



DUKE POWER

November 17, 1994

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

Subject: Catawba Nuclear Station
Docket No. 50-414
LER 414/94-007

Gentlemen:

Attached is Licensee Event Report 414/94-007 concerning REACTOR TRIP AND TECHNICAL SPECIFICATION VIOLATION.

This event was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'D. L. Rehn'.

D. L. Rehn

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U. S. Nuclear Regulatory Commission
November 17, 1994
Page Two

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NRC FORM 366 <small>(5-92)</small>		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95					
<h2 style="margin: 0;">LICENSEE EVENT REPORT (LER)</h2> <p style="margin: 5px 0 0 0;"><small>(See reverse for required number of digits/characters for each block)</small></p>							<small>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 (MVB 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.</small>			
FACILITY NAME (1) Catawba Nuclear Station, Unit 2					DOCKET NUMBER (2) 05000414		PAGE (3) 1 OF 14			
TITLE (4) Reactor Trip and Technical Specification Violation										
EVENT DATE (5)			LER NUMBER (6)			REPORT NUMBER (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
10	18	94	94	007	00	11	17	94	N/A	05000
									FACILITY NAME	DOCKET NUMBER
										05000
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)								
1		20.402(b)			20.405(c)			X 50.73(a)(2)(iv)		73.71(b)
POWER LEVEL (10)		20.405(a)(1)(i)			50.36(c)(1)			50.73(a)(2)(v)		73.71(c)
100		20.405(a)(1)(ii)			50.36(c)(1c)			50.73(a)(2)(vii)		OTHER
		20.405(a)(1)(iii)			X 50.73(a)(2)(i)			50.73(a)(2)(viii)(A)		<small>(Specify in Abstract below and in Text, NRC Form 366A)</small>
		20.405(a)(1)(iv)			50.73(a)(2)(ii)			50.73(a)(2)(viii)(B)		
		20.405(a)(1)(v)			50.73(a)(2)(iii)			50.73(a)(2)(x)		
LICENSEE CONTACT FOR THIS LER (12)										
NAME D.P. Kimball, Safety Review Group Manager								TELEPHONE NUMBER (include Area Code) (803)831-3743		
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRCDS						
SUPPLEMENTAL REPORT EXPECTED (14)										
YES <small>(if yes, complete EXPECTED SUBMISSION DATE)</small>					X NO			EXPECTED SUBMISSION DATE (15)		MONTH DAY YEAR
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16) <p>On October 18, 1994 at 0955 hours, with Unit 2 in Mode 1, Power Operation, at 100% power, a Reactor Trip occurred. Two Instrumentation and Electrical (IAE) teams were performing independent tests on components of the Reactor Trip System when both trains of the Solid State Protection System (SSPS) received General Warning indications, causing the Reactor Trip Breakers to open. The Train B General Warning was expected; the Train A General Warning occurred unexpectedly when an IAE technician moved the SSPS Train A multiplexer test switch through "Inhibit". The root cause of this event is attributed to Document Use Practices, with a contributing cause of less than adequate Management Directions. Corrective actions for the Reactor Trip include communication of expectations for procedure use, philosophies for cross train work, and identifying uncompleted work to Work Control. Following the trip, with Unit 2 in Mode 3, Hot Standby, the Auxiliary Feedwater (CA) Pumps were secured and the discharge flow control valves for the Motor Driven Pumps (2A and 2B) were closed. On October 21 at 0435 hours, with Unit 2 in Mode 1 at 100% power, an operator discovered during a routine Control Board walkdown that the valves were closed. Subsequent investigation revealed the CA system had not been placed in standby readiness per the operating procedure after the system was secured. The root cause of this event is due to Written Communication, with a contributing cause of less than adequate Work Practices. Corrective actions for the closed CA valves include procedure revisions and clarifying/communicating a clear philosophy on operator responsibilities.</p>										

