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1. INTRODUCTION

1.1. Objective


- 1.1.1. This Technical Specification describes the communication interfaces for integration of Topsides and Hull A&C Systems of the UNIT.
- 1.1.2. This document contains only automation interfaces of A&C discipline. It does not contain Topsides and Hull automation interfaces of other disciplines (Electrical, Telecom, and others).

1.2. Definitions

- 1.2.1. Refer to I-ET-3010.00-1200-940-P4X-002 - GENERAL TECHNICAL TERMS.

1.3. Abbreviations, acronyms and initialisms

A&C	Automation & Control
AEPR	Automation & Electrical Panels Room
AMS	Asset Monitoring System
BCSS	Submerged Submarine Centrifugal Pump (Portuguese: <i>Bomba Centrifuga Submersa Submarina</i>)
BDV	Blowdown Valve
CCR-EA	Central Control Room – Equipment Ambiance
CCR-OA	Central Control Room – Operation Ambiance
CSS	Control and Safety System
CPU	Central Processing Unit
DHSV	Down Hole Safety Valve
DHSV-e	Electrical Actuated DHSV
EPR	Essential Panels Room
ESD	Emergency Shutdown
FGS	Fire and Gas System
FWD	Forward
HCS	Hull Control System
HFGS	Hull Fire and Gas System
HSD	Hull Process Shutdown System
HSDN	High Speed Deterministic Network
HMI	Human-Machine Interface
LAN	Local Area Network
MMS	Machinery Monitoring System
OWS	Subsea Operation Workstation
PA/GA	Public Announcement/General Alarm
PAP	Protection and Acquisition Panel
PCS	Process Control System
PLC	Programmable Logic Controller
PSD	Process Shutdown System
RTDS	Real Time Data Server
SBMS	Submarine Multiphase Pumping System (Portuguese: <i>Sistema de Bombeamento Multifásico Submarino</i>)
SOS	Supervisory and Operation System
TEAP	Topsides Electrical Assignment Panel
TWAP	Topsides Well Assignment Panel

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2. REFERENCE DOCUMENTS, CODES AND STANDARDS

2.1. External references

2.1.1. International codes, recommended practices and standards

IEC – INTERNATIONAL ELECTROTECHNICAL COMMISSION

IEC 60079 EXPLOSIVE ATMOSPHERE – ALL PARTS

IEC 60529 DEGREES OF PROTECTION PROVIDED BY ENCLOSURES (IP CODE)

2.1.2. Brazilian Codes and Standards

INMETRO – INSTITUTO NACIONAL DE METROLOGIA, QUALIDADE E TECNOLOGIA

PORTARIA Nº 115 (21/MARÇO/2022) REQUISITOS DE AVALIAÇÃO DA CONFORMIDADE PARA EQUIPAMENTOS ELÉTRICOS PARA ATMOSFERAS EXPLOSIVAS - CONSOLIDADO

2.2. Internal references

2.2.1. Project Documents


I-DE-3010.2Q-5520-800-P4X-002	AUTOMATION AND CONTROL ARCHITECTURE
I-DE-3010.2Q-1200-800-P4X-002	CENTRAL CONTROL ROOM LAYOUT
I-DE-3010.00-5140-797-P4X-001	ELECTRICAL SYSTEM AUTOMATION ARCHITECTURE DIAGRAM
I-DE-3010.00-5140-797-P4X-002	ELECTRICAL SYSTEM AUTOMATION TYPICAL ACTUATION DIAGRAMS
I-ET-3010.00-5140-700-P4X-003	ELECTRICAL REQUIREMENTS FOR PACKAGES FOR OFFSHORE UNITS
I-ET-3010.00-5520-861-P4X-002	SUPERVISION AND OPERATION SYSTEM – SOS
I-LI-3010.2Q-1200-940-P4X-002	EQUIPMENT LIST
I-DE-3010.2Q-5140-946-P4X-002	KEY ONE-LINE DIAGRAM
I-DE-3010.2Q-5140-946-P4X-003	TOPSIDES 220V SYSTEMS ONE-LINE DIAGRAM
I-DE-3010.2Q-5140-946-P4X-004	HULL 220V SYSTEMS ONE-LINE DIAGRAM
I-DE-3010.2Q-5265-946-P4X-001	TOPSIDES UPS AND DC SYSTEMS ONE-LINE DIAGRAM
I-DE-3010.2Q-5265-946-P4X-002	HULL UPS AND DC SYSTEMS ONE-LINE DIAGRAM
I-LI-3010.00-5140-797-P4X-001	ELECTRICAL SYSTEM AUTOMATION INTERFACE SIGNALS LIST

2.2.2. PETROBRAS Reference Documents

DR-ENGP-M-I-1.3 SAFETY ENGINEERING GUIDELINE

2.3. Classification Society

2.3.1. The Detail Design Phase shall be submitted to approval by Classification Society. The design and installation shall comply with their requirements and comments.

