

REFERENCE DOCUMENTS

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY

GENERAL NOTES

- 1 - Intermittent operation. Required for high-arrival temperature, high BSW cases only. Deleted
- 2 - Intermittent operation. Required for low arrival temperature, low BSW cases only.
- 3 - Compressor capacity control by variable speed drive and cooled recycle. Common electric motor drive for C-2304 / C-2305 / C-2306.
- 4 - Fixed speed motor with suction throttling.
- 5 - Compressor capacity control by variable speed drive and cooled recycle. Common electric motor drive for C-2302 / C-2303.

HOLDS

1. Service gas offtake location.

KEY PLAN

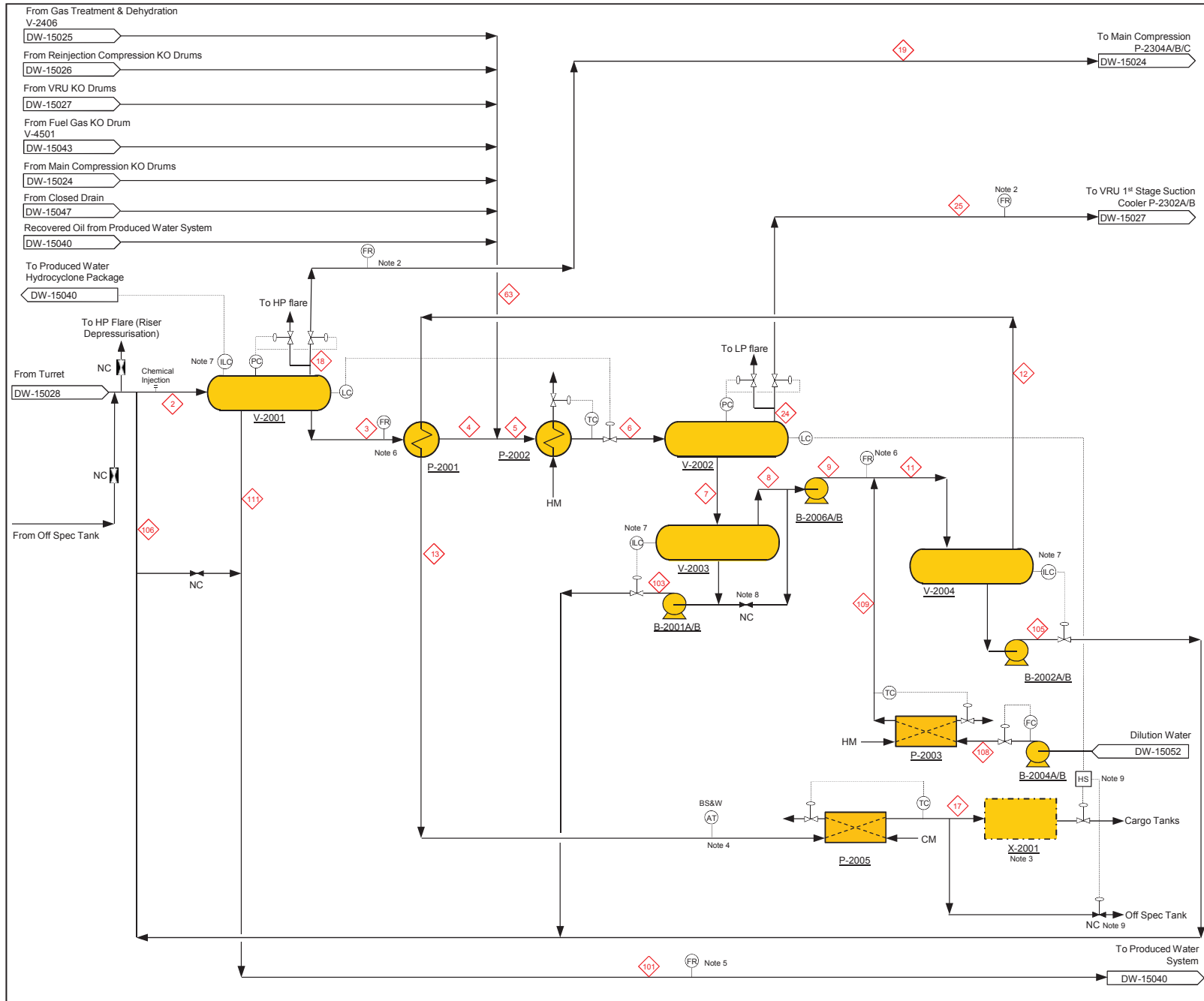
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D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-issued for Client Review	JN	DP	MZW
B3	07/05/14	Re-issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-issued for Client Review	RW	ED	DP
B1	04/04/14	Issued for Client Review	RW	ED	DP
AT	28/03/14	Issued for Internal Review	RW	RP	



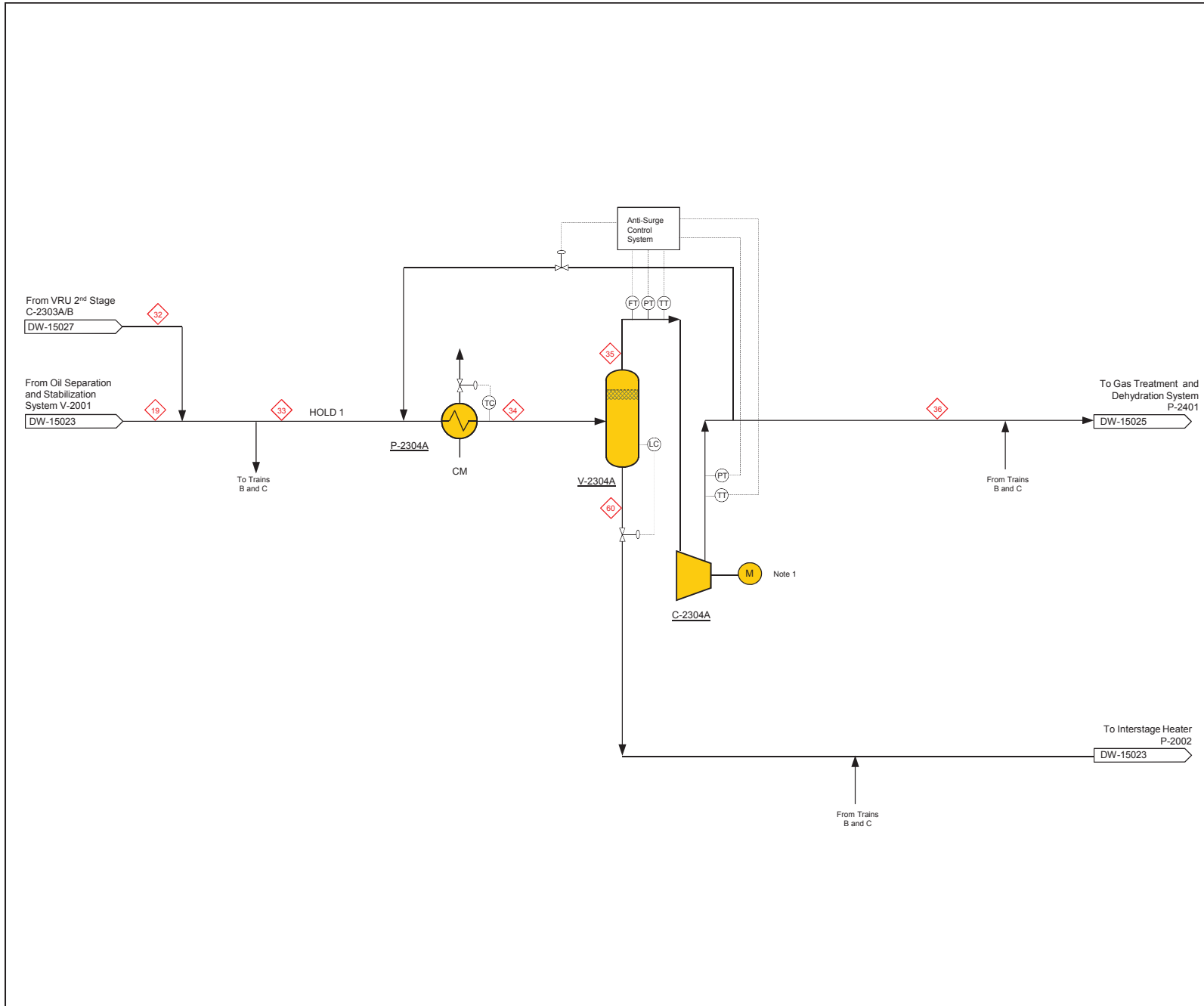
PROJECT LIBRA EWT FPSO

TITLE Preliminary General Process Flow Diagram

SCALE	UNITS	SHEET	01 OF 01
NUMBER	J20518B-P-DW-15020	REV.	D1



REFERENCE DOCUMENTS					
EQUIPMENT					
TAG	DESCRIPTION	TYPE	CAPACITY		
B-2001A/B (2x100%)	Oil Pre-Treater Pump				
B-2002A/B (2x100%)	Oil Treater Pump				
B-2004A/B (2x100%)	Dilution Water Pump				
B-2006A/B (2x100%)	Oil Transfer Pump				
V-2001	Free Water KO Drum	Horizontal			
V-2002	Flash Vessel	Horizontal			
V-2003	Pre-Treater (Electrostatic)	Horizontal			
V-2004	Oil Treater (Electrostatic)	Horizontal			
P-2001	Crude-Crude Exchanger	Shell & Tube			
P-2002	Interstage Heater	Shell & Tube			
P-2003	Dilution Water Heater	Plate & Frame			
P-2005	Export Oil Cooler	Plate & Frame			
X-2001	Metering Unit				
GENERAL NOTES					
1 - Deleted.					
2 - Flow Recorder for Operational Metering					
3 - Includes calibration					
4 - Online analyser with sampler					
5 - Allocation metering					
6 - PD, Coriolis or turbine meter with flow computer					
7 - Level Interface Controller					
8 - Intermittent Operation, required for low arrival temperature, low BS&W cases only.					
9 - Oil to Off Spec Tank requires manual switching.					
KEY PLAN					
D1	20/06/14	Issued Final	JN DP MZW		
B4	23/05/14	Re-issued for Client Review	JN DP MZW		
B3	09/05/14	Re-issued for Client Review	JN DP MZW		
B2	29/04/14	Re-issued for Client Review	VM ED DP		
B1	04/04/14	Issued for Client Review	VM ED DP		
A1	31/03/14	Issued for Internal Review	RW		
REV	DATE	DESCRIPTION	EXEC	CHECK	APPROV
		CLIENT 			
PROJECT <b>LIBRA EWT FPSO</b>					
TITLE <b>PROCESS FLOW DIAGRAM OIL SEPARATION &amp; STABILIZATION SYSTEM</b>					
SCALE	UNITS	SHEET	01 OF 01		
NUMBER	J20518B-P-DW-15023		REV	D1	



REFERENCE DOCUMENTS

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY
C-2304A/B/C (3x50%)	Main Compressor	Centrifugal	
P-2304A/B/C (3x50%)	Main Compressor Suction Cooler	Shell & Tube	
V-2304A/B/C (3x50%)	Main Compressor Suction KO Drum	Vertical	

GENERAL NOTES

1 - Variable speed electric motor drive. Common electric motor drive with C-2305 / C-2306

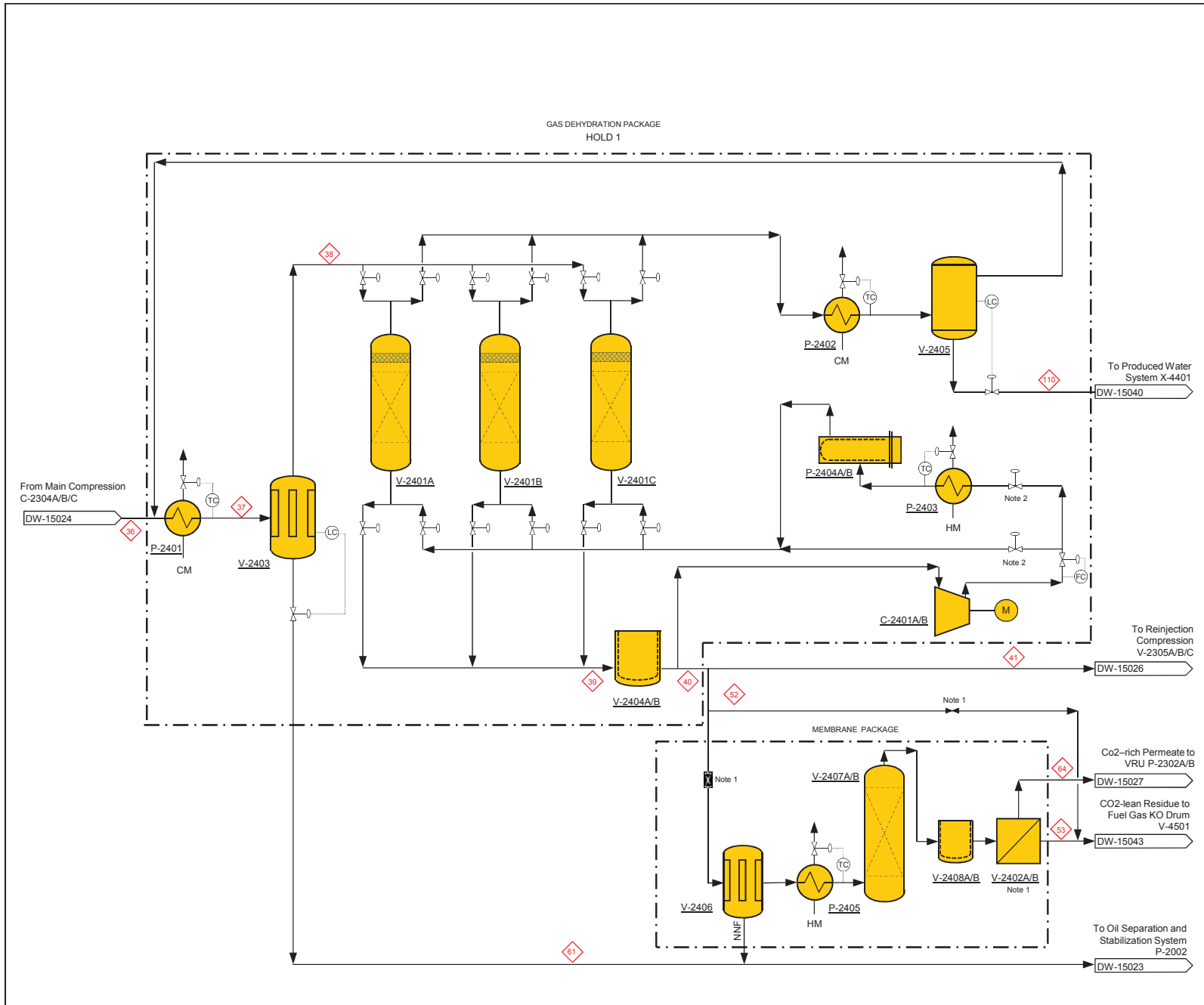
HOLDS

1 - Requirement for suction throttle valve for start-up, etc..

