

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Sequoyah, Unit 2	DOCKET NUMBER (2) 0 5 0 0 0 3 2 8 1	PAGE (3) OF 0 5
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Inadequate Work Control Caused Two Emergency Core Cooling System Pumps To Be Inoperable Resulting In An Inadvertent Entry Into Technical Specification 3.0.3

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER(S)
0 4	0 7	8 8	8 8	0 1	9	0 0	0 4	2 8	8 8		0 5 0 0 0
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OPERATING MODE (9) 3		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)									
POWER LEVEL (10) 0 1 0 1 0	20.402(b)		20.405(e)		50.73(a)(2)(iv)		73.71(b)				
	20.405(a)(1)(i)		50.36(e)(1)		50.73(a)(2)(v)		73.71(c)				
	20.405(a)(1)(ii)		50.35(e)(2)		50.73(a)(2)(vii)		OTHER (Specify in Abstract below and in Text, NRC Form 366A)				
	20.405(a)(1)(iii)	XX	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)						
	20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)						
	20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(ix)						

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER	
NAME Don Siska J. L. Long, Plant Operations Review Staff		AREA CODE 6 1 5 8 7 1 0 - 1 7 1 5 4	

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS

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

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

At 1215 EDT on April 7, 1988, with unit 2 in mode 3 (hot standby), it was determined that Technical Specification (TS) Limiting Condition for Operation (LCO) 3.0.3 had been in effect since approximately 1156 EDT that morning. LCO 3.0.3 was applicable because the handswitches for the "B" train residual heat removal (RHR) pump and the "A" train centrifugal charging pump (CCP) had both been placed in the "pull-to-lock" position, thereby rendering both pumps inoperable. As a result, two independent trains of emergency core cooling system (ECCS) subsystems were not available, and unit 2 was not in compliance with either the LCO or the action requirements of TS 3.5.2. At 1226 EDT, CCP 2A-A was returned to service, and LCO 3.0.3 was exited.

The immediate cause of this event was a personnel error that resulted from the high level of activity in the main control room (MCR). The root cause of this event was inadequate work control. The handswitches for both pumps were placed in the "pull-to-lock" position in accordance with approved plant procedures; however, these procedures should not have been allowed to be performed concurrently. To ensure that the activity in the MCR is maintained at a reasonable level during the restart of unit 2, the shift operations advisor (SOA) will assist the shift supervisor (SS) in monitoring the activity level in the MCR and recommend that activities in the MCR be slowed down or stopped when, in his opinion, too many activities are in progress simultaneously. In addition, TVA will revise the plant procedure for work control to ensure that activities controlled by Operations are adequately considered during the work impact evaluation. This revision will also require that the personnel responsible for work control maintain better communication with the Operations supervisors to ensure they are aware of ongoing activities.

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

DESCRIPTION OF EVENT

At approximately 1215 EDT on April 7, 1988, unit 2 was in mode 3 (0 percent power, 2235 psig, 547 degrees F) when it was determined that Technical Specification (TS) Limiting Condition for Operation (LCO) 3.0.3 had been in effect since approximately 1156 EDT that morning. LCO 3.0.3 was applicable because the handswitches for the "B" train residual heat removal (RHR) (EIIS Code BP) pump and the "A" train centrifugal charging pump (CCP) (EIIS Code BQ) had both been placed in the "pull-to-lock" position, thereby rendering the subject pumps inoperable. As a result, two independent trains of emergency core cooling system (ECCS) subsystems were not available, and unit 2 was not in compliance with either the LCO or the action statement of TS 3.5.2.

At approximately 0955 EDT, the unit 2 lead reactor operator (RO) received permission from the assistant shift operations supervisor (ASOS) to place the handswitch for RHR pump 2B-B in the "pull-to-lock" position and logged the entry into LCO 3.5.2. This action was taken to ensure that a spurious safety injection signal (SIS) (EIIS Code JE) would not automatically start the subject pump while preventative maintenance (PM) on the pump's mini-flow switches was being performed. Action requirement (a) to LCO 3.5.2, which is applicable during plant operation in modes 1, 2, and 3, allows one ECCS subsystem to be inoperable for up to 72 hours before a reduction in plant power and/or reactor coolant system (RCS) (EIIS Code AB) temperature must be initiated. (Note: An ECCS subsystem is defined as a CCP, a safety injection (EIIS Code BQ) pump, an RHR pump, and an RHR heat exchanger.)

