ULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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FACIL: 50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe 05000397
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RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 87-018-00 on 870626, reactor automaticaly scrammed by reactor protection sys due to actuation of sudden pressure relay on normal auxiliary power transformer. Caused by opening of test valve. Transformers inspected. W/870727 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 6
TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

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	AEOD/DSP/ROAB	2	2	AEOD/DSP/TPAB	1	1
	DEDRO	1	1	NRR/DEST/ADE	1	0
	NRR/DEST/ADS	1	0	NRR/DEST/CEB	1	1
	NRR/DEST/ELB	1	1	NRR/DEST/ICSB	1	1
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	NRR/DEST/PSB	1	1	NRR/DEST/RSB	1	1
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	REG FILE 02	1	1	RES DEPY GI	1	1
	RES TELFORD, J	1	1	RES/DE/EIB	1	1
	RGN5 FILE 01	1	1			
EXTERNAL:	EG&G GROH, M	5	5	H ST LOBBY WARD	1	1
	LPDR	1	1	NRC PDR	1	1
	NSIC HARRIS, J	1	1	NSIC MAYS, G	1	1

TOTAL NUMBER OF COPIES REQUIRED: LTTR 45 ENCL 43

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
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TITLE (4) Reactor Scrams Resulting from Reactor Protection System Actuation Due to Turbine Control Valve Fast Closure

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 5 0 0 0
0 6	2 6	8 7	8 7	— 0 1 8	— 0 0	0 7	2 7	8 7		0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 4 2	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		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	TELEPHONE NUMBER
J.D. Arbuckle, Compliance Engineer	AREA CODE 5 0 9 3 7 7 - 2 1 1 5

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

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

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

On June 26, 1987 at 1541 hours, the reactor automatically scrammed by Reactor Protection System (RPS) actuation due to Turbine Control Valve (TCV) Fast Closure. The TCV fast closure was in response to a unit lockout signal resulting from the actuation of a sudden pressure relay on Normal Auxiliary Power Transformer TR-N1.

On June 27, 1987 at 1813 hours, a similar event occurred involving the sudden pressure relay on Normal Auxiliary Power Transformer TR-N2.

The cause of both sudden pressure relay actuations was determined to be the unexpected opening of a test (poppet) valve associated with the relays (the valves are used to test the relays). When the valve opened, a differential pressure developed across the bellows of the sudden pressure relays. The relays responded as designed by causing a generator trip, a turbine trip and, because reactor power was above 30%, a reactor scram. In both instances, plant post-trip response was normal in all aspects.

There is no safety significance associated with either event in that plant protection systems and electrical distribution realignments functioned as designed. These events posed no threat to the health and safety of either the public or plant personnel.

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Plant Conditions

1. June 26, 1987

   a) Power Level - 42%
   b) Plant Mode - 1 (Power Operation)

2. June 27, 1987

   a) Power Level - 58%
   b) Plant Mode - 1 (Power Operation)

Event Description

On June 26, 1987, the Plant was ascending in power on a return to operations following a maintenance and refueling outage. Both Reactor Recirculation (RRC) pumps were operating in slow speed; and two condensate pumps, two booster pumps, two circulation water pumps and both feedwater pumps were in operation.

At 1541 hours, the reactor automatically scrammed by Reactor Protection System (RPS) actuation due to Turbine Control Valve (TCV) Fast Closure.

The TCV fast closure was the result of a turbine trip caused by the tripping of Unit Lockouts 86XU, 86XUOA, 86X1U and 86X1UOA. The Unit Lockouts were tripped by the actuation of a sudden pressure relay on Normal Auxiliary Power Transformer TR-N1. The Post-scram response of the Plant was normal in all aspects.

The cause of the TR-N1 sudden pressure relay actuation was initially believed to be a fault internal to the transformer. This conclusion was based on the following:

- The sudden pressure relay was found to be functioning properly as verified by tests specified by the vendor.

- The initial report from the Bonneville Power Administration (BPA) on oil samples taken from TR-N1 indicated a change in combustible gas concentration which could indicate an internal fault leading to a valid sudden pressure signal. TR-N1 had previously demonstrated some measurable internal changes due to a transient in 1985.

Accordingly, TR-N1 was isolated from the Plant Electrical Distribution System. Inspections of the Plant and Normal Auxiliary Power Transformer TR-N2 showed no abnormalities and, at 2200 hours, the Plant was restarted. Investigation of the problems associated with TR-N1 continued.

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

On June 27, 1987 the Plant was ascending in power on a return to operations following the scram on the previous day. Both RRC pumps were operating in fast speed; and three condensate pumps, two booster pumps, two circulation water pumps and both feedwater pumps were in operation. The electrical distribution lineup was abnormal in that TR-N1 was tagged out and isolated from the Electrical Distribution System.

At 1813 hours, the reactor automatically scrammed by RPS actuation due to TCV Fast Closure. The TCV fast closure was the result of a turbine trip caused by the tripping of Unit Lockouts 86XU, 86XUOA, 86X1U and 86X1UOA. The Unit Lockouts were tripped by the actuation of a sudden pressure relay on TR-N2. The post-scram response of the Plant was normal in all aspects.

