LICENSEE EVENT REPORT (LER)

Facility Name (1)	Docket Number (2)	Page (3)
Byron, Unit 1	0 5 0 0 0 4 5 4	1 of 0 3

Title (4) Tachometer Failure Caused Overspeed Trip of Main Feed Pump Resulting in Reactor Trip

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 7	1 6	8 8	8 8	0 0 4	0 0	0 8	1 0	8 8	NONE	0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)			
1		20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	0 9 8	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)
		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 AREA CODE
T. Tulon, Asst Superintendent Operating Extension 2213	8 1 5 2 3 4 - 5 4 4 1

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
X	S J	T A C	A 1 2 3	Y					

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)

Unit 1 was at 98 percent reactor power at 0431 on July 16, 1988, when the 1B Main Feedwater Pump (MFP) tripped. Steam Generator (S/G) levels decreased due to the feedwater flow-steam flow mismatch. In spite of licensed operator actions to reduce steam flow and increase feed flow, 1D S/G level decreased to the low-low reactor trip setpoint at 0434. An automatic reactor trip occurred and both Auxiliary Feedwater Pumps automatically started. The licensed operators complied with emergency operating procedures and brought the plant to a stable condition in Hot Standby at 0530. This report is submitted in accordance with 10CFR50.73 (a)(2)(iv) due to the automatic safety system actuations.

The 1B MFP's precision tachometer failed. The tachometer transmitted a constant increase speed output signal to the turbine's automatic speed control circuitry. Turbine speed increased until it reached the overspeed turbine trip setpoint and tripped.

The tachometer was repaired and 1B MFP operation was monitored during the subsequent Unit startup. The pump was returned to service without incident.

A similar previous occurrence was reported in Unit 2 Licensee Event Report 87-009.

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A. PLANT CONDITIONS PRIOR TO EVENT:

Event Date/Time 7/16/88 / 0434

Unit 1 MODE 1 - Power Operation Rx Power 98% RCS [AB] Temperature/Pressure Normal Operating

B. DESCRIPTION OF EVENT:

There were no systems or components inoperable at the beginning of this event that contributed to the event. Unit 1 was at 98 percent reactor power at 0434 on July 16, 1988, when the 1B Main Feedwater Pump (MFP) [SJ] turbine thrust bearing wear and the 1B MFP high discharge flow annunciators actuated in the main control room. The 1B MFP tripped and steam generator (S/G) levels decreased due to the feedwater flow-steam flow mismatch. The Nuclear Station Operator (NSO) (licensed reactor operator) initiated a Turbine Generator [TB] runback to 599 Megawatts-electric (MWe) at a rate of 175 MWe per minute and maximized feedwater flow rate by increasing 1C MFP speed and starting an additional Condensate/Condensate Booster Pump [SD]. In spite of these actions, S/G levels continued to decrease slowly and at 0434 1D S/G level dropped to the low-low level reactor trip setpoint (40.8%). An automatic reactor trip occurred and the 1A and 1B Auxiliary Feedwater Pumps (AFP) [BA] automatically started. A normal post reactor trip Feedwater Isolation occurred when average reactor coolant temperature (T_{avg}) decreased below 564°F with the reactor trip breakers open. The licensed operators entered and complied with "Reactor Trip or Safety Injection - Unit 1 Emergency Operating Procedure" (1BEP-0) and "Reactor Trip Response - Unit 1 Emergency Operating Procedure" (1BEP ES-0.1). At 0436 the NSO manually isolated chemical and Volume Control System [CB] letdown flow due to T_{avg} decreasing below the no load value and the corresponding decrease in pressurizer level. Auxiliary feedwater flow rate was reduced and the T_{avg} reduction was stopped at approximately 550°F. By 0450 T_{avg} returned to its no load value and letdown flow was established.

At 0451 the Feedwater Isolation signal was reset and the Startup Feedwater Pump was started and aligned to supply feedwater flow to the S/G's. At 0523 the 1B AFP was stopped and at 0527 the 1A AFP was stopped, since the pumps were no longer needed to maintain S/G levels. Stable plant conditions were achieved in Hot Standby at 0530.

This Licensee Event Report (LER) is submitted in accordance with 10CFR50.73 (a)(2)(iv) due to the automatic Reactor Protection System and Engineered Safety Features Systems actuations.

C. CAUSE OF EVENT:

The cause of the event was the loss of one Turbine Driven Feedwater Pump. The 1B Feedwater Turbine tripped due to an overspeed condition. The Feedwater Turbine's Tach-PAK series 600 Precision Tachometer was found to be defective. The tachometer transmitted a constant increase speed signal to the turbine's speed control circuitry. Turbine speed increased until it reached the overspeed turbine trip setpoint at which time the turbine tripped. The tachometer failure was caused by the electrical shorting of a diode.

D. SAFETY ANALYSIS:

Neither plant nor public safety were affected by the event. All safety systems actuated as designed. The AFP's actuated and provided feedwater flow to the Steam Generators as designed. The plant was stabilized in Hot Standby for investigation of the MFP trip.

E. CORRECTIVE ACTIONS:

The tachometer was repaired by replacing two failed diodes and a resistor and monitored for proper operation. The 1A Motor Driven Main Feedwater Pump was operated to conduct a Unit startup while allowing the 1B MFP to be monitored. The monitoring indicated proper operation of the 1B MFP and it was returned to service without incident.

No further corrective action is planned at this time.

F. PREVIOUS OCCURRENCES:

LER Number	LER Title
87-009 (Unit 2)	Manual Reactor Trip in Response to Decreasing Steam Generator Levels Resulting from a Feedwater Pump Trip Due to a Defective Speed Control Feedback Loop

G. COMPONENT FAILURE DATA:

a) MANUFACTURER	NOMENCLATURE	MODEL NUMBER	MFG PART NUMBER
AirPax Electronic Controls Division	Tack Pac Precision Tachometer	Series 600	990-000-815

Commonwealth Edison
Byron Nuclear Station
4450 North German Church Road
Byron, Illinois 61010

August 10, 1988

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

Dear Sir:

The enclosed Licensee Event Report from Byron Generating Station is being transmitted to you in accordance with the requirements of 10CFR50.73(a)(2)(iv).

This report is number 88-004; Docket No. 50-454.

Sincerely,

T. P. [signature]
for R. Pleniewicz
Station Manager
Byron Nuclear Power Station

Enclosure: Licensee Event Report No. 88-004-00

cc: A. Bert Davis, NRC Region III Administrator
P. Brochman, NRC Senior Resident Inspector
INPO Record Center
CECo Distribution List

Ltr: BYRON 88-0845 (1921M/0206M)

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