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3. INTERFACE DESCRIPTION

3.1. General

- 3.1.1. A&C System of the UNIT is composed by 2 (two) A&C Systems: Topsides A&C System, responsible for automation and control of the plant unit, and Hull A&C System, responsible for the automation and control of Hull and facilities. For further details, see documents listed at 2.2.1.
- 3.1.2. All instruments, panels, materials and equipment proper to be used in hazardous areas, shall have conformity certificates complying with *PORTARIA INMETRO Nº 115 de 21/MARÇO/2022*, and its annexes, and shall be approved by Classification Society.
- 3.1.3. The interface signals described in item 4 shall pass through PN-5500550 (INTERFACE PANEL HULL x TOPSIDE). For requirements and specifications of this panel, see item 3.2.
- 3.1.4. Definition of electrical actuation of each electrical load is in accordance with I-ET-3010.00-5140-700-P4X-003 – ELECTRICAL REQUIREMENTS FOR PACKAGES FOR OFFSHORE UNITS.
- 3.1.5. Additional interface signals (not mentioned in item 4) may be needed according to Detail Engineering Design.
- 3.1.6. Hull A&C System integration with Topsides A&C System shall consider that:
- All hardwired and optical interconnections between CCR-OA and AEPR shall be routed through junction boxes close to the CCR-EA after passing through PN-5500550. These junction boxes shall be located outside accommodation module, where a terminal strip for input and another for output points shall be available. These junction boxes shall be used to optical fiber and hardwired signals passages.
 - Hull Electro-Optical Conversion Panel (PN-5523505), located at CCR-EA and Topsides Electro-Optical Conversion Panel (PN-5523005), located at AEPR, shall be used for optical interconnections from junction boxes cited above, for more information on signals interconnected to these panels, refer to I-DE-3010.2Q-5520-800-P4X-002 - AUTOMATION AND CONTROL ARCHITECTURE. Electro-optical converters shall be installed in these panels. Hardwired interconnection shall not be considered in these panels.
 - Cables, multicables and optical fibers interconnecting the CCR-EA to Topsides equipment installed inside CCR-OA or RADIO ROOM shall be Topsides scope. Cables length shall be defined according to the layout shown in I-DE-3010.2Q-1200-800-P4X-002 – CENTRAL CONTROL ROOM LAYOUT. These cables shall be 5 m longer than the minimum required distance. Routing and size of these cables shall be defined during Detail Engineering Design Phase and shall be agreed upon by all parts involved.
 - Cables used inside CCR-OA shall be Topsides scope, when used to interconnect equipment supplied by Topsides.
 - Power supply for all automation panels, workstations and electrical devices is described in I-ET-3010.00-5140-700-P4X-003 - ELECTRICAL REQUIREMENTS FOR PACKAGES FOR OFFSHORE UNITS.

3.2. PN-5500550 Requirements

- 3.2.1. This panel shall contain all necessary means to perform the interconnection of the signals described in item 4.



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3.2.2. PN-5500550 shall be a standard panel, with dimensions of, at least, 1.6 m x 0.8 m x 2.0 m (L x W x H). It shall have IP-56 protection degree, according to IEC 60529 and shall be classified as Ex-e, according to IEC-60079. This panel shall be made of AISI 316L stainless steel plates.

3.3. Automation Equipment

3.3.1. Hull Automation Equipment

- For interface purposes, the following equipment represented at I-DE-3010.2Q-5520-800-P4X-002 - AUTOMATION AND CONTROL ARCHITECTURE shall be considered as Hull Automation Equipment, even if located in Toppides areas or furnished by Toppides SELLER. Their dimensions, weight and nominal power are described in I-LI-3010.2Q-1200-940-P4X-002 – EQUIPMENT LIST.