At approximately 1156 EDT, the unit 2 lead RO received permission from the ASOS to place the handswitch for CCP 2A-A in the "pull-to-lock" position and logged the entry into LCOs 3.1.2.4 and 3.5.2. This action was performed in accordance with step 6.2.3 of Surveillance Instruction (SI)-40.1, "Centrifugal Charging Pump Casing and Discharge Piping Venting." The subject SI requires the CCP to be taken out of service to ensure a spurious SIS will not automatically start the CCP while maintenance personnel remove a blank flange on the downstream piping and replace it with a flange suitable for venting the pump casing. At approximately 1215 EDT, the RO recognized that both handswitches were in the "pull-to-lock" position, and consequently, LCO 3.0.3 was applicable. The RO immediately notified the ASOS of the event and instructed the maintenance personnel to replace the vent flange on the CCP 2A-A piping. At approximately 1226 EDT, the vent flange was in place and the RO returned CCP 2A-A to the automatic position thereby exiting LCO 3.0.3. Since LCO 3.0.3 was in effect for only 30 minutes, an RCS cooldown was not required.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/90

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

CAUSE OF EVENT

The immediate cause of this event was a personnel error by the unit 2 lead RO and the ASOS. The personnel error has been attributed to the high level of activity in the MCR on the April 7, 1988 day shift. During the interval from 0908 EDT to 1156 EDT, 11 LCO entries were made and two functional tests were performed. This high activity level and large number of LCO entries adversely affected the lead RO's and ASOS's ability to recognize that two separate entries into LCO 3.5.2 were made.

The root cause of this event was inadequate work control. Both the PM work on RHR pump 2B-B and the SI on CCP 2A-A had been screened by the work control group (WCG) before Operations personnel gave permission to initiate the work. However, since SI-40.1 was scheduled to be completed during the midnight shift and the PM on RHR pump 1B-B was scheduled to be initiated during the day shift (both on April 7), the members of the WCG were not aware that the PM was in progress when SI-40.1 was initiated. In addition, although the WCG was aware that SI-40.1 was scheduled to be performed, there are no controls in place to ensure that the WCG reviews Operations controlled activities such as SI-40.1.

ANALYSIS OF EVENT

This event is being reported in accordance with 10 CFR 50.73, paragraph a.2.i.b, as an operation prohibited by the plant's TSs.

During normal plant operation in modes 1, 2, and 3, the CCPs provide reactor coolant pump seal injection flow, core reactivity control through the addition of borated water, and allow for the addition of other chemicals necessary to maintain proper RCS chemistry. The RHR pumps do not perform any required function during normal operation in modes 1, 2, and 3. Since chemical and reactivity control are not performed automatically, and seal injection flow was being supplied by the operable CCP, this event did not have any effect on normal plant operation.

During accident conditions, the CCPs provide automatic high head safety injection flow to the RCS following a SIS. Specifically, at least one train of high head safety injection flow (assuming a single failure of the redundant train) is required to show acceptable results for the loss of coolant accident (LOCA) and the main steam line break (MSLB) accident. The RHR pumps provide low head safety injection flow to the RCS following an SIS, and at least one train must be operable to ensure compliance with the requirements of 10 CFR 50.46 following a large break LOCA. The potential consequences of CCP 2A-A and RHR pump 2B-B in the pull-to-lock position on the LOCA and MSLB accidents are discussed below.

