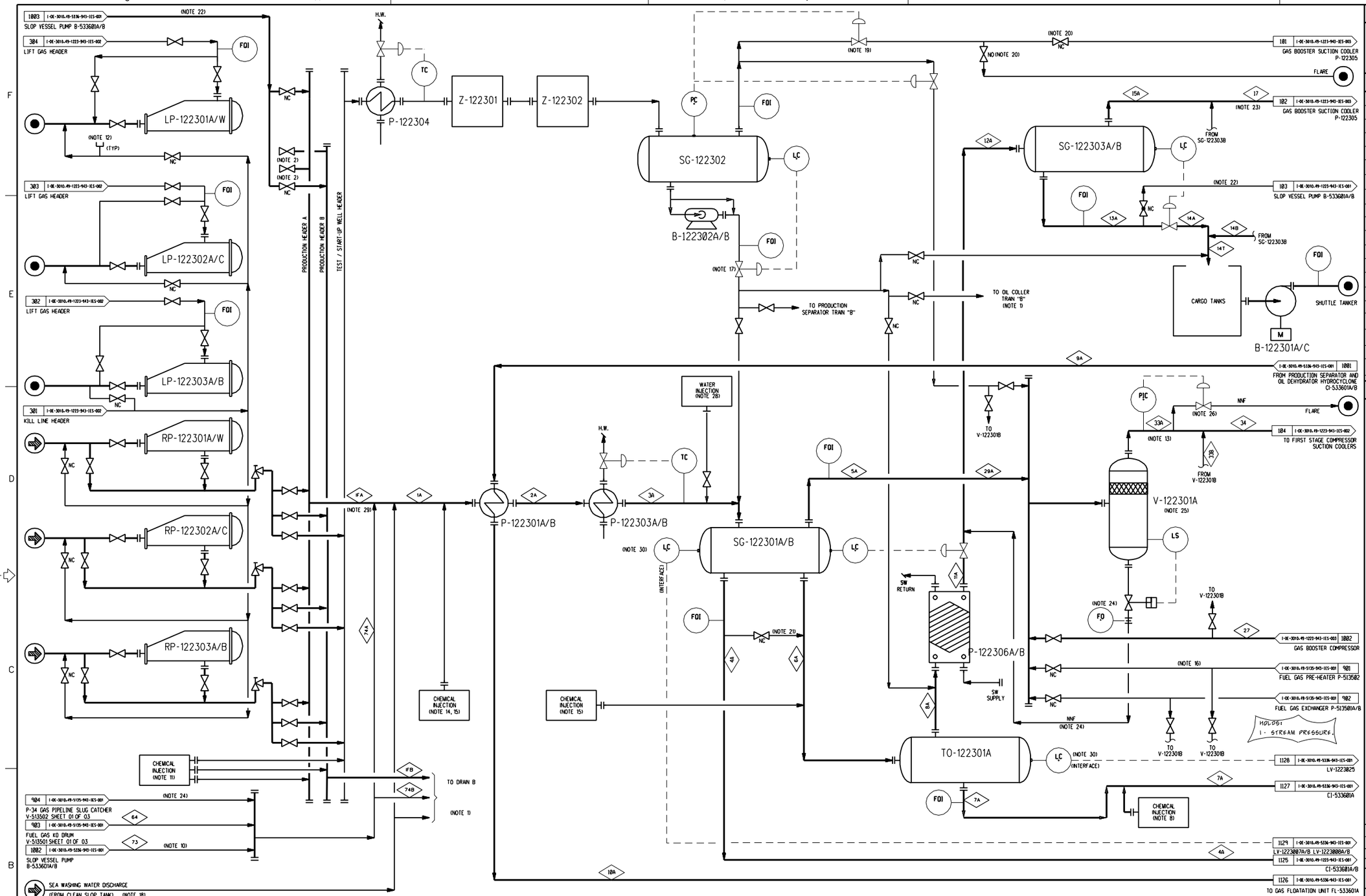

STREAM CHARACTERISTICS		1FA	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	13A	14A	14B	14T	15A	15B	17	27	29A	33A	33B	34	64	73	74A	74B
WATER	H2O	35,65	35,02	35,02	35,02	100,00	4,10	54,92	100,00	10,09	100,00	100,00	10,09	10,09	9,98	9,98	9,98	9,98	11,22	11,22	11,22	6,88	4,10	4,23	4,23	4,23	0,00	0,06	0,04	0,04
NITROGEN	N2	0,40	0,40	0,40	0,40	0,00	0,82	0,01	0,00	0,01	0,00	0,00	0,01	0,01	0,00	0,00	0,00	0,00	0,12	0,12	0,12	0,29	0,82	0,79	0,79	0,79	0,08	0,00	0,03	0,03
CARBON DIOXIDE	CO2	0,13	0,13	0,13	0,13	0,00	0,26	0,01	0,00	0,02	0,00	0,00	0,02	0,02	0,00	0,00	0,00	0,00	0,19	0,19	0,19	0,21	0,26	0,26	0,26	0,26	0,06	0,00	0,06	0,06
METHANE	C1	33,94	33,47	33,47	33,47	0,00	68,03	1,50	0,00	2,81	0,00	0,00	2,81	2,81	0,25	0,25	0,25	0,25	28,35	28,35	28,35	38,78	68,03	66,66	66,66	66,66	19,48	0,08	7,09	7,09
ETHANE	C2	5,23	5,22	5,22	5,22	0,00	10,46	0,81	0,00	1,51	0,00	0,00	1,51	1,51	0,31	0,31	0,31	0,31	13,07	13,07	13,07	12,92	10,46	10,29	10,29	10,29	12,84	0,36	4,87	4,87
PROPANE	C3	4,92	5,05	5,05	5,05	0,00	8,97	1,84	0,00	3,44	0,00	0,00	3,44	3,44	1,55	1,55	1,55	1,55	21,57	21,57	21,57	19,35	8,97	9,46	9,46	9,46	28,67	2,92	12,22	12,22
I-BUTANE	IC4	0,83	0,88	0,88	0,88	0,00	1,38	0,56	0,00	1,04	0,00	0,00	1,04	1,04	0,70	0,70	0,70	0,70	4,36	4,36	4,36	5,77	1,38	1,49	1,49	1,49	7,45	2,09	4,02	4,02
N-BUTANE	NC4	1,88	2,04	2,04	2,04	0,00	2,98	1,56	0,00	2,92	0,00	0,00	2,92	2,92	2,18	2,18	2,18	2,18	10,03	10,03	10,03	8,58	2,98	3,24	3,24	3,24	18,07	7,59	11,38	11,38
