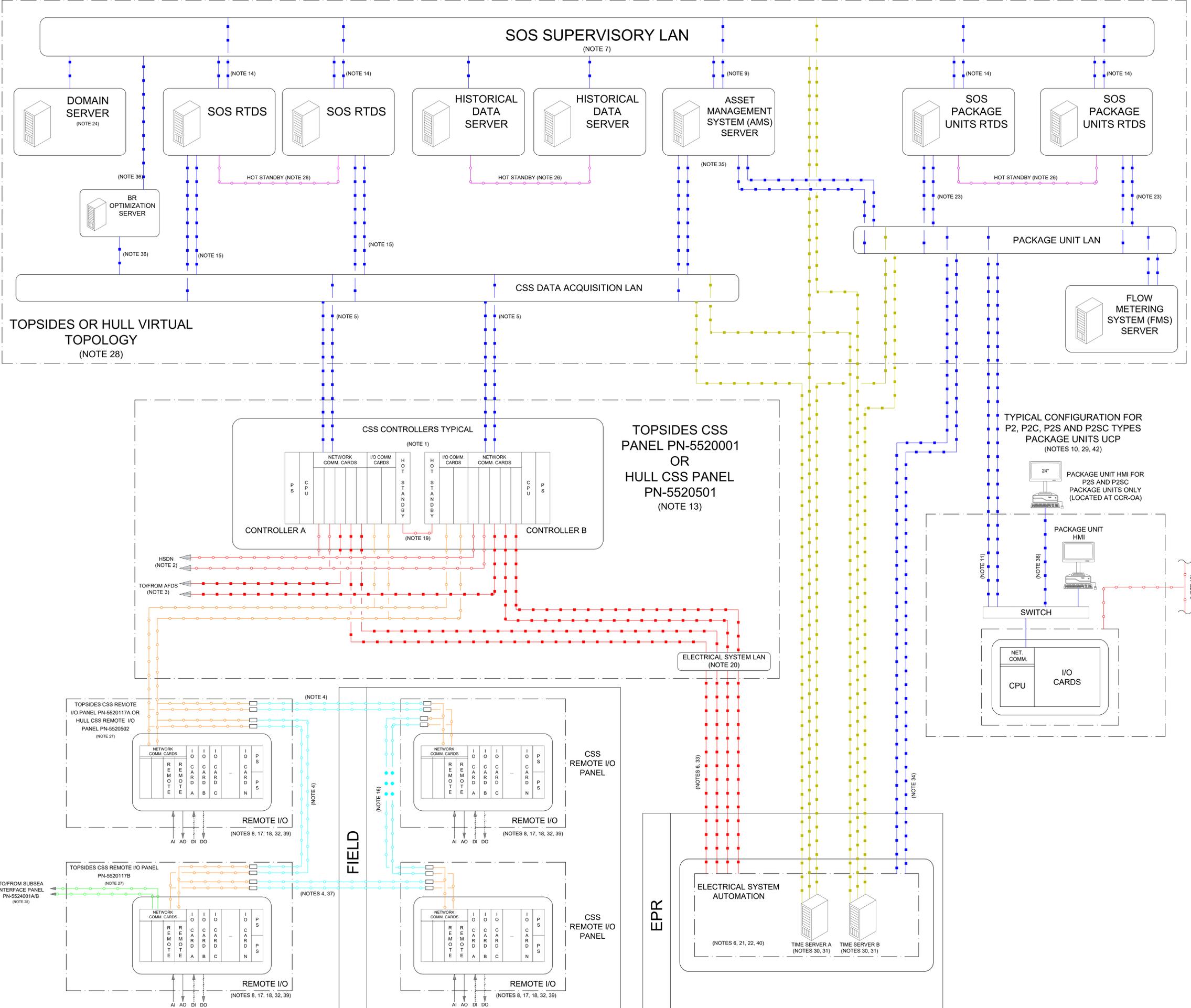


TYPICAL CONFIGURATION FOR CSS CONTROLLERS (PCS, PSD, FGS, HCS, HSD, HFSGS),
 CSS REMOTE I/O PANELS AND VIRTUAL SOS REAL TIME DATA SERVERS (PCS, PSD, HCS, HSD,
 FGS, HFSGS, TOPSIDES PACKAGE UNITS AND HULL PACKAGE UNITS), VIRTUAL SOS HISTORICAL DATA SERVERS (TOPSIDES AND HULL) AND VIRTUAL DOMAIN SERVER



