

HULL EMERGENCY LOADS SYSTEM - 220VDC

HULL EMERGENCY LOADS SYSTEM - 220VAC

REFERENCE DOCUMENTS

- DR-ENGP-M4.1.3 - SAFETY ENGINEERING
- I-ET-3010.00-0000-940-P4X-002 - SYMBOLS FOR PRODUCTION UNITS DESIGN
- I-ET-3010.00-0140-773-P4X-001 - SPECIFICATION FOR DC UPS FOR OFFSHORE UNITS
- I-ET-3010.00-0140-700-P4X-001 - SPECIFICATION FOR ELECTRICAL DESIGN FOR OFFSHORE UNITS
- I-ET-3010.00-0140-700-P4X-002 - SPECIFICATION FOR ELECTRICAL MATERIAL FOR OFFSHORE UNITS
- I-ET-3010.00-0140-700-P4X-005 - REQUIREMENTS FOR HUMAN ENGINEERING DESIGN FOR ELECTRICAL SYSTEMS OF OFFSHORE UNITS
- I-ET-3010.00-0140-773-P4X-003 - SPECIFICATION FOR GENERIC DC UPS FOR OFFSHORE UNITS
- I-ET-3010.00-0140-773-P4X-004 - ELECTRICAL SYSTEM AUTOMATION INTERFACE SIGNALS LIST
- I-DE-3010.00-0140-797-P4X-001 - ELECTRICAL SYSTEM AUTOMATION ARCHITECTURE DIAGRAM
- I-DE-3010.20-5265-946-P4X-001 - EMERGENCY LOADS LIST
- I-DE-3010.20-1200-944-P4X-002 - GENERAL ARRANGEMENT
- I-DE-3010.20-5265-946-P4X-001 - TOPSIDES UPS AND DC SYSTEMS ONE-LINE DIAGRAM
- I-ET-3010.00-0140-741-P4X-004 - SPECIFICATION FOR LOW-VOLTAGE GENERIC ELECTRICAL PANELS FOR OFFSHORE UNITS
- I-ET-3010.00-0140-714-P4X-001 - SPECIFICATION FOR ELECTRICAL BATTERIES FOR OFFSHORE UNITS
- I-DE-3010.20-1200-944-P4X-001 - AREA CLASSIFICATION - GENERAL

GENERAL NOTES AND REQUIREMENTS

- EACH DC UPS SHALL GUARANTEE NORMAL VOLTAGE IN ITS DISTRIBUTION PANEL, EVEN DURING MALFUNCTION IN ONE OF THE COMPONENTS (RECTIFIER, TRANSFORMERS, ETC.). THE OUTPUT VOLTAGE SHALL BE INDEPENDENT FROM OTHER SYSTEMS, EQUIPMENT, EXTERNAL CONTROL VOLTAGES OR CONTACTS INCLUDING OTHER AC UPS, GENERIC DC UPS OR A&C SYSTEM.
- LOADS SUPPLIED BY AC UPS SHALL BE BALANCED AMONG THE THREE PHASES.
- LOADS SUPPLIED BY AC UPS SHALL BE BALANCED AMONG THE THREE PHASES.
- ALL DC UPS SHALL BE PROVIDED WITH ALARM AND MONITORING AT A&C, IN ACCORDANCE WITH I-ET-3010.00-0140-797-P4X-001 - ELECTRICAL SYSTEM AUTOMATION INTERFACE SIGNALS LIST.
- ONLY EMERGENCY LOADS DEFINED IN I-DE-3010.20-5265-946-P4X-001 - EMERGENCY LOADS LIST SHALL BE FED BY EMERGENCY LOADS BATTERY-CHARGER 220VDC (CB-5265501A/B) OR BY EMERGENCY LOADS UPS 220VAC (UPS-5265001A/B).
- REQUIRED CAPACITY FOR EMERGENCY LOADS BATTERY 220VDC (BT-5265501A/B) AND FOR CB-5265501A/B ARE PRELIMINARY AND SHALL BE CONFIRMED DURING DETAILED DESIGN.
- BATTERIES CIRCUIT-BREAKERS SHALL NOT HAVE UNDERVOLTAGE TRIP COILS (UVT) OR BE MOTOR OR SOLENOID OPERATED.
- FOR MORE INFORMATION ABOUT TELECOMMUNICATIONS DISTRIBUTION PANELS, REFER TO I-DE-3010.20-5265-946-P4X-001 - ELECTRICAL SYSTEM AUTOMATION ARCHITECTURE DIAGRAM.
- THESE SHALL NOT BE NON-EMERGENCY LOADS FED FROM ANY OF THESE SYSTEMS. INCLUSION OF THESE KIND OF LOADS SHALL BE APPROVED BY PETROBRAS. IN CASE OF INCLUSION OF THESE KIND OF LOADS IN THESE SYSTEMS, WHEN INSTALLED IN NON-HAZARDOUS EXTERNAL AREAS, THEY SHALL BE TRIPPED BY ESD SIGNALS OR SHALL BE PROPER FOR INSTALLATION IN ZONE 2 GROUP IA TEMPERATURE T3. WHEN INSTALLED IN HAZARDOUS EXTERNAL AREAS, LOADS EQUIPMENT SHALL BE CERTIFIED IN ACCORDANCE WITH I-DE-3010.20-1200-944-P4X-001 - AREA CLASSIFICATION - GENERAL.
- OTHER LOCAL SIGNALING AND INSTRUMENTS SHALL BE INSTALLED IF REQUIRED IN I-ET-3010.00-0140-773-P4X-001 - SPECIFICATION FOR DC UPS FOR OFFSHORE UNITS.
- CAPACITY OF CIRCUIT-BREAKERS SHALL BE CALCULATED DURING DETAILED DESIGN.
- ALL SIGNALS SENT TO A&C SHALL BE THROUGH HULL ELECTRICAL SYSTEM AUTOMATION CONTROLLERS. THIS DOCUMENT DOES NOT CONTAIN ALL SIGNALS BETWEEN EQUIPMENT AND ELECTRICAL SYSTEM AUTOMATION. FOR MORE INFORMATION REFER TO I-DE-3010.00-0140-797-P4X-001 - ELECTRICAL SYSTEM AUTOMATION ARCHITECTURE DIAGRAM, I-ET-3010.00-0140-773-P4X-001 - ELECTRICAL SYSTEM AUTOMATION INTERFACE SIGNALS LIST AND I-ET-3010.00-0140-700-P4X-005 - REQUIREMENTS FOR HUMAN ENGINEERING FOR ELECTRICAL SYSTEMS FOR OFFSHORE UNITS.
- HULL EMERGENCY DISTRIBUTION PANEL 220VAC FED BY TOPSIDE PANELS SHALL HAVE EFI (EARTH FAULT INDICATORS), COMPATIBLE WITH INSULATION MONITORING DEVICES INSTALLED IN TOPSIDE EMERGENCY DISTRIBUTION PANELS.
- FOR MORE INFORMATION ABOUT TOPSIDE EMERGENCY LOADS DISTRIBUTION PANELS 220VAC AND TOPSIDE EMERGENCY LOADS DISTRIBUTION PANELS 220VDC, REFER TO I-DE-3010.20-5265-946-P4X-001 - TOPSIDES UPS AND DC SYSTEMS ONE-LINE DIAGRAM.
- THE QUANTITY OF SPARE OUTGOING CIRCUIT-BREAKERS SHALL BE ACCORDING TO I-ET-3010.00-0140-773-P4X-001 - SPECIFICATION FOR DC UPS FOR OFFSHORE UNITS AND I-ET-3010.00-0140-773-P4X-001 - SPECIFICATION FOR LOW-VOLTAGE GENERIC ELECTRICAL PANELS FOR OFFSHORE UNITS.
- FOR PANELS WITH POSSIBILITY TO OPERATE IN "C" CONFIGURATION WITH INTERCONNECTION CIRCUIT-BREAKERS CLOSED, IT SHALL BE PROVIDED A LOGIC TO DISABLE ONE OF INSULATION MONITORING DEVICES IN THIS CONDITION. IT SHALL ALSO BE PROVIDED A LOGIC TO ENABLE BOTH OF INSULATION MONITORING DEVICES DURING THE RETURN TO "C" CONFIGURATION.
- IN EMERGENCY DISTRIBUTION PANELS:
 - FOR REDUNDANT EMERGENCY LOADS INSTALLED IN HAZARDOUS AREA ZONE 1 (EXCLUDING DISTRIBUTION PANEL INCOMING CIRCUITS), OUTGOING CIRCUIT-BREAKERS SHALL HAVE INDIVIDUAL GROUND FAULT DETECTOR DEVICES (EFI). IN CASE OF GROUND FAULT DETECTION, EFI SHALL ALARM AND INSTANTANEOUSLY TRIP THE CIRCUIT-BREAKERS.
 - OTHER EMERGENCY LOADS SHALL BE GROUPED IN A SAME EFI. IN CASE OF GROUND FAULT DETECTION, EFI SHALL ONLY ALARM.
- FOR MORE INFORMATION REFER TO I-ET-3010.00-0140-741-P4X-004 - SPECIFICATION FOR LOW-VOLTAGE GENERIC ELECTRICAL PANELS FOR OFFSHORE UNITS.
- LOW INSULATION SHALL GENERATE AN ALARM SIGNAL TO BE SENT TO ELECTRICAL SYSTEM AUTOMATION, THROUGH INTELLIGENT RELAYS.
- FOR CONTROL PANEL AND BATTERIES LOCATION, REFER TO I-DE-3010.20-1200-944-P4X-002 - GENERAL ARRANGEMENT.
- FOR MORE INFORMATION ABOUT INTELLIGENT RELAYS AND SIGNALS TO BE MONITORED BY THEM, REFER TO I-ET-3010.00-0140-773-P4X-001 - SPECIFICATION FOR DC UPS FOR OFFSHORE UNITS AND I-ET-3010.00-0140-773-P4X-001 - ELECTRICAL SYSTEM AUTOMATION INTERFACE SIGNALS LIST.
- EMERGENCY LOADS INSTALLED IN NON-HAZARDOUS EXTERNAL AREAS SHALL BE PROPER FOR INSTALLATION IN ZONE 2 GROUP IA TEMPERATURE T3.
- EMERGENCY LOADS EQUIPMENT INSTALLED IN HAZARDOUS EXTERNAL AREAS SHALL BE CERTIFIED IN ACCORDANCE WITH I-DE-3010.20-1200-944-P4X-001 - AREA CLASSIFICATION - GENERAL.
- BATTERY BANK CIRCUIT-BREAKER SHALL NOT BE TRIPPED DURING DISCHARGING. VOLTAGE DECREASING REACHES MINIMUM OPERATIONAL VOLTAGE AT BATTERY TERMINALS. IN THIS CASE A&C SHALL BE SENT TO ELECTRICAL SYSTEM AUTOMATION, IN ACCORDANCE WITH I-ET-3010.00-0140-797-P4X-001 - ELECTRICAL SYSTEM AUTOMATION INTERFACE SIGNALS LIST.
- IN CASE OF BATTERIES OVERLOAD, CIRCUIT-BREAKER SHALL TRIP AND RECTIFIER SHALL TRIP AN ALARM TO ELECTRICAL SYSTEM AUTOMATION, IN ACCORDANCE WITH I-ET-3010.00-0140-797-P4X-001 - ELECTRICAL SYSTEM AUTOMATION INTERFACE SIGNALS LIST.
- FUSES OR CIRCUIT-BREAKERS TO PROTECT THE CABLES SHALL BE INSTALLED INSIDE A BOX, IN A SAFE PLACE OUTSIDE THE BATTERY ROOM, BUT CLOSE TO IT.
- BLOCK DIODE SHALL BE PROVIDED. DROP DIODES SHALL NOT BE ACCEPTED AS MEAN TO MAINTAIN THE CONSUMER VOLTAGE IN DISTRIBUTION PANEL IN THE RANGE OF 100% AND 115%.
- EQUIPMENT CB-5265501A, BT-5265501A, PCC-5265501A, PCC-5265501B SHALL BE INSTALLED IN A DIFFERENT LOCATION FROM CB-5265501B, BT-5265501B, PCC-5265501B RESPECTIVELY.

