



**OIL INDIA LIMITED
(A Govt. of India Enterprise)
PIPELINE HEADQUARTERS
NARENGI, GUWAHATI
ASSAM**

AA) OIL INDIA LIMITED (OIL), a Govt. of India “**MAHARATNA**” category PSU under the Ministry of Petroleum and Natural Gas, is a premier up-stream E&P Company engaged in exploration, production, transportation of crude oil and natural gas and production of LPG. OIL also has presence in the downstream sector with majority equity stake in Numaligarh Refinery. OIL has its Registered Office and its Field Headquarters at Duliajan and its Pipeline Headquarters at Guwahati, Assam. OIL’s commitment to growth has enabled the company to spread its wings from the north-eastern part of India to establish pan India presence along with global footprints.

BB) The Pipeline Sphere of OIL deals with transportation of petroleum to various refineries and thus operates a total of 1900 Km of hydrocarbon pipelines. For this purpose, it owns a 1157 Km long pipeline Right-of-Way (RoW) from Duliajan to Barauni traversing three states of Assam, West Bengal and Bihar. This RoW has multiple hydrocarbon pipelines viz. crude, product & natural Gas. Oil has its own PL Right-Of-Way (ROW) from Duliajan(Assam) to Barauni (Bihar) most of which is 18.3m (60 ft) width. On this ROW OIL has laid its own OFC along with two other pipeline- GSPL(IOCL-product pipeline) and DNPL(AGCL-Natural Gas Pipeline)

CC) Oil India Limited is in the process of formulating a contract for Implementation of OFC-Based Pipeline Intrusion Detection System (PIDS) on its entire Pipeline for monitoring the third-party intrusion along the Pipeline ROW for an approximate stretch of 1165 KM.

In this connection, OIL intends to organize a Pre-Tender meeting on 15.10.2025 (Wednesday) through Video Conference.

DD) BEC/BRC (Tentative)

Vendors with following experience criteria and interested in providing the service can participate in the Pre-Tender meeting

1.0 The Bidder shall be an Original Equipment Manufacturer (OEM) of the tendered items or systems.

- 1.1 The Bidder should be Original Equipment manufacturer of the offered Pipeline Intrusion Detection System (PIDS) for five (05) years preceding the original bid closing date of the tender.
- 1.2 The Bidder shall have successfully supplied, executed & commissioned at least one (1) order for optical fiber-based Pipeline Intrusion Detection System (PIDS) by installing & integrating at-least two controllers (minimum 1 single channel controller & 1 dual channel controller OR minimum 2 dual channel controllers) with monitoring range of at least 50 Km or more for each Sensor port in one direction along with Server, Client systems etc. for hydrocarbon pipelines of minimum 80 KM single stretch length in India to Central Government / State Government / PSUs / Oil & Gas organisations which is used to detect intrusion in buried underground petroleum pipeline. The length of the pipeline sector to which the system caters without having any installation in between (except the optical sensing cable) should not be less than 50 Km and the system should have successfully completed a period of minimum six (6) months after commissioning.

OR

2.0 A certified authorised dealer / authorised representative of OEM for the tendered items or systems offered in the bid.

2.1 In case of Bidder is a certified authorised dealer/ authorised representative, valid authorisation certificate from the OEM must be submitted along with the bid. The authorisation certificate should have signature, email, and contact number of the issuer. This certificate should be valid at the time of bidding and should remain valid throughout the entire contractual period of bid including Warranty & Post Warranty including extension, if any. Moreover, the Bidder must submit OEM authorisation for this specific tender with technical vetting of the solution by OEM and own complete responsibility for all activities of execution, QA/QC, unconditional technical support, guaranteed performance, warranty & post warranty support along with bidder. OEM/ TM should declare that as a company policy, they do not quote directly

2.2 The Bidder shall have successfully supplied, executed & commissioned at least one (1) order for optical fiber-based Pipeline Intrusion Detection System (PIDS) by installing & integrating at-least two controllers (minimum 1 single channel controller & 1 dual channel controller OR minimum 2 dual channel controllers) with monitoring range of at least 40 Km or more for each Sensor port in one direction along with Serv

er, Client systems etc. for hydrocarbon pipelines of minimum 80 KM single stretch length in India to Central Government / State Government / PSUs / Oil & Gas organisations which is used to detect intrusion in buried underground petroleum pipeline. The length of the pipeline sector to which the system caters without having any installation in between (except the optical sensing cable) should not be less than 50 Km and the system should have successfully completed a period of minimum six (6) months after commissioning.