AEPR OR CCR-EA (NOTE 27)

REFERENCE DOCUMENTS

VIRTUAL MACHINE SYMBOLOGY

CONNECTION SYMBOLOGY

ABBREVIATIONS, ACRONYMS AND INITIALISMS

GENERAL NOTES

1. TYPICAL CONFIGURATION FOR CSS SYSTEMS (PCS, PSD, FGS, HCS, HSD, HFSGS).
2. REDUNDANT HIGH SPEED DETERMINISTIC NETWORK (HDN) BETWEEN ALL CSS SYSTEMS (PCS, PSD, FGS, HCS, HSD, HFSGS) AND UNDER CONTROLLED NETWORK CONDITIONS. ONLY THE NETWORK SHALL BE DESIGNED WITH PHYSICAL SEGMENTATION IN ACCORDANCE WITH DNI-05-202 CH. 2, ITEM 2.2. SAFETY SYSTEMS ARE REQUIRED TO BE MUTUALLY INDEPENDENT OF CONTROL SYSTEMS (DNI-05-202, CH. 2, SEC. 2, ITEM 1.1.3).
3. FOR INFORMATION REGARDING COMMUNICATION LINK BETWEEN CSS FGS/HFSGS AND AFRS, SEE I-DE-3010-20-1200-850-PAX-001 - ADDRESSABLE FIRE DETECTION SYSTEM.
4. REDUNDANT I/O NETWORK SHALL BE DIRECTLY CONNECTED TO EACH REDUNDANT CPU AND BOTH REDUNDANT CPU SHALL BE ACCESSIBLE BY EACH REDUNDANT CPU INDEPENDENTLY OF THE STATUS OF THE OTHER REDUNDANT CPU APPLICABLE TO ALL CSS SYSTEMS. THESE CONNECTIONS SHALL BE MADE USING OPTICAL FIBER CONVERTERS LOCATED AT CSS REMOTE I/O PANELS.
5. REDUNDANT NETWORK TO CSS DATA ACQUISITION LAN, APPLICABLE TO ALL CSS SYSTEMS.
6. COMMUNICATION WITH THE ELECTRICAL SYSTEM IMPLEMENTED USING MODBUS/PROFIBUS. APPLICABLE TO PCS, PSD, FGS AND HFSGS SYSTEMS. FOR FURTHER DETAILS, SEE I-ET-3010-00-520-861-PAX-001 - CONTROL AND SAFETY SYSTEM.
7. SOS/HM SHALL BE ABLE TO MONITOR AND CONTROL ALL FGS/HFSGS FIELD DEVICES (BOTH HULL AND TOPSIDES).
8. TYPICAL CONFIGURATION FOR CSS REMOTE I/O PANEL. FOR FURTHER DETAILS, SEE I-ET-3010-20-1200-850-PAX-001 - CONTROL AND SAFETY SYSTEM - CSS.
9. THIS CONNECTION IS TEMPORARY. IT IS MEANT TO ALLOW ACCESS FROM PN-5520501 - HULL SOS/HM AND PN-5520501 - TOPSIDES SOS/HM TEMPORARY AMS CLIENTS TO THE AMS SERVER DURING COMMISSIONING PHASE FOR LOOP TESTS AND INSTRUMENT CONFIGURATION FROM CCR-EA.
10. TYPICAL CONFIGURATION FOR PACKAGE UNIT UCP. FOR MORE DETAILS, SEE I-ET-3010-20-1200-850-PAX-001 - SPECIAL MONITORING SYSTEM.
11. TO PACKAGE UNIT LAN, APPLICABLE TO ALL P2, P2C, P2S AND P2SC TYPES PACKAGE UNIT. COMMUNICATION WITH PACKAGES SHALL BE REDUNDANT AND SHALL BE SPLIT BETWEEN BOTH PACKAGE UNIT LAN SWITCHES.
12. TO MACHINE MONITORING SYSTEM (MMS), APPLICABLE TO PACKAGE UNITS LISTED ON DOCUMENT I-ET-3010-00-520-854-PAX-001 - MACHINERY MONITORING SYSTEM (MMS).
13. PCS, PSD AND FGS PLCS ARE MOUNTED INSIDE PN-5520001 - TOPSIDES CSS PANEL. HCS, HSD AND HFSGS PLCS ARE MOUNTED INSIDE PN-5520001 - HULL CSS PANEL.
14. TYPICAL CONFIGURATION FOR DATA SERVERS:
