SPECIFICATION

MM 2730

SUBMARINE PIPELINE INSPECTION

OROT RABIN (HADERA) AND ESHKOL (ASHDOD) TERMINALS
1. PURCHASER: Israel Electric Corporation Limited (I.E.C.)
2. NAME OF PROJECT: Submarine pipelines inspections.
3. LOCATION OF PROJECT: HADERA and ASHDOD on the Mediterranean Coastline.

4. SCOPE OF WORK:

4.1. Pipelines Technical Data

4.1.1. Orot Rabin submarine pipeline

4.1.1.1. Diameter: 32" with 1" external cement coating
4.1.1.2. As-Built wall thickness: 12.7 mm
4.1.1.3. Material: API 5 L Gr. B
4.1.1.4. Fluid: Oil # 6 (fuel oil)
4.1.1.5. Length: ~1,700 meters
4.1.1.6. Water depth at end: 20.5 meters
4.1.1.7. Year of Installation ~ 1980
4.1.1.8. The pipeline is in the 283° azimuth, the anchorage is at 1620m from the shore, at a depth of 20.5 m. (See drawing 121085 in the supplements).
4.1.1.9. On the shore side, the line is underground at elevation of 1.750 m for about 60 m, and from this point the line joins the aboveground line by a flanged pipe connection. This connection is located inside a concrete pit (See drawing MAK 46205/e in the supplements). The flanged connection onshore will be dismantled for the inspection, i.e. the inspection tools access will be from the onshore pipe end.
4.1.1.10. In November 2011, an In-line inspection was executed using the on-shore pit. Prior to the inspection, a cleaning procedure was
performed. The cleaning procedure included the following cleaning tools: disk pig, brush pig and finally a magnetic pig.

4.1.1.11. One pipe ovality with a ratio of about 0.056 and a maximum cross-sectional difference > 87 mm was observed during the inspection. The ovality is located 865.19 meter from the zero point located on the flanged connection on-shore. The ovality is approximately 3.4 meter long. (The complete inspection report will be provided after contract award).

4.1.2. Eshkol Submarine pipeline

4.1.2.1. Diameter: 24"

4.1.2.2. Fluid: Oil # 6 (fuel oil)

4.1.2.3. Length: ~1800 meter

4.1.2.4. As-Built Wall thickness: ~12.7 [mm]

4.1.2.5. Material: ASTM A-106 Gr. B. external tar coating

4.1.2.6. Water depth at offshore end: ~21 meter

4.1.2.7. Year of Installation: ~1970

4.1.2.8. In 2003 an In-line inspection of the 24" pipelines was executed from the offshore end of the pipeline, the total pipeline length of 1742 meters was successfully inspected.

4.1.2.9. In October 2010, an In-line inspection was executed by MFL bidirectional inspection tool from the offshore end of the pipeline. Prior the inspection, a cleaning procedure was performed. The cleaning procedure included the following cleaning tools: disk pig, brush pig and finally a magnetic pig.

4.1.2.10. The total pipeline length of 1,742 meters was successfully inspected.
4.2. Scope of supply:

This specification covers the requirements for performing an inline inspection survey that will establish the actual condition of the 32” submarine pipeline facing the Orot Rabin site and the 24” submarine pipeline facing Eshkol site.

4.2.1. The inspection measuring equipment shall be a self-propelled umbilical operated tool.

4.2.2. The inline inspection measurements will include the actual wall thickness measurements, internal and external corrosion/erosion, pitting, cracks assessments and integrity of welds.

4.2.3. The inspection shall be performed from an existing pit on the shore for the Orot-Rabin site and executed from a single access point situated at an offshore location for the Eshkol site.

4.2.4. For Eshkol site, I.E.C. is checking the possibility to perform the inspection from a flanged spool piece located on-shore. **Hence, the bidder will have to submit two different proposals.**

4.2.5. During the inspection, the bidder shall provide the exact position of the entire of each of the pipelines i.e. depth, distance from zero inspection point, latitude and longitude coordinates verified by GPS.

4.2.6. Special technical requirements are elaborated in paragraph 10 as follows.

5. Division of responsibility

5.1. Work provided by I.E.C.:  

5.1.1. Orot Rabin site

5.1.1.1. Flushing the pipeline with minimum three pipeline volumes of seawater at a velocity of at least 1.5 m/sec.

5.1.1.2. The pipe will be filled with seawater before the inspection.

5.1.1.3. The on-shore "S" spool will be dismantled.
5.1.2. **Eshkol site**

5.1.2.1. Flushing the pipeline with minimum three pipeline volumes of seawater at a velocity of at least 1.5 m/sec

5.1.2.2. The pipe will be filled with seawater.

5.2. **Work provided by Contractor**

The contractor shall perform all the auxiliary works necessary to the inspection, including:

5.2.1. **General**

Supply and mobilization to both sites of all equipment, materials, staff and accessories needed for the satisfactory completion of the inspections according to this document, including (but not limited to) launch trap (tray), inspection tools, hoses, electronic equipment, barge and crane, equipment and staff to handle sea pollution, as necessary.