REQUIRED NUMBER OF DIGITS/CHARACTERS
FOR EACH BLOCK

BLOCK NUMBER	NUMBER OF DIGITS/CHARACTERS	TITLE
1	UP TO 46	FACILITY NAME
2	8 TOTAL 3 IN ADDITION TO 05000	DOCKET NUMBER
3	VARIES	PAGE NUMBER
4	UP TO 76	TITLE
5	6 TOTAL 2 PER BLOCK	EVENT DATE
6	7 TOTAL 2 FOR YEAR 3 FOR SEQUENTIAL NUMBER 2 FOR REVISION NUMBER	LER NUMBER
7	6 TOTAL 2 PER BLOCK	REPORT DATE
8	UP TO 18 -- FACILITY NAME 8 TOTAL -- DOCKET NUMBER 3 IN ADDITION TO 05000	OTHER FACILITIES INVOLVED
9	1	OPERATING MODE
10	3	POWER LEVEL
11	1 CHECK BOX THAT APPLIES	REQUIREMENTS OF 10 CFR
12	UP TO 50 FOR NAME 14 FOR TELEPHONE	LICENSEE CONTACT
13	CAUSE VARIES 2 FOR SYSTEM 4 FOR COMPONENT 4 FOR MANUFACTURER NPRDS VARIES	EACH COMPONENT FAILURE
14	1 CHECK BOX THAT APPLIES	SUPPLEMENTAL REPORT EXPECTED
15	6 TOTAL 2 PER BLOCK	EXPECTED SUBMISSION DATE

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)
Catawba Nuclear Station, Unit 2	05000 414	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 14
		94	- 007	- 00	

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

BACKGROUND

The Reactor Trip System [EIS:JC] automatically keeps the reactor [EIS:RCT] operating within a safe region by shutting down the reactor whenever the limits of the region are approached. The following systems make up the Reactor Trip System:

1. Process Instrumentation and Control System [EIS:JF]
2. Nuclear Instrumentation System [EIS:IG]
3. Solid State Protection System (SSPS)
4. Reactor Trip Switchgear [EIS:SWGP]
5. Manual Actuation Circuit

Each of the two logic trains, A and B, is capable of opening a separate and independent Reactor Trip Breaker [EIS:52], RTA and RTB, respectively. Bypass breakers BYA and BYB are provided to permit testing of the Reactor Trip Breakers.

The Solid State Protection System takes binary inputs from the process and instrument channels corresponding to conditions of plant parameters. The system combines these signals in the required logic combination and generates a trip signal to the undervoltage coils [EIS:CL] of the Reactor Trip Breakers when the necessary combination of signals occur. The system also provides annunciator [EIS:ANN], status light, and events recorder input signals which indicate the condition of bistable input signals, partial trip and full trip functions, and the status of various blocking, permissive, and actuation functions. Each train contains a multiplexing test switch [EIS:JS]. This switch is a three position switch; the positions, in order, are Normal, Inhibit, and A + B. At the start of a 7300 Process Instrumentation and Control System test, this switch (in either train) is placed in the A + B position. The A + B position alternately allows information to be transmitted from the two trains to the main control board [EIS:MCBD].

Each of the two trains of the SSPS is continuously monitored by the General Warning alarm [EIS:ALM] Reactor Trip subsystem. The warning circuits are actuated if undesirable train conditions exist. Two conditions that result in a train related General Warning indication are:

- a. Multiplexing test switch in Inhibit position
- b. Reactor Trip Bypass Breaker racked in and closed

LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

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TEXT (If more space is required, use additional copies of NRC Form 366A). (17)

If any of the General Warning conditions, including those listed above, exists in both trains (A and B) simultaneously, the General Warning alarm circuits will automatically trip the reactor.

Technical Specification (T/S) 3.3.1 requires two trains of Reactor Trip Breakers operable in Modes 1, Power Operation, and 2, Startup; and in Modes 3, Hot Standby, 4, Hot Shutdown, and 5, Cold Shutdown if the breakers are closed and capable of rod [EIS:ROD] withdrawal. The applicable T/S Action statement allows one train to be bypassed for up to 2 hours for surveillance testing per 4.3.1.1, provided the other train is operable.

IP/2/A/3200/08B, Train B Reactor Trip Breaker Trip Actuating Device Functional and Operational Test, is performed to meet T/S 4.3.1.1 and 4.3.2 surveillance requirements. IP/2/A/3200/02B, Solid State Protection System Train B Periodic Testing, also fulfills T/S 4.3.1.1 and 4.3.2 surveillance requirements and is routinely performed in conjunction with IP/2/A/3200/08B. When performing these tests, SSPS Train B is placed in TEST, bypass breaker BYB is placed in the "connect" position and closed, and the Train B multiplexer test switch is ultimately required to be placed in A + B. With BYB closed, a Train B General Warning is expected to exist.