KEY PLAN

D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-issued for Client Review	JN	DP	MZW
B3	09/05/14	Re-issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-issued for Client Review	LD	ED	DP
B1	04/03/14	Issued for Client Review	LD	ED	DP
A1	31/03/14	Issued for Internal Review	LD	ED	
REV	DATE	DESCRIPTION	EXEC	CHECK	APPROV

	CLIENT
PROJECT	LIBRA EWT FPSO
TITLE	PROCESS FLOW DIAGRAM MAIN COMPRESSION
SCALE	UNITS SHEET
	01 OF 01
NUMBER	J20518B-P-DW-15024
REV.	D1



REFERENCE DOCUMENTS

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY
C-2401A/B (2x100%)	Regeneration Gas Blower	Centrifugal	
P-2401	Dehydration Inlet Cooler	Shell & Tube	
P-2402	Regeneration Gas Cooler	Shell & Tube	
P-2403	Regeneration Gas Pre-Heater	Shell & Tube	
P-2404A/B (2x100%)	Regeneration Gas Heater	Electrical	
P-2405	Membrane Unit Pre-Heater	-	
V-2401 A/B/C	Molecular Sieve	Shell & Tube	
V-2402A/B (2x100%)	CO2 Removal Membrane	-	
V-2403	Gas Coalescer Filter	Coalescer	
V-2404A/B (2x100%)	Particulate Filter	Cartridge	
V-2405	Regeneration Gas Separator	Vertical	
V-2406A/B (2x100%)	Membrane Unit Inlet Filter Coalescer	Vertical	
V-2407A/B 2x100%	Membrane Unit Guard Beds	Vertical	
V-2408A/B (2x100%)	Membrane Unit Particulate Filter	Vertical	

GENERAL NOTES

- 1 – Fuel gas has maximum of 40% CO2 content. Membrane unit not used when production gas has less than 40% CO2.
- 2 – On/off valves for heating/cooling steps in regeneration cycle.

HOLDS

- 1 – Number of beds and regeneration cycle time by vendor.

KEY PLAN

REV	DATE	DESCRIPTION	EXEC.	CHECK	APPROV
D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-issued for Client Review	JN	DP	MZW
B3	09/05/14	Re-issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-issued for Client Review	DT	ED	DP
B1	04/03/14	Issued for Client Review	DT	ED	DP
A1	31/03/14	Issued for Internal Review	DT	ED	

CLIENT

**GENESIS Technip**

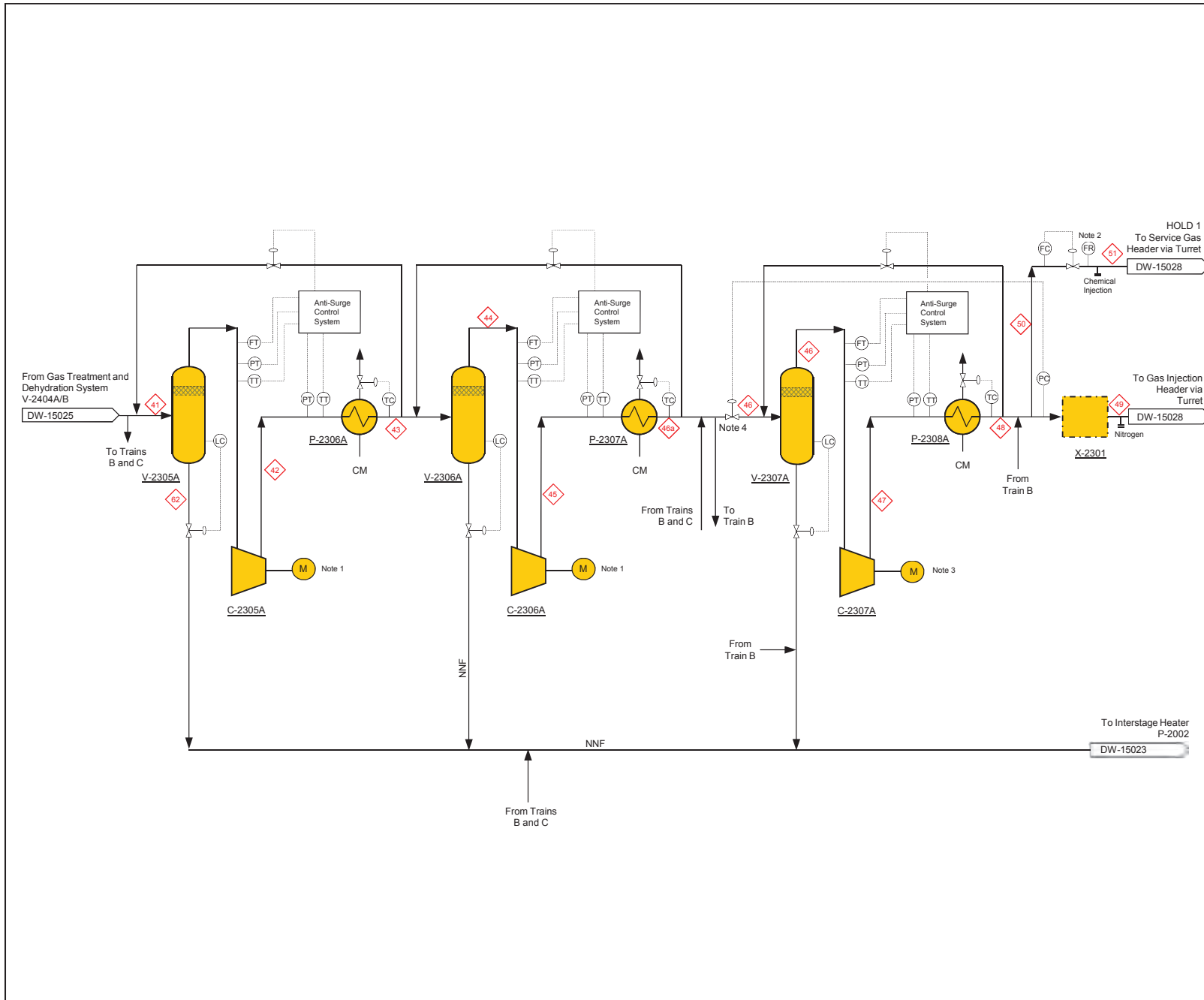
**ODEBRECHT**  
Oil & Gas

PROJECT: LIBRA EWT FPSO

TITLE: PROCESS FLOW DIAGRAM GAS TREATMENT & DEHYDRATION

SCALE: UNITS: SHEET: 01 OF 01

NUMBER: J20518B-P-DW-15025 REV: D1



REFERENCE DOCUMENTS

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY
C-2305A/B/C (3x50%)	Stage 1 Reinjection Compressor	Centrifugal	
C-2306A/B/C (3x50%)	Stage 2 Reinjection Compressor	Centrifugal	
C-2307A/B (2x100%)	Stage 3 Reinjection Compressor	Centrifugal	
P-2306A/B/C (3x50%)	Reinjection Compressor 1 <sup>st</sup> Stage Aftercooler	Shell & Tube	
P-2307A/B/C (3x50%)	Reinjection Compressor 2 <sup>nd</sup> Stage Aftercooler	Shell & Tube	
P-2308A/B (2x100%)	Reinjection Compressor 3 <sup>rd</sup> Stage Aftercooler	Shell & Tube	
V-2305A/B/C (3x50%)	Reinjection Compressor 1 <sup>st</sup> Stage Suction KO Drum	Vertical	
V-2306A/B/C (3x50%)	Reinjection Compressor 2 <sup>nd</sup> Stage Suction KO Drum	Vertical	
V-2307A/B (2x100%)	Compressor Suction 3 <sup>rd</sup> Stage KO Drum	Vertical	
X-2301	Injection Gas Metering Unit		

GENERAL NOTES

- 1 - Variable speed electric motor drive. Common electric motor drive with C-2304.
- 2 - Flow recorder for operational metering.
- 3 - Fixed speed electric motor drive.
- 4 - Suction throttle valve for discharge pressure control.

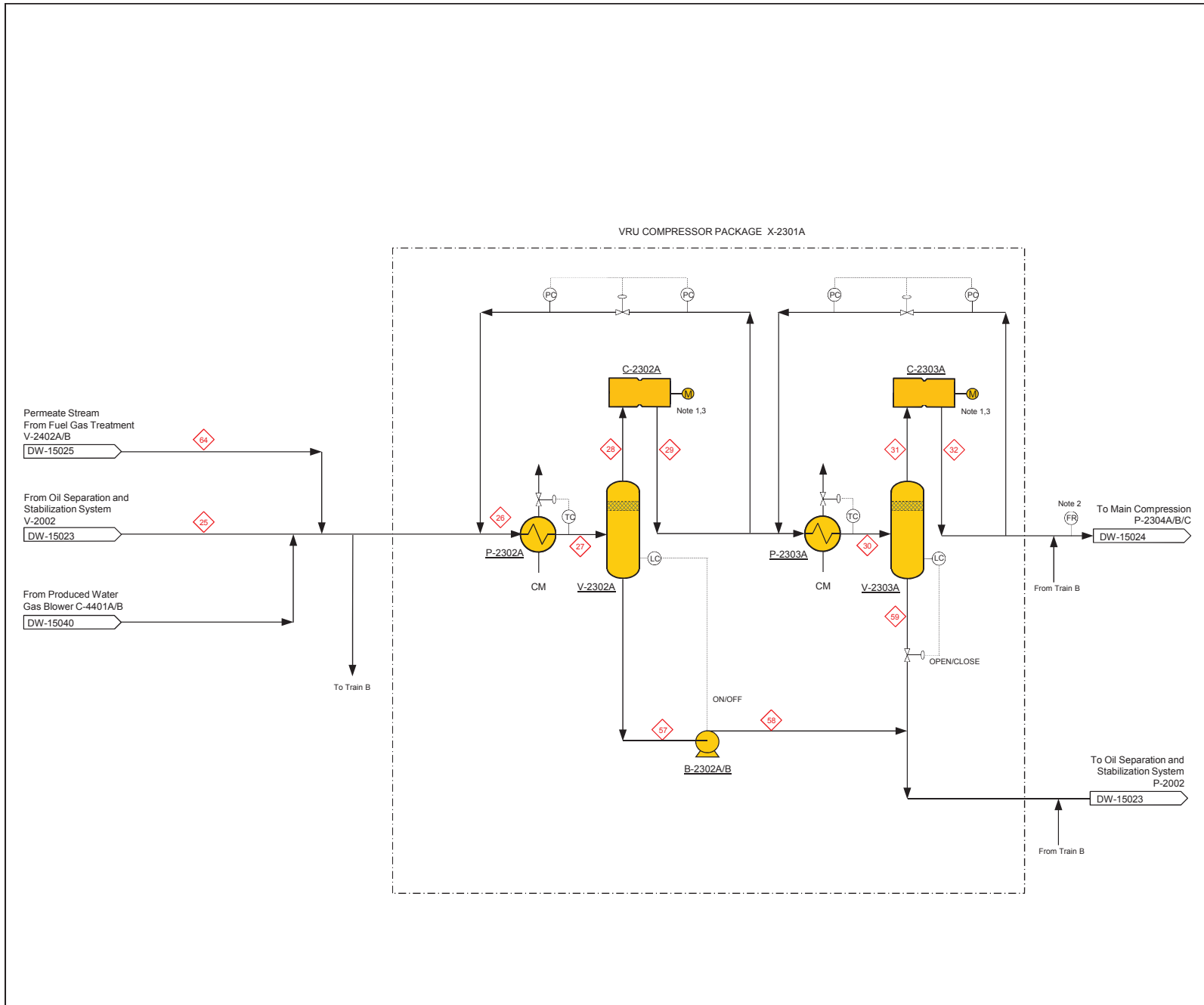
HOLDS

- 1 - Service gas offtake location.

