

Sun Petrochemicals Private Limited

(SunPetro)

Commercial & Supply Chain Management

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CIN: U24219GJ1995PTC028519

No. SunPetro/Gujarat/Well Fluid/2023-24/SPPL-164/Bulletin-4

Date:20.02.2024

BULLETIN #4

Sub: Additional Well Fluid Processing Train & Associated Equipment at CPF, Bhaskar Field.

Ref: Tender No.: SunPetro/Gujarat/Well Fluid/2023-24/SPPL-164

Sun Petrochemicals Private Limited (SunPetro), hereby authorized following amendment / clarification in the above referred Tender:

A) Revised Scope of Work / Responsibility Matrix / Price Schedule

Bidder to note the changes incorporated in tender Section-4, Section-5 & Section-7 as below and remaining section of the tender remains unchanged:

1	Scope of Work (Section-4)	Modification in Scope of Work highlighted in Red Font and deletion is strike through – Refer Section-4A & 5A
2	Responsibility Matrix (Section-5)	
3	Price Schedule (Section-7)	<p>Proposed changes done in Price Schedule and highlighted in Red Font and deleted requirement is indicated as strike through.</p> <p>Bidder to submit Price Bid as per revised Price Schedule format as attached at Section-7A.</p> <p>Submission of Bid- Your wax sealed bid (ENVELOPE-I and ENVELOPE-II), complete in every respect & strictly in accordance with the Terms & condition in the Tender Documents, are to be submitted through one waxed envelope containing both envelopes as described above, at the reception of “Tendering Office” as detailed above, on or before Due date of Submission.</p>

B) Clarification on Bidder Query

Sr. No.	Ref No./Page No	Reference Clause	Bidder Queries	SunPetro Response
1	Tender-SPPL-164-WFPT Equipment-250124 Pg 48 of 85 Scope of Work for Additional process facilities (Train-2) at CPF.	C. (a) 7. Hot oil unit with expansion tank.	As per bidder's understanding Hot oil unit consist of pump, Heater, chimney etc with new expansion tank is in bidder's scope. Kindly provide the existing hot oil unit with expansion tank P&ID & technical documents for better understanding.	Existing Expansion tank shall be modified with strengthening of structure
2	Tender-SPPL-164-WFPT Equipment-250124 Pg 48 of 85 Scope of Work for Additional process facilities (Train-2) at CPF.	C. (a) 7.Hot oil unit with expansion tank.	As per bidder's understanding there is no scope of modification of existing hot oil unit and expansion tank.	Piping of existing expansion tank and HOU shall be connected with isolation valves with New Unit.

3	Tender-SPPL-164-WFPT Equipment-250124 Pg 48 of 85 Scope of Work for Additional process facilities (Train-2) at CPF.	C. (b) 17. Interconnecting Piping for gravity chemical Injection system (Vessel free Issue by SunPetro) with process units.	Kindly give us proper understanding regarding civil scope & provide reference P&ID, drawings for better understanding.	P&ID attached as Annexure -4 with bulletin
4	-	-	Inlet Stream composition for simulation – specified (In bulletin #2) however pressure, temperature, flow at Inlet of Train 2 is required	- Operating Pressure: 7 kg/cm ² - Temperature: 30-45 ° C - Flow - 20,000 BLPD (max)
5	-	-	Does the gas from the HP and LP separators routed to flare?	Routing indicated in Annexure - A
6	-	-	Where the vapour recovery column Gas routed?	Routing indicated in Annexure - A
7	-	-	Does existing flare system to be used?	Yes
8	-	-	Kindly provide clarity about Relief system.	Part of Deign & Engineering
9	-	-	Does SIL to be considered?	NA
10	-	-	What Oil RVP to be maintained?	RVP shall be maintained below 10 PSI.
11	-	-	Final PFD	Attached as Annexure - A
12	-	-	Existing P&ID (if available)	Attached as Annexure - B
13	-	-	Process Parameters like Pressure, Temperature and Flow rate of the fluids	Refer Sr. No 1
14	-	-	Tie-in Points/Hook up points mark up in layout.	Indicated in PFD and shall be finalised during detailed engineering
15	-	-	Marked layout mentioning the area allotted for Train 2	Indicated in SoW
16	-	-	Existing Flare Line Layout	Indicated in Plot Plan
17	-	-	Power Source and Existing Cable Routing	Shall be sourced from existing MCC room and cable shall be routed parallel to existing cable route outside the cable trench but UG.
18	-	-	SLD	Attached as Annexure - C
19	-	-	Existing DCS details	Attached as Annexure - D
20	-	-	Are we going to use Existing Vapor Recovery Column	Yes
21	-	-	Pls mention the scope of Blue Lines in P&ID	These are existing lines, only for info
22	-	-	Whether Surge tank vent is open to atmosphere	Surge controller doesn't have vent
23	-	-	Flare pipe support structure and foundation details	Shall be shared during detailed engineering

All other terms and conditions of the tender remain unchanged.

Regards,

Sun Petrochemicals Pvt. Ltd

REVISED

❖ SCOPE OF WORK (Section-4A)

❖ RESPONSIBILITY MATRIX (Section-5A)

❖ PRICE SCHEDULE (Section-7A)

SECTION-4A

SCOPE OF WORK

SCOPE OF WORK FOR DESIGN, ENGINEERING, PROCUREMENT, FABRICATION, TRANSPORTATION, INSTALLATION & COMMISSIONING OF ADDITIONAL TRAIN FOR HANDLING 20,000 BLPD WELL FLUID.

A. Introduction:

Sun Petrochemicals Pvt Ltd., (SunPetro) is an Oil & Gas company producing Oil & gas from its various Oil & gas fields located in the state of Gujarat.

SunPetro is presently operating following fields with 100 % Participating Interest:

- Bhaskar-I
- Hazira
- Baola
- Modhera

SunPetro is producing cumulatively about 7500 BOEPD from its fields.

In addition, SunPetro has been awarded 6 blocks/fields in offshore Gulf of Khambhat & Gulf of Kutch. The total acreage of the blocks is about 4500 Sq Km.



Fig-1, Overview of SunPetro fields

Bhaskar-I field is spread across an area of 72 sq.km near Khambhat, Anand district, Gujarat. The field is having presently around 21 producing wells and Central processing facility (CPF) and Water Injection plant. The well fluids from the wells are routed to CPF through collector pipeline (6") for processing at CPF. The processed crude oil is stored in crude oil storage tanks and is pumped through 10" Export pipeline to IOCL Bareja Terminal. In addition, a Water injection plant is also installed in the field for pressure maintenance of the field.

The present scope of work is for Design, Engineering, Procurement, Fabrication, Transportation, Installation & Commissioning of Additional Train for Handling 20,000 BLPD Well Fluid along with the required heating facility and its integration with existing facilities in the plant.

B. Description of existing facility at CPF:

The processing capacity of existing train at CPF is as below:

- I. Well fluid: 12,000 BLPD.
- II. Gas: 50,000 SCMD (GOR: 25 v/v)

At the CPF the Well Fluid undergoes phase separation and is treated in HP, LP and Vapor recovery unit for achieving the Reid vapor pressure and water content requirement of the Crude Oil for export to the refinery. Produced water is further treated in Produced water treatment facility for its disposal in injection/disposal wells. Separated gas from the well fluid is routed to nearby consumers and is equipped with zero gas flaring system etc.

Apart from the above plant is equipped with other facilities like Firefighting system, Servo gas system, Fire and gas system, Distributed control system.



Fig-2, Location of Train 2 at CPF

C. Scope of Work for Additional process facilities (Train-2) at CPF:

a. Description

It is proposed to install an additional processing train (Train-2) at CPF next to existing Train-1 for handling additional production from field. The work involves design, engineering, procurement, fabrication, transportation, installation, hook up & commissioning of Train-2 and associated works.

Train-2 shall be designed for the following flowrate:

I. Well fluid: 20,000 BLPD.

II. Gas: 1,60,000 SCMD (GOR: 50 v/v)

Well fluid of Train-2 shall be treated in the same manner as of Train-1.

Train-2 shall consist of the following components:

1. Surge Killer
2. HP separator
3. LP Separator
4. Well Fluid – Crude oil Heat Exchanger
5. Crude oil – Hot oil Heat Exchanger
- ~~6. Tank vapor recovery unit (TVRU) (Requirement Deleted)~~
7. Hot oil unit with use of existing expansion tank with increased capacity, the existing structure shall be used after strengthening.
8. Interconnecting piping with valves
9. Hot insulation for vessels, exchangers, and piping
10. Instrumentation and controls, Hooking up with existing DCS (Emerson)
11. Electrical works and area lighting.
12. Mass flow meters for Crude Oil (Coriolis meter), Produced Gas (Orifice) & Produced Water (Orifice). Both the Trains shall have interconnection before HP Separator & after HP separator.
13. Fire Detection & Suppression System
14. Life Saving Appliances (Shower & Eye Wash Station)

b. Scope details:

1. Crude from the collector lines is made available at the outlet of Pig Launcher/Receiver located adjacent to the existing Pig Launcher/Receiver for Bhaskar I field at CPF.
2. Interconnecting piping from Pig Launcher/Receiver to inlet manifold and Surge Killer-Controller.
3. 1 No. Surge Controller.
4. Interconnecting piping from outlet of 'Surge Killer' to inlet of 'HP Three Phase Separator'.
5. 1 No. HP Three Phase Separator.
6. Interconnecting crude oil piping from outlet of 'HP Three Phase Separator' to inlet of 'Well Fluid – Crude oil Heat Exchanger'.
7. For Servo Gas System: Piping connection from HP Separator to Servo Gas System.
8. 1 No. Well Fluid – Crude oil Heat Exchanger
9. Interconnecting crude oil piping from outlet of 'Well Fluid – Crude oil Heat Exchanger' to inlet of 'Hot Oil – Crude Oil Heat Exchanger'.
10. 1 No. Hot oil – Crude oil Heat Exchanger (Estimated capacity of 19,00,000 Kcal/hr) with 'On-Off' type controller.
11. Interconnecting crude oil piping from outlet of 'Hot Oil – Crude Oil Heat Exchanger' to inlet of 'LP Three Phase Separator'.
12. 1 No. LP Three Phase Separator.
13. Interconnecting hot oil piping from 'LP Three Phase Separator' to 'Well Fluid – Crude oil Heat Exchanger' and from 'Well Fluid – Crude oil Heat Exchanger' to the main piping header connected to 'Tank Vapour Recovery Column' of Train-1.
14. Interconnecting piping from existing Train-1 manifold to inlet of HP Three Phase Separator for diverting Train-1 fluid to Train-2 as and when required. Similarly crude oil line from outlet of existing 'HP Three Phase Separator' to the outlet line of new 'HP Three Phase Separator' for diverting Train-1 crude to Train-2.
15. Piping for Produced gas from 'HP Three Phase Separator', 'LP Three Phase Separator' and 'Tank Vapor Recovery Unit' (V-103, Train-1) to Inlet of existing Knock-Out Drum (V-105) considering maximum 0.25 Barg pressure drop in the line.

16. HP Separator Gas Outlet line connection to Ejector Inlet
17. Interconnecting Piping within respective equipment / skid package.
18. Interconnecting produced water piping from 'HP Three Phase Separator', 'LP Three Phase Separator' & 'Tank Vapor Recovery Column' to existing 'Oily Water Separator Tank'.
19. Interconnecting piping for Gravity Chemical injection system (Vessel free issue by Sunpetro) with Process units.
20. HP Separator, LP Separator & Heat Exchanger bottom drain line connected to Closed Drain Vessel (V-104) through a common line.
21. PSV & BDV discharge shall be connected to Seal pot Inlet.
22. Signal Cable laying through tray.
23. Earthing strip connected to all vessels, Electrical Equipment to Earth Pit.
24. Control and signal cables for respective package terminated in Junction box mounted on respective skid package.
25. Control and signal cables from respective JB's on equipment / packages skid to existing SCADA system. All signal and control cables shall be laid in cable trays tray.
26. Lighting with required electrical power cables within the Train-2 area. Power supply for lighting in Train-2 area is provided from the lighting distribution board available near Train-2 area. Cables shall be laid in cable trays.
27. Adequacy check to be carried out for existing utilities like Firefighting system, Fire and gas system etc for Train-2.
28. Documentation for seeking approval for CTO and CTE from OISD, DGMS or any other government agency.
29. Separated gas shall be routed to existing flare line for diverting the same to the consumer / Flare and to the servo gas system after measurement.
30. The produced water from HP, LP and column shall be routed to existing produced water treatment system after measurement.
31. Insulation for Thermal and Personal protection
32. Required surface coating as per painting systems and colour coding.
33. Any other work required for successful commissioning of the plant.
~~The Crude oil from Vapor recovery unit shall be connected to the outlet of the existing Vapor recovery unit after measurement and shall be routed to Crude oil storage tanks. Similarly;~~

Revised PFD of the proposed facility & its interconnection with existing facility is attached as Annexure-A

Bidders are requested to visit the CPF facility to understand the scope of work and its integration with existing facilities.

D. Facilities to be provided by SunPetro at Site:

Bidder shall be allotted an area of about 50 m X 50 m, close to the plant. Bidder shall create temporary infrastructure for site fabrication work and temporary storage for materials and office facility. Power shall be supplied free of charge to the contractor for fabrication work, however, the required cable and panel to be provided by the contractor.

E. List of applicable standards:

ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
API	American Petroleum Institute
ISA	International Society of Automation
NACE	National Association of Corrosion Engineers
IEC	International Electro-technical Commission
IEEE	Institute of Electronic and Electrical Engineers

ASCE 7-16 and other structures	Minimum design loads and associated criteria for buildings
ASME Standards	
ASME B16.5	Pipe Flanges and Flanged Fittings
ASME B30.7	Base Mounted Drum Hoists
ASME B31.3	Process Piping
ASME B36.10M	Welded and Seamless Wrought Steel Pipe
ASME BPVC Sec V	Non-destructive Examination
ASME BPVC Sec IX	Welding Procedure and Performance Qualification
NORSOK M_501	Surface Preparation and Protective Coating
AACE system.	Recommended Practice 18R-97 Cost Estimate Classification
AGA BS 5781	Measurement and Calibration Systems Part-1
IS/IEC-60079 Requirements	Electrical apparatus for explosive gas atmospheres – General
IS/IEC-61241	Electrical Apparatus for use in the presence of combustible dusts.
IS/IEC 62271-200	High-voltage switchgear and control gear – Part 200: AC metal- enclosed switchgear and control gear for rated voltages above 1 kV and up to and including 52 kV.
IS/IEC 62305	Lightning Protection
IEEE 519	Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems
ISO/TR 12765	Measurement of fluid flow in closed conduits – Methods using transit time Ultrasonic flow meters
ISO 5168	Measurement of Fluid Flow – Estimation of uncertainty of a Flow Rate Measurement
ISA 5.1	Instrumentation Symbols and Identification
ISA 5.4	Instrument loop diagrams
ISA 5.5	Graphic symbols for process display
ISA 7.0.01	Quality standard for instrument air
ISA 12.04.01	Electrical apparatus for explosive gas atmospheres - part 2: pressurized enclosures "p"
ISA RP12.06.01	Recommended practice for wiring methods for hazardous (classified) locations instrumentation - part 1: intrinsic safety.
ISA 20	Specification forms for process measurement and control instruments, primary elements, and control valves
ISA 75.01.01	Flow equations for sizing control valves
ISA 75.08.01	Face-to-face dimensions for integral flanged globe-style control valve bodies (classes 125, 150, 250, 300, and 600)
ISA 75.08.02	Face-to-face dimensions for flange less control valve bodies (classes 150, 300 and 600)
ISA MC96.1	Temperature measurement thermocouples
ISA 18.2	Management of alarm systems for the process industries
ISA 75.17	Control valve aerodynamic noise prediction L.K. Spink Principles and Practice of Flow Metering Engineering R. Miller Flow Measurement Engineering Handbook
60079-0	Explosive Atmospheres Part 0: equipment – general requirements
60079-1	Explosive atmospheres - part 1: equipment protection by flameproof enclosures "d"

60079-2	Explosive atmospheres - part 2: equipment protection by pressurized enclosure "p"
60079-7	Explosive atmospheres - part 7: equipment protection by increased safety "e"
60079-11	Explosive atmospheres - part 11: equipment protection by intrinsic safety "i"
60079-14	Explosive atmospheres - part 14: electrical installations design, selection, and erection
60079-15	Electrical apparatus for explosive gas atmospheres - part 15: construction, test and marking of type of protection "n" electrical apparatus.
60079-25	Electrical apparatus for explosive gas atmospheres - part 25: intrinsically safe systems
60079-27	Explosive atmospheres - part 27: field bus intrinsically safe concept (fisco)
60079-29-1	Explosive atmospheres - part 29-1: gas detectors – performance requirements of detectors for flammable gases
60079-29-2	Explosive atmospheres - part 29-2: gas detectors – selection, installation, use and maintenance of detectors for flammable gases and oxygen.
60529	Degrees of protection provided by enclosures (IP code)
61508	All parts - functional safety of electrical/electronic/programmable electronic safety related systems
61511	All parts - functional safety - safety instrumented systems for the process industry sector
61000	All parts - electromagnetic compatibility (EMC)
60751	Industrial platinum resistance thermometers and platinum temperature Sensors
60584	Thermocouples
60534	Industrial-process control valves
61158	All parts - industrial communication networks – field bus specifications
60228	Conductors of insulated cables
EN 54	All parts - fire detection and fire alarm systems
ISO EN 5167	Measurement of fluid flow by means of pressure differential devices.
ISO EN 4126	All parts: safety devices for protection against excessive pressure
EN ISO 15848-1	Industrial valves - measurement, test and qualification procedures for fugitive emissions - part 1: classification system and qualification procedures for type testing of valves
EN ISO 10497	Testing of valves - fire type-testing requirements
NFPA 10	Standard for Portable Fire Extinguishers
NFPA 11	Standard for Low, Medium, and High-Expansion Foam NFPA
NFPA 12	Standard for Carbon Dioxide extinguishing Systems.
NFPA 14	Standard for the installation of Standpipe and Hose System
NFPA 15	Standard for Water Spray Fixed Systems for Fire Protection
NFPA 17	Standard for the Dry Chemical Extinguishing System
NFPA 24	Standard for the Installation of Private Fire Service Water Mains
NFPA 72	National Fire Alarms and Signalling Code

NFPA 2001	Standard on Clean Agent Fire Extinguishing Systems
NFPA 11	Standard for Low, Medium, and High-Expansion Foam NFPA
NFPA 70	National electric code (NEC)
NFPA 85	Boiler and combustion systems hazards code
NFPA 496	Purged and pressurized enclosures for electrical equipment in hazardous (classified) locations.
OISD-STD-109	Process Design and Operating Philosophies on Blow Down & sewer system
OISD-RP-110	Recommended Practices on Static Electricity
OISD-STD-111	Process Design & Operating Philosophies on Fired Process Furnace
OISD-STD-113	Classification of Area for Electrical Installations at Hydrocarbon Processing & Handling Facilities
OISD-STD-114	Safe Handling of Hazardous Chemicals
OISD-GDN-115	Guidelines on Fire Fighting Equipment and Appliances in Petroleum Industry
OISD-STD-116	Fire Protection Facilities for Petroleum Refineries and Oil/Gas Processing Plants
OISD-STD-117	Fire Protection Facilities for Petroleum Depots, Terminals, Pipeline Installations & Lube oil installations
OISD-STD-118	Layouts for Oil and Gas Installations
OISD-RP-149	Design aspects for safety in electrical systems
OISD-STD-152	Safety Instrumentation for Process System in Hydrocarbon Industry
OISD-STD-163	Safety of Control Room in Hydrocarbon industry
OISD-STD-164	Fireproofing of Steel Supporting Structures in Oil & Gas Industry
OISD-GDN-180	Lightning Protection
OISD-STD-186	Simultaneous Operations in E&P Industry
OISD-GDN-192	Safety Practices during Construction
OISD-GDN-207	Contractor Safety

Note: All works shall be executed as per good engineering practices.

F. Completion Schedule

Project should be completed in every respect and ready for commissioning within a period of 12 months from placement of LOI.

SECTION-5A

RESPONSIBILITY MATRIX

Sl. No.	Aspect		Description	Responsibility	
				SunPetro	Contractor
1	Design & Engineering	A	Testing of soil for design of civil foundation	---	√
		B	Civil Foundation for HP-Separator, LP-Separator, Heat Exchanger (2 no), Crude oil stabilizing vessel, Hot oil unit & Tag Structure	---	√
		C	Piping size calculation, Stress calculation, Supports load calculation & Tag structure load calculation.	---	√
		D	Structural steel design	---	√
		E	HP-separator, LP-separator, crude oil stabilizing vessel & Heat Exchanger, Hot oil unit and design of support structure for expansion tank with increase capacity	---	√
		F	Skid Layout, Tag Structural, Piping layout, Piping GAD, Pipe support & Isometrics	---	√
		G	Electrical cable route Drawing	---	√
		H	Instrumentation & Control for each Unit, GAD & isometric	---	√
		I	Integration with DCS	---	√
		J	Shutdown & Control valves	---	√
		K	Hookup with DCS	---	√
		L	Sizing of Flare line upto Flare KOD, Flare tip, Seal Pot, and Consumer line as per applicable standards	---	√
		M	Fire & Gas safety study & its implementation	---	√
		N	Participation in HAZOP study and closing of observations	---	√
		O	Native files of all the software used for designing shall be submitted to Client	---	√
		P	Updating of area classification drawings	---	√
2	Adequacy check	A	Firefighting system	---	√
		B	Fire water network	---	√
		C	Fire hydrant/Monitor	---	√
		D	UPS	---	√
		E	DCS	---	√
3	Utilities/Lifting equipment	A	Fabrication yard for the prefabrication works and storage. (~ 50 m X 50 m, as per availability)	√	---
		B	Skid Lifting Tool & tackles. (Lifting lugs, Spreader Bar, slings, Tackles, as applicable)	---	√
		C	Utility Consumption list	---	√
		D	Lifting Equipment required at CPF	---	√
		E	Power Supply	√	---
		F	Water Supply (Disposal water)	√	---
		G	Man & Material Transportation	---	√

4	Supply & Installation of Process Packages, Equipment, Piping, Valves, Fittings, Electrical and instrumentation	A	Inlet Manifold with 18", 8" tie-in point, and spare tie-in point for future inlet connection. And spare tie-in point at outlet for connection to existing train.	---	√
		B	Surge killer -Controller	√	---
		C	HP separator consists of following elements. 1. Hydrocyclone inside the vessel 2. Sacrificial anode 3. Sparger for removal of bottom sediments Note: HP Separator shall be skid mounted at the outlet of surge killer	---	√
		D	LP separator consisting of following elements. 1. Hydrocyclone inside the vessel 2. Sacrificial anode 3. Sparger for removal of bottom sediments Note: LP Separator shall be skid mounted at the Highest elevation above the heat exchangers. Structure for the same shall be in scope of the bidder.	---	√
		E	Vapor recovery column (Dia.- 2m, Height- 16 m. Schematic attached)	---	√
		F	Hot oil unit and elevated Expansion tank suitable for both the trains & its integration with the existing hot oil unit and with both the trains (estimated heat duty 1900000 Kcal/hr, however, contractor shall carryout design and engineering for the requirement of heat duty for both the existing & new train along with Hot oil recirculation pumps (1W+1S/by)). Modification of existing expansion tank along with strengthening of structural support with required elevation.	---	√
		G	Shed for Hot oil unit	√	---
		H	Tie-in point with associated piping for Chemical injection system at inlet of HP separator (Demulsifier) at 6 o'clock and 12 o'clock with ½ " Ball valves for Gravity injection system.	---	√
		I	Gravity feed chemical injection skid (free issue)	√	---
		J	Tie-in point with Chemical dosing pump (metering type), 8 – 50 LPH @ 7 Barg maximum (1W+1S/by) with flame proof motor and associated piping for Chemical injection system at outlet of LP separator (PPD).	---	√
		K	Tag structure for equipment	---	√
		L	Ejector for recovering low pressure gas from the Vapor recovery column	√	---
		M	Installation and hooking up of Ejector	---	√
		N	Pipe, Valves, fittings, structural material	---	√
		O	Power cable, cable tray, supports, VFDs, heat tracing	---	√
		P	Control valves, shut down valves, pressure gauge, temperature gauge, pressure transmitter, temperature transmitter, signal cable, junction box, PSV, PRV, Blow down valve	---	√
		Q	Mass flow meters for crude oil (Coriolis meter), gas(Orifice) & produce water(Orifice)	---	√
		R	Eye wash system	---	√
		S	MCP (manual call point)	---	√

5	QA / QC	A	TPI Agency	√	---
		B	QAP	---	√
		C	FAT / SAT	√	√
		D	ITP	---	√
6	Civil	A	Construction of Civil foundation as per Approved Design	√	---
		B	Fabrication & installation of steel structure for mounting various packages as per the required elevation.	---	√
		C	Supply & Grouting of Anchor Bolt as per Design.	---	√
		D	Inspection & acceptance of Civil foundation for erection of equipment	---	√
7	General	A	Surface Coating as specified	---	√
		B	Flushing & cleaning of equipment and piping	---	√
		C	Passive fire protection cement coating of support structure of process equipment.	---	√
		D	Transportation of Free issue equipment from Workshop to Location and installation.	---	√
		E	Supply of spare Gaskets (400%) & Fasteners (200 %).	---	√
		F	Arrangement of material handling equipment at site as per requirement.	---	√
		G	Thermal Insulation for 'Hot oil unit', Hot oil piping, 'LP separator', 'LP separator' to 'Well Fluid-Crude Oil Heat Exchanger' piping, 'Hot Oil-Crude Oil Heat exchanger' to LP Separator inlet,	---	√
		H	Hook up & Integration of Train-2 with existing Train-1	---	√
		I	Pre-Commissioning of Unit/System including inertization of system.	---	√
		J	Presence of vendor during commissioning	---	√
		K	Functional Test of Control System through DCS	---	√
8	Instrumentation	A	Functional test of Instrumentation during FAT	---	√
		B	Supply & Laying of Control cables from Unit to DCS at Control Room.	---	√
		C	Supply and Erection of Cable tray	---	√
		D	Fire detection, Gas detection system	---	√
		E	Earthing Connection, Earth Pits	---	√
		F	Hook up & Integration with DCS (Delta V) & Functional Test	---	√
		G	Cause & Effect Functional Test	---	√
		H	Interlocking System Functional Test through DCS	---	√

9	Electrical	A	Electrical Power cable supply and laying for Power Supply 415V, 220 V (AC) & 24 & 12 V (DC).	---	√
		B	Earthing Connection to Vessel & JB, Earth Pits	---	√
		C	Supply and Erection of Cable tray	---	√
		D	Area Illumination	---	√
10	Tie-in/Hot tapping	A	18" & 8" line with Inlet manifold	---	√
		B	Hot tapping with vapor recovery column outlet line (12")	---	√
		C	Flare line	√	√
		D	Produce water line	√	√
		E	Disposal water line	√	√
		F	Fuel gas inlet for Hot oil unit	√	√
11	Commissioning	A	Supply of Commissioning & two years' spares (extra)	---	√
		B	Site Acceptance test	√	√
		C	Pre-Commissioning / Commissioning	√	√
		D	HOTO Process	√	√
12	HSE Consideration	A	HAZOP Study	---	√
		B	PPE supply during Construction, Erection & Commissioning Activities.	---	√
		C	ERP for Construction Activities.	√	√
		D	Cause & Effect matrix	---	√
		E	Waste Management during Construction & Erection	---	√
		F	SIMOPS	---	√
13	Records & Document	A	As Built Drawings, Data sheet & Documents with Native files	---	√
		B	Material Test Certificates	---	√
		C	Vessel Hydro Test Certificates	---	√
		D	NDT reports.	---	√
		E	Instrument Calibration Certificates	---	√
		F	PSV calibration Certificate	---	√
		G	Anode Material composition Certificates	---	√
		H	HOTO signed Document	√	√
		I	3D Model with Native files	---	√

SECTION – 7A

PRICE SCHEDULE

PRICE SCHEDULE					
DESIGN, ENGINEERING, PROCUREMENT, FABRICATION, TRANSPORTATION, INSTALLATION & COMMISSIONING OF ADDITIONAL TRAIN FOR HANDLING 20,000 BLPD WELL FLUID AT CPF					
Sr No	Item/ Description of Work/Activity	UOM	Rate in INR	QTY	Amount
A-DESIGN & ENGINEERING					
A1	Design & Engineering for additional processing train (Train-2).	Lumpsum		-	
B- Equipment Packages					
B1	Skid Mounted HP three phase separator	No		1	
B2	Skid Mounted LP three phase separator	No		1	
B3	Skid Mounted Well fluid - Crude Oil Heat Exchanger	No		1	
B4	Skid Mounted Crude Oil - Hot oil Heat Exchanger	No		1	
B5	Hot Oil Unit with Expansion—tank Modification of existing expansion tank along with strengthening of structural support.	No		1	
C- Procurement					
C1	Procurement of pipes, fittings, Valves, and any other material required	Lumpsum		-	
C2	Procurement of Electrical Power cables, Lighting, Cable trays and any other material required	Lumpsum		-	
C3	Procurement of Instrument control cables, instruments, JB, Supports and any other material required	Lumpsum		-	
C4	Procurement of any other materials as per design required for commissioning of plant.	Lumpsum		-	
C5	Procurement Support Structures for Processing units	Lumpsum		-	
C6	Procurement Surface Coating material	Lumpsum		-	
C7	Procurement thermal insulation material	Lumpsum		-	
C8	Procurement of First fill of Hot Oil	Lumpsum		-	
D- Installation					
D1	Fabrication, Installation and erection of Structure for Processing units/Packages	Lumpsum		-	
D2	Installation of Surge Killer-Controller	Lumpsum		1	
D3	Installation of Skid Mounted HP three phase separator	Lumpsum		1	
D4	Installation of Skid Mounted LP three phase separator	Lumpsum		1	
D5	Installation of Skid Mounted Well fluid - Crude Oil Heat Exchanger	Lumpsum		1	
D6	Installation of Skid Mounted Crude Oil - Hot oil Heat Exchanger	Lumpsum		1	
D7	Installation of Hot Oil Unit with-Expansion tank —Modification of existing expansion tank along with strengthening of structural support.	Lumpsum		1	

D8	Fabrication, Installation, and erection Structural works including supports	Lumpsum		-	
D9	Installation of piping, fittings, valves etc.	Lumpsum		-	
D10	Installation of Instruments, control valves, Shutdown valves, MOVs, JB etc	Lumpsum		-	
D11	Control Cable laying	Lumpsum		-	
D12	Integration of inputs of Train-2 with existing DCS	Lumpsum		-	
D13	Electrical cable Laying	Lumpsum		-	
D14	Electrical works (lighting, Cable tray installation etc)	Lumpsum		-	
D15	Surface coating including Passive fire protection coating	Lumpsum		-	
D16	Thermal Insulation and Cladding	Lumpsum		-	
	Sub - Total				

NOTE:

- Price shall be inclusive of all taxes and duties except GST/IGST which will be paid extra as applicable.
- The above rates are inclusive of all charges including transportation cost till our specified site location in Gujarat. No additional charges towards freight / transportation / insurance / loading / unloading etc. shall be payable.
- The above prices shall be inclusive of all considering delivery, installation, commissioning & testing at designated site of Sun Petro.
- All packages must bear labels mentioning name of product, name of manufacturer, date of manufacturing, batch no, tare weight, gross weight and net weight of material.
- Delivery Period: As per SOW.
- Warranty Period:**
Eighteen (18) months from date of supply or Twelve (12) months from date of commissioning whichever is earlier. However, bidder can quote the warranty period beyond 18 months. Bidder to specify visits of the operator during warranty period for routine checkups and troubleshooting.
- Payment Schedule**
Refer 3.29.8 of Section-3 (Model Contract).
- Delivery Address:
➤ **Bhaskar Field**
Sun Petrochemicals Pvt. Ltd. (SunPetro). Bhaskar Field, Central Processing Facility (CPF), Pandad-Tamsa Road, Village: Pandad, Tal: Khambhat, Dist: Anand, Gujarat – 388625.
- Documents to be submitted at the time of delivery**
Original – Challan/Packing List, Invoice, Consignment Note/ Bill of Lading/ Air Waybill, Inspection Certificate, Material Test Certificate if any, Guarantee/Warranty Certificate, Installation Manuals, and any other supporting documents.
- Note for Essential Certificate**
Bidder is required to confirm from SunPetro prior to delivery of Material for availability of Essentiality Certificate (EC) for availing zero customs duty / concessional taxes benefit.