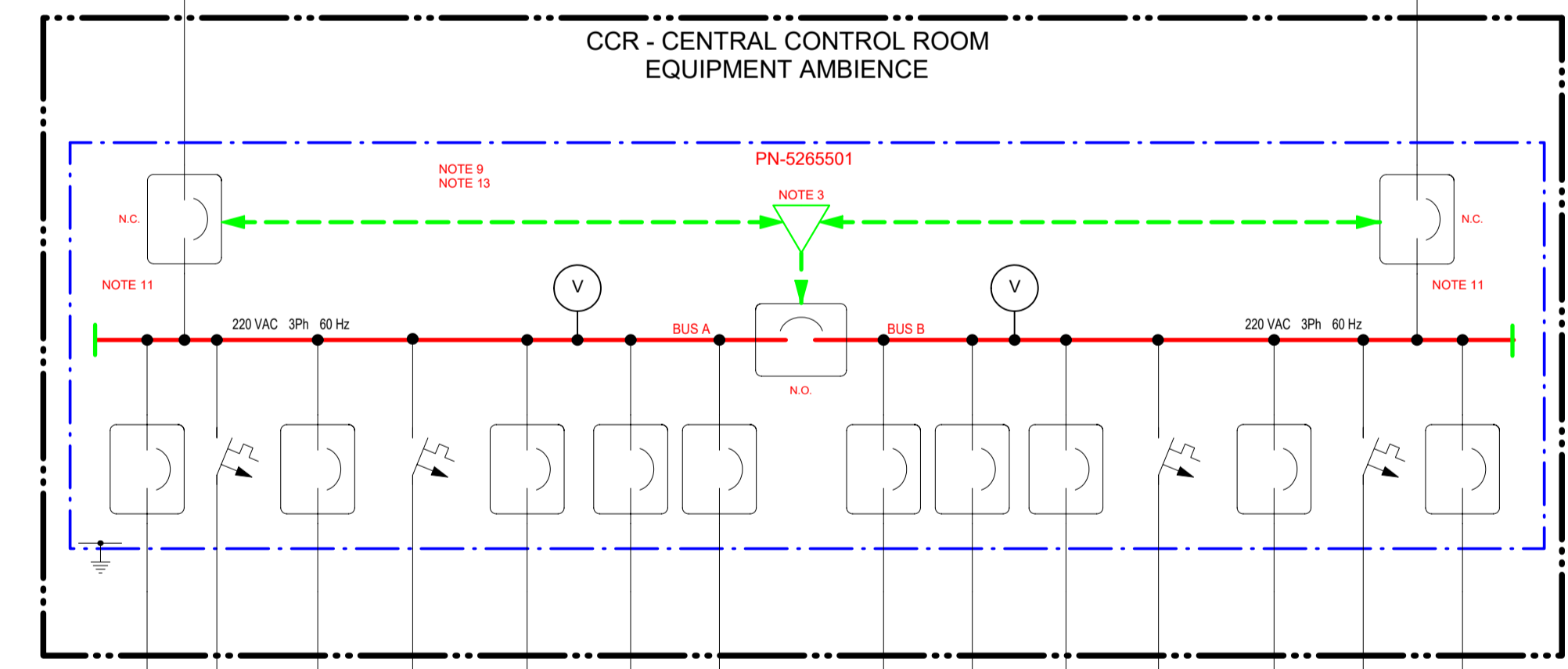
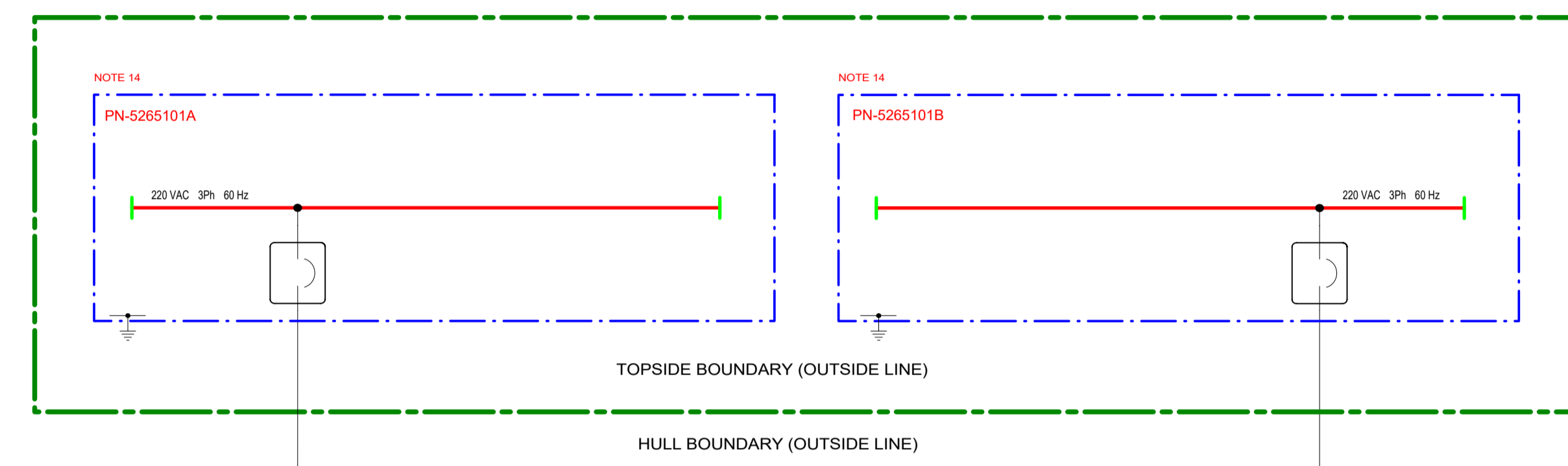
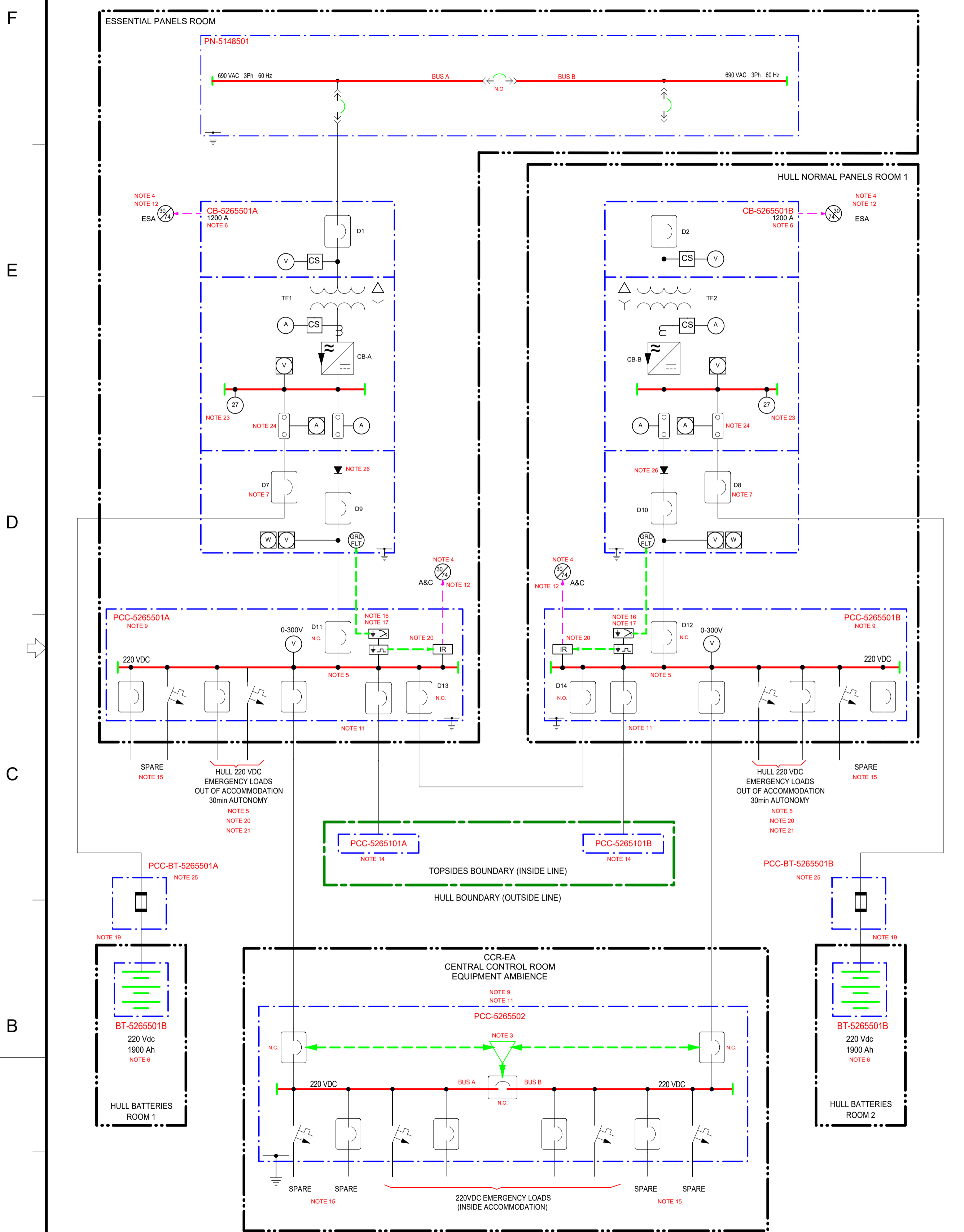
LEGEND

