Nuclear Management Company, LLC
Point Beach Nuclear Plant
6610 Nuclear Road
Two Rivers, WI 54241

NPL 2000-0440

October 9, 2000

Document Control Desk
U.S. NUCLEAR REGULATORY COMMISSION
Mail Station P1-137
Washington, D.C. 20555

10 CFR 50.73

Ladies/Gentlemen:

DOCKET NOS. 50-266 AND 50-301
SUPPLEMENTAL LICENSEE EVENT REPORT 266/2000-006-01
INADEQUATE PROCEDURAL GUIDANCE TO RESTORE
EQUIPMENT NECESSARY TO MAINTAIN HOT SAFE SHUTDOWN
AS REQUIRED BY APPENDIX R DESIGN BASIS
POINT BEACH NUCLEAR PLANT UNITS 1 AND 2

Enclosed is Licensee Event Report 266/2000-006-01 for the Point Beach Nuclear Plant Units 1 and 2. This report is provided in accordance with 10 CFR 50.73(a)(2)(ii)(B) as, "any event or condition that resulted ...in the nuclear power plant being:...(B) In a condition that was outside the design basis of the plant." This report describes the discovery that the procedural guidance for restoration of cooling to the Primary Auxiliary Building battery and inverter rooms to ensure cooling of the D-109 charger was inadequate to ensure maintenance of temperatures for hot shutdown equipment. The Appendix R design basis does not allow for repairs of hot shutdown equipment needed to achieve or maintain hot safe shutdown; therefore, the plant was declared to be in a condition outside the Appendix R design basis. The results of testing to provide additional information concerning the heat up rate for these rooms following a loss of normal ventilation has been completed and is reported in this supplement. In addition, a calculation has been completed which demonstrates that an alternate power source was available to supply the vital instruments.

Corrective action commitments identified in this report have been completed.

Please contact us if you require additional information.

Sincerely,

Dan Cole
Manager, Site Assessment

Enclosure

cc: NRC Resident Inspector
NRC Regional Administrator
NRC Project Manager
INPO Support Services
PSCW

IE22

NRC FORM 366 (4-95)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Point Beach Nuclear Plant, Unit 1	05000266	1 of 8

TITLE (4)

Inadequate Procedural Guidance to Restore Equipment Necessary To Maintain Hot Safe Shutdown as Required by Appendix R Design Basis

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	24	2000	2000	- 006 -	01	10	09	2000	Unit 2	05000301
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	N
POWER LEVEL (10)	100

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

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

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
James E. Knorr, Regulation & Compliance Manager	(920) 755-6863

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

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)

While completing a re-verification and re-validation of the Fire Protection Evaluation Report fire scenarios, the licensee's Appendix R Rebaselining Project Team determined that the procedural guidance for restoration of cooling to the Primary Auxiliary Building battery and inverter rooms to ensure adequate cooling of the D-109 battery charger may have been less than adequate to ensure maintenance of temperatures for hot shutdown equipment. The Appendix R design basis does not allow for repairs of hot shutdown equipment needed to achieve or maintain hot safe shutdown; therefore, the plant was declared to be in a condition outside the Appendix R design basis. Procedure revisions have been made to establish timely cooling to the battery and inverter rooms to ensure operability of the inverter and preclude the need to repair the inverter. Testing and analyses completed subsequent to the original LER have demonstrated that there is adequate time to restore room ventilation during this Appendix R scenario and that an alternate source of power was available to the vital instrument bus inverters. Therefore this event had no safety significance.

Event Description:

Wisconsin Electric, licensee for the Point Beach Nuclear Plant (PBNP), has been in the process of conducting a 10 CFR 50 Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," Rebaselining Project. This project includes reviews of Appendix R fire scenarios as described in the Fire Protection Evaluation Report (FPER). The FPER presently assumes that the D-109 battery charger is a piece of equipment that is only required to achieve cold shutdown; however, during the hot shutdown phase of an Appendix R fire scenario in an area that would affect the normal power to the primary auxiliary building (PAB) battery and inverter rooms, the temperature in the rooms could reach temperatures in excess of the qualifying temperature (122°F) for the D-109 charger. Station battery chargers are not needed for the initial shutdown phase because each vital 125 VDC bus is supplied by a safety related station battery that can power the 125 VDC loads until the cooldown phase is initiated. Critical safe shutdown loads powered from the 125 VDC system include emergency diesel generator and switchgear control power and the vital inverters which power process instrumentation.