KEY PLAN

D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-issued for Client Review	JN	DP	MZW
B3	09/05/14	Re-issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-issued for Client Review	LD	ED	DP
B1	04/04/14	Issued for Client Review	LD	ED	DP
A1	31/03/14	Issued for Internal Review	LD	ED	
REV.	DATE	DESCRIPTION	EXEC	CHECK	APPROV

	CLIENT
PROJECT	
LIBRA EWT FPSO	
TITLE	
PROCESS FLOW DIAGRAM REINJECTION COMPRESSION	
SCALE	UNITS
	SHEET
	01 OF 01
NUMBER	REV.
J20518B-P-DW-15026	D1



REFERENCE DOCUMENTS

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY
B-2302 A/B/C/D (4x100%)	VRU 1 <sup>st</sup> Stage Scrubber Liquids Pump	Centrifugal	
C-2302A/B (2x100%)	VRU 1 <sup>st</sup> Stage Compressor	Screw	
C-2303A/B (2x100%)	VRU 2 <sup>nd</sup> Stage Compressor	Screw	
P-2302A/B (2x100%)	VRU 1 <sup>st</sup> Stage Suction Cooler	Shell & Tube	
P-2303A/B (2x100%)	VRU 2 <sup>nd</sup> Stage Suction Cooler	Shell & Tube	
V-2302A/B (2x100%)	VRU 1 <sup>st</sup> Stage Scrubber	Vertical	
V-2303A/B (2x100%)	VRU 2 <sup>nd</sup> Stage Scrubber	Vertical	
X-2301A/B (2x100%)	VRU Compressor Package		

GENERAL NOTES

- 1 – Common motor for both compression stages.
- 2 – Operational metering (orifice plate)
- 3 – Compressor capacity control by combination of variable speed drive and cooled recycle

KEY PLAN

D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-issued for Client Review	JN	DP	MZW
B3	09/05/14	Re-issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-issued for Client Review	DT	ED	DP
B1	04/03/14	Issued for Client Review	DT	ED	DP
A1	03/31/14	Issued for Internal Review	DT	ED	
REV	DATE	DESCRIPTION	EXEC	CHECK	APPROV

CLIENT

**GENESIS Technip**

**ODEBRECHT**  
Oil & Gas

PROJECT

**LIBRA EWT FPSO**

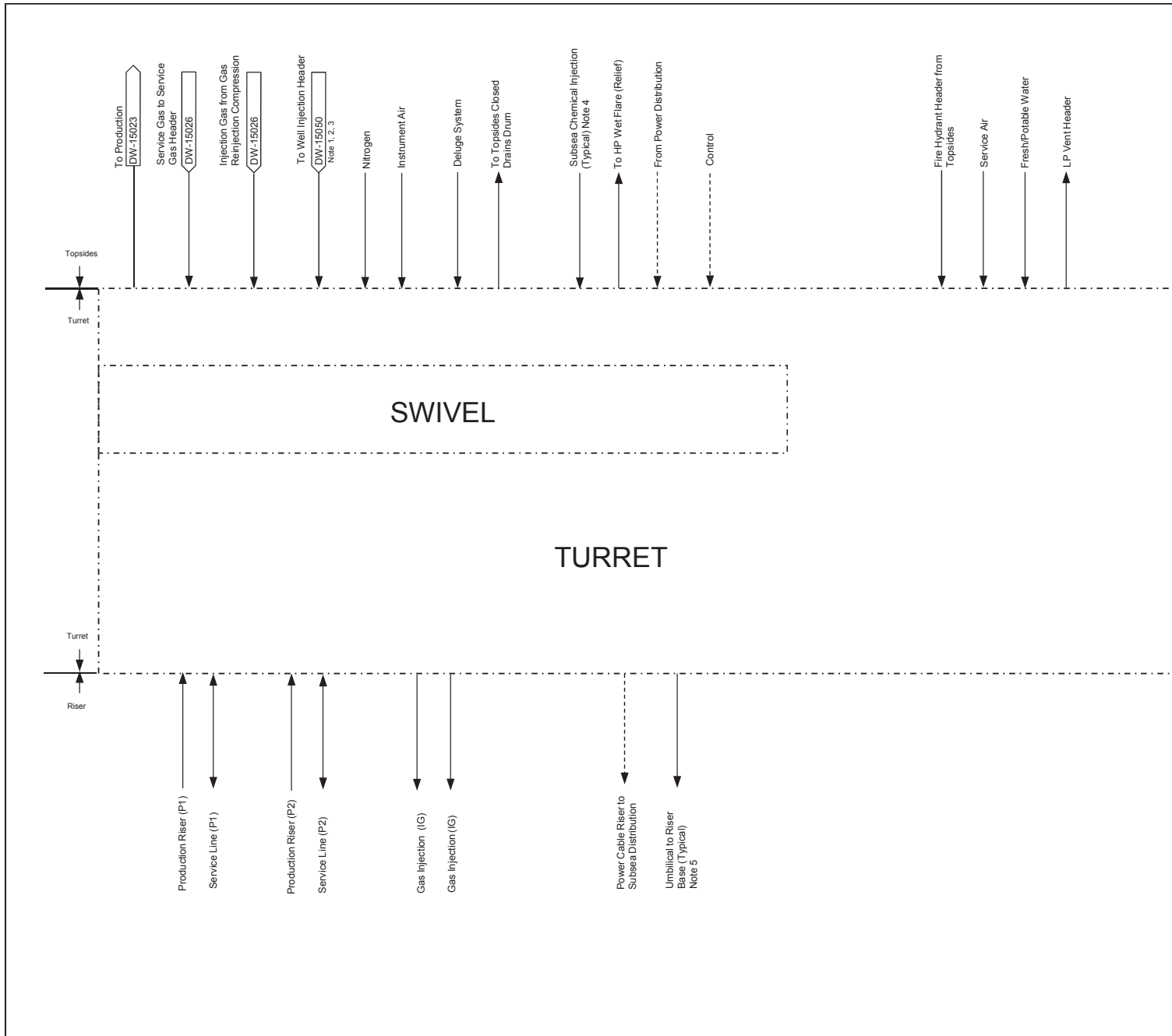
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**PROCESS FLOW DIAGRAM  
VAPOR RECOVER UNIT**

SCALE UNITS SHEET

01 OF 01

NUMBER J20518B-P-DW-15027 REV: D1



REFERENCE DOCUMENTS

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY

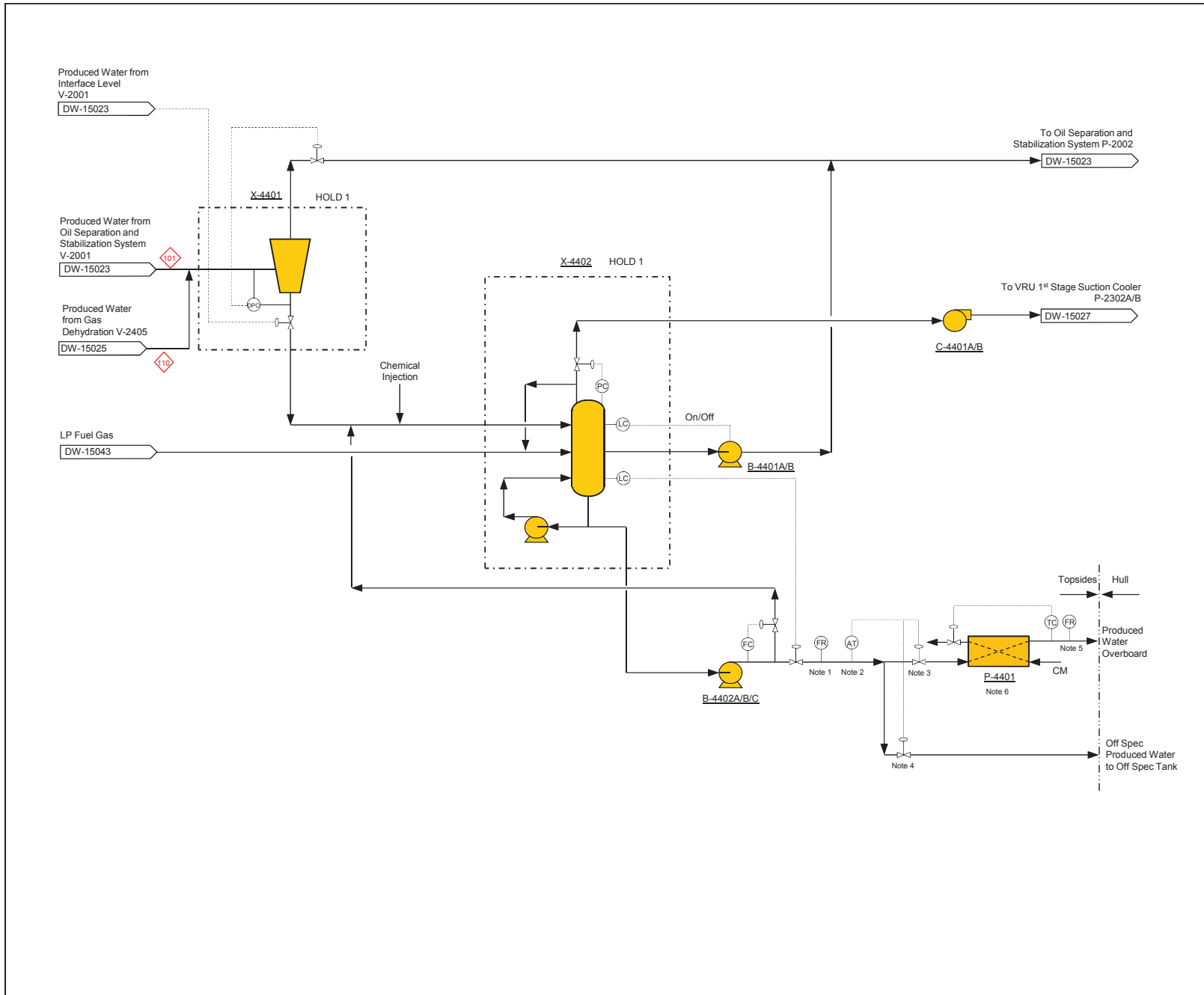
GENERAL NOTES

- 1 - Hot Diesel (maximum 90°C) may be injected upstream production choke. Maximum injection rate is 40 m<sup>3</sup>/h.
- 2 - Maximum diesel injection rate is 60 m<sup>3</sup>/h.
- 3 - Well Services include:
  - MEG or Ethanol Injection for riser commissioning
  - Seawater for riser leak test
  - Diesel for flushing and pigging operations
- 4 - Chemical routed to chemical routing panel (DW-15045)
- 5 - One control umbilical for each Wet Christmas Tree.

KEY PLAN

D1	20/06/14	Issued Final	LW	DP	MZW
B4	23/05/14	Re-issued client review	LW	DP	MZW
B3	09/05/14	Re-issued client review	JN	DP	MZW
B2	29/04/14	Re-issued client review	JN	DP	MZW
B1	11/04/14	Issued for client review	LD	VM	RH
A1	09/04/14	Issued for internal review	LD	RH	
REV.	DATE	DESCRIPTION	EXEC	CHECK	APPROV.

	CLIENT	
	PROJECT	
LIBRA EWT FPSO		
MODULE NUMBER		
TITLE		
PROCESS FLOW DIAGRAM TURRET SYSTEM		
SCALE	UNITS	SHEET
		01 OF 01
NUMBER	J20518-A-P-DW-15028	REV. D1



REFERENCE DOCUMENTS

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY
B-4401A/B (2x100%)	Skimmed Oil Return Pumps	Centrifugal	
B-4402A/B/C (3x50%)	Produced Water Booster Pumps	Centrifugal	
C-4401A/B (2x100%)	Produced Water Gas Blower	Centrifugal	
P-4401	Produced Water Cooler		
X-4401	Produced Water Hydrocyclone Package		
X-4402	Produced Water Gas Flotation Unit		

GENERAL NOTES

- Allocation Metering.
- Online analyser and sampling.
- On/off valve to route on-spec produced water routed overboard.
- On/off valve to route off-spec produced water to off spec tank.
- Operational metering.
- Produced Water Cooler designed for outlet temperature of 40°C.

HOLD

- Vendor confirmation of package equipment details.

KEY PLAN

REV.	DATE	DESCRIPTION	EXEC.	CHECK	APPROV.
D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-issued for Client Review	JN	DP	MZW
B3	09/05/14	Re-issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-issued for Client Review	LD	DT	RH
B1	11/04/14	Issued for Client Review	LD	DT	RH
A1	09/04/14	Issued for Internal Review	LD	RH	

