	50.36(c)(2)
			50.73(a)(2)(i)	50.73(a)(2)(ii)
			50.73(a)(2)(iii)	50.73(a)(2)(iv)
			50.73(a)(2)(vii)	50.73(a)(2)(viii)(A)
			50.73(a)(2)(viii)(B)	50.73(a)(2)(ix)
				73.71(b)
				73.71(c)
				OTHER (Specify in Abstract below and in Text, NRC Form 366A) Special Report

LICENSEE CONTACT FOR THIS LER (12)

NAME
M. H. Chernoff, Regulatory Compliance Specialist

TELEPHONE NUMBER
AREA CODE (803)
831-3414

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
									N
									N

SUPPLEMENTAL REPORT EXPECTED (14)

YES (if yes, complete EXPECTED SUBMISSION DATE)	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
---	---	----	-------------------------------	-------	-----	------

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

On September 6, 1998, at 1405 hours, during tagout of Diesel Generator "B", the wrong potential transformer was isolated, satisfying the logic for undervoltage on 4160 VAC Essential Bus 2ETB. The Black Out Load Sequencer relays performed a load shed on Bus 2ETB and opened the feeder breaker. The "B" Diesel Generator had been removed from service and did not start. All engineered safety features equipment responded properly. The Centrifugal Charging Pump (CCP) Discharge Valve went to the full open position, maximizing charging and seal injection flow. Suction of the CCPs swapped to the Refueling Water Storage Tank. Pressurizer heatup and cooldown rate limits were exceeded, and an evaluation of the structural integrity of the pressurizer was done which confirmed its continued operability. One Pressurizer Power Operated Relief Valve cycled in Low Temperature Overpressure Protection mode to maintain Reactor Coolant System pressure. This Report also satisfies the Technical Specifications requirement for a Special Report for this occurrence.

At 1435 hours, power was restored to Bus 2ETB. The event has been attributed to inadequate work practices, in that the appropriate verification was not performed to determine the correct component to be tagged when labeling discrepancies were encountered. Management expectations regarding actions to be taken in this situation have been reiterated to appropriate personnel.

9810140083 981006
PDR ADOCK 05000414
S PDR

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station Unit 2	05000414	1998	004	00	2 of 12

Background

This report describes an event in which an error was made during tagout of a Diesel Generator [EIIS:DG], which ultimately caused de-energization of the "B" train Class 1E 4160 VAC Essential Auxiliary Power Bus [EIIS:BUS]. This event is reportable pursuant to 10 CFR 50.73 (a)(2)(iv) as an actuation of Engineered Safety Features equipment. During the ensuing transient, a Power Operated Relief Valve [EIIS:PCV] operated to maintain Reactor Coolant System [EIIS:AB] pressure at its Low Temperature Overpressure Protection setpoint. Technical Specification 3.4.9.3 requires submittal of a Special Report for this occurrence. This Licensee Event Report also serves as that Special Report.

The 4160 VAC Essential Auxiliary Power System [EIIS:EB] supplies power to those Class 1E loads required to safely shut down the unit following a design basis accident. The system is divided into two completely redundant and independent trains designated A and B, each consisting of one 4160 volt switchgear assembly [EIIS:SWGR], three 6900/4160 volt transformers [EIIS:XFMR], two 600 volt load centers [EIIS:MCC], and associated loads.

Normally, each Class 1E 4160 volt switchgear is powered from its associated non-Class 1E train of the 6900VAC Normal Auxiliary Power System [EIIS:EB]. Each train has an alternate source of power from the 6900 volt system via two separate and independent 6900/4160 volt transformers. These transformers are shared between units.

Each train of the 4160 VAC Essential Auxiliary Power System is also provided with a separate and independent diesel generator to supply the Class 1E loads required to safely shut down the unit following a design basis accident. Each diesel generator is also capable of supplying its associated 4160 volt blackout switchgear through a connection with the 4160 volt essential switchgear.

Each of the redundant 4160 volt essential buses is provided with two levels of undervoltage protection to monitor bus voltage. Each level is provided with a separate set of three undervoltage relays [EIIS:RLY] which are utilized in a two-out-of-three logic scheme. The first level of undervoltage relays detect a loss of voltage on the 4160VAC essential bus and has a ten cycle time delay. The second level provides degraded voltage protection and actuates in the existence of a prolonged degraded voltage condition.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station Unit 2	05000414	1998	004	00	3 of 12

If the undervoltage relays are actuated, the diesel generator starts, and if the undervoltage condition does not clear in 8.5 seconds, the Class 1E switchgear incoming breaker [EIIS:BKR] is tripped and the bus is load shed. At 1.1 seconds, the diesel generator breaker [EIIS:BKR] closes, thus aligning the diesel generator to the essential bus, and the necessary automatic load sequencing begins. The loads sequenced onto the bus are dependent on whether a blackout and/or Loss of Coolant Accident (as evidenced by a Safety Injection Actuation Signal) exists.