 - SOS TOPSIDES REAL TIME DATA SERVERS (PCS, PSD, FGS AND TOPSIDES PACKAGE UNITS);
 - SOS/HULL REAL TIME DATA SERVERS (HCS, HSD, HFSGS AND HULL PACKAGE UNITS);
15. CONNECTION APPLICABLE ONLY TO TOPSIDES PCS, PSD, FGS, HULL, HCS, HSD AND HFSGS DATA SERVERS.
16. THE CSS REMOTE I/O PANELS SHALL BE CONNECTED IN RING TOPOLOGY. THE CONNECTION SEQUENCE SHALL BE DEFINED BY DETAIL DESIGN PHASE TAKING INTO ACCOUNT THE PANELS FINAL POSITIONING AND THE OPTICAL CABLES WAY.
17. PN-5520117A/B - TOPSIDES CSS REMOTE I/O PANELS SHALL BE INSTALLED AT AFRS. THE DISTRIBUTION OF REMOTE I/O SHALL BE AS FOLLOWS:
 - TOPSIDES I/O ASSOCIATED TO TURBOGENERATION MODULES (M-12, M-13 AND M-16) SHALL BE INSTALLED IN THE TURBOGENERATION CONTROL ROOM (TCR) IN M-13.
 - TOPSIDES I/O OF PCS AND HSD OF REMAINING MODULES REMAIN IN THE FIELD WITH EX-F PRESSURIZATION.
 - TOPSIDES I/O OF FGS OF THE REMAINING MODULES PLACED IN AFRS.
 - MODULE M-16 DOES NOT HAVE A CSS REMOTE I/O PANEL.
18. PN-5520502 - HULL CSS REMOTE I/O PANEL SHALL BE INSTALLED AT COREA. THE DISTRIBUTION OF REMOTE I/O SHALL BE AS FOLLOWS:
 - HFSGS I/O SHALL BE DISTRIBUTED AMONG HULL CSS REMOTE I/O PANELS PN-5520502 AND PN-5520501 BY PROXIMITY, WHICH ARE LOCATED IN ESSENTIAL ROOMS.
 - REMAINING HULL CSS REMOTE I/O PANELS SHALL ONLY CONTAIN HCS AND HSD I/O POINTS.
19. REDUNDANT NETWORK.
20. THIS LAN SHALL BE USED TO EXCHANGE DATA WITH ELECTRICAL SYSTEM IN ORDER TO GUARANTEE REDUNDANCY.
21. PANELS INTERFACE TO FROM POWER MANAGEMENT SYSTEM (PMS) AND TURBOGENERATOR CONTROL PANEL (TOP) ARE INDICATED BY I-DE-3010-00-540-797-PAX-001 - ELECTRICAL SYSTEM AUTOMATION ARCHITECTURE DIAGRAM.
22. COMMUNICATION WITH ELECTRICAL SYSTEM IMPLEMENTED USING GIGABIT ETHERNET (GEC) FOR THE SUPERVISORY LAYER, MODBUS TCP/IP FOR CONTROL LAYER.
23. CONNECTION APPLICABLE ONLY TO PACKAGE UNITS DATA SERVERS (BOTH HULL AND TOPSIDES).
24. THIS SERVER IS OPTIONAL. IF NECESSARY, IT SHALL ESTABLISH IP ADDRESSES OF ALL EQUIPMENTS RELATED TO A/C ARCHITECTURE.
25. PN-5520001A/B - SUBSEA INTERFACE PANEL SHALL BE CONNECTED TO TOPSIDES PCS DATA SERVERS VIA PN-5520117B - TOPSIDES CSS REMOTE I/O PANEL THROUGH MODBUS COMMUNICATION PROTOCOL. FOR FURTHER INFORMATION, SEE I-ET-3010-20-1200-850-PAX-001 - SPECIAL MONITORING SYSTEMS.
26. REDUNDANT SERVERS IN HOT STANDBY CONFIGURATION FOR FURTHER DETAILS, SEE I-ET-3010-00-520-861-PAX-002 - SUPERVISION AND OPERATION SYSTEM - SOS.
27. LOCATION OF PANELS SHALL BE CORE-EA FOR HULL AUTOMATION SYSTEM PANELS AND AFRS FOR TOPSIDES AUTOMATION SYSTEM PANELS.