The Battery Chargers, which are supplied from the 480VAC system, are required to be restored before the station batteries reach minimum design voltage. The existing PBNP Appendix R actions include removing unnecessary loads from the batteries as soon as possible. As a minimum, the batteries are assumed to operate for 1 hour. They are also expected to last some period of time past 1 hour, possibly up to 8 hours. Since it is acceptable by regulation to take as long as 72 hours to achieve cold shutdown, the battery chargers may be needed prior to leaving hot shutdown conditions. Accordingly, the battery chargers have now been viewed more appropriately, and conservatively, by the Appendix R Rebaselining Project as hot shutdown equipment. The DC power from the batteries supplies control power and instrumentation to many of the systems required for maintenance of hot shutdown.

Power for the ventilation systems to the PAB battery and inverter room could be lost due to a fire in the Control Room, Cable Spreading Room, Vital Switchgear Room or the Auxiliary Feed Pump Room. Procedural Guidance is provided in Abnormal Operating Procedure (AOP) 10B, "Safe Shutdown to Cold Shutdown in Local Control," to restore power to the ventilation system by installation of temporary power cables to either of the redundant supply fans for the PAB battery and inverter rooms. In the initial evaluation of this event, it was postulated that AOP 10B may not be entered in sufficient time to allow maintenance to install and energize the temporary power cables prior to reaching the maximum allowable operating temperatures for the chargers.

We have subsequently determined, based upon results of a loss of ventilation heat up test of the PAB battery and inverter rooms and determining that during performance of AOP 10A certain DC power supplies are tripped which will result in certain relays de-energizing which will trip all Battery Chargers, that it would take greater than 22 hours for the D-109 battery charger to reach 122°F. Therefore, there is a high probability that the step in procedure AOP 10B would be reached prior to the failure of a charger.

Additionally, it was determined, based on the results of a battery loading calculation, that the batteries supplying the required vital inverters will last greater than 72 hours. This will allow the Units to achieve cold shutdown prior to the need to restore a battery charger. Should D-109 have failed, it would be known well before 72 hours and there would be ample time to restore power to an alternate battery charger to supply the batteries after achieving cold shutdown.

Section III.G.1 of Appendix R states that one train of systems needed for hot shutdown must be free of fire damage. Thus, one train of systems needed for hot shutdown must be operable during and following a fire. Operability of the hot shutdown systems,

including the ability to overcome a fire or fire suppression induced maloperation of hot shutdown equipment and the plant's power distribution system, must exist without repairs (NRC Position Paper, "Position Statement on Allowable Repairs for Alternate Shutdown and on the Appendix R Requirement for Time Required to Achieve Cold Shutdown," dated July 2, 1982.) Therefore, as a result of recognizing that the battery chargers should be viewed more appropriately as hot shutdown equipment, the PBNP staff conservatively determined that the plant was outside the design basis for Appendix R events.

A condition report was submitted at 1408 CST on May 24, 2000 (CR 00-1644,) which identified inadequate procedural guidance for maintaining a hot shutdown condition. A one hour notification to the NRC was completed at 1448 CST on May 24 pursuant to 10 CFR 50.72(b)(1)(ii)(B) for, "Any event or condition during operation that results...(B) In a condition that is outside the design basis of the plant."

Cause:

The cause of this event was the incorrect assumption that the safety related station battery chargers were not needed to achieve and maintain hot safe shutdown. Although it is possible to achieve the hot safe shutdown condition using the station batteries to power the 125V distribution system loads, it has been confirmed that under some scenarios the battery chargers may be necessary to power a 125V DC bus to maintain hot shutdown. The re-verification and re-validation of the FPER fire scenarios by the Appendix R Rebaselining Project discovered inadequate procedural guidance to assure the availability of station battery chargers for the maintenance of hot shutdown.

Corrective Actions:

1. A Revision to AOP 10A, Safe Shutdown Local Control, has been completed to ensure either the restoration of power to the ventilation system for the PAB battery and inverter room or provisions for temporary ventilation are provided.

2. As a compensatory measure, a twice per shift fire watch patrol was established for fire zones 187, 237, 304, 305, 318, 326 and 336. These fire watch patrols cover fire zones containing battery charger power supplies. These fire watch patrols were in effect until the revisions to AOP 10A were issued.

3. A test has been conducted to establish the heat up rate for the PAB battery and inverter rooms following a loss of normal ventilation.

4. A calculation has been issued to document that under the Alternate Shutdown scenario, the station batteries will last greater than 72 hours, thus allowing the Units to achieve cold shutdown without loss of vital instrumentation.

