Commonwealth Edison Company
Dresden Generating Station
6500 North Dresden Road
Morris, IL 60450
Tel 815-942-2920

ComEd

June 12, 1996

JSPLTR #96-0090

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

Licensee Event Report 96-006, Docket 50-249 is attached and is being submitted pursuant to 10CFR50.73(a)(2)(iv), which requires reporting of any event that results in unplanned manual or automatic actuation of any engineered safety feature, including the Reactor Protection System.

If you have any questions, please contact Pete Holland, Dresden Regulatory Assurance Supervisor at (815) 942-2920 extension, 2714.

Sincerely,

FOR
J. Stephen Perry
Site Vice President
Dresden Station

Enclosure

cc: H. Miller, Regional Administrator, Region III
NRC Resident Inspector's Office
Illinois Department of Nuclear Safety

200078

IE22
1/1

NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Dresden Nuclear Power Station, Unit 3	05000249	1 OF 5

TITLE (4)
Reactor Scram While Shutdown Due to Trip of 3B Reactor Protection System Due to Improperly Sized Overload Relays

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 NAME	DOCKET NUMBER
05	20	96	96	-- 006 --	00	06	12	96	None	
									FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	N
POWER LEVEL (10)	000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.2201(b)		20.2203(a)(3)(i)		50.73(a)(2)(iii)		73.71(b)
	20.2203(a)(1)		20.2203(a)(3)(ii)	X	50.73(a)(2)(iv)		73.71(c)
	20.2203(a)(2)(i)		20.2203(a)(4)		50.73(a)(2)(v)		OTHER
	20.2203(a)(2)(ii)		50.36(c)(1)		50.73(a)(2)(vii)		(Specify in Abstract below and in Text, NRC Form 366A)
	20.2203(a)(2)(iii)		50.36(c)(2)		50.73(a)(2)(viii)(A)		
	20.2203(a)(2)(iv)		50.73(a)(2)(i)		50.73(a)(2)(viii)(B)		
	20.2203(a)(2)(v)		50.73(a)(2)(ii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Paul Craig, System Engineering Ext. 3631	(815) 942-2920

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 15 single-spaced typewritten lines) (16)

On May 20, 1996 at 0106 hours with Unit 3 in the Cold Shutdown mode, the main power supply to the 3B Reactor Protection System (RPS) Motor Generator (MG) drive motor tripped. This resulted in the loss of RPS Bus A, a full scram, and the auto start of the A Standby Gas Treatment (SBGT) train with the associated Unit 2 and Unit 3 Reactor Building Ventilation isolation. The power feed to RPS Bus A was restored from the reserve power supply and the channel A RPS logic reset. Investigation of the RPS MG drive motor and controls revealed one of the thermal overloads had tripped. This was determined to be the result of a previously identified combination of high ambient temperature and less than optimum design application of the thermal overload (TOL) relay and heater. The corrective action was to replace the TOL relay and heater for the 3B RPS MG with the same design optimized model devices previously installed on 2A RPS MG. Additionally, the same component replacements have been performed on 3A RPS MG and 2B RPS MG. Due to the unit status and the observed correct response by all other systems the safety significance of this event is minimal.

EVENT IDENTIFICATION:

Reactor Scram while shutdown due to trip of 3B Reactor Protection System due to improperly sized overload relays.

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 3 Event Date: May 20, 1996 Event Time: 0106 Hours

Reactor Mode: N Mode Name: Shutdown Power Level: 0%

Reactor Coolant System Pressure: 0 psig

B. DESCRIPTION OF EVENT:

This event is being reported as required by 10CFR50.73(a)(2)(iv) which requires the reporting of any condition that resulted in manual or automatic actuation of any Engineered Safety Feature including the reactor protection system (RPS).

On May 20, 1996 at 0106 with Unit 3 in the Shutdown mode due to a forced outage, a full reactor scram occurred when the 3B RPS MG [JC] tripped causing the 3A RPS bus [JC] to deenergize (the B RPS MG supplies power to the A RPS bus). At the time of the event DIS 7500-01 (Standby Gas Treatment Auto Initiation Test) had just been started. With the Reactor Mode switch not in Run (the mode switch was in Shutdown) and reactor pressure below 600 psig the Main Steam Isolation Valves (MSIV) Closure and Low Condenser Vacuum scrams were automatically bypassed. When RPS Bus A deenergized the following instrumentation was lost.

- Main Steam Line Radiation Monitors, channels A & C.
- Average Power Range Neutron Monitors (APRM), channels A, C, & E.
- Reactor Building Ventilation Radiation Monitor, channel A.
- Refuel Floor Radiation Monitor, channel A.
- Primary Containment Isolation System, channel A logic.
- Reactor Protection System, channel A logic.
- Reactor Protection System, channel B MSIV Closure & Low Condenser Vacuum Bypass relays.

Loss of the channel A APRMs resulted in the first out annunciator indicating the cause of the scram to be APRM 1-3 HI HI/INOP. A full scram occurred, as designed, due to a loss of the bypass relays for the Main Steam Isolation Valves (MSIV) Closure and Low Condenser Vacuum scrams. To ensure no single failure could cause the bypass of one of these scram signals when the conditions for bypass are not met, two relays, one powered from each RPS bus, must be energized to initiate the bypass. When RPS bus A deenergized, all MSIV Closure and Low Condenser Vacuum scram bypasses were removed; resulting in a full scram., The loss of RPS bus A resulted in initiation of SBGT and the associated Reactor Building Ventilation Isolation due to loss of the A channel Reactor Building and Refuel Floor Radiation monitors. At the time of the event DIS 7500-01 (Standby Gas Treatment Auto Initiation Test) had been started but had only progressed to the point of removing the A channel fuse to simulate a Group II containment isolation signal. This is the same circuit which deenergized on loss of RPS

bus A and therefore the conduct of the surveillance test did not effect the event. The Auto initiation of SBGT resulted from the deenergized Reactor Building and Refuel Floor Radiation monitors. The Group II isolation did not occur since only half of that logic was made up. One unexpected result of the full scram was a trip of the running A Control Rod Drive pump on low suction pressure.

