

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Susquehanna Steam Electric Station-Unit 1										DOCKET NUMBER (2) 0 5 0 0 0 3 8 7 1				PAGE (3) 1 OF 0 3		
TITLE (4) Reactor Recirculation Pump Discharge Valve Stem Galling.																
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 3	0 3	8 4	8 4	0 1 8	0 0 0	5 1	5 8	4					0 5 0 0 0			
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)														
3		20.402(b)				20.405(e)				50.73(a)(2)(iv)				73.71(b)		
POWER LEVEL (10)		20.405(a)(1)(i)				50.36(e)(1)				50.73(a)(2)(v)				73.71(c)		
0 0 0		20.405(a)(1)(ii)				50.36(e)(2)				50.73(a)(2)(vii)				<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 365A)		
		20.405(a)(1)(iii)				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)(x)						
LICENSEE CONTACT FOR THIS LER (12)																
NAME Benjamin L. Wilks										TELEPHONE NUMBER						
										AREA CODE 7 1 7 5 4 2 - 1 3 1 2 3 1 9						
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						
B	A/D	IISV	A5A5	N												
SUPPLEMENTAL REPORT EXPECTED (14)												EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)												<input checked="" type="checkbox"/> NO				

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

During the performance of surveillance SO-164-001, "Recirculation Pump Discharge Valve and Bypass Operability Test", on March 3, 1984 prior to Unit 1 restart, Recirculation Discharge Valve 1F031B failed to operate. As a result, Unit 1 was cooled down and the valve was disassembled. Inspection showed that the valve's stem was binding with the upper and intermediate packing glands upon stroking. The galling of the valve's stem was extensive, requiring it to be replaced. The upper and intermediate packing glands were machined to allow greater tolerance between the stem and glands. Alignment between the new stem and the packing glands was assured by verifying proper clearance utilizing feeder gauges at the time the packing glands were installed. Similar suction and discharge valves on the recirculation loops for both Units 1 and 2 were inspected and proper packing gland-stem clearance adjustments performed.

Unit 1 remained shutdown during this event; primary system integrity was maintained and no release of radiation occurred. The health and safety of the public was not affected.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED CME NO. 3150-0104

EXPIRES 8/31/88

FACILITY NAME (1) Susquehanna Steam Electric Station Unit 1	DOCKET NUMBER (2) 0500038784	LER NUMBER (3)			PAGE (3)	
		YEAR	SECURITY AL NUMBER	REVISION NUMBER		
		01	8	010	02	OF 03

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

During the performance of surveillance SO-164-001, "Recirculation Pump Discharge and Bypass Valve Operability Test", on March 3, 1984 prior to Unit 1 restart, Recirculation Discharge Valve 1F031B failed to operate. The Recirculation Discharge Valve would be required to close should Low Pressure Coolant Injection or Loop B RHR operation be needed. Unit 1 was cooled down and the valve was disassembled.

Special care was taken during valve disassembly to prevent leakage since there is no isolation between the valve and the reactor vessel. A special procedure, MT-064-008, "Reactor Recirculation Pump Discharge Valve Disassembly and Reassembly", was written to perform the work. Valve disassembly was begun by cycling the valve to the closed position and carefully opening the valves drain and vent lines; no leakage from the drain valve verified the valve to be seated in the closed position. After removal of the valve packing, a valve stem locking device was placed around the valve's stem and jacked up against the valve's yoke. In addition, a stem jacking rig was then placed atop the valve's stem to prevent any upward movement of the disc. With the stem locking device and jacking rig securely mounted, the valves actuator (mounted atop the valve yoke) was removed. Four (4) valve body to bonnet studs were removed and replaced with four (4) long B7 studs. The valve stem locking device was then repositioned with the jacking bolts removed. Two crossmembers were placed across the stem clamp and attached to the B7 long bolts. All but two (2) bonnet nuts and studs were then removed. The last two (2) nuts were loosened and the bonnet with the yoke attached was slowly raised approximately an inch in order to determine any leakage. With no leakage evident, the remaining two (2) nuts were removed. The valve bonnet was then raised high enough to allow access to install a disc locking device within the valve's body, over which a locking device top plate was placed and securely bolted to the valve body.