All documents, as applicable to be sent at least two (2) weeks prior to SunPetro by email to enable SunPetro to initiate obtaining Essentiality Certificate to avail zero customs duty / concessional taxes benefit.

1. Annexure – A: Revised PFD for Train-2 **(Enclosed)**
2. Annexure – B: P&ID of Existing Train-1 at CPF **(Enclosed)**
3. Annexure – C: Single line diagram (SLD), CPF **(Enclosed)**
4. Annexure – D: DCS Details, CPF **(Enclosed)**

Annexure – A: Revised PFD for Train-2
(Enclosed)

CPF EXPANSION

Drawing No-1: Produced Oil System

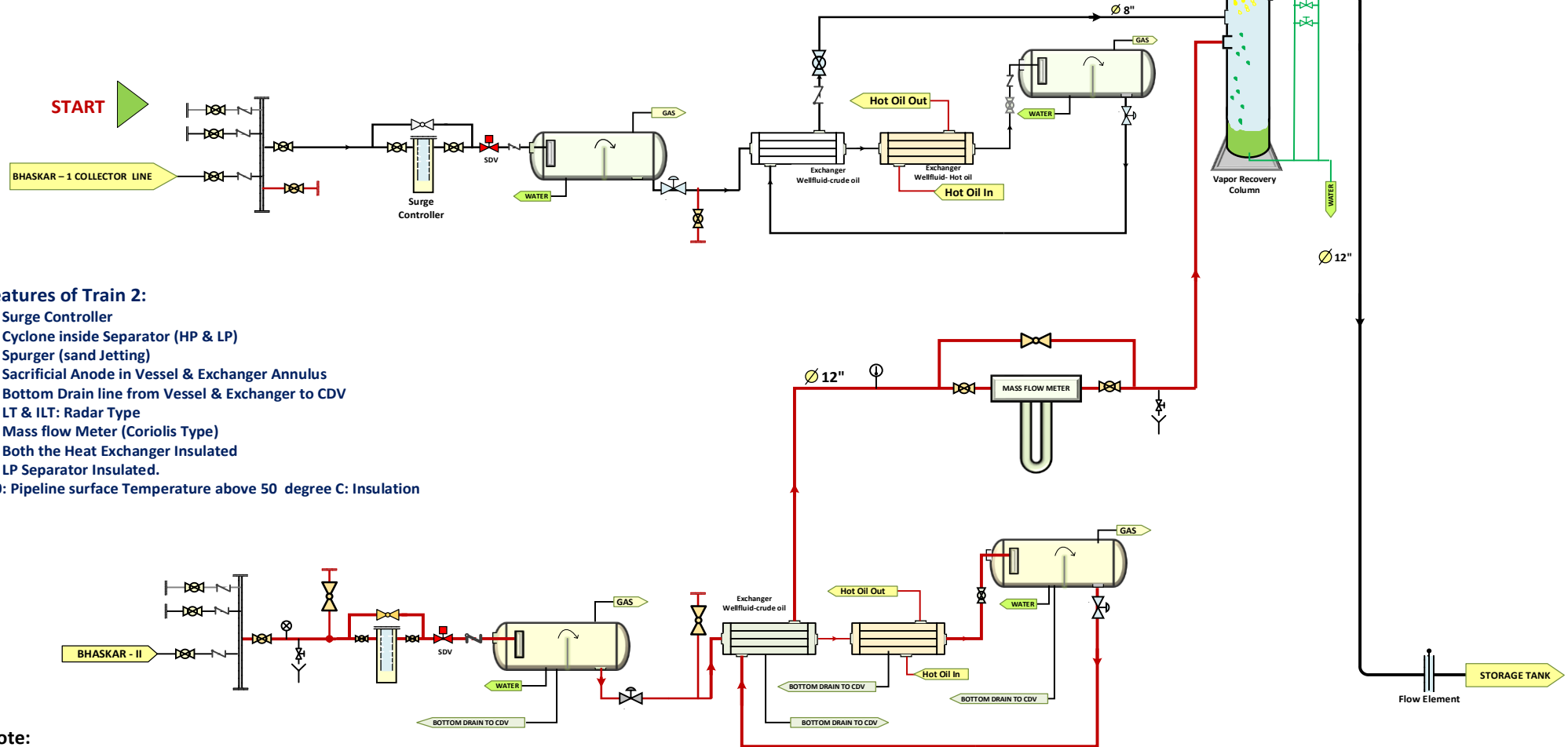
Drawing No-2: Produced Gas System

Drawing No-3: Produced Water System

Drawing No-4: Hot Oil System

Drawing No: 1

CPF EXPANSION - PRODUCED OIL STREAM



Features of Train 2:

1. Surge Controller
2. Cyclone inside Separator (HP & LP)
3. Spurger (sand Jetting)
4. Sacrificial Anode in Vessel & Exchanger Annulus
5. Bottom Drain line from Vessel & Exchanger to CDV
6. LT & ILT: Radar Type
7. Mass flow Meter (Coriolis Type)
8. Both the Heat Exchanger Insulated
9. LP Separator Insulated.
- 10: Pipeline surface Temperature above 50 degree C: Insulation

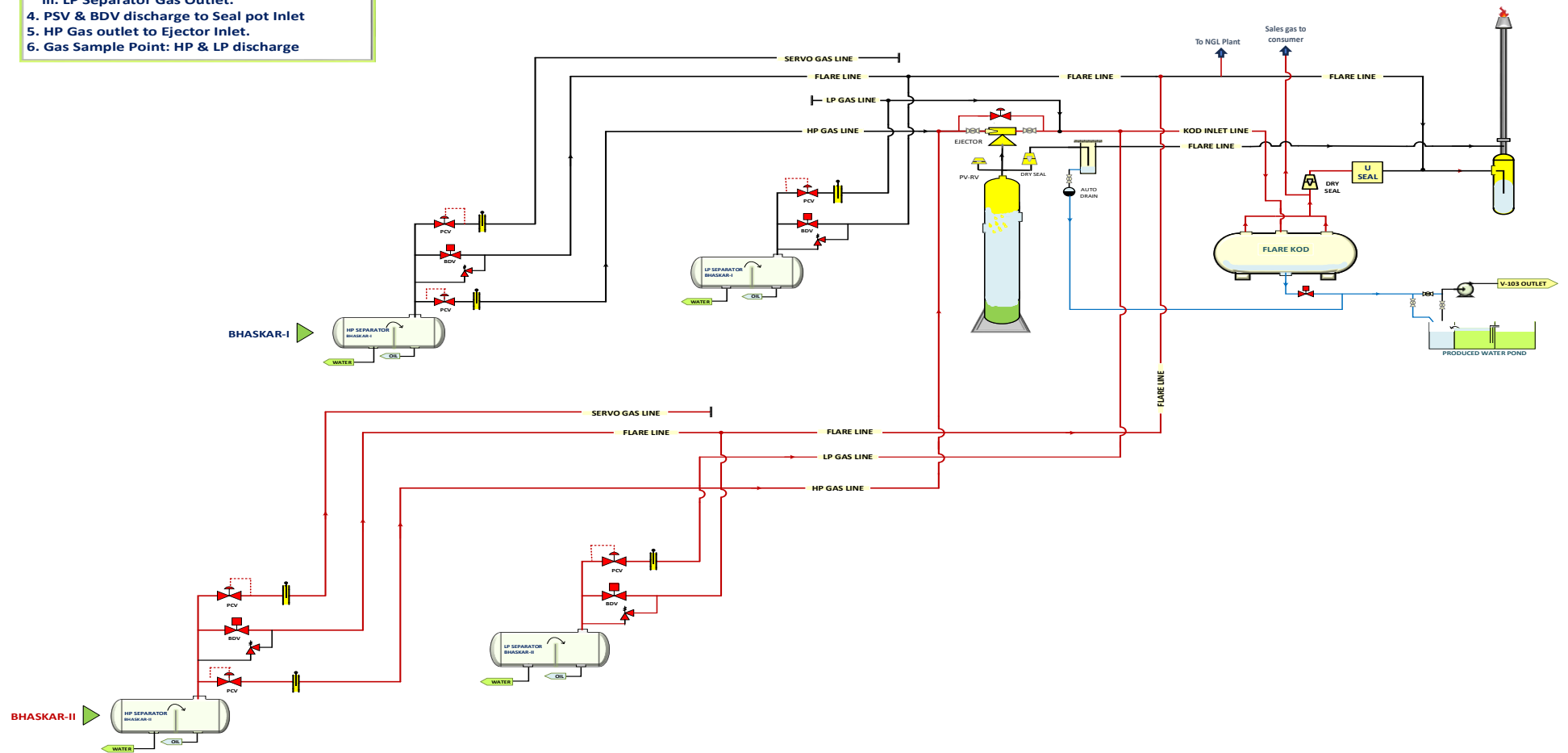
Note:

1. Red Line is for Phase-2 Facility
2. Black Line is for Existing Facility

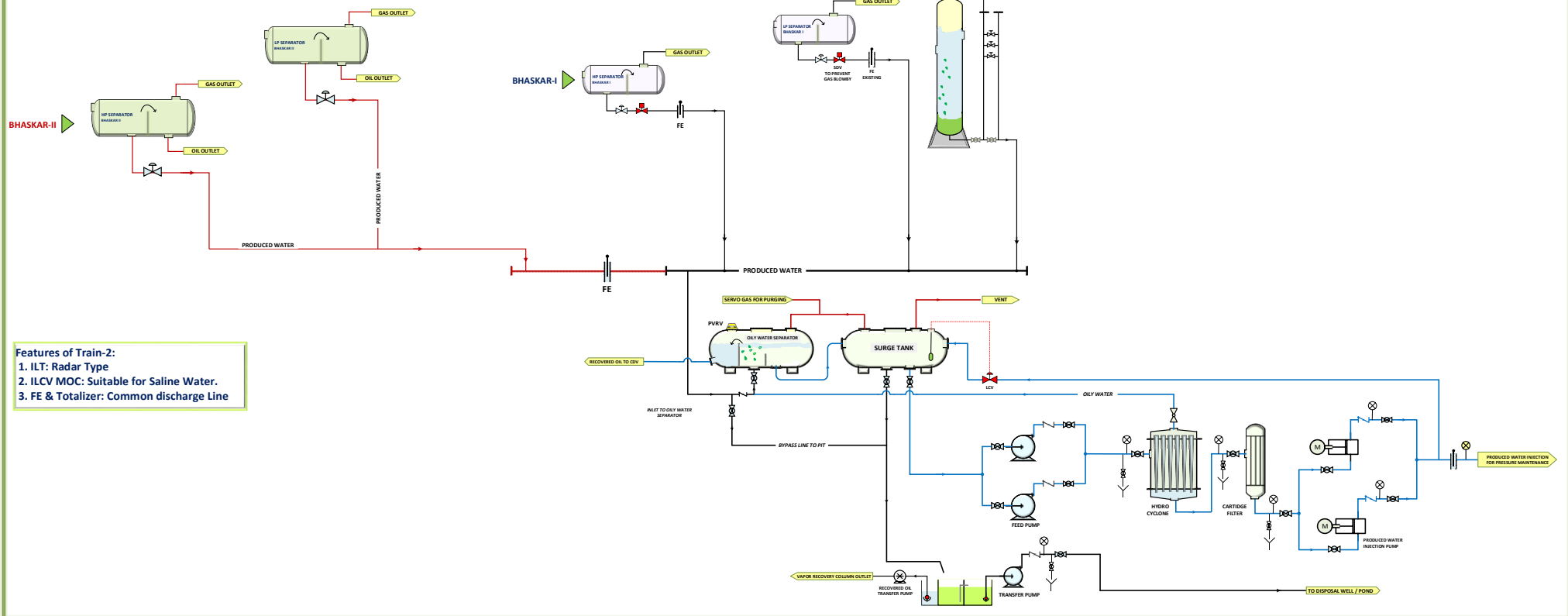
Drawing No - 2
CPF EXPANSIONP - PRODUCED GAS STREAM

Features of Train-2:

1. PSV configuration: N + 1 with Isolation Valve
2. BDV: Isolation valve
3. FE & Totalizer:
 - i. HP separator Gas outlet
 - ii. Consumer Line
 - iii. LP Separator Gas Outlet.
4. PSV & BDV discharge to Seal pot Inlet
5. HP Gas outlet to Ejector Inlet.
6. Gas Sample Point: HP & LP discharge



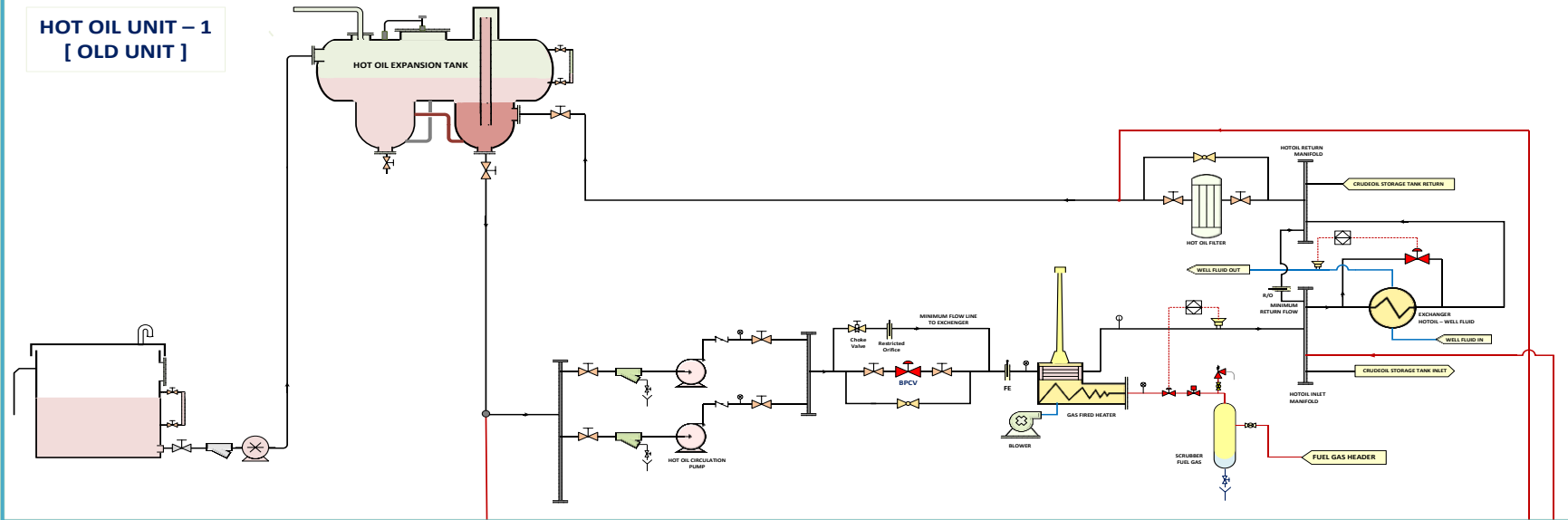
CPF EXPANSION - PRODUCED WATER STREAM



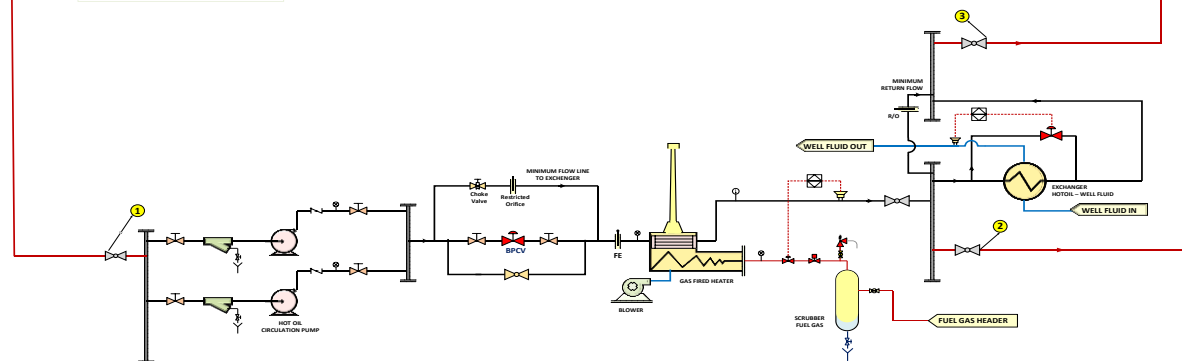
Drawing No-4

NEW & OLD HOT OIL UNITS INTEGRATION

HOT OIL UNIT – 1 [OLD UNIT]



HOT OIL UNIT- 2 [NEW UNIT]

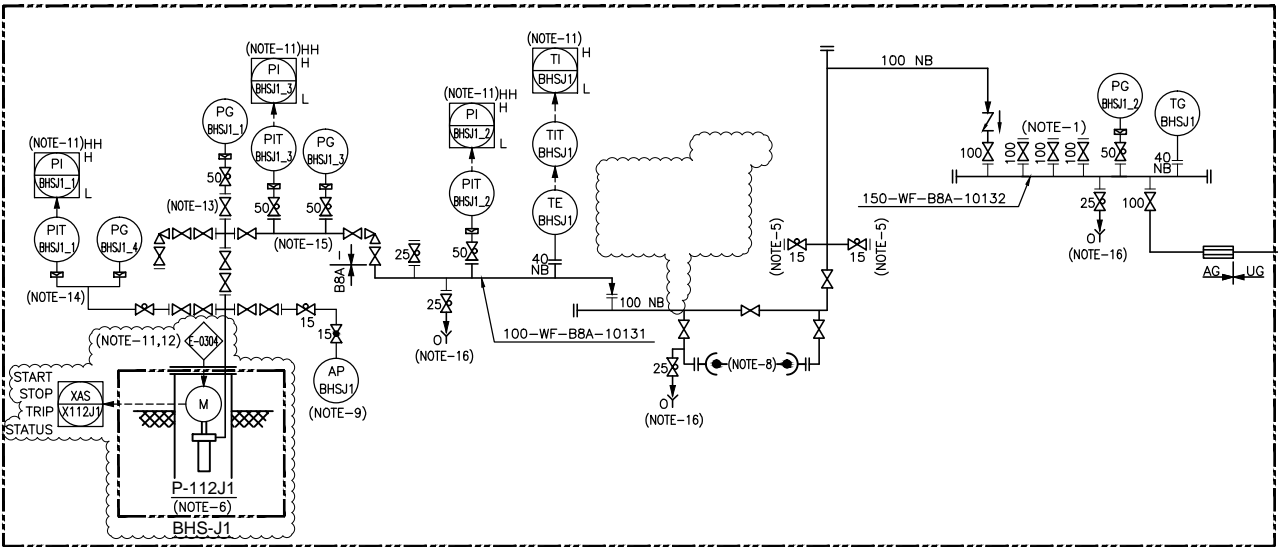


Note:

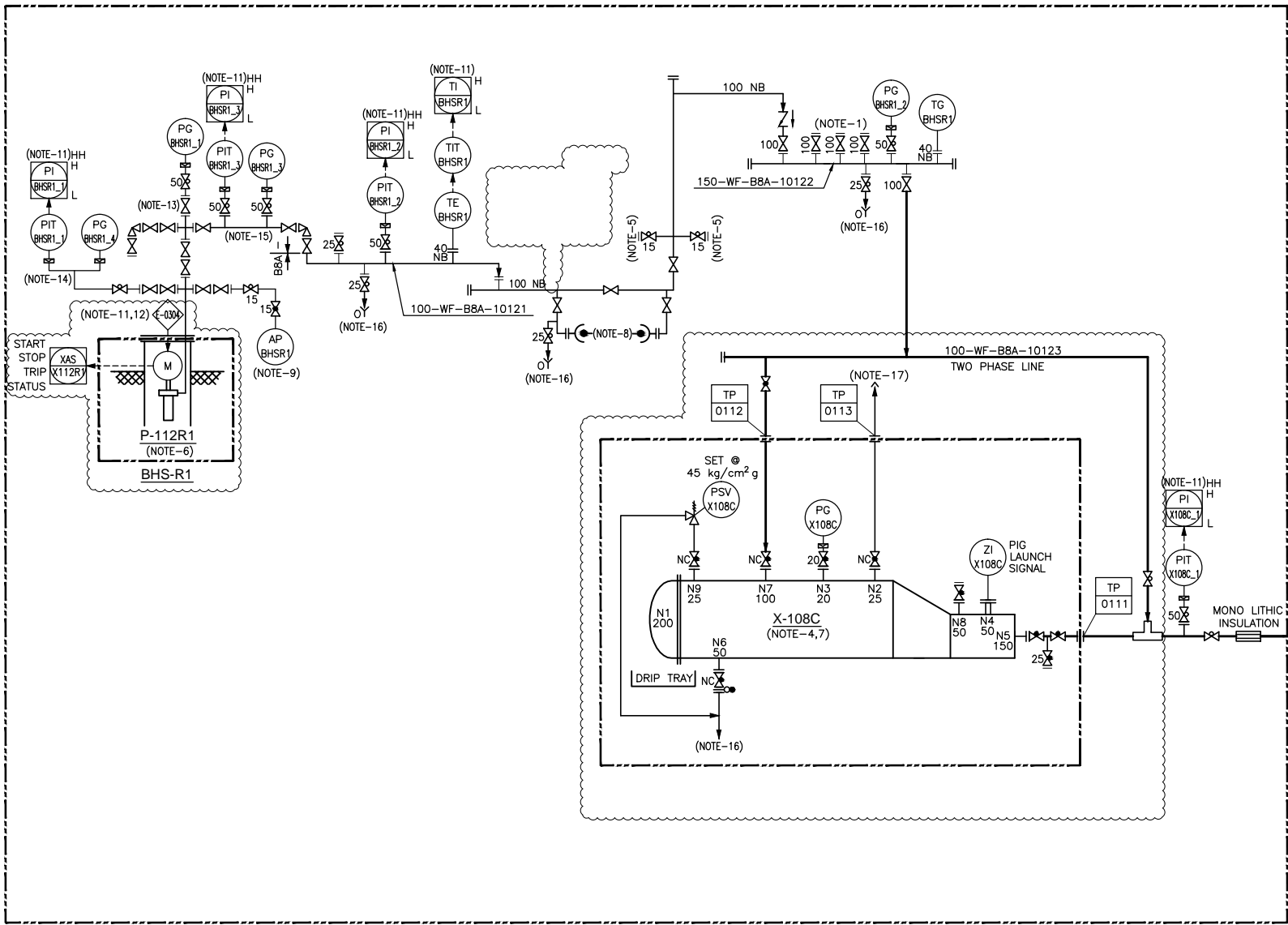
1. Present Hot oil Unit Capacity: 7 Lacs K Cal/hr.
2. Hot Oil Expansion tank Capacity: 1.9 KI.
3. Existing Expansion Tank Volume shall be increased, so that it will be suitable for both the Units.
3. Hot Oil Expansion Tank: Inlet & Outlet line size shall be changed accordingly.
4. Expansion Tank Structure shall be strengthen.
5. Hot Oil Pump Suction Header, Hot Oil Inlet Header & Hot Oil return Headers are Inter connected to Operate:
 - i) any one of the Hot Oil Unit
 - ii) both the Hot Oil Units simultaneously.

Annexure – B: P&ID of Existing Train-1 at CPF
(Enclosed)