IP/2/A/3222/00D, Analog Channel Operational Test Channel IV 7300, is performed to comply with T/S surveillance requirements. This procedure requires the SSPS Train A multiplexer test switch to be placed in A + B.

P-12, Lo Lo Tave Interlock [EIS:IEL], is part of the Engineered Safety Features Actuation [EIS:JE](ESFAS) System. The purpose of the interlock is to block steam dump valve [EIS:V] actuation to prevent excessive cooldown below the minimum temperature for criticality. Its setpoint is 553 degrees F on two of any four (2/4) Reactor Coolant [EIS:AB](NC) System loops. If the logic is satisfied, the steam dump valves close until NC System temperature is above 553 degrees F.

The Main Feedwater [EIS:SJ](CF) System supplies feedwater to the four Steam Generators [EIS:SG](S/G) at the temperature, pressure, and flow required to maintain the proper Steam Generator water level. A Feedwater Isolation signal is activated by any one of the following: Safety Injection, Reactor Trip with low Tave (less than 564 degrees F), Hi-Hi S/G level, and Manual actuation. A Feedwater Isolation closes the Feedwater Isolation valves, Feedwater Purge valves, Feedwater Control valves, Feedwater Control Bypass valves, Feedwater Preheater Bypass valves, and Feedwater Bypass Tempering Flow valves.

The Auxiliary Feedwater [EIS:BA](CA) System provides a nuclear safety related source of emergency feedwater to the Steam Generators to maintain secondary side level at times when the CF System is not

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

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TEXT (If more space is required, use additional copies of NRC Form 365A) (17)

available. In this function, the CA System is designed to remove primary coolant stored energy and residual core energy, and to prevent overpressurization of the NC System. The CA System is designed to automatically start upon any of the following:

1. Loss of both CF pumps [EHS:P]
2. Two out of four (2/4) low-low level alarms in any one S/G
3. Safety Injection signal
4. Loss of power on essential switchgear
5. AMSAC signal (provides control logic for Anticipated Transient Without Scram, or ATWS)

The following valves are located on the CA pump discharge headers to the S/Gs and are used to control flow from the Motor [EHS:MO] Driven CA pumps:

2CA40, Motor Driven CA Pump 2B Discharge to S/G D Control Valve
 2CA44, Motor Driven CA Pump 2B Discharge to S/G C Control Valve
 2CA56, Motor Driven CA Pump 2A Discharge to S/G B Control Valve
 2CA60, Motor Driven CA Pump 2A Discharge to S/G A Control Valve

These are pneumatically operated, fail open valves that receive a safety signal to automatically open to their travel stop settings on a Motor Driven CA Pump auto start signal.

T/S 3.7.1.2 requires three independent Steam Generator auxiliary feedwater pumps and associated flowpaths to be operable in Modes 1, 2, and 3. With two pumps inoperable, action is required to be in at least Hot Standby within six hours and in Hot Shutdown within the following six hours. Surveillance 4.7.1.2.1.a.4 requires that each automatic valve in the flowpath be fully open when CA is in automatic control or when above 10% Rated Thermal Power.

EVENT DESCRIPTION

October 18, 1994

0837 hours

Work Order 94057581-01 for 7300 Channel IV ACOT was entered into TSAIL. This Work Order was partially completed on the previous day

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

(October 17), but was not fully completed due to corrective maintenance that was required to be performed on a failed component that was encountered during the test. IAE Technicians A and B resumed work in IP/2/A/3222/00D. The technicians performed the Preliminary Requirements and Control Board Alignment as required. This included placing the SSPS Train A multiplexer test switch in the A + B position.

~0900 hours

The Work Control Center Senior Reactor Operator (WCC SRO) signed on work for IAE Technicians C and D to perform Unit 2 Reactor Trip Breaker Train B testing (W/O 94074423-01, IP/2/A/3200/08B) and SSPS Train B testing (W/O 94074422-01, IP/2/A/3200/02B). Note: TSAIL entry is not required until bypass breaker is placed in the "connect" position.

0922 hours

Just prior to placing Train B bypass breaker BYB in "connect", IAE contacted the WCC SRO and informed him to make appropriate TSAIL entries. BYB was placed in "connect", then closed per the procedure. SSPS Train B General Warning existed as expected and was verified by IAE.