CLIENT

**GENESIS Technip**

**ODEBRECHT**  
Oil & Gas

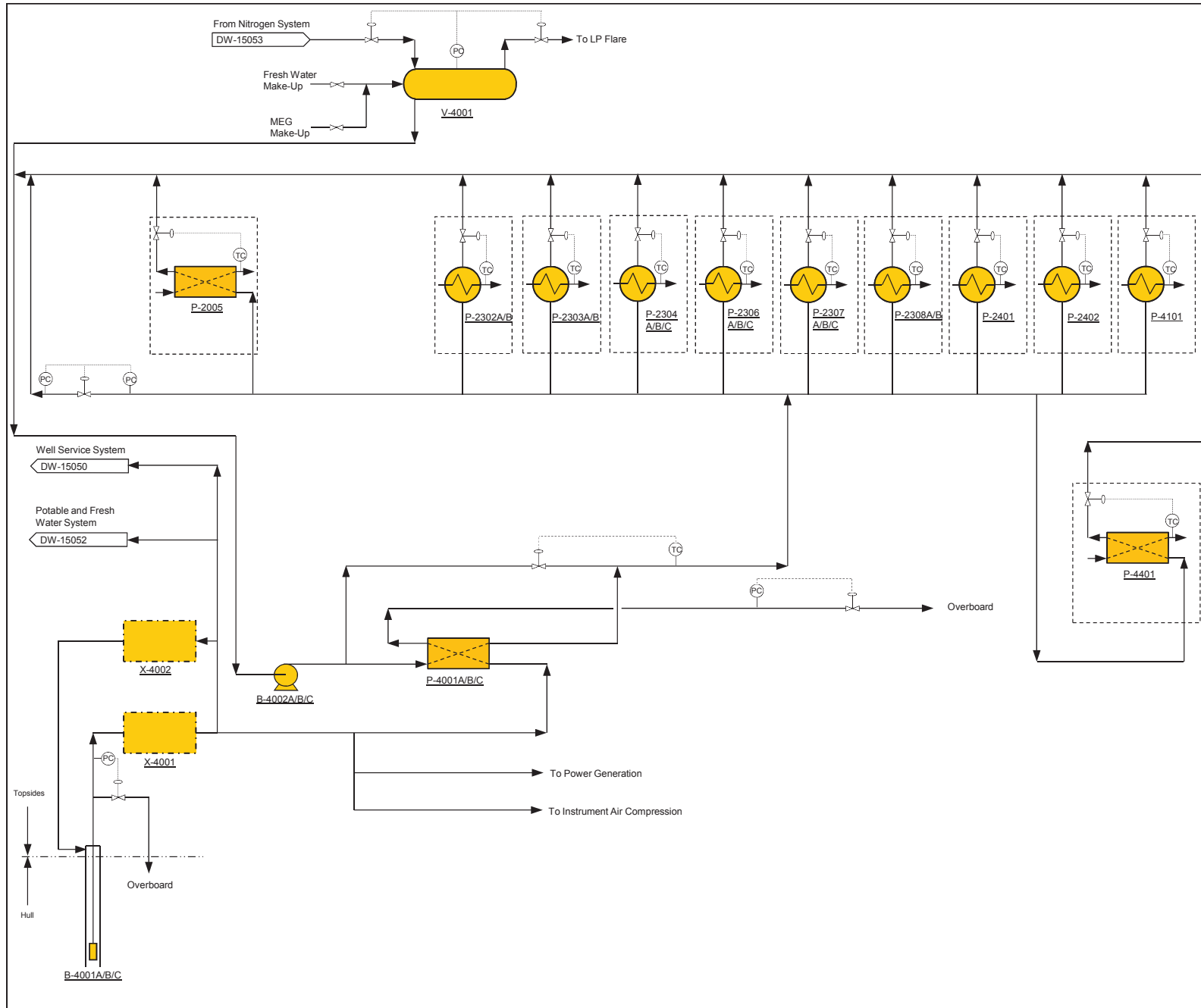
PROJECT: **LIBRA EWT FPSO**

TITLE: **UTILITY FLOW DIAGRAM PRODUCED WATER SYSTEM**

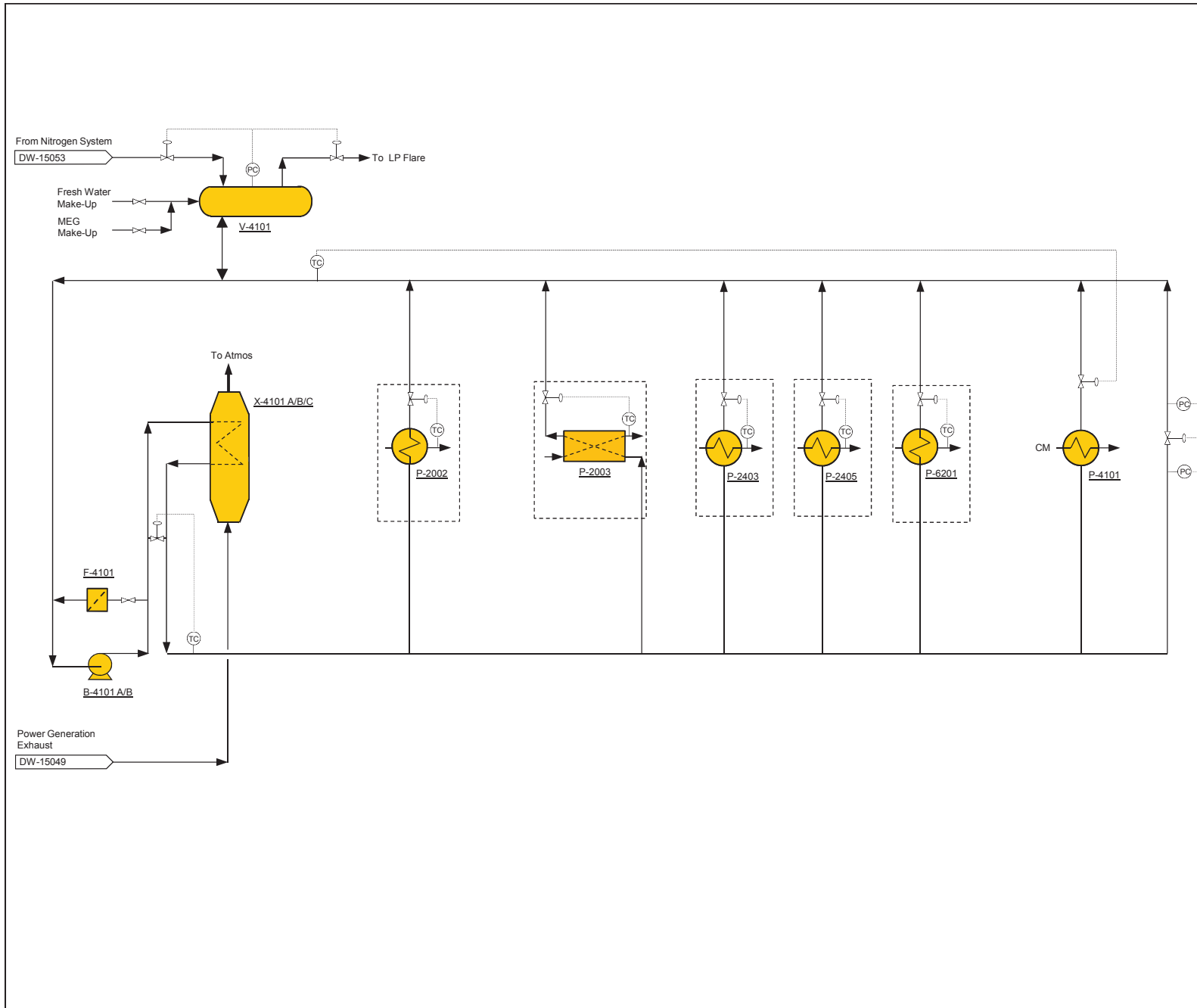
SCALE: UNITS SHEET **01 OF 01**



NUMBER: J20518-A-P-DW-15040 REV. **D1**

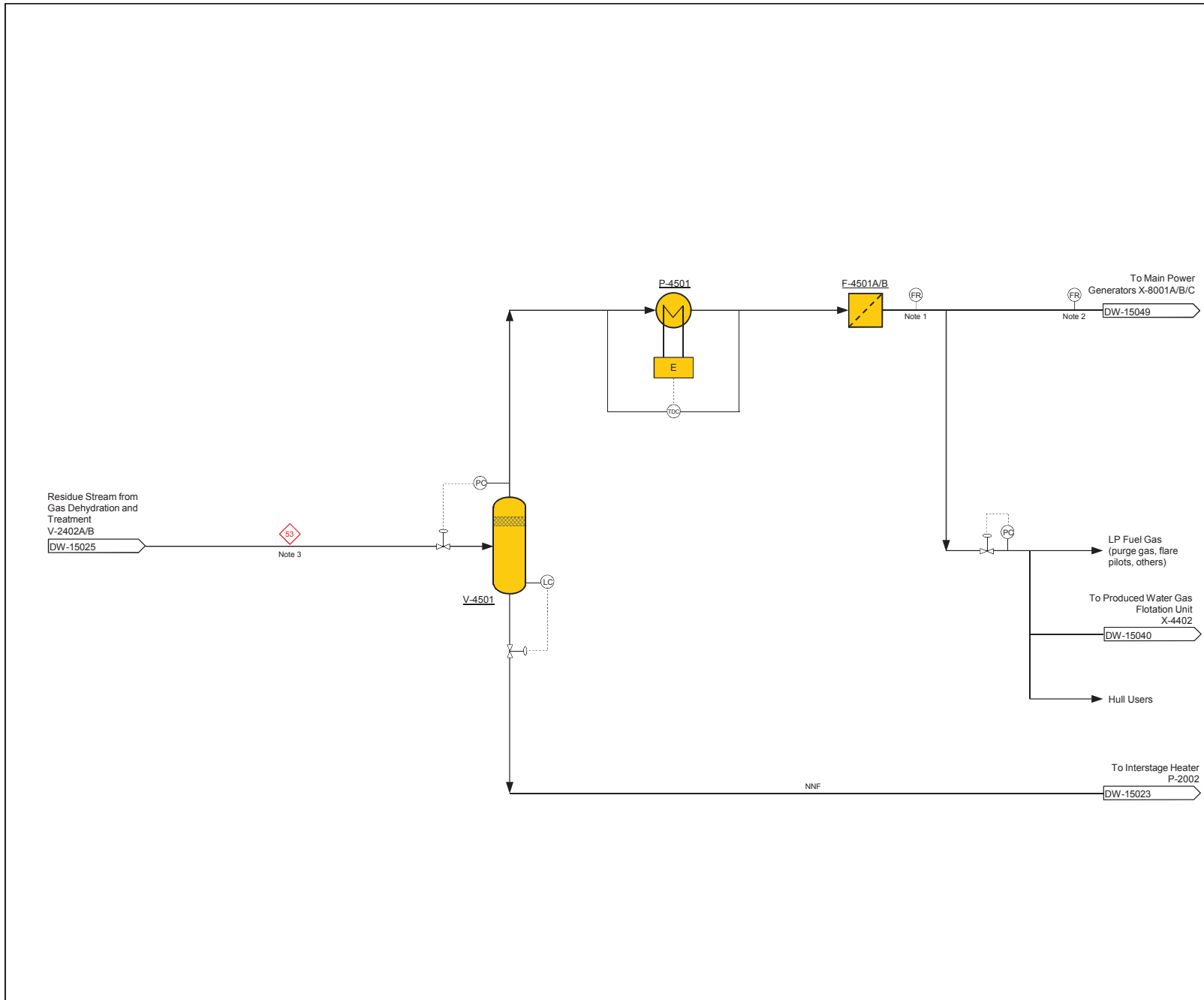




REFERENCE DOCUMENTS			
EQUIPMENT			
TAG	DESCRIPTION	TYPE	CAPACITY
B-4001 A/B/C (3X50%)	Seawater Lift Pump		
B-4002 A/B/C 3x50%	Cooling Medium Circulation Pump		
P-2005	Export Oil Cooler	Plate & Frame	
P-2302A/B	VRU Suction 1 <sup>st</sup> Stage Cooler	Shell & Tube	
P-2303A/B	VRU Suction 2 <sup>nd</sup> Stage Cooler	Shell & Tube	
P-2304 A/B/C	Main Compressor Suction Cooler	Shell & Tube	
P-2306 A/B/C	Reinjection Compressor 1 <sup>st</sup> Stage Aftercooler	Shell & Tube	
P-2307 A/B/C	Reinjection Compressor 2 <sup>nd</sup> Stage Aftercooler	Shell & Tube	
P-2308A/B	Reinjection Compressor 3 <sup>rd</sup> Stage Aftercooler	Shell & Tube	
P-2401	Dehydration Inlet Cooler	Shell & Tube	
P-2402	Dehydration Regeneration Gas Cooler	Shell & Tube	
P-4001 A/B/C	CCCM / Seawater Cooler	Plate & Frame	
P-4101	Heating Medium Trim Cooler	Shell & Tube	
P-4401	Produced Water Cooler Package	Plate & Frame	
V-4001	Cooling Medium Expansion Vessel	Horizontal	
X-4001	Seawater Coarse Filter Package		
X-4002	Hypochlorite Generation Package		
GENERAL NOTES			
KEY PLAN			
D1	20/06/14	Issued Final	JN DP MZW
B4	23/05/14	Re-issued for Client Review	JN DP MZW
B3	09/05/14	Re-issued for Client Review	JN DP MZW
B2	29/04/14	Re-issued for Client Review	DT ED DP
B1	04/04/14	Issued for Client Review	DT ED DP
A1	31/03/14	Issued for Internal Review	DT VM
REV	DATE	DESCRIPTION	EXEC CHECK APPROV
CLIENT			
PROJECT			
LIBRA EWT FPSO			
TITLE			
UTILITY FLOW DIAGRAM COOLING MEDIUM SYSTEM			
SCALE	UNITS	SHEET	01 OF 01
NUMBER	J20518B-P-DW-15041	REV.	D1



REFERENCE DOCUMENTS					
EQUIPMENT					
TAG	DESCRIPTION	TYPE	CAPACITY		
B-4101A/B (2x100%)	Heating Medium Circulating Pumps				
F-4101	Heating Medium Filter				
P-2002	Production Heater	Shell & Tube			
P-2003	Dilution Water Heater	Plate & Frame			
P-2403	Dehydration Regeneration Gas Pre- Heater	Shell & Tube			
P-2405	Membrane Unit Pre-Heater	Shell & Tube			
P-4101	Heating Medium Trim Cooler	Shell & Tube			
P-6201	Hot Diesel Heater	Shell & Tube			
V-4101	Heating Medium Expansion Tank	Horizontal			
X-4101 A/B/C	Waste Heat Recovery Unit				
GENERAL NOTES					
KEY PLAN					
D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-issued for Client Review	JN	DP	MZW
B3	09/05/14	Re-issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-issued for Client Review	VM	ED	DP
B1	04/04/14	Issued for Client Review	VM	ED	DP
A1	31/03/14	Issued for Internal Review	VM	ED	
REV.	DATE	DESCRIPTION	EXEC	CHECK	APPROV
 					
PROJECT			LIBRA EWT FPSO		
TITLE					
UTILITY FLOW DIAGRAM HEATING MEDIUM SYSTEM					
SCALE		UNITS	SHEET		01 OF 01
NUMBER		J20518B-P-DW-15042			REV. D1



REFERENCE DOCUMENTS

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY
F-4501A/B (2x100%)	Fuel Gas Filters		
P-4501 (1x100%)	Fuel Gas Heater	Electric	
V-4501 (1x100%)	Fuel Gas KO Drum	Vertical	

GENERAL NOTES

- 1 - Fiscal Metering - Fuel Gas Total.
- 2 - Fiscal Metering.
- 3 - Fuel gas has maximum of 40% CO2 content.