10	A	B	C	D	E	F	G	H	I	J	10																																																								
9	<p>LINE SYMBOLS</p> <p>PROCESS LINES OTHER PROCESS LINES EXISTING EQUIPMENT PACKAGE UNIT BOUNDARY LIMIT INSTRUMENT ELECTRICAL LEADS INSTRUMENT AIR TUBING INSTRUMENT CAPILLARY TUBING DISTRIBUTED CONTROL SOFTWARE LINK 1021-PS-PID-xxx SHEET-X OF X</p> <p>FURNISHED BY E - ELECTRICAL I - INSTRUMENTS M - MECHANICAL P - PIPING V - VENDOR</p> <p>TP PIPING TIE-IN FLAG</p> <p>PIPING SPECIALTY ITEM * B-BELLOW C-SPECTACLE BLIND F-FLAME ARRESTOR G-SIGHT/FLOW GLASS H-HOSE & COUPLING M-MISC. P-SUCTION/PRIMING POT S-STRAINER</p>		<p>CONTROL VALVE SYMBOLS</p> <p>MOV ELECTRIC OPERATED VALVE DIAPHRAGM ACTUATOR DIAPHRAGM ACTUATOR W/ HANDWHEEL SOLENOID VALVE PISTON ACTUATOR</p> <p>EXTERNALLY CONNECTED BACK PRESSURE VALVE EXTERNALLY CONNECTED PRESSURE REDUCING VALVE INTERNALLY CONNECTED BACK PRESSURE VALVE INTERNALLY CONNECTED PRESSURE REDUCING VALVE DIFFERENTIAL PRESSURE REDUCING VALVE PRESSURE REGULATOR W/ EXTERNAL TAP FO - FAIL OPEN FC - FAIL CLOSED FL - FAIL LAST</p> <p>PSV PRESSURE RELIEF VALVE TRV THERMAL RELIEF VALVE VRV VACUUM RELIEF VALVE 3 - WAY SOLENOID VALVE, SHADED SECTION INDICATES NORMALLY CLOSED PORT, CURVED ARROW INDICATES FLOW DIRECTION WHEN DEENERGIZED ON-OFF VALVE M MOTOR</p>		<p>INSTRUMENT SYMBOLS</p> <p>LOCALLY MOUNTED INSTRUMENT INSTRUMENT MOUNTED ON LOCAL PANEL INSTRUMENT MOUNTED ON PANEL IN CONTROL ROOM INSTRUMENT MOUNTED BEHIND LOCAL PANEL INSTRUMENT MOUNTED BEHIND PANEL IN CONTROL ROOM INSTRUMENT WITHIN DISTRIBUTED CONTROL SYSTEM AND DISPLAYED ON OPERATOR CONSOLE INSTRUMENT WITHIN DISTRIBUTED CONTROL SYSTEM BUT NOT DISPLAYED ON OPERATOR CONSOLE INSTRUMENT WITHIN PROGRAMMABLE LOGIC CONTROL AND DISPLAY ON OPERATOR CONSOLE INTERLOCK ROTAMETER ORIFICE PLATE W/ FLANGE TAPS VENTURI TUBE OR FLOW NOZZLE VORTEX TURBINE METER POSITIVE DISPLACEMENT METER MAG - MAGNETIC MAS - MASS PIT - PITOT TUBE PRESSURE SAFETY RUPTURE DISK VACUUM SAFETY RUPTURE DISK FLOW OR RESTRICTION ORIFICE CHEMICAL SEAL BREATHING VALVE W/(W/O) FLAME ARRESTOR VORTEX BREAKER</p>		<p>INSTRUMENT SYMBOLS</p> <p>FD-FLAME DETECTOR GD-GAS DETECTOR H2O-WATER ANALYZER WATER CUT ANALYZER</p> <p>RELAY FUNCTION BLOCK/DESIGNATIONS</p> <p>X - SEE LIST BLOCK IN 5MM SIZE BLOCK LOCATED IN UPPER RIGHT HAND CORNER</p> <p>TYPICAL RELAY SYMBOL</p> <p>SOLENOID SUMMING (ADD) DIFFERENCE (SUBTRACT) BIAS MULTIPLY DIVIDE</p> <p>EXTRACT SQUARE ROOT HIGH SELECT LOW SELECT REVERSE ON - OFF CONVERSION (INPUT/OUTPUT FORMS SHOWN BELOW)</p>		<p>GENERAL NOTES (FOR ALL P&IDs):</p> <p>a. PROVIDE ALL DRAIN CONNECTIONS AT LOWEST POINT AND VENT CONNECTIONS AT HIGHEST POINT. b. ALL PUMP SUCTION, GRAVITY, VAPOR & TWO PHASE LINES TO HAVE MINIMUM LENGTH, MINIMUM BENDS AND NO LOOPS. c. DELETED. d. CONTROL VALVE BYPASS VALVE TO BE OFFSET AND NOT EXACTLY ABOVE/BELOW THE CONTROL VALVE. e. ALL ROTAMETERS TO BE INSTALLED IN VERTICALLY UPWARD DIRECTION WITH FLUID FLOW FROM BOTTOM TO TOP. f. ALL FIELD INSTRUMENTS (GAUGES)/VALVES TO BE MOUNTED AT ACCESSIBLE LEVEL. SIGHT GLASS AND LIGHT GLASS TO BE PROVIDED AT EASILY VISIBLE LOCATION. g. ALL PSV/RD UPSTREAM & DOWNSTREAM PIPING TO BE FREE DRAINING TOWARDS SOURCE EQUIPMENT & DESTINATION EQUIPMENT RESPECTIVELY. h. PROVIDE SUITABLE SUPPORT FOR ALL TWO PHASE LINES TO AVOID VIBRATION. i. GENERAL PURPOSE VENT & DRAIN SUCH AS HYDROTEST, HIGH POINT VENT, LOW POINT DRAIN ETC. ARE NOT SHOWN AND TO BE DECIDED BY PIPING BASED ON LINE ROUTING. j. WHERE A REDUCER IS SHOWN FOR A LINE WITH NO POCKET OR GRAVITY FLOW, THE REDUCER TO BE FLAT BOTTOM ECCENTRIC TYPE AND FOR PUMP SUCTION LINE THE REDUCER TO BE FLAT TOP ECCENTRIC TYPE. k. PLEASE REFER INSTRUMENT HOOK UP DRAWINGS FOR UPSTREAM / DOWNSTREAM STRAIGHT PIPE LENGTHS FOR FLOWMETERS & CONTROL VALVES. l. MAGNETIC FLOW METER AND MASS FLOW METER SHALL BE FLOODED. m. ISOLATION VALVES HAVE BEEN SHOWN FOR EACH EQUIPMENT-EQUIPMENT ISOLATION AS WELL AS EACH EQUIPMENT LINE BRANCHING ISOLATION. ONE OUT OF TWO ISOLATION VALVES IN SERIES FALLING NEARBY CAN BE DELETED AFTER DISCUSSING WITH PROCESS. n. DELETED.</p> <p>NOTES:</p> <p>1. VALVE TYPE SHOWN IS INDICATIVE ONLY. FOR ACTUAL VALVE TYPE/SIZE REFER P&ID DIAGRAM AND/OR INSTRUMENT HOOK UP DRAWING.</p>		9																																																								
8	<p>PIPING SYMBOLS</p> <p>CO - CLEAN OUT SC - SAMPLE CONNECTION SO - STEAM OUT SEWER O - ORGANIC A - AQUEOUS PIPE REDUCER BLIND FLANGE WELD CAP SCREWED CAP PIPING PLUG FLEXIBLE HOSE HOSE CONNECTION COUPLING W / PLUG EXPANSION JOINT TEMPORARY STRAINER "Y" TYPE STRAINER BASKET STRAINER SPECTACLE BLIND & SPACER EXHAUST HEAD SPRAY NOZZLE P.D. PULSATION DAMPNER SAFETY SHOWER FLUID LOOP CONTINUOUS DRAINER M - MANHOLE H - HANDHOLE QUICK RELEASE COUPLING FLAME ARRESTOR SLOPE SS WIRE MESH SIGHT / FLOW GLASS MAGNETIC SEPARATOR MAG SAMPLE COLLECTION D-DRAIN V-VENT MONO LITHIC INSULATION BARRED TEE</p>		<p>TYPICAL ON-OFF VALVE ARRANGEMENT</p> <table> <tr> <th>P&ID</th><th>ACTUAL</th></tr> <tr> <td></td><td></td></tr> </table>		P&ID	ACTUAL			<p>INSULATION SYMBOLS</p> <p>A. METHOD FOR SHOWING INSULATION ON LINES, FLANGES, AND VALVES.</p> <p>EQUIPMENT</p> <p>B. CLASSIFICATION H - HOT INSULATION P - HOT INSULATION FOR PERSONNEL PROTECTION C - COLD INSULATION CA - COLD INSULATION FOR ANTI-SWEAT ST - TRACED - STEAM ET - TRACED - ELECTRIC HW - TRACED - HOT WATER LT - TRACED - LIQUID (HOT OIL CYCLE ETC.) SJ - JACKETED (STEAM) WITH INSULATION JC - CLAMP-ON JACKET (STEAM) WITH HOT INSULATION LW - JACKETED (HOT LIQUID) WITH INSULATION</p>		<p>INSTRUMENT IDENTIFICATION LETTERS</p> <table> <tr> <th>FIRST LETTER</th><th>SUCCEEDING LETTER</th></tr> <tr><td>A</td><td>ANALYSIS</td></tr> <tr><td>B</td><td>BURNER FLAME, BREATHING</td></tr> <tr><td>C</td><td>CONDUCTIVITY (ELECTRICAL)</td></tr> <tr><td>D</td><td>DENSITY (MASS) OR S.G.</td></tr> <tr><td>E</td><td>VOLTAGE</td></tr> <tr><td>F</td><td>FLOW</td></tr> <tr><td>G</td><td>GAGING (DIMENSIONAL)</td></tr> <tr><td>H</td><td>HAND (MANUALLY INITIATED)</td></tr> <tr><td>I</td><td>CURRENT (ELECTRICAL)</td></tr> <tr><td>J</td><td>POWER</td></tr> <tr><td>K</td><td>TIME, TIME SCHEDULE</td></tr> <tr><td>L</td><td>LEVEL</td></tr> <tr><td>M</td><td>MOISTURE OR HUMIDITY</td></tr> <tr><td>N</td><td>USER'S CHOICE</td></tr> <tr><td>O</td><td>USER'S CHOICE</td></tr> <tr><td>P</td><td>PRESSURE OR VACUUM</td></tr> <tr><td>Q</td><td>QUANTITY OR EVENT</td></tr> <tr><td>R</td><td>RADIOACTIVITY</td></tr> <tr><td>S</td><td>SPEED OR FREQUENCY</td></tr> <tr><td>T</td><td>TEMPERATURE</td></tr> <tr><td>U</td><td>MULTIVARIABLE</td></tr> <tr><td>V</td><td>VIBRATION</td></tr> <tr><td>W</td><td>WEIGHT OR FORCE</td></tr> <tr><td>X</td><td>UNCLASSIFIED</td></tr> <tr><td>Y</td><td>USER'S CHOICE</td></tr> <tr><td>Z</td><td>POSITION</td></tr> </table>		FIRST LETTER	SUCCEEDING LETTER	A	ANALYSIS	B	BURNER FLAME, BREATHING	C	CONDUCTIVITY (ELECTRICAL)	D	DENSITY (MASS) OR S.G.	E	VOLTAGE	F	FLOW	G	GAGING (DIMENSIONAL)	H	HAND (MANUALLY INITIATED)	I	CURRENT (ELECTRICAL)	J	POWER	K	TIME, TIME SCHEDULE	L	LEVEL	M	MOISTURE OR HUMIDITY	N	USER'S CHOICE	O	USER'S CHOICE	P	PRESSURE OR VACUUM	Q	QUANTITY OR EVENT	R	RADIOACTIVITY	S	SPEED OR FREQUENCY	T	TEMPERATURE	U	MULTIVARIABLE	V	VIBRATION	W	WEIGHT OR FORCE	X	UNCLASSIFIED	Y	USER'S CHOICE	Z	POSITION	8
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7	<p>VALVE SYMBOLS</p> <p>DIAPHRAGM (FULL PORT) DIAPHRAGM GATE GLOBE BALL (REDUCED PORT) BALL (FULL PORT) PLUG BUTTERFLY KNIFE GATE VALVE SLIDE GATE VALVE CHOKE VALVE DAMPER VALVE AUTOMATIC RECIRCULATION VALVE</p> <p>NC - NORMALLY CLOSED NO - NORMALLY OPEN CSO - CAR SEAL OPEN CSC - CAR SEAL CLOSED THREE WAY FOUR WAY NEEDLE NRV RAM TYPE PISTON VALVE LC - LOCK CLOSE LO - LOCK OPEN BLOCK & BLEED FOOT VALVE</p>		<p>LINE NOMENCLATURE</p> <p>LINE/JACKET SIZE (mm NB) LINE SERVICE LINE PIPE SPEC. LINE NO. (*) I - INSULATION P - INSULATION TYPE INSULATION THICKNESS(mm) XX - XXX-XXX-aaabbb-IP P-25 P&ID NO. 101 ONWARDS LINE NO. 01 ONWARDS</p>		<p>INSTRUMENT HOOK UP (NOTE-1)</p> <p>1. PRESSURE INSTRUMENTS</p> <p>P&ID SYMBOL PG - PRESSURE GAUGE PI - PRESSURE INDICATOR PS - PRESSURE SWITCH PT - PRESSURE TRANSMITTER PC - PRESSURE CONTROLLER (PIPING VALVE TYPE AS PER LINE SPEC.) NOT FOR PT TYPICAL INSTALLATION</p> <p>2. FLOW TRANSMITTERS</p> <p>P&ID SYMBOL TYPICAL INSTALLATION</p>		<p>3. LEVEL INSTRUMENTS (NO BRIDLE)</p> <p>P&ID SYMBOL LG - LEVEL GAUGE LC - LEVEL CONTROLLER LS - LEVEL SWITCH LT - LEVEL TRANSMITTER TYPICAL INSTALLATION</p> <p>4. LEVEL INSTRUMENTS (ON BRIDLE)</p> <p>P&ID SYMBOL TYPICAL INSTALLATION LEVEL SWITCH ARRANGEMENT SHOWN FOR ALARM ONLY (ARRANGEMENT FOR SHUTDOWN MUST HAVE SEPARATE SWITCH) LEVEL CONTROLLER VESSEL 20 NPT UNION 50 NB STANDPIPE</p>		7																																																										
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BHS-J1 WELL SITE



BHS-R1 WELL SITE

GENERAL NOTES (FOR ALL P&IDs):

a. REFER 1019-PS-PID-100 GENERAL NOTES.

NOTES :

- PROVISION FOR FUTURE.
- BURIED LINE SHALL BE PROTECTED WITH CATHODIC PROTECTION.
- COLLECTOR LINE SHALL BE PIGGABLE.
- PIG LAUNCHER DOOR OPENING MECHANISM TO BE CONSTRUCTED SUCH THAT THE DOOR CAN NOT BE OPENED UNLESS IT IS FULLY DEPRESSURIZED. REFER COLLECTOR LINE VENDOR P&ID FOR MORE DETAIL.
- PROVISION FOR INJECTION OF PPD AND WAX DISPERSION. PROVISION POINT TO BE 180° APART AND IN VERTICAL ORIENTATION.
- ESP OR PCP TYPE ARTIFICIAL LIFTING PUMPS ARE FUTURE PROVISION.
- COLLECTOR LINE PIG LAUNCHER AT BHS-R1 WELL SITE.
- CHIKSAN WITH END CAP FOR WELL TESTING AND PORTABLE MULTI-PHASE FLOW METER. 25 NB VALVE FOR LINE DEPRESSURIZATION AFTER WELL TESTING.
- SAMPLING VALVE TO BE PROVIDED WITH PLUG.
- VENT AND DRAIN SHOWN IN THIS P&ID ARE TYPICAL & TO BE FINALIZED BASED ON PIPE ROUTING DURING DETAIL ENGINEERING.
- SIGNAL/ALARM & INTERLOCK BETWEEN CPF, BHASKAR FIELD AND WELLS LOCATION SHALL BE TRANSMITTED VIA SCADA SYSTEM (RADIO FREQUENCY).
- (E-0304) INTERLOCK IS FOR FUTURE PROVISION TO STOP ARTIFICIAL LIFT PUMPS OF WELLS.
- BULL PLUG WITH PG TO BE PROVIDED ON WELL HEAD.
- PT AND PG TO BE PROVIDED FOR CASING PRESSURE MONITORING.
- BEAN HOUSING WITH PT AND PG FOR MONITORING TUBING HEAD PRESSURE.
- DRAIN TO BE ROUTED IN CELLAR PIT.
- VENT AT HIGH POINT SAFE LOCATION.

INTERLOCK DESCRIPTION :

SR NO.	I/L NO.	P & ID	CAUSE	EFFECT
1	E-0304	1019-PS-PID-101 (SHEET 2 OF 2) 1019-PS-PID-103	CLOSE XV-V101_2 OF V-101 (ZSC-XV-V101_2)	TRIP P-112J1, TRIP P-112R1 ARTIFICIAL LIFT PUMPS OF WELLS (NOTE-12)

3	30.09.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
2	18.08.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
1	13.06.2020	ISSUED FOR ENGINEERING	PD	VS	CM	AK
0	22.05.2020	ISSUED FOR REVIEW	PD	MS	CM	AK
No.	DATE	REVISION	DRAWN	CHD	REVD	APPD

QUANTA PROCESS SOLUTIONS PVT.LTD.
www.quantaprocess.com

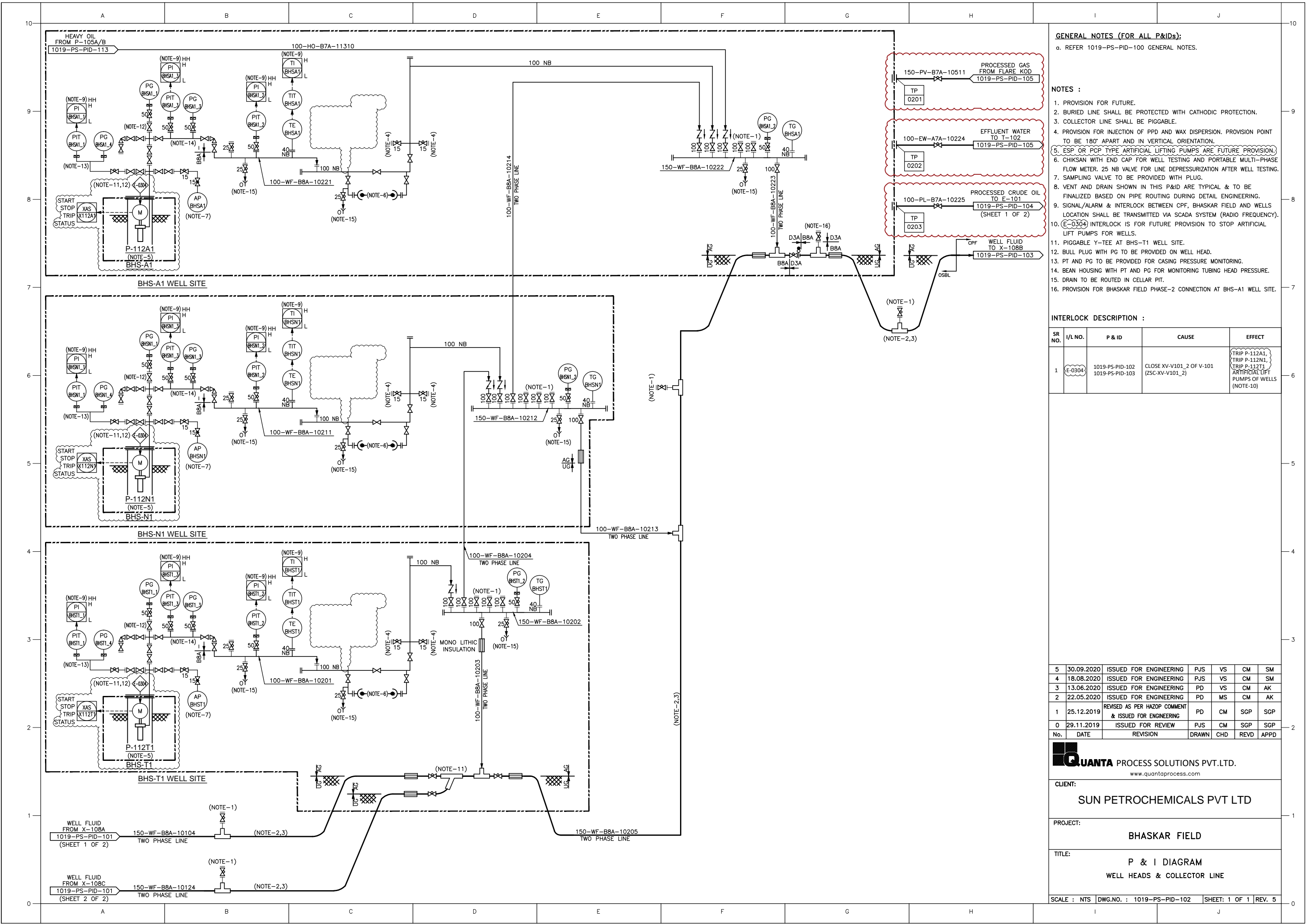
CLIENT:
SUN PETROCHEMICALS PVT LTD

PROJECT:
BHASKAR FIELD

TITLE:
**P & I DIAGRAM
WELL HEADS AND PIG LAUNCHER AT BHS-R1**

SCALE : NTS | DWG.NO. : 1019-PS-PID-101 | SHEET: 2 OF 2 | REV. 3

TAG. NO.	X-108C
TITLE	COLLECTOR LINE PIG LAUNCHER
DESCRIPTION	MAJOR BARREL,mm : 219 ID x 2800 L MINOR BARREL,mm : 188 ID x 1900 L DP : 45/FV kg/cm ² g DT : 80 °C MOC : CS ELEVATION:AT GRADE



- GENERAL NOTES (FOR ALL P&IDs):**
- a. REFER 1019-PS-PID-100 GENERAL NOTES.
- NOTES :**
- 1. PROVISION FOR FUTURE.
 - 2. BURIED LINE SHALL BE PROTECTED WITH CATHODIC PROTECTION.
 - 3. COLLECTOR LINE SHALL BE PIGGABLE.
 - 4. PROVISION FOR INJECTION OF PPD AND WAX DISPERSION. PROVISION POINT TO BE 180° APART AND IN VERTICAL ORIENTATION.
 - 5. ESP OR PCP TYPE ARTIFICIAL LIFTING PUMPS ARE FUTURE PROVISION.
 - 6. CHIKSAN WITH END CAP FOR WELL TESTING AND PORTABLE MULTI-PHASE FLOW METER. 25 NB VALVE FOR LINE DEPRESSURIZATION AFTER WELL TESTING.
 - 7. SAMPLING VALVE TO BE PROVIDED WITH PLUG.
 - 8. VENT AND DRAIN SHOWN IN THIS P&ID ARE TYPICAL & TO BE FINALIZED BASED ON PIPE ROUTING DURING DETAIL ENGINEERING.
 - 9. SIGNAL/ALARM & INTERLOCK BETWEEN CPF, BHASKAR FIELD AND WELLS LOCATION SHALL BE TRANSMITTED VIA SCADA SYSTEM (RADIO FREQUENCY).
 - 10. (E-0304) INTERLOCK IS FOR FUTURE PROVISION TO STOP ARTIFICIAL LIFT PUMPS FOR WELLS.
 - 11. PIGGABLE Y-TREE AT BHS-T1 WELL SITE.
 - 12. BULL PLUG WITH PG TO BE PROVIDED ON WELL HEAD.
 - 13. PT AND PG TO BE PROVIDED FOR CASING PRESSURE MONITORING.
 - 14. BEAN HOUSING WITH PT AND PG FOR MONITORING TUBING HEAD PRESSURE.
 - 15. DRAIN TO BE ROUTED IN CELLAR PIT.
 - 16. PROVISION FOR BHASKAR FIELD PHASE-2 CONNECTION AT BHS-A1 WELL SITE.

INTERLOCK DESCRIPTION :

SR NO.	I/L NO.	P & ID	CAUSE	EFFECT
1	(E-0304)	1019-PS-PID-102 1019-PS-PID-103	CLOSE XV-V101_2 OF V-101 (ZSC-XV-V101_2)	TRIP P-112A1, TRIP P-112N1, TRIP P-112T1 ARTIFICIAL LIFT PUMPS OF WELLS (NOTE-10)

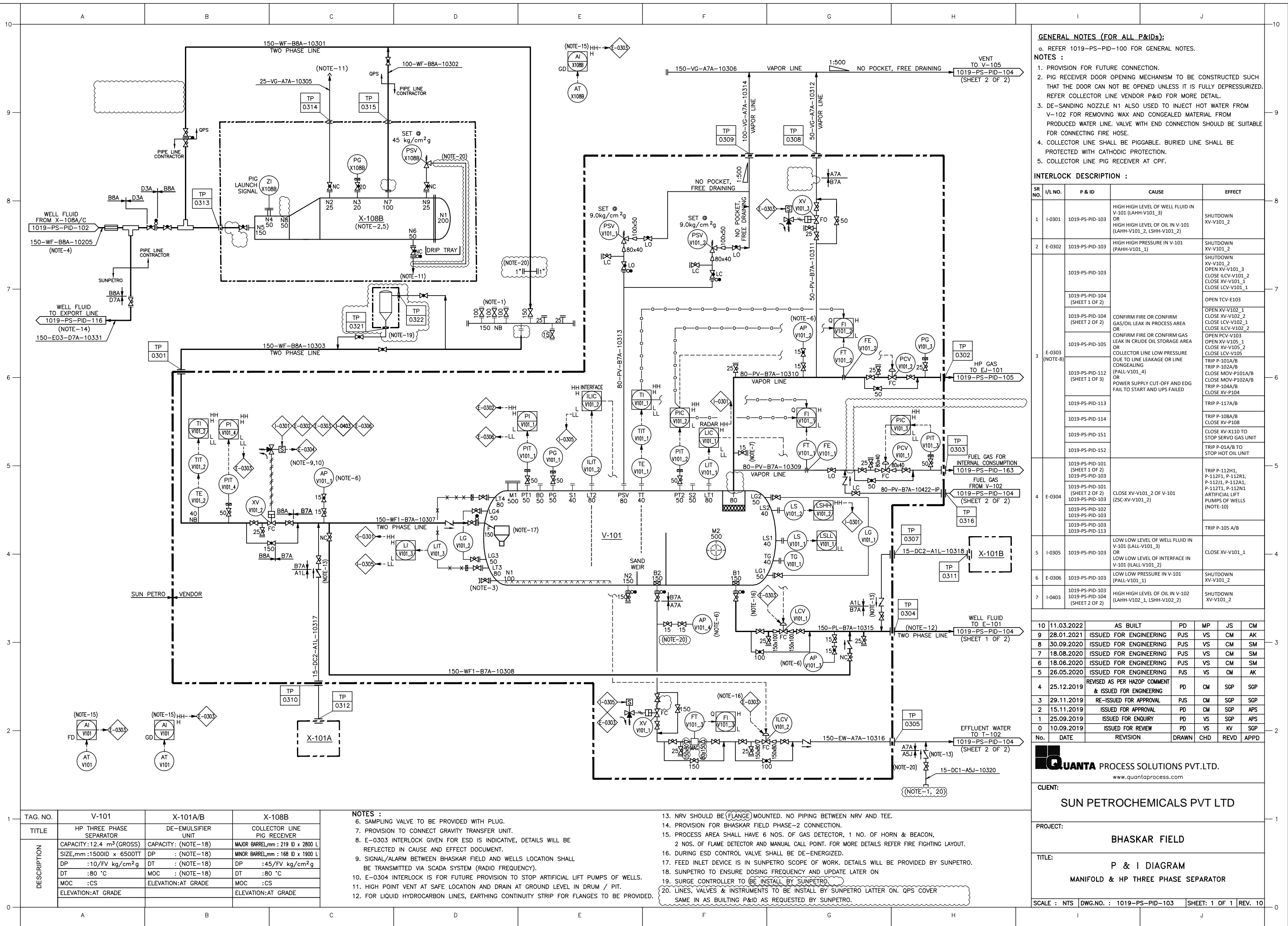
5	30.09.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
4	18.08.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
3	13.06.2020	ISSUED FOR ENGINEERING	PD	VS	CM	AK
2	22.05.2020	ISSUED FOR ENGINEERING	PD	MS	CM	AK
1	25.12.2019	REVISED AS PER HAZOP COMMENT & ISSUED FOR ENGINEERING	PD	CM	SGP	SGP
0	29.11.2019	ISSUED FOR REVIEW	PJS	CM	SGP	SGP
No.	DATE	REVISION	DRAWN	CHD	REVD	APPD

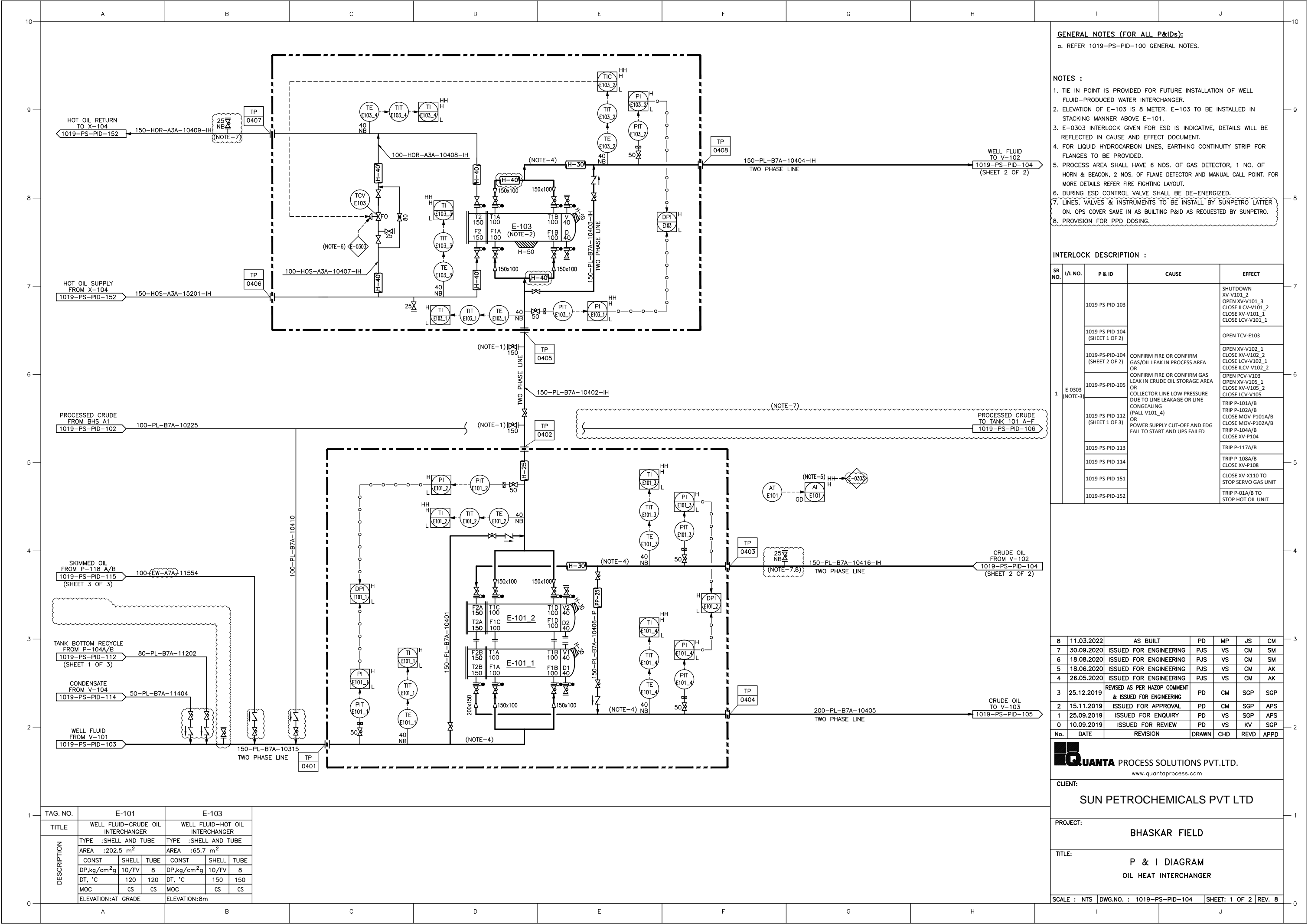
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CLIENT:
SUN PETROCHEMICALS PVT LTD

PROJECT:
BHASKAR FIELD

TITLE:
**P & I DIAGRAM
WELL HEADS & COLLECTOR LINE**





GENERAL NOTES (FOR ALL P&IDs):

a. REFER 1019-PS-PID-100 GENERAL NOTES.

NOTES :

1. TIE IN POINT IS PROVIDED FOR FUTURE INSTALLATION OF WELL FLUID-PRODUCED WATER INTERCHANGER.
2. ELEVATION OF E-103 IS 8 METER. E-103 TO BE INSTALLED IN STACKING MANNER ABOVE E-101.
3. E-0303 INTERLOCK GIVEN FOR ESD IS INDICATIVE, DETAILS WILL BE REFLECTED IN CAUSE AND EFFECT DOCUMENT.
4. FOR LIQUID HYDROCARBON LINES, EARTHING CONTINUITY STRIP FOR FLANGES TO BE PROVIDED.
5. PROCESS AREA SHALL HAVE 6 NOS. OF GAS DETECTOR, 1 NO. OF HORN & BEACON, 2 NOS. OF FLAME DETECTOR AND MANUAL CALL POINT. FOR MORE DETAILS REFER FIRE FIGHTING LAYOUT.
6. DURING ESD CONTROL VALVE SHALL BE DE-ENERGIZED.
7. LINES, VALVES & INSTRUMENTS TO BE INSTALL BY SUNPETRO LATTER ON. QPS COVER SAME IN AS BUILDING P&ID AS REQUESTED BY SUNPETRO.
8. PROVISION FOR PPD DOSING.

