

REFERENCE DOCUMENTS

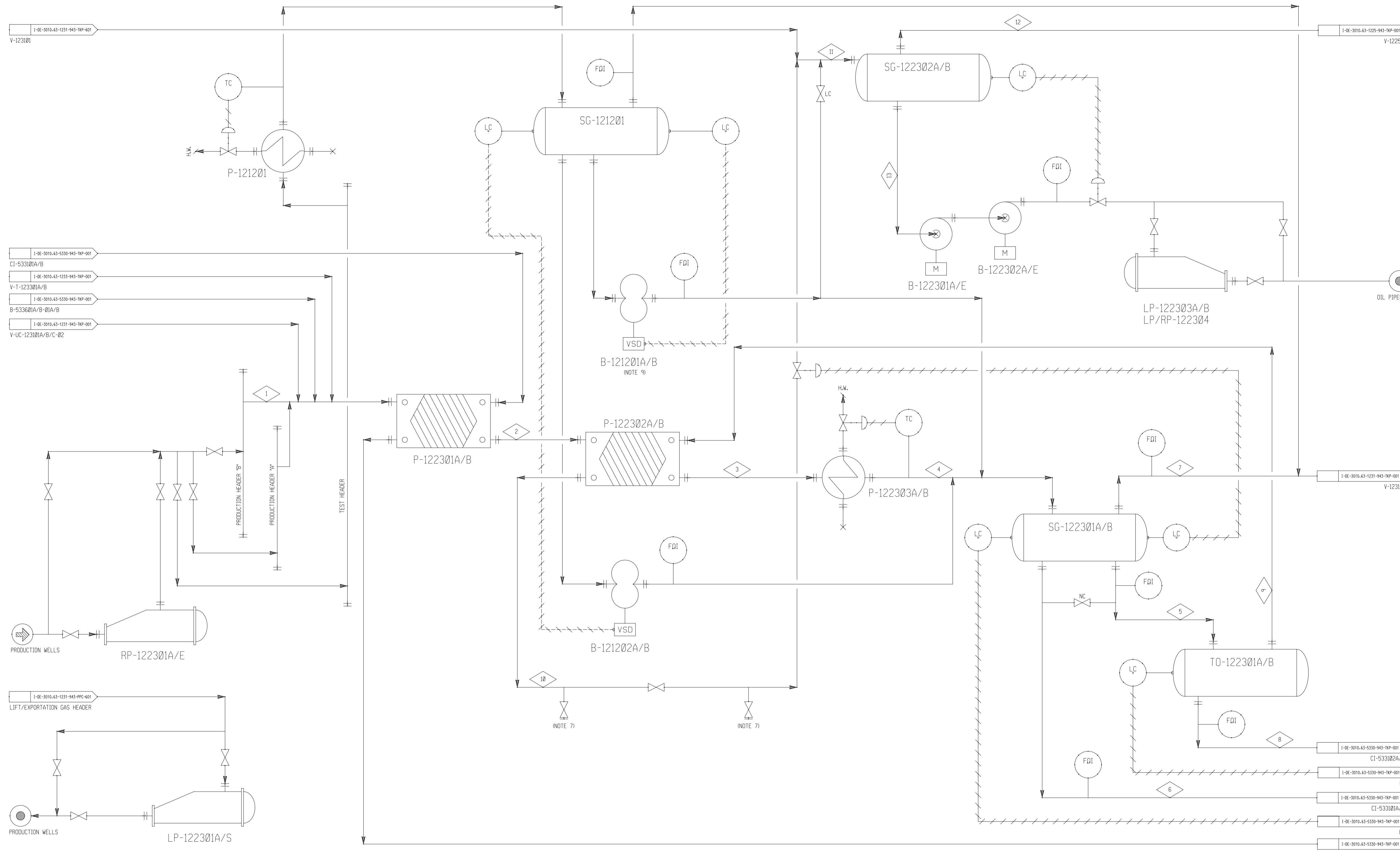
I-ET-3000.00-1200-941-TKP-002 REV.G - SYMBOLS AND ABBREVIATIONS
 I-DE-3010.63-1223-943-PPC-601 REV.C - OIL COLLECTING, SEPARATION AND PUMPING (MAXIMUM OIL/GAS)