28. THIS IS A REPRESENTATION OF THE VIRTUAL ARCHITECTURE OF THE SOS SYSTEM IN ORDER TO INDICATE VIRTUAL MACHINE IN WHICH CLUSTER, REFER TO SHEETS 1 AND 2 OF THIS DOCUMENT.
29. THE HMI OF P2S, P2SC PACKAGES AND SOME EXTRA HMIs REQUIRED BY SOME PACKAGES HAVE NOT BEEN DRAWN ON THIS DOCUMENT. FOR MORE INFORMATION, SEE I-ET-3010-20-1200-850-PAX-001 - AUTOMATION AND CONTROL SYSTEM FUNCTIONS AND I-ET-3010-20-1200-850-PAX-014 - AUTOMATION INTERFACE OF PACKAGED UNITS.
30. THE SERVERS ARE LOCATED ON ELECTRICAL SYSTEM CONTROLLER. SWP PACKETS SHALL BE DISTRIBUTED VIA AUTOMATION NETWORKS (SOS, CSS, AND PACKAGE LAN) IN ORDER TO SYNCHRONIZE ALL P2S EQUIPMENT. REPEATERS AND OTHER EQUIPMENT SHALL BE PROVIDED AS NECESSARY BY AUTOMATION SUPPLIER IN ORDER TO MAKE SYNCHRONIZATION POSSIBLE.
31. THE SERVERS A AND B ARE DEFINED BY ELECTRICAL DISCIPLINE IN DOCUMENT I-DE-3010-00-540-797-PAX-001 - ELECTRICAL SYSTEM AUTOMATION ARCHITECTURE DIAGRAM.
32. EACH I/O PANEL SHALL HAVE AT LEAST ONE SECTION FOR EACH REQUIRED SYSTEM.
33. THIS COMMUNICATION SHALL CONSIST ONLY OF CONTROL SIGNALS. FOR QUANTITY OF CONNECTIONS, SEE I-DE-3010-00-540-797-PAX-001 - ELECTRICAL SYSTEM AUTOMATION ARCHITECTURE DIAGRAM.
34. THIS COMMUNICATION SHALL CONSIST ONLY OF SUPERVISORY SIGNALS.
35. ASSET MANAGEMENT APPLICATION AND PLCS APPLICATION PROGRAMS (CSS AND PACKAGES) SHALL BE INSTALLED ON AMS SERVER. THIS CONNECTION IS DESTINED TO ACQUIRE DATA FROM CSS AND PACKAGE UNITS DEVICES TO PERFORM COMMISSIONING AND OPERATION MAINTENANCE.
36. THERE ARE DIFFERENT OPTIMIZATION AND ADVANCED CONTROL SOFTWARE WHICH WILL BE INSTALLED EITHER IN BR OPTIMIZATION SERVER OR IN A VIRTUAL MACHINE IN TELECOMS' AUTOMATION (VM) CLUSTER IN THE O&M BR OF INNOVATION SERVER SHALL ACQUIRE DATA FROM PCS SERVERS AND FROM METEORICAL SERVER. FOR MORE INFORMATION, SEE I-ET-3010-20-1200-850-PAX-001 - SPECIAL MONITORING SYSTEMS.
37. FOR HULL AUTOMATION, LAST CSS REMOTE I/O PANEL ON FIELD SHALL BE CONNECTED TO PN-5520502 - HULL CSS REMOTE I/O PANEL.
38. COMMUNICATION BETWEEN DEDICATED WORKSTATION WITH RELATED PACKAGE PANEL SHALL BE IMPLEMENTED USING OPTICAL CABLES.
39. FOR DETAILS REGARDING TOPSIDES AND HULL AUTOMATION INTERFACE, SEE I-ET-3010-20-1200-850-PAX-003 - GENERAL ARRANGEMENT I-DE-3010-20-1200-850-PAX-002 - CENTRAL CONTROL ROOM LAYOUT I-DE-3010-20-1200-850-PAX-001 - M-17 - AUTOMATION AND ELECTRICAL - EQUIPMENT LAYOUT PLAN AND I-ET-3010-20-1200-850-PAX-002 - EQUIPMENT LIST.
40. FOR PACKAGES SCORE DETAILING, SEE DOCUMENTS I-AD-3010-20-320-800-PAX-001 - AUTOMATION AND CONTROL SYSTEM FUNCTIONS AND I-ET-3010-20-1200-850-PAX-014 - AUTOMATION INTERFACE OF PACKAGED UNITS.

