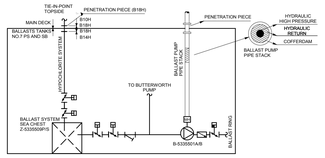
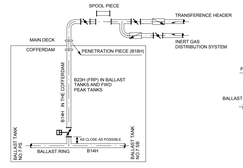
TYPICAL DETAIL I



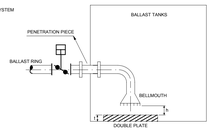
NOTE 1, 2

TYPICAL DETAIL II



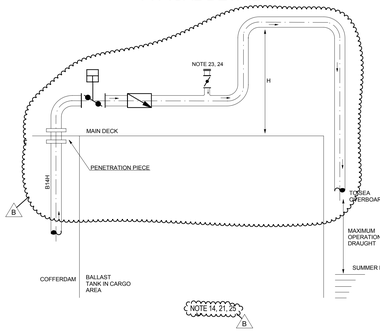
NOTE 3

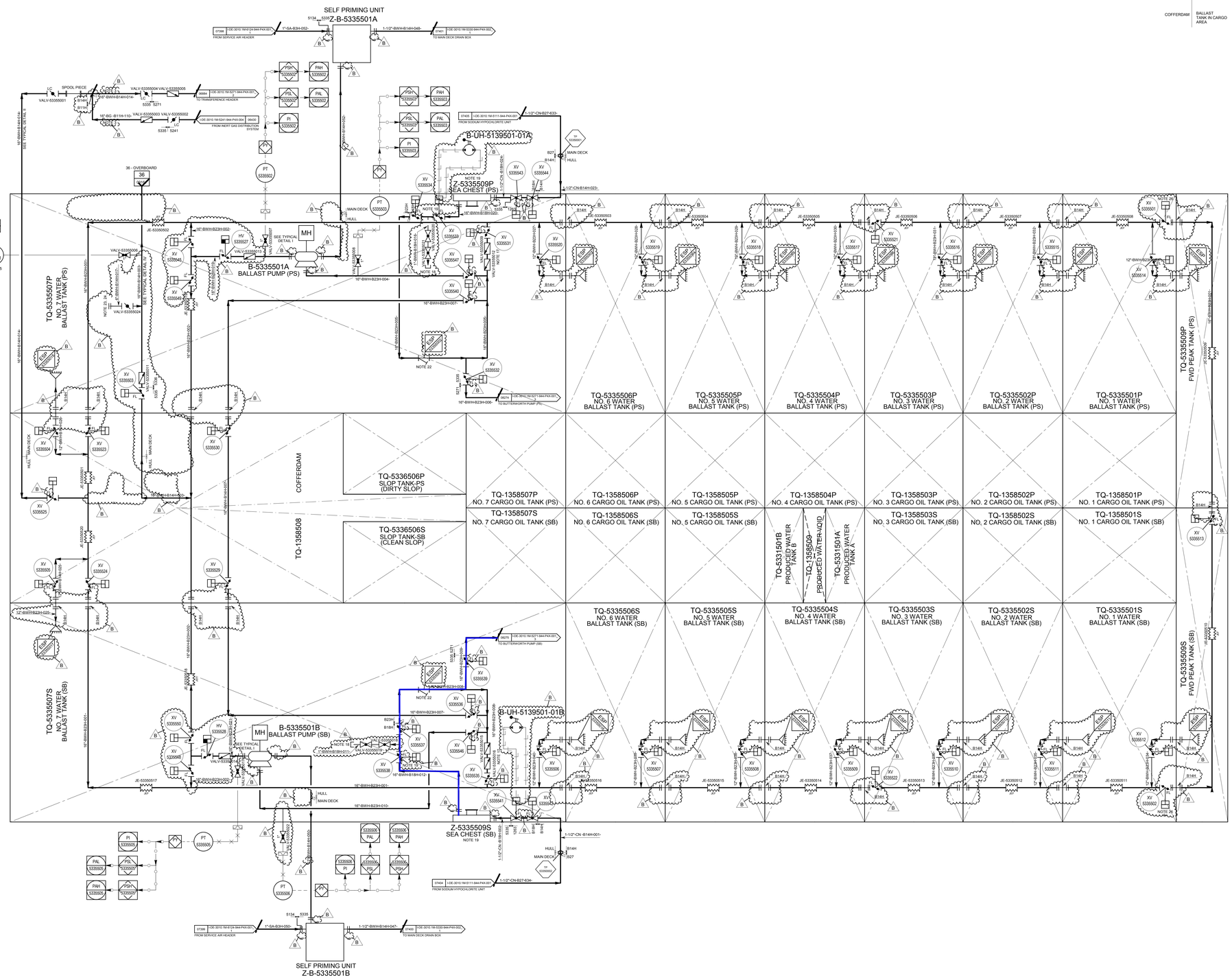
TYPICAL DETAIL III



NOTE 4

TYPICAL DETAIL IV





REFERENCE DOCUMENTS

- I-MD-3010.1M-1200-940-P4X-017 - DESCRIPTIVE MEMORANDUM - GENERAL
- I-DE-3010.1M-1200-944-P4X-001 - PIPING INSTRUMENT DIAGRAM - GENERAL NOTES
- I-ET-3010.1M-1200-200-P4X-002 - PIPING SPECIFICATION FOR HULL
- I-ET-3000.00-0000-940-P4X-002 - SYMBOLS FOR PRODUCTION UNITS DESIGN
- I-ET-3000.00-1200-940-P4X-001 - TAGGING PROCEDURE FOR PRODUCTION UNITS DESIGN
- I-DE-3010.1M-1350-960-P4X-002 - CAPACITIES PLAN
- I-ET-3000.00-0000-960-P4X-001 - GENERAL CRITERIA FOR INSTRUMENTATION PROJECTS
- I-ET-3010.00-1200-800-P4X-002 - AUTOMATION, CONTROL AND INSTRUMENTATION ON PACKAGE UNITS
- I-ET-3010.00-1350-940-P4X-001 - SYSTEMS OPERATION PHILOSOPHY