- ESA = ELECTRICAL SYSTEM AUTOMATION
 - A&C = AUTOMATION AND CONTROL SYSTEM
 - HR = HUMAN MACHINE INTERFACED BT = BATTERY IN DISCHARGE
 - UM = UNIT ALARM MALFUNCTION
 - US = UNIT ALARM SHUT-DOWN
 - GRD.F.T. = GROUND FAULT
- BOUNDARY LINE BETWEEN TOPSIDE AND HULL
 - EQUIPMENT ENCLOSURE
 - COMPARTMENT BOUNDARY
 - GENERAL NETWORK COMMUNICATION
 - HARDWIRED COMMUNICATION
 - IR = INTELLIGENT RELAY

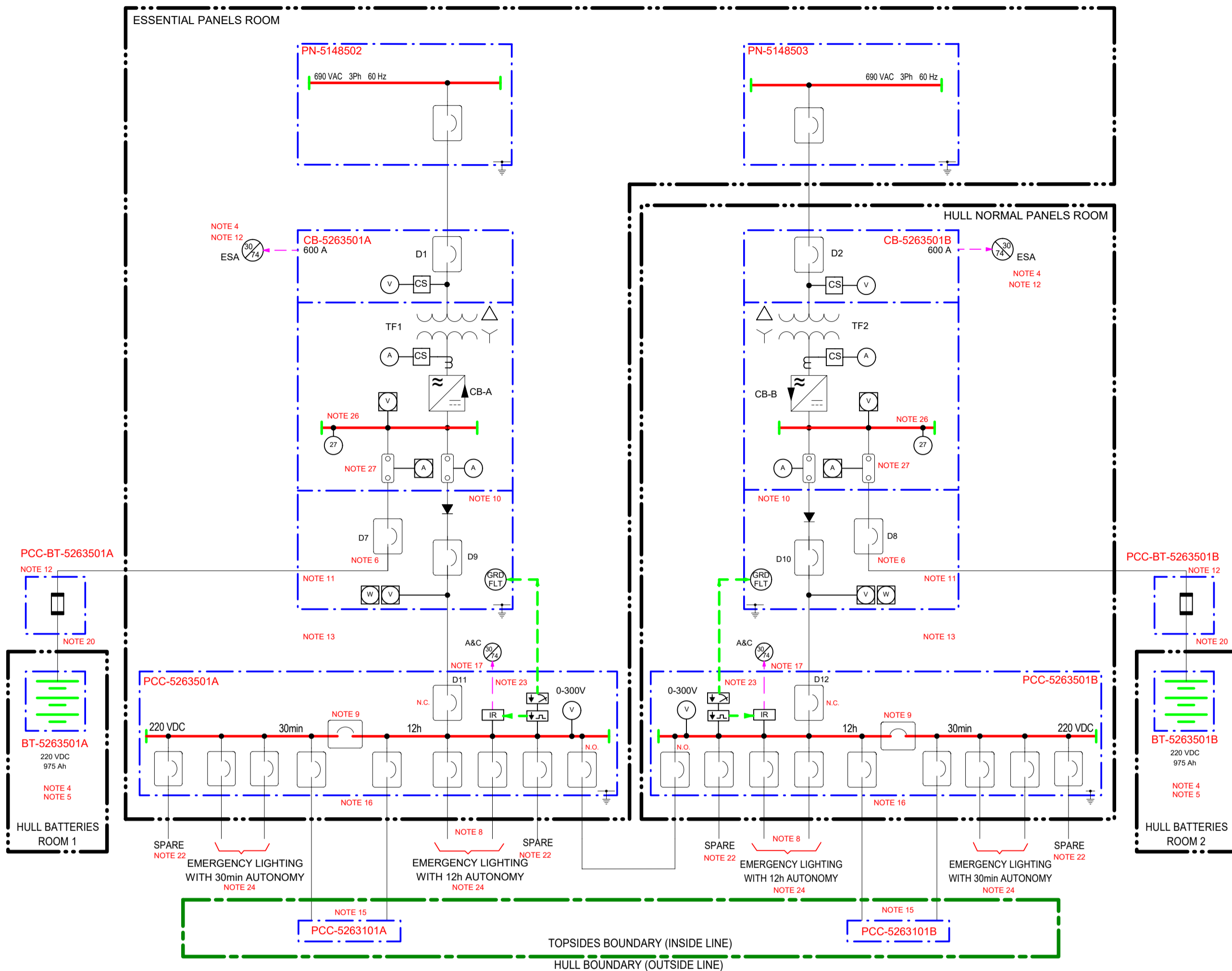
REV.	DESCRIPTION	DATE	EXEC.	CHECK	APPROV.

THE INFORMATION CONTAINED IN THIS DOCUMENT IS PETROBRAS PROPERTY AND MAY NOT BE USED FOR PURPOSES OTHER THAN THOSE SPECIFICALLY INDICATED HEREIN.
THIS FORM IS PART OF STANDARD RETROBRAS N-301 REJ L ANEX A - FIGURE A.9
Smart Electrical 2019 7 I-DE-3010.20-5265-946-P4X-002

