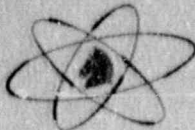


**FGE**



Portland General Electric Company  
Trojan Nuclear Plant  
71760 Columbia River Hwy.  
Rainier, Oregon 97068  
(503) 556-3713

WRR-084-90  
September 5, 1990

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington DC 20555

Gentlemen:

Enclosed is Revision 1 to Trojan Nuclear Plant Licensee Event Report (LER) 90-20. LER 90-20 was submitted to the Nuclear Regulatory Commission on June 22, 1990. The report discussed an event in which the Containment atmosphere and effluent particulate radiation monitor was found to be out-of-service because the filter paper roll had torn and no alarm indicating that condition was received. Among the corrective actions described in the report was a plan to install a mechanical stop to prevent the paper sensing arm from breaking the micro-switch associated with the low paper alarm. This corrective action has been determined not to be reasonable and will not be completed. This revision to LER 90-20 is submitted to reflect this change and provide details of alternative corrective actions.

Sincerely,

W. R. Robinson  
General Manager  
Trojan Nuclear Plant

c: Mr. John B. Martin  
Regional Administrator, Region V  
U.S. Nuclear Regulatory Commission

Mr. David Stewart-Smith  
State of Oregon  
Department of Energy

Mr. R. C. Barr  
USNRC Resident Inspector  
Trojan Nuclear Plant

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20585, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Trojan Nuclear Plant DOCKET NUMBER (2) 050003441 OF 06 PAGE (3) 6  
 TITLE (4) Particulate Channel of Containment Radiation Monitor Inoperable Due to Loss of Filter Paper and Failure of Filter Paper Alarm

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)
01	30	90	90	020	01	09	05	90	N/A		05000

OPERATING MODE (9) 1 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one of the following) (11)

20.4 (2)(b)	20.405(e)	50.73(e)(2)(iv)	73.71(b)
20.735(e)(1)(i)	50.38(e)(1)	50.73(e)(2)(v)	73.71(e)
20.405(e)(1)(ii)	50.38(e)(2)	50.73(e)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.405(e)(1)(iii)	X 50.73(e)(2)(i)	50.73(e)(2)(viii)(A)	
20.405(e)(1)(iv)	50.73(e)(2)(ii)	50.73(e)(2)(viii)(B)	
20.405(e)(1)(v)	50.73(e)(2)(iii)	50.73(e)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
E. W. Ford, Compliance Engineer	503 556-1557

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
X	BIB	MION	V1115	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)  NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

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

On January 30, 1990, the Trojan Nuclear Plant was Operating at 100% Power. At approximately 1855, during the performance of a Periodic Operating Test on Process Radiation Monitor (PRM) 2, a check of PRM 1 was performed to observe the filter paper installation. It was discovered that the filter paper in the radioactive airborne particulate channel of PRM 1 was depleted. No alarms had been received at the controller for this condition. The monitor was declared inoperable and a new supply of filter paper was installed. An alarm was not received due to a broken micro-switch on the paper out alarm and a broken wire on the paper tear alarm. No procedures existed to determine operability of the alarms on a periodic basis. The broken micro-switch has been bypassed and the paper tear alarm has been restored. A periodic check has been implemented to monitor the filter paper supply.

On February 16, 1990, during an evaluation of the above event it was determined that the filter paper speed was set at 2.5 inches per hour instead of the required 1 inch per hour. Immediate actions were taken to restore the filter paper speed to 1 inch per hour. The cause was due to inadequate procedures for restoring power to the monitor controller. The Operating Instruction has been revised to include provisions for resetting filter paper speed when reenergizing the monitor.

**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 RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20548, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  Trojan Nuclear Plant	DOCKET NUMBER (2)  0 5 0 0 0 3 4 4 9 0	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		---	0 2 0	---	0 1	0 2 OF 0 6

TEXT (If more space is required, use additional NRC Form 288A's) (17)

**EVENT DESCRIPTION**

On Tuesday, January 30, 1990, the Trojan Nuclear Plant was operating in Mode 1 (Power Operation) at 100% Rated Thermal Power. At approximately 1855, a Periodic Operating Test (POT) 26-2, "Radiation Monitoring System", was being performed on Process Radiation Monitor (PRM) 2. PRM 2 monitors the Auxiliary Building Ventilation Exhaust. During performance of the POT a paper tear alarm was received. The filter paper advances from a supply spool to a take up spool and passes in front of the detector as the air sample is being filtered. (See Figure 1)

The Auxiliary Operator performing the POT informed the Shift Chemist of the torn paper alarm. The Shift Chemist initiated prompt action to replace the filter paper. Difficulty was encountered in getting the torn paper alarm to reset. The Auxiliary Operator together with the Shift Chemist attempted to verify proper installation of the filter paper in PRM 2A by inspecting the filter paper installation of PRM 1A. PRM 1A monitors Containment Atmosphere and the Effluent Exhaust Stack and is an identical particulate monitoring unit to PRM 2A.