KEY PLAN

REV	DATE	DESCRIPTION	EXEC	CHECK	APPROV
D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-issued for Client Review	JN	DP	MZW
B3	09/05/14	Re-issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-issued for Client Review	VM	DT	RH
B1	11/04/14	Issued for Client Review	VM	DT	RH
A1	08/04/14	Issued for Internal Review	VM	RH	

CLIENT

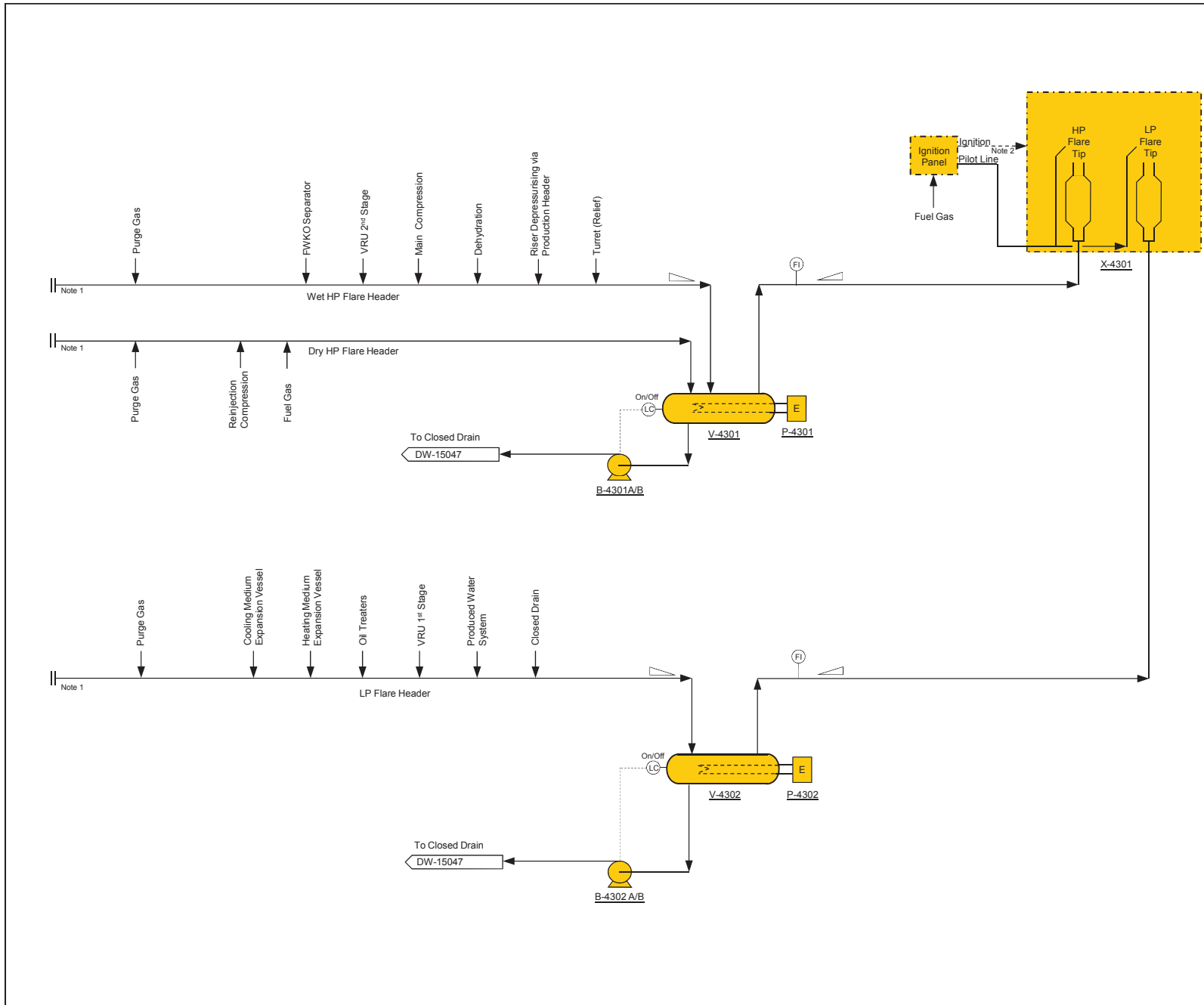
**GENESIS Technip** **ODEBRECHT** Oil & Gas

PROJECT: **LIBRA EWT FPSO**

TITLE: **UTILITY FLOW DIAGRAM FUEL GAS**

SCALE: UNITS: SHEET: **01 OF 01**

NUMBER: J20518-A-DW-15043 REV: D1



REFERENCE DOCUMENTS

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY
B-4301 A/B (2x100%)	HP Flare KO Drum Pumps	Centrifugal	
B-4302 A/B (2x100%)	LP Flare KO Drum Pumps	Centrifugal	
P-4301	HP Flare KO Drum Heater		
P-4302	LP Flare KO Drum Heater		
V-4301	HP Flare KO Drum		
V-4302	LP Flare KO Drum		
X-4301	Flare Tip Package		

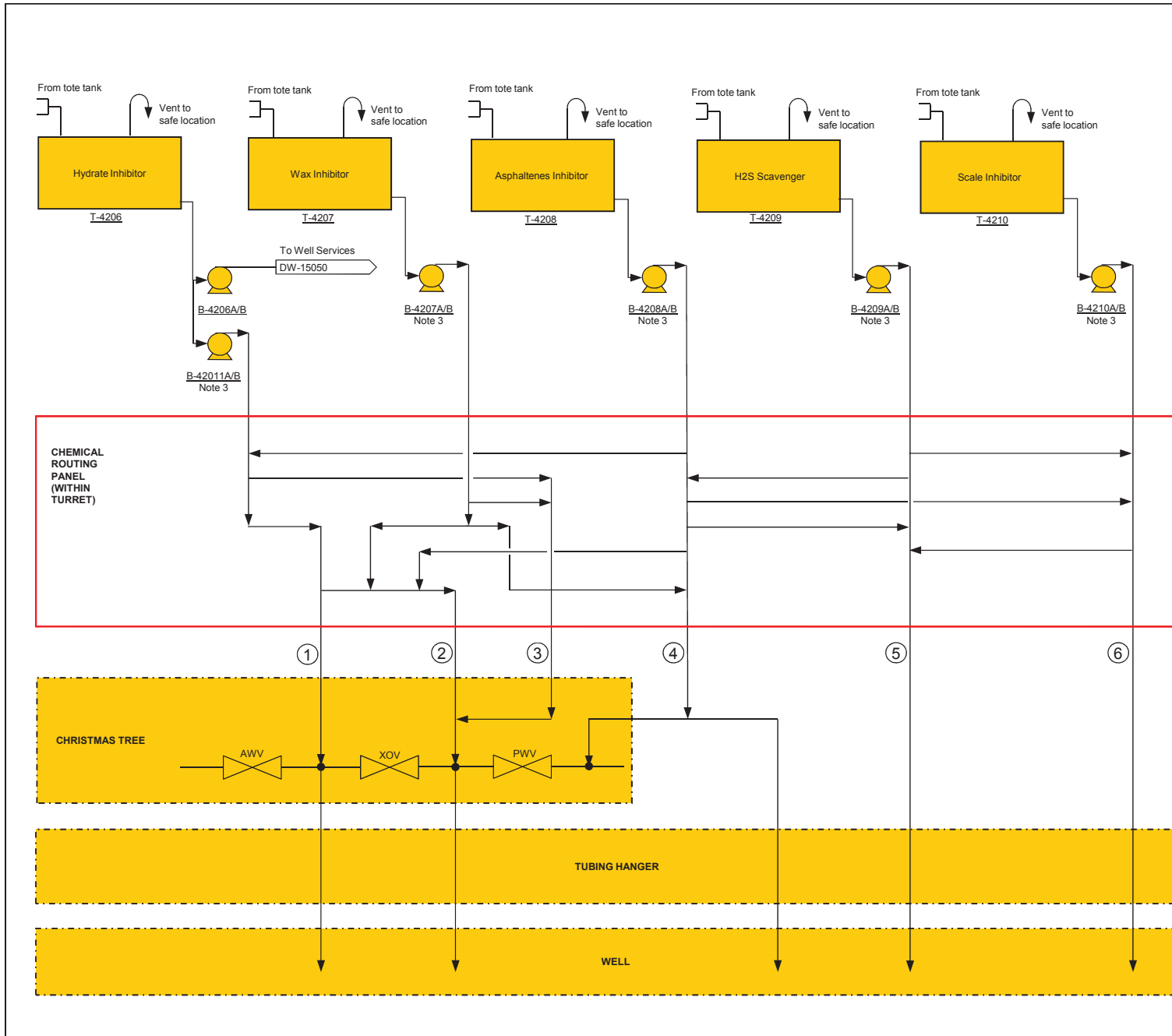
GENERAL NOTES

- 1 – Connections shown to HP & LP flare headers are typical.
- 2 – Ignition system with backup.

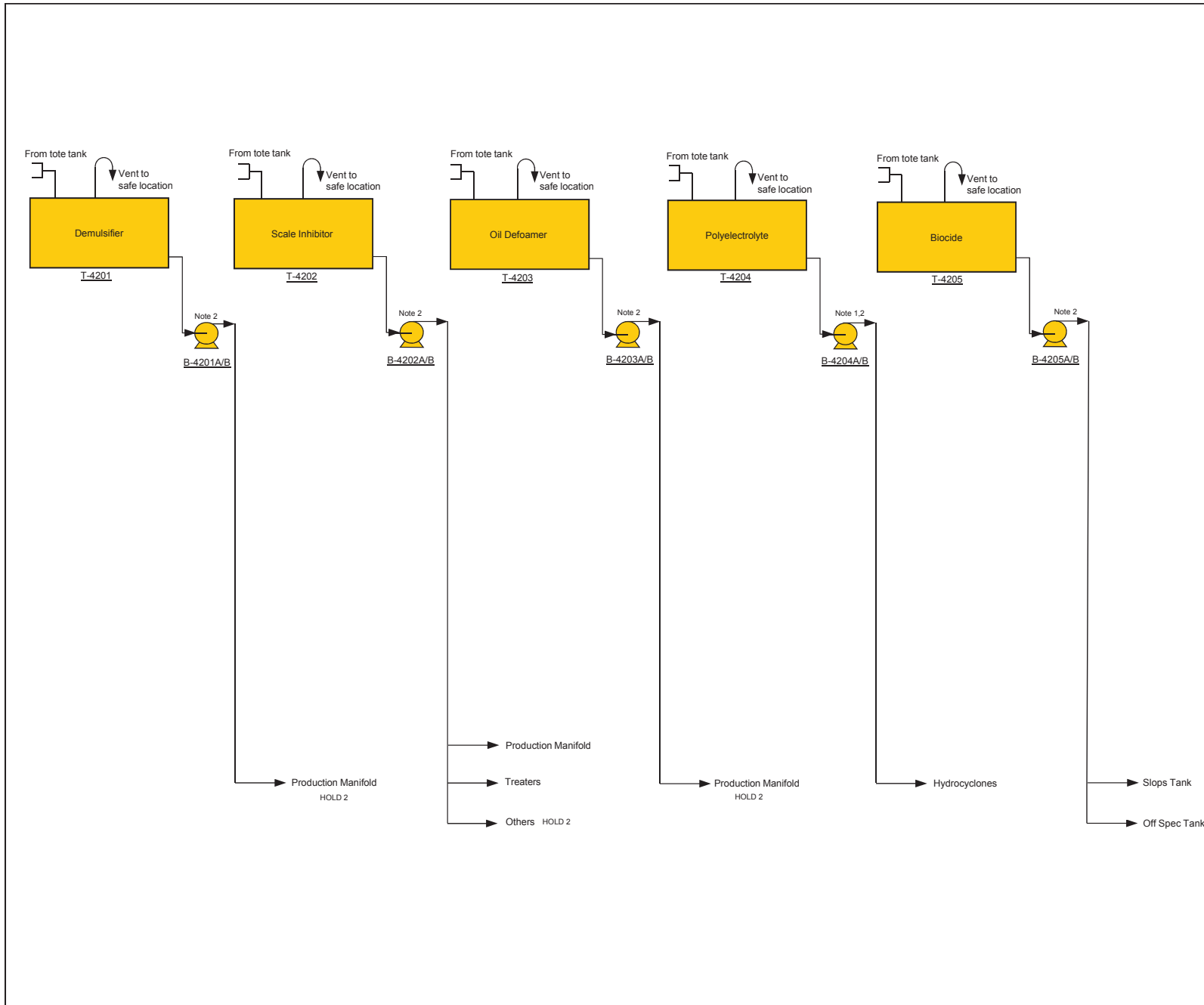
KEY PLAN

D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-issued for Client Review	JN	DP	MZW
B3	09/05/14	Re-issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-issued for Client Review	DT	VM	RH
B1	11/04/14	Issued for client review	DT	VM	RH
A1	07/04/14	Issued for Internal Review	DT	RH	
REV	DATE	DESCRIPTION	EXEC.	CHECK	APPROV

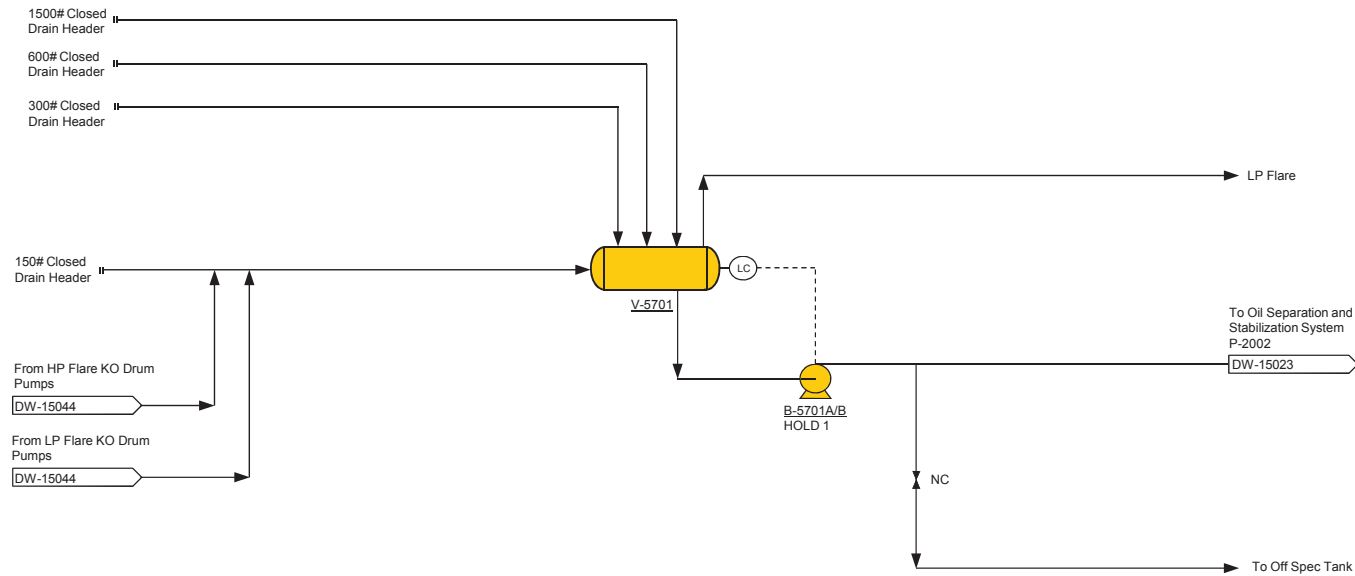
	CLIENT	
PROJECT		
LIBRA EWT FPSO		
TITLE		
UTILITY FLOW DIAGRAM HP/LP FLARE SYSTEM		
SCALE	UNITS	SHEET
		01 OF 01
NUMBER	J20518B-P-DW-15044	REV.
		D1