The "Diesel Generator 2B PT Fuse Drawer" is located in the Diesel Generator 2B Control Panel. The "2ETB Bus PT" and "Diesel Gen 2B Source PT" drawers are located in the Turbine Building in cubicle 2ETB 19.

Technical Specification 3.4.9.3, Overpressure Protection Systems, applicable for Mode 5 operations, provides requirements for operability of the Overpressure Protection Systems. Action d of this Technical Specification requires in the event the Power Operated Relief Valves (PORVs) or the Reactor Coolant System vent(s) [EIIS:RV] are used to mitigate a Reactor Coolant System pressure transient, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 30 days. The report shall describe the circumstances initiating the transient, the effect of the PORVs or Reactor Coolant System vent(s) on the transient, and any corrective action necessary to prevent recurrence.

Technical Specification 3.4.9.2, Pressurizer [EIIS:PZR], specifies that the pressurizer temperature shall be limited to a maximum heatup of 100 degrees Fahrenheit in any one-hour period, and a maximum cooldown of 200 degrees Fahrenheit in any one-hour period. The associated Action states that with the pressurizer temperature limits in excess of any of these limits, restore the temperature to within the limits within 30 minutes, perform an engineering evaluation to determine the effects of the out-of-limit condition on the structural integrity of the pressurizer, and determine that the pressurizer remains acceptable for continued operation or be in at least Hot Standby within the next 6 hours and reduce the pressurizer pressure to less than 500 psig within the following 30 hours.

Event Description

September 6, 1998

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS
INFORMATION COLLECTION REQUEST 50.0 HRS. FORWARD COMMENTS
REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS
MANAGEMENT BRANCH (MNBB 7714), 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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station Unit 2	05000414	1998	004	00	4 of 12

Catawba Unit 2 was in Mode 5, Cold Shutdown, in the initial phase of the End of cycle 9 Refueling Outage. The Reactor Coolant System temperature was approximately 180 degrees and pressure was approximately 300 psig. Reactor Coolant Pumps A and B [EIIS:P] were in operation, and preparations were in progress to perform a crud burst.

Emergency Diesel Generator 2B had been run for 24 hours and it was planned to remove it from service. A pre-job brief was held between the Senior Reactor Operator and two non-licensed operators, who would be performing the Removal and Restoration Tagout.

1221 hours

Emergency Diesel Generator 2B was removed from service.

1358 hours

Diesel Generator Output Breaker 2ETB-18 was racked out and tagged.

The next step directed on the Tagout Sheet and in the procedure was to tag "Diesel Generator 2B PT Fuse Drawer" [EIIS: FU] in the open position. Following that step, the "D/G 2B Source PT Fuses" in Cubicic 2ETB 19 were to be removed and tagged. The non-licensed operators proceeded to cubicle 2ETB 19. After some discussion between the operators, it was erroneously concluded that the drawer labeled "2ETB Bus PT" was the same drawer specified in the Tagout Sheet as "Diesel Generator 2B PT Fuse Drawer".

1405 hours

The 2ETB Bus PT fuse drawer was opened. This caused the circuitry to sense an undervoltage condition on 2ETB. The 2ETB undervoltage relays actuated and 8.5 seconds later the feeder breaker was tripped, isolating the bus from off-site power sources. The Train B blackout sequencer was actuated which shed the loads on 2ETB.

The blackout sequencer sent a start signal to Diesel Generator 2B, but the Diesel Generator had been removed from service and did not start. The sequencer also sent a start signal to the "B" train Blackout Class 1E loads. The "B" train Pressurizing Filter Train Fan of the Control Room Area Ventilation System was in standby and aligned to receive power from Catawba Unit 1 prior to the event. It automatically started. The steam supply valves to the Turbine Driven Auxiliary Feedwater Pump

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station Unit 2	05000414	1998	004	00	5 of 12

[EIIS:P] opened, but the Pump did not start because there was no steam. The remainder of the Class 1E loads did not start because 2ETB was not energized.

Valve 2NV-294, Centrifugal Charging Pump Discharge Flow Control Valve [EIIS:FCV], went to the full open position upon loss of "B" train power, causing maximum charging flow.