I-PENTANE	IC5	0,56	0,66	0,66	0,66	0,00	0,74	0,78	0,00	1,46	0,00	0,00	1,46	1,46	1,33	1,33	1,33	1,33	2,70	2,70	2,70	2,26	0,74	0,81	0,81	0,81	5,08	7,18	6,42	6,42
N-PENTANE	NC5	0,79	0,95	0,95	0,95	0,00	0,98	1,24	0,00	2,32	0,00	0,00	2,32	2,32	2,20	2,20	2,20	2,20	3,54	3,54	3,54	2,96	0,98	1,07	1,07	1,07	6,34	12,41	10,22	10,22
HEXANE	NC6	0,92	1,22	1,22	1,22	0,00	0,73	2,24	0,00	4,19	0,00	0,00	4,19	4,19	4,37	4,37	4,37	4,37	2,51	2,51	2,51	2,06	0,73	0,80	0,80	0,80	1,66	27,48	18,15	18,15
HEPTANE	NC7	1,34	1,57	1,57	1,57	0,00	0,49	3,45	0,00	6,46	0,00	0,00	6,46	6,46	6,98	6,98	6,98	6,98	1,46	1,46	1,46	1,20	0,49	0,52	0,52	0,52	0,15	22,55	14,46	14,46
OCTANE	NC8	1,50	1,60	1,60	1,60	0,00	0,23	3,84	0,00	7,17	0,00	0,00	7,17	7,17	7,86	7,86	7,86	7,86	0,61	0,61	0,61	0,50	0,23	0,25	0,25	0,25	0,00	11,09	7,08	7,08
NONANE	NC9	1,31	1,33	1,33	1,33	0,00	0,09	3,33	0,00	6,23	0,00	0,00	6,23	6,23	6,86	6,86	6,86	6,86	0,19	0,19	0,19	0,16	0,09	0,09	0,09	0,09	0,00	4,10	2,62	2,62
DECANE	NC10	1,08	1,08	1,08	1,08	0,00	0,03	2,75	0,00	5,14	0,00	0,00	5,14	5,14	5,67	5,67	5,67	5,67	0,06	0,06	0,06	0,05	0,03	0,03	0,03	0,03	0,00	1,51	0,97	0,97
UNDECANE	NC11	0,92	0,91	0,91	0,91	0,00	0,01	2,32	0,00	4,34	0,00	0,00	4,34	4,34	4,79	4,79	4,79	4,79	0,02	0,02	0,02	0,02	0,01	0,01	0,01	0,01	0,00	0,58	0,37	0,37
C12+ (NOTE 5) RSJ-485 ENCHOVA	C12+	3,54	3,48	3,48	3,48	0,00	0,00	8,98	0,00	16,79	0,00	0,00	16,79	16,79	18,54	18,54	18,54	18,54	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
C12+ (NOTE 5) RSJ-383 MARLIM	C12+	5,07	4,98	4,98	4,98	0,00	0,00	12,86	0,00	24,05	0,00	0,00	24,05	24,05	26,55	26,55	26,55	26,55	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	TOTAL	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00