With the disc locking device installed, both the stem clamp and the stem jacking rig were removed allowing removal of the valve yoke, packing glands and finally the valve's stem. Following inspection, the valve was reassembled using a new stem, in a manner reverse to that described above.

Inspection showed that valve 1F031B's stem was contacting the upper and intermediate packing glands when stroked causing the development of a metal burr or gall point on the stem. Additional valve motion lead to binding of the valve.

The valve vendor was contacted and more detailed direction for proper adjustment of the packing glands was obtained; specifically, during reinstallation of the valve's packing glands, measurements were made to assure the glands were not cocked during draw down (i.e., the tightening of the gland jam nuts). The vendor also recommended that the inner diameters of the upper and intermediate packing glands be increased by .042 and .028 inches respectively prior to valve reassembly.

During post maintenance testing, a scratch and gall mark was found on the new stem for valve 1F031B. Additional stroking continued to worsen the condition; the valve however, did not bind. The valves packing glands were raised. The valve stem, packing glands and back seat were inspected. Contact between the stainless steel stem and stainless steel glands initiate the scratch on the stem. All raised metal was removed.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Susquehanna Steam Electric Station Unit 1	0 5 0 0 0 3 8 7	8 4	— 0 1 8	— 0 0	0 3	OF	0 3

TEXT (If more space is required, use additional NRC Form 388A's) (17)

Investigation revealed that the tolerances between the valve's stem and gland, even after assuring the glands were straight, allowed sufficient lateral movement of the gland in its stuffing box to permit contact between the stem and gland.

The maintenance work plan was revised to require feeler gauge checks around the valve stem after installation of the upper and intermediate packing glands to ensure adequate clearance between the valve stem and packing glands.

Dimensional checks on the gap between the valve stem and back seat; the valve stem and stuffing box showed the back seat bushing to be slightly off set with respect to the bore for the lower stuffing box. This offset causes the valve stem to ride very close to one of the back seat bushing and come in contact with one side of the back seat during valve motion. Indications are that galling of the stem did not result from the stem's contact with the stellite back seat but that the back seat accelerated any galling once it was initiated.

Although the actions identified reduce the possibility of galling the valve stem, factors inherent in the valve's design tend to increase the potential for such an occurrence. Specifically, those factors are:

(1) The tight clearances between the valve's stem and its packing glands; the stem, prior to boring the glands, was approximately 2.751 ± 0.005 inches in diameter with an opening of 2.771 ± 0.005 inches between the packing glands; allowing approximately .01 ± 0.005 inches of clearance between the stem and the glands.

(2) The valve's stem and glands are both made of stainless steel; since both are of similar hardness, significant galling of the stem results with contact occurs between the two.

(3) The design of the intermediate and upper packing glands (i.e., the height, or depth of the glands and their stacked configuration) aids in their misalignment that results in contact with the stem. A small change in the adjustment of the jam nut, at the top of the gland and on the valves exterior, can easily produce misalignment of that portion of the gland nearest the valve's stem.

Following the second rework of valve 1F031B, the valve was stroked several times with no evidence of galling. All other Unit 1 and Unit 2 Recirculation system suction and discharge valves were inspected using the revised inspection procedure.

Unit 1 remained shutdown during this event; primary system integrity was maintained and no release of radiation occurred. The health and safety of the public was not affected.



Pennsylvania Power & Light Company

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May 15, 1984

U.S. Nuclear Regulatory Commission
Document Control Desk
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SUSQUEHANNA STEAM ELECTRIC STATION
LICENSEE EVENT REPORT 84-018-00
ER 100450 FILE 841-23
PLA- 2203

Attached is Licensee Event Report 84-018-00. This event, although not reportable per 10CFR50.73, is being made to inform the NRC of the circumstances surrounding the failure of a Recirculation Discharge Valve to open and of damage to the stem of the valve.

H.W. Keiser
Superintendent of Plant-Susquehanna

BLW:pjg

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