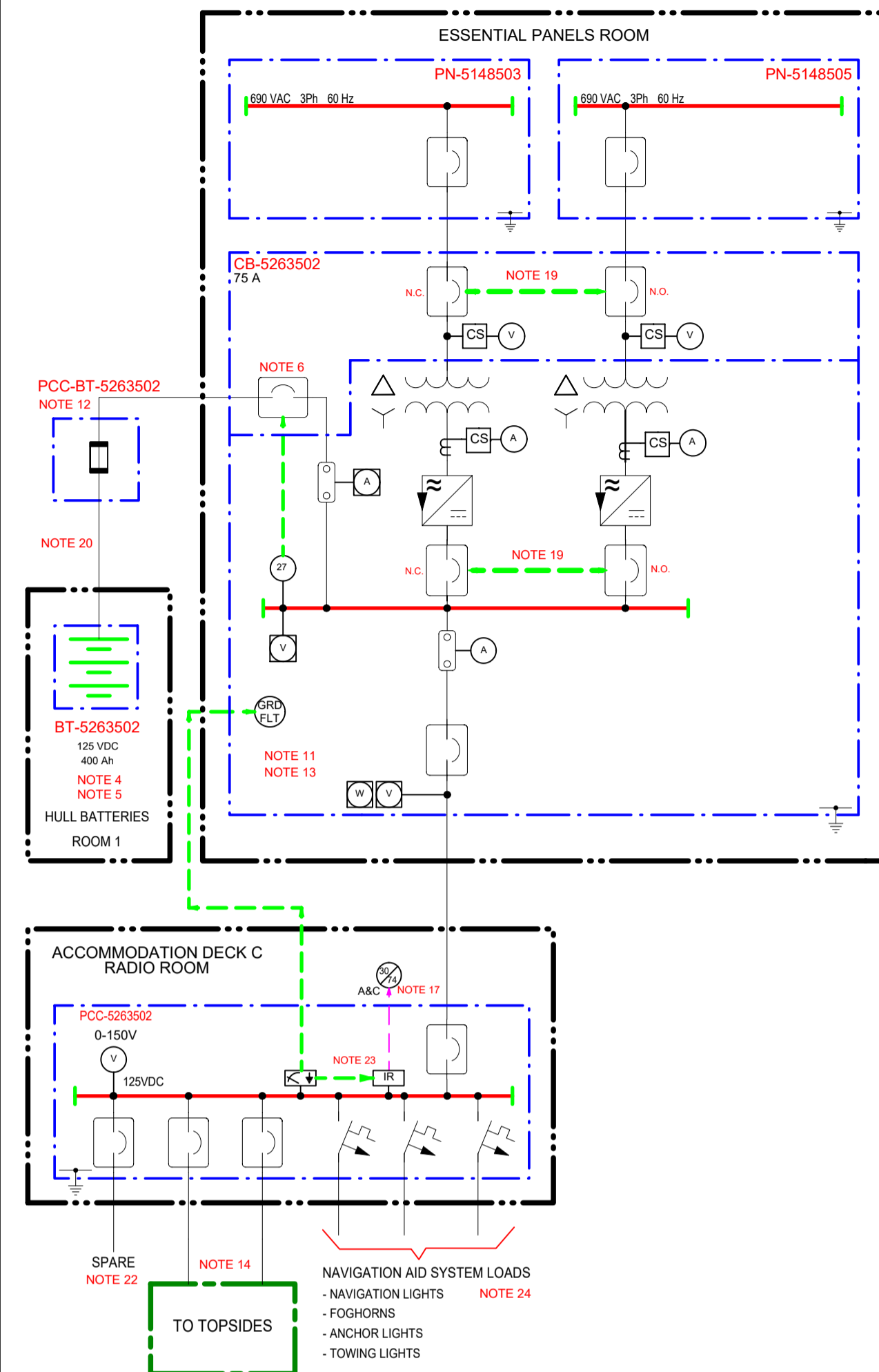
		SRGE
CLIENT:	MARLIM LESTE E SUL	
JOB:	BASIC DESIGN - REVIT I	
AREA:	MARLIM LESTE E SUL	
TITLE:	HULL UPS AND DC SYSTEMS ONE-LINE DIAGRAM	
DESIGN	ESUP	EXEC.
SCALE	NOT TO SCALE	DRAWING
DATE	INTERNAL	ESUP
No.	I-DE-3010.20-5265-946-P4X-002	



EMERGENCY LIGHTING SYSTEM - 220VDC

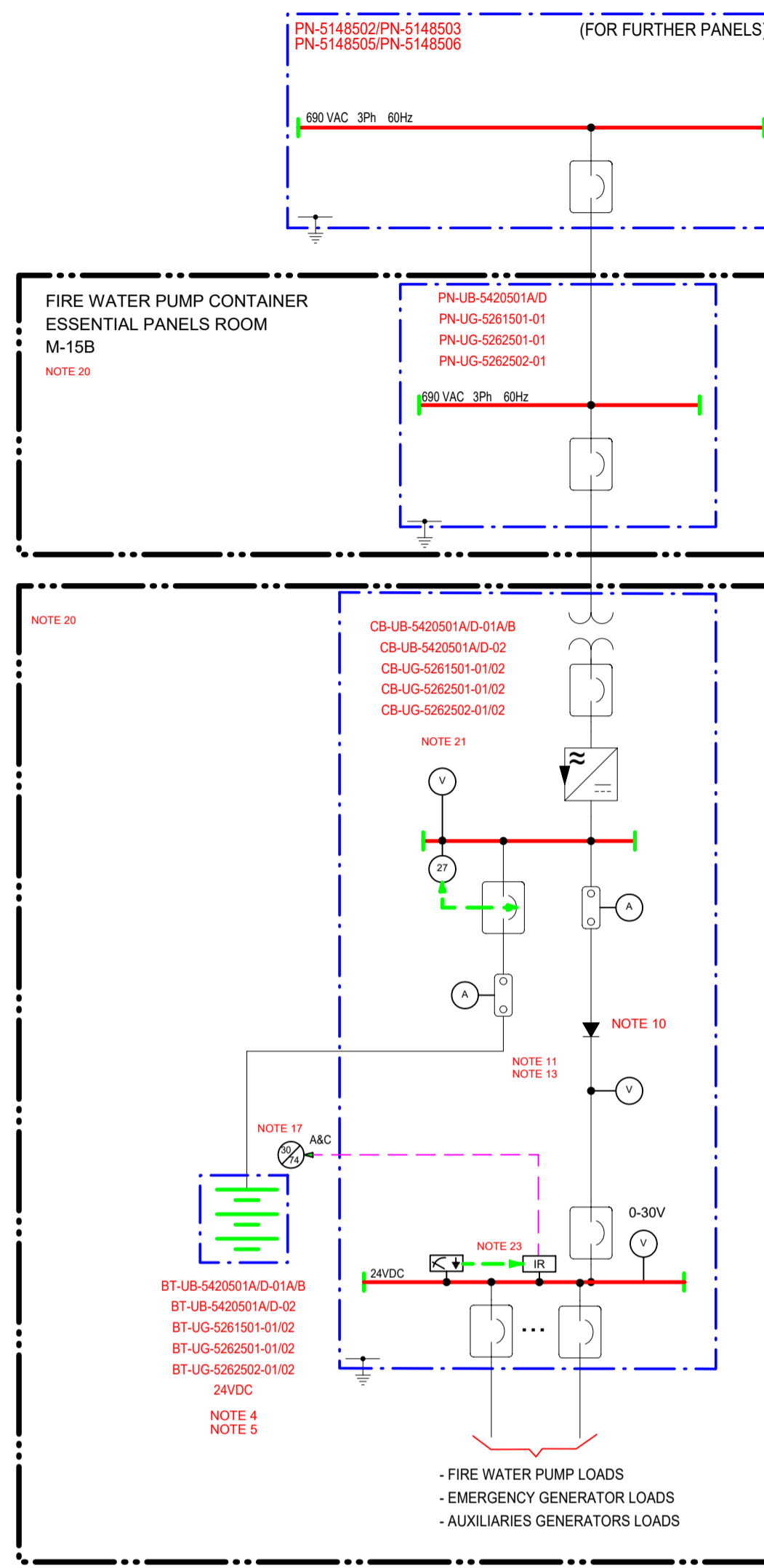


125 VDC - NAVIGATION AID SYSTEM



TYPICAL 24 VDC SYSTEMS FOR:

