



**DETAILED ENGINEERING OF PIGGING SET UP FOR
GORU AND TIPU WELLS**



DATASHEET FOR PIG SIGNALLERS

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DHK-2052-PIP-DAS-0001

REV.: B

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08-Sept-2025

MARI ENERGIES LIMITED

DATASHEET FOR PIG SIGNALLERS

**DETAILED ENGINEERING OF PIGGING SET UP
FOR GORU AND TIPU WELLS**

| | | | | | |
|------------|--------------------|-------------|-----------------|----------------|-----------------|
| B | Issued for Use | 8-Sep-25 | MAN | UMK | SMW |
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1.0 DEFINITIONS

| | |
|-------------------------|---|
| CLIENT / COMPANY | MariEnergies Ltd. |
| VENDOR | The company which carries out Vent, Dispersion, and Radiation Study of the PROJECT |
| CONSULTANT | The company which carries out all or part of the Engineering Design of the PROJECT (BRILLANTE ENGINEERS LTD.) |
| PROJECT | DETAILED ENGINEERING OF PIGGING SET UP FOR GORU AND TIPU WELLS |
| SHALL | Indicates a mandatory requirement |
| SHOULD | Indicates a strong recommendation to comply with the requirements of this document |

2.0 LIST OF ABBREVIATIONS

| | |
|------|--|
| SGPC | Sachal Gas Processing Complex |
| MD | Mari Deep |
| SMLS | Seamless |
| RF | Raised Face |
| ASME | American Society of Mechanical Engineers |

3.0 INTRODUCTION

MariEnergies Gas Field, located at Daharki approximately 96 kilometers North of Sukkur in District Ghotki, Sindh. Goru-B reservoir was discovered within MariEnergies Field in the year 1997 and Tipu was discovered as a compartmentalized Goru-B reservoir in 2017. Currently Goru / Tipu Gas is being processed in Sachal Gas Processing Complex (SGPC).

Goru B Reservoir Gas has corrosive nature, attributed to its high CO₂ content (partial pressure ~475 psig) with increased water production levels. For internal protection of underground pipelines, pigging/batch inhibition process at regular intervals is imperative to maintain pipeline integrity and maximize the throughput.



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Therefore, MPCL intends to install permanent pigging facilities at MariEnergies Deep (MD) Wells.
Location are as follows:

1. Location 1: MD-12 to Junction-1 (MD-03)
2. Location 2: MD-04 to Junction-2 (MD-13)
3. Location 3: Azadi-1 to Junction-1 (MD-03)
4. Location 4: MD-21 to Junction-3 (MD-14)
5. Location 5: Parwaaz Deep-1 to Junction-2 (MD-14)
6. Location 6: MD-17 to Junction-5 (MD-15)
7. Location 7: Tipu-01 to Tipu-02
8. Location 8: Junction-1 (MD-03) to Junction-2 (MD-13)
9. Location 9: Junction-2 to Junction-3 (MD-14)
10. Location 10: Tipu-02 to SGPC
11. Location 11: SGPC to CMF-02
12. Location 12: Junction-3 to Junction-4 (MD-04)
13. Location 13: Junction-4 to Junction-5 (MD-15)
14. Location 14: Junction-5 to SGPC
15. Location 15: MD-19 to Junction-1 (MD-03)



4.0 DATASHEETS

General Notes

1. TBA = To Be Advised
2. Indication for pig passage shall be flag type i.e. horizontal position for "pig not passed" and vertical position for "pig passed".
3. The pig signallers shall be able to be removed / installed while system is under pressure and necessary retrieval tool shall be provided by the VENDOR. VENDOR to provide detailed procedure for installation / removal of pig signallers on line.
4. Vendor shall provide a permanently attached stainless steel tag for each pig signaller.
5. The indicators shall be designed for manual reset and allow replacement of all moving parts while the pipeline is under pressure.
6. The design methodology as described in ASME VIII, Division I, shall be used for the design calculation of the pig signaller pressure housing.
7. Isolation valve, to be provided by VENDOR, shall be integral and bolted to the Pig Signaller (refer to schematic installation as per Figure 1 in this document).
8. Trigger mechanism can be adjusted in the field. The amount of adjustment is limited to about 25 mm (1 in).
9. Penetration of the trigger into the main pipe shall not exceed 25 mm (1 in) to avoid unnecessary obstruction of the fluid flow.
10. The signaller shall be capable of indicating the passage of all types of scraper devices used for measurement.
11. Hazard area certificates and Material certificates, Dimensional drawings and Operation Manuals shall be provided for each signaller.
12. Gasket material for pig indicator shall have spiral wound construction.