INTERLOCK DESCRIPTION :				
SR NO.	I/L NO.	P & ID	CAUSE	EFFECT
1	E-0303 (NOTE-3)	1019-PS-PID-103	CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN PROCESS AREA OR CONFIRM FIRE OR CONFIRM GAS LEAK IN CRUDE OIL STORAGE AREA OR COLLECTOR LINE LOW PRESSURE DUE TO LINE LEAKAGE OR LINE CONGEALING (PALL-V101_4) OR POWER SUPPLY CUT-OFF AND EDG FAIL TO START AND UPS FAILED	SHUTDOWN XV-V101_2 OPEN XV-V101_3 CLOSE ILCV-V101_2 CLOSE XV-V101_1 CLOSE LCV-V101_1
		1019-PS-PID-104 (SHEET 1 OF 2)		OPEN TCV-E103
		1019-PS-PID-104 (SHEET 2 OF 2)		OPEN XV-V102_1 CLOSE XV-V102_2 CLOSE LCV-V102_1 CLOSE ILCV-V102_2
		1019-PS-PID-105		OPEN PCV-V103 OPEN XV-V105_1 CLOSE XV-V105_2 CLOSE LCV-V105
		1019-PS-PID-112 (SHEET 1 OF 3)		TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104
		1019-PS-PID-113		TRIP P-117A/B
		1019-PS-PID-114		TRIP P-108A/B CLOSE XV-P108
		1019-PS-PID-151		CLOSE XV-X110 TO STOP SERVO GAS UNIT
		1019-PS-PID-152		TRIP P-01A/B TO STOP HOT OIL UNIT

8	11.03.2022	AS BUILT	PD	MP	JS	CM
7	30.09.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
6	18.08.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
5	18.06.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	AK
4	26.05.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	AK
3	25.12.2019	REVISED AS PER HAZOP COMMENT & ISSUED FOR ENGINEERING	PD	CM	SGP	SGP
2	15.11.2019	ISSUED FOR APPROVAL	PD	CM	SGP	APS
1	25.09.2019	ISSUED FOR ENQUIRY	PD	VS	SGP	APS
0	10.09.2019	ISSUED FOR REVIEW	PD	VS	KV	SGP
No.	DATE	REVISION	DRAWN	CHD	REVD	APPD

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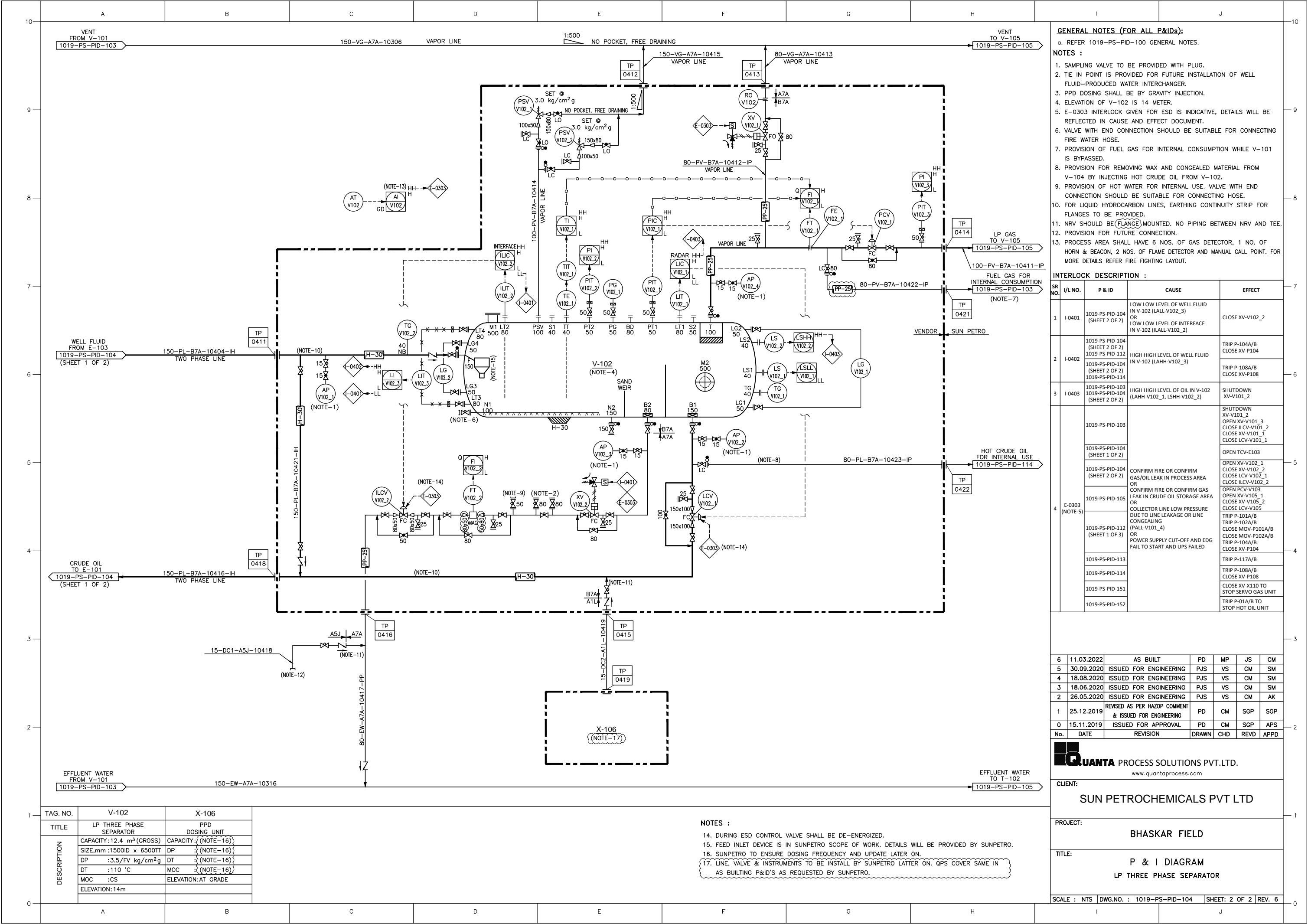
CLIENT:
SUN PETROCHEMICALS PVT LTD

PROJECT:
BHASKAR FIELD

TITLE:
**P & I DIAGRAM
OIL HEAT INTERCHANGER**

SCALE : NTS DWG.NO. : 1019-PS-PID-104 SHEET: 1 OF 2 REV. 8


TAG. NO.	E-101			E-103		
	WELL FLUID-CRUDE OIL INTERCHANGER			WELL FLUID-HOT OIL INTERCHANGER		
	TYPE :SHELL AND TUBE			TYPE :SHELL AND TUBE		
	AREA :202.5 m ²			AREA :65.7 m ²		
	CONST	SHELL	TUBE	CONST	SHELL	TUBE
	DP,kg/cm ² g	10/FV	8	DP,kg/cm ² g	10/FV	8
	DT, °C	120	120	DT, °C	150	150
DESCRIPTION	MOC	CS	CS	MOC	CS	CS
	ELEVATION:AT GRADE			ELEVATION:8m		



- GENERAL NOTES (FOR ALL P&IDs):**
- a. REFER 1019-PS-PID-100 GENERAL NOTES.
- NOTES :**
- SAMPLING VALVE TO BE PROVIDED WITH PLUG.
 - TIE IN POINT IS PROVIDED FOR FUTURE INSTALLATION OF WELL FLUID-PRODUCED WATER INTERCHANGER.
 - PPD DOSING SHALL BE BY GRAVITY INJECTION.
 - ELEVATION OF V-102 IS 14 METER.
 - E-0303 INTERLOCK GIVEN FOR ESD IS INDICATIVE, DETAILS WILL BE REFLECTED IN CAUSE AND EFFECT DOCUMENT.
 - VALVE WITH END CONNECTION SHOULD BE SUITABLE FOR CONNECTING FIRE WATER HOSE.
 - PROVISION OF FUEL GAS FOR INTERNAL CONSUMPTION WHILE V-101 IS BYPASSED.
 - PROVISION FOR REMOVING WAX AND CONGEALED MATERIAL FROM V-104 BY INJECTING HOT CRUDE OIL FROM V-102.
 - PROVISION OF HOT WATER FOR INTERNAL USE. VALVE WITH END CONNECTION SHOULD BE SUITABLE FOR CONNECTING HOSE.
 - FOR LIQUID HYDROCARBON LINES, EARTHING CONTINUITY STRIP FOR FLANGES TO BE PROVIDED.
 - NRV SHOULD BE (FLANGE) MOUNTED. NO PIPING BETWEEN NRV AND TEE.
 - PROVISION FOR FUTURE CONNECTION.
 - PROCESS AREA SHALL HAVE 6 NOS. OF GAS DETECTOR, 1 NO. OF HORN & BEACON, 2 NOS. OF FLAME DETECTOR AND MANUAL CALL POINT. FOR MORE DETAILS REFER FIRE FIGHTING LAYOUT.

INTERLOCK DESCRIPTION :				
SR NO.	I/L NO.	P & ID	CAUSE	EFFECT
1	I-0401	1019-PS-PID-104 (SHEET 2 OF 2)	LOW LOW LEVEL OF WELL FLUID IN V-102 (LALL-V102_3) OR LOW LOW LEVEL OF INTERFACE IN V-102 (ILALL-V102_2)	CLOSE XV-V102_2
2	I-0402	1019-PS-PID-104 (SHEET 2 OF 2) 1019-PS-PID-112 (SHEET 2 OF 2) 1019-PS-PID-114	HIGH HIGH LEVEL OF WELL FLUID IN V-102 (LAHH-V102_3)	TRIP P-104A/B CLOSE XV-P104 TRIP P-108A/B CLOSE XV-P108
3	I-0403	1019-PS-PID-103 1019-PS-PID-104 (SHEET 2 OF 2)	HIGH HIGH LEVEL OF OIL IN V-102 (LAHH-V102_1, LSHH-V102_2)	SHUTDOWN XV-V101_2
4	E-0303 (NOTE-5)	1019-PS-PID-103 1019-PS-PID-104 (SHEET 1 OF 2) 1019-PS-PID-104 (SHEET 2 OF 2) 1019-PS-PID-105 1019-PS-PID-112 (SHEET 1 OF 3) 1019-PS-PID-113 1019-PS-PID-114 1019-PS-PID-151 1019-PS-PID-152	SHUTDOWN XV-V101_2 OPEN XV-V101_3 CLOSE ILCV-V101_2 CLOSE XV-V101_1 CLOSE LCV-V101_1 CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN PROCESS AREA OR CONFIRM FIRE OR CONFIRM GAS LEAK IN CRUDE OIL STORAGE AREA OR COLLECTOR LINE LOW PRESSURE DUE TO LINE LEAKAGE OR LINE CONGEALING (PALL-V101_4) OR POWER SUPPLY CUT-OFF AND EDG FAIL TO START AND UPS FAILED	SHUTDOWN XV-V101_2 OPEN XV-V101_3 CLOSE ILCV-V101_2 CLOSE XV-V101_1 CLOSE LCV-V101_1 OPEN TCV-E103 OPEN XV-V102_1 CLOSE XV-V102_2 CLOSE LCV-V102_1 CLOSE ILCV-V102_2 OPEN PCV-V103 OPEN XV-V105_1 CLOSE XV-V105_2 CLOSE LCV-V105 TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104 TRIP P-117A/B TRIP P-108A/B CLOSE XV-P108 CLOSE XV-X110 TO STOP SERVO GAS UNIT TRIP P-01A/B TO STOP HOT OIL UNIT

6	11.03.2022	AS BUILT	PD	MP	JS	CM
5	30.09.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
4	18.08.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
3	18.06.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
2	26.05.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	AK
1	25.12.2019	REVISED AS PER HAZOP COMMENT & ISSUED FOR ENGINEERING	PD	CM	SGP	SGP
0	15.11.2019	ISSUED FOR APPROVAL	PD	CM	SGP	APS
No.	DATE	REVISION	DRAWN	CHD	REVD	APPD



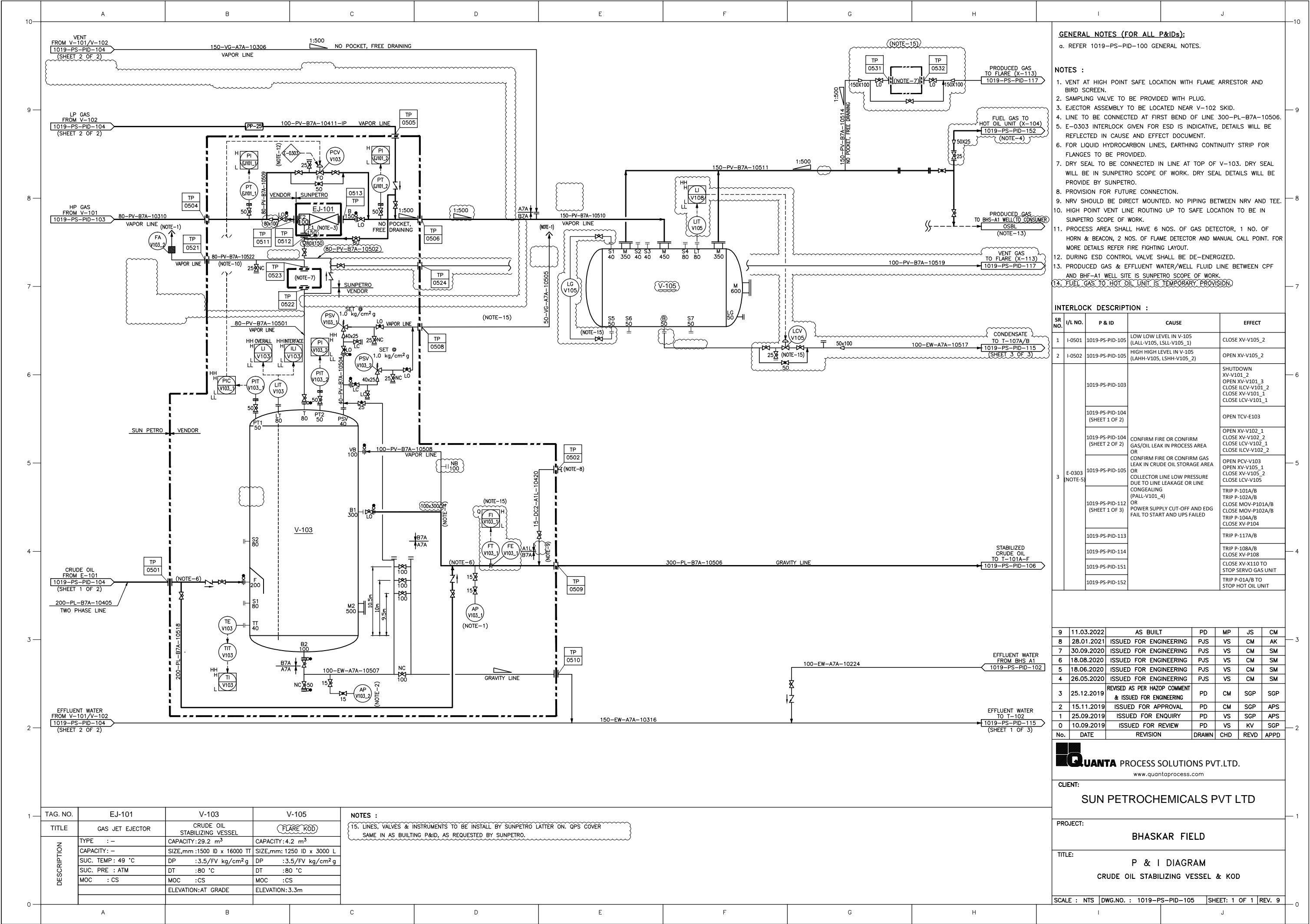
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CLIENT:
SUN PETROCHEMICALS PVT LTD

PROJECT:
BHASKAR FIELD

TITLE:
**P & I DIAGRAM
LP THREE PHASE SEPARATOR**


SCALE : NTS | DWG.NO. : 1019-PS-PID-104 | SHEET: 2 OF 2 | REV. 6



- GENERAL NOTES (FOR ALL P&IDs):**
- a. REFER 1019-PS-PID-100 GENERAL NOTES.
- NOTES :**
- VENT AT HIGH POINT SAFE LOCATION WITH FLAME ARRESTOR AND BIRD SCREEN.
 - SAMPLING VALVE TO BE PROVIDED WITH PLUG.
 - EJECTOR ASSEMBLY TO BE LOCATED NEAR V-102 SKID.
 - LINE TO BE CONNECTED AT FIRST BEND OF LINE 300-PL-B7A-10506.
 - E-0303 INTERLOCK GIVEN FOR ESD IS INDICATIVE, DETAILS WILL BE REFLECTED IN CAUSE AND EFFECT DOCUMENT.
 - FOR LIQUID HYDROCARBON LINES, EARTHING CONTINUITY STRIP FOR FLANGES TO BE PROVIDED.
 - DRY SEAL TO BE CONNECTED IN LINE AT TOP OF V-103. DRY SEAL WILL BE IN SUNPETRO SCOPE OF WORK. DRY SEAL DETAILS WILL BE PROVIDE BY SUNPETRO.
 - PROVISION FOR FUTURE CONNECTION.
 - NRV SHOULD BE DIRECT MOUNTED. NO PIPING BETWEEN NRV AND TEE.
 - HIGH POINT VENT LINE ROUTING UP TO SAFE LOCATION TO BE IN SUNPETRO SCOPE OF WORK.
 - PROCESS AREA SHALL HAVE 6 NOS. OF GAS DETECTOR, 1 NO. OF HORN & BEACON, 2 NOS. OF FLAME DETECTOR AND MANUAL CALL POINT. FOR MORE DETAILS REFER FIRE FIGHTING LAYOUT.
 - DURING ESD CONTROL VALVE SHALL BE DE-ENERGIZED.
 - PRODUCED GAS & EFFLUENT WATER/WELL FLUID LINE BETWEEN CPF AND BHF-A1 WELL SITE IS SUNPETRO SCOPE OF WORK.
 - FUEL GAS TO HOT OIL UNIT IS TEMPORARY PROVISION.

INTERLOCK DESCRIPTION :				
SR NO.	I/L NO.	P & ID	CAUSE	EFFECT
1	I-0501	1019-PS-PID-105	LOW LOW LEVEL IN V-105 (LALL-V105, LSL-V105_1)	CLOSE XV-V105_2
2	I-0502	1019-PS-PID-105	HIGH HIGH LEVEL IN V-105 (LAHH-V105, LSHH-V105_2)	OPEN XV-V105_2
3	E-0303 (NOTE-5)	1019-PS-PID-103	CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN PROCESS AREA OR CONFIRM FIRE OR CONFIRM GAS LEAK IN CRUDE OIL STORAGE AREA OR COLLECTOR LINE LOW PRESSURE DUE TO LINE LEAKAGE OR LINE CONGEALING (PALL-V101_4) OR POWER SUPPLY CUT-OFF AND EDG FAIL TO START AND UPS FAILED	SHUTDOWN XV-V101_2 OPEN XV-V101_3 CLOSE LCV-V101_2 CLOSE XV-V101_1 CLOSE LCV-V101_1
		1019-PS-PID-104 (SHEET 1 OF 2)		OPEN TCV-E103
		1019-PS-PID-104 (SHEET 2 OF 2)		OPEN XV-V102_1 CLOSE XV-V102_2 CLOSE LCV-V102_1 CLOSE LCV-V102_2
		1019-PS-PID-105		OPEN PCV-V103 OPEN XV-V105_1 CLOSE XV-V105_2 CLOSE LCV-V105
		1019-PS-PID-112 (SHEET 1 OF 3)		TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104
		1019-PS-PID-113		TRIP P-117A/B
		1019-PS-PID-114		TRIP P-108A/B CLOSE XV-P108
		1019-PS-PID-151		CLOSE XV-X110 TO STOP SERVO GAS UNIT
		1019-PS-PID-152		TRIP P-01A/B TO STOP HOT OIL UNIT
		1019-PS-PID-106		

9	11.03.2022	AS BUILT	PD	MP	JS	CM
8	28.01.2021	ISSUED FOR ENGINEERING	PJS	VS	CM	AK
7	30.09.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
6	18.08.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
5	18.06.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
4	26.05.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
3	25.12.2019	REVISED AS PER HAZOP COMMENT & ISSUED FOR ENGINEERING	PD	CM	SGP	SGP
2	15.11.2019	ISSUED FOR APPROVAL	PD	CM	SGP	APS
1	25.09.2019	ISSUED FOR ENQUIRY	PD	VS	SGP	APS
0	10.09.2019	ISSUED FOR REVIEW	PD	VS	KV	SGP
No.	DATE	REVISION	DRAWN	CHD	REVD	APPD

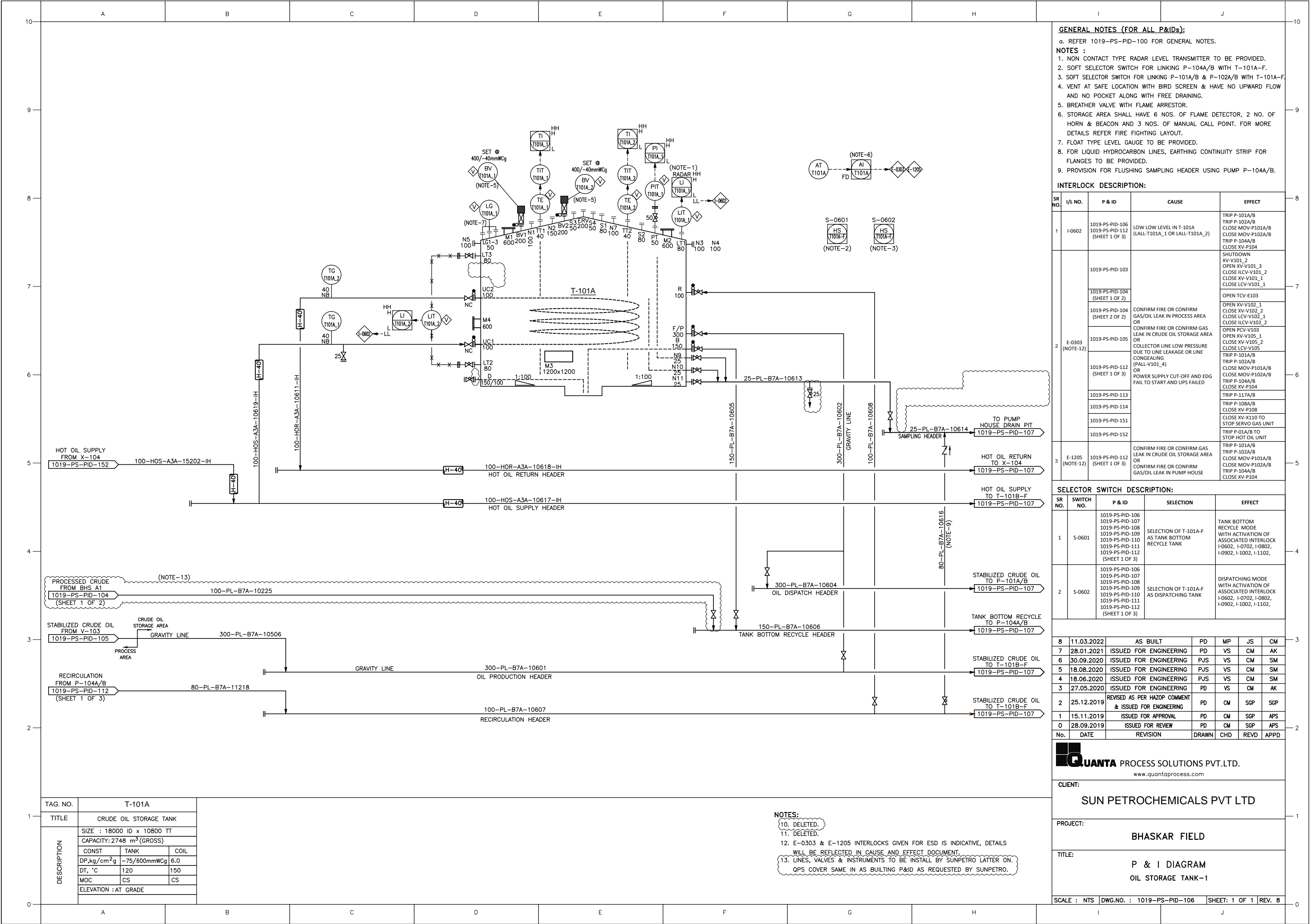
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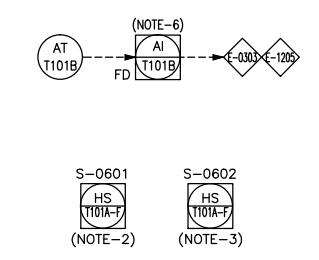
CLIENT:
SUN PETROCHEMICALS PVT LTD

PROJECT:
BHASKAR FIELD

TITLE:
**P & I DIAGRAM
CRUDE OIL STABILIZING VESSEL & KOD**

SCALE : NTS | DWG.NO. : 1019-PS-PID-105 | SHEET: 1 OF 1 | REV. 9






INTERLOCK DESCRIPTION:				
SR NO.	I/L NO.	P & ID	CAUSE	EFFECT
1	I-0702	1019-PS-PID-107 1019-PS-PID-112 (SHEET 1 OF 3)	LOW LOW LEVEL IN T-101B (LALL-T101B_1 OR LALL-T101B_2)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104
2	E-0303 (NOTE-11)	1019-PS-PID-103	CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN PROCESS AREA OR CONFIRM FIRE OR CONFIRM GAS LEAK IN CRUDE OIL STORAGE AREA OR COLLECTOR LINE LOW PRESSURE DUE TO LINE LEAKAGE OR LINE CONGEALING (PALL-V101_4) OR POWER SUPPLY CUT-OFF AND EDG FAIL TO START AND UPS FAILED	SHUTDOWN XV-V101_2 OPEN XV-V101_3 CLOSE ILCV-V101_2 CLOSE XV-V101_1 CLOSE LCV-V101_1
		1019-PS-PID-104 (SHEET 1 OF 2)		OPEN TCV-E103
		1019-PS-PID-104 (SHEET 2 OF 2)		OPEN XV-V102_1 CLOSE XV-V102_2 CLOSE ILCV-V102_1 CLOSE ILCV-V102_2
		1019-PS-PID-105		OPEN PCV-V103 OPEN XV-V105_1 CLOSE XV-V105_2 TRIP LCV-V105
		1019-PS-PID-112 (SHEET 1 OF 3)		TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104
		1019-PS-PID-113		TRIP P-117A/B
		1019-PS-PID-114		TRIP P-108A/B CLOSE XV-P108
		1019-PS-PID-151		CLOSE XV-X110 TO STOP SERVO GAS UNIT
		1019-PS-PID-152		TRIP P-01A/B TO STOP HOT OIL UNIT
3	E-1205 (NOTE-11)	1019-PS-PID-112 (SHEET 1 OF 3)	CONFIRM FIRE OR CONFIRM GAS LEAK IN CRUDE OIL STORAGE AREA OR CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN PUMP HOUSE	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104

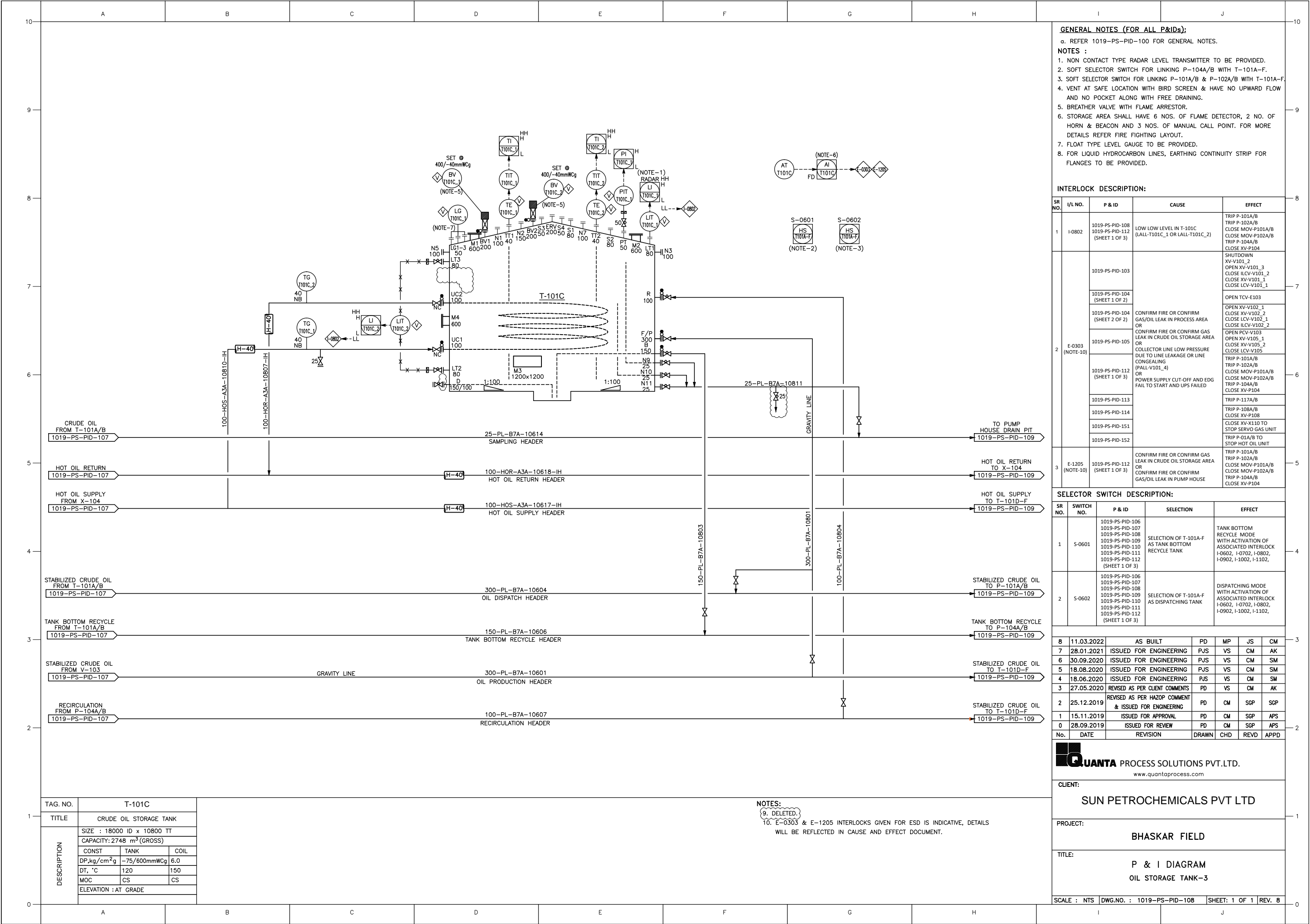
8	11.03.2022	AS BUILT	PD	MP	JS	CM
7	28.01.2021	ISSUED FOR ENGINEERING	PJ	VS	CM	AK
6	30.09.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
5	18.08.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
4	18.06.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
3	27.05.2020	REVISED AS PER CLIENT COMMENTS	PD	VS	CM	AK
2	25.12.2019	REVISED AS PER HAZOP COMMENT & ISSUED FOR ENGINEERING	PD	CM	SGP	SGP
1	15.11.2019	ISSUED FOR APPROVAL	PD	CM	SGP	APS
0	28.09.2019	ISSUED FOR REVIEW	PD	CM	SGP	APS
No.	DATE	REVISION	DRAWN	CHD	REV'D	APP'D

