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Event	Date	(5)		LER Number	Report Date (7)			Other Facilities Involved (8)						
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			COMPL	ETE ONE LINE	FOR E	ACH COMPON	ENT FAIL	URE DE	SCRIBED	IN THIS RE	PORT (1	3)		
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At 1700 on October 9, 1987, surveillance 18wOS 3.4.2.A-1, Turbine Throttle, Governor, Reheat and Intercept Valve was in progress. The Digital Electro Hydraulic Control System (DEH) was in the automatic mode. Megawatt feedback loop was out, per procedure, and the turbine throttle valves were in the test mode. At approximately 1725, as throttle valve #2 being cycled, megawatt output became erratic, and the governor valves went to their fully closed position. Attempts were made to manually open the governor valves, but were unsuccessful. The turbine tripped on anti-motoring which resulted in a Reactor Trip at 1726.

The root cause of the event has not yet been determined. Immediate corrective action was to establish stable plant conditions. Additionally, temporary instrumentation has been installed on the sensing line of turbine impulse pressure transmitter 1PI-MS002 to monitor the impulse pressure signal. Also, Westinghouse, Control and Monitoring Section, of the Steam Turbine Generator Division, is currently testing the Braidwood Turbine DEH Software on their simulator. When the root cause of the turbine trip is determined, a supplemental report will be issued. There have been no previous occurrences of a turbine trip resulting from an unstable impulse pressure during valve testing.

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A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: <u>Braidwood 1</u>; Event Date: <u>October 9, 1987</u>; Event Time: <u>1726</u> MODE: <u>1</u> - <u>Power Operation</u>; Rx Power: <u>49%</u>; RCS [AB] Temperature/Pressure: <u>579°F/2235 psig</u>

B. DESCRIPTION OF EVENT:

There were no systems or components inoperable at the beginning of the event which contributed to the severity of the event.

At approximately 1700 on October 9, 1987, Operating Department personnel were performing 1BwOS 3.4.2.A-1, Turbine Throttle, Governor, Reheat and Intercept Valve monthly surveillance. The purpose of this surveillance is to fully cycle each of the subject valves from the running position in order to support operability verification of the turbine overspeed protection system. The surveillance consists of two parts: testing at power (Part 1) and testing during plant startup (Part 2). Performance of either part satisfies the surveillance requirements. This was the initial execution of Part 1. A Westinghouse Turbine Digital Electro Hydraulic (DEH) (JJ) Control System Engineer was in attendance during the surveillance as requested by station management.

The surveillance was entered with the DEH System in fully automatic with the governor valves in single valve control. The surveillance procedure required the megawatt feedback loop OUT (deactivated), and turbine throttle valves in VALVE TEST MODE.

At approximately 1715 on October 9, 1987, throttle valve #1 was cycled, per the procedure from the fully open to the fully closed position and was then fully reopened. No apparent problems were observed. The governor valves controlled the turbine in a stable condition as verified by the governor valve stability. Turbine megawatts varied only a few percent, which is not unusual since the megawatt feedback loop was deactivated. This was done in accordance with the latest vendor information.

At approximately 1725 on October 9, 1987, throttle valve #2 was cycled in the same manner as throttle valve #1. However, as the valve approached the fully closed position, megawatt output became erratic. The governor valves went to their fully closed position. At this time, the operator placed the DEH Turbine Controller in manual. Attempts made by the operator to manually open the turbine governor valves were not successful, and subsequently the turbine tripped on anti-motoring which resulted in a reactor trip at 1726 per the design of the Reactor Protection System.

On October 16, 1987, the unit was brought back on line. During the power ascension, part 2, testing during plant startup, was performed to meet the requirements of surveillance 18wOS 3.4.2.A-1.

Operator actions neither increased or decreased the severity of the event.

The appropriate NRC notification via the ENS Phone System was made at 1843 on October 9, 1987, pursuant to 10CFR50.72(B)(2)(II).

This event is being reported pursuant to 10CFR50.73(A)(2)(IV) - any event or condition that resulted in manual or automatic actuation of any engineered safety feature, including the reactor protection system.

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C. CAUSE OF EVENT:

The root cause as to why the load swing occurred when the #2 throttle valve approached the closed position has not been determined. Upon review of records following the event, it was discovered that turbine impulse pressure became unstable.

Westinghouse Engineering is assisting in the evaluation of why impulse pressure became un table. The results of the evaluation with respect to the root cause will be documented in a supplement to this report.

D. SAFETY ANALYSIS:

The safety consequences of this event were minimal as the turbine trip resulted in an immediate reactor trip, per the design of the reactor protection system. Under worst case conditions of operating at 100% power, sufficient redundancy exists in the reactor protection system logic to ensure that a turbine trip and reactor trip would occur. Therefore, the safety of the plant and public would not be affected.

E. CORRECTIVE ACTIONS:

Immediate corrective action was to establish stable plant conditions.

Other actions in progress to determine the appropriate corrective actions to prevent recurrence include:

- Temporary instrumentation has been installed on the sensing line of turbine impulse pressure transmitter IPT-MS002 to monitor the impulse pressure signal being supplied to the DEH computer. The sensing line is approximately ninety-nine feet in length, which may dampen the pressure signal being sensed at the transmitter. The purpose of the temporary instrumentation is to determine the affects, if any, of the long sensing line on the ability of the turbine DEH system to control the turbine during a transient.
- Westinghouse, Control and Monitoring Section, Steam Turbine Generator Division, is currently testing the Braidwood turbine DEH software on their simulator. The purpose of the software simulation is to see if a software problem exists.

When the root cause of the turbine trip is determined, any additional corrective actions will be documented in a supplemental report.

F. PREVIOUS OCCURRENCES:

There have been no previous occurrences of a turbine trip resulting from an unstable impulse pressure during valve testing.

G. COMPONENT FAILURE DATA:

No components failed due to or as a result of this event.



Commonwealth Edison Braidwood Nuclear Power Station Route #1, Box 84 Dracevilla, Illinois 60407 Telephone 815/458-2801

EEF/87-1712

November 4, 1987

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

Dear Sir:

The enclosed Licensee Event Report from Braidwood Generating Station is being transmitted to you in accordance with the requirements of 10CFR50.73(a)(2) (iv) which requires a 30 day written report.

This report is number 87-057-00; Docket No. 50-456.

Very truly yours,

11/5/87 Estito Patin E. E. Fitzpatrick

Station Manager Braidwood Nuclear Station

EEF/PMB/jab (6111z)

Enclosure: Licensee Event Report No. 87-057-00

cc: NRC Region III Administrator T. Tongue, NRC Resident Inspector INPO Record Center CECo Distribution List