Schematics of pig signaller installations

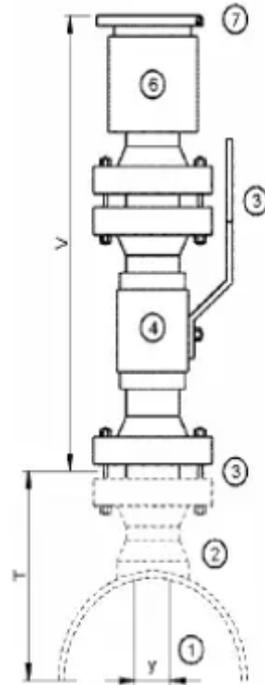


Figure 1

- | | |
|-------|---|
| ① | run pipe \geq DN 100 \leq DN 1400 (\geq NPS 4 \leq NPS 56) |
| ② | weldolet or pup piece , DN 50 (NPS 2) |
| ③ | flange connection, DN 50 (NPS 2) |
| ④ | isolating valve, DN 50 (NPS 2) |
| ⑤ | pipe, DN 50 (NPS 2) |
| ⑥ | main component of the pressure housing |
| ⑦ | mechanical indicator |
| A | = length of actuated pig signaller |
| E | \leq 1500 mm (60 inch) |
| S | = length of pig signaller housing |
| V | = length of pig signaller housing plus valve |
| T, W | \leq 1200 mm (60 inch) plus $\frac{1}{2}$ run pipe diameter |
| y | = ID minimum of 38mm (1.5 inch) |
| | = prepared by the Principal |



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DATASHEET FOR PIG SIGNALLERS

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| | |
|--|--|
| Client: Mari Energies | |
| Project: 925012 - Detailed Engineering of Pigging Set Up for Goru and Tipu Wells | |
| Location: Daharki, Ghotki District, Sindh, Pakistan | |
| GENERAL: | |
| Location: | Refer to attached Table 1 |
| Tags: | Refer to attached Table 1 |
| Quantity: | 35 |
| P&ID Number: | Refer to attached Table 1 |
| Reference Specification: | SHELL DEP 31.40.21.33-GEN |
| PIPELINE DETAILS: | |
| Barrel Size: | Refer to attached Table 1 |
| Design Code: | ASME B31.8 |
| Material: | API 5L Gr. X52 (SMLS), as per ASME B36.10 |
| Pipe Thickness: | Sch. 80 for all sizes |
| Service: | Process Gas |
| Design Pressure : | 1350 psig (93 barg) |
| Design Temperature (Min/Max): | 212° F |
| DETAILS FOR SIGNALLERS: | |
| Pig Signaller Size: | 2" |
| Type: | Intrusive / Mechanical Flag / Local Indication / Uni-Directional / Manual Reset (Note-1) |
| Design Code: | SHELL DEP 31.40.21.33-GEN / ASME B31.8 |
| Dimensions (mm) | Pig Signaller Housing plus Valve Length: TBA BY VENDOR |
| Hydrotest Pressure: | 2250 psig (140 barg) |
| ANSI Rating: | Class 600 |
| Installation: | See figure 1 attached to this document |
| Indication Type: | Red Flag |
| Sensor Element Type: | Mechanical |
| Sensor Mounting Position: | 12 O'Clock Position |
| Isolation Valve Required: | Yes |
| Isolation Valve Details: | 2" / 600# / Ball Valve / RF / FB |
| Gasket Type / Rating: | Spiral Wound, 4.5mm THK., Graphite Filler, Duplex SS 2205 Inner Ring, CS Outer Ring, Duplex SS 2205 Windings, 600# |
| Ingress Protection Class: | IP65 |
| Housing & Trigger Shaft Material Specification: | Duplex SS 2205 |
| End Details: | Flanged RF as per ASME B16.5 |
| Body: | API 5L Gr. X52 |
| Internals: | Duplex SS 2205 |
| Tag Required: | Yes |
| Tag Material: | SS 316L |
| Connection Branch Details: | |
| 2" NPS Nozzle: | 600# / Weld Neck Flange / B16.5 / RF |
| Length of Trigger Required: | TBA BY VENDOR |
| Functional Requirement: | |
| 1)The trigger shall not make obstruct, damage, or be damaged as pig passing. | |
| 2)The penetration of the trigger shall be kept to a minimum to avoid unnecessary obstruction. | |
| 3)The mechanical signal flag shall not be triggered, by the flow or internal pressure of the pipeline. | |
| 4)Pig signaller shall be maintenance free as permanent installation in outdoor environment. | |
| 5)When the pig passage through then the flag is flipped from a position perpendicular to the axis of the signaller. The flag is received manually. | |