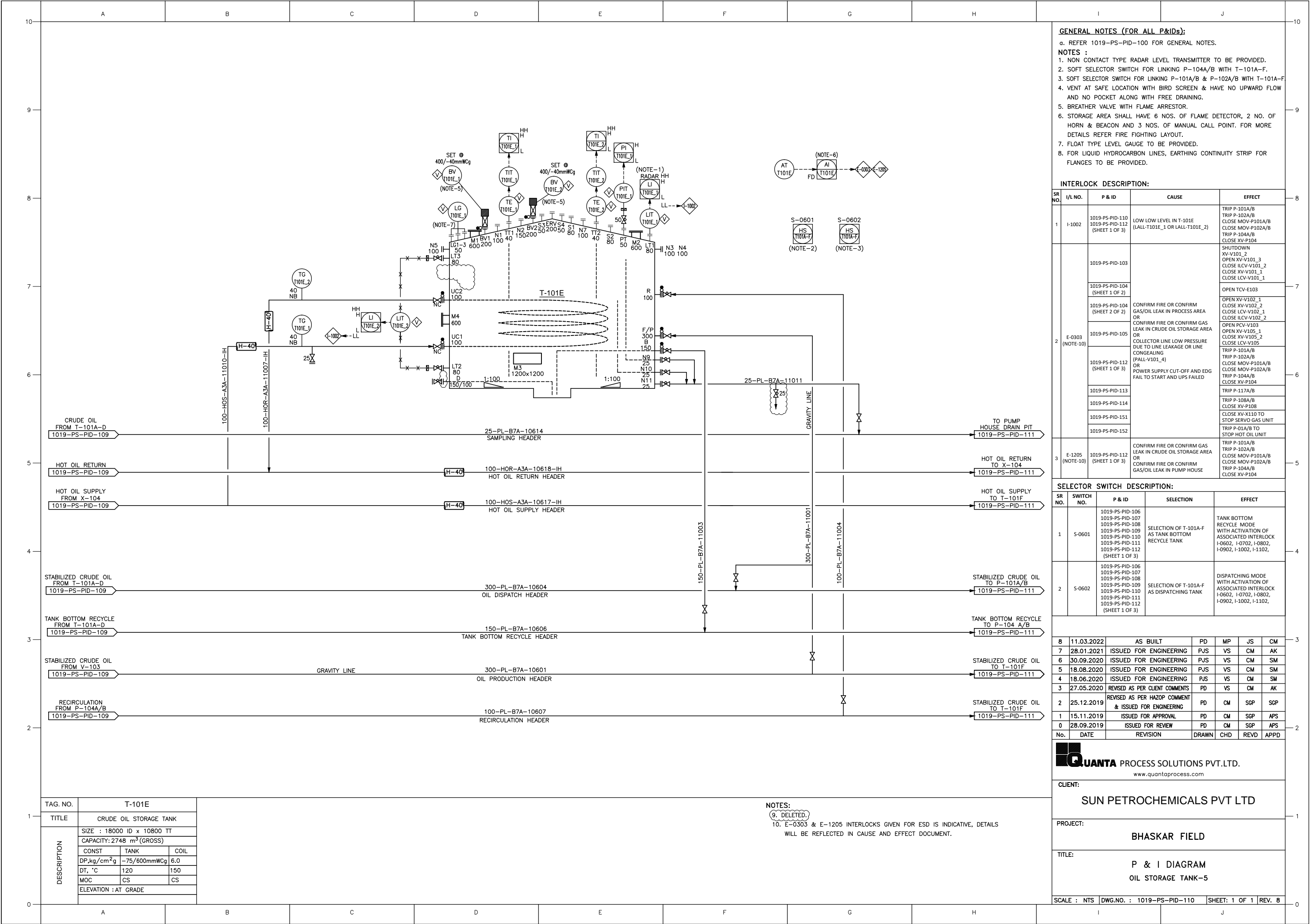
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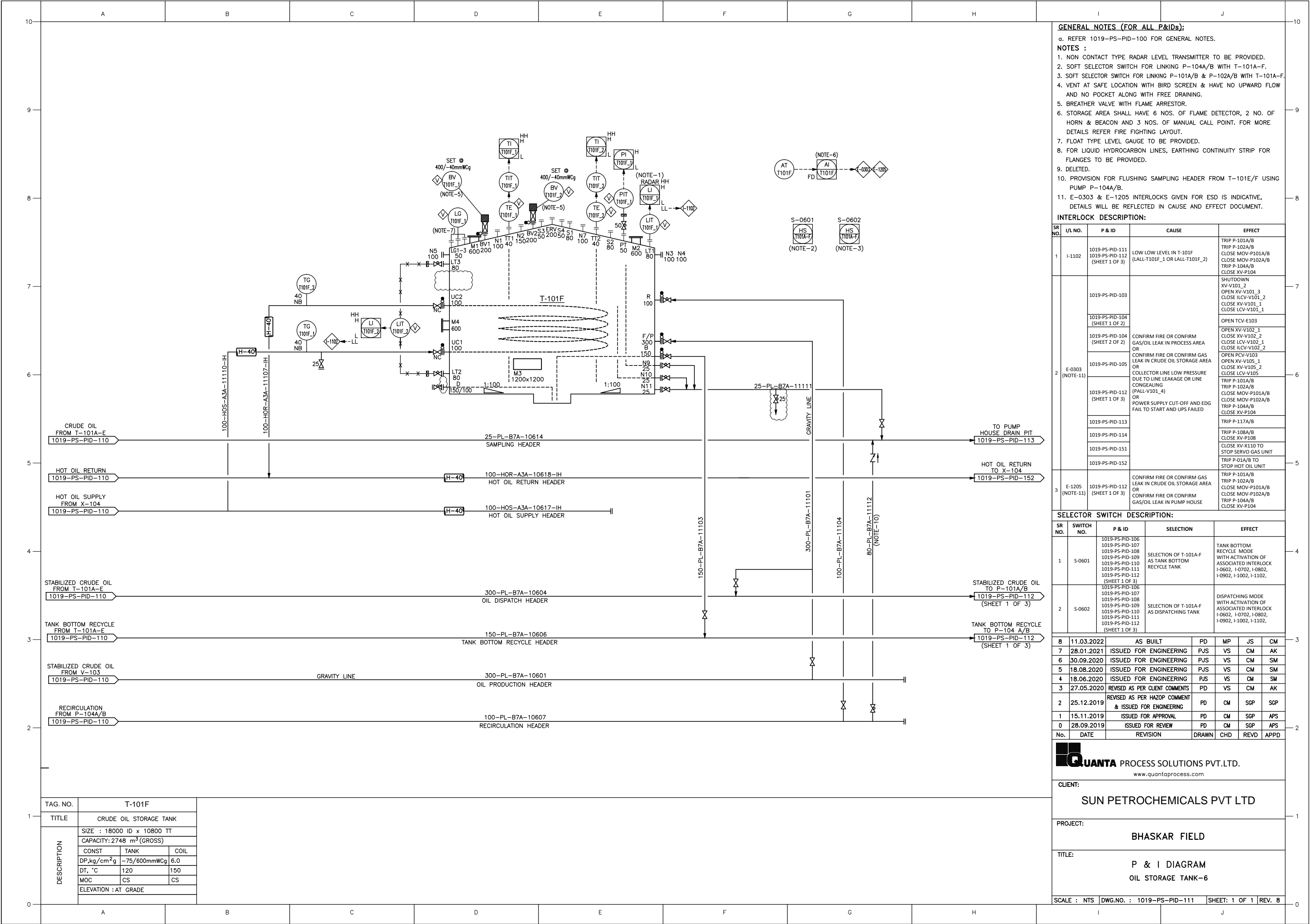
10. DELETED.

11. E-0303 & E-1205 INTERLOCKS GIVEN FOR ESD IS INDICATIVE, DETAILS WILL BE REFLECTED IN CAUSE AND EFFECT DOCUMENT.

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CLIENT: SUN PETROCHEMICALS PVT LTD			
PROJECT: BHASKAR FIELD			
TITLE: P & I DIAGRAM WELL HEADS AND PIG LAUNCHER AT BHS-F1			
SCALE :	NTS	DWG.NO. :	1019-PS-PID-107
SHEET:	1 OF 1	REV.	8







- GENERAL NOTES (FOR ALL P&IDs):**
- a. REFER 1019-PS-PID-100 FOR GENERAL NOTES.
- NOTES :**
- NON CONTACT TYPE RADAR LEVEL TRANSMITTER TO BE PROVIDED.
 - SOFT SELECTOR SWITCH FOR LINKING P-104A/B WITH T-101A-F.
 - SOFT SELECTOR SWITCH FOR LINKING P-101A/B & P-102A/B WITH T-101A-F.
 - VENT AT SAFE LOCATION WITH BIRD SCREEN & HAVE NO UPWARD FLOW AND NO POCKET ALONG WITH FREE DRAINING.
 - BREATHER VALVE WITH FLAME ARRESTOR.
 - STORAGE AREA SHALL HAVE 6 NOS. OF FLAME DETECTOR, 2 NO. OF HORN & BEACON AND 3 NOS. OF MANUAL CALL POINT. FOR MORE DETAILS REFER FIRE FIGHTING LAYOUT.
 - FLOAT TYPE LEVEL GAUGE TO BE PROVIDED.
 - FOR LIQUID HYDROCARBON LINES, EARTHING CONTINUITY STRIP FOR FLANGES TO BE PROVIDED.
 - DELETED.
 - PROVISION FOR FLUSHING SAMPLING HEADER FROM T-101E/F USING PUMP P-104A/B.
 - E-0303 & E-1205 INTERLOCKS GIVEN FOR ESD IS INDICATIVE, DETAILS WILL BE REFLECTED IN CAUSE AND EFFECT DOCUMENT.

INTERLOCK DESCRIPTION:				
SR NO.	I/L NO.	P & ID	CAUSE	EFFECT
1	I-1102	1019-PS-PID-111 1019-PS-PID-112 (SHEET 1 OF 3)	LOW LOW LEVEL IN T-101F (LALL-T101F_1 OR LALL-T101F_2)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104
2	1019-PS-PID-103			SHUTDOWN XV-V101_2 OPEN XV-V101_3 CLOSE ILCV-V101_2 CLOSE XV-V101_1 CLOSE LCV-V101_1
	1019-PS-PID-104 (SHEET 1 OF 2)			OPEN TCV-E103
	1019-PS-PID-104 (SHEET 2 OF 2)		CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN PROCESS AREA OR	OPEN XV-V102_1 CLOSE XV-V102_2 CLOSE LCV-V102_1 CLOSE ILCV-V102_2
	1019-PS-PID-105		CONFIRM FIRE OR CONFIRM GAS LEAK IN CRUDE OIL STORAGE AREA OR	OPEN PCV-V103 OPEN XV-V105_1 CLOSE XV-V105_2 CLOSE LCV-V105
	1019-PS-PID-112 (SHEET 1 OF 3)		COLLECTOR LINE LOW PRESSURE DUE TO LINE LEAKAGE OR LINE CONGEALING (PALL-V101_4) OR	TRIP P-101A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104
	1019-PS-PID-113		POWER SUPPLY CUT-OFF AND EDG FAIL TO START AND UPS FAILED	TRIP P-117A/B
	1019-PS-PID-114			TRIP P-108A/B CLOSE XV-P108
	1019-PS-PID-151			CLOSE XV-X110 TO STOP SERVO GAS UNIT
	1019-PS-PID-152			TRIP P-01A/B TO STOP HOT OIL UNIT
	1019-PS-PID-152			
3	E-1205 (NOTE-11)	1019-PS-PID-112 (SHEET 1 OF 3)	CONFIRM FIRE OR CONFIRM GAS LEAK IN CRUDE OIL STORAGE AREA OR CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN PUMP HOUSE	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104

SELECTOR SWITCH DESCRIPTION:				
SR NO.	SWITCH NO.	P & ID	SELECTION	EFFECT
1	S-0601	1019-PS-PID-106 1019-PS-PID-107 1019-PS-PID-108 1019-PS-PID-109 1019-PS-PID-110 1019-PS-PID-111 1019-PS-PID-112 (SHEET 1 OF 3)	SELECTION OF T-101A-F AS TANK BOTTOM RECYCLE TANK	TANK BOTTOM RECYCLE MODE WITH ACTIVATION OF ASSOCIATED INTERLOCK I-0602, I-0702, I-0802, I-0902, I-1002, I-1102,
2	S-0602	1019-PS-PID-106 1019-PS-PID-107 1019-PS-PID-108 1019-PS-PID-109 1019-PS-PID-110 1019-PS-PID-111 1019-PS-PID-112 (SHEET 1 OF 3)	SELECTION OF T-101A-F AS DISPATCHING TANK	DISPATCHING MODE WITH ACTIVATION OF ASSOCIATED INTERLOCK I-0602, I-0702, I-0802, I-0902, I-1002, I-1102,

8	11.03.2022	AS BUILT	PD	MP	JS	CM
7	28.01.2021	ISSUED FOR ENGINEERING	PJS	VS	CM	AK
6	30.09.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
5	18.08.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
4	18.06.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
3	27.05.2020	REVISED AS PER CLIENT COMMENTS	PD	VS	CM	AK
2	25.12.2019	REVISED AS PER HAZOP COMMENT & ISSUED FOR ENGINEERING	PD	CM	SGP	SGP
1	15.11.2019	ISSUED FOR APPROVAL	PD	CM	SGP	APS
0	28.09.2019	ISSUED FOR REVIEW	PD	CM	SGP	APS
No.	DATE	REVISION	DRAWN	CHD	REVD	APPD

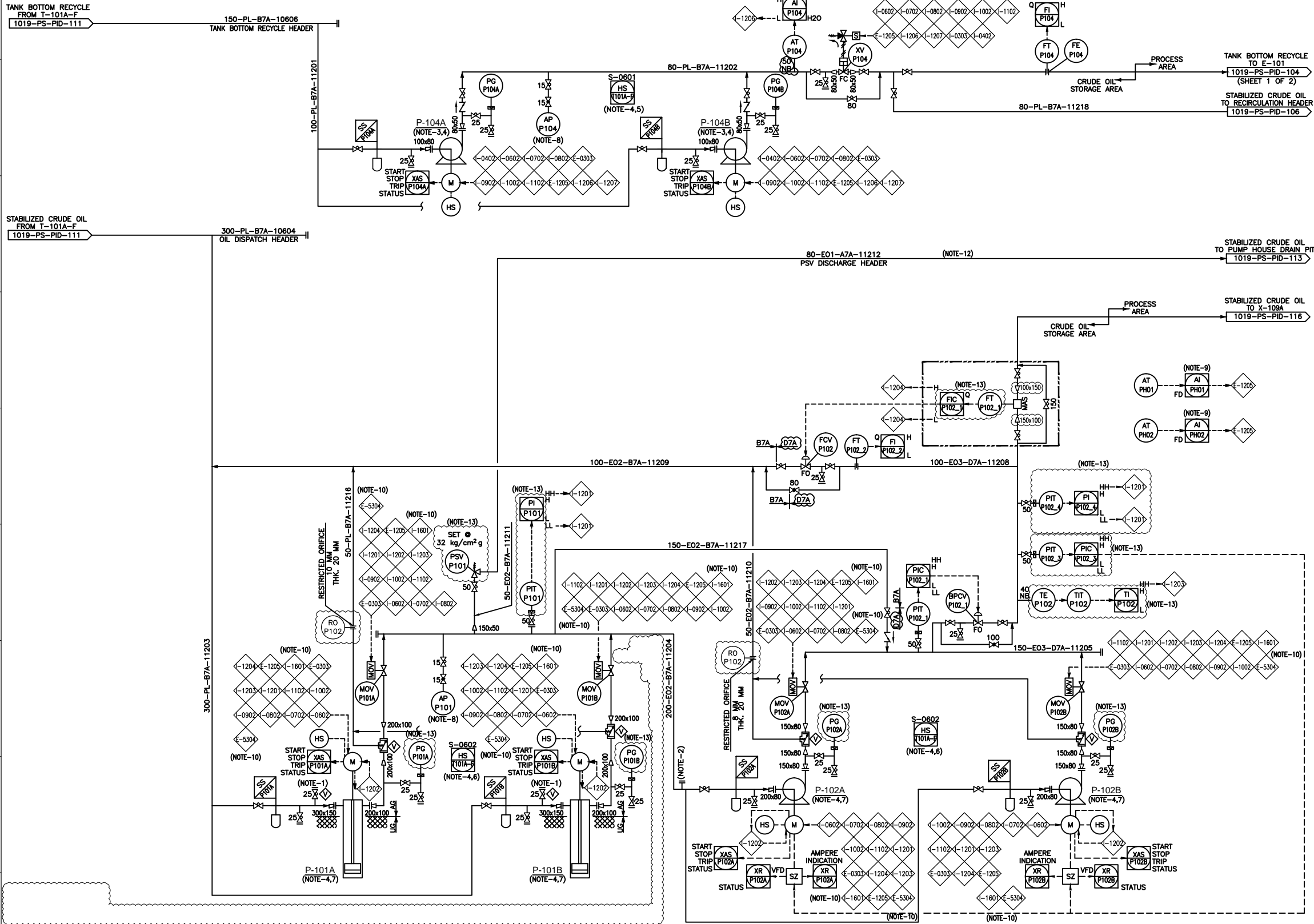
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CLIENT:
SUN PETROCHEMICALS PVT LTD

PROJECT:
BHASKAR FIELD

TITLE:
**P & I DIAGRAM
OIL STORAGE TANK-6**

SCALE : NTS | DWG.NO. : 1019-PS-PID-111 | SHEET: 1 OF 1 | REV. 8



- GENERAL NOTES (FOR ALL P&IDs):**
- a. REFER 1019-PS-PID-100 FOR GENERAL NOTES.
- NOTES :**
1. PROVISION FOR NITROGEN INJECTION.
 2. PROVISION FOR CHEMICAL INJECTION.
 3. DISPATCH TANK HAVE TO BE LINED UP WITH PUMP AND MANUALLY START THE PUMP P-104A/B FOR FIRST TIME.
 4. FOR INTERLOCK AND SOFT SELECTOR SWITCH DESCRIPTION PLEASE REFER 1019-PS-PID-112 (SH. 2 OF 3).
 5. SOFT SELECTOR SWITCH FOR LINKING P-104A/B WITH TANK T-101A-F.
 6. SOFT SELECTOR SWITCH FOR LINKING P-101A/B & P-102A/B WITH T-101A-F.
 7. FOR VENTING ARRANGEMENT DETAILS OF P-101A/B AND P-102A/B PLEASE REFER 1019-PS-PID-112(SH. 3 OF 3).
 8. SAMPLING VALVE TO BE PROVIDED WITH PLUG.
 9. PUMP HOUSE AREA SHALL HAVE 2 NOS. OF FLAME DETECTOR & 1 NO. OF MANUAL CALL POINT. FOR MORE DETAILS REFER FIRE FIGHTING LAYOUT.
 10. SIGNAL/ALARM BETWEEN CTM SKID AT ONGC, AKHOLJUNI AND BHASKAR FIELD SHALL BE TRANSMITTED VIA SCADA SYSTEM (RADIO FREQUENCY) TO TRIP P-101A/B & P-102A/B.
 11. E-0303, E-1205, E-5304 INTERLOCK GIVEN FOR ESD IS INDICATIVE, DETAILS WILL BE REFLECTED IN CAUSE AND EFFECT DOCUMENT.
 12. PSV DISCHARGE TO BE ROUTED TO PUMP HOUSE DRAIN PIT SIZE OF LINE 80 NB
 13. LINES, VALVES & INSTRUMENTS TO BE INSTALL BY SUNPETRO LATTER ON, QPS COVER SAME IN AS BUILDING P&ID'S AS REQUESTED BY SUNPETRO.

9	11.03.2022	AS BUILT	PD	MP	JS	CM
8	28.01.2021	ISSUED FOR ENGINEERING	PJS	VS	CM	AK
7	30.09.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
6	18.08.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
5	13.06.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	AK
4	29.05.2020	ISSUED FOR ENGINEERING	PD	VS	CM	AK
3	25.12.2019	REVISED AS PER HAZOP COMMENT & ISSUED FOR ENGINEERING	PD	CM	SGP	SGP
2	29.11.2019	RE-ISSUED FOR APPROVAL	PJS	CM	SGP	SGP
1	26.11.2019	ISSUED FOR APPROVAL	PD	CM	SGP	APS
0	03.10.2019	ISSUED FOR REVIEW	PD	CM	SGP	APS
No.	DATE	REVISION	DRAWN	CHD	REVD	APPD

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CLIENT:
SUN PETROCHEMICALS PVT LTD

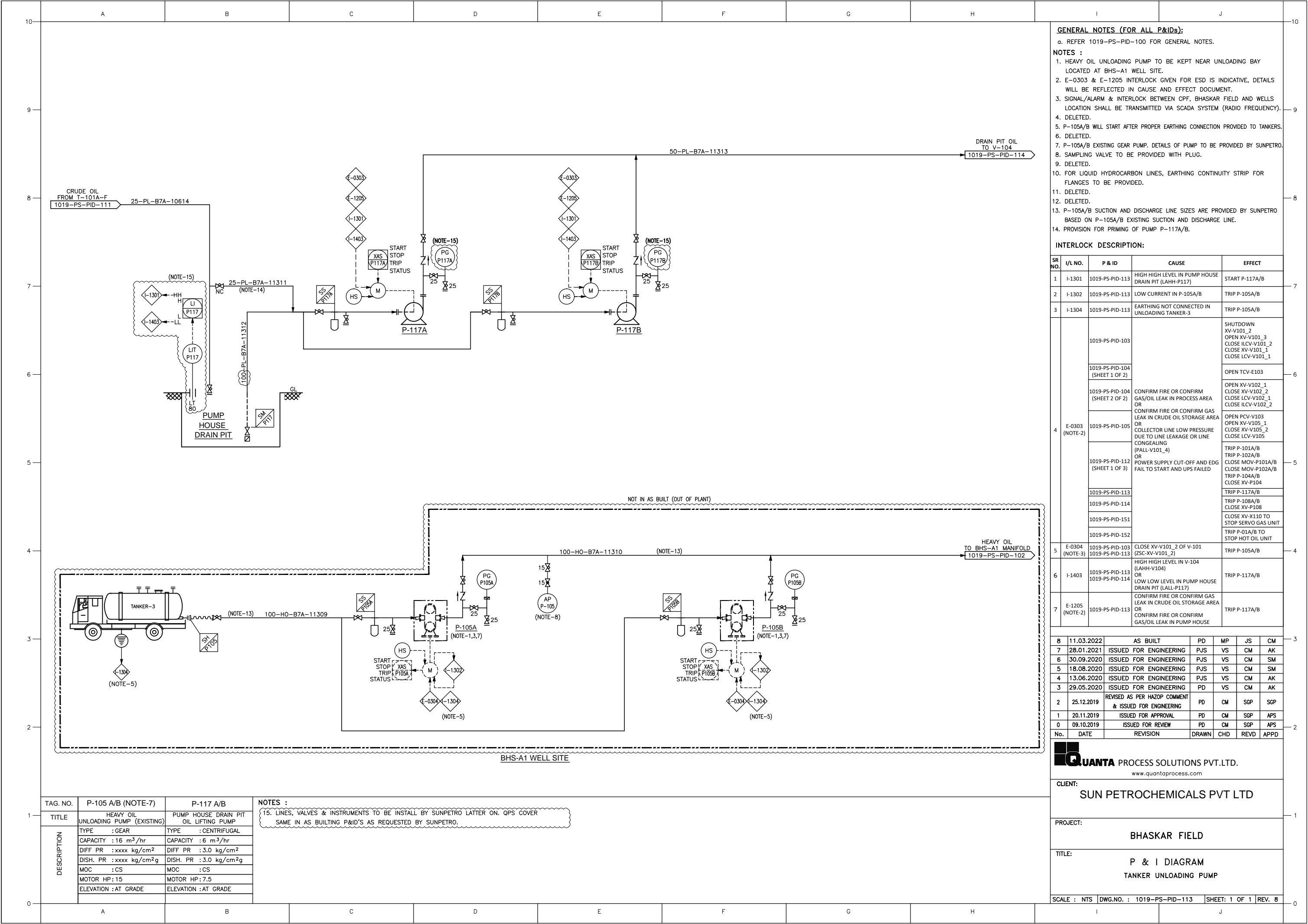
PROJECT:
BHASKAR FIELD

TITLE:
**P & I DIAGRAM
CRUDE OIL EVACUATION SYSTEM**

SCALE : NTS DWG.NO. : 1019-PS-PID-112 SHEET: 1 OF 3 REV. 9

TAG. NO.	P-101A/B	P-102A/B	P-104A/B
TITLE	FEED BOOSTER PUMP	OIL EXPORT PUMP	TANK BOTTOM RECYCLE PUMP
DESCRIPTION	TYPE : CENTRIFUGAL (VERTICAL BARREL CAN TYPE) CAPACITY : 63 m ³ /hr DIFF PR : 28.32 kg/cm ² DISH. PR : 29.33 kg/cm ² MOC : CS MOTOR HP: 180	TYPE : CENTRIFUGAL CAPACITY : 63 m ³ /hr DIFF PR : 66.49 kg/cm ² DISH. PR : 72.43 kg/cm ² MOC : CS MOTOR HP: 215	TYPE : CENTRIFUGAL CAPACITY : 15 m ³ /hr DIFF PR : 7.2 kg/cm ² DISH. PR : 7.2 kg/cm ² MOC : SS316 MOTOR HP: 20