The RPS MG 3B motor trip was found to have resulted from actuation of the MCC thermal overload relay. Extensive tests on the MG and the MCC did not reveal any cause for an actual overload condition to have existed. A review of equipment history and the thermal overload design concluded the installed thermal overload heater and relay was not an optimal design application and could actuate under high ambient temperature conditions with normal load current to the motor. At the time of this event (0106 hours on 5/20/96) the outside air temperature was still 80 degrees after having been over 90 degrees during the previous three day period. Temperatures in the area of RPS MG 3B MCC in the Turbine Building were not recorded, but based on personnel observations were well above 90 degrees. A similar event involving the Dresden Unit 2 2A RPS MG thermal overloads is documented in LER 89-015, Docket 50-237. The thermal overload relay settings for the 2A RPS MG run contactors were increased from 100% to 115% and the overload heater was replaced with a model CR123C40.0B, rated for 40 amps. In 1993 the 2A RPS MG was again identified as exhibiting "nuisance trips" of the thermal overloads due to high ambient temperatures. In response to this problem an overload heater sizing calculation was performed which recommended replacing the overload heater with model CR123K51.5B. This model is rated for 45 amps and was installed in the thermal overload for 2A RPS MG. Additionally, in 1993 preventive maintenance performed under Work Request 930051856 replaced thermal overload like for like and the same model overload heater and relay were used as originally installed. An upgrade to a model using ambient temperature compensation was not performed. Neither the model from the 1989 RPS MG 2A tripping event nor the model identified in the March 1993 S&L letter were considered for use. The cause of the 3B RPS MG trip is use of a thermal overload heater and relay which do not provide sufficient operational margin for all ambient temperature conditions that might be expected to occur during normal plant operations. (Design Deficiency)

When the reactor scrammed the A Control Rod Drive (CRD) [AA] pump was in service. Immediately following the scram this pump tripped on Low Suction Pressure. This event was investigated by the CRD System manager and the cause determined to be runout of the pump due to ambient reactor pressure and mispositioning of the 3-301-25 Control Rod Drive Charging Water Header Service throttle valve. This valve is set for one-quarter turn open and was found about three-eighths of a turn open. The reason for this valve to be set only slightly open is believed to be deterioration of the restricting orifice 3-302-16.

The problem with the Reducing Orifice was previously identified in LER 95-019, Docket 50-249 and is the subject of a design study presently being tracked on Nuclear Tracking System (NTS) number 2491809501912A, the design study is in progress. As an immediate corrective action an indicator marking device has been attached to throttle valve 3-301-25 to assure it is set correctly.

C. CAUSE OF EVENT:

The root cause of the event is management deficiency, NRC cause code E, producing improper scoping of corrective actions for a previous event. Specifically, this was a failure to implement a previously identified design change in one RPS MG power supply MCC, in the remaining three MG set MCCs. This appears to be due to a failure to evaluate the impact of a design problem in one piece of equipment on similar equipment. A contributing cause is the original design deficiency.

D. SAFETY ANALYSIS:

The Reactor Protection System logic fails conservatively whenever a RPS bus is deenergized. The unit was in cold shutdown with the Reactor Mode switch in the Refuel position at the time. Due to the unit status and the observed correct response by all other systems the safety significance of this event is minimal. The other RPS bus remained energized during and following the RPS MG trip. Had the same RPS MG failure occurred with the unit at full power the result would have been a half scram, which likewise represent an event of minimal safety significance.

E. CORRECTIVE ACTIONS:

Inadequate corrective actions at Dresden have been a recurring problem. Current enhancements in the corrective action process are:

1) Implementation of the root cause problem reporting system called the Integrated Reporting Process (IRP).

2) Creation of the Corrective Actions Review Board and the Plant Operations Review Committee both of which critically review root cause reports.

3) Increased sensitivity to the opposite unit and redundant equipment train when developing corrective actions.

4) The root cause report process was proceduralized.

5) An effectiveness review process for corrective actions was proceduralized.

These improvements are considered adequate corrective actions for the management deficiency.

The thermal overload heater and relay in RPS MG 3B MCC were replaced with a more appropriately sized heater and a relay which has ambient temperature compensation.

The thermal overload heater and relay in RPS MG 3A MCC were also replaced to ensure a similar failure does not occur.

Subsequent to this event, the thermal overload heater and relay in RPS MG 2B MCC has been replaced with the same models as RPS MG 2A MCC.

The thermal overload devices for all RPS MG sets on Dresden Units 2 and 3 have now been changed to the proper model.

F. PREVIOUS OCCURRENCES:

LER 89-015/Docket 05000237, Trip of the 2A Reactor Protection System (RPS) Motor Generator (MG) Set Due to High Ambient Temperature.

Corrective actions included replacement of the thermal overload heater with one of a size larger and increasing the thermal overload setting from 100% to 115%. These corrective actions, if applied to the Unit 3 RPS MG sets would have precluded LER 96-006/Docket 05000249.

G. COMPONENT FAILURE DATA:

No component failure occurred during this event. Consequently an NPRDS search for similar component failures was not performed.