- FIRE WATER PUMPS
- EMERGENCY GENERATOR
- AUXILIARIES GENERATORS

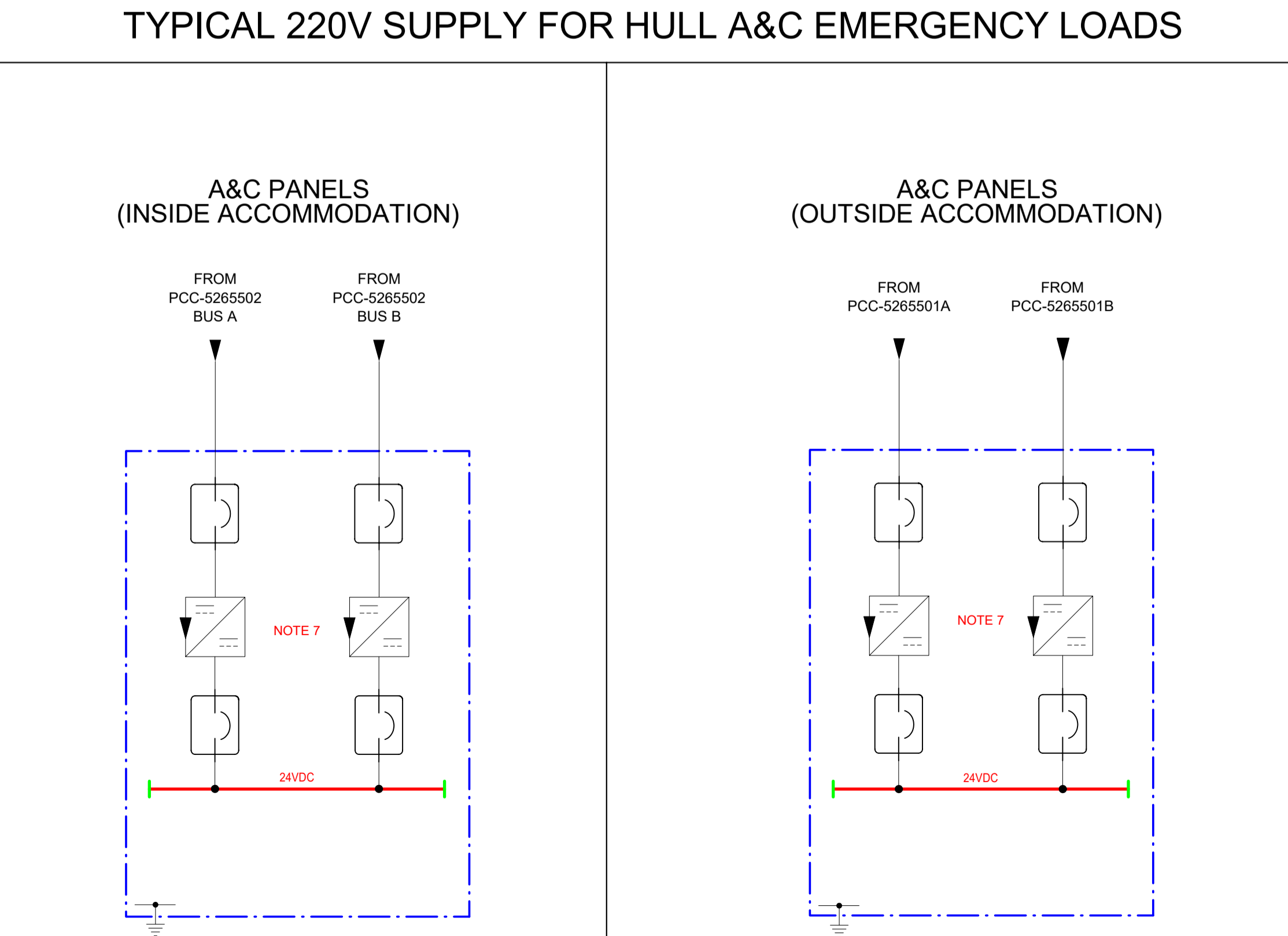


REFERENCE DOCUMENTS

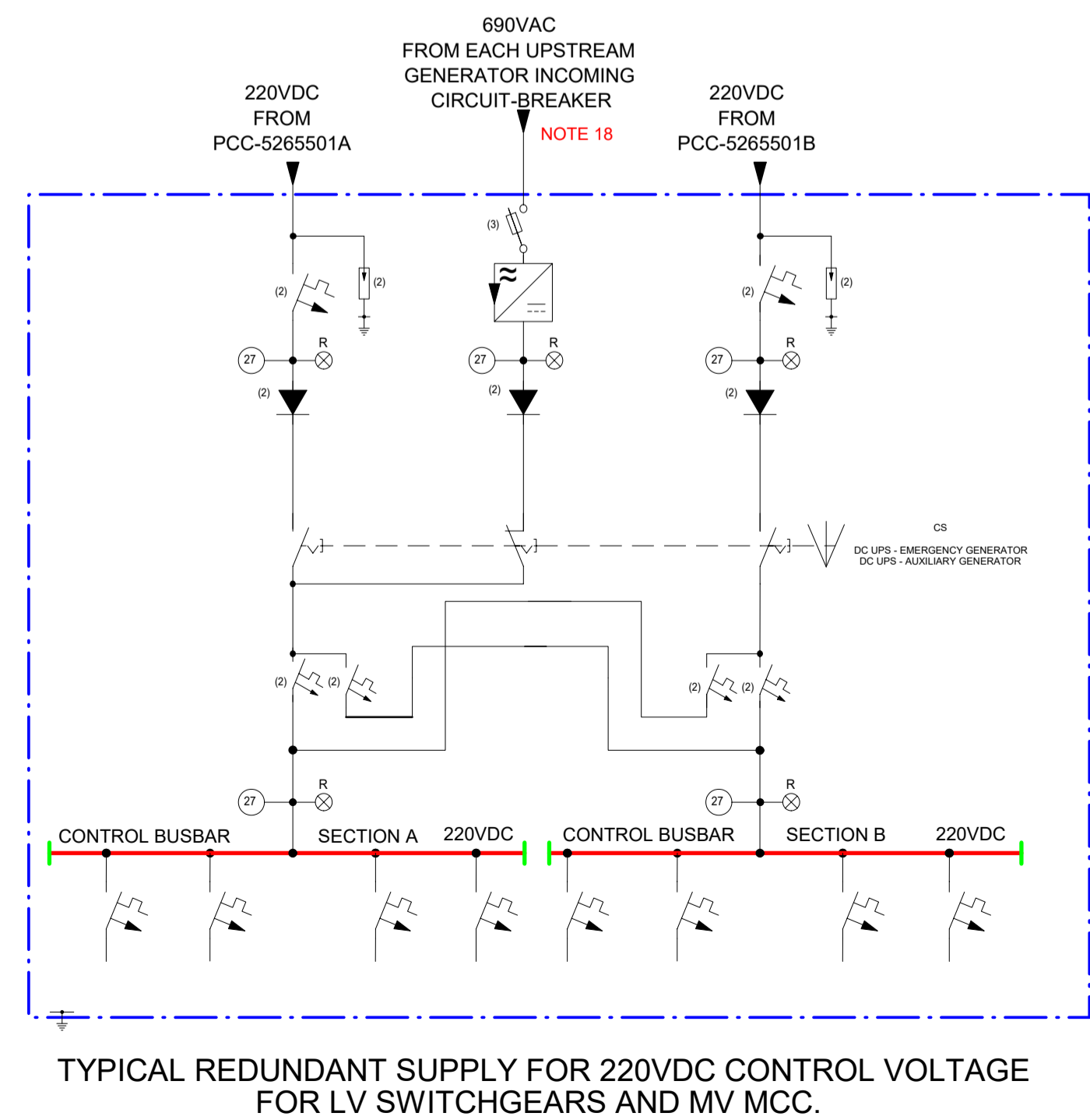
DR-ENGP-M-1.3 - SAFETY ENGINEERING
LET-3000.00.0000-940-P4X-002 - SYMBOLS FOR PRODUCTION UNITS DESIGN
LET-3000.00.0000-940-P4X-001 - SPECIFICATION FOR DC UPS FOR OFFSHORE UNITS
LET-3000.00.0000-940-P4X-002 - SPECIFICATION FOR ELECTRICAL DESIGN FOR OFFSHORE UNITS
LET-3000.00.0000-940-P4X-003 - SPECIFICATION FOR ELECTRICAL MATERIAL FOR OFFSHORE UNITS
LET-3000.00.0000-940-P4X-004 - REQUIREMENTS FOR HUMAN ENGINEERING DESIGN FOR ELECTRICAL SYSTEMS OF OFFSHORE UNITS
LET-3000.00.0000-940-P4X-005 - SPECIFICATION FOR GENERIC DC UPS FOR OFFSHORE UNITS
LET-3000.00.0000-940-P4X-006 - ELECTRICAL SYSTEM AUTOMATION INTERFACE SIGNALS LIST
LET-3000.00.0000-940-P4X-007 - ELECTRICAL SYSTEM AUTOMATION ARCHITECTURE DIAGRAM
LET-3000.00.0000-940-P4X-008 - EMERGENCY LOADS LIST
LET-3000.00.0000-940-P4X-009 - GENERAL ARRANGEMENT
LET-3000.00.0000-940-P4X-010 - HULL TELECOMMUNICATIONS ENERGY ONE LINE DIAGRAM
LET-3000.00.0000-940-P4X-011 - HULL TELECOMMUNICATIONS ENERGY ONE LINE DIAGRAM
LET-3000.00.0000-940-P4X-012 - TOPSIDES TELECOMMUNICATIONS ENERGY ONE LINE DIAGRAM
LET-3000.00.0000-940-P4X-013 - HULL 220V SYSTEMS ONE LINE DIAGRAM
LET-3000.00.0000-940-P4X-014 - MEDIUM-VOLTAGE MOTOR CONTROL CENTER AND SWITCHGEAR FOR OFFSHORE UNITS
LET-3000.00.0000-940-P4X-015 - LOW-VOLTAGE MOTOR CONTROL CENTER AND SWITCHGEAR FOR OFFSHORE UNITS
LET-3000.00.0000-940-P4X-016 - SPECIFICATION FOR LOW-VOLTAGE GENERATOR ELECTRICAL PANELS FOR OFFSHORE UNITS
LET-3000.00.0000-940-P4X-017 - SPECIFICATION FOR ELECTRICAL BATTERIES FOR OFFSHORE UNITS
LET-3000.00.0000-940-P4X-018 - AUXILIARY GENERATOR PACKAGE FOR OFFSHORE UNITS
LET-3000.00.0000-940-P4X-019 - EMERGENCY GENERATOR PACKAGE FOR OFFSHORE UNITS
LET-3000.00.0000-940-P4X-020 - DIESEL HYDRAULIC FIRE WATER PUMPING UNIT
LET-3000.00.0000-940-P4X-021 - AUTOMATION PANELS
LET-3000.00.0000-940-P4X-022 - AREA CLASSIFICATION - GENERAL