REFERENCE DOCUMENTS					
EQUIPMENT					
TAG	DESCRIPTION	TYPE	CAPACITY		
B-4206A/B	Hydrate Inhibitor Pump (Well Services)				
B-4207A/B	Wax Inhibitor Pump				
B-4208A/B	Asphaltenes Inhibitor Pump				
B-4209A/B	H2S Scavenger Pump				
B-4210A/B	Scale Inhibitor Pump				
B-4211A/B	Hydrate Inhibitor Pump (Metering)				
T-4206	Hydrate inhibitor Storage Tank		40 m <sup>3</sup>	Note 1,2	
T-4207	Wax Inhibitor Storage Tank		6 m <sup>3</sup>	Note 2	
T-4208	Asphaltenes Inhibitor Storage Tank		6 m <sup>3</sup>	Note 2	
T-4209	H2S Scavenger Storage Tank		14 m <sup>3</sup>	Note 2	
T-4210	Scale Inhibitor Storage Tank		5 m <sup>3</sup>	Note 2	
GENERAL NOTES					
1 - 20 m <sup>3</sup> tank + 20 m <sup>3</sup> storage					
2 - Tank volume per minimum required in GTD I-ET-001 Rev 0.					
3 - Metering Pumps.					
KEY PLAN					
D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-issued for Client Review	JN	DP	MZW
B3	09/05/14	Re-issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-issued for Client Review	JN	DP	RH
B1	11/04/14	Issued for Client Review	JN	DP	RH
A1	07/04/14	Issued for Internal Review	VM		
REV	DATE	DESCRIPTION	EXEC	CHECK	APPROV
		CLIENT 			
PROJECT LIBRA EWT FPSO					
TITLE UTILITY FLOW DIAGRAM SUBSEA CHEMICAL INJECTION SYSTEM					
SCALE	UNITS	SHEET		01 OF 01	
NUMBER	J20518B-P-DW-15045	REV.	D1		



REFERENCE DOCUMENTS					
EQUIPMENT					
TAG	DESCRIPTION	TYPE	CAPACITY		
B-4201A/B	Demulsifier Pumps				
B-4202A/B	Scale Inhibitor Pumps				
B-4203A/B	Defoamer Pumps				
B-4204A/B	Polyelectrolyte Pumps				
B-4205A/B	Biocide Pumps				
T-4201	Demulsifier Storage Tank		2 m³		
T-4202	Scale Inhibitor Storage Tank		5 m³		
T-4203	Oil Defoamer Storage Tank		5 m³		
T-4204	Polyelectrolyte Storage Tank		5 m³		
T-4205	Biocide Storage Tank				
GENERAL NOTES					
1 - Polyelectrolyte shall be diluted on line with fresh water . The dilution range shall be adjusted from 0.5% to 20% of polyelectrolyte. 2 - Metering pumps.					
HOLD					
1 - Storage tank volumes are minimum required as per the GTD. 2 - Additional locations for injection					
D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-issued for Client Review	JN	DP	MZW
B3	09/05/14	Re-issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-issued for Client Review	LD	DT	RH
B1	11/04/14	Issued for Client Review	LD	DT	RH
A1	08/04/14	Issued for Internal Review	VM	RH	
REV	DATE	DESCRIPTION	EXEC	CHECK	APPROV
CLIENT					
PROJECT					
LIBRA EWT FPSO					
TITLE					
UTILITY FLOW DIAGRAM TOPSIDES CHEMICAL INJECTION SYSTEM					
SCALE	UNITS	SHEET		01 OF 01	
NUMBER	J20518B-P-DW-15046			REV. D1	



REFERENCE DOCUMENTS

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY
B-5701 (2x100%)	Closed Drain Pump		
V-5701	Closed Drain Vessel		

GENERAL NOTES

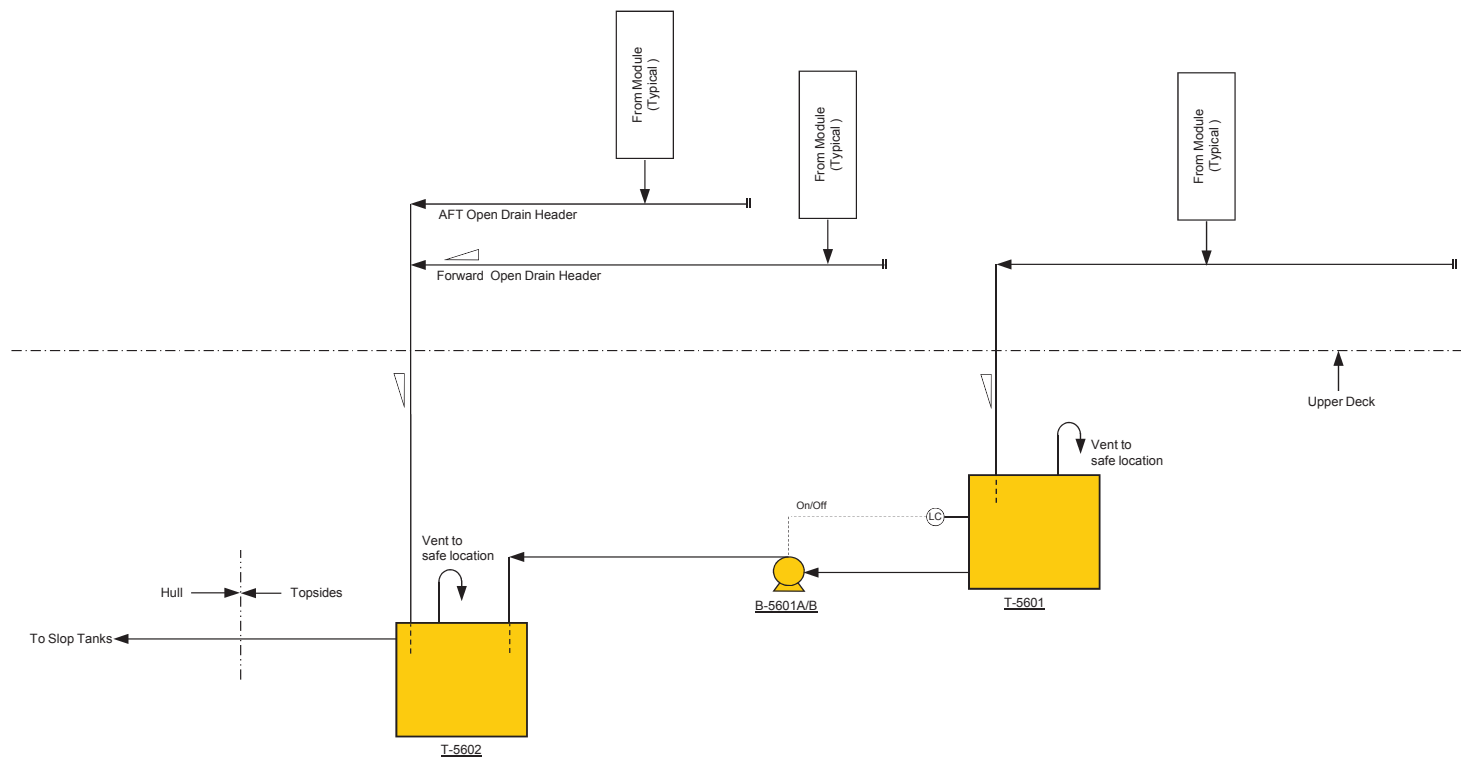
HOLD

1 - Type of Pump - Horizontal or Vertical mounted inside Vessel.

KEY PLAN

D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-Issued for Client Review	JN	DP	MZW
B3	09/05/14	Re-Issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-Issued for Client Review	DT	LD	RH
B1	11/04/14	Issued for Client Review	DT	LD	RH
A1	07/04/14	Issued for Internal Review	DT	RH	
REV.	DATE	DESCRIPTION	EXEC	CHECK	APPROV.

	CLIENT
PROJECT	LIBRA EWT FPSO
TITLE	UTILITY FLOW DIAGRAM CLOSED DRAIN SYSTEM
SCALE	UNITS SHEET
	01 OF 01
NUMBER	J20518B-P-DW-15047
REV.	D1



REFERENCE DOCUMENTS

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY
T-5601	Non-Hazardous Area Open Drains Tank		
T-5602	Hazardous Area Open Drains Tank		
B-5601A/B (2x100%)	Non-Hazardous Area Open Drains Tank Pumps		

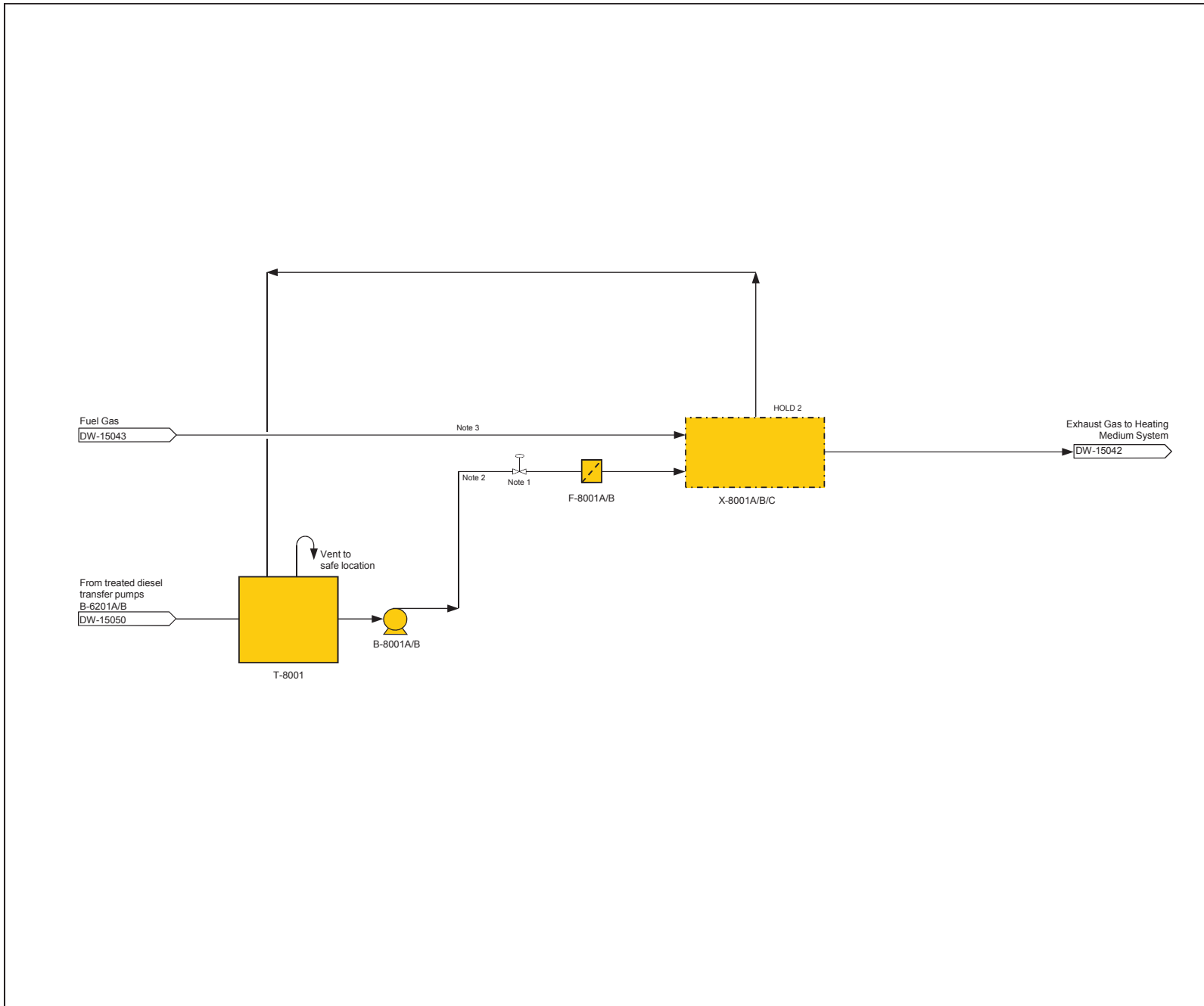
GENERAL NOTES

KEY PLAN

D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-issued for Client Review	JN	DP	MZW
B3	09/05/14	Re-issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-issued for Client Review	JN	DP	MW
B1	11/04/14	Issued for Client Review	JN	DP	MW
A1	08/04/14	Issued for Internal Review	VM	RH	
REV	DATE	DESCRIPTION	EXEC.	CHECK	APPROV

	CLIENT
PROJECT	
LIBRA EWT FPSO	
TITLE	
UTILITY FLOW DIAGRAM OPEN DRAIN	
SCALE	UNITS SHEET
	01 OF 01
NUMBER	REV.
J20518B-P-DW-15048	D1





REFERENCE DOCUMENTS

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY
B-8001A/B (2x100%)	Power Generation Diesel Transfer Pump	Centrifugal	16m <sup>3</sup> /h
F-8001A/B (2x100%)	Diesel Filter Coalescer		
T-8001	Main Power Generation Diesel Day Tank		200m <sup>3</sup>
X-8001 A/B/C	Main power generation package		

GENERAL NOTES

- 1 - Provision for auto changeover to diesel on fuel gas low pressure or fuel gas low temperature.
- 2 - Diesel to be used during start up and when insufficient fuel gas for power generation.
- 3 - Fuel gas has maximum of 40% CO2 content.

