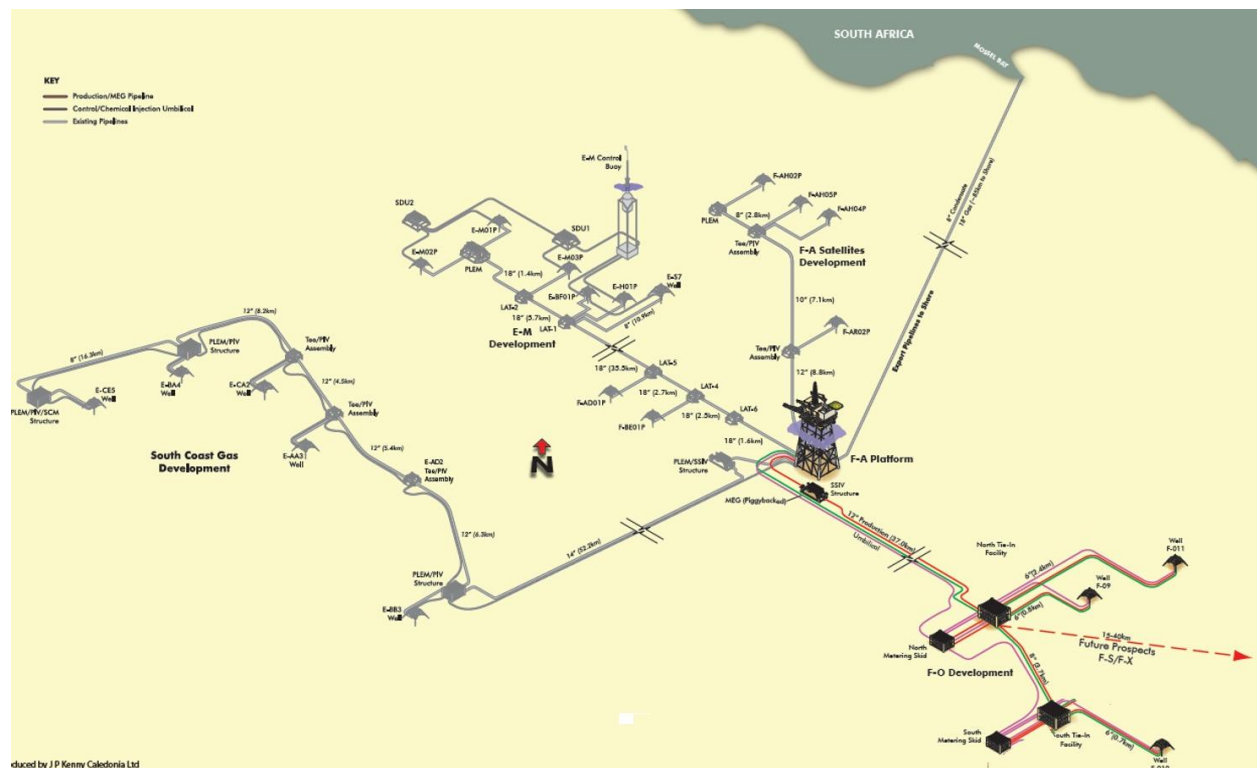


CTT 26938

STATUTORY INSPECTION OF SUBSEA INFRASTRUCTURE USING REMOTE OPERATED VEHICLE (ROV)

1. INTRODUCTION

PetroSA own and operates 4 Gas and Condensate fields in South Africa which are tied to the FA Platform for separation of Gas and Condensate and forwarding to an onshore refinery to produce petroleum products. The picture below depict the fields mentioned above.



The EM field has seven (7) wells connected to the FA Platform via a daisy chained 18" pipeline of approximately 50km length with nine (9) subsea structures namely (PLEM, SDU and Lateral Structures, pigging skids) which link the well to the main pipeline. Two (2) out of the seven (7) wells are controlled from the FA platform via electro hydraulic

umbilical which runs parallel to the pipeline while the rest are connected to the unmanned EM Buoy through which FA Platform controls the wells via a radio link.

The Ikhwezi Field consists of three (3) producing wells connected to the FA platform via an approximately 37km daisy chained 12" and 8" rigid and flexible pipelines respectively. The flexible lines from the wells are connecting the wells to the main pipeline via four (4) subsea structures namely TIFs and metering skids. The wells are also controlled from the FA Platform via an electrohydraulic umbilical.

Both the fields have a 3 inch MEG line, piggy backed to the main production pipeline. This document details the scope work for the inspection of the subsea infrastructure utilizing a remote operated vehicle (ROV) on PetroSA gas and condensate fields namely EM, SCG, FO and Satellite Field.