The tendered item refers to "Optical fiber-based Pipeline Intrusion Detection System (PIDS) which is used to detect intrusion in buried underground petroleum pipeline using DAS Technology."

Note: A draft scope of work enclosed herewith. Vendors are requested to review the document thoroughly before attending the meeting

EE) In view of above, we request interested vendors to depute their representative to attend the Pre-Tender meeting to be held as per following details:

Date: 15.10.2025

Time: 02:00 PM

Venue: Through Video Conference. Link for attending Video Conference is given below;

Microsoft Teams Need help?

Join the meeting now

Meeting ID: 462 039 351 422 9

Passcode: UT7XJ9j2

Join on a video conferencing device

Tenant key: teams@oilindia.onpexip.com

Video ID: 132 160 566 7

https://teams.microsoft.com/l/meetup-join/19%3ameeting_NjcwYmQ0YzUtM2Y5MS00N2U3LWExYTAtOWU5MTIiMzI2MGU4%40thread.v2/0?context=%7b%22Tid%22%3a%22e31a7fb6-0272-4369-aa63-b1e02fa1144d%22%2c%22Oid%22%3a%228c5a10cf-06ba-44d7-bba1-1c2c7df173f4%22%7d

FF) TENTATIVE SCOPE OF WORK

The scope of work of Vendor shall include project management, design, engineering, manufacturing, factory testing, packaging, shipping, complete supply, integration, installation, calibration, commissioning, site testing, trial run, training, warranty, post warranty support & documentation with turnkey responsibilities, meeting the objectives, functional and specific requirements described in the specifications but not limited to the following:

1.0 OIL-PIDS MONITORING TECHNOLOGY & GENERAL DESCRIPTION

The System is being procured with the objective of detecting intrusion along the Pipeline ROW thereby promoting pipeline integrity and security.

- I. The Pipeline Intrusion Detection system shall utilise Rayleigh Backscatter Coherent Optical Time Domain Reflectometry (COTDR) technology. The system launches a single or dual light pulse into a fibre of buried OFC cable and analyses the change in Amplitude/Energy level/ Amplitude and Phase shift of back scatter light due to vibration of the sensor. The system shall be capable of monitoring changes in the optical signal resulting from vibration of the sensor using proper analysis software, thereby having the capability of detecting intrusions associated with third party interference or Intrusion.
- II. OIL-PIDS shall detect, classify & locate any third-party intrusion attempt (e.g. movement of objects along or crossing the pipeline route, manual or mechanical excavation attempt) on a continuous & real time basis around the pipeline using optical fibre as the sensor and the monitoring shall be based on distributed acoustic sensing philosophy.
- III. The OIL-PIDS shall basically consist of two elements - the optical fibre cable and the server - controller - display unit which shall be connected to one end of the fibre and sends a pulsed laser into the fibre. Noises or vibrations reaching the fibre will create an intrinsic property change and alter the phase of the backscatter from the laser pulses. These effects shall be detected at each meter along its length, located and analysed and shall be automatically notified / displayed in the OIL-PIDS system.
- IV. The pipeline intrusion detection system shall use the unused fibres of the OIL's existing buried 24-core single-mode optical fibre cable as the vibration sensor as well as for transmitting the data back to the controller.
- V. The equipment & system shall be rack-mounted at a designated indoor equipment room.
- VI. The system shall not require any electrical power or connectivity in PL ROW.
- VII. The system shall be capable of locating the point of interference (distance from controller and its GPS co-ordinates).