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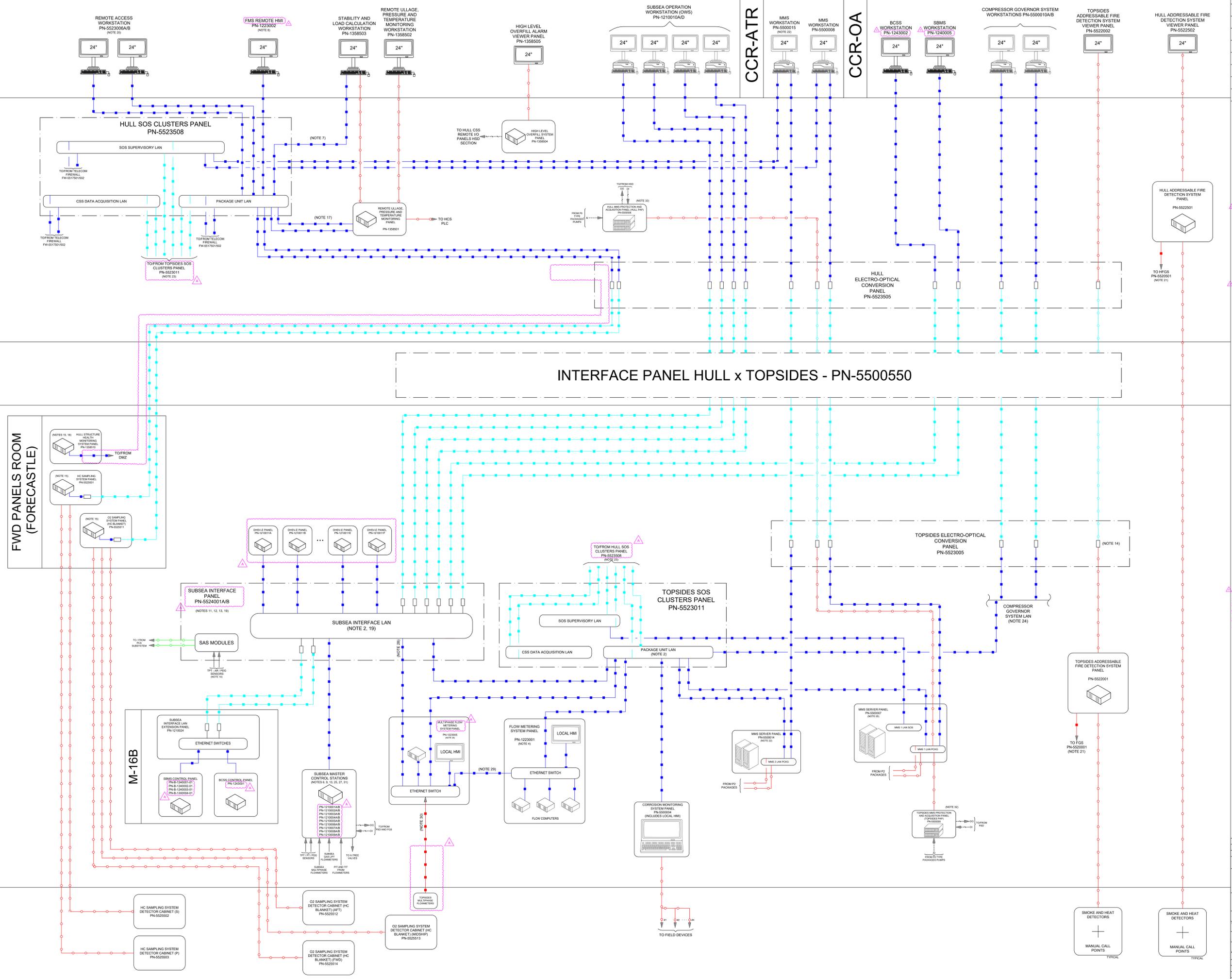
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I-DE-3010-20-5520-800-PAX-002