It was observed at this time that the PRM 1A filter paper was depleted and no alarms had been actuated on the PRM 1A monitor controllers, either locally or in the Control Room. With the filter paper roll depleted, both the paper torn and paper out alarms should have been received. PRM 1A serves the following functions: 1) Reactor Coolant System (RCS) Leakage Detection, 2) Containment Ventilation Isolation, and 3) Effluent Release Monitoring and is required to be operable per the following Technical Specifications: 3.3.2 (Engineered Safety Feature (ESF) Actuation System Instrumentation), 3.3.3.11 (Process and Effluent Monitoring), and 3.4.6.1 (RCS Leakage Monitoring).

The Control Operator was notified of the out of paper condition of PRM 1A and entered the appropriate action statements in accordance with the above Technical Specifications. Filter paper was successfully added to PRM 1A but the alarm function could not be restored.

At approximately 2050 the Shift Chemist was requested to bypass PRM 1A (particulate channel) and to take a composite sample for particulates because of the inoperability of the alarm function on PRM 1A. At approximately 2155 the Control Room was informed that a composite sample had been started and that PRM 1A was bypassed. A Maintenance Request (MR 90-1828) was issued to investigate the alarm failures on PRM 1A. The investigation revealed that the low paper alarm micro-switch was broken and that a wire on the paper tear alarm was broken. The low paper alarm micro-switch was not repairable and a replacement was not available so the circuit was bypassed. The loss of this alarm function is compensated for by reliance on the paper tear alarm which indicates an out of paper condition. The broken wire on the paper tear alarm was repaired and the alarm was verified to be operating properly by post-maintenance testing on January 31, 1990.

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 RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  Trojan Nuclear Plant	DOCKET NUMBER (2)  0 5   0 0   0 3   4 4	LER NUMBER (6)			PAGE (3)  9   0   —   0   2   0   —   0   1   0   3   OF   0   6
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	

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

On Friday, February 16, 1990, while still in Mode 1 at 100% Rated Thermal Power, as part of the investigation of the event on January 30, 1990, a Plant System Engineer questioned the actual paper speed as being appropriate for PRM 1A operability. The paper speed was 2.5 inches per hour. The filter paper speed for PRMs 1A and 2A has a default setting of 2.5 inches per hour. This default value is generated when power is restored to the unit. Once the monitors are operating, it is necessary to readjust the filter paper speed to achieve a speed of 1 inch per hour. The Offsite Dose Calculation Manual (ODCM) calculations for the effluent radiation monitor setpoints, are based on a 1 inch per hour speed. The 1 inch per hour speed is used to determine PRM 1A and 2A efficiencies and setpoints. Since the as found paper speed was not consistent with that assumed in the ODCM calculations, PRM 1A was declared inoperable at 1517.

Containment pressure reduction was in progress per Operating Instruction (OI-10-3, "Containment HVAC"). The Control Operator was notified of the out of specification monitor and action statements for Technical Specifications 3.3.2 (ESF Actuation System Instrumentation), 3.6.4.3 (Hydrogen Venting), 3.4.6.1 (RCS Leakage Monitoring) and 3.3.3.11 (Process and Effluent Monitoring) were entered and containment venting was stopped. The Shift Chemist was notified and grab samples were initiated in accordance with Technical Specifications.

This report is being submitted in accordance with the reporting requirements of 10CFR50.73(a)(2)(i)(B).

CAUSE

The causes of this event are as follows:

- 1) An inadequate design feature in the PRMs which allowed the low paper alarm micro-switch to be rendered inoperable during paper replacement due to contact with the monitoring arm. Whenever the supply roll is removed, the spring loaded monitor arm presses against the micro-switch using it as a mechanical stop.
- 2) A broken wire on the paper tear alarm. This broken wire prevented actuation of the paper tear alarm on the remote and local controllers.
- 3) No testing was in place to periodically verify alarm functions.
- 4) There were no requirements to periodically inspect the monitors to ensure an adequate supply of filter paper.
- 5) There was a procedural inadequacy in that the Operating Instruction did not specify that the filter paper speed required adjustment after re-energizing the PRMs.

**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 RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20586, AND TO THE PAPERWORK REDUCTION PROJECT (3150-01-3), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  Trojan NNuclear Plant	DOCKET NUMBER (2)  0 5 0 0 0 3 4 4 9 0	LER NUMBER (6)			PAGE (3)  0 4 OF 0 6
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
		0	2	0	

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

The reason for this event not being reported within the 30 day time limit of 10CFR50.73 is due to a misinterpretation of the guidance contained in NUREG 1022, "Licensee Event Report System". This event was originally reported as a four hour report and was subsequently withdrawn based on misapplication of the guidance of NUREG 1022.

CORRECTIVE ACTIONS

Immediate Corrective Actions

Upon identification of the out of paper condition, PRM 1A was declared inoperable in accordance with Technical Specifications and appropriate grab samples were initiated. Upon discovery of the inappropriate 2.5 inch per hour filter paper speed, containment pressure reduction which was in progress was stopped and the appropriate Technical Specification Action Statements were entered. The PRMs were adjusted to the proper speed and were returned to service.