GROUP TAG	DESCRIPTION	QUANTITY	MODULE
PN-1358501	REMOTE ULLAGE, PRESSURE AND TEMPERATURE MONITORING PANEL	1	CCR EQUIPMENT AMBIANCE
PN-1358502	REMOTE ULLAGE, PRESSURE AND TEMPERATURE MONITORING WORKSTATION	1	CCR OPERATION AMBIANCE
PN-1358503	STABILITY AND LOAD CALCULATION WORKSTATION	1	CCR OPERATION AMBIANCE
PN-1358504	HIGH LEVEL OVERFILL SYSTEM PANEL	1	CCR EQUIPMENT AMBIANCE
PN-1358505	HIGH LEVEL OVERFILL ALARM VIEWER PANEL	1	CCR OPERATION AMBIANCE
PN-1358510	HULL STRUCTURE HEALTH MONITORING SYSTEM PANEL	1	FORECASTLE
PN-5500011	ASSET MANAGEMENT SYSTEM (AMS) WORKSTATION	1	CCR AUTOMATION AND TURBOMACHINE ROOM
PN-5500013	ASSET MANAGEMENT SYSTEM (AMS) WORKSTATION	1	INSTRUMENTATION WORKSHOP
PN-5500506	HULL MMS PROTECTION AND ACQUISITION PANEL (HULL PAP)	1	CCR EQUIPMENT AMBIANCE
PN-5500516	HULL CPU PANEL	1	CCR EQUIPMENT AMBIANCE
PN-5500550	INTERFACE PANEL HULL X TOPSIDE	1	NOTE 1
PN-5520501	HULL CSS PANEL	1	CCR EQUIPMENT AMBIANCE
PN-5520502	HULL CSS REMOTE I/O PANEL	1	CCR EQUIPMENT AMBIANCE
PN-5520503	HULL CSS REMOTE I/O PANEL	1	EPR
PN-5520504	HULL CSS REMOTE I/O PANEL	1	EPR
PN-5520505	HULL CSS REMOTE I/O PANEL	1	ENGINE ROOM 2ND DECK

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GROUP TAG	DESCRIPTION	QUANTITY	MODULE
PN-5520506	HULL CSS REMOTE I/O PANEL	1	ENGINE ROOM 5TH DECK
PN-5520507	HULL CSS REMOTE I/O PANEL	1	FORECASTLE - FWD PANELS ROOM
PN-5520508	HULL CSS REMOTE I/O PANEL	1	M-15B
PN-5522501	HULL ADDRESSABLE FIRE DETECTION SYSTEM PANEL	1	CCR EQUIPMENT AMBIANCE
PN-5522502	HULL ADDRESSABLE FIRE DETECTION SYSTEM VIEWER PANEL	1	CCR OPERATION AMBIANCE
PN-5523502A/E	HULL SOS HMI	5	CCR OPERATION AMBIANCE
PN-5523503	HULL MAIN HMI	1	CCR OPERATION AMBIANCE
PN-5523505	HULL ELECTRO-OPTICAL CONVERSION PANEL	1	CCR EQUIPMENT AMBIANCE
PN-5523506	HULL SOS PROCESS CLUSTER	1	CCR EQUIPMENT AMBIANCE
PN-5523507	HULL SOS SAFETY CLUSTER	1	CCR EQUIPMENT AMBIANCE
PN-5523508	HULL SOS CLUSTERS PANEL	1	CCR EQUIPMENT AMBIANCE
PN-5525501	HC SAMPLING SYSTEM PANEL	1	FORECASTLE - FWD PANELS ROOM
PN-5525502	HC SAMPLING SYSTEM DETECTOR CABINET (S)	1	MAIN DECK
PN-5525503	HC SAMPLING SYSTEM DETECTOR CABINET (P)	1	MAIN DECK
PN-5525511	O2 SAMPLING SYSTEM PANEL (HC BLANKET)	1	FORECASTLE - FWD PANELS ROOM
PN-5525512	O2 SAMPLING SYSTEM DETECTOR CABINET (HC BLANKET) (AFT)	1	MAIN DECK
PN-5525513	O2 SAMPLING SYSTEM DETECTOR CABINET (HC BLANKET) (MIDSHIP)	1	MAIN DECK
PN-5525514	O2 SAMPLING SYSTEM DETECTOR CABINET (HC BLANKET) (FWD)	1	MAIN DECK
PN-5527501	HULL OPERATOR DESK ALARM PANEL	1	CCR OPERATION AMBIANCE

NOTE 1: This panel location shall be defined by Detail Engineering Design Phase.