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	<div><div>INTERLOCK DESCRIPTION:</div><table><tr><th>SR NO.</th><th>I/L NO.</th><th>P & ID</th><th>CAUSE</th><th>EFFECT</th></tr><tr><td>1</td><td>I-1201</td><td>1019-PS-PID-112 (SHEET 1 OF 3)</td><td>HIGH HIGH PRESSURE IN EXPORT LINE 150-EO-D3A-11205 (PAHH-P102_4) OR HIGH HIGH PRESSURE IN BOOSTER DISCHARGE LINE 200-EO2-B7A-11204 (PAHH-P101) OR LOW LOW PRESSURE IN EXPORT LINE 150-EO-D3A-11205 (PALL-P102_4) OR LOW LOW PRESSURE IN BOOSTER DISCHARGE LINE 200-EO2-B7A-11204 (PALL-P101)</td><td>TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B</td></tr><tr><td>2</td><td>I-1202</td><td>1019-PS-PID-112 (SHEET 1 OF 3)</td><td>HIGH CURRENT IN IN P-101A/B OR P-102A/B LOW CURRENT IN P-101A/B OR P-102A/B</td><td>TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B</td></tr><tr><td>3</td><td>I-1203</td><td>1019-PS-PID-112 (SHEET 1 OF 3)</td><td>HIGH HIGH TEMPARATURE IN EXPORT LINE 150-EO-D3A-11205 (TAHH-P102)</td><td>TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B</td></tr><tr><td>4</td><td>I-1204</td><td>1019-PS-PID-112 (SHEET 1 OF 3)</td><td>HIGH FLOW IN EXPORT LINE 150-EO-D3A-11205 (FAH-P102_1) OR LOW FLOW IN EXPORT LINE 150-EO-D3A-11205 (FAL-P102_1)</td><td>TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B</td></tr><tr><td>5</td><td>E-1205 (NOTE-2)</td><td>1019-PS-PID-112 (SHEET 1 OF 3)</td><td>CONFIRM FIRE OR CONFIRM GAS LEAK IN CRUDE OIL STORAGE AREA OR CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN PUMP HOUSE</td><td>TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104</td></tr><tr><td>6</td><td>I-1206 (NOTE-1)</td><td>1019-PS-PID-112 (SHEET 1 OF 3)</td><td>LOW LOW WATER CONTENT IN P-104A/B DISCHARGE LINE 80-PL-B7A-11202 (AAL-P104) TRIP P-104A/B FOR 2 HOURS</td><td>TRIP P-104A/B, CLOSE XV-P104</td></tr><tr><td>7</td><td>I-1207 (NOTE-1)</td><td>1019-PS-PID-112 (SHEET 1 OF 3)</td><td>START P-104A/B AFTER EVERY 2 HOURS OF PAUSE TIME</td><td>START P-104A/B, OPEN XV-P104</td></tr><tr><td>8</td><td>E-0303 (NOTE-2)</td><td>1019-PS-PID-103 1019-PS-PID-104 (SHEET 1 OF 2) 1019-PS-PID-104 (SHEET 2 OF 2) 1019-PS-PID-105 1019-PS-PID-112 (SHEET 1 OF 3) 1019-PS-PID-113 1019-PS-PID-114 1019-PS-PID-151 1019-PS-PID-152</td><td>SHUTDOWN XV-V101_2 OPEN XV-V101_3 CLOSE ILCV-V101_2 CLOSE XV-V101_1 CLOSE LCV-V101_1 OPEN TCV-E103 OPEN XV-V102_1 CLOSE XV-V102_2 CLOSE LCV-V102_1 CLOSE ILCV-V102_2 CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN PROCESS AREA OR CONFIRM FIRE OR CONFIRM GAS LEAK IN CRUDE OIL STORAGE AREA OR COLLECTOR LINE LOW PRESSURE DUE TO LINE LEAKAGE OR LINE CONGEALING (PALL-V101_4) OR POWER SUPPLY CUT-OFF AND EDG FAIL TO START AND UPS FAILED TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104 TRIP P-117A/B TRIP P-108A/B CLOSE XV-P108 CLOSE XV-X110 TO STOP SERVO GAS UNIT TRIP P-01A/B TO STOP HOT OIL UNIT</td><td></td></tr><tr><td>9</td><td>I-0402</td><td>1019-PS-PID-104 (SHEET 2 OF 2) 1019-PS-PID-112 (SHEET 1 OF 3)</td><td>HIGH HIGH LEVEL IN V-102 (LAHH-V102_3)</td><td>TRIP P-104A/B, CLOSE XV-P104,</td></tr><tr><td>10</td><td>I-0602</td><td>1019-PS-PID-106 1019-PS-PID-112 (SHEET 1 OF 3)</td><td>LOW LOW LEVEL IN T-101A (LALL-T101A_1 OR LALL-T101A_2)</td><td>TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104</td></tr></table></div> <div><div>INTERLOCK DESCRIPTION:</div><table><tr><th>SR NO.</th><th>I/L NO.</th><th>P & ID</th><th>CAUSE</th><th>EFFECT</th></tr><tr><td>11</td><td>I-0702</td><td>1019-PS-PID-107 1019-PS-PID-112 (SHEET 1 OF 3)</td><td>LOW LOW LEVEL IN T-101B (LALL-T101B_1 OR LALL-T101B_2)</td><td>TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104</td></tr><tr><td>12</td><td>I-0802</td><td>1019-PS-PID-108 1019-PS-PID-112 (SHEET 1 OF 3)</td><td>LOW LOW LEVEL IN T-101C (LALL-T101C_1 OR LALL-T101C_2)</td><td>TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104</td></tr><tr><td>13</td><td>I-0902</td><td>1019-PS-PID-109 1019-PS-PID-112 (SHEET 1 OF 3)</td><td>LOW LOW LEVEL IN T-101D (LALL-T101D_1 OR LALL-T101D_2)</td><td>TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104</td></tr><tr><td>14</td><td>I-1002</td><td>1019-PS-PID-110 1019-PS-PID-112 (SHEET 1 OF 3)</td><td>LOW LOW LEVEL IN T-101E (LALL-T101E_1 OR LALL-T101E_2)</td><td>TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104</td></tr><tr><td>15</td><td>I-1102</td><td>1019-PS-PID-111 1019-PS-PID-112 (SHEET 1 OF 3)</td><td>LOW LOW LEVEL IN T-101F (LALL-T101F_1 OR LALL-T101F_2)</td><td>TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104</td></tr><tr><td>16</td><td>I-1601 (NOTE-3)</td><td>1019-PS-PID-112 (SHEET 1 OF 3) 1019-PS-PID-116</td><td>CLOSE XV-CTM OF EXPORT LINE 150-EO-D3A-11601 AT ONGC, AKHOLIJUNI (ZSC-XV-CTM)</td><td>TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B</td></tr><tr><td>17</td><td>E-5304 (NOTE-2,4)</td><td>1019-PS-PID-112 (SHEET 1 OF 3) 1019-PS-PID-116 1019-PS-PID-153</td><td>CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN CTM SKID OR POWER SUPPLY CUT-OFF</td><td>TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B CLOSE XV-CTM</td></tr></table></div> <div><div>SELECTOR SWITCH DESCRIPTION:</div><table><tr><th>SR NO.</th><th>SWITCH NO.</th><th>P & ID</th><th>SELECTION</th><th>EFFECT</th></tr><tr><td>1.00 000 0</td><td>S-0601</td><td>1019-PS-PID-106 1019-PS-PID-107 1019-PS-PID-108 1019-PS-PID-109 1019-PS-PID-110 1019-PS-PID-111 1019-PS-PID-112 (SHEET 1 OF 3)</td><td>SELECTION OF T-101A-F AS TANK BOTTOM RECYCLE TANK</td><td>TANK BOTTOM RECYCLE MODE WITH ACTIVATION OF ASSOCIATED INTERLOCK I-0602, I-0702, I-0802, I-0902, I-1002, I-1102,</td></tr><tr><td>2.00 000 0</td><td>S-0602</td><td>1019-PS-PID-106 1019-PS-PID-107 1019-PS-PID-108 1019-PS-PID-109 1019-PS-PID-110 1019-PS-PID-111 1019-PS-PID-112 (SHEET 1 OF 3)</td><td>SELECTION OF T-101A-F AS DISPATCHING TANK</td><td>DISPATCHING MODE WITH ACTIVATION OF ASSOCIATED INTERLOCK I-0602, I-0702, I-0802, I-0902, I-1002, I-1102,</td></tr></table></div>										SR NO.	I/L NO.	P & ID	CAUSE	EFFECT	1	I-1201	1019-PS-PID-112 (SHEET 1 OF 3)	HIGH HIGH PRESSURE IN EXPORT LINE 150-EO-D3A-11205 (PAHH-P102_4) OR HIGH HIGH PRESSURE IN BOOSTER DISCHARGE LINE 200-EO2-B7A-11204 (PAHH-P101) OR LOW LOW PRESSURE IN EXPORT LINE 150-EO-D3A-11205 (PALL-P102_4) OR LOW LOW PRESSURE IN BOOSTER DISCHARGE LINE 200-EO2-B7A-11204 (PALL-P101)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B	2	I-1202	1019-PS-PID-112 (SHEET 1 OF 3)	HIGH CURRENT IN IN P-101A/B OR P-102A/B LOW CURRENT IN P-101A/B OR P-102A/B	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B	3	I-1203	1019-PS-PID-112 (SHEET 1 OF 3)	HIGH HIGH TEMPARATURE IN EXPORT LINE 150-EO-D3A-11205 (TAHH-P102)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B	4	I-1204	1019-PS-PID-112 (SHEET 1 OF 3)	HIGH FLOW IN EXPORT LINE 150-EO-D3A-11205 (FAH-P102_1) OR LOW FLOW IN EXPORT LINE 150-EO-D3A-11205 (FAL-P102_1)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B	5	E-1205 (NOTE-2)	1019-PS-PID-112 (SHEET 1 OF 3)	CONFIRM FIRE OR CONFIRM GAS LEAK IN CRUDE OIL STORAGE AREA OR CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN PUMP HOUSE	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104	6	I-1206 (NOTE-1)	1019-PS-PID-112 (SHEET 1 OF 3)	LOW LOW WATER CONTENT IN P-104A/B DISCHARGE LINE 80-PL-B7A-11202 (AAL-P104) TRIP P-104A/B FOR 2 HOURS	TRIP P-104A/B, CLOSE XV-P104	7	I-1207 (NOTE-1)	1019-PS-PID-112 (SHEET 1 OF 3)	START P-104A/B AFTER EVERY 2 HOURS OF PAUSE TIME	START P-104A/B, OPEN XV-P104	8	E-0303 (NOTE-2)	1019-PS-PID-103 1019-PS-PID-104 (SHEET 1 OF 2) 1019-PS-PID-104 (SHEET 2 OF 2) 1019-PS-PID-105 1019-PS-PID-112 (SHEET 1 OF 3) 1019-PS-PID-113 1019-PS-PID-114 1019-PS-PID-151 1019-PS-PID-152	SHUTDOWN XV-V101_2 OPEN XV-V101_3 CLOSE ILCV-V101_2 CLOSE XV-V101_1 CLOSE LCV-V101_1 OPEN TCV-E103 OPEN XV-V102_1 CLOSE XV-V102_2 CLOSE LCV-V102_1 CLOSE ILCV-V102_2 CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN PROCESS AREA OR CONFIRM FIRE OR CONFIRM GAS LEAK IN CRUDE OIL STORAGE AREA OR COLLECTOR LINE LOW PRESSURE DUE TO LINE LEAKAGE OR LINE CONGEALING (PALL-V101_4) OR POWER SUPPLY CUT-OFF AND EDG FAIL TO START AND UPS FAILED TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104 TRIP P-117A/B TRIP P-108A/B CLOSE XV-P108 CLOSE XV-X110 TO STOP SERVO GAS UNIT TRIP P-01A/B TO STOP HOT OIL UNIT		9	I-0402	1019-PS-PID-104 (SHEET 2 OF 2) 1019-PS-PID-112 (SHEET 1 OF 3)	HIGH HIGH LEVEL IN V-102 (LAHH-V102_3)	TRIP P-104A/B, CLOSE XV-P104,	10	I-0602	1019-PS-PID-106 1019-PS-PID-112 (SHEET 1 OF 3)	LOW LOW LEVEL IN T-101A (LALL-T101A_1 OR LALL-T101A_2)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104	SR NO.	I/L NO.	P & ID	CAUSE	EFFECT	11	I-0702	1019-PS-PID-107 1019-PS-PID-112 (SHEET 1 OF 3)	LOW LOW LEVEL IN T-101B (LALL-T101B_1 OR LALL-T101B_2)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104	12	I-0802	1019-PS-PID-108 1019-PS-PID-112 (SHEET 1 OF 3)	LOW LOW LEVEL IN T-101C (LALL-T101C_1 OR LALL-T101C_2)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104	13	I-0902	1019-PS-PID-109 1019-PS-PID-112 (SHEET 1 OF 3)	LOW LOW LEVEL IN T-101D (LALL-T101D_1 OR LALL-T101D_2)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104	14	I-1002	1019-PS-PID-110 1019-PS-PID-112 (SHEET 1 OF 3)	LOW LOW LEVEL IN T-101E (LALL-T101E_1 OR LALL-T101E_2)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104	15	I-1102	1019-PS-PID-111 1019-PS-PID-112 (SHEET 1 OF 3)	LOW LOW LEVEL IN T-101F (LALL-T101F_1 OR LALL-T101F_2)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104	16	I-1601 (NOTE-3)	1019-PS-PID-112 (SHEET 1 OF 3) 1019-PS-PID-116	CLOSE XV-CTM OF EXPORT LINE 150-EO-D3A-11601 AT ONGC, AKHOLIJUNI (ZSC-XV-CTM)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B	17	E-5304 (NOTE-2,4)	1019-PS-PID-112 (SHEET 1 OF 3) 1019-PS-PID-116 1019-PS-PID-153	CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN CTM SKID OR POWER SUPPLY CUT-OFF	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B CLOSE XV-CTM	SR NO.	SWITCH NO.	P & ID	SELECTION	EFFECT	1.00 000 0	S-0601	1019-PS-PID-106 1019-PS-PID-107 1019-PS-PID-108 1019-PS-PID-109 1019-PS-PID-110 1019-PS-PID-111 1019-PS-PID-112 (SHEET 1 OF 3)	SELECTION OF T-101A-F AS TANK BOTTOM RECYCLE TANK	TANK BOTTOM RECYCLE MODE WITH ACTIVATION OF ASSOCIATED INTERLOCK I-0602, I-0702, I-0802, I-0902, I-1002, I-1102,	2.00 000 0	S-0602	1019-PS-PID-106 1019-PS-PID-107 1019-PS-PID-108 1019-PS-PID-109 1019-PS-PID-110 1019-PS-PID-111 1019-PS-PID-112 (SHEET 1 OF 3)	SELECTION OF T-101A-F AS DISPATCHING TANK	DISPATCHING MODE WITH ACTIVATION OF ASSOCIATED INTERLOCK I-0602, I-0702, I-0802, I-0902, I-1002, I-1102,	<div><div>GENERAL NOTES (FOR ALL P&IDs):</div><div>a. REFER 1019-PS-PID-100 FOR GENERAL NOTES.</div><div>NOTES : 1. DISPATCH TANK HAVE TO BE LINED UP WITH PUMP AND MANUALLY START THE PUMP P-104A/B FOR FIRST TIME. 2. E-0303, E-1205, E-5304 INTERLOCK GIVEN FOR ESD IS INDICATIVE, DETAILS WILL BE REFLECTED IN CAUSE AND EFFECT DOCUMENT. 3. SIGNAL/ALARM BETWEEN CTM SKID AT ONGC, AKHOLIJUNI AND BHASKAR FIELD SHALL BE TRANSMITTED VIA SCADA SYSTEM (RADIO FREQUENCY) TO TRIP P-101A/B & P-102A/B. 4. E-5304 INTERLOCK GIVEN FOR ESD IS INDICATIVE, & WILL BE INITIATED FROM EXISTING F&G PANEL OF ONGC AKHOLIJUNI. SAME WILL BE TRANSMITTED TO BHASKAR FIELD VIA SCADA SYSTEM. DETAILS WILL BE REFLECTED IN CAUSE AND EFFECT DOCUMENT.</div></div>	
SR NO.	I/L NO.	P & ID	CAUSE	EFFECT																																																																																																																						
1	I-1201	1019-PS-PID-112 (SHEET 1 OF 3)	HIGH HIGH PRESSURE IN EXPORT LINE 150-EO-D3A-11205 (PAHH-P102_4) OR HIGH HIGH PRESSURE IN BOOSTER DISCHARGE LINE 200-EO2-B7A-11204 (PAHH-P101) OR LOW LOW PRESSURE IN EXPORT LINE 150-EO-D3A-11205 (PALL-P102_4) OR LOW LOW PRESSURE IN BOOSTER DISCHARGE LINE 200-EO2-B7A-11204 (PALL-P101)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B																																																																																																																						
2	I-1202	1019-PS-PID-112 (SHEET 1 OF 3)	HIGH CURRENT IN IN P-101A/B OR P-102A/B LOW CURRENT IN P-101A/B OR P-102A/B	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B																																																																																																																						
3	I-1203	1019-PS-PID-112 (SHEET 1 OF 3)	HIGH HIGH TEMPARATURE IN EXPORT LINE 150-EO-D3A-11205 (TAHH-P102)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B																																																																																																																						
4	I-1204	1019-PS-PID-112 (SHEET 1 OF 3)	HIGH FLOW IN EXPORT LINE 150-EO-D3A-11205 (FAH-P102_1) OR LOW FLOW IN EXPORT LINE 150-EO-D3A-11205 (FAL-P102_1)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B																																																																																																																						
5	E-1205 (NOTE-2)	1019-PS-PID-112 (SHEET 1 OF 3)	CONFIRM FIRE OR CONFIRM GAS LEAK IN CRUDE OIL STORAGE AREA OR CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN PUMP HOUSE	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104																																																																																																																						
6	I-1206 (NOTE-1)	1019-PS-PID-112 (SHEET 1 OF 3)	LOW LOW WATER CONTENT IN P-104A/B DISCHARGE LINE 80-PL-B7A-11202 (AAL-P104) TRIP P-104A/B FOR 2 HOURS	TRIP P-104A/B, CLOSE XV-P104																																																																																																																						
7	I-1207 (NOTE-1)	1019-PS-PID-112 (SHEET 1 OF 3)	START P-104A/B AFTER EVERY 2 HOURS OF PAUSE TIME	START P-104A/B, OPEN XV-P104																																																																																																																						
8	E-0303 (NOTE-2)	1019-PS-PID-103 1019-PS-PID-104 (SHEET 1 OF 2) 1019-PS-PID-104 (SHEET 2 OF 2) 1019-PS-PID-105 1019-PS-PID-112 (SHEET 1 OF 3) 1019-PS-PID-113 1019-PS-PID-114 1019-PS-PID-151 1019-PS-PID-152	SHUTDOWN XV-V101_2 OPEN XV-V101_3 CLOSE ILCV-V101_2 CLOSE XV-V101_1 CLOSE LCV-V101_1 OPEN TCV-E103 OPEN XV-V102_1 CLOSE XV-V102_2 CLOSE LCV-V102_1 CLOSE ILCV-V102_2 CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN PROCESS AREA OR CONFIRM FIRE OR CONFIRM GAS LEAK IN CRUDE OIL STORAGE AREA OR COLLECTOR LINE LOW PRESSURE DUE TO LINE LEAKAGE OR LINE CONGEALING (PALL-V101_4) OR POWER SUPPLY CUT-OFF AND EDG FAIL TO START AND UPS FAILED TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104 TRIP P-117A/B TRIP P-108A/B CLOSE XV-P108 CLOSE XV-X110 TO STOP SERVO GAS UNIT TRIP P-01A/B TO STOP HOT OIL UNIT																																																																																																																							
9	I-0402	1019-PS-PID-104 (SHEET 2 OF 2) 1019-PS-PID-112 (SHEET 1 OF 3)	HIGH HIGH LEVEL IN V-102 (LAHH-V102_3)	TRIP P-104A/B, CLOSE XV-P104,																																																																																																																						
10	I-0602	1019-PS-PID-106 1019-PS-PID-112 (SHEET 1 OF 3)	LOW LOW LEVEL IN T-101A (LALL-T101A_1 OR LALL-T101A_2)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104																																																																																																																						
SR NO.	I/L NO.	P & ID	CAUSE	EFFECT																																																																																																																						
11	I-0702	1019-PS-PID-107 1019-PS-PID-112 (SHEET 1 OF 3)	LOW LOW LEVEL IN T-101B (LALL-T101B_1 OR LALL-T101B_2)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104																																																																																																																						
12	I-0802	1019-PS-PID-108 1019-PS-PID-112 (SHEET 1 OF 3)	LOW LOW LEVEL IN T-101C (LALL-T101C_1 OR LALL-T101C_2)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104																																																																																																																						
13	I-0902	1019-PS-PID-109 1019-PS-PID-112 (SHEET 1 OF 3)	LOW LOW LEVEL IN T-101D (LALL-T101D_1 OR LALL-T101D_2)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104																																																																																																																						
14	I-1002	1019-PS-PID-110 1019-PS-PID-112 (SHEET 1 OF 3)	LOW LOW LEVEL IN T-101E (LALL-T101E_1 OR LALL-T101E_2)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104																																																																																																																						
15	I-1102	1019-PS-PID-111 1019-PS-PID-112 (SHEET 1 OF 3)	LOW LOW LEVEL IN T-101F (LALL-T101F_1 OR LALL-T101F_2)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104																																																																																																																						
16	I-1601 (NOTE-3)	1019-PS-PID-112 (SHEET 1 OF 3) 1019-PS-PID-116	CLOSE XV-CTM OF EXPORT LINE 150-EO-D3A-11601 AT ONGC, AKHOLIJUNI (ZSC-XV-CTM)	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B																																																																																																																						
17	E-5304 (NOTE-2,4)	1019-PS-PID-112 (SHEET 1 OF 3) 1019-PS-PID-116 1019-PS-PID-153	CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN CTM SKID OR POWER SUPPLY CUT-OFF	TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B CLOSE XV-CTM																																																																																																																						
SR NO.	SWITCH NO.	P & ID	SELECTION	EFFECT																																																																																																																						
1.00 000 0	S-0601	1019-PS-PID-106 1019-PS-PID-107 1019-PS-PID-108 1019-PS-PID-109 1019-PS-PID-110 1019-PS-PID-111 1019-PS-PID-112 (SHEET 1 OF 3)	SELECTION OF T-101A-F AS TANK BOTTOM RECYCLE TANK	TANK BOTTOM RECYCLE MODE WITH ACTIVATION OF ASSOCIATED INTERLOCK I-0602, I-0702, I-0802, I-0902, I-1002, I-1102,																																																																																																																						
2.00 000 0	S-0602	1019-PS-PID-106 1019-PS-PID-107 1019-PS-PID-108 1019-PS-PID-109 1019-PS-PID-110 1019-PS-PID-111 1019-PS-PID-112 (SHEET 1 OF 3)	SELECTION OF T-101A-F AS DISPATCHING TANK	DISPATCHING MODE WITH ACTIVATION OF ASSOCIATED INTERLOCK I-0602, I-0702, I-0802, I-0902, I-1002, I-1102,																																																																																																																						
<table><tr><td>1</td><td>30.09.2020</td><td>ISSUED FOR APPROVAL</td><td>PJS</td><td>VS</td><td>CM</td><td>SM</td></tr><tr><td>0</td><td>18.08.2020</td><td>ISSUED FOR REVIEW</td><td>PJS</td><td>VS</td><td>CM</td><td>SM</td></tr><tr><td>No.</td><td>DATE</td><td>REVISION</td><td>DRAWN</td><td>CHD</td><td>REVD</td><td>APPD</td></tr></table> <div><div><div></div><div>QUANTA</div></div>PROCESS SOLUTIONS PVT.LTD. www.quantaprocess.com</div> <div>CLIENT: SUN PETROCHEMICALS PVT LTD</div> <div>PROJECT: BHASKAR FIELD</div> <div>TITLE: P & I DIAGRAM CRUDE OIL EVACUATION SYSTEM</div> <div>SCALE : NTS DWG.NO. : 1019-PS-PID-112 SHEET: 2 OF 3 REV. 1</div>										1	30.09.2020	ISSUED FOR APPROVAL	PJS	VS	CM	SM	0	18.08.2020	ISSUED FOR REVIEW	PJS	VS	CM	SM	No.	DATE	REVISION	DRAWN	CHD	REVD	APPD	0																																																																																											
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- GENERAL NOTES (FOR ALL P&IDs):**
- a. REFER 1019-PS-PID-100 FOR GENERAL NOTES.
- NOTES :**
- HEAVY OIL UNLOADING PUMP TO BE KEPT NEAR UNLOADING BAY LOCATED AT BHS-A1 WELL SITE.
 - E-0303 & E-1205 INTERLOCK GIVEN FOR ESD IS INDICATIVE, DETAILS WILL BE REFLECTED IN CAUSE AND EFFECT DOCUMENT.
 - SIGNAL/ALARM & INTERLOCK BETWEEN CPF, BHASKAR FIELD AND WELLS LOCATION SHALL BE TRANSMITTED VIA SCADA SYSTEM (RADIO FREQUENCY).
 - DELETED.
 - P-105A/B WILL START AFTER PROPER EARTHING CONNECTION PROVIDED TO TANKERS.
 - DELETED.
 - P-105A/B EXISTING GEAR PUMP. DETAILS OF PUMP TO BE PROVIDED BY SUNPETRO.
 - SAMPLING VALVE TO BE PROVIDED WITH PLUG.
 - DELETED.
 - FOR LIQUID HYDROCARBON LINES, EARTHING CONTINUITY STRIP FOR FLANGES TO BE PROVIDED.
 - DELETED.
 - DELETED.
 - P-105A/B SUCTION AND DISCHARGE LINE SIZES ARE PROVIDED BY SUNPETRO BASED ON P-105A/B EXISTING SUCTION AND DISCHARGE LINE.
 - PROVISION FOR PRIMING OF PUMP P-117A/B.

INTERLOCK DESCRIPTION:				
SR NO.	I/L NO.	P & ID	CAUSE	EFFECT
1	I-1301	1019-PS-PID-113	HIGH HIGH LEVEL IN PUMP HOUSE DRAIN PIT (LAHH-P117)	START P-117A/B
2	I-1302	1019-PS-PID-113	LOW CURRENT IN P-105A/B	TRIP P-105A/B
3	I-1304	1019-PS-PID-113	EARTHING NOT CONNECTED IN UNLOADING TANKER-3	TRIP P-105A/B
4	1019-PS-PID-103	E-0303 (NOTE-2)	CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN PROCESS AREA OR CONFIRM FIRE OR CONFIRM GAS LEAK IN CRUDE OIL STORAGE AREA OR COLLECTOR LINE LOW PRESSURE DUE TO LINE LEAKAGE OR LINE CONGEALING (PALL-V101_4) OR POWER SUPPLY CUT-OFF AND EDG FAIL TO START AND UPS FAILED	SHUTDOWN XV-V101_2 OPEN XV-V101_3 CLOSE ILCV-V101_2 CLOSE XV-V101_1 CLOSE LCV-V101_1
	1019-PS-PID-104 (SHEET 1 OF 2)			OPEN TCV-E103
	1019-PS-PID-104 (SHEET 2 OF 2)			OPEN XV-V102_1 CLOSE XV-V102_2 CLOSE LCV-V102_1 CLOSE ILCV-V102_2
	1019-PS-PID-105			OPEN PCV-V103 OPEN XV-V105_1 CLOSE XV-V105_2 CLOSE LCV-V105
	1019-PS-PID-112 (SHEET 1 OF 3)			TRIP P-101A/B TRIP P-102A/B CLOSE MOV-P101A/B CLOSE MOV-P102A/B TRIP P-104A/B CLOSE XV-P104
	1019-PS-PID-113			TRIP P-117A/B
	1019-PS-PID-114			TRIP P-108A/B CLOSE XV-P108
5	1019-PS-PID-151	E-0304 (NOTE-3)	CLOSE XV-V101_2 OF V-101 (ZSC-XV-V101_2)	CLOSE XV-X110 TO STOP SERVO GAS UNIT
	1019-PS-PID-152			TRIP P-01A/B TO STOP HOT OIL UNIT
6	1019-PS-PID-113 1019-PS-PID-114	I-1403	HIGH HIGH LEVEL IN V-104 (LAHH-V104) OR LOW LOW LEVEL IN PUMP HOUSE DRAIN PIT (LALL-P117)	TRIP P-105A/B
7	E-1205 (NOTE-2)			TRIP P-117A/B

8	11.03.2022	AS BUILT	PD	MP	JS	CM
7	28.01.2021	ISSUED FOR ENGINEERING	PJS	VS	CM	AK
6	30.09.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
5	18.08.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
4	13.06.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	AK
3	29.05.2020	ISSUED FOR ENGINEERING	PD	VS	CM	AK
2	25.12.2019	REVISED AS PER HAZOP COMMENT & ISSUED FOR ENGINEERING	PD	CM	SGP	SGP
1	20.11.2019	ISSUED FOR APPROVAL	PD	CM	SGP	APS
0	09.10.2019	ISSUED FOR REVIEW	PD	CM	SGP	APS
No.	DATE	REVISION	DRAWN	CHD	REVD	APPD

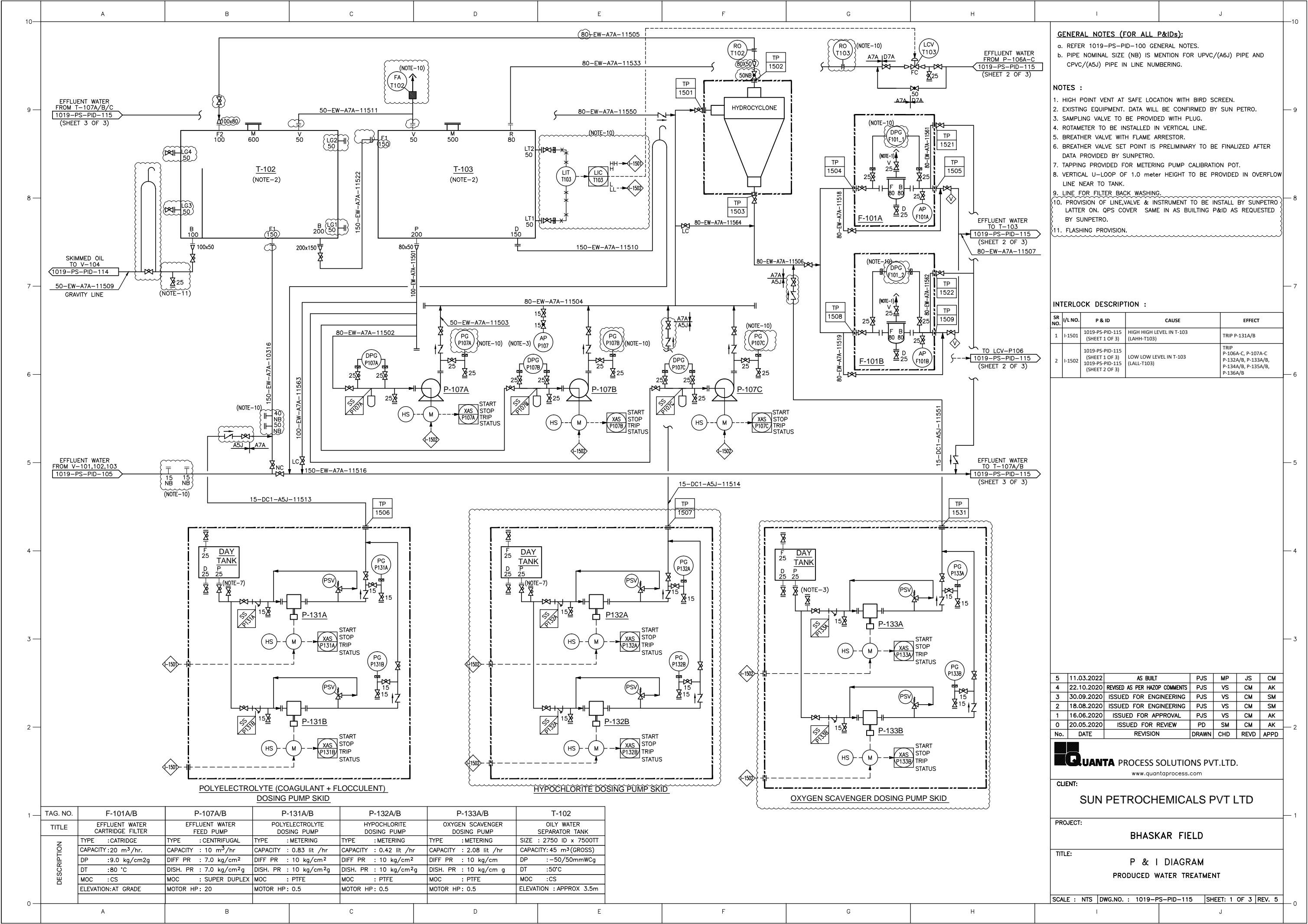
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CLIENT:
SUN PETROCHEMICALS PVT LTD

PROJECT:
BHASKAR FIELD

TITLE:
**P & I DIAGRAM
TANKER UNLOADING PUMP**

SCALE : NTS | DWG.NO. : 1019-PS-PID-113 | SHEET: 1 OF 1 | REV. 8



- GENERAL NOTES (FOR ALL P&IDs):**
- a. REFER 1019-PS-PID-100 GENERAL NOTES.
 - b. PIPE NOMINAL SIZE (NB) IS MENTION FOR UPVC/(A6J) PIPE AND CPVC/(A5J) PIPE IN LINE NUMBERING.
- NOTES :**
- 1. HIGH POINT VENT AT SAFE LOCATION WITH BIRD SCREEN.
 - 2. EXISTING EQUIPMENT. DATA WILL BE CONFIRMED BY SUN PETRO.
 - 3. SAMPLING VALVE TO BE PROVIDED WITH PLUG.
 - 4. ROTAMETER TO BE INSTALLED IN VERTICAL LINE.
 - 5. BREATHING VALVE WITH FLAME ARRESTOR.
 - 6. BREATHING VALVE SET POINT IS PRELIMINARY TO BE FINALIZED AFTER DATA PROVIDED BY SUNPETRO.
 - 7. TAPPING PROVIDED FOR METERING PUMP CALIBRATION POT.
 - 8. VERTICAL U-LOOP OF 1.0 meter HEIGHT TO BE PROVIDED IN OVERFLOW LINE NEAR TO TANK.
 - 9. LINE FOR FILTER BACK WASHING.
 - 10. PROVISION OF LINE, VALVE & INSTRUMENT TO BE INSTALL BY SUNPETRO LATER ON. QPS COVER SAME IN AS BUILDING P&ID AS REQUESTED BY SUNPETRO.
 - 11. FLASHING PROVISION.

INTERLOCK DESCRIPTION :

SR NO.	I/L NO.	P & ID	CAUSE	EFFECT
1	I-1501	1019-PS-PID-115 (SHEET 1 OF 3)	HIGH HIGH LEVEL IN T-103 (LAHH-T103)	TRIP P-131A/B
2	I-1502	1019-PS-PID-115 (SHEET 1 OF 3) 1019-PS-PID-115 (SHEET 2 OF 3)	LOW LOW LEVEL IN T-103 (LALL-T103)	TRIP P-106A-C, P-107A-C P-132A/B, P-133A/B, P-134A/B, P-135A/B, P-136A/B

5	11.03.2022	AS BUILT	PJS	MP	JS	CM
4	22.10.2020	REVISED AS PER HAZOP COMMENTS	PJS	VS	CM	AK
3	30.09.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
2	18.08.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
1	16.06.2020	ISSUED FOR APPROVAL	PJS	VS	CM	AK
0	20.05.2020	ISSUED FOR REVIEW	PD	SM	CM	AK
No.	DATE	REVISION	DRAWN	CHD	REVD	APPD

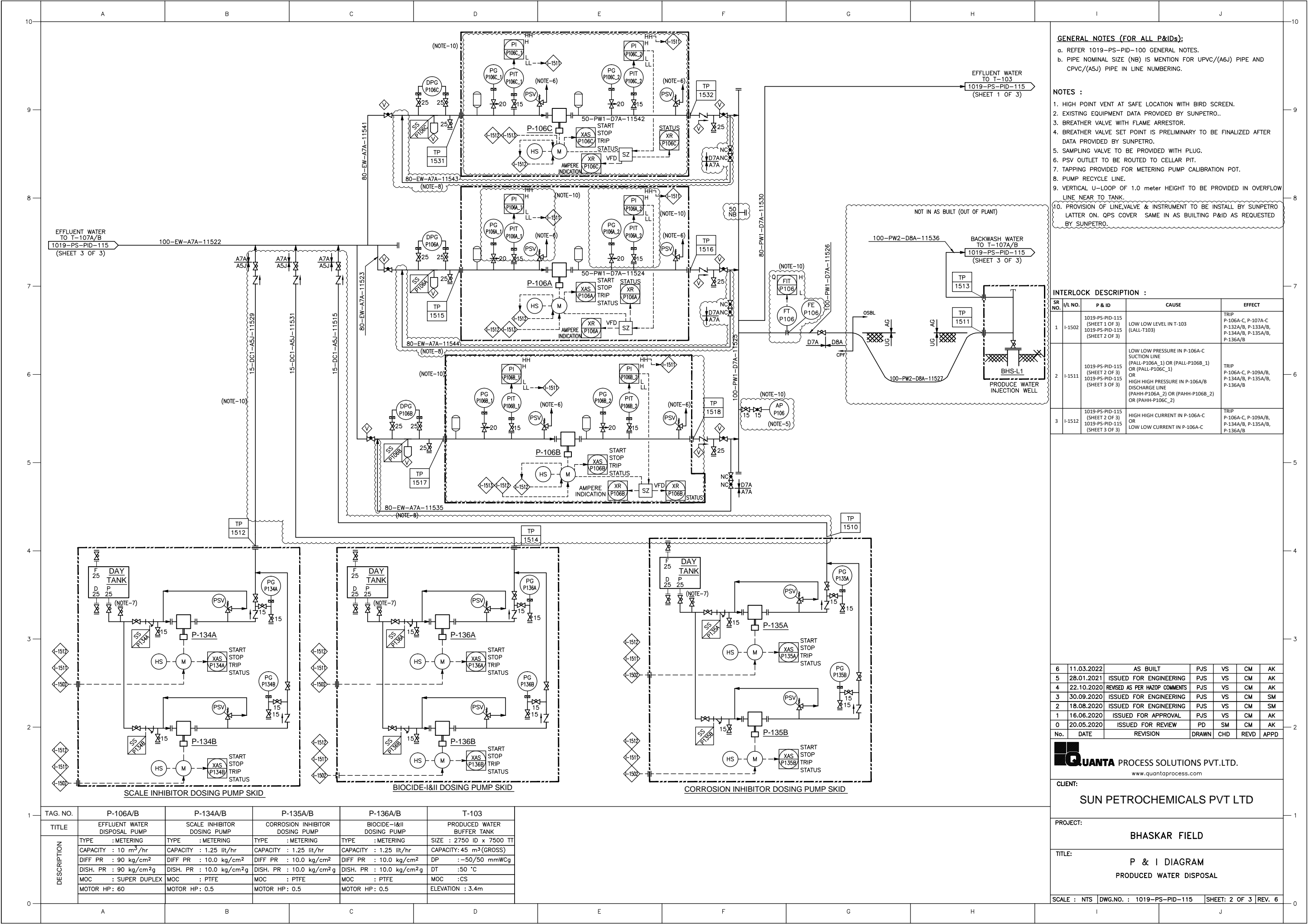
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CLIENT:
SUN PETROCHEMICALS PVT LTD

PROJECT:
BHASKAR FIELD

TITLE:
**P & I DIAGRAM
PRODUCED WATER TREATMENT**

SCALE : NTS | DWG.NO. : 1019-PS-PID-115 | SHEET: 1 OF 3 | REV. 5



GENERAL NOTES (FOR ALL P&IDs):

- a. REFER 1019-PS-PID-100 GENERAL NOTES.
- b. PIPE NOMINAL SIZE (NB) IS MENTION FOR UPVC/(A6J) PIPE AND CPVC/(A5J) PIPE IN LINE NUMBERING.