5.0 TABLE 1

| Sr No. | Location | Description | Launcher/Receiver Tag No. | Pig Signaller Tag No. | Size | P&ID No. |
|--------|--------------------|------------------|---------------------------|-----------------------|------|---|
| 1 | Azadi-1 | 8" Pig Launcher | A01-V-001 | A01-PXI-101 | 2" | 0603284-A-01-PID-002 (Sheet 1 of 1) |
| 2 | CMF-02 | 14" Pig Receiver | CMFII-V-002 | CMFII-PXI-104 | 2" | DHK-2052-PRO-PID-0021 (Sheet 1 of 1) |
| 3 | Junction-4 (MD-02) | 16" Pig Receiver | D02-V-003 | D02-PXI-104 | 2" | 2981-D-02-PID-001 (Sheet 2 of 2) |
| 4 | | 20" Pig Launcher | D02-V-002 | D02-PXI-101 | 2" | 2981-D-02-PID-001 (Sheet 2 of 2) |
| 5 | Junction-1 (MD-03) | 6" Pig Receiver | D03-V-003 | D03-PXI-104 | 2" | DHK-2052-PRO-PID-0033 (Sheet 1 of 1) |
| 6 | | 8" Pig Receiver | D03-V-1001 | D03-PXI-103 | 2" | 2981-D-03-PID-001 (Sheet 1 of 1) |
| 7 | | 12" Pig Launcher | D03-V-004 | D03-PXI-101 | 2" | 2981-D-03-PID-001 (Sheet 2 of 2) |
| 8 | | 8" Pig Receiver | D03-V-005 | D03-PXI-102 | 2" | DHK-2052-PRO-PID-0029 (Sheet 1 of 1) |
| 9 | MD-04 | 6" Pig Launcher | D04-V-002 | D04-PXI-101 | 2" | DHK-2052-PRO-PID-0034 (Sheet 1 of 1) |
| 10 | MD-12 | 6" Pig Launcher | D12-V-001 | D12-PXI-101 | 2" | DHK-2052-PRO-PID-0032 (Sheet 1 of 1) |
| 11 | Junction-2 (MD-13) | 6" Pig Receiver | D13-V-005 | D13-PXI-104 | 2" | DHK-2052-PRO-PID-0035 (Sheet 1 of 1) |
| 12 | | 12" Pig Receiver | D13-V-002 | D13-PXI-105 | 2" | 2981-D13-PID-001 (Sheet 2 of 2) |
| 13 | | 12" Pig Launcher | D13-V-006 | D13-PXI-101 | 2" | 2981-D13-PID-001 (Sheet 2 of 2) |
| 14 | Junction-3 (MD-14) | 8" Pig Receiver | D14-V-006 | D14-PXI-101 | 2" | 2981-D-14-PID-001 (Sheet 2 of 2) |
| 15 | | 8" Pig Receiver | D14-V-005 | D14-PXI-102 | 2" | 2981-D-14-PID-001 (Sheet 2 of 2) |
| 16 | | 12" Pig Receiver | D14-V-007 | D14-PXI-103 | 2" | DHK-2052-PRO-PID-0017 (Sheet 1 of 1) |