- ### GENERAL NOTES AND REQUIREMENTS
- EACH UPS, BATTERY CHARGER AND RECTIFIER SHALL GUARANTEE NORMAL VOLTAGE IN ITS DISTRIBUTION PANEL, EVEN DURING MAINTENANCE IN ONE OF THE COMPONENTS (RECTIFIER, INVERTERS, TRANSFORMERS, ETC.). THE OUTPUT VOLTAGE SHALL BE INDEPENDENT FROM OTHER SYSTEMS, EQUIPMENT, EXTERNAL CONTROL, VOLTAGES OR CONTACTS INCLUDING OTHER UPS, CB OR A/C SYSTEM.
 - ALL DC UPS AND GENERIC DC UPS SHALL BE PROVIDED WITH ALARM AND MONITORING AT A&C IN ACCORDANCE WITH IET-3000.00.0000-940-P4X-001 - ELECTRICAL SYSTEM AUTOMATION INTERFACE SIGNALS LIST.
 - ONLY LOADS DEFINED AS "EMERGENCY SERVICES" IN DR-ENGP-M-1.3 - SAFETY ENGINEERING AND EMERGENCY LOADS DEFINED IN IET-3000.00.0000-940-P4X-008 - EMERGENCY LOADS LIST SHALL BE FED BY EMERGENCY LOADS BATTERY CHARGER 220VDC (CB-5263501A/B).
 - REQUIRED AUTONOMY FOR EMERGENCY LIGHTING BATTERY 220VDC (BT-5263501A/B) AND NAVIGATION AID SYSTEM BATTERY 125VDC (BT-5263502) SHALL BE ACCORDING TO DR-ENGP-M-1.3 - SAFETY ENGINEERING, REQUIRED AUTONOMY FOR EMERGENCY GENERATOR CONTROL BATTERY 24VDC (BT-UG-5262501-01) AND STARTING REQUIREMENTS FOR EMERGENCY GENERATOR START BATTERY 24VDC (BT-UG-5262501-02) SHALL BE ACCORDING TO IET-3000.00.0000-940-P4X-001 - EMERGENCY GENERATOR PACKAGE FOR OFFSHORE UNITS. REQUIRED AUTONOMY FOR AUXILIARIES GENERATORS STARTING BATTERY 24VDC (BT-UG-5262501-02) AND BT-UG-5262502-01) SHALL BE ACCORDING TO IET-3000.00.0000-940-P4X-001 - AUXILIARY GENERATOR PACKAGE FOR OFFSHORE UNITS. REQUIRED AUTONOMY FOR FIRE WATER PUMP 24VDC CONTROL BATTERY (BT-UB-5420501A-D-01A/B) AND STARTING REQUIREMENTS FOR FIRE WATER PUMP 24VDC STARTING BATTERY (BT-UB-5420501A-D-01A/B) SHALL BE ACCORDING TO IET-3000.00.0000-940-P4X-002 - DIESEL HYDRAULIC FIRE WATER PUMP UNIT.
 - BATTERIES CAPACITY, WHERE DEFINED, IS PRELIMINARY AND SHALL BE CONFIRMED DURING DETAILED DESIGN. BATTERIES CAPACITY OF EMERGENCY GENERATOR, AUXILIARIES GENERATORS AND FIRE WATER PUMP SYSTEMS SHALL BE SCOPE OF MANUFACTURER.
 - CIRCUIT-BREAKERS SHALL NOT HAVE UNDERVOLTAGE TRIP COILS (UVT) OR BE MOTOR OR SOLENOID OPERATED, WHERE FORESEEN, AN ALARM OF BATTERY IN DISCHARGE (BAT DIS) SHALL BE SENT TO A&C.
 - THIS DRAWING SHALL NOT BE CENTRAL CONVERTERS AND RECTIFIERS FOR 24VDC SYSTEMS. EACH A&C EQUIPMENT THAT REQUIRES THIS CONTROL VOLTAGE SHALL HAVE INTERNAL REDUNDANT CONVERTERS AND RECTIFIERS, BESIDE. SOME A&C PANELS DO NOT REQUIRE ANY CONVERTERS OR RECTIFIERS. IN THIS WAY, THIS DRAWING IS NOT INTENDED TO DETAIL INTERNAL COMPONENTS OF A&C PANELS. FOR MORE INFORMATION ABOUT CONVERTERS AND RECTIFIERS INSIDE AUTOMATION PANELS, REFER TO IET-3000.00.0000-940-P4X-001 - AUTOMATION PANELS.
 - AT LEAST IN THE FOLLOWING PLACES SHALL HAVE EMERGENCY LIGHTING WITH 12h AUTONOMY:
 - CENTRAL CONTROL ROOM
 - RADIO ROOMS
 - TELECOM ROOMS
 - MASTER STATIONS
 - EMBARKATION STATIONS
 - EMERGENCY GENERATOR ROOM
 - AUXILIARY GENERATOR ROOMS
 - ESSENTIAL PANELS ROOM
 - CIRCUIT-BREAKERS SHALL OPEN AFTER 30 MINUTES OF CONTINUOUS OPERATION WITHOUT 690VAC POWER SUPPLY TO THE CB-5263501A/B. DISCONNECTING PART OF THE EMERGENCY LIGHTING AND CONTROL SYSTEMS INSTEAD OF CIRCUIT-BREAKERS SHALL BE APPROVED BY PETROBRAS. INTENDED DISCONNECTING PART OF THE ELECTRICAL SYSTEM SHALL NOT TRIGGER THE FOREMENTIONED LOGIC FOR THE CIRCUIT-BREAKERS.
 - BLOCK DIAGRAMS SHALL BE PROVIDED. DROP DIODES SHALL NOT BE ACCEPTED AS MEANS TO MAINTAIN THE CONSUMER VOLTAGE IN DISTRIBUTION PANEL IN THE RANGE OF 100% AND 115%.
 - A&C = AUTOMATION AND CONTROL SYSTEM
 - HMI = HUMAN MACHINE INTERFACE
 - BAT DIS = BATTERY IN DISCHARGE
 - UAM = UNIT ALARM MALFUNCTION
 - UAS = UNIT ALARM SHUT-DOWN
 - GRD FLT = GROUND FAULT
 - FUSES OR CIRCUIT-BREAKERS TO PROTECT THE CABLES SHALL BE INSTALLED INSIDE A BOX, IN A SAFE PLACE OUTSIDE THE BATTERIES ROOM, BUT CLOSE TO THE BATTERIES.
 - OTHER LOCAL SIGNALING AND INSTRUMENTS SHALL BE INSTALLED IF REQUIRED IN IET-3000.00.0000-940-P4X-001 - SPECIFICATION FOR DC UPS FOR OFFSHORE UNITS.
 - PCC-5263502 SHALL HAVE TWO SPARE OUTGOING CIRCUIT-BREAKERS FOR FUTURE USE BY TOPSIDES. IN ADDITION TO SPARE OUTGOING CIRCUIT-BREAKERS REQUIRED IN IET-3000.00.0000-940-P4X-004 - SPECIFICATION FOR LOW-VOLTAGE GENERATOR ELECTRICAL PANELS FOR OFFSHORE UNITS.
 - EACH TOPSIDE PANEL PCC-5263501A AND PCC-5263501B WILL HAVE TWO BUS-BARS, ONE FOR LIGHTING LOADS WITH AUTONOMY TIME 30 MINUTES AND OTHER FOR LIGHTING LOADS WITH AUTONOMY TIME 12 HOURS.
 - CAPACITY OF CIRCUIT-BREAKERS TO BE DEFINED BY DETAILED DESIGN.
 - THIS DOCUMENT DOES NOT CONTAIN ALL SIGNALS BETWEEN EQUIPMENT AND ELECTRICAL SYSTEM AUTOMATION. FOR MORE INFORMATION REFER TO IET-3000.00.0000-940-P4X-001 - ELECTRICAL SYSTEM AUTOMATION ARCHITECTURE DIAGRAM, IET-3000.00.0000-940-P4X-002 - SPECIFICATION FOR ELECTRICAL DESIGN FOR OFFSHORE UNITS, IET-3000.00.0000-940-P4X-003 - SPECIFICATION FOR ELECTRICAL MATERIAL FOR OFFSHORE UNITS.
 - THE CONTROL BUSBAR FOR THESE ELECTRICAL PANELS, LOW-VOLTAGE SWITCHGEAR FED DIRECTLY BY GENERATORS SHALL ALSO RECEIVE CONTROL SUPPLY FROM UPSTREAM INCOMING CIRCUIT-BREAKER THROUGH INTERNAL RECTIFIERS, MEDIUM-VOLTAGE MCCS, FED DIRECTLY BY GENERATORS SHALL ALSO RECEIVE CONTROL SUPPLY FROM EACH UPSTREAM CIRCUIT-BREAKER THROUGH INTERNAL AUXILIARY TRANSFORMERS (SECONDARY VOLTAGE IN 220VAC - 220VDC), INTERNAL COMPONENTS AND DISTRIBUTION RE LATED TO THIS SUPPLY ARE DESCRIBED IN IET-3000.00.0000-940-P4X-001 - LOW-VOLTAGE MOTOR CONTROL CENTER AND SWITCHGEAR FOR OFFSHORE UNITS, AND IET-3000.00.0000-940-P4X-002 - MEDIUM-VOLTAGE MOTOR CONTROL CENTER AND SWITCHGEAR FOR OFFSHORE UNITS.
 - MECHANICAL INTERLOCKING TO AVOID SIMULTANEOUS CLOSING OF MORE THAN TWO CIRCUIT-BREAKERS.
 - FOR CONTROL PANEL AND BATTERIES LOCATION, REFER TO IET-3000.00.0000-940-P4X-002 - GENERAL ARRANGEMENT.
 - BATTERY CHARGER AND BATTERY CAPACITIES DEFINED BY PACKAGER.
 - THE QUANTITY OF SPARE OUTGOING CIRCUIT-BREAKERS SHALL BE ACCORDING TO IET-3000.00.0000-940-P4X-004 - SPECIFICATION FOR LOW-VOLTAGE GENERATOR ELECTRICAL PANELS FOR OFFSHORE UNITS.
 - FOR MORE INFORMATION ABOUT INTELLIGENT RELAYS AND SIGNALS TO BE MONITORED BY THEM, REFER TO IET-3000.00.0000-940-P4X-002 - SPECIFICATION FOR ELECTRICAL MATERIAL FOR OFFSHORE UNITS AND IET-3000.00.0000-940-P4X-001 - ELECTRICAL SYSTEM AUTOMATION INTERFACE SIGNALS LIST.
 - EMERGENCY LIGHTING FIXTURES INSTALLED OUTDOORS AND NAVIGATION AID SYSTEM LAMPS SHALL BE SUITABLE FOR INSTALLATION IN ZONE II GROUP I/IIA TEMPERATURE T3.
 - FOR MORE INFORMATION ABOUT TELECOMMUNICATION ONE LINE DIAGRAM, REFER TO IET-3000.00.0000-940-P4X-010 - HULL TELECOMMUNICATIONS ENERGY ONE LINE DIAGRAM AND IET-3000.00.0000-940-P4X-011 - TOPSIDES TELECOMMUNICATIONS ENERGY ONE LINE DIAGRAM.
 - BATTERY BANK CIRCUIT-BREAKER SHALL NOT BE TRIPPED IF DURING DISCHARGING, VOLTAGE DECREASING REACHES MINIMUM OPERATIONAL VOLTAGE AT BATTERY TERMINALS. IN THIS CASE A ALARM SHALL BE SENT TO ELECTRICAL SYSTEM AUTOMATION, IN ACCORDANCE WITH IET-3000.00.0000-940-P4X-001 - SPECIFICATION FOR DC UPS FOR OFFSHORE UNITS AND IET-3000.00.0000-940-P4X-001 - ELECTRICAL SYSTEM AUTOMATION INTERFACE SIGNALS LIST.
 - IN CASE OF BATTERIES OVERLOAD, CIRCUIT-BREAKER SHALL TRIP AND RECTIFIER SHALL TRIP AN ALARM TO ELECTRICAL SYSTEM AUTOMATION, IN ACCORDANCE WITH IET-3000.00.0000-940-P4X-001 - SPECIFICATION FOR DC UPS FOR OFFSHORE UNITS AND IET-3000.00.0000-940-P4X-001 - ELECTRICAL SYSTEM AUTOMATION INTERFACE SIGNALS LIST.
 - BESIDES THE REQUIREMENTS OF IET-3000.00.0000-940-P4X-002 - SPECIFICATION FOR GENERIC DC UPS FOR OFFSHORE UNITS, CB-5263501A/B SHALL HAVE REDUNDANT INCOMING TRANSFORMERS AND RECTIFIERS WITH A MECHANICAL INTERLOCKING TO AVOID SIMULTANEOUS CLOSING OF CIRCUIT-BREAKERS, TO GUARANTEE POWER SUPPLY FOR THE BATTERIES IN CASE OF FAILURE IN ONE INPUT TRANSFORMER OR IN ONE RECTIFIER.