Component and System Description:

The 125 VDC electrical distribution system (125V) is described in Section 8.7 of the PBNP FSAR. A simplified diagram of the 125V distribution system is provided with this LER. The safety related portion of the 125V system is divided into four separate buses each of which can be powered from two sources, the 480VAC system via battery chargers or the station batteries. The 125V system also has two swing buses each of which are capable of supplying either of two 125V buses.

During normal operation each safety-related DC bus shall supply uninterruptible DC power of adequate voltage and quality to support systems that monitor for abnormal/accident conditions and initiate protective actions. During abnormal or

emergency conditions, with or without a concurrent loss of offsite power, each safety-related DC bus shall supply uninterruptible DC power of adequate voltage and quality to safety-related loads for accident mitigation. During station blackout, the system shall continuously supply power to those loads required to achieve and maintain safe reactor shutdown during the blackout period. During normal plant operation, the system shall continuously supply power of adequate voltage and quality to connected non-safety-related loads.

The 125V system consists of four main distribution buses: D01, D02, D03, and D04. The D01 and D02 main DC distribution buses supply power for control, emergency lighting, and the red and blue 120 VAC Vital Instrument bus inverters. The D03 and D04 main DC distribution buses supply power to the white and yellow 120 VAC Vital Instrument buses. Each of the four main distribution buses is powered by a battery charger (D07, D08, D107 and D108) and is backed up by a station battery (D05, D06, D105, and D106). The function of the battery chargers is to supply their respective DC loads, while maintaining the batteries at full charge. All of the battery chargers are powered from the 480V AC system. The battery chargers are interlocked such that a loss of offsite power combined with a safety injection signal will disconnect the battery chargers from their 480V AC source. This limits the loading on the emergency diesel generators (DG) during the period immediately following a safety injection signal. The 125V DC loads would then be supplied by the aligned station battery until such time as power to the chargers from the 480V system can be restored.

In addition to the four 125V distribution buses, there exist two safety-related swing DC distribution buses (D301 and D302) which permit the connection of a swing battery (D305)to one of the four main distribution buses. Two swing battery chargers are available through the two swing DC distribution buses. Swing charger D09 is connected to swing DC distribution bus D301 and can provide a source of DC power to distribution buses D01 or D02. Likewise, swing charger D109 is connected to swing DC distribution bus D302 and can provide a source of DC power to distribution buses D03 or D04. In addition, there exists a swing safety-related battery D305 which is connected to swing DC distribution bus D301. This swing battery is capable of being aligned to any one of the four main distribution buses to take the place of the normal battery.

The VNBI ventilation system provides ventilation to the PAB Electrical Equipment Rooms and associated Battery Rooms. There are two Electrical Equipment Rooms with one containing the distribution bus D03, the White 120 VAC Vital Instrument bus inverters, the battery charger D107 and the battery charger D109. The other room contains the distribution bus D04, the Yellow 120 VAC Vital Instrument bus inverters and the battery charger D108. The battery rooms contain the associated D105 and D106 batteries. The ventilation system is supplied by two redundant train fans, W-85 and W-86. One Fan is powered from a U2 A Train 480V MCC and the other from a U2 B Train 480V MCC.

Safety Assessment:

The defense-in-depth approach to Point Beach Nuclear Plant's Fire Protection Program, which includes both fire detection and suppression provisions, would mitigate the significance of this condition and provide a high likelihood that postulated in-plant fires would be controlled adequately and the safe shutdown equipment would remain available. The twice per shift fire watch patrols, which have been implemented as a compensatory measure in the affected fire zones for this event, (Fire zones 187, 237, 304, 305, 318, 326, and 336) provide additional assurance that conditions leading to a potential in-plant fire are even less likely to occur. However, in the event of a worst case fire scenario, the ventilation system for the PAB battery and inverter room could be lost and the temperature in the room could increase to above the rated temperature for the battery chargers (122°F). Under these circumstances, based upon the results of a controlled heat up test and conservative assumptions such as high ambient starting air temperatures, high ambient starting lake temperatures and high battery accident loading;

the calculated time available to have ventilation restored within the rooms to ensure the continued operation of the D-109 battery charger and consequently the batteries is more than 22 hours.

The inverters and battery chargers contained in the rooms are required to power process monitoring instrumentation. A circuit analysis was performed to determine when the equipment in the rooms is required and the ventilation could be lost. The D-109 charger is required for alternate shutdown instruments and D-109 and the inverters are required for response to an Auxiliary Feed Pump (AFP) room fire. Without the equipment, all process monitoring would eventually be lost for the Control Room, Cable Spreading Room and 4 kV Vital Switchgear Room fire events (Alternate Shutdown areas) and partial process monitoring would be lost for an AFP Room fire.