MOLAR FLOW RATE	(KGMOL/H)	7672,3	7809,5	7809,5	7809,2	1010,2	3775,5	3023,6	1406,7	1616,9	2416,9	2416,9	1616,9	1616,9	1464,4	1464,4	1464,4	1464,4	2928,8	152,5	152,5	305,0	370,8	3775,5	3960,9	3960,9	792,7	99,1	175,3	137,2	137,2
MASS FLOWRATE	(KG/H)	571696	581647	581647	581626	18199	91908	47159	25341	44617	43540	43540	44617	44617	44043	44043	44043	44043	88086	5747	5747	11493	12922	91908	98369	98369	19673	4400	15501	9950	9950
OIL VOLUMETRIC FLOW RATE (NOTE 3)	(M3/H)	543,2	558,4	551,4	509,0	-	-	508,4	-	508,4	-	-	508,4	497,2	497,2	496,8	496,8	496,8	993,7	-	-	-	-	-	-	-	-	7,4	23,3	15,8	15,8
GAS VOLUMETRIC FLOWRATE (NOTE 4)	(M3/H)	74033	74237	76364	90579	-	90820	-	-	-	-	-	3669	-	101	101	202	3669	3669	7337	8918	90820	95279	95279	190558	485	-	69	69	
WATER VOLUMETRIC FLOWRATE (NOTES 3, 6)	(M3/H)	49,27	49,27	49,23	46,61	18,22	-	28,32	25,38	2,94	43,60	43,60	2,94	2,64	2,64	2,63	2,63	5,25	-	-	-	-	-	-	-	-	0,00	0,00	0,00	0,00	0,00
MOLECULAR WEIGHT	(KG/KMOL)	74,51	74,48	74,48	74,48	18,01	24,34	155,95	18,01	275,95	18,01	18,01	275,95	275,95	300,76	300,76	300,76	300,76	37,68	37,68	37,68	34,85	24,34	24,84	24,84	24,84	44,39	88,43	72,52	72,52
PRESSURE	(KPA ABS)	1403	1403	1256	1109	1079	1079	1079	1079	1079	1079	932	932	118	118	101	101	101	118	118	118	951	951	951	951	951	1423	1423	1423	1423
TEMPERATURE	(°C)	15	15	20	80	80	80	80	80	80	80	40	55	53	53	53	53	53	53	53	53	99	79	80	80	80	-5	28	23	23
OIL DENSITY (NOTE 27)	(KG/M3)	849	843	844	830	-	-	831	-	831	-	-	847	857	857	857	857	857	-	-	-	-	-	-	-	-	564	655	619	619	