CCR-OA
CCR-EA
AUTOMATION & ELECTRICAL PANELS ROOM (AEPR)
FIELD



INTERFACE PANEL HULL x TOPSIDES - PN-5500550

REFERENCE DOCUMENTS

VIRTUAL MACHINE SYMBOLOGY

CONNECTION SYMBOLOGY

ABBREVIATIONS, ACRONYMS AND INITIALISMS

GENERAL NOTES

- 1- THE MAIN AUTOMATION NETWORK RINGS SHALL BE IMPLEMENTED USING OPTICAL CABLES.
- 2- COMMUNICATION BETWEEN EACH PACKAGE CONTROL UNIT AND THE PACKAGE ETHERNET SWITCH INSTALLED AT THE SAME ROOM SHALL BE IMPLEMENTED USING TWISTED PAIR CABLE.
- 3- COMMUNICATION BETWEEN DEDICATED WORKSTATION WITH RELATED PACKAGE PANEL SHALL BE IMPLEMENTED USING OPTICAL CABLES.
- 4- THIS PANEL SHALL INTEGRATE ALL FLOW METERING SYSTEM. IT SHALL ALSO CONTAIN A LOCAL HMI AND A MANAGEABLE SWITCH. THE FLOW COMPUTERS SHALL HAVE THEIR DATA RETRIEVED BY THE FMS DATA SERVER VIRTUAL MACHINE (RUNNING AT PN-5523009 - TOPSIDES SOS PROCESS CLUSTER) AND ITS PERFORMANCE SHALL BE AVAILABLE THROUGH SUPERVISORY CLIENTS. AT BOTH THE LOCAL HMI AT PN-1223001 - FLOW METERING SYSTEM PANEL AND PN-1223002 - FMS REMOTE HMI AT CCR-OA.
- 5- MMS CONSIST OF SERVER PANEL, WORKSTATION, MONITORS PANEL AND MMS PROPRIETARY NETWORK CONNECTED TO EACH PACKAGE'S MACHINERY PROTECTION MONITORS. FOR FURTHER DETAILS, REFER TO LET-3010.2Q-1200-850-P4X-001 - MACHINERY MONITORING SYSTEM (MMS).
- 6- THE HMI FOR MULTIPHASE CONTROL SYSTEM WILL BE INTERCONNECTED TO THE MCS THROUGH ETHERNET (OPIC) OR MODBUS/TCP PROTOCOLS AND IT IS PART OF SUBSEA MASTER CONTROL SYSTEM.
- 7- THIS CONNECTION IS MEANT TO ALLOW COMMUNICATION BETWEEN PN-135810 - HULL STRUCTURE HEALTH MONITORING SYSTEM PANEL AND PN-135803 - STABILITY AND LOAD CALCULATION WORKSTATION. PN-135803 - STABILITY AND LOAD CALCULATION WORKSTATION SHALL BE SUPPLIED WITH AN ADDITIONAL NETWORK INTERFACE CARD IN ORDER TO ALLOW THIS COMMUNICATION.
- 8- THIS WORKSTATION SHALL BE A THIN CLIENT (SUPPLIED BY FMS MANUFACTURER) ABLE TO READ FMS SERVER VIRTUAL IMAGES RUNNING AT PN-5523009 - TOPSIDES SOS PROCESS CLUSTER.
- 9- MCS CONSIST OF (9 NINE) REDUNDANT PANELS, TOTAL OF 18 (EIGHTEEN) PANELS.
- 10- TPT-ASPTPOG SIGNALS FROM PRODUCTION AND WAG WELLS CONNECTED TO THE MULTIPLEXED SYSTEM ARE TO BE ACQUIRED BY MCS PANELS SIGNALS FROM DIRECT CONNECTED PRODUCTION WELLS TO BE ACQUIRED BY SAS AND TOPSIDES CSS-PCS.
