

LICENSEE EVENT REPORT (LER)

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

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FACILITY NAME (1) South Texas, Unit 2	DOCKET NUMBER (2) 05000 499	PAGE (3) 1 of 4
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TITLE (4)
Automatic reactor trip due to low-low level in steam generator 2A

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
09	22	1998	98	-- 002 --	00	10	15	1998	FACILITY NAME	DOCKET NUMBER 05000
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9) 1	POWER LEVEL (10) 100	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
		20.2201(b)	20.2203(a)(2)(v)	50.73(a)(2)(i)	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 Scott Head - Licensing Supervisor	TELEPHONE NUMBER (Include Area Code) (512) 972-7136
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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/a	n/a	n/a	n/a	N					

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

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

On September 22, 1998, Unit 2 experienced an automatic reactor trip from 100 percent power when the water level in Steam Generator 2A decreased below the Reactor Protection System trip setpoint. The level decrease followed the inadvertent closure of Main Feedwater Regulating Valve 2A during corrective maintenance on the control circuitry for Low Power Feedwater Regulating Valve 2A. Work instructions governing the activity were technically incorrect, in that they directed personnel to install an unintended jumper across terminals associated with the Main Feedwater Regulating Valve. The jumper was removed subsequent to the reactor trip. Corrective actions include reviewing other similar work in progress, discussing lessons learned with key stakeholders, and developing a case study.

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

DESCRIPTION OF EVENT:

On September 22, 1998, Unit 2 experienced an automatic reactor trip from 100 percent power when the water level in Steam Generator 2A decreased below the Reactor Protection System trip setpoint. The level decrease followed the inadvertent closure of Main Feedwater Regulating Valve 2A during corrective maintenance on the control circuitry for Low Power Feedwater Regulating Valve 2A. Work instructions governing the activity were technically incorrect, in that they directed personnel to install an unintended jumper across terminals associated with the Main Feedwater Regulating Valve.

On August 28, 1998 a work order package was prepared and approved governing the replacement of a printed circuit card associated with Low Power Feedwater Regulating Valve 2A. The work instructions, as written, provided an acceptable and technically accurate methodology for performing the activity.

On September 1, 1998, the work package was screened by the Instrumentation & Control (I&C) supervisor whose crew would later perform the work. The station work process program allows field supervisors to make discretionary changes to work instructions without an independent review, provided such changes do not alter the scope or intent of the activity. The supervisor elected to change the work instructions to direct certain tasks to be completed using portions of an approved station procedure, which he assumed pertained only to the Low Power Feedwater Regulating Valve. The supervisor's decision was based upon his observation that the procedure in question provided precautions and other information, such as a list of impacted control room indications, which would be useful when the job was worked. The supervisor failed to note that the designated procedure encompassed testing of both Main Feedwater Regulating Valves and Low Power Feedwater Regulating Valves. The resulting work instructions were technically incorrect, in that they directed the installation of jumpers which would disable both valves.

Replacement of the printed circuit card in Low Power Feedwater Regulating Valve 2A was scheduled for September 22, 1998. The supervisor who had changed the work instructions was absent that day; consequently, responsibility for task performance was assigned to another I&C supervisor. The second supervisor reviewed the work package and noted that critical steps were to be performed using portions of an approved site procedure. He noted that the procedure required the installation of two jumpers, but assumed both pertained to the Low Power Feedwater Regulating Valve. Based upon his confidence in the technical accuracy of site procedures, he departed from established practices by not performing a thorough independent technical review of the work package. The supervisor then completed a Work Risk Assessment Form, in which he concluded that the activity posed no risk to the plant.

The supervisor performed a pre-job briefing with the I&C technicians assigned to the job, neither of whom routinely performed work on the Main Feedwater Control System. The briefing included a review of the procedure steps which directed jumpers to be installed in the circuit. The technicians, sharing the supervisor's confidence in the technical accuracy of site procedures, did not fulfill site expectations to challenge the work instructions. The second technician's confidence in the competence of the supervisor who changed the work

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instructions also influenced his decision to accept them as written. At no time did the supervisor or technicians responsible for task implementation consider the possibility that the specified procedure might be inappropriate for the prescribed task. The extent of their reliance on existing barriers is exhibited by the fact that the crew did not review drawings of the circuit included within the work package, which showed that the terminals upon which the first jumper would be landed were associated with the Main Feedwater Regulating Valve.