REFERENCE DOCUMENTS

SYMBOLS AND ABBREVIATIONS (ET-3000.00-1200-941-PPC-002)

PFD- OIL COLLECTING, SEPARATION AND PUMPING (MAXIMUN OIL/ TOTAL LIQUIDS YR 2005) (I-DE-3010.49-1223-943-BRY-001)

EQUIPMENTS

TAG	DESCRIPTION	TYPE	CAPACITY (NOTE 7)
P-122301A/B (2x50%)	OIL/WATER PRE HEATER	SHELL AND TUBE	13.4×10^6 W
P-122306A (2x50%)	OIL COOLER	PLATE	$6,46 \times 10^6$ W
P-122303A (2x50%)	PRODUCTION HEATER	SHELL AND TUBE	25.4×10^6 W
P-122304 (1x100%)	START-UP WELL HEATER	SHELL AND TUBE	9.76×10^6 W
SG-122301A/B (2x50%)	PRODUCTION SEPARATOR	HORIZONTAL	12000 m^3 /d (NOTE 9)
SG-122302 (1x100%)	START-UP WELL SEPARATOR	HORIZONTAL	3000 m^3 /d (NOTE 9)
SG-122303A/B (2x50%)	ATMOSPHERIC SEPARATOR	HORIZONTAL	12000 m^3 /d (NOTE 9)
TO-122301A (2x50%)	OIL DEHYDRATOR	ELECTROSTATIC	12000 m^3 /d (NOTE 9)
LP-122301A/W (21x100%)	PIG LAUNCHER - 10"	-	-
LP-122302A/C (3x100%)	PIG LAUNCHER - 10"	-	-
LP-122303A/B (2x100%)	PIG LAUNCHER - 8"	-	-
RP-122301A/W (21x100%)	PIG RECEIVER - 12"	-	-
B-122301A/C (3x50%)	CARGO OIL PUMP	CENTRIFUGAL	3412 m^3 /h
Z-122301	MULTIPHASE FLOW METER	-	-
Z-122302	MULTIPHASE FLOW METER	-	-
RP-122302A/C (3x100%)	PIG RECEIVER - 10"	-	-
RP-122303A/B (2x100%)	PIG RECEIVER - 10"	-	-
V-122301A (2x50%)	SAFETY GAS K.O. DRUM	VERTICAL	3,000,000 m^3/d
B-122302A/B (2x100%)	START-UP WELL SEPARATOR PUMP.	CENTRIFUGAL	125 m^3 /h

GENERAL NOTES

1- OIL SEPARATION TRAINS 'A' AND 'B' ARE IDENTICAL.
2- FUTURE PHASE II OIL IMPORTING CONNECTIONS.