2. SCOPE OF SERVICES

The scope of work shall include, but not limited to the following activities once the entire Pipeline Survey spread as well as Excavation and CT Scan inspection tools has been integrated to the vessel and Work class ROV and Inspection Class ROV, calibrated and tested together

- **Pipeline**

- Take visuals of all subsea infrastructure.
- Continuous Cathodic Protection (CP) measurement using Voltage Gradient method.
- Take contact CP stabs at anodes or bare metal along the pipeline where available at twelve (12) meter intervals.
- Estimate percentage anodes remaining.
- Continuous Pipeline depth Profiling
- Noting of start & end co-ordinates of Pipeline Free Span in WGS84 format and estimate free span height.
- Noting of debris within 2m radius of the pipeline.
- 3" Piggyback start & end co-ordinates where 3" line has been ripped/detached off main production line.
- Cathodic Protection contact measurement of 3" Piggyback line at 50m intervals.
- Note section of pipeline that's is buried if any, particularly the co-ordinates of start & end points of the burial.
- Note any gas leaks on subsea infrastructure.
- Deploy jetting tool to excavate at least 3m deep, 3.6m Wide and 4m in length around the main pipelines. A total of 25 excavation are to be done.

- Recover and Swap excavation tool with subsea CT scan inspection tool & undertake inspection on the excavated section of the pipeline. The table below bears the number of excavations and scans to be undertaken:

Field	Main Pipe Size with 3" Piggy Back Line	No of Subsea Excavations & CT Scans
SCG Field	14"	6
	12"	4
	8"	1
EM Field	18"	6
Satellite Field	12"	1
	10"	1
	8"	1
Ikhwezi Field	12"	4
Total		24

- Structures (PLEM, SDU, PIGGING SKIDS, LATs, SSXTs)**
 - Cathodic Protection stab on at least five (5) points of the structures (e.g. Structure/Subsea Christmas Tree (SSXT) corners and top centre point)
 - Check for any damage or anomaly to structures & associated umbilical's/flexible flowlines
 - Check for any Gas leaks on flanges or emanating from Structure or SSXT
 - Debris within 2.5m radius of structure/SSXT
 - Take co-ordinates of centre point of structure and SSXT (coordinates to be in WGS84)
 - Water depth on structure/SSXT top and structure/SSXT seabed bottom.

3. Supplies by Service Provider

- Equipment**

The service provider shall supply all topside and subsea survey and inspection equipment and consumables to interconnect the survey equipment and to integrate them to the vessel and the ROV so as to achieve the scope of work listed above.

This will include but not only the following:

- ROV mounted CP probes
- ROV mounted cameras to visualize free spans on both side of the pipeline.
- Seabed profilers.
- Depth sensors and altimeters.
- Excavation and CT Scan Inspection tool.

- **Personnel**

As a minimum the following personnel shall be provided by the survey company:

- Party Chief
- Data Recorder/Party Chief Assistance
- CAD operator
- 2 x Online Surveyor
- 2 x video logging personnel
- 2 x corrosion engineers
- 2 x excavation tool operators
- 2 x CT Scan Inspection personnel

In the event that the personnel mentioned above are NOT South African, it is required by the South African Law that they apply for South African VISA Section 11(2) with authorization to work in South Africa and have it approved before travelling to South Africa. All none South African will not be allowed to work on PetroSA site without valid visa. PetroSA will provide support letter to the service provider's personnel for visa applications.

All personnel should have valid offshore survival certificate and full offshore medical written in English language. The full offshore medical certificate should detail which type of medical examination test have been conducted on personnel.

Note should be taken by the service provider that at all PetroSA worksite any personnel entering the work site shall be breathalysed for alcohol. No personnel intoxicated with alcohol will be allowed to enter PetroSA sites. There exist also random drug testing at PetroSA worksite access points. Any

person found to be intoxicated with alcohol or drugs shall be denied access to PetroSA site.

The Scope of work will be conducted from PetroSA chartered DP2 Platform Supply Vessel (PSV) and all policies and procedures with regards to safety, rules and regulations from the Vessel Master must be adhered to.

4. Supplies by PetroSA

- **Equipment and Personnel**

- DP2 Platform Supply Vessel
- Mobile Crane , operator and rigging personnel for in-harbour lifting services from quay site onto the vessel

- **Documentation**

PetroSA shall provide the service provider with the following documentations and any other (depending on what is requested and availability) on request in order to enhance the scope of work:

- Pipeline alignment sheet.
- Field layout diagram.
- Vessel Deck Layout indicating location PetroSA owned dive system.

5. Deliverables

- 3 x hard copy survey reports noting anomalies, damages, free spans etc.
- Corrosion and CT Scan report.
- 3 x soft copies in external hard drive of survey & corrosion report complete with associated media files and raw survey data and etc.
- Daily progress report.

6. Scope Execution

The scope of work shall be undertaken in two different campaigns one after the other:

- **Campaign 1**

- Mobilization of Work class ROV, ROV Mounted Excavation tool, ROV mounted CT Scan tool and operation personnel to Mossel Bay
- Installation of the Work class ROV onto PetroSA supply DP2 Vessel, testing and execution of the work offshore
- Demobilization

- **Campaign 2**

- Mobilization of the survey team (Surveyors, Corrosion Engineers, CAD Operators, Video Data Loggers, Party Chief etc.) complete with their tools to Mossel Bay.
- Installation of survey spread to PetroSA owned Inspection Class ROV , testing and scope execution offshore.
- Demobilization.

7. Enquiries

Technical enquiries regarding this tender should be addressed to **Velaphi Gumede** in the Tender Office at telephone no. **+27 44 601 2331**, fax no. **+27 21 929 9298** or e-mail address **velaphi.gumede@petrosa.co.za**.