TYPICAL 220V SUPPLY FOR HULL A&C EMERGENCY LOADS

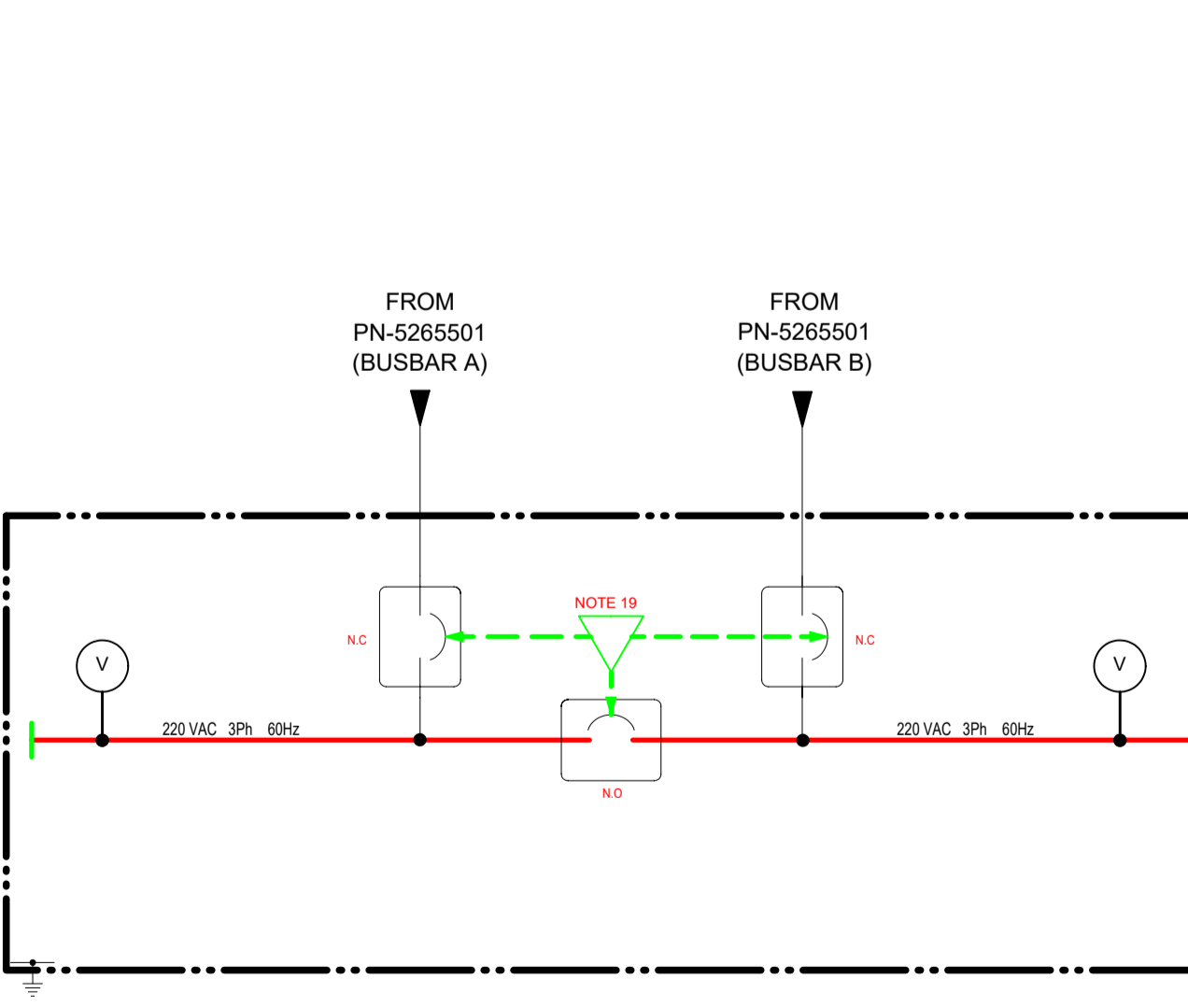


TYPICAL SUPPLY FOR HULL ELECTRICAL PANELS



TYPICAL REDUNDANT SUPPLY FOR 220VDC CONTROL VOLTAGE FOR LV SWITCHGEARS AND MV MCC.

TYPICAL SUPPLY FOR HULL TELECOMMUNICATION LOADS



LEGEND

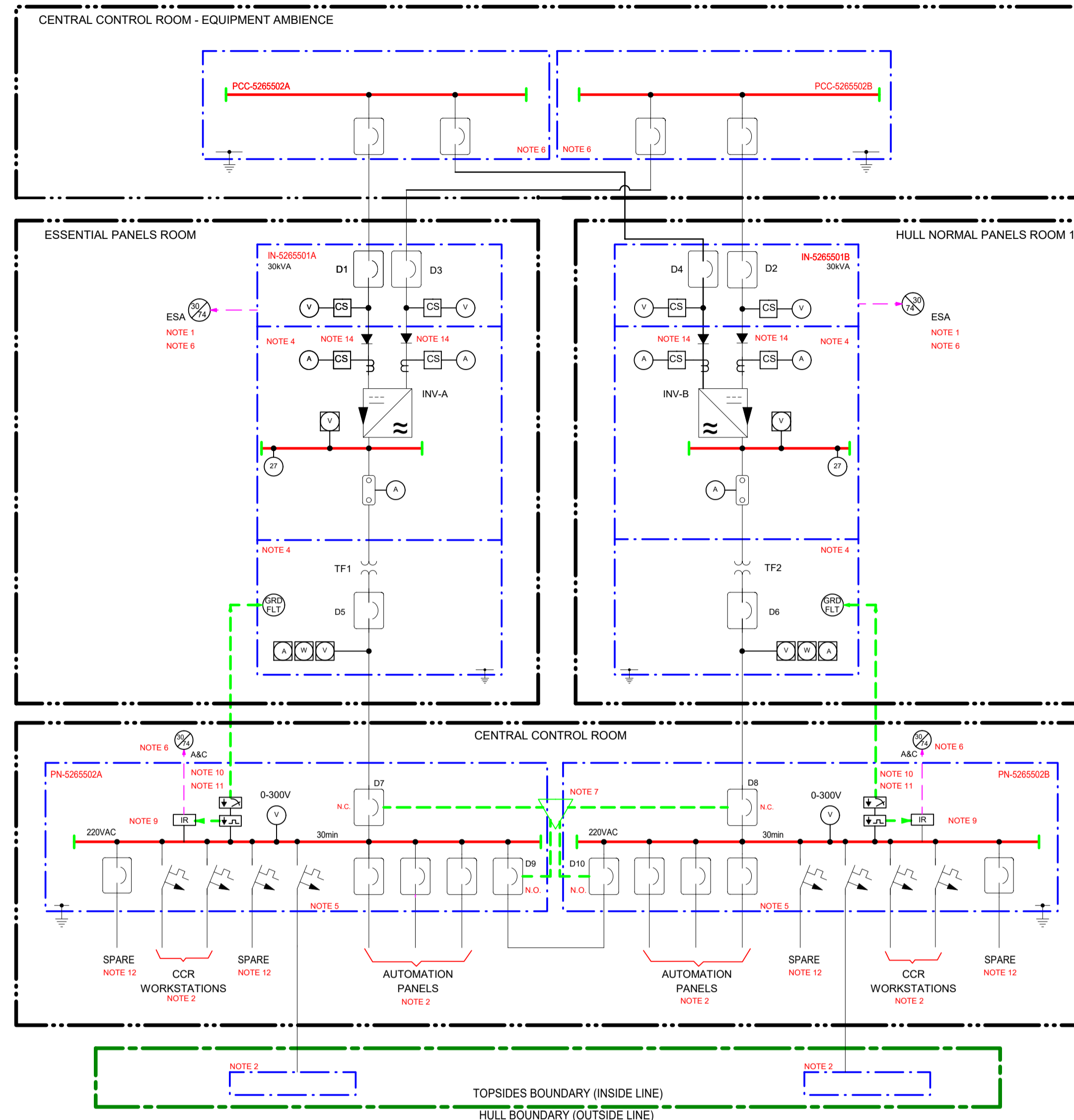
--- (dashed line)	BOUNDARY LINE BETWEEN TOPSIDE AND HULL
--- (dotted line)	EQUIPMENT ENCLOSURE
--- (dash-dot line)	COMPARTMENT BOUNDARY
--- (long-dashed line)	GENERAL NETWORK COMMUNICATION
--- (short-dashed line)	HANDWIRED COMMUNICATION
--- (dash-dot-dot line)	INTELLIGENT RELAY

REV.	DESCRIPTION	DATE	EXEC.	CHECK	APPROV.