Heat-up in the rooms will be primarily driven by the electrical equipment which remains energized, with the battery chargers and inverters being the largest contributors. The battery chargers are tripped on a loss of offsite power (LOOP) and the inverters will remain energized, even if the chargers are tripped, powered from the station batteries. Thus, the worst case scenario is without a LOOP where all equipment in the rooms remains energized and ventilation is lost. Once the condition is discovered, operations personnel would be able to open doors, reduce load and/or provide portable fans until the normal ventilation can be restored by installing a temporary power cable to the normal fans as directed by procedure AOP 10B.

The impact in the four areas where a fire event will result in loss of ventilation and the equipment in the rooms is relied upon (the Control Room, Cable Spreading Room, the 4 kV Vital Switchgear Room and the AFP Room), is described as follows:

For the AFP Room fire event, discovery would be immediate because the existing ventilation alarm would remain available and would initiate on low flow.

For the 4 kV Vital Switchgear Room fire event, any loss of power to the ventilation fans would also mean a loss of power to the battery chargers because the entire 480V switchgear would be de-energized, which powers both. The ventilation alarm could not be relied upon due to cables in the areas. However, with the battery chargers tripped, the time for heat-up in the rooms would be sufficiently extended such that operators would discover the condition during their normal inspections of the plant after the fire event and/or in preparation for installing the temporary power cable.

For the Cable Spreading Room and Control Room fire events, it is possible for all loads to remain energized and the ventilation alarm could not be relied upon due to the presence of its cables in the areas. AOP 10A did not contain any specific guidance which would have ensured that the operators would have discovered the loss of ventilation condition. Discovery of the condition would come during normal inspections of the plant after the fire event and/or in preparation for installing the temporary power cable.

Thus, the critical areas of concern are the Cable Spreading Room and the Control Room fire events. For these events the equipment located in the PAB Electrical Equipment Room which is required, is the D-109 Battery Charger. This component supplies long term power to the Alternate Red Instrument Inverters which supply instrument power to all process monitoring instruments which are relied upon for these fire events. Procedure AOP-10A would be entered for this scenario and would specifically line the vital instruments up to the D-106 Station Battery. D-106 would provide power to the vital instruments and D-109 would be relied upon to provide long term charging to the Station Battery. Loss of D-109 would mean that once the Station battery (D-10**6**) was exhausted, no power would be available to the process monitoring instrumentation.

However, subsequently a calculation (Ref Calc. 2000-0055) has been performed which shows that the D-106 battery will have sufficient capacity to supply the vital inverters for greater than 72 hours. This will allow the Units to achieve cold shutdown prior to exhausting the battery.

As mentioned above, a test was run where normal ventilation was turned off to the PAB Electrical Equipment Rooms. Temperature monitoring equipment was placed in the rooms to measure the actual rate of heat rise. This data was used to determine a more realistic time frame for reaching maximum equipment qualification temperatures in the rooms. This test demonstrated that the time to reach maximum permissible temperatures in this room was in excess of 22 hours. Therefore, it is likely that operations personnel haveample time to discover the loss of ventilation condition and take measures to compensate for this loss until the temporary cable could be installed to restore normal ventilation to the rooms.

The existing procedural repair provisions identified in this report did not meet the Appendix R design basis. However, the defense in depth design of fire protection at PBNP, the availability of the station battery for greater than 72 hours and the availability of compensatory measures to restore adequate ventilation in the rooms, provide assurance that the potential impact on the health and safety of the public or plant personnel as a result of this event was not significant. Since the evaluation of the conditions identified in this LER did not identify the loss of any safety related function, this event does not constitute a Safety System Functional Failure.

System and Component Identifiers:

The Energy Industry Identification System component function identifier for each component/system referred to in this report are as follows:

Component/System	Identifier
Low Voltage Power System - Class 1E	ED
DC Power System - Class 1E	EJ
Battery	BTRY
Charger, Battery	BYC

Similar Occurrences:

A review of recent LERs (past two years) identified the following events which involved Appendix R safe shutdown equipment.