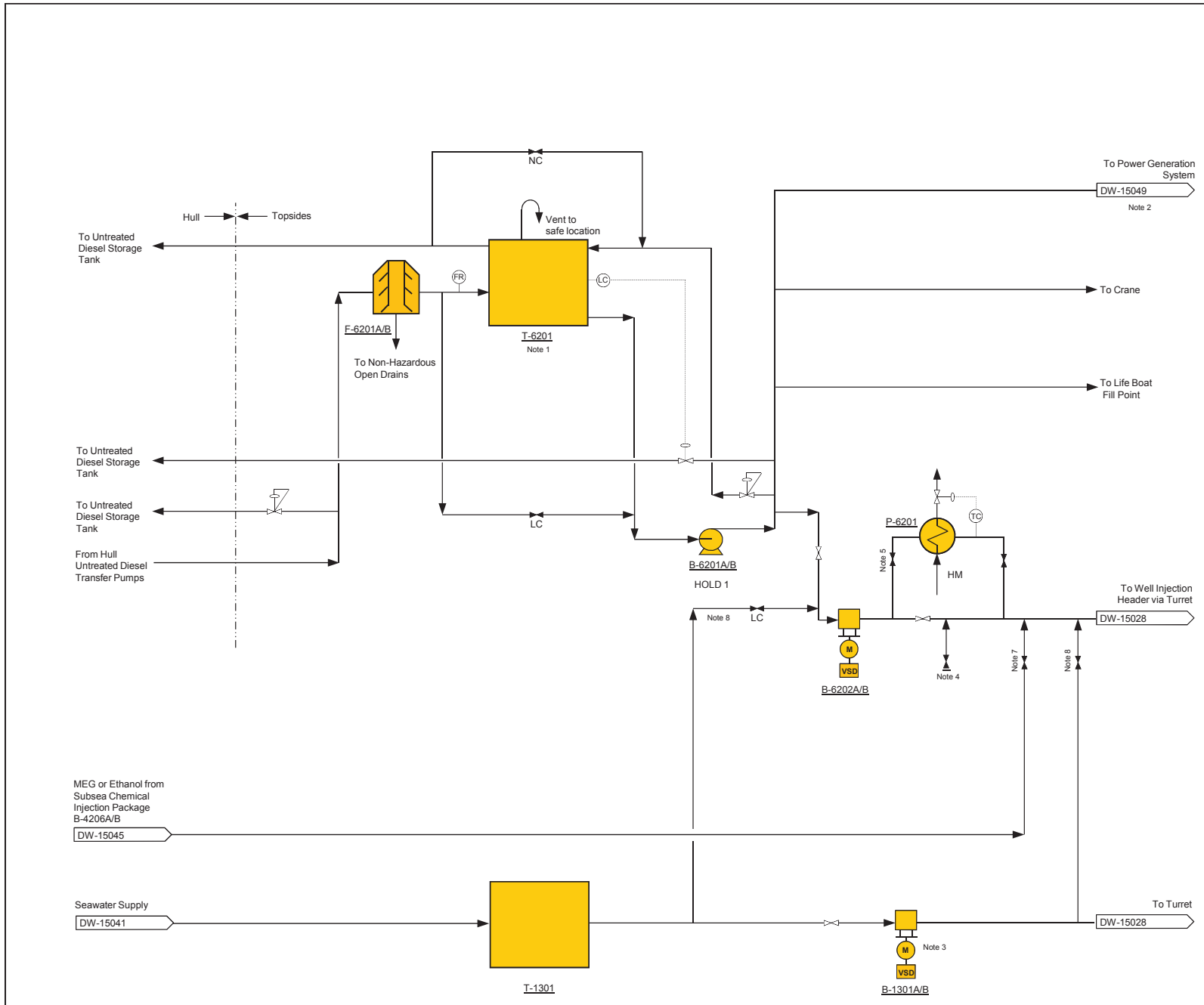
HOLDS

- 1 - Deleted
- 2 - Details of power generation facilities to confirmed by GE.

KEY PLAN

D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-issued for Client Review	JN	DP	MZW
B3	09/05/14	Re-issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-issued for Client Review	VM	LD	RH
B1	11/04/14	Issued for Client Review	VM	LD	RH
A1	08/04/14	Issued for Internal Review	VM	RH	
REV	DATE	DESCRIPTION	EXEC	CHECK	APPROV.

	CLIENT
PROJECT	
LIBRA EWT FPSO	
TITLE	
UTILITY FLOW DIAGRAM POWER GENERATION SYSTEM	
SCALE	UNITS
	SHEET
	01 OF 01
NUMBER	REV.
J20518B-P-DW-15049	D1



REFERENCE DOCUMENTS

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY
B-1301A/B (2x100%)	Leak Test Pump	Reciprocating	5m³/h
B-6201A/B (2x100%)	Treated Diesel Transfer Pump	Centrifugal	60m³/h
B-6202A/B (2x100%)	Well Service Pump	Reciprocating	60m³/h
F-6201A/B (2x100%)	Diesel Centrifuge		60m³/h
P-6201	Diesel Heater	Shell & Tube	
T-6201	Treated Diesel Storage Tank		60m³
T-1301	Service Tank		

GENERAL NOTES

- 1 - Treated diesel storage tank capacity should be sufficient to supply one hour at peak consumption.
- 2 - Power Generators provided with diesel day tank.
- 3 - Leak Test Pumps to be connected to Production, Service and Gas Injection risers in turret.
- 4 - One permanent and dedicated line from bunkering station to be provided to perform remote operations from Special Purpose Boats (squeeze, etc.)
- 5 - Hot Diesel for flushing operations.
- 6 - Deleted
- 7 - For commissioning of service riser.
- 8 - Well Service Pump to fill risers with water whilst the Leak Test Pump shall pressurise the riser up to leak test pressure.

HOLDS

- 1 - Capacity of pumps for simultaneous supply of diesel to power generation and well services.

KEY PLAN

D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-issued for Client Review	JN	DP	MZW
B3	09/05/14	Re-issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-issued for Client Review	LD	DT	RH
B1	11/04/14	Issued for Client Review	LD	DT	RH
A1	08/04/14	Issued for Internal Review	LD	RH	
REV.	DATE	DESCRIPTION	EXEC.	CHECK	APPROV.

CLIENT

**GENESIS**  
*Technip*

**ODEBRECHT**  
Oil & Gas

PROJECT

**LIBRA EWT FPSO**

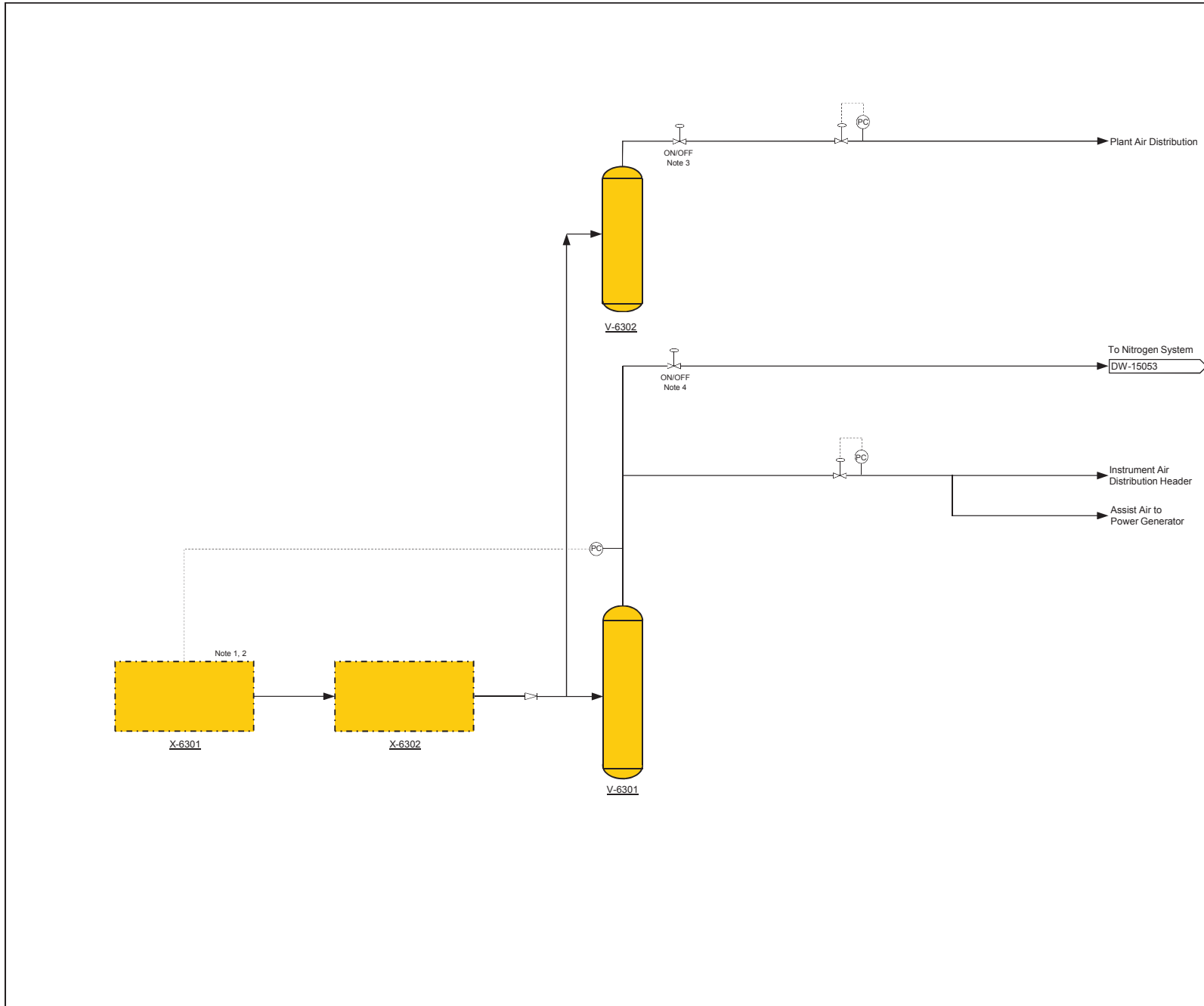
TITLE

**UTILITY FLOW DIAGRAM  
WELL SERVICE/DIESEL SYSTEM**

SCALE UNITS SHEET

01 OF 01

NUMBER J20518B-P-DW-15050 REV. D1



REFERENCE DOCUMENTS

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY
V-6301	Dry Air Receiver	-	
V-6302	Plant Air Receiver	-	
X-6301	Air Compressor Package	-	
X-6302	Air Dryer Package		

GENERAL NOTES

- 1 - Package includes 2x100% air compressor. Each compressor to be provided with intake filter. Aftercooler and moisture separator.
- 2 - 1x100% air compressor to be powered by auxiliary power generator to allow black restart.
- 3 - Low low pressure trip shuts plant air to preserve Nitrogen and Instrument Air supply.
- 4 - Low low pressure trip shuts supply to Nitrogen Generator to preserve Instrument Air supply for safe shutdown of topsides.

KEY PLAN

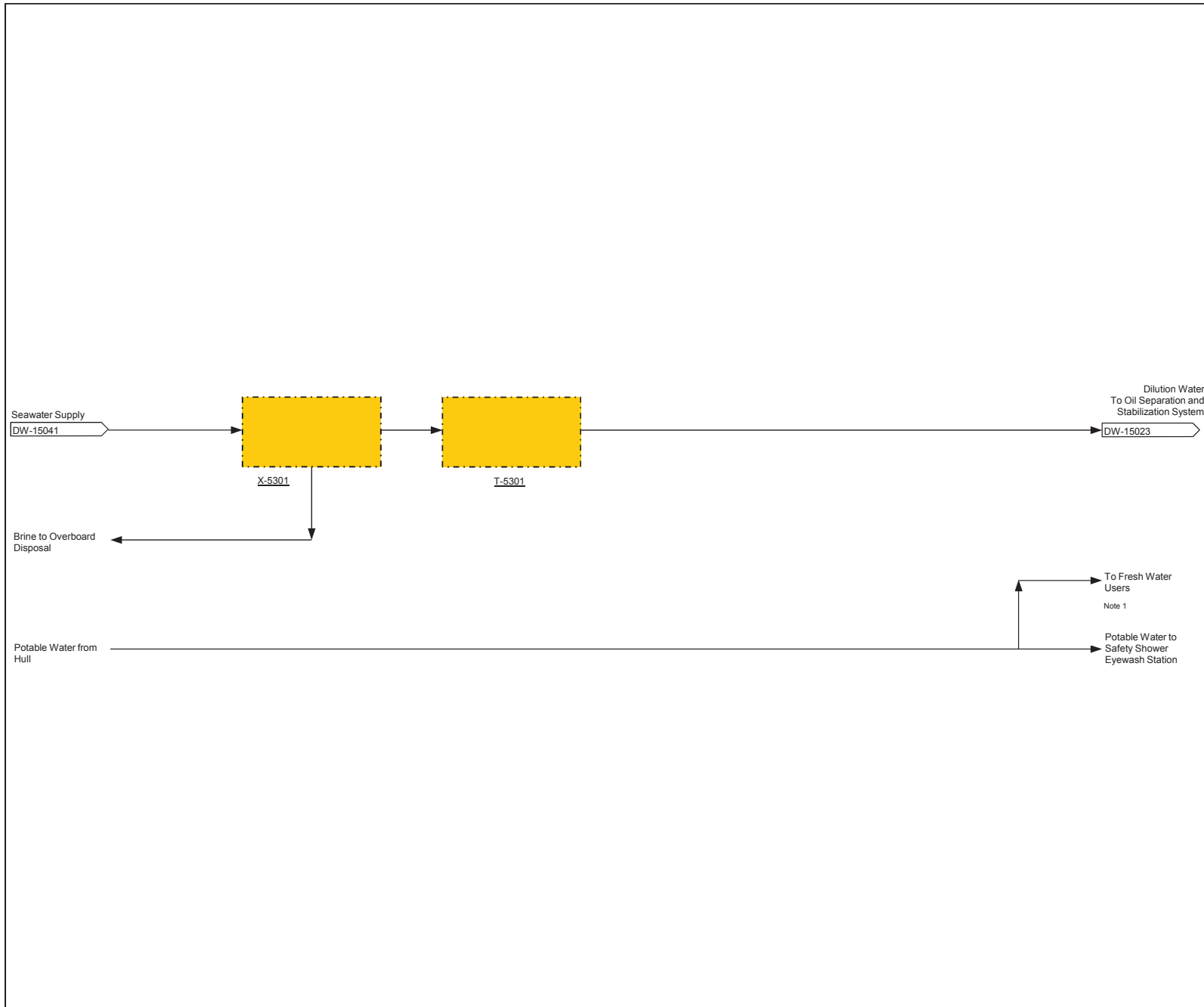
D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-issued for Client Review	JN	DP	MZW
B3	09/05/14	Re-issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-issued for Client Review	DT	VM	RH
B1	11/04/14	Issued for Client Review	DT	VM	RH
A1	07/04/14	Issued for Internal Review	DT	VM	
REV	DATE	DESCRIPTION	EXEC	CHECK	APPROV