3.3.2. Topsides Automation Equipment

- For interface purposes, the following equipment represented at I-DE-3010.2Q-5520-800-P4X-002 – AUTOMATION AND CONTROL ARCHITECTURE shall be considered as Topsides Automation Equipment, even if located in Hull areas or furnished by Hull

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SELLER. Their dimensions, weight and nominal power are described in I-LI-3010.2Q-1200-940-P4X-002 – EQUIPMENT LIST.

GROUP TAG	DESCRIPTION	QUANTITY	MODULE
PN-1210001A/B	SUBSEA MASTER CONTROL STATION	2	A & E PANELS ROOM (M-17)
PN-1210002A/B	SUBSEA MASTER CONTROL STATION	2	A & E PANELS ROOM (M-17)
PN-1210003A/B	SUBSEA MASTER CONTROL STATION	2	A & E PANELS ROOM (M-17)
PN-1210004A/B	SUBSEA MASTER CONTROL STATION	2	A & E PANELS ROOM (M-17)
PN-1210005A/B	SUBSEA MASTER CONTROL STATION	2	A & E PANELS ROOM (M-17)
PN-1210006A/B	SUBSEA MASTER CONTROL STATION	2	A & E PANELS ROOM (M-17)
PN-1210007A/B	SUBSEA MASTER CONTROL STATION	2	A & E PANELS ROOM (M-17)
PN-1210008A/B	SUBSEA MASTER CONTROL STATION	2	A & E PANELS ROOM (M-17)
PN-1210009A/B	SUBSEA MASTER CONTROL STATION	2	A & E PANELS ROOM (M-17)
PN-1210010A/D	SUBSEA OPERATION WORKSTATION (OWS)	4	CCR OPERATION AMBIANCE
PN-1210011A/F	DHSV-E PANEL	6	A & E PANELS ROOM (M-17)
PN-1210016A/B	TOPSIDES ELECTRICAL ASSIGNMENT PANEL (TEAP)	2	A & E PANELS ROOM (M-17)
PN-1210017	TOPSIDES WELL ASSIGNMENT PANEL (TWAP)	1	A & E PANELS ROOM (M-17)
PN-1210018	TOPSIDES WELL ASSIGNMENT PANEL (TWAP)	1	M-09
PN-1210019A/B	TOPSIDES ELECTRICAL ASSIGNMENT PANEL (TEAP)	2	M-09
PN-1210024	SUBSEA INTERFACE LAN EXTENSION PANEL	1	M-16B
PN-1223001	FLOW METERING SYSTEM PANEL	1	A & E PANELS ROOM (M-17)
PN-1223002	FMS REMOTE HMI	1	CCR OPERATION AMBIANCE
PN-1223005	MULTIPHASE FLOW METERING SYSTEM PANEL	1	A & E PANELS ROOM (M-17)
PN-1240005	SBMS WORKSTATION	1	CCR OPERATION AMBIANCE
PN-1243001	BCSS CONTROL PANEL	1	M-16B
PN-1243002	BCSS WORKSTATION	1	CCR OPERATION AMBIANCE
PN-5400002A/B	EMERGENCY PANEL	2	CCR OPERATION AMBIANCE/RADIO ROOM (NOTE 1)
PN-5500001A/B	AUTOMATION ENGINEERING WORKSTATION	2	CCR AUTOMATION AND TURBOMACHINE ROOM (NOTE 1)