At this point, both IAE teams were progressing through their respective procedures/tests. The SSPS Train A multiplexer test switch was in A + B with no General Warning. The SSPS Train B multiplexer test switch was in Normal, but a Train B General Warning existed due to BYB being closed. In addition, the SSPS Train B Mode Selector switch was in TEST.

~0945 hours

Technicians C and D reached a step in IP/2/A/3200/02B (SSPS Train B test) that required the Train B multiplexer test switch to be placed in A + B. The technicians stopped at this point because the SSPS Train A switch was in A + B. Technicians C and D approached Technicians A and B to discuss the configuration of the SSPS multiplexer test switches. As a result of this discussion, the technicians determined the proper action would be to place the Train A switch back in Normal, then place the Train B switch in A + B.

0955 hours

Technician C placed the SSPS Train A multiplexer test switch in Normal. Note: Moving this switch from the A + B position to Normal requires momentarily going through the Inhibit position. As the switch passed through Inhibit, a Train A SSPS General Warning was activated.

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

0955:42 hours Reactor Trip was initiated due to coincident Train A and Train B SSPS General Warnings.

0955:57 hours CA Motor Driven Pump 2A auto started due to low-low S/G level. Note: The CA Motor Driven Pump 2B did not auto start on low-low S/G level due to the SSPS Train B Mode Selector switch being in TEST.

0956:25 hours Feedwater Isolation initiated due to Reactor Trip with low Tave.

0956:27 hours CA Turbine [EIIS:TRB] Driven Pump steam supply valves opened.

0956:56 hours CA Motor Driven Pump 2B auto started due to AMSAC signal.

0958 hours Steam dump valves closed due to P-12 actuation.

Upon receipt of the Reactor Trip, Control Room [EIIS:NA] Operators entered Emergency Procedure EP/2/A/5000/E-0, Reactor Trip or Safety Injection, and began the process of stabilizing the plant. Since no Safety Injection was initiated or required, operators entered EP/2/A/5000/ES-0.1, Reactor Trip Response.

Following the trip, feedwater was being supplied to the S/Gs via the CA system. Operations was requested to remain on CA following the trip to ensure post-trip data could be collected accurately. Step 16.e of EP/2/A/5000/ES-0.1 directed the operators to stop CA pumps not needed per the CA Operating Procedure. Since CA was still being used to feed the S/Gs, the CA pumps were not stopped at this point.

~ 1810 hours After directions were received that it was acceptable to transfer S/G feed to CF, Control Room Operators proceeded to align CF to the S/Gs per OP/2/A/6100/05, Unit Fast Recovery. During this evolution, the CA pumps were stopped and the flow controllers [EIIS:FCO] for valves 2CA40, 2CA44, 2CA56, and 2CA60 were set to zero (closed).

Unit 2 was in Mode 3.

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

October 19, 1994

1720 hours Unit 2 entered Mode 2.

1830 hours Unit 2 entered Mode 1.

October 21, 1994

Unit 2 was in Mode 1 at 100% power.

~0435 hours

While performing a routine Control Board walkdown, the Unit 2 Operator At The Controls (OATC) discovered that valves 2CA40, 2CA44, 2CA56, and 2CA60 were all in the closed position. The OATC immediately notified the Unit Supervisor and the Control Room Senior Reactor Operator (CR SRO) and opened the valves. In addition, OP/2/A/6250/02, Auxiliary Feedwater System, Enclosure 4.1, Placing The CA System In Standby Readiness, was completed with no additional discrepancies noted.

CONCLUSIONReactor Trip

The root cause of the Reactor Trip on October 18, 1994 was less than adequate Document Use Practices. IAE technicians discussed the status of the SSPS multiplexer test switches and made the decision to place the SSPS Train A switch in Normal. Technician C placed the switch in the Normal position without using an approved procedure. In addition, Technicians A and B allowed the switch to be repositioned, thereby removing SSPS Train A from the alignment specified in their procedure, IP/2/A/3222/00D, 7300 Channel IV ACOT. When an unusual or unexpected condition is encountered during use of a procedure such that the procedure cannot be completed as written or actions not addressed in the procedure are required, technicians are expected to stop work and contact supervision. In addition, when working with components/systems that are required to be in a specific alignment, technicians are expected to maintain control of these components/systems and prevent any repositioning that would conflict with their required alignment. The technicians involved did not perform these actions as expected. A communication will be made to all station personnel that clearly states the requirements associated with procedure use. Specific issues covered will include what to do when unusual or unexpected conditions are encountered that are not covered by the procedure, and ownership of components/systems that are being worked on.