THE INFORMATION CONTAINED IN THIS DOCUMENT IS PETROBRAS PROPERTY AND MAY NOT BE USED FOR PURPOSES OTHER THAN THOSE SPECIFICALLY INDICATED HEREIN. THIS FORM IS PART OF STANDARD PETROBRAS N-301-REV.1-ANEXO-A - FIGURE A.9. Smart Electrical 2019 / I-DE-3010.2Q-5265-946-P4X-002

CLIENT:	MARLIM LESTE E SUL	
JOB:	BASIC DESIGN - REVIT I	
AREA:	MARLIM LESTE E SUL	
TITLE:	HULL UPS AND DC SYSTEMS ONE-LINE DIAGRAM	
DESIGN:	ESUP	EXEC.
SCALE:	NOT TO SCALE	DRAWING
DATE:	INTERNAL	ESUP
No. I-DE-3010.2Q-5265-946-P4X-002		

AC CCR EMERGENCY LOADS SUPPLIED BY DC/AC INVERTERS



REFERENCE DOCUMENTS

- DR-ENGP-M-1.3 - SAFETY ENGINEERING
- I-ET-3010.00-0000-940-P4X-002 - SYMBOLS FOR PRODUCTION UNITS DESIGN
- I-ET-3010.00-5140-773-P4X-001 - SPECIFICATION FOR DC UPS FOR OFFSHORE UNITS
- I-ET-3010.00-5140-700-P4X-001 - SPECIFICATION FOR ELECTRICAL DESIGN FOR OFFSHORE UNITS
- I-ET-3010.00-5140-700-P4X-002 - SPECIFICATION FOR ELECTRICAL MATERIAL FOR OFFSHORE UNITS
- I-ET-3010.00-5140-700-P4X-005 - REQUIREMENTS FOR HUMAN ENGINEERING DESIGN FOR ELECTRICAL SYSTEMS OF OFFSHORE UNITS
- I-ET-3010.00-5140-773-P4X-002 - SPECIFICATION FOR GENERIC DC UPS FOR OFFSHORE UNITS
- I-ET-3010.00-5140-797-P4X-001 - ELECTRICAL SYSTEM AUTOMATION INTERFACE SIGNALS LIST
- I-DE-3010.00-5140-797-P4X-001 - ELECTRICAL SYSTEM AUTOMATION ARCHITECTURE DIAGRAM
- I-DE-3010.20-5265-946-P4X-001 - EMERGENCY LOADS LIST
- I-DE-3010.20-1200-942-P4X-002 - GENERAL ARRANGEMENT
- I-DE-3010.20-5265-846-P4X-001 - TOPSIDES UPS AND DC SYSTEMS ONE LINE DIAGRAM
- I-ET-3010.00-5140-741-P4X-001 - SPECIFICATION FOR LOW-VOLTAGE GENERIC ELECTRICAL PANELS FOR OFFSHORE UNITS
- I-ET-3010.00-5140-714-P4X-001 - SPECIFICATION FOR ELECTRICAL BATTERIES FOR OFFSHORE UNITS
- I-ET-3010.00-5020-886-P4X-001 - AUTOMATION PANELS
- I-DE-3010.20-1200-844-P4X-001 - AREA CLASSIFICATION - GENERAL

GENERAL NOTES AND REQUIREMENTS

- 1 ALL INVERTERS SHALL BE PROVIDED WITH ALARM AND MONITORING AT A&C.
- 2 LOADS SUPPLIED BY INVERTERS DISTRIBUTION PANELS PN-5265502A/B SHALL IN ACCORDANCE WITH I-ET-3010.00-5140-773-P4X-001 - EMERGENCY LOAD LIST. THERE SHALL NOT BE ANY OTHER LOADS FED FROM THIS SYSTEM. INCLUSION OF LOADS SHALL BE APPROVED BY PETROBRAS.
- 3 LOADS SUPPLIED BY AC UPS SHALL BE BALANCED AMONG THE THREE PHASES.
- 4 OTHER LOCAL SIGNALING AND INSTRUMENTS SHALL BE INSTALLED IF REQUIRED IN I-ET-3010.00-5140-773-P4X-001 - SPECIFICATION FOR DC UPS FOR OFFSHORE UNITS.
- 5 CAPACITY OF CIRCUIT-BREAKERS SHALL BE CALCULATED DURING DETAILED DESIGN.
- 6 THIS DOCUMENT DOES NOT CONTAIN ALL SIGNALS BETWEEN EQUIPMENT AND ELECTRICAL SYSTEM AUTOMATION. FOR MORE INFORMATION REFER TO I-DE-3010.00-5140-797-P4X-001 - ELECTRICAL SYSTEM AUTOMATION ARCHITECTURE DIAGRAM AND I-ET-3010.00-5140-797-P4X-001 - ELECTRICAL SYSTEM AUTOMATION INTERFACE SIGNALS LIST AND I-ET-3010.00-5140-700-P4X-005 - REQUIREMENTS FOR HUMAN ENGINEERING DESIGN FOR ELECTRICAL SYSTEMS OF OFFSHORE UNITS.
- 7 MECHANICAL INTERLOCKING TO AVOID SIMULTANEOUS CLOSING OF MORE THAN THREE CIRCUIT-BREAKERS.
- 8 FOR EQUIPMENT LOCATION REFER TO I-DE-3010.20-1200-942-P4X-002 - GENERAL ARRANGEMENT.
- 9 FOR MORE INFORMATION ABOUT INTELLIGENT RELAYS AND SIGNALS TO BE MONITORED BY THEM REFER TO I-ET-3010.00-5140-700-P4X-007 - SPECIFICATION FOR GENERIC ELECTRICAL EQUIPMENT FOR OFFSHORE UNITS AND I-ET-3010.00-5140-773-P4X-002 - SPECIFICATION FOR GENERIC DC UPS FOR OFFSHORE UNITS.
- 10 FOR PANELS WITH POSSIBILITY TO OPERATE IN "L" CONFIGURATION WITH INTERCONNECTION CIRCUIT-BREAKERS CLOSED, IT SHALL BE PROVIDED A LOGIC TO DISABLE ONE OF INSULATION MONITORING DEVICES IN THIS CONDITION. IT SHALL ALSO BE PROVIDED A LOGIC TO ENABLE BOTH OF INSULATION MONITORING DEVICES DURING THE RETURN TO "1" CONFIGURATION.
- 11 LOW INSULATION SHALL GENERATE AN ALARM SIGNAL TO BE SENT TO ELECTRICAL SYSTEM AUTOMATION THROUGH INTELLIGENT RELAYS.
- 12 THE QUANTITY OF SPARE OUTGOING CIRCUIT-BREAKERS SHALL BE ACCORDING TO I-ET-3010.00-5140-741-P4X-004 - SPECIFICATION FOR LOW-VOLTAGE GENERIC ELECTRICAL PANELS FOR OFFSHORE UNITS.
- 13 EQUIPMENT IN-5265501A SHALL BE INSTALLED IN A DIFFERENT LOCATION FROM IN-5265501B.
- 14 BLOCK DIODE SHALL BE PROVIDED. DROP DIODES SHALL NOT BE ACCEPTED AS MEAN TO AMOUNTAIN THE CONSUMER VOLTAGE IN DISTRIBUTION PANEL IN THE RANGE OF 100% AND 115%.

LEGEND

- ESA = ELECTRICAL SYSTEM AUTOMATION
- A&C = AUTOMATION AND CONTROL SYSTEM
- HMI = HUMAN MACHINE INTERFACE
- BAT DIS = BATTERY IN DISCHARGE
- LAM = LIMIT ALARM MALFUNCTION
- UAS = UNIT ALARM SHUT-DOWN
- GRD FLT = GROUND FAULT
- BOUNDARY LINE BETWEEN TOPSIDE AND HULL
- EQUIPMENT ENCLOSURE
- COMPARTMENT BOUNDARY
- GENERAL NETWORK COMMUNICATION
- HARDWIRED COMMUNICATION
- IR INTELLIGENT RELAY

REV.	DESCRIPTION	DATE	EXEC.	CHECK	APPROV.

THE INFORMATION CONTAINED IN THIS DOCUMENT IS PETROBRAS PROPERTY AND MAY NOT BE USED FOR PURPOSES OTHER THAN THOSE SPECIFICALLY INDICATED HEREIN.
THIS FORM IS PART OF STANDARD PETROBRAS N-3011-REV.1 ANEXO A - FIGURE A.9
Smart Electrical 2019.7 I-DE-3010.20-5265-946-P4X-002



SRGE

CLIENT: MARLIM LESTE E SUL

JOB: BASIC DESIGN - REVIT I

AREA: MARLIM LESTE E SUL

TITLE: HULL UPS AND DC SYSTEMS ONE-LINE DIAGRAM

DESIGN: ESUP EXEC: CHECK: APPROV:

SCALE: NOT TO SCALE DRAWING SHEET 3 of 3

INTERNAL ESUP

DATE: No. I-DE-3010.20-5265-946-P4X-002

F

E

D

C

B

A