- I-ET-3010.00-1350-800-P4X-001 - AUTOMATION INTERFACE OF PACKAGE UNITS
- I-DE-3010.1M-5241-944-P4X-004 - INERT GAS SYSTEM DISTRIBUTION
- I-DE-3010.1M-5271-944-P4X-001 - TANKS CLEANING AND RECIRCULATION SYSTEM

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY
B-5335501A/B (2 x 100%)	BALLAST PUMP (PS)	VERTICAL SUBMERGED	800 m³/h
Z-B-5335501A/B (2 x 100%)	SELF PRIMING UNIT		
B-UH-5139501-01A/B (2 x 100%)	LOCAL HYDRAULIC ACTUATION PUMP	RECIPROCATING	

GENERAL NOTES

1. THE BALLAST PUMPS ARE HYDRAULIC DRIVEN SUBMERGED BALLAST PUMPS. FOR MORE DETAILS OF THESE BALLAST PUMPS AND THEIR INSTALLATION IN THE BALLAST TANKS 7 PORT AND 7 STARBOARD SEE TYPICAL DETAIL I.
2. FOR MORE DETAILS OF THE BALLAST SYSTEM SEA CHESTS HYPOCHLORITE INJECTION LINES INSIDE THE BALLAST TANKS 7 PORT AND 7 STARBOARD, SEE TYPICAL DETAIL I.
3. THE BALLAST SYSTEM SHALL DO THE FOLLOWING CONTINGENCY OPERATIONS:
   - BALLASTING OF CARGO TANKS
   - INERT GAS INJECTION IN THE BALLAST TANKS ADJACENT TO THE CARGO TANKS, INCLUDING THE FORE PEAK TANK.