5.2.2. **Orot Rabin Site**

5.2.2.1. Connecting and supporting the launch trap pig to the on-shore flange (pit).

5.2.2.2. Performing the inspection.

5.2.2.3. Providing a site report.

5.2.2.4. Providing a full report.

5.2.3. **Eshkol site**

5.2.3.1. **Alternative 1: the inspection will be performed from offshore pipeline end:**

The offshore manifold is covered with sand, therefore the Contractor shall do all the necessary work needed to execute the inspection, including but not limited to:

5.2.3.1.1. Expose the offshore manifold and removing the sand.

5.2.3.1.2. Dismantle the hoses
5.2.3.1.3. Dismantle the offshore manifold.
5.2.3.1.4. Connect the launcher to the pipeline.
5.2.3.1.5. Performing the inspection
5.2.3.1.6. Providing a site report
5.2.3.1.7. Providing a full report
5.2.3.1.8. At the end of the inspection, retrieve the offshore manifold and the hoses to the original condition.

5.2.3.2. Alternative 2: the inspection will be performed from onshore flange:
5.2.3.2.1. Connecting the launch trap pig at shore point.
5.2.3.2.2. Performing the inspection
5.2.3.2.3. Providing a site report
5.2.3.2.4. Providing a full report

6. CYBER & INFORMATION SECURITY
NA

7. QUALITY ASSURANCE AND QUALITY CONTROL
7.1. The Contractor and the main subcontractors shall be valid certified to ISO-9001 for the herein scope of services, or equivalent quality program that shall be approved by I.E.C (purchaser).
7.2. The Contractor shall submit upon request a copy of its Quality Assurance Manual including Quality Procedures.

8. STANDARDS AND CODES:
8.1. Standards and Codes referenced in this Specification and in the Supplements to this Specification form an integral part of this Specification - to the extent their requirements are consistent and conform to the requirements specifically set forth
herein. All such Standards and Codes are to the issue, including all amendments, supplements, etc., current as of the date of the Contract, unless indicated otherwise.

In the event of a variance between the requirements of the Standards and Codes and the particular requirements set forth in the Specification, the requirements specifically set forth in the Specification shall take precedence.

8.2. Following are the main codes/standards to be used during the assessment of the anomalies after the inspection:

8.2.1. Pipeline Govern design Standard: ASME B31.4.
8.2.2. Pipeline Inspection Code: API-570.
8.2.3. Detected Anomalies evaluation and assessment standard are: ASME FFS-1 (fitness for service) / API-579, and/or ASME B31G.

9. TECHNICAL DOCUMENTATION

Contractor's reports, plots, data, calculations and other technical documents shall be submitted to the Purchaser after the completion of the inspection, and will be the Purchaser property.

9.1. All submittals under this Paragraph shall be addressed to:

   Israel Electric Corporation Ltd.
   P.O. BOX 10
   Haifa - 3100001
   Israel

   Attention: Mr. Menashe Rami
   Email: rami.menashe@iec.co.il

9.2. Technical Documentation to be provided attached to the proposal:

The bidder shall enclose the following documents:

9.2.1. A full inspection procedure for each pipeline.
9.2.2. A safety plan during the inspection.
9.2.3. A method to locate the exact location of a detected defect from the outside surface of the pipe (sub sea marker).

9.2.4. An emergency plan to act in case of stuck pig.

9.2.5. A list of all the equipment needed in order to execute the inspection. All of the equipment will be included in the summary of price.

9.2.6. A full description of means and facilities to cope during the procedure with:
   - Seawater contamination problems;
   - Soil pollution.

9.2.7. The procedure will be approved by I.E.C.

9.3. Technical Documentation to be provided during inspection and after inspection completion:

9.3.1. Preliminary site Report for each pipeline after inspection:

9.3.1.1. During the inspection, the detected areas below the minimum wall thickness of 9 mm shall be marked and rescanned with higher resolution.

9.3.1.2. Upon completion of the inspection, a preliminary site report shall be submitted to I.E.C. with indication for all the areas below wall thickness of 9 mm.

9.3.2. Final Report:

9.3.2.1. The Contractor shall submit three (3) copies of the final report of each pipeline no later than six (6) weeks after the inspection completion. The final report shall be approved by the Purchaser.

9.3.2.2. Final Report shall include at least the following:

   o Method and system description
   o Operational information
   o Inspection results.
   o Wall thickness measurements.
   o Indications of Internal corrosion.
   o Indications of External corrosion / erosion
- Indications of Cracks.
- Indications of Laminations.
- Indications of pitting.
- Welds position.
- Reports of internal wall loss showing a data display, including plots/maps showing locations from zero point, latitude and longitude coordinates that supporting the inspection results.
- CD-Disk/electronic file containing all the inspection data and a suitable software to explore the data.

9.3.2.3. The contractor will train I.E.C.'s representatives how to analyze the data by using the software (if necessary).