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY
B-121201A/C	OIL TEST SEPARATOR PUMP	ROTARY	135 m ³ /h
B-121202A/B	WATER TEST SEPARATOR PUMP	ROTARY	104 m ³ /h
B-122301A/E (5x25Z)	CRUDE OIL BOOSTER PUMP	CENTRIFUGAL	307 m ³ /h
B-122302A/E (5x25Z)	CRUDE OIL EXPORTATION PUMP	CENTRIFUGAL	307 m ³ /h
LP-122301A/S (17x100Z)	PIG LAUNCHER - 10"	-	-
P-121201 (1x100Z)	TEST HEATER	SHELL AND TUBE	50.075 x 10 ⁶ W
P-122301A/B (2x50Z)	OIL/WATER PRE-HEATER	PLATE	28.6 x 10 ⁶ W
P-122302A/B (2x50Z)	OIL/OIL PRE-HEATER	PLATE	20.6 x 10 ⁶ W
P-122303A/B (2x50Z)	PRODUCTION HEATER	SHELL AND TUBE	34.9 x 10 ⁶ W
RP-122301A/E (5x100Z)	PIG RECEIVER - 12"x14"	-	-
SG-121201 (1x100Z)	TEST SEPARATOR	HORIZONTAL	6500 m ³ /d (NOTE 1)
SG-122301A/B (2x50Z)	PRODUCTION SEPARATOR	HORIZONTAL	16000 m ³ /d (NOTE 1)
SG-122302A/B (2x50Z)	ATMOSPHERIC SEPARATOR	HORIZONTAL	16000 m ³ /d (NOTE 1)
TO-122301A/B (2x50Z)	OIL DEHYDRATOR	ELECTROSTATIC	16000 m ³ /d (NOTE 1)
LP-122303A/B (2x100Z)	OIL PIPELINE PIG LAUNCHER 24"	-	-
LP/RP-122304A/B (2x100Z)	OIL PIPELINE PIG LAUNCHER/RECEIVER 20"	-	-

GENERAL NOTES

- LIQUID FLOW RATE SPECIFIED AT STANDARD CONDITIONS.
- THE PERFORMANCE CHARACTERISTICS OF EQUIPMENT AND SYSTEMS, AS SHOWN ON THE UPPER PART OF THIS DRAWING, ARE DESIGN DATA AND MAY NOT AGREE WITH THE BALANCE INFORMATION HEREUNDER, WHICH ARE ACTUAL EQUILIBRIUM VALUES.
- OIL VOLUMETRIC FLOW RATE AND OIL DENSITY ARE THE ACTUAL VALUES.
- GAS FLOW RATE AT PRESSURE AND TEMPERATURE OPERATION CONDITIONS.
- CHARACTERISTICS OF FRACTIONS:
 - C₁₂* FROM 3-MLS-2-RJS: PM=654; API=16.5
 - C₂₀* FROM 4-RJS-0442: PM=479; API=6.7
- THIS FLOW SHOWS THE WATER PRESENT ONLY IN THE LIQUID PHASE. THIS VALUE MUST BE CORRECTED TO SEA WATER DENSITY OF 1030 kg/m³.
- CONNECTIONS FOR FUTURE OIL COOLER INSTALLATION (ESTIMATED DUTY OF 2.4 x 10 W). ENOUGH AREA SHALL BE PROVIDED.
- MASS AND ENERGY BALANCE REFERS TO YEAR 2007.
- THE PUMP B-121201C (STAND-BY PUMP) SHOULD BE STORED IN THE WAREHOUSE.