Operators entered AP/2/A/5500/07, Loss of Power To An Essential Bus, due to loss of power to ETB.

1409 hours

Centrifugal Charging Pump suction valves [EIIS:V] from the Refueling Water Storage Tank [EIIS:TK] opened, and the Volume Control Tank [EIIS:TK] Outlet valves closed.

1411 hours

Operators increased pressurizer spray flow to reduce the Reactor Coolant System pressure increase.

1414 hours

Due to increased charging flow, the Reactor Coolant System pressure increased, and Power Operated Relief Valve 2NC-32B lifted numerous times to control Reactor Coolant System pressure. Power Operated Relief Valve 2NC-32B was set at its Low Temperature Overpressure Protection setpoint of 400 psig.

1425 hours

Throttling of charging line flow was performed in accordance with procedure AP/2/A/5500/07.

1435 hours

Voltage was restored to 2ETB. The Pressurizer PORV lifted for the last time.

1447 hours

Volume Control Tank Outlet Valves were reopened.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station Unit 2	05000414	1998	004	00	6 of 12

1501 hours

Centrifugal Charging Pump Discharge Flow Control Valve was returned to its throttled position. Plant conditions were stabilized.

Conclusion

This event occurred as a result of an inappropriate action by non-licensed operators who inadvertently de-energized 2ETB 4160 volt essential bus by isolating the 2ETB bus side potential transformer rather than the 2B Diesel Generator side potential transformer when tagging out the 2B Diesel Generator. The Diesel Generator had been previously removed from service, and the Diesel Generator Output Breaker had been racked out. The next action in the Removal and Restoration Tagout Sheet and the applicable procedure specified opening the Diesel Generator 2B PT Fuse Drawer. Following this action, the fuses were to be removed in 2ETB 19, the D/G 2B Source PT Fuses. One of the non-licensed operators noted that the 2ETB 19 cubicle was referenced in the Tagout Sheet and procedure and recalled that there were two potential transformer fuse drawers located in the 2ETB 19 cubicle. However, the fuse drawers were labeled 2ETB Bus PT and Diesel Gen 2B Source PT. The two non-licensed operators discussed the fact that the label 2ETB Bus PT was not identical to the nomenclature on the Tagout Sheet and procedure. Concluding that this was a poor labeling issue, and believing that the 2ETB 19 cubicle was the correct location for both PT's, the operator opened the 2ETB Bus PT fuse drawer, actuating the loss of voltage and degraded bus sensing circuit. This action, a rule based error involving misjudgment, was not consistent with expected work practices at Catawba. When there is uncertainty regarding the correct component, personnel are expected to verify information from an independent source prior to taking action. Therefore, the root cause of this event is inadequate work practices due to lack of information verification.

During review of this event, two contributing factors were identified. During this event, the process of independent verification was not executed as intended. When safety-related components are removed from service, independent verification is required. It is intended that one operator perform the component manipulations and a second operator independently verify the action is correct. During this event, the two operators discussed the difference in nomenclature and together determined that the drawer was the correct one, rather than independently reaching a conclusion.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station Unit 2	05000414	1998	004	00	7 of 12

Additionally, the Removal and Restoration Tagout Sheet package contained incomplete and misleading information, even though the tagout was a computerized, pre-planned tagout. The Sheet did not specify the correct location of the DG2B Fuse Drawer. The tag stub, which was attached to the tag to be placed, indicated that the component was in the rear of the Diesel Generator Control Panel, but stated that this was located in the Turbine Building, rather than the Diesel Generator Room. There were additional discrepancies in the supporting documentation in the package. While these discrepancies did not contribute directly to this event, the existence of other discrepancies may have contributed to acceptance of the component nomenclature discrepancy.

An engineering review of plant response to this event was conducted. The review concluded that all equipment responded as designed to the transient. The major plant effects included valve 2NV-294, Centrifugal Charging Pump Discharge Flow Control Valve, failing open upon loss of power to the "B" train. The valve went as designed to the full open position to ensure an abundance of charging upon loss of air or power. Approximately 4 minutes later, low level in the Volume Control Tank was reached, and suction of the Centrifugal Charging Pump automatically swapped to the Refueling Water Storage Tank. The increased charging header pressure, coupled with increasing backpressure due to the Volume Control Tank being isolated caused an overall decrease in differential pressure across the Reactor Coolant Pumps Number One Seal. The increase in charging also caused a cooldown in the pressurizer, along with an increase in level. Pressurizer PORV NC32B cycled numerous times at its setpoint of 400 psig to control Reactor Coolant System pressure.