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

A contributing cause of the Reactor Trip was less than adequate Management Directions. Several factors were identified that indicated a formal philosophy was not well defined or understood for certain situations that were encountered during this event. These factors included:

- 1) During this event, the multiplexer test switches in Train A and Train B SSPS were required to be manipulated. The 7300 Process Instrumentation and Control System is divided into four independent channels (I - IV) which are not directly train related. All IAE procedures for 7300 ACOTs on Channels I - IV require the Train A multiplexer test switch to be manipulated, however the use of either the A or B Train switch is technically acceptable. Considering these factors that complicated the event, it is apparent that a clear, formal philosophy for train related work and a review of 7300 Channel work is needed.

- a. The scheduling philosophy at Catawba currently requires train related work to be completed within designated work weeks with no overlap between trains allowed. This philosophy will be clearly communicated to all station personnel. In addition, all station personnel will be informed that cross train work (e.g. Train A work during a Train B week) requires prior approval by the Station Manager (or Duty Station Manager).

For interim measures, Operations management has issued a statement to all Operations personnel indicating that cross train work will not be allowed without prior approval from the Station Manager (or Duty Station Manager).

- b. Work Control currently schedules 7300 Channels I and III in Train A weeks and Channels II and IV in Train B weeks. IAE/Engineering will review the 7300 ACOT procedures and, if feasible, make the necessary changes to allow the Train A multiplexer test switch to be used during Channel I and III tests and the Train B switch to be used during Channel II and IV tests.

- 2) Originally, the 7300 Channel IV ACOT was scheduled for Monday, October 17 and the Train B Reactor Trip Breaker and Train B SSPS tests were scheduled for Tuesday, October 18. However, on Monday, October 17 Technicians A and B were delayed due to a failed card in the Pressurizer Pressure section of the 7300 Channel IV ACOT procedure. As a result, the 7300 Channel IV ACOT could not be completed on October 17 and was carried over to Tuesday. The discipline scheduler in Work Control and the Work Window Manager were not aware that this work had carried over since no formal process was in place for this communication to take place between IAE and Work Control. In addition, the supervisors for the two IAE teams were not aware of the other team's scheduled work items.

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

- a. All station personnel will be instructed to contact the Work Window Manager (or Shift Work Manager on backshift or weekends) when Technical Specification related work on an operating unit cannot be completed as scheduled by the end of the shift. The Work Window Manager (or Shift Work Manager) will evaluate the impact of this carryover work. In addition, at the end of each work week, the Work Window Manager will review incomplete work scheduled for that week to determine how to properly reschedule that work.
- b. IAE/Engineering will review other Reactor Trip System activities to determine if possible scheduling conflicts could occur. If possible conflicts are identified, they will be forwarded to Work Control to prevent these activities from being performed concurrently. As an interim measure, the two IAE team supervisors that are responsible for Reactor Trip System work are currently reviewing each other's daily schedules for conflicts. In addition, IAE management has reviewed this event with the two IAE teams responsible for work/testing on Reactor Trip System components and instructed them to stop work and contact their supervisor if they encounter another team working with a Reactor Trip System component.

During the investigation of the October 18 Reactor Trip, other issues were identified that were not causal factors for this event, but warrant corrective actions or enhancements to existing processes/procedures.

- 1) Procedures IP/2/A/3200/08B (Train B Reactor Trip Breaker test) and IP/2/A/3200/02B (Train B SSPS periodic test) are routinely performed concurrently. After placing the Reactor Trip Bypass Breaker (BYB) in the "connect" position, IAE technicians have only two hours per Technical Specifications to complete these tests. Discussions with IAE indicates that this evolution is normally completed with only 15-30 minutes to spare until the two hours expire. The IAE technicians involved in this event indicated a concern with the time limits that are associated with completion of these tasks. As a result, these tests will be evaluated to determine if work execution or procedure changes can be made to minimize the time limits involved with these tasks.
- 2) When reviewing the IAE procedures for the tests being performed during this event, it was determined that some of the procedures can be enhanced to give technicians an additional level of defense against activating concurrent SSPS General Warnings. IAE and Engineering will review procedures and implement changes that would require technicians to check for existing General Warnings prior to any manipulation of switches that would activate an SSPS General Warning.

