Commonwealth Edison
Dresden Nuclear Power Station
6500 North Dresden Road
Morris, Illinois 60450
Telephone 815/942-2920

July 7, 1994

GFSLTR 94-0220

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

SUBJECT: LER 94-018

License Event Report 94-018, Docket 50/237 is being submitted as required by Technical Specification 6.6, NUREG 1022, 10 CFR50.73(a)(2)(ii) and 10 CFR50.73(a)(2)(iv).

Sincerely,

Gary F. Spedl
Station Manager
Dresden Station

GFS/GE/rmj

Enclosure

cc: J. Martin, Regional Administrator, Region III
NRC Resident Inspector's Office
File/
File/Numerical

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 2	05000237	1 OF 7

TITLE (4)
Potential Trip of Motor Control Centers Due to Improper Feed Breaker Settings

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: Dresden, Unit 3	DOCKET NUMBER: 05000249
06	08	94	94	-- 018 --	00	07	07	94	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)	X	50.73(a)(2)(ii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
George C. Eckert II, Plant Support Engineer Ext. 2796	(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
X YES (If yes, complete EXPECTED SUBMISSION DATE).	NO		09	16	94

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

With Unit 3 in Refuel, while performing a 24 hour endurance run of the Unit 3 Emergency Diesel Generator, motor control center (MCC) 39-2 tripped. The trip of MCC 39-2 caused a trip of the Unit 3 Emergency Diesel Generator Cooling Water Pump and consequently a trip of the Unit 3 Emergency Diesel Generator on high temperature. Loss of MCC 39-2 also caused a loss of the 3B Reactor Protection System (RPS) MG-Set, the "B" Standby Gas Treatment (SBGT) Train, the 125VDC Charger #3 and the 250VDC Charger #2/3. The loss of the RPS MG-Set caused a Unit 3 half scram, and the loss of the "B" SBGT train caused a start of the "A" SBGT train, which is considered an ESF actuation. An operability determination was made which stated that the MCC trip was due to an improperly set feed breaker. It also stated that the MCC was operable provided the compensatory action of controlling running load on the MCC was implemented. Station Operations department controlled the loading on the MCC until trip settings could be revised. A review of the MCC loading indicated that the original setting of the breaker was adequate but that load additions over time had created an overload situation. This event initiated a review of all safety related MCC feed breakers. The review indicated that MCCs 28-3 and 38-3 also had improperly set feed breakers. A separate operability assessment was performed on these two MCCs, which included immediate compensatory actions of controlling running loads to below the breakers' trip settings. The loading restrictions remained in place until the breakers could be properly set.

EVENT IDENTIFICATION:

Potential Trip of MCCs Due to Improper Feed Breaker Settings

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 2(3) Event Date: 06/08/94 Event Time: 1913 hrs

Reactor Mode: N(N) Mode Name: Run(Refuel) Power Level: 99(00) %

Reactor Coolant System Pressure: 1005(00) psig

B. DESCRIPTION OF EVENT:

On June 8, 1994 with Unit 3 in Refuel Mode, MCC 39-2 inadvertently tripped at 1913. The trip occurred concurrently with a 24 hour endurance run of the Unit 3 Emergency Diesel Generator [EK], during operation of the Unit 2/3 SBGT System [BH] "B" train, and during a Unit 2 High Pressure Coolant Injection (HPCI) [BJ] surveillance. There were no failed components which contributed to this event. The following equipment is fed by MCC 39-2 and consequently became unavailable when the MCC tripped:

Unit 3 Emergency Diesel Generator Cooling Water Pump [LB]
Unit 3 Emergency Diesel Generator Vent Fan [EK]
Unit 3 Emergency Diesel Generator Starting Air Compressor 3B [LC]
Unit 3 Emergency Diesel Generator Fuel Transfer Pump [EK]
CCSW Pump Cubicle Cooler C Fans 1 and 2 [BO]
CCSW Pump Cubicle Cooler D Fans 1 and 2 [BO]
SBGT Inlet Damper 2/3B [BH]
SBGT Air Heater 2/3B [BH]
SBGT Fan Discharge Damper 2/3B [BH]
SBGT Fan 2/3B [BH]
SBGT Outside Air Damper 2/3B [BH]
Reactor Building Vent to SBGT Damper 2/3B [BH]
RPS Motor-Generator Set 3B [JC]
125VDC Battery Charger 3 [EJ]
250VDC Battery Charger 2/3 [EJ]
Turbine Building Emergency Lighting [FG]
Condensate Transfer Pump 3B [KA]