| 17 | | 16" Pig Launcher | D14-V-009 | D14-PXI-104 | 2" | DHK-2052-PRO-PID-0022 (Sheet 1 of 1) |
| 18 | Junction-5 (MD-15) | 8" Pig Receiver | D15-V-004 | D15-PXI-104 | 2" | 2981-D-15-PID-001 (Sheet 2 of 3) |
| 19 | | 20" Pig Receiver | D15-V-005 | D15-PXI-105 | 2" | 2981-D-15-PID-001 (Sheet 2 of 3) |
| 20 | | 20" Pig Launcher | D15-V-003 | D15-PXI-101 | 2" | 2981-D-15-PID-001 (Sheet 2 of 3) |
| 21 | MD-17 | 8" Pig Launcher | D17-V-109 | D17-PXI-101 | 2" | DHK-2052-PRO-PID-0010 (Sheet 1 of 1) |
| 22 | MD-19 | 8" Pig Launcher | D19-V-001 | D19-PXI-104 | 2" | 0603284-D-19-PID-002 (Sheet 1 of 1) |
| 23 | MD-21 | 8" Pig Launcher | D21-V-001 | D21-PXI-001 | 2" | 0603284-D-21-PID-002 (Sheet 1 of 1) |
| 24 | Parwaz Deep-1 | 8" Pig Launcher | PD-V-107 | PD-PXI-101 | 2" | DHK-2052-PRO-PID-0008 (Sheet 1 of 1) |
| 25 | | 8" Pig Launcher | PD-V-107 | PD-PXI-102 | 2" | DHK-2052-PRO-PID-0008 (Sheet 1 of 1) |
| 26 | SGPC Plant | 14" Pig Receiver | SGPC-V-003 | SGPC-PXI-103 | 2" | DHK-2052-PRO-PID-0019 (Sheet 1 of 1) |
| 27 | | 14" Pig Launcher | SGPC-V-001 | SGPC-PXI-101 | 2" | DHK-2052-PRO-PID-0020 (Sheet 1 of 1) |
| 28 | | 20" Pig Receiver | SGPC-V-002 | SGPC-PXI-104 | 2" | DHK-2052-PRO-PID-0027 (Sheet 1 of 1) |
| 29 | Tipu-01 | 10" Pig Launcher | T1-V-001 | T1-PXI-101 | 2" | 0903582-T1-PRO-PID-0002 (Sheet 1 of 1) |
| 30 | Tipu-02 | 10" Pig Receiver | T2-V-003 | T2-PXI-104 | 2" | 0903582-T2-PRO-PID-0002 (Sheet 1 of 1) |
| 31 | | 14" Pig Launcher | T2-V-002 | T2-PXI-101 | 2" | 0903582-T2-PRO-PID-0002 (Sheet 1 of 1) |
| 32 | 6" NEW LOCATION | 6" Pig Launcher | WH1-V-001 | WH1-PXI-101 | 2" | DHK-2052-PRO-PID-0002 (Sheet 1 of 1) |
| 33 | | 6" Pig Receiver | WH1-V-002 | WH1-PXI-104 | 2" | DHK-2052-PRO-PID-0003 (Sheet 1 of 1) |
| 34 | 10" NEW LOCATION | 10" Pig Launcher | WH2-V-001 | WH2-PXI-101 | 2" | DHK-2052-PRO-PID-0030 (Sheet 1 of 1) |
| 35 | | 10" Pig Receiver | WH2-V-002 | WH2-PXI-104 | 2" | DHK-2052-PRO-PID-0031 (Sheet 1 of 1) |