STREAM CHARACTERISTICS COMPOSITION (% MOLAL) AND FLOW RATES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
WATER	H ₂ O	5.40	5.40	5.40	5.40	0.96	6.90	0.96	0.96	0.96	0.96	12.97	0.39																	
NITROGEN	N ₂	0.09	0.09	0.09	0.09	0.00	0.12	0.00	0.00	0.00	0.00	0.05	0.00																	
CARBON DIOXIDE	CO ₂	0.34	0.34	0.34	0.34	0.03	0.45	0.03	0.03	0.03	0.03	0.53	0.01																	
METHANE	C1	58.87	58.87	58.87	58.87	2.97	77.72	2.97	2.97	2.97	2.97	59.15	0.33																	
ETHANE	C2	3.19	3.19	3.19	3.19	0.48	4.11	0.48	0.48	0.48	0.48	6.90	0.17																	
PROPANE	C3	2.99	2.99	2.99	2.99	0.93	3.69	0.93	0.93	0.93	0.93	8.11	0.59																	
I-BUTANE	I-C4	0.62	0.62	0.62	0.62	0.32	0.72	0.32	0.32	0.32	1.63	0.26																		
N-BUTANE	N-C4	1.69	1.69	1.69	1.69	1.04	1.91	1.04	1.04	1.04	4.30	0.89																		
I-PENTANE	I-C5	0.73	0.73	0.73	0.73	0.72	0.74	0.72	0.72	0.72	1.51	0.69																		
N-PENTANE	N-C5	0.87	0.87	0.87	0.87	0.96	0.84	0.96	0.96	0.96	1.64	0.93																		
N-HEXANE	N-C6	1.16	1.16	1.16	1.16	2.03	0.86	2.03	2.03	2.03	1.35	2.07																		
N-HEPTANE	N-C7	1.56	1.56	1.56	1.56	3.82	0.80	3.82	3.82	3.82	0.97	3.96																		
N-OCTANE	N-C8	2.02	2.02	2.02	2.02	6.15	0.63	6.15	6.15	6.15	0.59	6.42																		
N-NONANE	N-C9	1.59	1.59	1.59	1.59	5.49	0.28	5.49	5.49	5.49	0.19	5.74																		
N-DECANE	N-C10	1.44	1.44	1.44	1.44	5.31	0.14	5.31	5.31	5.31	0.08	5.56																		
N-UNDECANE	N-C11	1.25	1.25	1.25	1.25	4.78	0.06	4.78	4.78	4.78	0.03	5.00																		
N-DODECANE	N-C12	0.26	0.26	0.26	0.26	1.02	0.01	1.02	1.02	1.02	0.00	1.07																		
N-TRIDECA	N-C13	0.32	0.32	0.32	0.32	1.27	0.00	1.27	1.27	1.27	0.00	1.33																		
N-TETRADECANE	N-C14	0.31	0.31	0.31	0.31	1.22	0.00	1.22	1.22	1.22	0.00	1.28																		
N-PENTADECANE	N-C15	0.31	0.31	0.31	0.31	1.23	0.00	1.23	1.23	1.23	0.00	1.28																		
N-HEXADECANE	N-C16	0.24	0.24	0.24	0.24	0.94	0.00	0.94	0.94	0.94	0.00	0.99																		
N-HEPTADECANE	N-C17	0.26	0.26	0.26	0.26	1.02	0.00	1.02	1.02	1.02	0.00	1.07																		
N-OCTADECANE	N-C18	0.23	0.23	0.23	0.23	0.91	0.00	0.91	0.91	0.91	0.00	0.95																		
N-NONADECANE	N-C19	0.16	0.16	0.16	0.16	0.62	0.00	0.62	0.62	0.62	0.00	0.65																		
C12+ (NOTE 5) 3-MLS-2-RJS	C12+	7.20	7.20	7.20	7.20	28.54	0.00	28.54	28.54	28.54	0.00	29.88																		
C20+ (NOTE 5) 4-RJS-0442	C20+	6.87	6.87	6.87	6.87	27.22	0.00	27.22	27.22	27.22	0.00	28.50																		
TOTAL		100	100	100	100	100	100	100	100	100	100	100																		
MOLAR FLOW RATE	(kmol/h)	12214.1	12214.1	12214.1	12214.1	3081.0	9133.1	3081.0	3081.0	3081.0	3081.0	138.3	2942.7																	
MASS FLOW RATE	(kg/h)	352853.7	352853.7	352853.7	352853.7	114804.1	204809.6	114804.1	114804.1	114804.1	114804.1	3687.7	1144355.4																	
OIL VOLUMETRIC FLOW RATE	(m ³ /h)	1323.9	1323.9	1323.9	1323.9	1326.8	1326.8	1326.8	1326.8	1326.8	1326.8	0.0	1262.1																	
GAS VOLUMETRIC FLOW RATE (NOTE 4) (m ³ /h)		15614.1	16672.2	22519.3	30018.2	0.0	30018.2	0.0	0.0	0.0	0.0	3239.0	3239.0	0.0																
WATER VOLUMETRIC FLOW RATE	(m ³ /h)	11.5	11.5	11.5	11.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
MOLECULAR WEIGHT	(kg/kmol)	110.8	110.8	110.8	110.8	372.6	22.4	372.6	372.6	372.6	26.7	388.9																		
PRESSURE	(kPa abs)	1176.8	1108.2	1039.5	980.7	980.7	980.7	980.7	912.0	117.7	117.7	117.7																		
TEMPERATURE	(°C)	22.0	22.0	69.7	120.0	120.0	120.0	120.0	60.0	59.9	59.9	59.9																		
OIL DENSITY	(kg/m ³)	906.3	907.0	886.5	865.3	865.3	865.3	865.3	904.0	906.7	906.7	906.7																		

Figura 2.4-10 - Planta de Óleo Produzido

0	FOR PNBV COMMENT	19/JAN/05	BMOUGLIRA	RSAMPADO	RSBRASSO
REV.	DESCRIPTION	DATE	EXEC.	CHECK	APPROV.
THIS DOCUMENT IS PROPERTY OF PETROBRAS AND IT IS PROTECTED IN ACCORDANCE WITH PREVALENT LAW. IT SHALL ONLY BE USED FOR THE PURPOSE IT IS DELIVERED. STANDARDIZED FORM BY N-381 (PETROBRAS) REV.F - ANNEX A					
					TQP Nº: 1 B20257-TQP-PPD-1223-001 CONTRACT Nº: 1 899.2.010.03-9 TECHNICAL RESP: Roberto Jourdan Aquino TEXTILES: RBARRASSO
FIG. Nº.: 20050202-01 PROJEÇÃO: 1-10-DE-3010.63-1223-943-TKP-001.DWG CHECK Nº.: 48748-D					
			ENGENHARIA / IEMS		
CLIENT OR USER: UN - RIO / ATP - MLS					
JOB OR PROJECT: MARLIM SUL FIELD DEVELOPMENT					
AREA OR UNIT: PETROBRAS 51 (P-51)					
TITLE: PROCESS FLOW DIAGRAM OIL COLLECTING, SEPARATION AND PUMPING (MAXIMUM OIL/GAS)					
DESIGN BY: TKP	DRAWN BY: BMOUGLIRA	CHECKED BY: RSAMPADO	APPROVED BY: RBARRASSO		
SCALE: NO SCALE		DRAWING TYPE: A1	CC:	SHEET 1 of 1	
DATE: 19/JAN/05		PB Nº.: I-DE-3010.63-1223-943-TKP-001			