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GROUP TAG	DESCRIPTION	QUANTITY	MODULE
PN-5500004	CORROSION MONITORING SYSTEM PANEL	1	A & E PANELS ROOM (M-17)
PN-5500005A/B	AUTOMATION MAINTENANCE WORKSTATION	2	CCR AUTOMATION AND TURBOMACHINE ROOM (NOTE 1)
PN-5500007	MMS SERVER PANEL	1	A & E PANELS ROOM (M-17)
PN-5500008	MMS WORKSTATION	1	CCR OPERATION AMBIANCE
PN-5500009	TOPSIDES MMS PROTECTION AND ACQUISITION PANEL (TOPSIDES PAP)	1	A & E PANELS ROOM (M-17)
PN-5500010A/B	COMPRESSOR GOVERNOR SYSTEM WORKSTATIONS	1	CCR OPERATION AMBIANCE
PN-5500014	MMS SERVER PANEL	1	A & E PANELS ROOM (M-17)
PN-5500015	MMS WORKSTATION	1	CCR AUTOMATION AND TURBOMACHINE ROOM
PN-5500016	TOPSIDES CPU PANEL	1	CCR EQUIPMENT AMBIANCE
PN-5520001	TOPSIDES CSS PANEL	1	A & E PANELS ROOM (M-17)
PN-5520101	TOPSIDES CSS REMOTE I/O PANEL	1	M-01
PN-5520103	TOPSIDES CSS REMOTE I/O PANEL	1	M-03
PN-5520105A/B	TOPSIDES CSS REMOTE I/O PANEL	2	M-05/M-05B
PN-5520106	TOPSIDES CSS REMOTE I/O PANEL	1	M-06
PN-5520108	TOPSIDES CSS REMOTE I/O PANEL	1	M-08
PN-5520109	TOPSIDES CSS REMOTE I/O PANEL	1	M-09
PN-5520110A/C	TOPSIDES CSS REMOTE I/O PANEL	3	M-10A/C
PN-5520111	TOPSIDES CSS REMOTE I/O PANEL	1	M-11
PN-5520112	TOPSIDES CSS REMOTE I/O PANEL	1	M-13 GENERATORS CONTROL PANELS ROOM
PN-5520113A/B	TOPSIDES CSS REMOTE I/O PANEL	2	M-13 GENERATORS CONTROL PANELS ROOM
PN-5520114	TOPSIDES CSS REMOTE I/O PANEL	1	M-14
PN-5520115	TOPSIDES CSS REMOTE I/O PANEL	1	M-15
PN-5520116B	TOPSIDES CSS REMOTE I/O PANEL	1	M-16B
PN-5520117A/B	TOPSIDES CSS REMOTE I/O PANEL	2	A & E PANELS ROOM (M-17)
PN-5522001	TOPSIDES ADDRESSABLE FIRE DETECTION SYSTEM PANEL	1	A & E PANELS ROOM (M-17)



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GROUP TAG	DESCRIPTION	QUANTITY	MODULE
PN-5522002	TOPSIDES ADDRESSABLE FIRE DETECTION SYSTEM VIEWER PANEL	1	CCR OPERATION AMBIANCE
PN-5523002A/E	TOPSIDES SOS HMI	5	CCR OPERATION AMBIANCE
PN-5523003	TOPSIDES MAIN HMI	1	CCR OPERATION AMBIANCE
PN-5523004	FIRE AND GAS HMI	1	CCR OPERATION AMBIANCE
PN-5523005	TOPSIDES ELECTRO-OPTICAL CONVERSION PANEL	1	A & E PANELS ROOM (M-17)
PN-5523006A/B	REMOTE ACCESS WORKSTATION	2	CCR OPERATION AMBIANCE
PN-5523007A/B	OPERATORS ROOM SOS HMI	2	OPERATOR'S ROOM (M-15B)
PN-5523008A/B	PACKAGE MAINTENANCE WORKSTATION	2	CCR AUTOMATION AND TURBOMACHINE ROOM (NOTE 1)
PN-5523009	TOPSIDES SOS PROCESS CLUSTER	1	A & E PANELS ROOM (M-17)
PN-5523010	TOPSIDES SOS SAFETY CLUSTER	1	A & E PANELS ROOM (M-17)
PN-5523011	TOPSIDES SOS CLUSTERS PANEL	1	A & E PANELS ROOM (M-17)
PN-5524001A/B	SUBSEA INTERFACE PANEL	2	A & E PANELS ROOM (M-17)
PN-5527001	TOPSIDES OPERATOR DESK ALARM PANEL	1	CCR OPERATION AMBIANCE
PN-B-1240001-01	SBMS CONTROL PANEL	1	M-16B
PN-B-1240002-01	SBMS CONTROL PANEL	1	M-16B
PN-B-1240003-01	SBMS CONTROL PANEL	1	M-16B
PN-B-1240004-01	SBMS CONTROL PANEL	1	M-16B

NOTE 1: PN-5400002A, PN-5400002B, PN-5500001A/B, PN-5500005A/B and PN-5523008A/B shall be installed early in their final position in order to make them available for use during HULL commissioning.