- 11- THE DATA ACQUISITION EQUIPMENT RELATED TO THE DATA FROM PRODUCTION WELLS SHALL BE INSTALLED INSIDE THIS PANEL.
- 12- THE INTERFACE BETWEEN GAS UNIT AND TOPSIDES CSS-PCS WILL BE DONE THROUGH MODBUS RTU PROTOCOL OR MODBUS TCP (4 SCAVES) APPLICABLE TO PN-550117B - TOPSIDES CSS REMOTE I/O PANEL (PCS). FOR FURTHER INFORMATION, SEE LET-3010.2Q-1200-850-P4X-001 - SPECIAL MONITORING SYSTEM.
- 13- IT SHALL BE POSSIBLE TO MONITOR AND SUPERVISE SATELLITE AND MANIFESTED WELLS VARIABLES FROM TOPSIDES SOS HMI.
- 14- REDUNDANT FIBER OPTICAL CABLE AND ELECTRO-OPTICAL CONVERTER (01 SPARE FOR FUTURE CONNECTION).
- 15- ELECTRICAL-OPTICAL CONVERTERS SHALL BE INSTALLED INSIDE PN-135810 - HULL STRUCTURE HEALTH MONITORING SYSTEM PANEL, PN-552501 - HC SAMPLING SYSTEM PANEL AND PN-552511 - O2 SAMPLING SYSTEM PANEL (HC BLANKET). IN CASE THESE MEDIA CONVERTERS ARE NOT SUPPLIED BY PANELS VENDOR, CONTRACTOR IS RESPONSIBLE FOR ITS SUPPLY AND INSTALLATION INSIDE AFOREMENTIONED PANELS.
- 16- PN-5500550 - INTERFACE PANEL HULL X TOPSIDES SHALL BE LOCATED BY DETAIL ENGINEERING DESIGN PHASE.
- 17- REMOTE ULLAGE, PRESSURE AND TEMPERATURE MONITORING PANEL ALSO HAS A REDUNDANT CONNECTION TO PACKAGE UNIT LAN LINE REPRESENTED IN PAGE 2 FOR ALL PACKAGES (EXCEPT A AND P1 PACKAGES, WHICH DO NOT COMMUNICATE USING NETWORK). THE CONNECTIONS REPRESENTED IN THIS PAGE ARE ADDITIONAL CONNECTIONS APPLICABLE ONLY TO THIS PACKAGE.
- 18- THIS PANEL IS LOGICALLY PLACED AT THE DMZ. IT COMMUNICATES WITH METOCAN SYSTEM (ENV) AND NAVIGATION SYSTEM (NAV), THROUGH DMZ. BESIDES, IT COMMUNICATES WITH PN-5523009 - STABILITY AND LOAD CALCULATION WORKSTATION, WHICH IS IN PACKAGE UNIT LAN. THIS LAST CONNECTION SHALL HAPPEN VIA TELECOM FIREWALL. FIREWALL RULES SHALL BE CONFIGURED IN TELECOM FIREWALL IN ORDER TO ALLOW THIS COMMUNICATION.
- 19- ETHERNET L3 SWITCHES DEDICATED TO SUBSEA DEVICES SHALL BE INSTALLED AT PN-5524001A/B - SUBSEA INTERFACE PANEL (ONE SWITCH IN EACH PANEL). ALL EQUIPMENT MUST BE CONNECTED TO BOTH SWITCHES.
- 20- THESE WORKSTATIONS SHALL BE THIN CLIENTS, ABLE TO ACCESS THEIR RESPECTIVE VIRTUAL IMAGES RUNNING AT PN-5523009 - TOPSIDES SOS PROCESS CLUSTER. THEY ARE DEDICATED TO ACCESS PACKAGE SCREENS IN ORDER TO REMOTELY OPERATE AND MONITOR THEIR SUPERVISORY SYSTEM.