Indication of charging flow and seal injection flow was lost during this event. Based on a flow balance using best available data, it was determined that flow exceeded the manufacturer's recommended flow through the Regenerative Heat Exchanger [EIIS:HX]. The effects of this transient on the Regenerative Heat Exchanger have been evaluated and found acceptable.

When power was lost to 2ETB, valve 2NV-294 went to the full open position and 2NV-309, Seal Water Injection Flow valve, also went to the full open position, causing increased seal injection flow. Indication of total seal injection flow was lost and the instruments indicating seal injection flow to individual pumps were pegged high. Based on a review of the data, it was concluded that a positive flow from the pump seal cavity into the Reactor Coolant System was maintained.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station Unit 2	05000414	1998	004	00	8 of 12

When suction of the Centrifugal Charging Pumps swapped to the Refueling Water Storage Tank, the Volume Control Tank outlet isolation valve closed. Volume Control Tank pressure began increasing, creating a higher backpressure to the Reactor Coolant Pumps Number One seal, and causing a decrease in seal leakoff flow. Since the occurrence of a seal face plate rub cannot be conclusively ruled out, a seal inspection on the 2A Reactor Coolant Pump was planned. However, the seal was damaged during removal and has been replaced. Replacement of the seal on the other Reactor Coolant Pump operating during this event, the 2B Reactor Coolant Pump, was already planned for this outage and has been completed. The seal was inspected and there was evidence of rubbing, although the indications found on the seal cannot be positively attributed to this event. The other two Reactor Coolant Pumps were not in operation and were not affected by this event.

The insurge of cooler water caused by the increase in charging caused a temperature decrease in the Pressurizer. Prior to this transient, the pressurizer water temperature was approximately 416 degrees Fahrenheit and the surge line temperature was approximately 418 degrees Fahrenheit. Ten minutes after the loss of power, indicated temperature of the water reached a minimum of 234 degrees Fahrenheit and the surge line reached a minimum of 188 degrees Fahrenheit. Within a few minutes, indicated temperatures had increased to 399 degrees for Pressurizer Water temperature and 392 degrees for surge line temperature. The temperature changes in the pressurizer were caused by the movement of the relatively stagnant mass of water in the pressurizer. As this mass of water was displaced upward by the insurge due to increased charging flow, the temperature decreased at the location monitored by the Resistance Temperature Detectors. When spray was initiated, the mass of water was displaced downward, causing an increase in temperature at the location monitored by the Detectors. During this event, the station was in noncompliance with the cooldown and heatup limits of Technical Specification 3.4.9.2. In accordance with the Action of Technical Specification 3.4.9.2, an engineering evaluation was performed to determine the effects of the out-of-limit condition on the structural integrity of the pressurizer. This evaluation concluded that this transient did not adversely affect the structural integrity of the pressurizer and that the pressurizer continued to be operable.

The increase in charging caused the pressurizer to go water solid. Approximately 8 minutes after the interruption of power, Pressurizer PORV 2NC32B began cycling at its low temperature overpressure setpoint of 400 psig. The valve cycled numerous times over a 22 minute period, relieving to the Pressurizer Relief Tank [EIIIS:TK]. The maximum pressure reached in the Pressurizer Relief Tank was 95 psig. The high pressure setpoint for

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND REGISTRATION MANAGEMENT BRANCH (MNBB 7714), 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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station Unit 2	05000414	1998	004	00	9 of 12

the rupture disk is 100 psig. The rupture disk did not rupture during this event. The Power Operated Relief Valve was successful in controlling Reactor Coolant System pressure. The maximum indicated Reactor Coolant System pressure during the transient was 408 psig as indicated by the 2C Wide Range Reactor Coolant System Hot Leg Pressure Transmitter. Potential adverse effects on the valve include the potential for seat leakage and inability of the valve to meet stroke time requirements. Following this event, the valve remained closed for several days without any indication of seat leakage. Stroke time testing and limit switch indication verification for all three PORVs was already planned to be performed during this outage. Corrective actions to prevent recurrence of the circumstances requiring actuation of the valve in Low Temperature Overpressure Protection mode are provided in the Corrective Action section of this report. The other Power Operated Relief Valve which was operable during this event, 2NC34A, is fed from a different pressure transmitter than 2NC-32B. The maximum pressure sensed by the 2B Wide Range pressure transmitter associated with 2NC-34A was 396 psig, which is less than the setpoint of 400 psig. Therefore, 2NC-34A did not actuate during this event.