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If a LOCA had occurred concurrent with a loss of offsite power (LOP) and the failure of diesel generator (D/G) 2B-B to start or load, high head safety injection flow would not have been automatically available. Similarly, if a LOCA had occurred concurrent with a LOP and the failure of D/G 2A-A to start or load, low head safety injection flow would not have been automatically available. In either case, however, plant operators are instructed by Emergency Procedure E-0, "Reactor Trip or Safety Injection," to verify at least one train of ECCS subsystems are operating following an SIS. In the events described above, the plant operators would be able to verify that the CCP or the RHR pump was not operating and would then have taken the appropriate action (i.e., place the handswitch in automatic and manually start the pump) to ensure at least one train of ECCS subsystems was operating. Thus, the event described herein did not significantly compromise the ability of plant safety systems to mitigate the consequences of a LOCA.

During a MSLB accident, borated water from high head safety injection is necessary to mitigate the reactivity transient that accompanies the uncontrolled RCS cooldown associated with a MSLB. The addition of borated water by the CCPs precludes a possible post-reactor trip power excursion and ensures that the local heat flux at the hottest fuel pin in the core (EIIS Code AC) remains below the heat flux at which departure from nucleate boiling (DNB) is predicted to occur. If a MSLB had occurred concurrent with the failure of D/G 2B-B to start or load, borated water from the CCPs would not have reached the core within the time assumed in the FSAR Chapter 15 accident analysis. However, during this event, the RCS boron concentration was at least 2000 parts per million (ppm). With this boron concentration, the neutron multiplication factor (k-eff) of the core was well below 0.95; hence, an RCS cooldown of any credible magnitude could not have resulted in a post-reactor trip power excursion.

CORRECTIVE ACTION

TVA has reviewed the sequence of events described herein with all Operations shift crews presently on shift to stress the importance of a thorough evaluation of the plant status before removing safety-related equipment from service. Other Operations personnel will review this event during their requalification training. In addition, the ASOS and the RO involved in this event have received appropriate administrative action.

To ensure that the activity in the MCR is maintained at a reasonable level during the restart of unit 2, the shift operations advisor (SOA) will assist the shift operations supervisor (SOS) in monitoring the operations activities in the MCR and, where appropriate, make recommendations to the SOS. The SOA will recommend that activities be slowed down or stopped when, in his opinion, control of activities by cognizant Operations personnel is being threatened by too many activities in progress at any one time. This monitoring by the SOA has already been implemented.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

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

TVA has recently established a program to schedule work on only one train of safety-related equipment every week. This program will decrease the potential of inadvertently removing two independent trains of safety-related equipment from service at the same time.

To improve the work control reviews and prevent recurrence of this event, TVA will revise SQA-199, "Integrated Schedule and Work Control," to ensure that activities controlled by Operations personnel are adequately considered during the work impact evaluation. This change will require that the WCG cross-check work impact evaluations against operations controlled activities or, alternatively, require that all operations controlled activities (except those that only collect data or do not require a plant configuration change) be screened by the WCG. Implementation of this change will assist the WCG in identifying potential conflicts in work documents associated with TS-required equipment. The change to SQA-199 will also require that the WCG maintain better communication with the unit supervisors to ensure the WCG is aware of the status of ongoing (or recently closed out) activities. The change to SQA-199 will be complete by May 31, 1988.

ADDITIONAL INFORMATION

There has been one previously reported occurrences where inadequate work control has resulted in noncompliance with TSs - SQRO-50-327/88011.

COMMITMENTS

TVA will revise SQA-199 to ensure that:

1. Activities controlled by Operations personnel are adequately considered during the work impact evaluation.
2. The WCG maintains better communication with the unit supervisors to ensure the WCG is aware of the status of ongoing activities.

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April 28, 1988

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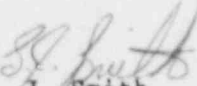
Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNIT 2 - DOCKET NO.
50-328 - FACILITY OPERATING LICENSE DPR-79 - REPORTABLE OCCURRENCE REPORT
SQRO-50-328/88019

The enclosed licensee event report provides details concerning an inadequate work control process that caused two emergency core cooling system pumps to be inoperable resulting in an inadvertent entry into Technical Specification 3.0.3. This event is reported in accordance with 10 CFR 50.73, paragraph a.2.i.b.

Very truly yours,

TENNESSEE VALLEY AUTHORITY


S. J. Smith
Plant Manager

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