   TO PERFORM THESE OPERATIONS ONE VERTICAL HEADER SHALL BE FITTED INSIDE THE COFFERDAM, CONNECTING THE BALLAST RING TO THE INERT GAS DISTRIBUTION HEADER AND TO THE TRANSFERENCE HEADER ON MAIN DECK BY MEANS OF A SPOOL PIECE. FOR MORE DETAILS OF THIS VERTICAL HEADER SEE TYPICAL DETAIL II.
4. UNDER ALL SUCTION AND DISCHARGE BELLMOUTHS SHALL BE WELDED A DOUBLE PLATE OF THE SAME THICKNESS (t) OF THE HULL BOTTOM PLATES (TYPICAL DETAIL III). THE DISTANCE BETWEEN THE BELLMOUTH AND THE DOUBLE PLATE (h) SHALL BE DEFINED DURING DETAIL DESIGN PHASE ACCORDING BELLMOUTH AND SUCTION PIPING DIAMETERS.
5. BALLAST RING EXPANSION JOINTS SHALL BE ONLY OF THE DRESSER COUPLING TYPE. THE NUMBER AND LOCATION OF DRESSER JOINTS SHALL BE DETERMINED IN ACCORDANCE WITH DETAIL PIPING ARRANGEMENTS AND THEY SHALL COMPLY WITH THE FRP PIPES VENDOR REQUIREMENTS.
6. THE HORIZONTAL PIPING SUPPORTS OF THE BALLAST SYSTEM STEEL PIPING SHALL HAVE ANTI-FRICTION PTFE PADS TO AVOID PIPING WEARING.
7. ALL PIPING SUPPORTS INSIDE BALLAST TANKS SHALL HAVE A PAINTING SCHEME, INSIDE AND OUTSIDE, OF THE SAME TYPE OF THE BALLAST TANKS.
8. THE HORIZONTAL PIPING SUPPORTS OF THE BALLAST SYSTEM FRP PIPING SHALL BE IN ACCORDANCE WITH THE FRP VENDOR REQUIREMENTS, THIS SUPPORTS SHALL AVOID PIPING WEARING.
9. ALL PIPING SHALL HAVE ELECTRICAL CONTINUITY.
10. ALL PIPINGS SHALL BE GROUNDED ACCORDING CLASSIFICATION SOCIETY RULES.
11. THE BOLTS, SCREWS, NUTS AND JUMPERS DEDICATED TO MAINTAIN THE CONTINUITY AND TO THE GROUNDING PROCEDURE SHALL BE CONDUCTED IN STAINLESS STEEL AISI 316 OR SIMILAR.
12. THE BALLAST SYSTEM PENETRATION PIECES ON MAIN DECK SHALL BE BUILT WITH INTERNALLY LINED STEEL PIPE SPEC B18H. REMAINING PENETRATION PIECES SHALL BE BUILT WITH INTERNALLY COATED STEEL PIPE B14H.
13. THE BALLAST PUMPS PIPESTACKS PENETRATION PIECES ON MAIN DECK SHALL BE SUPPLIED BY THE BALLAST PUMPS VENDORS.
14. THE BALLAST SYSTEM SHALL HAVE ONE (1) OVERBOARD DISCHARGE LOCATED ABOVE THE MAXIMUM DRAFT OF THE FPSO. THIS OVERBOARD DISCHARGE SHALL BE LOCATED AT PORTSIDE OR AT A STARBOARD SIDE OUTSIDE SUPPLY VESSELS MOORING AREA. FOR MORE DETAILS SEE TYPICAL DETAIL IV.
15. ONE TOQ SHALL BE FITTED ON THE OVERBOARD DISCHARGE LINE. IN CASE OF ANY PRESENCE OF OIL INSIDE THE BALLAST TANKS, A SPECIFIC PROCEDURE SHALL BE DONE TO REMOVE THE CONTAMINATED BALLAST WATER TO THE SLOP TANKS. THIS OPERATION SHALL BE DONE UTILIZING THE PORTABLE CARGO PUMPS AND THE TRANSFERENCE HEADER. IT IS NOT ALLOWED TO HAVE OILY WATER INSIDE BALLAST TANKS.
16. THIS P&ID SHALL BE UPDATED DURING DETAILED DESIGN PHASE FOLLOWING ALL EQUIPMENT MANUFACTURERS RECOMMENDATION.
17. DIISSIMILAR NON RETURN VALVES.
18. OVERSIDE VALVE LEVEL SOUNDING FACILITY CONNECTION.
19. VALVES SHALL BE CERTIFIED BY CLASSIFICATION SOCIETY FOR SIDE SHELL.
20. SYSTEM DATA: HOLD1
   - WORKING PRESSURE: 400.0 kPag
   - DESIGN PRESSURE: 800.0 kPag
   - TEST PRESSURE: 1.5xDP = 1200.0 kPag
   - WORKING TEMPERATURE: 27.22°C (METOCEAN DATA)
   - DESIGN TEMPERATURE: 60.0°C
21. DOUBLE PLATES SHALL BE PAINTED WITH ANTICORROSIVE PAINT.
22. FILTER FOR CLEANING.
23. CONNECTION FOR DEBALLAST FROM CARGO TANKS (CONTINGENCY OPERATION). FOR THIS OPERATION A CONNECTION HOSE SHALL BE PROVIDED. IN CONTINGENCY CASE, THIS LINE SHALL BE CONNECTED WITH THE LINE 6"-PCG-B14H-019- FROM P&ID I-DE-3010.1M-1350-944-P4X-003 - CARGO SYSTEM.
24. CONNECTION TO PORTABLE CARGO PUMP DISCHARGE (COFFERDAM TQ-1358508 DRAINAGE TO OVERBOARD - CONTINGENCY OPERATION).
25. THE MINIMUM HEIGHT (H) SHALL AVOID CLASH WITH ESCAPE ROUTE.
26. HYDRAULIC CONTROL VALVES TO BE SECURED DIRECTLY TO THE COLLISION BULKHEAD OUTSIDE THE FOREPEAK TANK PROVIDED THEY ARE SECURED TO THE AFTER SIDE OF THE COLLISION BULKHEAD AND THE VALVES ARE READILY ACCESSIBLE AT ALL TIMES, ACCORDING CLASSIFICATION SOCIETY RULES.

HOLD TABLE

1 - FINAL SYSTEM DATA

REV.	DESCRIPTION	DATE	EXEC.	CHECK	APPROV.
B	REVISED WHERE INDICATED ACCORDING TO HAZOP COMMENTS	17 Aug 2019	GMONTEIRO	SAVLA	CHRISTINO
A	REVISED WHERE INDICATED	31 mai 2019	GMONTEIRO	RODIAT	CHRISTINO
0	ORIGINAL ISSUE	22 mai 2019	GMONTEIRO	ALVARES	CHRISTINO

PETROBRAS — DP&T-SRGE

CLIENT: SRGE

JOB: REFERENCE BASIC DESIGN

AREA: BÚZIOS

TITLE: PIPING AND INSTRUMENT DIAGRAM BALLAST SYSTEM (FWD)

DESIGN	ESUP	EXEC.	GMONTEIRO	CHECK	ALVARES	APPROV.	CHRISTINO
SCALE	NO SCALE	DRAWING		1001056398 0010		SHEET	01 of 01
DATE	3/22/2019	No.	I-DE-3010.1M-5335-944-P4X-001				

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1189mm X 841mm