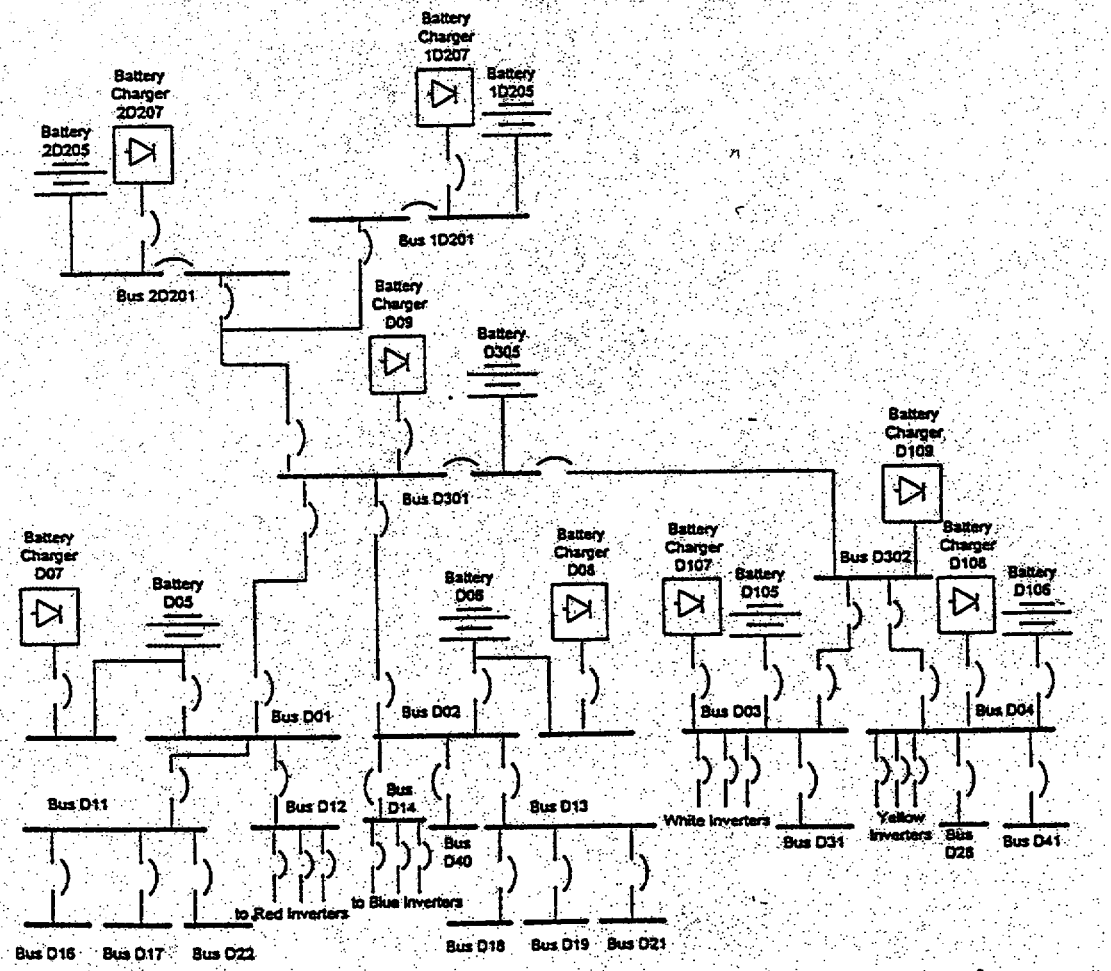
LER NUMBER	Title
301/2000-001-00	Replacement of Charging Pump Control Power Fuse Outside Appendix R Design Basis
266/2000-004-00	Potential Loss of Process Monitoring Instrumentation Due to a Fire In Containment
266/1999-008-00	Postulated Fire Could Lead To Loss Of Redundant Trains Of Charging Capacity
266/1999-007-00	Cable Tray Fire Stops Do Not Meet Appendix R Exemption Requirements

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Point Beach Nuclear Plant, Unit 1	05000266	2000	- 006	- 01	7 OF 8

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

266/1999-006-00	Postulated Fire and Inability to Isolate PORV Outside Appendix R Design Basis
266/1999-004-00	Fuel Oil Transfer Pump Cable in the AFW Pump Room Outside Appendix R Design Basis
301/1999-002-00	Red Channel of Steam Generator Pressure Indication Passes Through Fire Zone
266/98-030-00	Assumptions for Equipment Necessary To Maintain Hot Safe Shutdown Outside Appendix R Design Basis

FIGURE 1-1
125 VDC SYSTEM



Notes:
1. Circuit Switches, fuses, and interlocks are not shown.
2. Not intended to show detailed configuration, Refer to Single Line Diagram Bechtel 6118-E-6 for details