The cause of both sudden pressure relay actuations was the unexpected opening of a test valve installed on the relays. The valves were designed to open to atmosphere at nominally 10 psig and were installed by the manufacturer of the transformers. The purpose of the valves is to facilitate testing of the sudden pressure relays. These valves serve no function during normal operation and were not shown on the transformer manufacturer drawings. When the valves opened, a differential pressure developed across the bellows of the sudden pressure relays. The relays responded as designed by causing a generator trip, a turbine trip and, because reactor power was above 30%, a reactor scram.

Event Analysis

The root cause of the June 26 trip is inadequate design configuration control in that the installation of the poppet valve was not controlled and, as a result, the relationship of the sudden pressure relay and cover gas system operation was not fully understood.

The root cause of the June 27 trip is inadequate root cause determination of the previous (June 26) scram. Transformer oil sample analysis results were compared with data taken in March, 1986 rather than with the most recent data from January, 1987. Further data regarding the condition of TR-N1 were not sufficiently evaluated. While oil samples seemed to indicate a faulted condition, local and remote indications of oil and winding temperatures were all within normal limits. Insufficient data was used to conclude that a problem existed on TR-N1 and that further investigation into the actuation of the sudden pressure relay was not immediately required.

Immediate Corrective Action

1. June 26, 1987

   TR-N1 was isolated from the Plant Electrical Distribution System and oil samples were obtained and analyzed. Inspections of the Plant and TR-N2 were performed and the Plant was restarted. Investigation of the problems associated with TR-N1 continued.

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2. June 27, 1987

The test valves on the sudden pressure relays for TR-N1 and TR-N2 were removed and plugged, and oil samples were obtained and sent to BPA for analysis.

Further Evaluation Corrective Action

1. Further Evaluation

(a) Operating procedures require the internal pressure of TR-N1 and TR-N2 to be maintained between -3 and +8 psig. However, this range was incompatible with the as-found test valve lift pressure (4.5 psig for TR-N1 and 6 psig for TR-N2). When the internal pressures of TR-N1 and TR-N2 (which were still within the specified normal operating range) exceeded the test valve lift pressure, the valves lifted and caused the differential pressure across the bellows of the sudden pressure relays.

(b) Oil samples from both TR-N1 and TR-N2 were obtained and sent to BPA for anlaysis. The results of these analyses support the final conclusion that no internal faults occurred that would have caused a true sudden pressure relay actuation. This information was available before the transformers were again placed in service.

2. Further Corrective Action

(a) The Backup Transformers were inspected for similar sudden pressure relay configurations and no problems were identified. (The Main and Startup transformer sudden pressure protection is of a different design and does not have an installed test valve).

(b) A formal engineering interface will be established between the Supply System and BPA to coordinate maintenance of the Transformer Yard and other equipment of mutual interest, to improve understanding of the maintenance tests and schedules required, and to establish configuration control responsibilities.

(c) The procedure for testing sudden pressure relays will be reviewed to ensure that test valve installation, use and removal is properly addressed.

(d) Transformer oil-sample trending will be established (within the Supply System) to preclude using outdated information during future analysis of oil condition.

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(e) An engineering evaluation will be performed on the cover gas system configuration and operation.

(f) Steps have been taken to strengthen the post-trip review and root cause assessment process. Specifically, Plant Procedure 1.3.5, "Reactor Trip and Recovery," has been evaluated and will be revised to incorporate several planned improvements. In addition, a Management letter has been issued which directs Plant personnel to follow the intent of the changes until such time that the procedure is revised.

Safety Significance

There is no safety significance associated with this event in that Plant protection systems and electrical distribution realignments functioned as designed. These events posed no threat to the health and safety of either the public or plant personnel.

Similar Events

None

EIIS Information

Text Reference	EIIS Reference	
	System	Component
Reactor Protection System (RPS)	JC	---
Transformer (TR-N1 and TR-N2)	EA	XFMR
Unit Lockouts (86XU, 86XU0A, 86X1U, and 86X1U0A)	EA	RLY
Turbine Control Valve (TCV)	JJ	V

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

P.O. Box 968 • 3000 George Washington Way • Richland, Washington 99352

Docket No. 50-397

July 27, 1987

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

Subject: NUCLEAR PLANT NO. 2
LICENSEE EVENT REPORT NO. 87-018

Dear Sir:

Transmitted herewith is Licensee Event Report No. 87-018 for the WNP-2 Plant. This report is submitted in response to the report requirements of 10CFR50.73 and discusses the items of reportability, corrective action taken, and action taken to preclude recurrence.

Very truly yours,

C.M. Powers (M/D 927M)
WNP-2 Plant Manager

CMP:ac

Enclosure:
Licensee Event Report No. 87-018

cc: Mr. John B. Martin, NRC - Region V
Mr. R. T. Dodds, NRC Site (M/D 901A)
INPO Records Center - Atlanta, GA
Ms. Dottie Sherman, ANI.
Mr. D. L. Williams, BPA (M/D 399)

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