A review of Reactor Trips at Catawba in the past 24 months revealed one trip, Licensee Event Report (LER) 413/94-001, that was attributed to less than adequate Document Use Practices. Since the work groups involved in the two trips were different (Operations and IAE), this event is not recurring.

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.

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				94	007	00	

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

Technical Specification Violation for Two Inoperable Auxiliary Feedwater Pumps

On October 21, 1994 at approximately 0435 hours, a Control Room Operator discovered that the discharge flow control valves for CA Pumps 2A and 2B were closed. The operator contacted the Unit Supervisor and Control Room SRO and opened the valves. Further investigation by this shift revealed that the valves had been closed since October 18 at approximately 1810 hours. Enclosure 4.1, Placing the CA System In Standby Readiness, of OP/2/A/6250/02 was completed. The root cause of this event is attributed to less than adequate Written Communication due to omission of relevant information. Following the October 18 Reactor Trip, Control Room Operators entered EP/2/A/5000/ES-0.1, Reactor Trip Response, as required. When operators reached the section of the procedure where they are directed to shutdown unnecessary plant equipment, step 16.e directed them to "stop CA pumps not needed for feeding S/Gs". At this time, operators had been requested to remain on CA to ensure post-trip data could be collected accurately. Normally, at this time in the Emergency Procedure, CA is secured and S/G feed capability is resumed by the CF System. When CA pumps are stopped per step 16.e, the procedure prompts the operator to refer to OP/2/A/6250/02 which contains instructions for placing CA in standby readiness. In addition, step 16.e is written such that it is a normal sequential step. Therefore, when operators determined that CA was necessary for feeding the S/Gs, step 16.e was checked and they appropriately continued through the EP. Operations has revised EP/1(2)/A/5000/ES-0.1 to make step 16.e a nonsequential step (using the WHEN...THEN... format) and to clearly prompt the operator the place CA in standby readiness. Emergency Procedure usage guidelines require that nonsequential steps be "flagged" if the action cannot be taken at the time they are encountered when performing the procedure. When the action can be taken, operators are required to return to the flagged step and perform the listed action.

A contributing cause for this event was less than adequate Work Practices. On October 18 at approximately 1810 hours, the Control Room Operator placed CF in service and secured the CA pumps (and closed the subject valves). After securing the pumps and closing the valves, the operator did not take the necessary actions to ensure the CA System was aligned for standby readiness. This evolution occurred just prior to shift turnover; there was no information provided to the oncoming operator that CA had just been secured and needed to be placed in standby readiness. In addition, the valves remained in the closed position undetected for approximately two and one-half days with three different Operations Shift teams on duty. Senior Operations Management will clarify and enhance the Operations philosophy concerning the key aspects of this event; specifically, operators' responsibilities when securing components/systems and routine monitoring of Control Boards. This philosophy will be discussed with all Operations personnel.

During the investigation of the Technical Specification Violation for two Inoperable Auxiliary Feedwater Pumps, other issues were identified that were not causal factors for this event, but warrant corrective actions or enhancements to existing processes/procedures.

**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

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

- 1) OP/2/A/6100/05, Unit Fast Recovery, contains steps for resuming S/G feed capability using the CF System. When these steps were performed during this event, the operator did not ensure the CA System was placed in standby readiness. A step has been added to enhance OP/1(2)/A/6100/05 to require operators to align CA for standby readiness if CA pumps are off.
- 2) Operations Management Procedure (OMP) 2-22, Shift Turnover, contains a Control Board Indication Checklist that provides the required status for many key components and is performed at the beginning of each shift. Valves 1(2)CA40, 1(2)CA44, 1(2)CA56, and 1(2)CA60 (not previously on the checklist) have been added. In addition, Operations has completed an evaluation of the checklist to determine if other key components needed to be added or deleted. This review did not identify any needed changes.

Technical Specification Violations at Catawba due to less than adequate Written Communication for the past 24 months were reviewed. There have been no Licensee Event Reports attributed to Operations due to omission of relevant information in Written Communication, therefore this event is not recurring.

CORRECTIVE ACTIONS**Reactor Trip****Immediate**

- 1) Control Room Operators entered the appropriate Emergency Procedures and stabilized the plant.