3- OIL AND WATER VOLUMETRIC FLOWRATE ARE STANDARD VALUES AT 15,6° C AND 101,3 kPa abs.
4- GAS FLOWRATE @ 20°C AND 101.325 kPa abs.
5- CHARACTERISTICS OF C12+ FRACTIONS:
FROM ENCHOVA PM+560, API+23.69
FROM MARLIM PM+550, API+18,80
6- THIS FLOW SHOWS THE WATER PRESENT ONLY IN THE LIQUID PHASE. THIS VALUE MUST BE CORRECTED TO PRODUCED WATER DENSITY OF 1030 kg/m^3 INCLUDING FREE AND DISSOLVED WATER.
7- 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 FOR THE CASE SHOWN.
8- INVERTED EMULSION INHIBITOR INJECTION.
9- LIQUID FLOWRATE AT STANDARD CONDITIONS.
10- INTERMITENT FLOW.
11- ANTI-FOAM INJECTION.
12- SGN AND DIESEL INJECTION - TYPICAL FOR ALL GAS LIFT AND PRODUCED FLUIDS WELL KILL CONNECTIONS.
13- PRODUCTION SEPARATOR OPERATING PRESSURE IS 1079 kPa abs, HOWEVER, GAS COMPRESSOR DESIGN MINIMUM SUCTION PRESSURE CASE IS BASED ON 951 kPa abs.
14- SCALE INHIBITOR INJECTION.
15- DEMULSIFIER INJECTION.
16- REMAINDER GAS TO V-122301 IN YEAR 2002.
17- THIS VALVE SHALL BE DESIGNED FOR 3000 m^3 /d MAXIMUM FLOWRATE AT 15,6°C, 101.3 kPa abs AND 0,5 kg/cm^2 MAXIMUM PRESSURE DROP.
18- INTERCONNECTION WITH "SLOP DISCHARGE SYSTEM" (SEE I-ET-3010.49-1350-960-PPC-005,DWG6).
19- THIS VALVE IS SIZED FOR FOR 500000 m^3 /d (MAXIMUM GAS) AT 0°C AND 101.3 kPa abs.
20- VALVES WITH MECHANICAL INTERLOCKING SYSTEM IN ORDER TO AVOID SIMULTANEOUS CLOSING, THEY SHALL BE TWO WAY VALVES.
21- THIS LINE WILL BE USED DURING LOW WATER PRODUCTION TO ENSURE ADEQUATE WATER FEED TO THE OIL DEHYDRATOR.
22- THIS LINE SHALL BE USED DURING LINE WASHING WITH HOT OIL.
23- VOID.
24- NORMALLY NO FLOW.
25- TP VANE TYPE MIST ELIMINATOR.
26- THIS VALVE SHALL BE MAXIMUM TIGHTNESS CLASS SUITABLE TO THE SERVICE.
27- ACTUAL DENSITY.
28- WATER INJECTION FOR YEARS OF LOW WATER PRODUCTION TO PERMIT BSW ESPECIFICATION.
29- THE ARRIVAL FLUID TEMPERATURE IS ASSUMED TOBE 15°C.
30- THESE CONTROLLERS WILL CLOSE THE VALVES LOCATED AFTER HYDROCYCLONES.

Rev	Date	Description	BY	CHK	LEAD	MGNT	KBR	OWNER
B01	04-MAY-01	RELEASED FOR DESIGN - ADP-033B/01	RMC	GRR	RSS	RAC	RJ	
A01	10-APR-01	FOR COMMENTS	RMC	GRR	RSS	RAC		
001	14-MAR-01	INTER DISCIPLINE CHECK (IDC)	GRR	RSS	RSS	RAC		
								Released

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PETRÓLEO BRASILEIRO S.A. PETROBRAS
Barracuda & Caratinga Leasing Corporation
Brown & Root Energy Services
Pinepar Ltda.

USER: E & P BACIA DE CAMPOS

PROJECT TITLE: PRODUCTION FACILITIES PROJECT
BARRACUDA AND CARATINGA CRUDE OIL FIELDS

UNIT: FPSO UNIT - P-43

DRAWING TITLE: FIGURA 3.2.3-c
PROCESS FLOW DIAGRAM
OIL COLLECTING, SEPARATION AND PUMPING
(MAXIMUM OIL/TOTAL LIQUIDS YR 2005)

pg-1

CS APPROVAL	OWNER APPROVAL	COPY CODE	LIFE CYCLE	DATE
		BB		14-MAR-01

DRAWN BY	DESIGNED BY	CHECKED BY	APPROVED BY
JAA	GRR	RSS	RSS

PROJ. NUMBER: I-DE-FBT-1223-PR-P.10-001
SCALE:
REV.: B01
BR NUMBER: I-DE-3010.49-1223-943-IES-001
SHEET: 01/01

DD-P-43-P-10-001