Trips of these services caused the following system events to occur:

Loss of the SBGT [BH] "B" train caused an automatic initiation of the "A" train at 1913. This is considered an ESF actuation and an ENS notification was made at 2235 EST on June 8, 1994.

Loss of the Emergency Diesel Generator Cooling Water Pump [LB] and Vent Fan [EK] caused a trip of the Emergency Diesel Generator [EK] due to high temperature at 1914.

Loss of the RPS Motor-Generator Set [JC] caused a loss of power to the RPS and, consequently, a Unit 3 half scram.

Loss of the 125VDC charger #3 required that operators realign the Unit 3 125VDC system [EJ] to the available 125VDC charger #3A. Loss of the 250VDC charger 2/3 required that operators realign the Unit 3 250VDC battery system [EJ] to the available 250VDC charger #3. Both battery systems were realigned by 1928.

The next actions were to strip the MCC of all its loads and reclose the feed breaker at switchgear 39 which was completed at 1935. The SBGT "B" train was placed in off and then reenergized at 1937. The Emergency Diesel Generator Cooling Water Pump and Vent Fan were energized from MCC 39-2 and started. All remaining loads on MCC 39-2 were restored by 1942.

Due to existing plant conditions, the MCC trip was not believed to be a result of a fault condition. The trip was believed to be due to an overcurrent condition in the long time range of the feed breaker. Per discussions with operating personnel, the HPCI Auxiliary Oil Pump had been recently started when the breaker tripped. Starting the pump would cause the Unit 2/3 250VDC battery charger to go into a current limiting condition meaning that it would draw its maximum current rating from its AC source. This large load in conjunction with the other loads already running on the MCC caused a current of approximately 405 Amps to be drawn. This is in excess of the feed breakers 400 Amp trip setting. The trip of the breaker is not considered an equipment failure because it tripped as designed.

A review of the loads fed from MCC 39-2 indicated that the loads energized during the event may also be energized under certain accident conditions. This implied that the MCC and therefore the loads would not be available for accident mitigation under all scenarios. Because a basis for the existing feed breaker setpoint could not be immediately established, an operability determination was begun by Site Engineering to determine the worst case accident load scenario. The results indicated that the breaker was set too low for a postulated LOCA condition without loss of offsite power; a loading condition similar to the recent event. Immediate compensatory actions were directed to the station Operations Department. The compensatory actions included realigning the AC feed of the Unit 2/3 250VDC charger to MCC 29-2 and to consider the Condensate Transfer Pump 3B out of service. This would ensure the connected load would not trip the feed breaker under accident conditions.

The overcurrent trip device in MCC 39-2 is a General Electric dashpot type EC-2A device which is original plant equipment. Because a basis could not be established for the existing setting, all other MCCs using the original EC-2A devices were also suspect. A review was performed which determined that the remaining MCC feed breakers using EC-2A devices would not suffer from a similar overcurrent problem.

A review of all safety related MCC feed breakers, including those which used newer RMS-9 trip devices, was also performed. The review accounted for all accident conditions to determine the worst case loading and voltage conditions on the safety related switchgear and MCCs. The review indicated that the feed breakers for MCCs 28-3 and 38-3 were also set too low for all postulated conditions. Because the breakers to these MCCs were set too low for all postulated events, the emergency AC power system was believed to be outside of its design basis and an ENS notification was made at 1312 EST on June 13, 1994.