CLIENT

PROJECT LIBRA EWT FPSO

TITLE  
**UTILITY FLOW DIAGRAM  
INSTRUMENT AND SERVICE AIR**

SCALE	UNITS	SHEET
		<b>01 OF 01</b>
NUMBER	J20518B-P-DW-15051	REV. D1



REFERENCE DOCUMENTS

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY
T-5301	Dilution Water Tank		
X-5301	Dilution Water Maker Package		

GENERAL NOTES

1 – Fresh water for heating medium make-up, utility stations and other users.

KEY PLAN

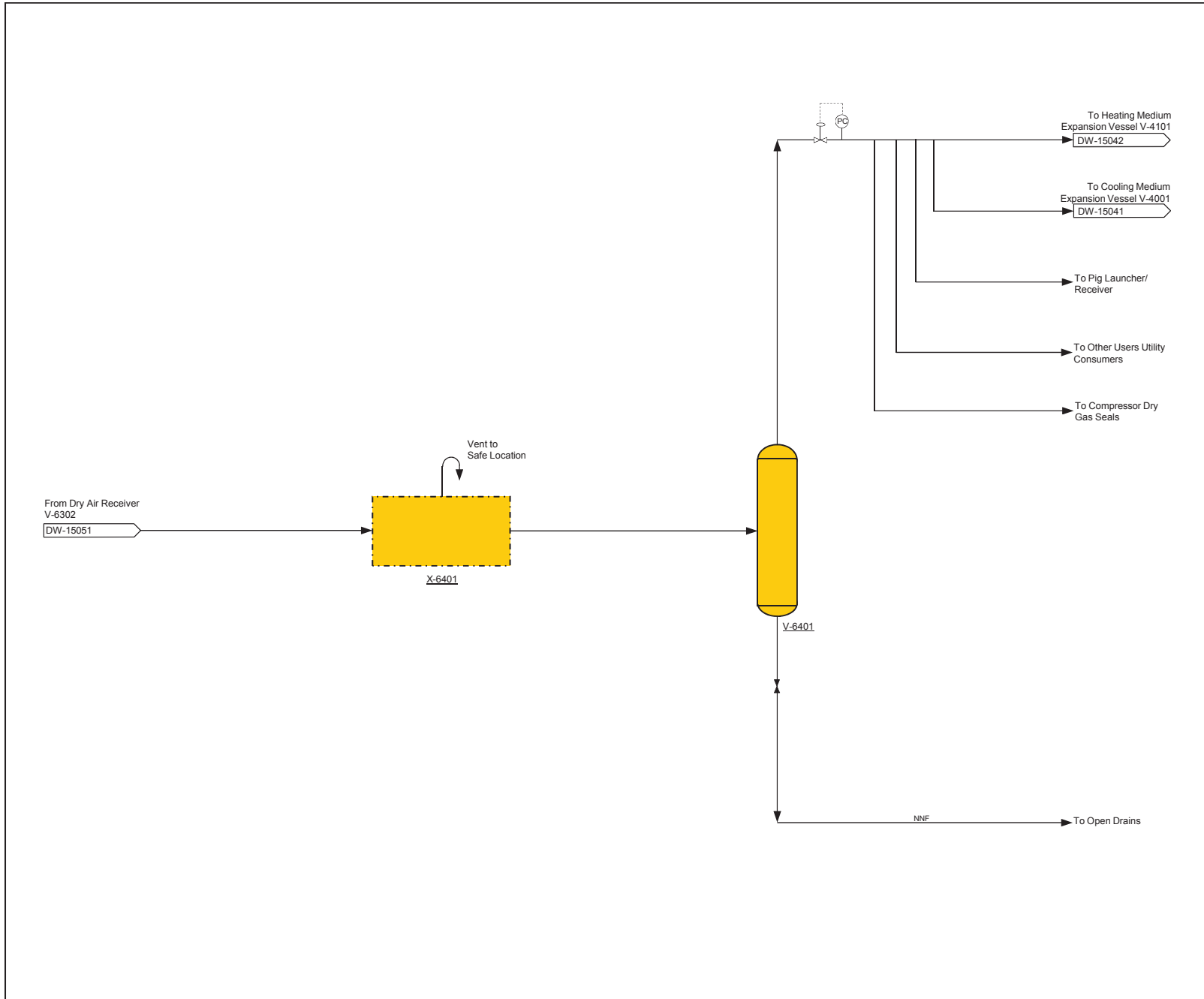
D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-issued for Client Review	JN	DP	MZW
B3	09/05/14	Re-issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-issued for Client Review	LD	DT	RH
B1	11/04/14	Issued for Client Review	LD	DT	RH
A1	08/04/14	Issued for Internal Review	LD	RH	
REV	DATE	DESCRIPTION	EXEC	CHECK	APPROV

CLIENT

PROJECT LIBRA EWT FPSO

TITLE  
**UTILITY FLOW DIAGRAM  
 POTABLE AND FRESH WATER  
 SYSTEM**

SCALE	UNITS	SHEET
		01 OF 01
NUMBER	J20518B-P-DW-15052	REV. D1



REFERENCE DOCUMENTS

EQUIPMENT

TAG	DESCRIPTION	TYPE	CAPACITY
V-6401	Nitrogen Buffer Vessel		
X-6401	Nitrogen Generation Package		

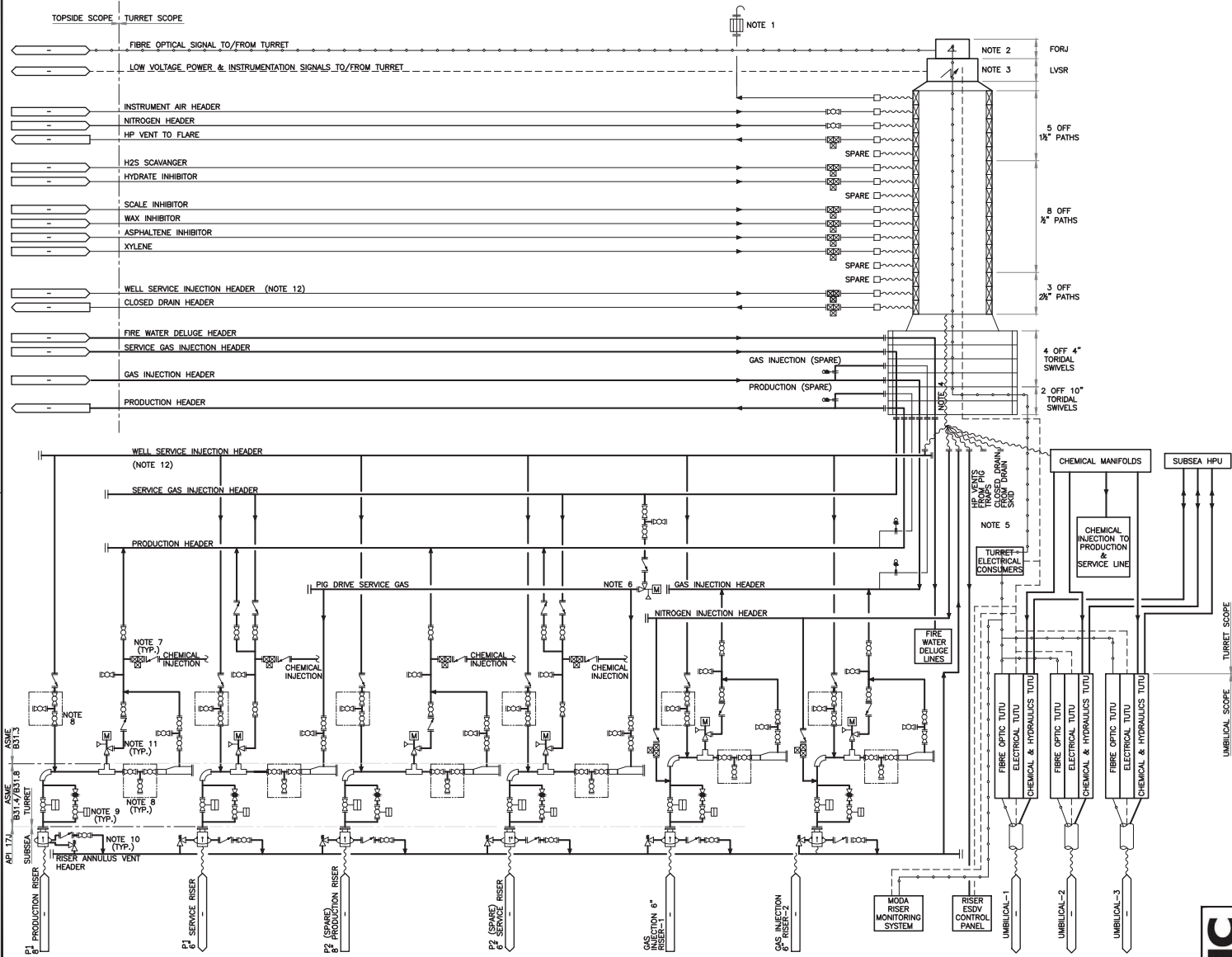
GENERAL NOTES

KEY PLAN

D1	20/06/14	Issued Final	JN	DP	MZW
B4	23/05/14	Re-issued for Client Review	JN	DP	MZW
B3	09/05/14	Re-issued for Client Review	JN	DP	MZW
B2	29/04/14	Re-issued for Client Review	DT	VM	RH
B1	11/04/14	Issued for Client Review	DT	VM	RH
A1	08/04/14	Issued for Internal Review	DT	RH	
REV.	DATE	DESCRIPTION	EXEC.	CHECK	APPROV.

		CLIENT 	
PROJECT <b>LIBRA EWT FPSO</b>			
TITLE <b>UTILITY FLOW DIAGRAM NITROGEN SYSTEM</b>			
SCALE	UNITS	SHEET <b>01 OF 01</b>	
NUMBER J20518A-P-DW-15053	REV. D1		

DO NOT SCALE: IF IN DOUBT, ASK



**NOTES:**

1. RISER ANNULUS VENT TO ATMOSPHERE VIA FLAME ARRESTER LOCATED AT SAFE LOCATION ON GANTRY.
2. FORJ – FIBRE OPTIC ROTARY JOINT.
3. LVSR – LOW VOLTAGE SLIP RING.
4. HOSE BUNDLE CONSISTING OF ALL HOSES FROM RESPECTIVE UTILITY PATHS.
5. CLOSED DRAINS FROM DRAIN SKID AND H.P. VENTS FROM PIG TRAPS WILL BE DETAILED AT LATER STAGE.
6. PIG DRIVE GAS DERIVED FROM SERVICE HEADER AND CONTROLLED VIA AUTOMATIC CHOKE VALVES.
7. CHEMICAL INJECTION ON PRODUCTION AND SERVICE LINES.
8. DOUBLE BLOCK & BLEED VALVE MODULAR ASSEMBLY.
9. AN BYPASS IS PROVIDED FOR RISER DEPRESSURISATION.
10. ALL THE ANNULUS VENT LINES SHALL BE MONITORED USING PRESSURE TRANSMITTERS AND SHALL ALSO HAVE RELIEF SYSTEMS AS PER TECHNICAL SPECIFICATION – I-ET-3010.00-5529-812-PAZ-001.
11. ALL THE CHOKES ON ALL RISER LINES SHALL BE AUTOMATIC WITH MANUAL OVER-RIDE.
12. WELL SERVICE INJECTION HEADER SHALL FACILITATE INJECTION OF FOLLOWING SERVICES INTO TURRET RISER PIPING.
  - DIESEL INJECTION
  - HOT DIESEL INJECTION
  - ETHANOL
  - MEG
  - LEAK TEST FLUID

ID	DWG No.	DESCRIPTION
REFERENCE DRAWINGS		
A02	19.05.14	RE-ISSUED FOR REVIEW
A01	25.04.14	ISSUED FOR REVIEW
REV	DATE	DESCRIPTION

	DESIGN: ODERBRECHT	PROJECT: PETROBRAS EWT FP SO LIBRA
	TURRET PROCESS FLOW DIAGRAM	
	SCALE: A3	CLIENT DWG No: -
	NTS	LMC DWG No: 8443-LMC-PIP-DWG-0002
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