4. TOPSIDES AND HULL AUTOMATION INTERFACES

4.1. Hardwired Interface



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4.1.1. The following hardwired interfaces between Topsides CSS and Hull CSS shall be done through PN-5500550 - INTERFACE PANEL HULL X TOPSIDE:

QUANTITY	TYPE	PANEL 1	PANEL 2	PURPOSE
1	DISCRETE	PN-5400002A	CSS-PSD Controllers	ESD-2
1	DISCRETE	PN-5400002B	CSS-PSD Controllers	ESD-2
2	DISCRETE	PN-5400002A	CSS-FGS Controllers	ESD-3P and ESD-3T
2	DISCRETE	PN-5400002B	CSS-FGS Controllers	ESD-3P and ESD-3T
1	DISCRETE	PN-5400002A	CSS-FGS Controllers	ESD-4
1	DISCRETE	PN-5400002B	CSS-FGS Controllers	ESD-4
1	DISCRETE	PN-5400002A	CSS-FGS Controllers	Prepare to abandon Push button
1	DISCRETE	PN-5400002B	CSS-FGS Controllers	Prepare to abandon Push button
2	DISCRETE	CSS-FGS Controllers	(PA/GA A/B)	Initiation of the sound alarm prepares to abandon
NOTE 1	DISCRETE	PN-5400002A	CSS-FGS Controllers	BDV's actuation. One signal per BDV
1	DISCRETE	CSS-PSD Controllers	CSS-HSD Controllers	ESD-2
1	DISCRETE	CSS-HSD Controllers	CSS-PSD Controllers	ESD-2
4	DISCRETE	CSS-FGS Controllers	CSS-HFGS Controllers	ESD-3P, ESD-3T, Fire Pump and Foam Pump Starts
2	DISCRETE	CSS-HFGS Controllers	CSS-FGS Controllers	ESD-3P and ESD-3T
1	DISCRETE	CSS-FGS Controllers	CSS-HFGS Controllers	ESD-4
1	DISCRETE	CSS-HFGS Controllers	CSS-FGS Controllers	ESD-4
6	DISCRETE	CSS-PCS Controllers	CSS-HCS Controllers	B-5133502A/C Pump start and stop commands (NOTE 3)
3	DISCRETE	CSS-PSD Controllers	CSS-HSD Controllers	B-5133502A/C Pump Trip command (NOTE 3)
4	DISCRETE	CSS-PCS Controllers	CSS-HCS Controllers	B-5133501A/B Pump start / stop (NOTE 3)
2	DISCRETE	CSS-PSD Controllers	CSS-HSD Controllers	B-5133501A/B Pump Trip Command (NOTE 3)
NOTE 2	ANALOG	TQ-5331501A/C	CSS-PSD Remote I/O Panels	TQ-5331501A/C commands
NOTE 2	DISCRETE	TQ-5331501A/C	CSS-PSD Remote I/O Panels	TQ-5331501A/C commands
NOTE 2	ANALOG	TQ-5331501A/C	CSS-PCS Remote I/O Panels	TQ-5331501A/C commands
NOTE 2	DISCRETE	TQ-5331501A/C	CSS-PCS Remote I/O Panels	TQ-5331501A/C commands
NOTE 2	ANALOG	TQ-1223501A/C	CSS-PSD Remote I/O Panels	TQ-1223501A/C commands
NOTE 2	DISCRETE	TQ-1223501A/C	CSS-PSD Remote I/O Panels	TQ-1223501A/C commands
NOTE 2	ANALOG	TQ-1223501A/C	CSS-PCS Remote I/O Panels	TQ-1223501A/C commands
NOTE 2	DISCRETE	TQ-1223501A/C	CSS-PCS Remote I/O Panels	TQ-1223501A/C commands
1	DISCRETE	CSS-PSD Controllers	PSD Alarms Panel	Signal to initiate sound and visual indication for PSD main alarms
1	DISCRETE	CSS-FGS Controllers	FGS Alarms Panel	Signal to initiate sound and visual indication for FGS

NOTE 1: Final quantity of BDVs, and therefore, the quantity of hardwired connections shall be confirmed during Detail Design phase.

NOTE 2: Final quantity of signals to be confirmed during Detail Design phase.

NOTE 3: HULL Seller is responsible for implementing selection logic between pumps A and B, and between pumps A, B and C.

NOTE 4: Z-1350001 - STRUCTURAL TANKS GAS RECOVERY UNIT package will have interfaces between HULL and Topsides inside the Package Scope (signals from hull instruments arriving at the panel, which is at AEPR). These signals shall not pass through PN-5500550 - INTERFACE PANEL HULL X TOPSIDE. Z-1350001 - STRUCTURAL TANKS GAS RECOVERY UNIT packager shall supply a dedicated interface panel, if necessary.



