1. Abnormal Occurrence Report No. 50-313/74-13

2. Report Date: 12/3/74 3. Occurrence Date: 11/23/74

4. Facility: Arkansas Nuclear One-Unit 1
Russellville, Arkansas

5. Identification of Occurrence:
Reactor Protection System failure to see Reactor Coolant Pump trips due to underpower/overpower monitoring relay maladjustment.

6. Conditions Prior to Occurrence:

Steady-State Power _____ Reactor Power 511.2 MWth

Hot Standby _____ Net Output 210 MWe

Cold Shutdown _____ Percent of Full Power 20 %

Refueling Shutdown _____

Routine Startup Operation _____

Routine Shutdown Operation _____

Load Changes During Routine Power Operation _____

Other (Specify) X
Power Transient testing per TP800.01, "Power Escalation Sequence" Test.

7. Description of Occurrence:

At 2202, Reactor Coolant Pumps A and D were shutdown for two pump testing per TP800.23, "Unit Load Transient Test", called for by controlling procedure TP800.01. A check of the RPS revealed that the pump trips were not seen. RC Pumps A and D were restarted and B and C were tripped. The RPS again gave no indication that the two pumps had tripped.

At 0235 on 11/25/74, Reactor Power at 25%, Reactor Coolant Pump D was tripped for 3 pump operation test. The pump monitor relay providing indication of pump trip to the RPS did not drop out. D Pump was restarted and again tripped with similar results. A Pump was tripped and D Pump was again restarted. The pump monitor relay on A Pump responded properly. Concurrent with C Pump trip, the D Pump monitor relay also tripped (D Pump still running) resulting in a reactor trip.

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8. Designation of Apparent Cause of Occurrence:

Design	X	Procedure	
Manufacture		Unusual Service Condition Including Environmental	
Installation/ Construction			
		Component Failure	
Operator			
Other (Specify)			

The holding coil of this type of relay is normally used to hold the contact arm in the tripped position after an overpower or underpower situation. In this application, the relay had to be adjusted so that the contact arm could overcome the electromagnetic force at a predetermined power. On 11/22/74, a relay technician adjusted the holding coils as they were designed to be adjusted, resulting in a less than conservative setting of the power monitoring relays.

9. Analysis of Occurrence:

The relays were immediately readjusted and tested by tripping each pump and verifying the RPS response. There were no safety implications or hazards to the public health or safety due to the immediate corrective action.

10. Corrective Action:

The underpower monitoring relays were removed during the following plant shutdown and bench tested. The overpower circuit holding coil of each relay was removed, enabling a more accurate setting of the relays and a more reliable operation. A test feature was added to each relay circuit to ensure the operability of each relay, allowing testing on a scheduled basis.

11. Failure Data:

The overpower/underpower relays can be identified by:

General Electric
Model #: 12CFW 11E24A
Type: CFW
Range: 0-800 Watts

12. Reviews and Approvals:

Reviewed and Approved by: Plant Safety Committee Yes (X) No ( )

Plant Superintendent Yes (X) No ( )

Reference: JWA 704 Date: 11/29/74

Reviewed by: Daniel H. Williams for Donald A. Rueter Date: 12/2/74
Licensing Supervisor

Approved by: N. C. McClintock Date: 12/3/74
Safety Review Committee

Approved by: Joe Martin for J. W. Cavanaugh Date: 12/3/74
Manager of Nuclear Services

Approved by: James R. Woodward by N. C. McClintock Date: 12/3/74
Director of Power Production

Approved by: Arch P. Pitts Date: 12/3/74
Senior Vice President