- VIII. viii)The system shall provide a computer-based operator interface with graphical alarm display, waterfall display and audio alarm annunciation.
- IX. The system shall be capable of communicating alarm information to local and multiple remote monitoring station via LAN / Internet network.
- X. The system shall have the capability to add, update & optimise, various signatures to its signatures library & subsequently detect/identify the same.
- XI. Shall be flexible to configure system's zoning to reflect changes in the built environment around a pipeline.
- XII. System does not involve any active electronics or electrical signal for sensing.
- XIII. The system shall have the capability to track the pigging activities of the pipeline operation.
- XIV. All attempts of intrusion & conditions of concern shall be detected in all weather conditions.
- XV. The same system should be capable of monitoring up to minimum 6 (six) segments of pipeline.
- XVI. The system shall be impervious to linear attenuation along the length of the sensor i.e. strong signals near the controller do not prevent distant quiet signals further along the sensor from being received, impervious to external jamming or interference from electromagnetic radiation.
- XVII. The system design and selection of sensor / controller model shall consider for additional 15 % optical loss in future (due to fibre attenuation, splice loss, maintenance etc.) for each section of pipeline with 5% additional increase in chainage length.

2.0 SYSTEM PERFORMANCE

2.1 DETECTION AND OPERATING PRINCIPLES

- I. The algorithm implemented by the PIDS system shall sense the changes in the received optical signal resulting from minute relative motion of the fibre strand within the fibre-optic sensor cable.
- II. The system shall monitor the optical signal continuously.
- III. Sensitivity of the fibre-optic sensor shall be continuous and uniform across its entire length.
- IV. Location of a disturbance along the sensor length shall be determined from the time of arrival of the changed optical signal.
- V. The controller units shall self-diagnose and self-test, providing warning alarms when system faults are detected. A failure of the primary detection system or OFC cut shall also automatically raise an alarm.

2.2 PROBABILITY OF DETECTION

- a. The system shall generate and report an alarm with greater than 95% probability for an isolated non-stealthy excavation attempt in the area near the buried sensor cable.
- b. Such attempts shall not be limited to but include:
 - I. Manual digging
 - II. Mechanized excavation using power machinery or equipment.
 - III. Vehicle movement
 - IV. Pipeline Pig tracking
 - V. Cable fault location

2.3 TIME TO DETECTION AND SYSTEM RESOLUTION

- I. The system shall be capable of detecting an event within 30 (thirty) seconds from the onset of an intrusion attempt that involves a disturbance of the sensor cable and classifying the event within 60 (sixty) seconds.
- II. The system shall be capable of detection and distinguishing of multiple simultaneous events more than 30 (thirty) meters apart for manual digging and 60 (sixty) meters apart for mechanized digging along the entire fibre cable, without any confusion between different locations.

2.4 ACCURACY OF INTRUSION LOCATION

The following key requirement factors are to be satisfied by the PIDS System:

- I. Successful detection of minimum 95 % of intrusions simulated in PL ROW along with the location (GPS & distance) data.
- II. Intrusion detection repeatability of minimum 95 % of same type of intrusion at multiple location.
- III. Accuracy of location detection should be within 100 Meters.
- IV. The proposed design of the PIDS system along with all the calculations and Equipment including sensor brochure are to be submitted along with tender document.

2.5 FALSE ALARMS

The false intrusion alarms generated due to occurrences other than sensor cable motion / vibration shall be limited to less than 5% of total intrusion alarm per month of continuous operation.

2.6 NUISANCE ALARMS

- I. The system shall be customised to be immune to nuisance alarms and performance degradation originating from electromagnetic and radio-frequency interference.
- II. The system shall be intrinsically capable of rejecting nuisance alarms due to moderate environmental disturbances.

- III. The system shall be capable of rejecting low-level disturbances such as those created by small animals or nearby vehicle traffic.
- IV. The system shall employ adaptive filtering algorithms to minimize the rate of environmental alarms.

3.0 FUNCTIONAL SPECIFICATIONS

The Intrusion Detection System (OIL-PIDS) shall meet the following functional requirements:

The minimum performance expectations with respect to detection range for a "standard" soil shall be:

- I. Manual Digging within Minimum 7 m from ofc / pipeline
- II. Moving Vehicle within Minimum 12m from ofc / pipeline
- III. Excavator within Minimum 18 m from ofc / pipeline
- IV. Pipeline Pig Tracking (complete length)