There have been no previous similar events involving an error while performing a tagout that caused actuation of Engineered Safety Features equipment during the previous two years. Therefore, this event is considered to be non-recurring.

There are no EPIX reportable equipment failures associated with this event.

Corrective Actions

Immediate

1. Power was restored to 2ETB in accordance with plant procedure AP/2/A/5500/07, Loss of Power To An Essential Bus, and plant systems were stabilized.

Subsequent

1. The individuals involved were counseled regarding this error.
2. Before resuming the 2B D/G tagout, the Senior Reactor Operator on shift reviewed the tagout with the Non-Licensed Operators and determined the critical portion of it. Based on that determination, he and the Non-Licensed Operators performed a walk through of the tagout before

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER # 3ER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station Unit 2	05000414	1998	004	00	10 of 12

actually performing it. During the tagout, there was direct oversight by the Senior Reactor Operator.

3. Operations management conducted face-to-face meetings with Operations personnel to discuss this event and to reinforce the proper ways to reduce human performance errors and management expectations for proper performance.
4. A "Human Performance" time-out was held for station personnel to discuss this event and stress how proper use of human performance improvement techniques could have prevented this event.
5. The Removal and Restoration tagout database was revised to reflect the correct location of the potential transformer.
6. A tag was placed on Units 1 and 2 ETA and ETB Potential Transformer cabinets warning personnel that opening the drawer will de-energize ETA or ETB.
7. A process was established to review electrical tagouts in advance to identify "critical" tagouts that need direct Senior Reactor Operator oversight. This type of tagout includes Diesel Generator tagouts and restoration, and any tagout involving manipulation of potential transformers. This process will be maintained throughout the refueling outage.
8. A team was established to assess whether this was an isolated occurrence, or common practice when a component labeling mismatch is identified. This review concluded that this was an isolated case. A communication was distributed to station personnel which reiterated management's expectations for component verification.
9. Management expectations for maintaining independent verification was distributed to station personnel via Station Division Team Notes. Station personnel were instructed to be careful not to collaborate or troubleshoot when performing an activity involving independent verification, but rather to bring the supervisor into the activity to perform the second check if there is the potential for compromise of independence of the verifier.
10. The seal on the 2A Reactor Coolant Pump was removed for inspection. The seal was damaged during removal and has been replaced. The seal on the 2B Reactor Coolant Pump has been replaced. The removed seal was

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNB 7714), 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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station Unit 2	05000414	1998	004	00	11 of 12

inspected. Indications of rubbing were identified on the seal. However, these indications cannot be positively attributed to this event.

11. As previously scheduled for this Refueling Outage, a modification was implemented to provide backup power to Centrifugal Charging Pumps Discharge Flow Control Valve 2NV-294 and Seal Injection Flow Valve 2NV-309, and other similar valves on Unit 2. This modification was implemented on Unit 1 during its End of Cycle 10 Refueling Outage.
12. The effects of this transient on the Regenerative Heat Exchanger have been evaluated and found to be acceptable.
13. In accordance with the Action of Technical Specification 3.4.9.2, an engineering evaluation was performed to determine the effects of the out-of-limit condition on the structural integrity of the pressurizer. The evaluation concluded that this transient did not adversely affect the structural integrity of the pressurizer and that the pressurizer continued to be operable.

Planned

1. The training provided to Non-Licensed Operators on potential transformers will be evaluated for needed enhancements.
2. As a long term project, the Equipment Database nomenclature used by the computerized pre-planned tagouts is being validated and revised for consistency with plant labels and drawings.
3. Stroke time testing and limit switch indication verification for all three PORVs will be conducted. This activity was already planned to be performed during this outage.

Safety Analysis

All equipment responded as designed to the initiating event. "A" Train equipment was not affected by this event and continued to function normally. Normal residual heat removal utilizing the train "A" Residual Heat Removal Pump was in service prior to de-energization of 2ETB. Normal residual heat removal was not interrupted by this event, and no setpoints or limits associated with this function were exceeded. The "B" train essential loads had already been removed from service in preparation for the Emergency Diesel Generator outage. The Pressurizer PORV successfully

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station Unit 2	05000414	1998	004	00	12 of 12

terminated the pressurization of the Reactor Coolant System due to this mass injection event and the allowable combinations of peak pressure and minimum temperature remained below and to the right of the limit lines shown in Table 3.4-3, Reactor Coolant System Cooldown Limitations.

At no time during this event was the health or safety of onsite personnel or the public jeopardized.