NOTES :

- 1. HIGH POINT VENT AT SAFE LOCATION WITH BIRD SCREEN.
- 2. EXISTING EQUIPMENT DATA PROVIDED BY SUNPETRO..
- 3. BREATHER VALVE WITH FLAME ARRESTOR.
- 4. BREATHER VALVE SET POINT IS PRELIMINARY TO BE FINALIZED AFTER DATA PROVIDED BY SUNPETRO.
- 5. SAMPLING VALVE TO BE PROVIDED WITH PLUG.
- 6. PSV OUTLET TO BE ROUTED TO CELLAR PIT.
- 7. TAPPING PROVIDED FOR METERING PUMP CALIBRATION POT.
- 8. PUMP RECYCLE LINE.
- 9. VERTICAL U-LOOP OF 1.0 meter HEIGHT TO BE PROVIDED IN OVERFLOW LINE NEAR TO TANK.
- 10. PROVISION OF LINE, VALVE & INSTRUMENT TO BE INSTALL BY SUNPETRO LATTER ON. QPS COVER SAME IN AS BUILDING P&ID AS REQUESTED BY SUNPETRO.

INTERLOCK DESCRIPTION :

SR NO.	I/L NO.	P & ID	CAUSE	EFFECT
1	I-1502	1019-PS-PID-115 (SHEET 1 OF 3) 1019-PS-PID-115 (SHEET 2 OF 3)	LOW LOW LEVEL IN T-103 (LALL-T103)	TRIP P-106A-C, P-107A-C P-132A/B, P-133A/B, P-134A/B, P-135A/B, P-136A/B
2	I-1511	1019-PS-PID-115 (SHEET 2 OF 3) 1019-PS-PID-115 (SHEET 3 OF 3)	LOW LOW PRESSURE IN P-106A-C SUCTION LINE (PALL-P106A_1) OR (PALL-P106B_1) OR (PALL-P106C_1) OR HIGH HIGH PRESSURE IN P-106A/B DISCHARGE LINE (PAHH-P106A_2) OR (PAHH-P106B_2) OR (PAHH-P106C_2)	TRIP P-106A-C, P-109A/B, P-134A/B, P-135A/B, P-136A/B
3	I-1512	1019-PS-PID-115 (SHEET 2 OF 3) 1019-PS-PID-115 (SHEET 3 OF 3)	HIGH HIGH CURRENT IN P-106A-C OR LOW LOW CURRENT IN P-106A-C	TRIP P-106A-C, P-109A/B, P-134A/B, P-135A/B, P-136A/B

6	11.03.2022	AS BUILT	PJS	VS	CM	AK
5	28.01.2021	ISSUED FOR ENGINEERING	PJS	VS	CM	AK
4	22.10.2020	REVISED AS PER HAZOP COMMENTS	PJS	VS	CM	AK
3	30.09.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
2	18.08.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
1	16.06.2020	ISSUED FOR APPROVAL	PJS	VS	CM	AK
0	20.05.2020	ISSUED FOR REVIEW	PD	SM	CM	AK
No.	DATE	REVISION	DRAWN	CHD	REVD	APPD

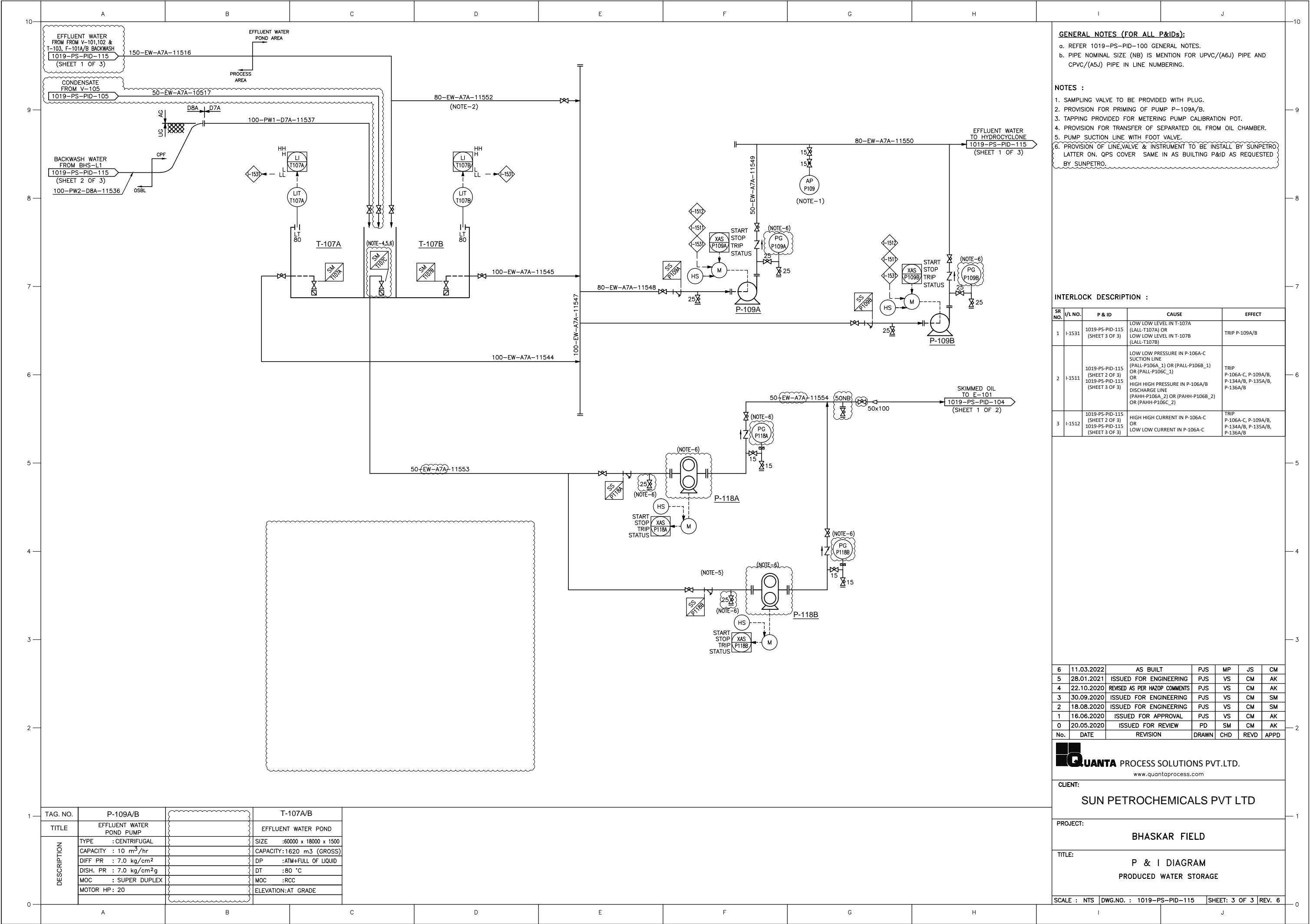
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SUN PETROCHEMICALS PVT LTD

PROJECT:
BHASKAR FIELD

TITLE:
**P & I DIAGRAM
PRODUCED WATER DISPOSAL**

SCALE : NTS | DWG.NO. : 1019-PS-PID-115 | SHEET: 2 OF 3 | REV. 6



GENERAL NOTES (FOR ALL P&IDs):

a. REFER 1019-PS-PID-100 GENERAL NOTES.

b. PIPE NOMINAL SIZE (NB) IS MENTION FOR UPVC/(A6J) PIPE AND CPVC/(A5J) PIPE IN LINE NUMBERING.

NOTES :

1. SAMPLING VALVE TO BE PROVIDED WITH PLUG.

2. PROVISION FOR PRIMING OF PUMP P-109A/B.

3. TAPPING PROVIDED FOR METERING PUMP CALIBRATION POT.

4. PROVISION FOR TRANSFER OF SEPARATED OIL FROM OIL CHAMBER.


5. PUMP SUCTION LINE WITH FOOT VALVE.

6. PROVISION OF LINE, VALVE & INSTRUMENT TO BE INSTALL BY SUNPETRO, LATTER ON. QPS COVER SAME IN AS BULTING P&ID AS REQUESTED BY SUNPETRO.

INTERLOCK DESCRIPTION :

SR NO.	I/L NO.	P & ID	CAUSE	EFFECT
1	I-1531	1019-PS-PID-115 (SHEET 3 OF 3)	LOW LOW LEVEL IN T-107A (LALL-T107A) OR LOW LOW LEVEL IN T-107B (LALL-T107B)	TRIP P-109A/B
2	I-1511	1019-PS-PID-115 (SHEET 2 OF 3) 1019-PS-PID-115 (SHEET 3 OF 3)	LOW LOW PRESSURE IN P-106A-C SUCTION LINE (PALL-P106A_1) OR (PALL-P106B_1) OR (PALL-P106C_1) OR HIGH HIGH PRESSURE IN P-106A/B DISCHARGE LINE (PAHH-P106A_2) OR (PAHH-P106B_2) OR (PAHH-P106C_2)	TRIP P-106A-C, P-109A/B, P-134A/B, P-135A/B, P-136A/B
3	I-1512	1019-PS-PID-115 (SHEET 2 OF 3) 1019-PS-PID-115 (SHEET 3 OF 3)	HIGH HIGH CURRENT IN P-106A-C OR LOW LOW CURRENT IN P-106A-C	TRIP P-106A-C, P-109A/B, P-134A/B, P-135A/B, P-136A/B

6	11.03.2022	AS BUILT	PJS	MP	JS	CM
5	28.01.2021	ISSUED FOR ENGINEERING	PJS	VS	CM	AK
4	22.10.2020	REVISED AS PER HAZOP COMMENTS	PJS	VS	CM	AK
3	30.09.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
2	18.08.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
1	16.06.2020	ISSUED FOR APPROVAL	PJS	VS	CM	AK
0	20.05.2020	ISSUED FOR REVIEW	PD	SM	CM	AK
No.	DATE	REVISION	DRAWN	CHD	REVD	APPD



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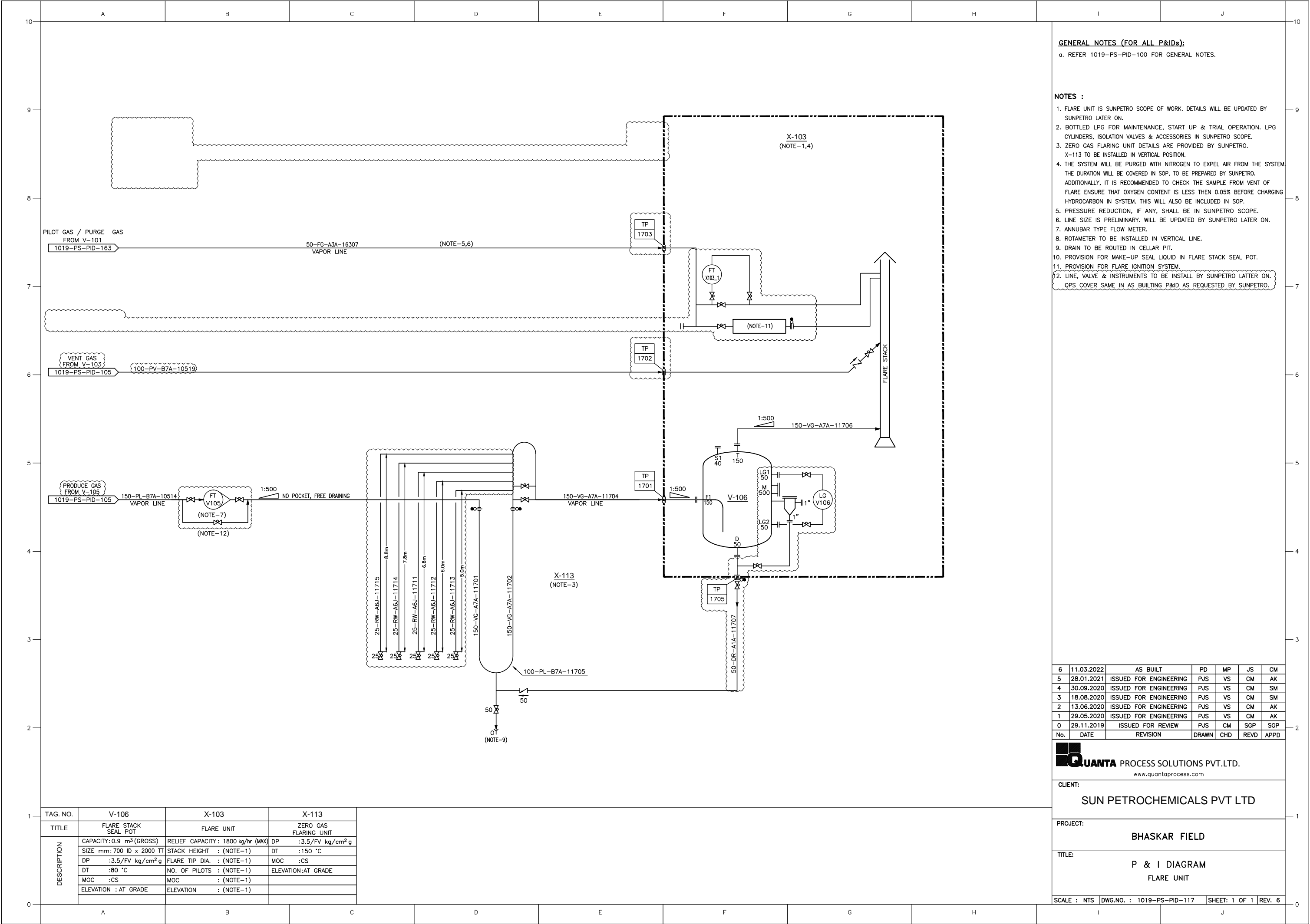
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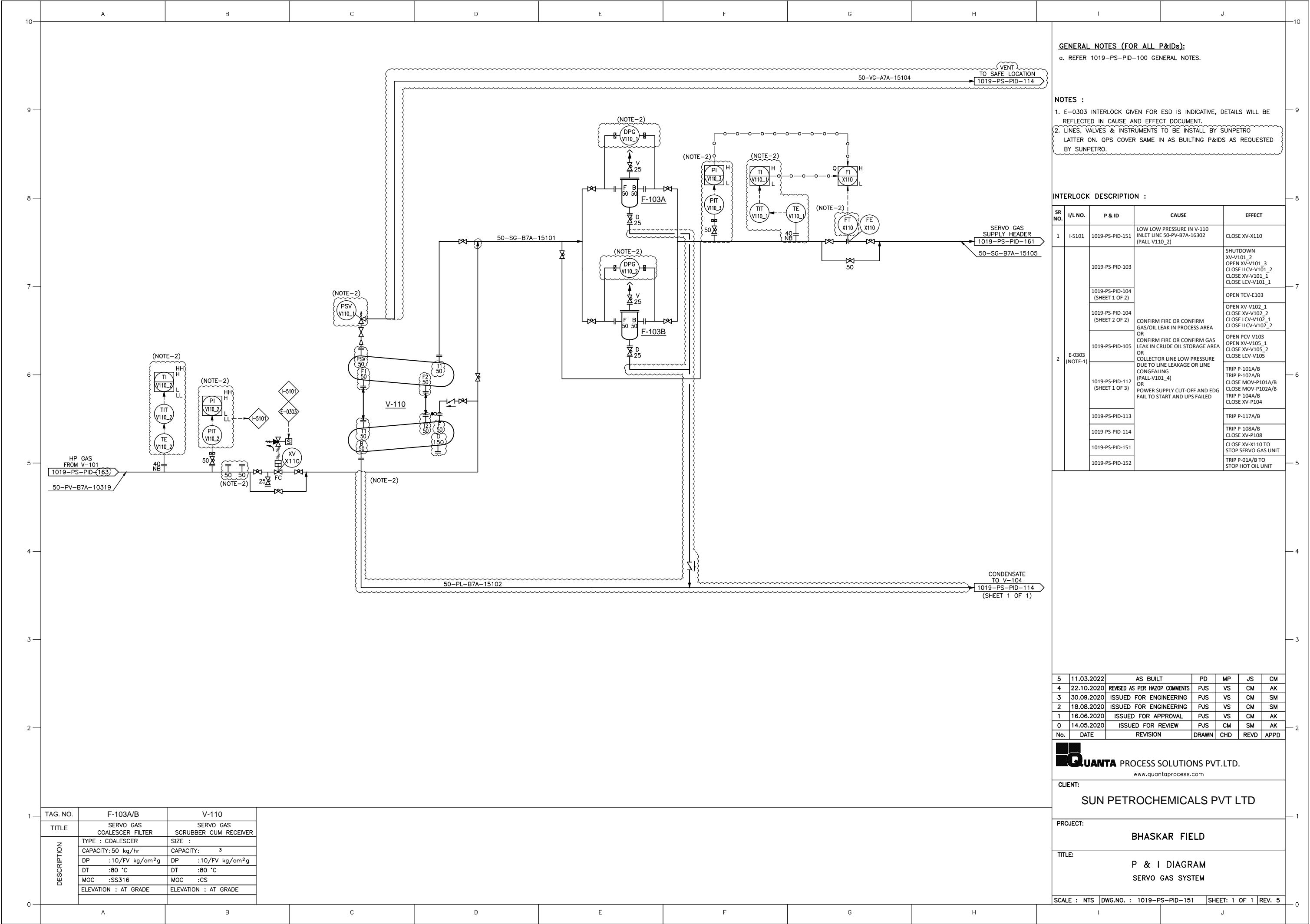
BHASKAR FIELD

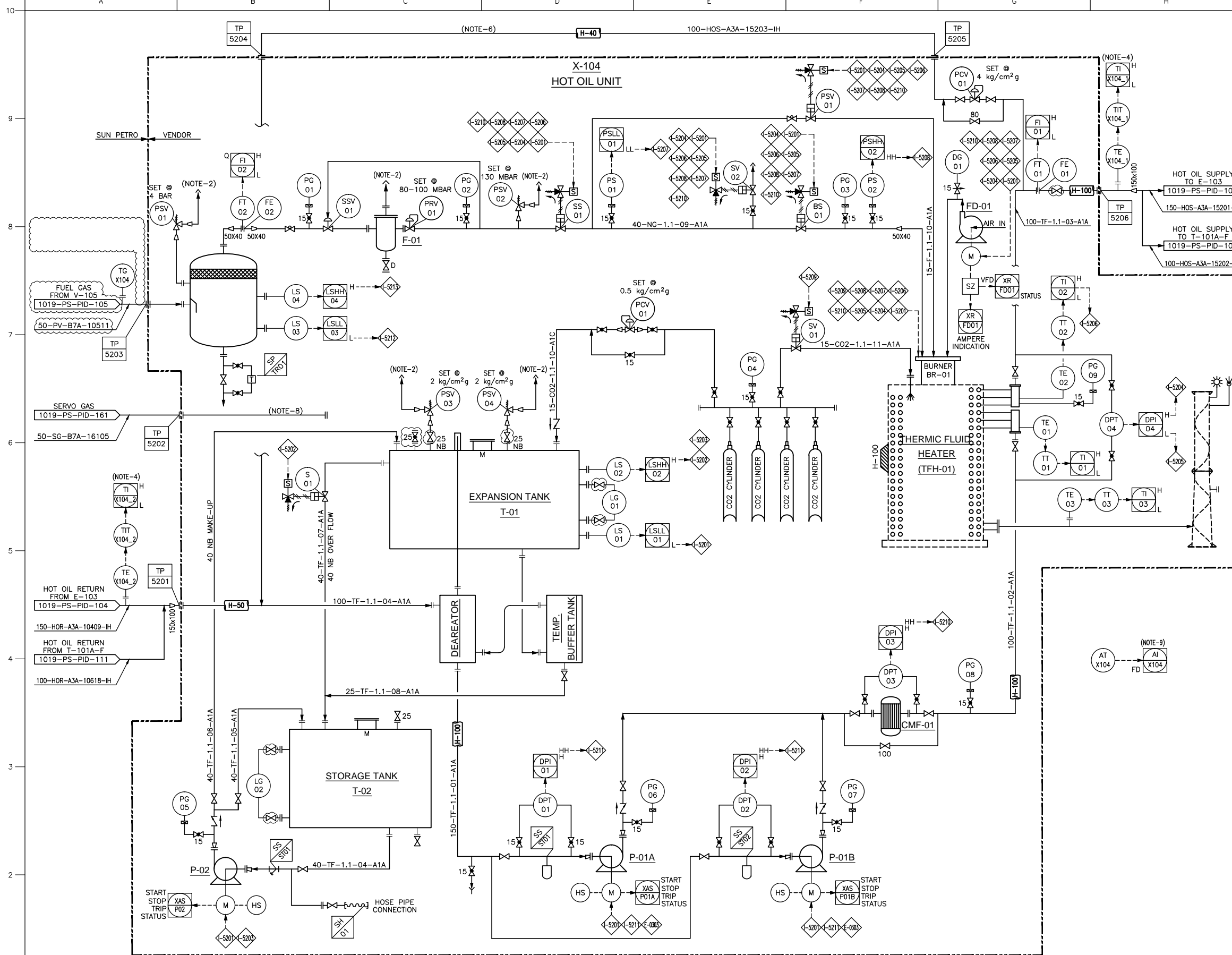
TITLE:

P & I DIAGRAM
PRODUCED WATER STORAGE

SCALE : NTS DWG.NO. : 1019-PS-PID-115 SHEET: 3 OF 3 REV. 6







GENERAL NOTES (FOR ALL P&IDs):

a. REFER 1019-PS-PID-100 FOR GENERAL NOTES.

NOTES :

1. HOT OIL UNIT INCLUDING HEATER, EXPANSION VESSEL, BLOWER, CIRCULATION PUMP, CHIMNEY, HOT OIL MAKEUP TANK, OIL MAKEUP PUMP, FUEL KOD.
REFER VENDOR P&ID FOR MORE DETAILS.
2. HIGH POINT VENT AT SAFE LOCATION WITH BIRD SCREEN.
3. ALL GAUGES ON SUPPLY HEADERS TO BE INSTALLED AT ACCESSIBLE LEVELS.
4. TRANSMITTERS SHOULD HAVE LOCAL INDICATION IN FIELD AT ACCESSIBLE LEVEL.
5. E-0303 INTERLOCK GIVEN FOR ESD IS INDICATIVE, DETAILS WILL BE REFLECTED IN CAUSE AND EFFECT DOCUMENT.
6. CONNECTING LINE FROM PUMP DISCHARGE RECIRCULATION LINE PCV-01 TO EXPIRATION TANK T-01. REFER VENDOR P&ID FOR MORE DETAILS.
7. HOT OIL UNIT PID-152 IS INDICATIVE BASED ON VENDOR PID (TFH/66/1.01_REV.4). LINE NOS. & INSTRUMENT TAG NOS. ARE SAME AS PROVIDED BY VENDOR. KINDLY REFER VENDOR PID FOR MORE DETAILS.
8. SERVO GAS HEADER FOR OPERATE PNEUMATIC VALVES. FURTHER DISTRIBUTION TO BE DONE BY VENDOR.
9. HOT OIL UNIT AREA SHALL HAVE 1 NOS. OF FLAME DETECTOR, & 1 NO. OF HORN & BEACON FOR MORE DETAILS REFER FIRE FIGHTING LAYOUT.

INTERLOCK DESCRIPTION :

Sr. No.	I/L NO.	P & ID	CAUSE	EFFECT
1	I-5201	1019-PS-PID-152	LOW LEVEL IN EXPANSION TANK (LAL-LSL01)	START P-02. TRIP P-01A, P-01B. SHUT-OFF THE BURNER BR-01. CLOSE SS-01, BS-01, PSV-01. OPEN SV-02.
2	I-5202 I-5203	1019-PS-PID-152	HIGH LEVEL IN EXPANSION TANK (LAH-LSH02)	TRIP P-02. OPEN S-01 IN EXPANSION TANK OVERFLOW LINE. CLOSE S-01 IN EXPANSION TANK OVER FLOW LINE WHEN HIGH INDICATION IS OFF & HOOTER INDICATION.
3	I-5204	1019-PS-PID-152	DIFFERENTIAL PRESSURE TRANSMITTER ACROSS RADIATIVE COIL (HIGH)	TRIP FD-01. SEQUENTIALLY TRIP BR-01. CLOSE SS-01, BS-01, PSV-01. OPEN S-02.
4	I-5205	1019-PS-PID-152	DIFFERENTIAL PRESSURE TRANSMITTER ACROSS RADIATIVE COIL (LOW)	TRIP FD-01. SEQUENTIALLY TRIP BR-01. CLOSE SS-01, BS-01, PSV-01. OPEN S-02.
5	I-5206	1019-PS-PID-152	LOW TEMPERATURE IN TIT-02	CONTROL BR-01 BURNER FUEL SERVO MOTOR.
6	I-5206	1019-PS-PID-152	HIGH TEMPERATURE IN TIT-02	TRIP FD-01. SEQUENTIALLY TRIP BR-01. CLOSE SS-01, BS-01, PSV-01. OPEN SV-02.
7	I-5207	1019-PS-PID-152	LOW PRESSURE IN PS-01 (PAL-PS-01)	TRIP FD-01. SEQUENTIALLY TRIP BR-01. CLOSE SS-01, BS-01, PSV-01. OPEN SV-02.
8	I-5208	1019-PS-PID-152	HIGH PRESSURE IN PS-02 (PAH-PS-02)	TRIP FD-01. SEQUENTIALLY TRIP BR-01. CLOSE SS-01, BS-01, PSV-01. OPEN SV-02.
9	I-5209	1019-PS-PID-152	CO2 PURGING AT BURNER START	OPEN BURNER CO2 SOV THEN BURNER START & OPEN BURNER CO2 SOV AFTER BURNER TRIP
10	I-5210	1019-PS-PID-152	DIFFERENTIAL PRESSURE TRANSMITTER ACROSS CMF	TRIP FD-01. SEQUENTIALLY TRIP BR-01. CLOSE SS-01, BS-01, PSV-01. OPEN SV-02.
11	I-5211	1019-PS-PID-152	DIFFERENTIAL PRESSURE TRANSMITTER ACROSS STRAINER	START STAND BY PUMP AND STOP WORKING PUMP AND HOOTER INDICATION
12	I-5212	1019-PS-PID-152	KNOCK OUT DRUM LOW LEVEL SWITCH (LAL-LSL-03)	HOOTER INDICATION
13	I-5213	1019-PS-PID-152	KNOCK OUT DRUM HIGH LEVEL SWITCH (LAH-LSH-04)	HOOTER INDICATION
14	E-0303 (NOTE-5)	1019-PS-PID-103 1019-PS-PID-152	CONFIRM FIRE OR CONFIRM GAS/OIL LEAK IN PROCESS AREA OR CONFIRM FIRE OR CONFIRM GAS LEAK IN CRUDE OIL STORAGE AREA OR COLLECTOR LINE LOW PRESSURE DUE TO LINE LEAKAGE AND CONGEAL (PALL-V101_4) OR POWER SUPPLY CUT-OFF AND EDG FAIL TO START OR UPS FAILED	TRIP P-01A/B TO STOP HOT OIL UNIT (X-104)

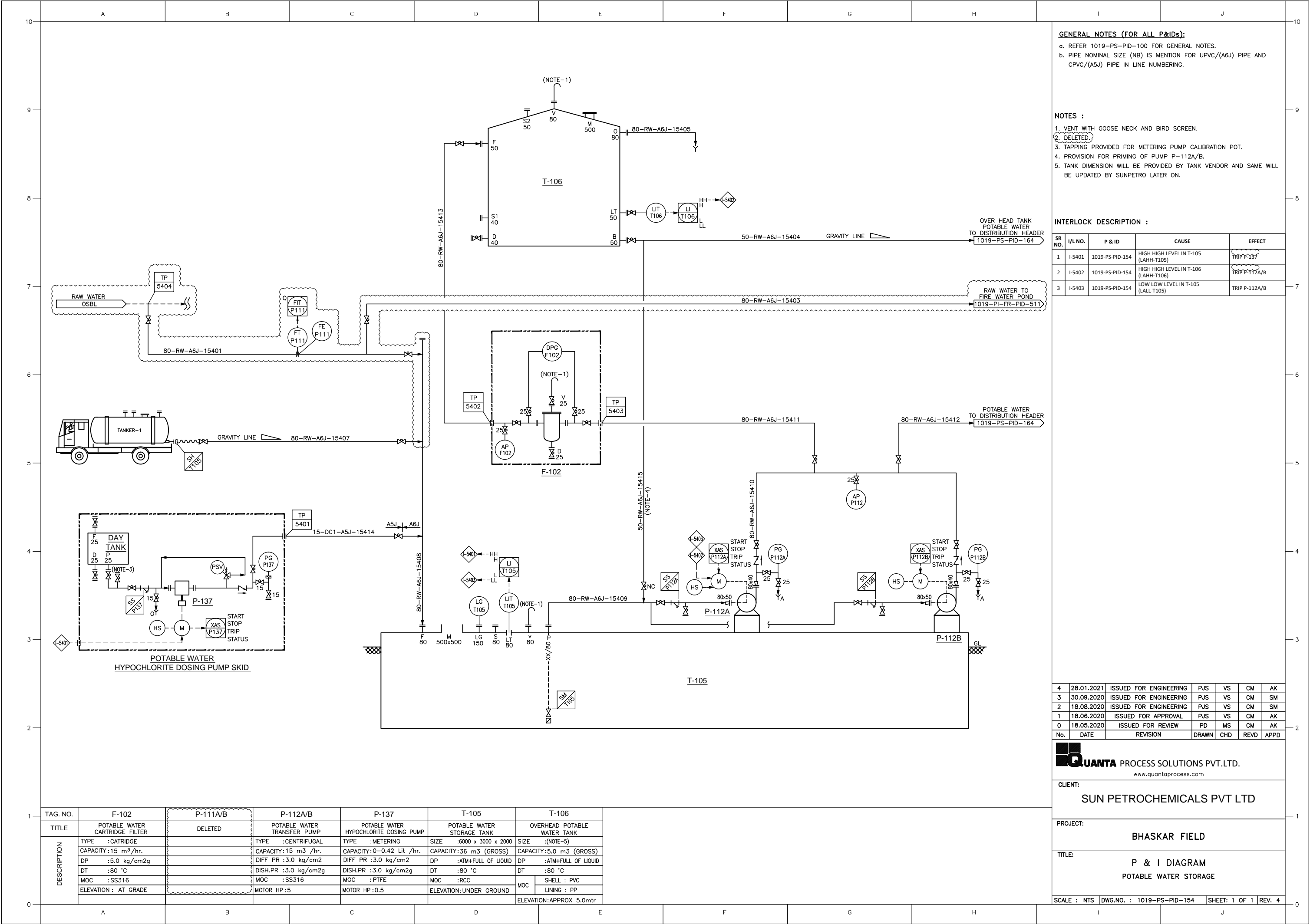
7	11.03.2022	ISSUED FOR ENGINEERING	PD	MP	JS	CM
6	28.01.2021	ISSUED FOR ENGINEERING	PJS	VS	CM	AK
5	30.09.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
4	18.08.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
3	17.06.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
2	29.05.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	AK
1	29.11.2019	ISSUED FOR APPROVAL	PJS	CM	SGP	SGP
0	04.10.2019	ISSUED FOR REVIEW	PD	BRB	CM	SGP
No.	DATE	REVISION	DRAWN	CHD	REV'D	APPRO