Follow-up Corrective Actions

The following corrective actions were taken to address each of the above listed causes:

- 1) A Temporary Modification (TM 90-003) was installed on PRM 1A, removing the low paper micro-switch from service since it was broken and no replacement was readily available. This was completed on February 2, 1990 via MR 90-1828. An evaluation was performed to address the installation of a mechanical stop to prevent the spring-loaded sensing arm from breaking the low paper micro-switch (RFE 90-059). This evaluation was completed on March 4, 1990. It has since been determined that installation of a mechanical stop is not reasonable, and this action will not be taken. As an alternative, the procedure which provides instructions for changing the filter paper (CP-56, PERM Cartridge and Filter Changeouts and Efficiency Checks) will be revised to include caution statements which indicate the vulnerability of the micro-switch to damage when changing paper. This procedure will also be revised to include a requirement to test the micro-switch and verify the alarm function. If the alarm does not function, the paper supply will be checked, daily, until the switch is replaced.
- 2) The broken wire on the paper tear alarm was repaired and the torn paper alarm was verified to be operating properly by post maintenance testing on January 31, 1990.
- 3) MP-2-32, "Post-Accident Airborne Radiation Monitors Calibration" has been revised to include periodic testing of the low paper and paper tear alarms for PRMs 1A and 2A.

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 RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20585, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  Trojan Nuclear Plant	DOCKET NUMBER (2)  0 5 0 0 0 3 4 4 9 0	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		0	2	0	0	5 OF 6

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

- 4) Chemistry has implemented a weekly routine to check filter paper supply. This requirement will be incorporated into a formal procedure by July 23, 1990.
- 5) A revision to Operating Instruction (OI) 2-5, "Radiation Monitoring" has been made to require the setting of the filter paper speed on the monitor controller when PRMs 1 and 2 are re-energized.

A training session for Nuclear Regulation Branch personnel will be held by June 29, 1990 to discuss the late reporting of this event and to provide additional guidance on using the information contained in NUREG 1022.

EVENT ANALYSIS

PRM 1 serves the following functions: RCS Leakage Detection, Containment Ventilation Isolation and Process and Effluent Monitoring. The significance of having PRM 1A out of service for each of these functions is discussed below.

RCS Leakage Detection

There are three methods which are used to identify and monitor RCS leakage. These include 1) the containment atmosphere particulate radioactivity monitoring system which is comprised of PRM 1A, 2) the containment sump inventory, and 3) either the containment air cooler condensate inventory or the containment atmosphere gaseous radioactivity monitoring system which includes PRM 1C and 1D (Noble Gas detectors). With PRM 1A inoperable there are still two independent methods of detecting RCS leakage. Having PRM 1A out of service did not significantly impact the ability to detect RCS leakage.

Containment Ventilation Isolation

There are four independent methods which are available to initiate containment ventilation isolation in the event of high radiation in the containment. These include 1) the containment atmosphere particulate radioactivity monitoring system - PRM 1A, 2) the containment atmosphere Iodine activity monitor - PRM 1B, 3) the containment atmosphere low level Noble Gas monitor - PRM 1C, and 4) the containment atmosphere high level Noble Gas monitor - PRM 1D. With PRM 1A inoperable there are still three independent methods of initiating containment ventilation isolation for this type of event. A release of particulate radioactive material inside containment would be expected to be accompanied by a radioactive gas and/or Iodine release. Since the Iodine and Noble Gas channels were not affected by this event containment ventilation isolation could still be initiated on high radiation.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-830), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  Trojan Nuclear Plant	DOCKET NUMBER (2)  0 5 0 0 0 3 4 4	LER NUMBER (3)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		9 0	0 2 0	0 1	0 6	OF 0 6

TEXT (if more space is required, use additional NRC Form 885A's) (17)

Process and Effluent Monitoring

PRM 1 is used as an effluent monitor to terminate releases when the activity of the effluent is in excess of Technical Specification limits. In addition to the particulate monitoring channel of PRM 1, there are two noble gas channels and one Iodine channel monitoring effluent releases. Any of the four channels can terminate effluent releases when high activity is detected. With PRM 1A inoperable there are still three independent methods available to terminate effluent releases. Having PRM 1A out of service did not significantly impact our ability to terminate effluent releases.

Furthermore, all releases are discharged through HEPA filters and are monitored independently of the PRM by composite isotopic analysis. Therefore, no unmonitored releases occurred.

PREVIOUS SIMILAR EVENTS

Two previous Maintenance Requests have been identified for the PRMs where the out of paper switch was not functioning properly. In one instance the low paper micro-switch needed adjustment and in the other instance the micro-switch was replaced. Post maintenance testing in both incidents verified that the alarms were functioning properly.

A review of previous event reports was performed to identify similar events. No other instances of paper out indications or filter paper speed problems were identified. This is considered to be an isolated incident.

FAILURE DATA

Victoreen, Inc.  
Post Accident Airborne Radiation Monitor  
Continuous Filter Air Sampler  
Model 859-1-50