A second operability assessment was performed to address MCCs 28-3 and 38-3. Immediate compensatory actions similar to those for the previous operability determination were again directed to the station Operations Department. The actions included considering the Turbine Bearing Lift Pumps out of service on MCC 28-3 and considering the Turbine Turning Gear out of service on MCC 38-3. These actions would ensure the connected loads would not trip the respective feed breakers.

C. CAUSE OF EVENT:

This report is being submitted in accordance with 10CFR50.73(a)(2)(ii), which requires the reporting of any event or condition that results in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded, or results in the nuclear power plant being in a condition that is outside the design basis of the plant; and in accordance with 10CFR50.73(a)(2)(iv), which requires the reporting of any event or condition that results in manual or automatic actuation of any Engineered Safety Feature.

The trip of MCC 39-2 was due to an incorrectly set feed breaker. The feed breaker for this MCC had a General Electric dashpot type EC-2A overcurrent trip device which was original equipment. The setting for this breaker was 400 amps +/- 10% due to tolerance of the EC-2A device. A review of the original loading on the MCC indicates that the 400 Amp setting was adequate. Load additions made to the MCC over time however, increased the available running load current above the 400 Amp setting.

The feed breakers to MCCs 28-3 and 38-3 have had their EC-2A trip devices replaced with General Electric solid state type RMS-9 trip devices. The new RMS-9 devices provide enhanced trip selectivity to allow 480VAC breaker coordination. The RMS-9 devices were installed in March 1993 for MCC 28-3 and November 1991 for MCC 38-3. Both of these feed breakers were set at 400 amps. The settings for these breakers were based on cable ampacity. The cause of the failure to revise MCC trip settings to reflect added loads is unknown and is being investigated at this time.

D. SAFETY ANALYSIS:

The following discussion makes reference to the equipment fed by MCCs 28-3 and 38-3; the loads tables are printed here for ease of discussion.

28-3

Turning Gear Oil Pump	Turning Gear
Piggy Back Motor	Turbine Bearing Lift Pumps
Fire Protection Panel FP-2	Unit 2 250VDC Charger
Unit 2 EDG Circ Lube Oil Pump	Unit 2 EDG Turbo Lube Oil Pump
Unit 2 EDG Immersion Heater	Unit 2/3 EDG Cooling Water Pump

38-3

Turning Gear Oil Pump	Turning Gear
Piggy Back Motor	Turbine Bearing Lift Pumps
Fire Protection Panel FP-3	CCSW Cubicle Cooler A Fans 1&2
RPS MG-Set 3A	CCSW Cubicle Cooler B Fans 1&2
Unit 3 EDG Circ Lube Oil Pump	Unit 3 EDG Turbo Lube Oil Pump
Unit 3 EDG Immersion Heater	Unit 2/3 EDG Cooling Water Pump
Distribution Panel 2253-85	

The auxiliary power system is designed using safety related and balance of plant switchgear and MCCs to provide AC power to normal and emergency plant loads. The safety related equipment is divided into two separate divisions to provide diversity and redundancy. Under accident conditions, the safety related equipment is designed to have power supplied from the safety related Emergency Diesel Generators of the same division. There are two accident scenarios which are considered to present the worst case loading conditions for the safety related equipment; 1) a Loss of Coolant Accident with a Loss of Offsite Power (LOCA/LOOP) and, 2) a Loss of Coolant Accident with offsite power available (LOCA).

During a LOCA/LOOP condition, some loads on MCCs 28-3, 38-3 and 39-2 will trip and not reenergize when the Emergency Diesel Generators start and provide power to the emergency buses. As such, the loading on the MCCs is significantly reduced and the voltage levels are greatly improved thereby reducing the current draw. Preliminary analysis has been performed which indicates that under LOCA/LOOP conditions, MCC 28-3 may trip due to current levels above the feed breaker's setting. The other MCCs will not trip due to excessive current.