9.3.2.4. Full indications assessment according to latest edition of API-570 code with appropriate explanations and A-scan presentations. The assessment shall include the following:

- The assessment shall include remaining life analysis
- Maximum operating pressure.
- Corrosion rate based on the previous inspection.
- The assessment and any conclusion shall be done with respect to the supplied previous inspections data.

9.3.2.5. For critical defects (below the minimum allowable pipeline wall thickness) the contractor shall provide anomaly report and recommendation for repair/maintenance/operational activities.

10. TECHNICAL REQUIREMENTS

The following requirement/information shall be considered:

10.1. The pipelines do not contain facilities such as pig-launcher and receiving facilities.

It's the contractor duty to supply all necessary equipment to perform the inspection as needed.
10.2. The inspection technique will be self-propelled umbilical operated tool UT or MFL that will provide data of the actual wall thickness measurements, internal corrosion, external corrosion, pitting, cracks assessments and welds.

10.3. In case of emergency condition or in case that the tool got stuck inside the pipeline, then the umbilical wire shall be capable to retrieve the inspection tool. The contractor shall select the appropriate reinforced umbilical wire with respect to the most severe expected condition.

10.4. The inspection of OROT RABIN 32" pipeline will be from an onshore pit as per attached drawing (refer to dwg. MAK 46205/e). The on-shore flange inside the pit is 32" according to ASME B16.47- #300, Series-B.

10.5. The inspection of Eshkol 24" pipeline shall be executed from a single access point situated at an offshore location. The 24" pipe end is equipped at its end with flanged manifold with ANSI #150 RF flange connection. (The manifold should be dismantled by Contractor before the inspection and retrieved after the inspection completion).

10.6. I.E.C. is checking the possibility to perform the inspection from the shore at Eshkol site. The bidder will have to submit two different proposals.

10.7. At completion of the Work, the Contractor will restore dismantled equipment (manifold and similar) as necessary.

10.8. The inspection pig shall be capable to detect and collect data while moving in the pipeline that is filled with seawater. During the inspection, the pipelines shall remain completely filled with seawater.

10.9. The inspection of the pipeline (presence on site) shall take no more than 10 working days. No Work is permitted on Saturday and Holidays. The inspection will be performed by no later than November 2015.

10.10. Seawater average temperature in October: from 18°C to 22°C.

10.11. Coverage, Measurement Accuracy and tolerances:

10.11.1. Minimum 100% coverage pipe circumference is required.
10.11.2. Based on the site on-line preliminary results, defected areas shall be rescanned with minimum 150% coverage.

10.11.3. Remaining wall thickness measurement accuracy = ± 0.2 [mm].

10.11.4. Minimum defect/pit diameter resolution = 10 [mm].

10.11.5. Defect location accuracy from nearest weld = ± 10 [mm].

10.11.6. Circumferential positioning accuracy = ± 10°.

10.12. Sub-contractors

10.12.1. Sub-contractors will have previous experience in marine and underwater works

10.12.2. The Contractor will maintain exclusive responsibility for the entire inspection works, including those provided by sub-contractors.

10.13. Safety:

10.13.1. The Equipment and the Service provided under this Specification shall be compatible with the U.S. "OCCUPATION, SAFETY, AND HAZARD ADMINISTRATION" (OSHA) requirements. The Contractor is responsible for its subcontractor/s safety and shall check and approve the subcontractor/s safety procedures.

10.13.2. The work will be subject to local and international marine regulations.

10.14. Environment

10.14.1. Any discharge waste material to the environment during the inspection is forbidden. Therefore, the contractor shall perform the inspection while taking precaution to prevent seawater/soil contamination.

10.14.2. During the inspection, the contractor will have on site and ready to act, staff and equipment needed to handle with contamination as mentioned above.
10.14.3. In case of contamination occurred during the inspection, the treatment of the discharge/waste should meet the current regulations of the Israeli law and the Israeli licensing authorities. All actions taken to deal with the contamination will be under contractor responsibility and I.E.C.s directions.

10.14.4. The contractor shall provide in the technical stage an environmental plan to prevent and handle seawater/soil contamination.

10.15. Supplements

10.15.1. Orot Rabin Site Drawings:
- Dwg: MAK-46205/e, showing the pit on shore at Orot-Rabin Power Station.
- Dwg: 121085, showing general longitudinal section of the 32" pipeline

10.15.2. Eshkol Site Drawings:
- Dwg: SK-756, showing the original 24" pipeline design.
- Dwg: SK-747, showing the offshore manifold of the 24" pipeline.
- Dwg: ACK-63424, showing the pigging access flange on-shore for the 24" pipeline.

11. TESTS & INSPECTION:
NA
12. SHIPMENT AND HANDLING OF EQUIPMENT

Transportation, import taxes, shipment and storage (as necessary) of the inspection equipment to and from the inspection site shall be at Contractor's sole responsibility and included in the lump sum price.

13. STORAGE & HANDLING:

NA

14. NAMEPLATE & MARKING:

NA

15. NOTES:

NA

16. SPECIAL REQUIREMENTS:

NA

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