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4.1.2. Whenever a Topside load is powered by a Hull electrical panel interfaces between Topside CSS Remote I/O Panel and Hull electrical panel shall be foreseen. Similarly, whenever a Hull load is powered by a Topside electrical panel interfaces between Hull CSS Remote I/O Panel and Topside electrical panel shall be foreseen.

For the required interfaces for each load type, refer to I-LI-3010.00-5140-797-P4X-001 - ELECTRICAL SYSTEM AUTOMATION INTERFACE SIGNALS LIST. To identify which Topside Loads are powered by a Hull electrical panel, refer to the following One-Line diagrams:

- I-DE-3010.2Q-5140-946-P4X-002 - KEY ONE-LINE DIAGRAM
- I-DE-3010.2Q-5140-946-P4X-003 - TOPSIDE 220V SYSTEMS ONE-LINE DIAGRAM
- I-DE-3010.2Q-5140-946-P4X-004 - HULL 220V SYSTEMS ONE-LINE DIAGRAM
- I-DE-3010.2Q-5265-946-P4X-001 - TOPSIDE UPS AND DC SYSTEMS ONE-LINE DIAGRAM
- I-DE-3010.2Q-5265-946-P4X-002 - HULL UPS AND DC SYSTEMS ONE-LINE DIAGRAM

4.1.3. For more information related to interfaces with electrical system, such as interfaces signals with PN-TG-5147001A/B/C/D-01, see I-LI-3010.00-5140-797-P4X-001 - ELECTRICAL SYSTEM AUTOMATION INTERFACE SIGNALS LIST.

4.2. Optical interfaces

4.2.1. The following optical interfaces between Topsides and Hull shall be done:

QUANTITY OF PAIRS (CONNECTIONS)	TYPE	EQUIPMENT 1	EQUIPMENT 2
2	MULTIMODE	Package LAN Hull Switches	Package LAN Topsides Switches
2	MULTIMODE	CSS LAN Hull Switches	CSS LAN Topsides Switches
2	MULTIMODE	SOS LAN Hull Switches	SOS LAN Topsides Switches
4	MULTIMODE	PN-1210010A/D	PN-1210001-009A/B via switch inside PN-5524001A/B
1	MULTIMODE	PN-5522001	PN-5522002
2	MULTIMODE	Compressor Governor System LAN (NOTE 1)	PN-5500010A/B
1	MULTIMODE	PN-5500506	PN-5500007
1	MULTIMODE	PN-5500007	PN-5500008
1	MULTIMODE	PN-5500015	PN-5500014
1 (NOTE 2)	MULTIMODE	HCS PLC (PN-5520501)	To HSDN
1 (NOTE 2)	MULTIMODE	HSD PLC (PN-5520501)	To HSDN
1 (NOTE 2)	MULTIMODE	HFGS PLC (PN-5520501)	To HSDN
1	MULTIMODE	PN-TG-5147001A/D-01	PN-TG-5147001A/D-03
1	MULTIMODE	PN-UC-1225001A/B-01	PN-UC-1225001A/B-04
1	MULTIMODE	PN-UC-1231001A/C-01	PN-UC-1231001A/C-04



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QUANTITY OF PAIRS (CONNECTIONS)	TYPE	EQUIPMENT 1	EQUIPMENT 2
1	MULTIMODE	PN-UC-1231002A/C-01	PN-UC-1231002A/C-04
1	MULTIMODE	PN-TG-5147002-01	PN-TG-5147002-03
1	MULTIMODE	PN-5524001A/B	PN-1240005
1	MULTIMODE	PN-5524001A/B	PN-1243002

NOTE 1: This interface shall be specified during detailing design. For more information, refer to I-DE-3010.2Q-5520-800-P4X-002 - AUTOMATION AND CONTROL ARCHITECTURE.

NOTE 2: Depending on HSDN Topology, the quantity of pairs may vary.

4.3. Software interface

4.3.1. In order to serve Fire and Gas HMI (PN-5523004), Topsides SOS RTDS (FGS) shall acquire data from HFGS PLC and display in PN-5523004 information from Fire and Gas Systems from both FGS and HFGS PLCs.

4.3.2. For further information about this integration, refer to I-ET-3010.00-5520-861-P4X-002 - SUPERVISION AND OPERATION SYSTEM – SOS.