Loss of MCC 28-3 would cause a loss of the Unit 2/3 Emergency Diesel Generator Cooling Water Pump. Although this pump has a backup source of power from MCC 38-3, it is assumed that under Unit 2 LOCA and full site LOOP conditions, MCC 38-3 would not have a source of power. Therefore, the Unit 2/3 Emergency Diesel Generator would not have cooling water and is assumed to be unavailable. Assuming a single failure on the Unit 2 Emergency Diesel Generator would render all Unit 2 emergency AC power sources unavailable. However, the Division I crosstie between buses 34-1 and 24-1 would be available to provide AC power. The remaining loads on MCC 28-3 are not required to mitigate the consequences of an accident or to ensure operability of safety related equipment.

Under the second condition of LOCA with offsite power available, it is conservatively assumed that the offsite power is degraded to a level slightly above the second level degraded voltage relay setpoint so that the Emergency Diesel Generator has started on the LOCA signal but is not connected to the bus, thereby forcing onsite power to its lowest postulated value. Under this condition, preliminary analysis has shown that MCCs 28-3, 38-3 and 39-2 will trip due to current levels above the feed breakers' settings thereby causing all loads on the MCCs to become deenergized. The Unit 2/3 and Unit 3 Emergency Diesel Generator Cooling Water Pumps would be lost causing the Emergency Diesel Generators to fail or require manual operator action to be controlled. An assumed single failure of the Unit 2 Emergency Diesel Generator would cause all on site emergency AC power to be unavailable. However, in the assumed scenario, offsite power is available to mitigate the consequences of the LOCA.

Another significant load is the feed to the SBGT "B" train. If a single failure of the "A" train is assumed, this may lead to an offsite dose release in excess of 10CFR100 limits. Mitigation of this accident would require operator actions to drop loads off the MCC and reenergize the SBGT "B" train equipment. However, this is not considered a credible accident because a second single failure would be needed for instigation. Also, loss of the CCSW cubicle cooler fans may cause a loss of the vaulted CCSW pumps and therefore inhibit long term cooling ability. This would again require operator action to mitigate the consequences of this loss. However, the CCSW motors are manually started loads and therefore operator action is already required. Loss of the remaining loads on the MCCs would not cause the inability to mitigate the consequences of an accident.

E. CORRECTIVE ACTIONS:

Immediate corrective actions during the loss of MCC 39-2 included reenergizing the tripped loads. Intermediate corrective actions included operability assessments performed by Site Engineering. The compensatory actions associated with the operability assessments included limiting the loads connected to the affected MCCs. Long term corrective actions of replacing the existing feed breakers to the affected MCCs with properly set breakers is complete. The feed breakers to MCCs 28-3, 38-3 and 39-2 have been replaced with breakers that contain RMS-9 trip devices. The trip devices have been set at levels that account for cable ampacity, breaker coordination and worst case current levels expected at the individual MCCs.

Actual running currents will be measured on certain loads of MCCs suspected to be overloaded. The loading used in the preliminary analysis is believed to be conservative. Actual loading values may reduce the calculated current draw of the MCCs to below the trip setting of the feed breakers. This will not affect the trip settings of the recently replaced feed breakers. Long term corrective actions of reviewing the cause of breaker trip settings not reflecting all loads is ongoing at this time. A supplement to this LER will be submitted.

Long term corrective actions also included reviewing various historical loading conditions on the auxiliary power system. The analysis considered the modifications to the auxiliary power system over the years including those due to degraded voltage considerations, addition of new MCCs, and other system changes. The review determined that loads were added which caused an overcurrent condition on these MCCs.

Long term corrective actions with regard to the modification process are not believed necessary due to this event. The load additions which created the overcurrent conditions were made prior to modification enhancements. The heightened level of awareness regarding the auxiliary power system design and the modification process in general have resulted in substantial required reviews during the process of adding loads. The modification process now requires a load analysis by the Electrical Load Monitoring System as well as breaker coordination and sizing calculations when a new load is added.

F. PREVIOUS OCCURRENCES:

There have been no previous occurrences in which a MCC spuriously tripped due to an incorrect breaker setting.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

G. COMPONENT FAILURE DATA:

Manufacturer	Nomenclature	Model Number	Mfg. Part Number
N/A			