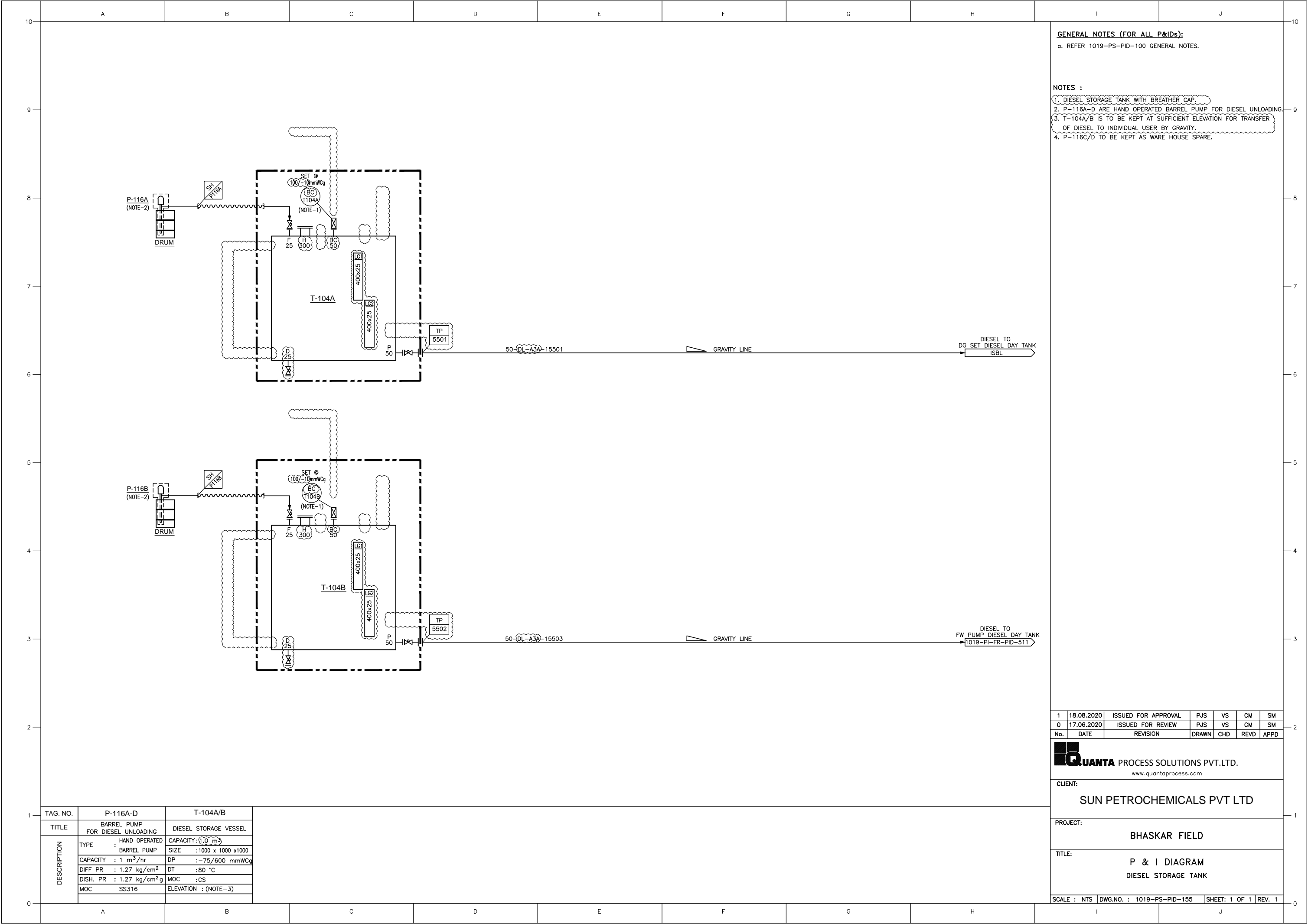


CLIENT: SUN PETROCHEMICALS PVT LTD

PROJECT:	BHASKAR FIELD
TITLE:	P & I DIAGRAM HOT OIL UNIT

SCALE : NTS	DWG.NO. : 1019-PS-PID-152	SHEET: 1 OF 1	REV. 7
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- GENERAL NOTES (FOR ALL P&IDs):**
- a. REFER 1019-PS-PID-100 GENERAL NOTES.
- NOTES :**
- 1. DIESEL STORAGE TANK WITH BREATHER CAP.
 - 2. P-116A-D ARE HAND OPERATED BARREL PUMP FOR DIESEL UNLOADING.
 - 3. T-104A/B IS TO BE KEPT AT SUFFICIENT ELEVATION FOR TRANSFER OF DIESEL TO INDIVIDUAL USER BY GRAVITY.
 - 4. P-116C/D TO BE KEPT AS WARE HOUSE SPARE.

1	18.08.2020	ISSUED FOR APPROVAL	PJS	VS	CM	SM
0	17.06.2020	ISSUED FOR REVIEW	PJS	VS	CM	SM
No.	DATE	REVISION	DRAWN	CHD	REVD	APPD

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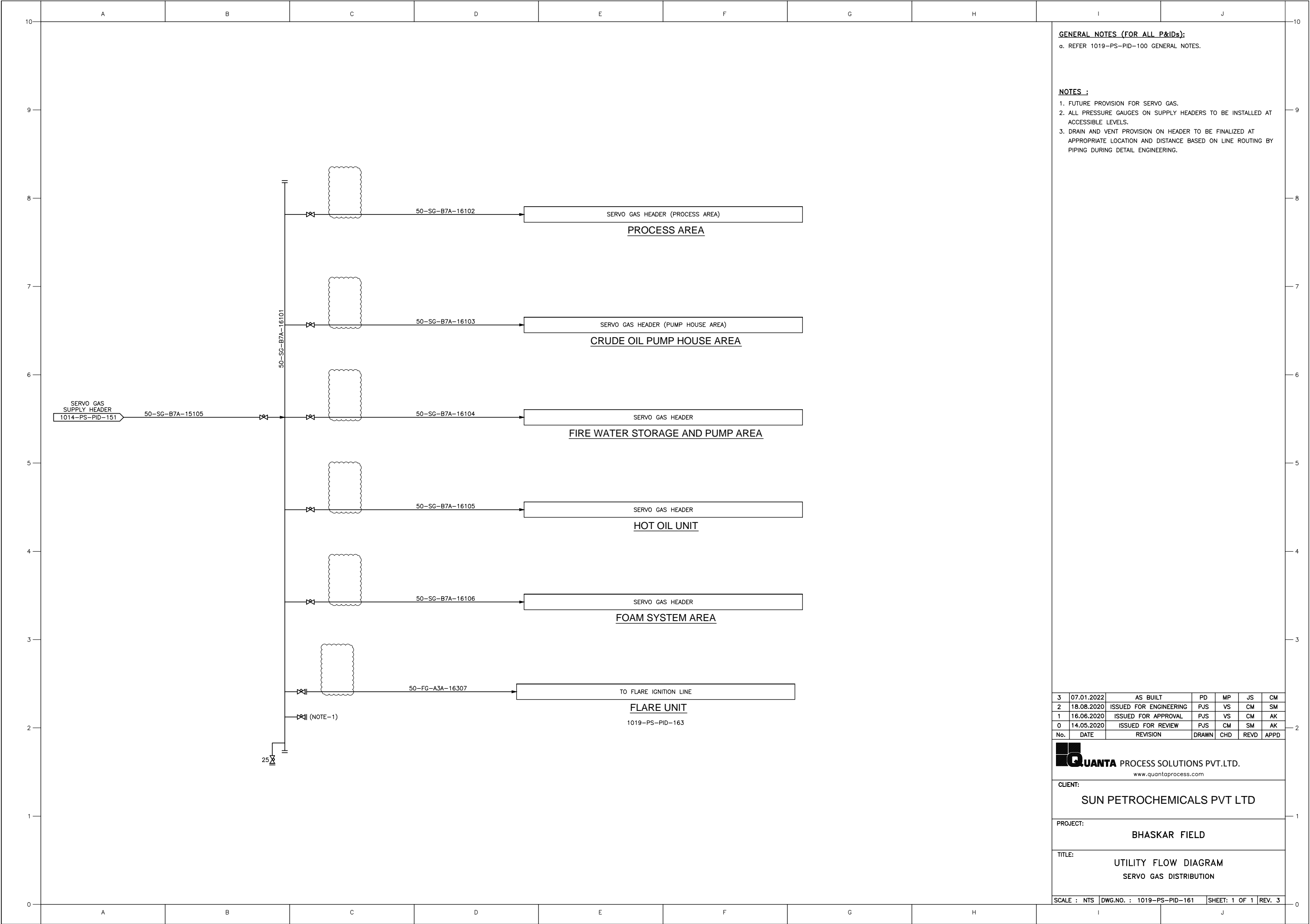
CLIENT:
SUN PETROCHEMICALS PVT LTD

PROJECT:
BHASKAR FIELD

TITLE:
**P & I DIAGRAM
DIESEL STORAGE TANK**

SCALE : NTS | DWG.NO. : 1019-PS-PID-155 | SHEET: 1 OF 1 | REV. 1


TAG. NO.	P-116A-D	T-104A/B
TITLE	BARREL PUMP FOR DIESEL UNLOADING	DIESEL STORAGE VESSEL
DESCRIPTION	TYPE : HAND OPERATED BARREL PUMP	CAPACITY : 1.0 m³
	CAPACITY : 1 m ³ /hr	SIZE : 1000 x 1000 x1000
	DIFF PR : 1.27 kg/cm ²	DP : -75/600 mmWCg
	DISH. PR : 1.27 kg/cm ² g	DT : 80 °C
	MOC : SS316	MOC : CS
		ELEVATION : (NOTE-3)



GENERAL NOTES (FOR ALL P&IDs):
a. REFER 1019-PS-PID-100 GENERAL NOTES.

NOTES :
1. FUTURE PROVISION FOR SERVO GAS.
2. ALL PRESSURE GAUGES ON SUPPLY HEADERS TO BE INSTALLED AT ACCESSIBLE LEVELS.
3. DRAIN AND VENT PROVISION ON HEADER TO BE FINALIZED AT APPROPRIATE LOCATION AND DISTANCE BASED ON LINE ROUTING BY PIPING DURING DETAIL ENGINEERING.

3	07.01.2022	AS BUILT	PD	MP	JS	CM
2	18.08.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
1	16.06.2020	ISSUED FOR APPROVAL	PJS	VS	CM	AK
0	14.05.2020	ISSUED FOR REVIEW	PJS	CM	SM	AK
No.	DATE	REVISION	DRAWN	CHD	REVD	APPD

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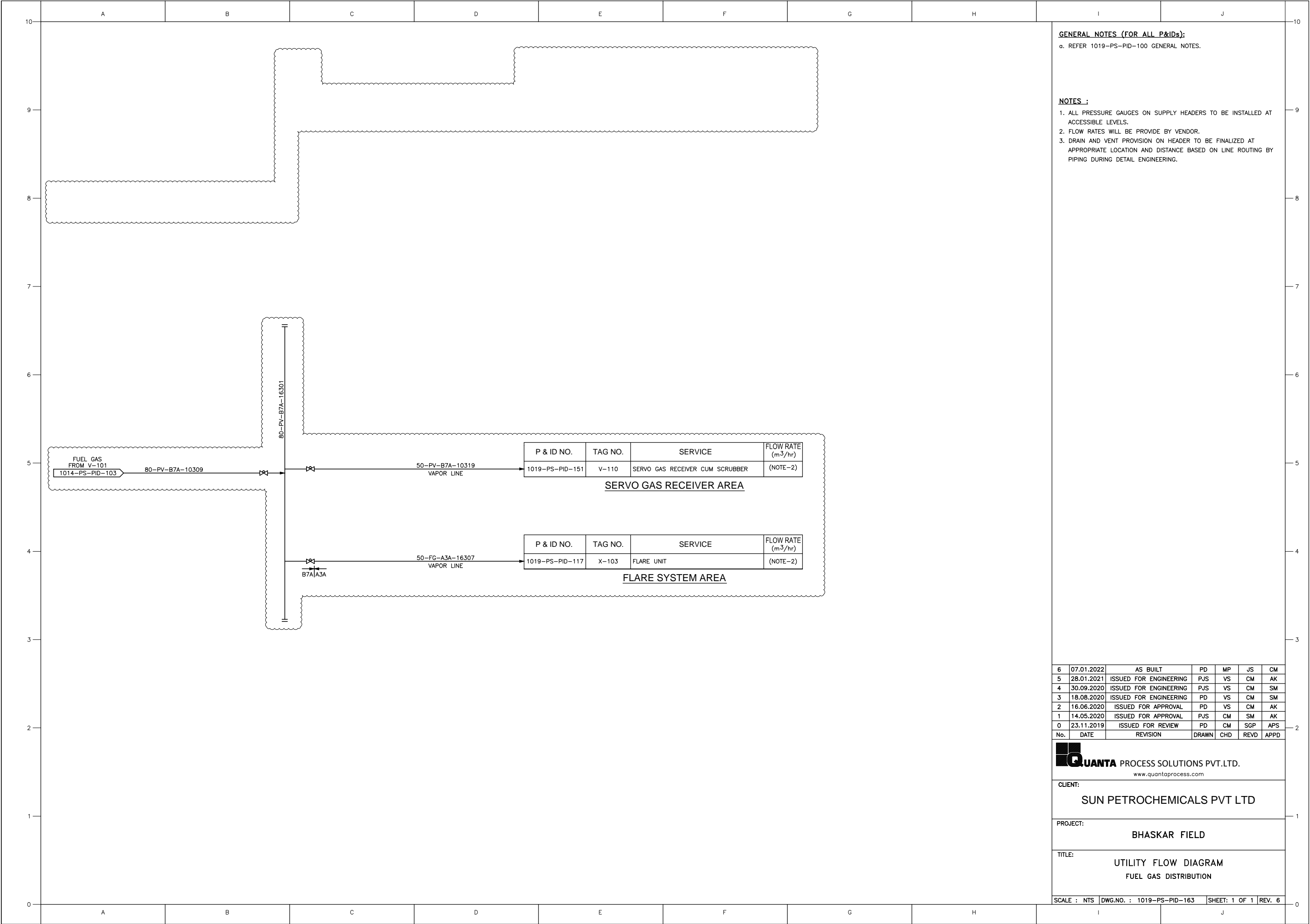
PROJECT:

BHASKAR FIELD

TITLE:

UTILITY FLOW DIAGRAM
SERVO GAS DISTRIBUTION


SCALE : NTS	DWG.NO. : 1019-PS-PID-161	SHEET: 1 OF 1	REV. 3
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GENERAL NOTES (FOR ALL P&IDs):
a. REFER 1019-PS-PID-100 GENERAL NOTES.

NOTES :
1. ALL PRESSURE GAUGES ON SUPPLY HEADERS TO BE INSTALLED AT ACCESSIBLE LEVELS.
2. FLOW RATES WILL BE PROVIDE BY VENDOR.
3. DRAIN AND VENT PROVISION ON HEADER TO BE FINALIZED AT APPROPRIATE LOCATION AND DISTANCE BASED ON LINE ROUTING BY PIPING DURING DETAIL ENGINEERING.

6	07.01.2022	AS BUILT	PD	MP	JS	CM
5	28.01.2021	ISSUED FOR ENGINEERING	PJS	VS	CM	AK
4	30.09.2020	ISSUED FOR ENGINEERING	PJS	VS	CM	SM
3	18.08.2020	ISSUED FOR ENGINEERING	PD	VS	CM	SM
2	16.06.2020	ISSUED FOR APPROVAL	PD	VS	CM	AK
1	14.05.2020	ISSUED FOR APPROVAL	PJS	CM	SM	AK
0	23.11.2019	ISSUED FOR REVIEW	PD	CM	SGP	APS
No.	DATE	REVISION	DRAWN	CHD	REVD	APPD



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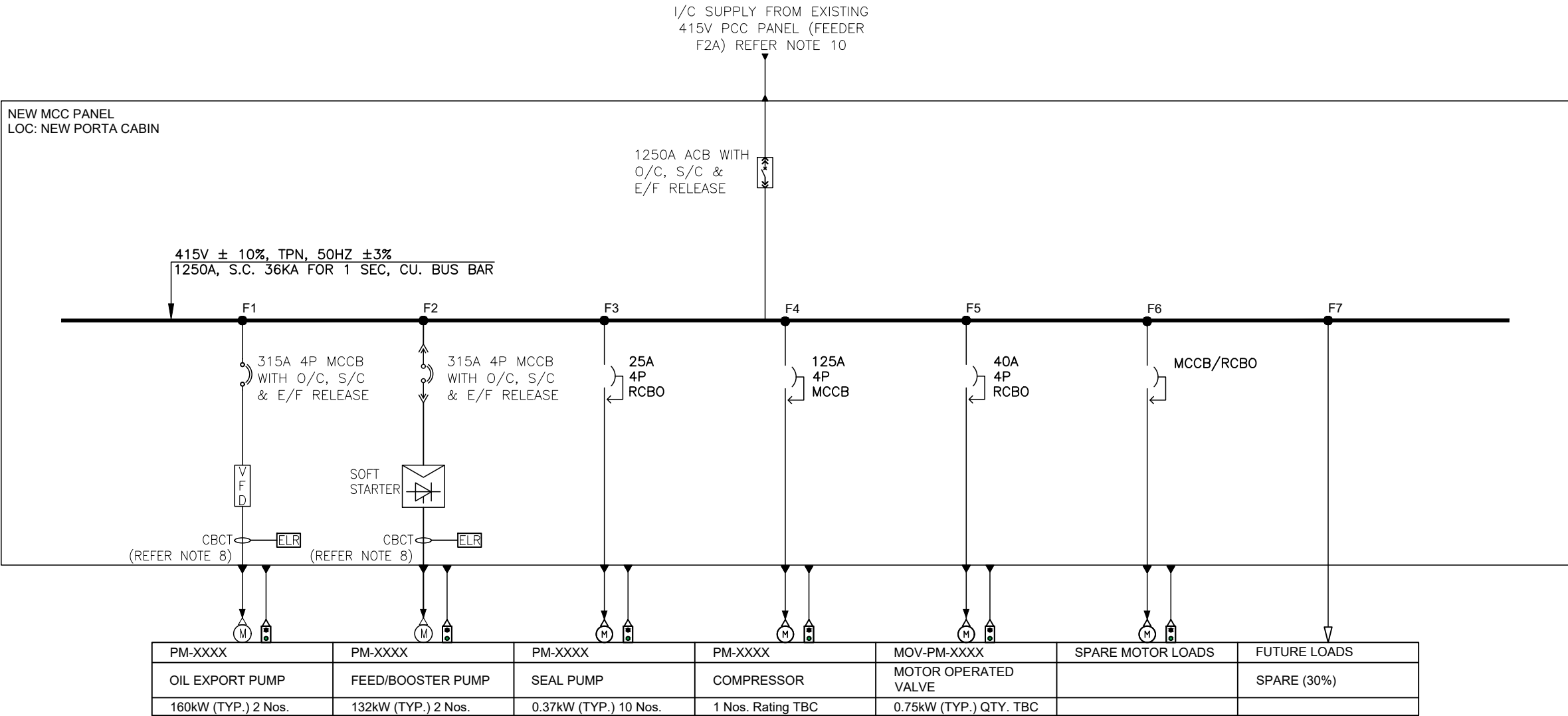
CLIENT:
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PROJECT:
BHASKAR FIELD

TITLE:
**UTILITY FLOW DIAGRAM
FUEL GAS DISTRIBUTION**

SCALE : NTS | DWG.NO. : 1019-PS-PID-163 | SHEET: 1 OF 1 | REV. 6

Annexure – C: Single line diagram (SLD), CPF
(Enclosed)



REFERENCE DRAWINGS

DRG. NO.	DESCRIPTION
1019-EL-SLD-001	SINGLE LINE DIAGRAM FOR PCC PANEL

NOTES:

- MCC RATING WILL BE 415V±10%, TPN, 50HZ ±3% 1250A, S.C. 36KA FOR 1 SEC(* REFER NOTE 11).
- MCC OUTGOING FEEDER WILL BE DOUBLE FRONT TYPE. PANEL MUST BE EXTENDABLE AT BOTH ENDS.
- ALL CABLE ENTRIES SHALL BE FROM BOTTOM ONLY.
- COMPONENT RATING SPECIFIED BASED ON TYPE –2 CO–ORDINATION. CONTACTOR RATING SELECTED BASED ON TYPE–2 RATING. VENDOR MAY CHANGE THE COMPONENT RATING BASED ON INDIVIDUAL SWITCHGEAR MANUFACTURER TYPE–2 CO–ORDINATION.
- VENDOR TO CONSIDER SPARE FEEDER AS SHOWN IN SLD.
- BUSBAR RATING SPECIFIED ARE INSIDE BUS BAR CHAMBER. CURRENT DENSITY OF BUS BAR SHALL BE 1.4A/SQ MM FOR COPPER.
- SEPERATE APFC PANEL FOR THIS NEW MOTOR LOADS ARE NOT CONSIDERED, ASSUMING EXISTING APFC PANEL CAN CATER THE PF CORRECTION DUE TO NEW LOADS.
- EARTH FAULT PROTECTION IS CONSIDERED FOR 132kW AND ABOVE MOTORS.
- AS PER DESIGN STANDARD 30% SPARE FEEDERS ARE CONSIDERED IN 415V MCC PANEL.
- FEEDER F2A INDICATES NEW MODIFIED FEEDER BETWEEN F2 & F3 AT EXISTING PCC PANEL.
- SHORT CIRCUIT CURRENT CAPACITY OF NEW 415V MCC BUSBAR TO BE FINALIZED AFTER SHORT CIRCUIT STUDY.
- THIS KEY SLD IS PROVIDED WITH TENTATIVE LOADS. DETAILED SLD WILL BE UPDATED BASED ON ACTUAL LOADS.

LEGENDS:

	AIR CIRCUIT BREAKER (ACB)
	MCCB
	MOTOR
	START-STOP LOCAL CONTROL STATION (LCS)
	RESIDUAL CIRCUIT BREAKER WITH OVERLOAD (RCBO)
	DRAW-OUT FEATURE
	VARIABLE FREQUENCY DRIVE
	SOFT STARTER
	CBCT CORE BALANCE CURRENT TRANSFORMER
	EARTH LEAKAGE RELAY
	TO BE CONFIRMED

0	24.07.2023	ISSUED FOR REVIEW	MM	KS	SPV
REV	DATE	DESCRIPTION	DRAWN	CHKD	APPD



GLOBAL MARITIME CONSULTANTS GROUP

CLIENT : SUN PETROCHEMICALS PVT LTD.



PROJECT : CENTRAL PROCESSING FACILITY AUGMENTATION

TITLE : KEY SINGLE LINE DIAGRAM OF NEW 415V MCC PANEL

SIZE	SCALE	DRAWING NO.	SHEET NO.	REV.
A3	N.T.S	BHII–CPF–ELE–DWG–5022	1 OF 1	0

Annexure – D: DCS Details, CPF
(Enclosed)

IO OCCUPANCY CHART - DELTA V MX CONTROLLER (AS-BUILT) DCS

Sr. No.	Controller	TYPE	Sub-type	IO AVILABLE	IO ASSINGED	SPARE - ONBOARD	SPARE - ONBOARD TOTAL
1	CNTRL - 1	AI	RED.	32	14	18	145
2	CNTRL - 1	AI	NON- RED	256	129	127	
3	CNTRL - 2	AI	RED.	16	0	16	389
4	CNTRL - 2	AI	NON- RED	384	11	373	
5	CNTRL - 1	AO	RED.	32	26	6	22
6	CNTRL - 2	AO	RED.	16	0	16	
7	CNTRL - 1	DI	NON- RED	160	78	82	211
8	CNTRL - 2	DI	NON- RED	160	31	129	
9	CNTRL - 1	DO	NON- RED	160	54	106	266
10	CNTRL - 2	DO	NON- RED	160	0	160	

CONTROLLER	IO AVILABLE	IO ASSIGNED	IO - OCCUPANCY	47.03
CNTRL -1	640	301		
CNTRL -2	736	42		5.71

IO OCCUPANCY CHART - DELTA V SZ CONTROLLER (AS-BUILT) ESD

Sr. No.	Controller	TYPE	Sub-type	IO AVILABLE	IO ASSINGED	SPARE - ONBOARD	SPARE - ONBOARD TOTAL
1	CSLS - 1	CB 1	LS AI 4-20 mA HART CHARM	12	4	8	92
2		CB 2	LS AI 4-20 mA HART CHARM	12	0	12	
3		CB 3	LS AI 4-20 mA HART CHARM	12	0	12	
4		CB 4	LS AI 4-20 mA HART CHARM	12	0	12	
5		CB 5	LS AI 4-20 mA HART CHARM	12	0	12	
6		CB 6	LS AI 4-20 mA HART CHARM	12	0	12	
7		CB 7	LS AI 4-20 mA HART CHARM	12	0	12	
8		CB 8	LS AI 4-20 mA HART CHARM	12	0	12	
9	CSLS - 2	CB 1	LS DI NAMUR CHARM	12	12	0	52
10		CB 2	LS DI NAMUR CHARM	12	12	0	
11		CB 3	LS DI NAMUR CHARM	12	12	0	
12		CB 4	LS DI NAMUR CHARM	12	4	8	
13		CB 5	LS DI NAMUR CHARM	12	0	12	
14		CB 6	LS DI NAMUR CHARM	12	0	12	
15		CB 7	LS DI NAMUR CHARM	12	0	12	
16		CB 8	LS DI NAMUR CHARM	12	4	8	
17	CSLS - 3	CB 1	LS DO 24 VDC DTA CHARM	12	12	0	2
18		CB 2	LS DO 24 VDC DTA CHARM	12	12	0	
19		CB 3	LS DO 24 VDC DTA CHARM	12	10	2	
20		CB 4	LS DO 24 VDC DTA CHARM	12	12	0	
21		CB 5	LS DO 24 VDC DTA CHARM	12	12	0	
22		CB 6	LS DO 24 VDC DTA CHARM	12	12	0	
23		CB 7	LS DO 24 VDC DTA CHARM	12	12	0	
24		CB 8	LS DO 24 VDC DTA CHARM	12	12	0	

25	CSLS - 4	CB 1	Intrinsically-Safe LS AI 4-20 mA HART CHARM	12	12	0	72
26		CB 2	Intrinsically-Safe LS AI 4-20 mA HART CHARM	12	12	0	
27		CB 3	Intrinsically-Safe LS AI 4-20 mA HART CHARM	12	0	12	
28		CB 4	Intrinsically-Safe LS AI 4-20 mA HART CHARM	12	0	12	
29		CB 5	Intrinsically-Safe LS AI 4-20 mA HART CHARM	12	0	12	
30		CB 6	Intrinsically-Safe LS AI 4-20 mA HART CHARM	12	0	12	
31		CB 7	Intrinsically-Safe LS AI 4-20 mA HART CHARM	12	0	12	
32		CB 8	Intrinsically-Safe LS AI 4-20 mA HART CHARM	12	0	12	
33	CSLS - 5	CB 1	Intrinsically-Safe LS AI 4-20 mA HART CHARM	12	0	12	92
34		CB 2	Intrinsically-Safe LS AI 4-20 mA HART CHARM	12	0	12	
35		CB 3	Intrinsically-Safe LS AI 4-20 mA HART CHARM	12	0	12	
36		CB 4	Intrinsically-Safe LS AI 4-20 mA HART CHARM	12	0	12	
37		CB 5	Intrinsically-Safe LS AI 4-20 mA HART CHARM	12	0	12	
38		CB 6	Intrinsically-Safe LS AI 4-20 mA HART CHARM	12	0	12	
39		CB 7	Intrinsically-Safe LS AI 4-20 mA HART CHARM	12	0	12	
40		CB 8	Intrinsically-Safe LS AI 4-20 mA HART CHARM	8	0	8	
41	CSLS - 6	CB 8	Intrinsically-Safe LS DI NAMUR CHARM	4	4	0	20
42		CB 1	LS DO 24 VDC DTA CHARM	12	12	12	
43		CB 2	LS DO 24 VDC DTA CHARM	12	11	1	
44		CB 3	Intrinsically-Safe LS DI NAMUR CHARM	12	12	0	
45		CB 4	Intrinsically-Safe LS DI NAMUR CHARM	12	12	0	
46		CB 5	Intrinsically-Safe LS DI NAMUR CHARM	12	12	0	
47		CB 6	Intrinsically-Safe LS DI NAMUR CHARM	12	9	3	
48		CB 7	Intrinsically-Safe LS DI NAMUR CHARM	12	8	4	
49	CSLS - 7	CB 1	LS DO 24 VDC DTA CHARM	12	10	2	45
50		CB 2	LS DO 24 VDC DTA CHARM	12	5	7	
51		CB 3	LS DO 24 VDC DTA CHARM	12	0	12	
52		CB 4	LS DO 24 VDC DTA CHARM	12	0	12	
53		CB 5	Intrinsically-Safe LS DI NAMUR CHARM	12	0	12	
54		CB 6	EMPTY	0	0	0	

CONTROL LER	IO AVILABLE	IO ASSIGNE D	IO - OCCUPANCY	41.83
SZ - 1	624	261		