- 21- FOR INFORMATION REGARDING COMMUNICATION LINK BETWEEN CSS-ASPTPOG AND AFE, SEE LET-3010.00-5520-850-P4X-002 - ADDRESSABLE FIRE DETECTION SYSTEM.
- 22- IF THE MIP OF ANY PACKAGE UNIT IS FROM A SECOND SUPPLIER, THIS SERVER AND WORKSTATION WILL BE DEDICATED TO THE SIGNALS FROM THOSE PACKAGES.
- 23- THESE CONNECTIONS SHALL GO THROUGH PN-5500550 - INTERFACE PANEL HULL X TOPSIDES.
- 24- THIS NETWORK MAY OR MAY NOT EXIST, DEPENDING ON THE SUPPLIED SYSTEM. IN CASE IT DOES NOT EXIST, THIS CONNECTION SHALL BE PEER-TO-PEER FROM EACH COMPRESSOR PLC AND EACH HMI. FOR FURTHER DETAILS, SEE LET-3010.2Q-1200-850-P4X-001 - SPECIAL MONITORING SYSTEMS.
- 25- TO PROVIDE INTERCONNECTION BETWEEN SIGNALS FROM WELLSHEAD TO MCS PANELS AND DRIVE PANELS, REARRANGEMENT PANELS SHALL BE SUPPLIED. THESE PANELS ARE PN-121017 AND PN-121018 (TOPSIDES WELL ASSIGNMENT PANEL (TWP)) FOR CONNECTION WITH MCS AND PN-1223001 (TWP) FOR CONNECTION WITH DRIVE. FOR ADDITIONAL INFORMATION, SEE LET-3010.2Q-1200-850-P4X-001 - SPECIAL MONITORING SYSTEMS.
- 26- THIS PANEL CONTAINS A STANDALONE COMPUTER RESPONSIBLE FOR PERFORMING OIL AND GAS ALL LOCATION BASED ON MULTIPHASE AND GAS LIFT FLOWMETERS (BOTH SUBSEA AND TOPSIDES). IT ALSO CONTAINS A LOCAL HMI WITH ALL REQUIRED SOFTWARE FOR THE MULTIPHASE FLOWMETERS COMMUNICATION, MONITORING, OPERATION, CALIBRATION, PARAMETERS SETTING AND FOR ISSUING OF REQUIRED REPORTS.
- 27- SUBSEA MULTIPHASE FLOWMETERS, SUBSEA GAS LIFT FLOWMETERS AND THEIR ASSOCIATED PRESSURE AND TEMPERATURE TRANSMITTERS ARE CONNECTED TO THIS PANELS.
- 28- PN-1223001 - MULTIPHASE FLOW METERING SYSTEM PANEL SHALL ACQUIRE DATA FROM SUBSEA MULTIPHASE FLOWMETERS AND SUBSEA GAS LIFT FLOWMETERS THROUGH THIS NETWORK.
- 29- TOPSIDES AND SUBSEA GAS LIFT AND MULTIPHASE FLOWMETERS DATA SHALL BE EXCHANGED BETWEEN PN-1223001 - MULTIPHASE FLOW METERING SYSTEM PANEL AND PN-1223001 - FLOW METERING SYSTEM PANEL THROUGH THIS NETWORK.
- 30- THERE SHALL BE ONE INPUT IN PN-1223001 (MULTIPHASE FLOW METERING SYSTEM PANEL) SWITCH FOR EACH TOPSIDES MULTIPHASE FLOWMETER.
- 31- FOR INFORMATION REGARDING CONNECTION BETWEEN MCS AND MAIN AUTOMATION SYSTEM, SEE LET-3010.2Q-1200-850-P4X-001 - SPECIAL MONITORING SYSTEMS.
- 32- FOR MORE DETAILS, SEE LET-3010.00-5520-850-P4X-001 - MACHINERY MONITORING SYSTEM (MMS).

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