The technicians proceeded to the control room and discussed the job scope with the Unit Supervisor. No formal pre-evolution briefing was held due to the work activity having been screened as involving no risk on the Work Risk Assessment Form. Upon obtaining approval for work start, one technician proceeded into the "at the controls" area in order to give the secondary reactor operator a list of indications which would be affected during the activity. The reactor operator, recognizing that the list contained items which should not have been impacted by work on the Low Power Feedwater Regulating Valve, questioned the technician as to whether the Main Feedwater Regulating Valve would also be affected. The technician then recognized that the procedure actually governed testing of both valves. Rather than stopping and evaluating this new information as site expectations dictate, the technician immediately assumed that the portions of the procedure specified for use applied only to the Low Power Feedwater Regulating Valve. The technician assured the reactor operator that the Main Feedwater Regulating Valve would not be affected. The technician did not subsequently inform the second technician that the procedure scope was broader than initially thought.

The technicians proceeded to the relay rack room and commenced work. When directed by the work package, they placed jumpers across TB-C terminals 1 & 2 (Main Feedwater Regulating Valve) and 4 & 5 (Low Power Feedwater Regulating Valve). The technicians heard several relays change state, immediately stopped work, and proceeded to the control room. Upon overhearing post-trip communications regarding the closure of Main Feedwater Regulating Valve 2A, the technicians deduced that their actions were likely responsible for the trip and informed the control room staff.

CAUSE OF EVENT

The cause of this event was the failure to adequately verify the technical accuracy of changes made to the original work instructions.

The following contributing factors were identified:

- 1) Complacency, fostered by overconfidence in site procedures and the competence of the supervisor who changed the work instructions, resulted in the lack of a questioning attitude among those tasked with work implementation. Consequently:
 - the second I&C supervisor did not fulfill expectations to verify the technical content of the work package before briefing the crew, resulting in an inadequate pre-job briefing and incorrectly completed Work Risk Assessment Form;

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- the I&C technicians did not fulfill expectations to challenge the technical content of the work instructions; and,
 - an I&C technician, upon learning that the procedure scope was broader than previously believed, did not fulfill expectations to properly evaluate new information prior to proceeding with the assigned task.
- 2) The second I&C supervisor and crew responsible for task performance had little prior experience with the Main Feedwater Control System, creating an error-likely situation. The supervisor did not afford this activity the additional attention such situations warrant.

ANALYSIS OF EVENT

Any event or condition that results in a manual or automatic actuation of any engineered safety feature, including the reactor protection system, is reportable under 10CFR50.73(a)(2)(iv). The inadvertent closure of the feedwater regulating valve following installation of the jumper caused level in Steam Generator 2A to drop below the reactor protection system (RPS) setpoint, inducing an automatic reactor trip from full power. All control rods fully inserted into the core and all plant equipment performed as expected following the trip. Unit 2 stabilized in Mode 3. No damage to plant systems or personnel injuries resulted from the transient. The event did not represent a significant challenge to reactor safety, or the safety of the general public.

CORRECTIVE ACTIONS

1. Lessons learned were discussed and personnel issues were addressed with the personnel involved in the event. (Completed September 29, 1998)
2. Lessons learned from the event were discussed with plant operations personnel, as well as craft personnel of all maintenance disciplines. (Completed September 23, 1998)
3. All Instrumentation & Control work packages worked over the next few days were thoroughly reviewed for similar problems prior to performance. (Completed September 23, 1998)
4. A case study or studies to include principles, roles and responsibilities will be developed and presented to key stakeholders. (Due January 28, 1999)

ADDITIONAL INFORMATION:

Inadequate preparation and review of work instructions was listed as a causal factor for several station events involving inadvertent trips and/or safety system actuations prior to 1992 (e.g. Licensee Event Reports 1-91-021, 1-91-13, 2-89-006). The 9/22/98 trip represents the first event involving an inadvertent safety system actuation attributed to technically incorrect work instructions since that time. No noteworthy events attributed to the technical inaccuracy of work document field revisions have been identified in station condition reports generated in the past 18 months.