Subsequent

- 1) Operations management has communicated to all operators that no cross train work will be allowed without Station Manager (or Duty Station Manager) approval.
- 2) Supervisors for the two IAE teams responsible for work/testing of Reactor Trip System components have initiated a cross-review of each other's daily work schedules to ensure conflicts do not occur.
- 3) The IAE teams responsible for work/testing of Reactor Trip System (SSPS, Reactor Trip Breakers, 7300 Process) components were instructed to stop work and contact their supervisor if they encounter another team working with the Reactor Trip System.

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.

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TEXT (If more space is required, use additional copies of NRC Form 366A). (17)

Planned

- 1) A communication will be made to all station personnel that clearly states the requirements associated with procedure use. Specific issues covered will include what to do when unusual conditions are encountered that are not covered by the procedure, and ownership of components/systems that are being worked on.
- 2) All station personnel will be informed of the philosophy for performing train related work within the designated work week and the need for Station Manager (or Duty Station Manager) approval prior to performing any cross train work.
- 3) IAE/Engineering will review the 7300 ACOT procedures and, if feasible, make the necessary changes to allow the Train A multiplexer test switch to be used during Channel I and III tests and the Train B switch to be used during Channel II and IV tests.
- 4) All station personnel will be informed of the need to contact the Work Window Manager (or Shift Work Manager on backshift or weekends) when Technical Specification related work on an operating unit cannot be completed on the shift it is scheduled to complete on.
- 5) IAE/Engineering will review other Reactor Trip System activities to determine if possible scheduling conflicts could occur. If conflicts are identified, they will be forwarded to Work Control to prevent these activities from being performed concurrently.
- 6) The procedures and work execution process for Reactor Trip Breaker testing and SSPS Periodic Testing will be reviewed to determine if changes can be made to minimize the time limits associated with these tasks.
- 7) IAE/Engineering will review procedures and implement changes that would require technicians to check for existing General Warnings prior to any manipulation of switches that would activate an SSPS General Warning.

Technical Specification Violation for Two Inoperable CA Pumps

Immediate

- 1) Valves 2CA40, 2CA44, 2CA56, and 2CA60 were opened.

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.

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TEXT (if more space is required, use additional copies of NRC Form 366A) (17)

Subsequent

- 1) Operations completed OP/2 ' ' 6250/02, Enclosure 4.1 to place the CA System in standby readiness.
- 2) Procedures EP/1(2)/A/5000/ES-0.1 and OP/1(2)/A/6100/05 were revised to give clear guidance for returning the CA System to standby readiness.
- 3) Valves 1(2)CA40, 1(2)CA44, 1(2)CA56, and 1(2)CA60 were added to the Control Room Indication Checklist.
- 4) Operations has reviewed the Control Board Indication Checklist for each Unit to determine if other key components needed to be added or deleted.

Planned

- 1) Senior Operations management will clarify and enhance the Operations philosophy for responsibilities of Operators, with special emphasis on Control Board monitoring and required actions when securing equipment. This philosophy will be communicated to all Operations personnel.

SAFETY ANALYSIS

The Reactor Trip occurred due to simultaneous General Warnings in both trains of the SSPS. With both trains of SSPS in General Warning, the Reactor Trip Breakers opened as designed. Following the trip, Motor Driven and Turbine Driven CA Pumps auto started, causing the NC system to cooldown. Feedwater Isolation occurred as designed due to Reactor Trip with low Tave. As NC temperature reached 553 degrees F, P-12 actuated and closed Steam Dump Valves to control the cooldown. Control Room Operators entered the appropriate Emergency Procedures and stabilized the plant. All safety systems responded as expected.

Following the Reactor Trip, Control Room Operators were in the process of returning the plant to normal operating status. When S/G feedwater supply was returned to the CF System and the CA System was secured, Control Room Operators closed the discharge flow control valves for CA Motor Driven Pumps 2A and 2B. These valves remained in the closed position from October 18 at approximately 1810 hours until October 21 at approximately 0435 hours. On October 18 at 1810 hours, Unit 2 was in Mode 3. Unit 2 entered Mode 2 on October 19 at 1720, Mode 1 on October 19 at 1830 hours, and was in Mode 1 at

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100% power on October 21 at 0435 when the valves were discovered to be closed. The subject valves are pneumatically operated and fail open upon loss of air. In addition, the subject valves receive a safety signal to open on a Motor Driven CA Pump auto start signal. Assuming a single failure of one of the four valves to open as designed, sufficient CA flow to the Steam Generators would still be provided through the remaining valves, as well as via the Turbine Driven CA Pump.

The health and safety of the public were not affected by these events.