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# Israel Natural Gas Lines

	6/2/2023	Final		
	Date	Description		
 <p>נתיבי הגז הטבעי לישראל ISRAEL NATURAL GAS LINES</p>	<p style="text-align: center;"><b>Document Title</b></p> <p style="text-align: center;"><b>International Public Tender for the Provision of Professional Advisory and Supervision Services</b></p> <p style="text-align: center;"><b>Scope of Services</b></p> <p style="text-align: center;"><b>(INGL/TENDER/2023/09)</b></p>			
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## 1. **General**

- 1.1. The main purpose of the Consultant's services is to support and consult INGL regarding the design, construction, operation, and maintenance of the Israeli natural gas high pressure transmission system and other energy related ventures.

The services will include *inter alia* and as required by INGL designs and technical documentation reviews, representing INGL in technical discussions and reviews, reviewing of design and construction procedures, internal inspection of designs, construction and installation of the system (including FAT and SAT), approbations of technical documentations which are being submitted to the authorities including Engineering Plans before starting the construction and Completion Certificates before starting the hot commissioning.

- 1.2. The Consultant shall engage all the appropriate personnel required for the duration of the provision of the services during the Contract Period. Such Personnel shall provide the services ordered by INGL remotely during for the whole duration of the Contract Period but may be required to be present in Israel, as required by the Company on an On-Call assignment basis:

**The On-Call assignment basis** shall apply should the period of assignment of a personnel member to Israel is usually expected to be less than three consecutive months. Such short-term/on-call personnel shall be made available by the Consultant and arrive to Israel within one month of receiving a written notice regarding such request for allocation from INGL in the form of a CSR.

Vacation, reporting to home office, illness, etc., shall not be interpreted as interrupting the long-term assignment. The rates apply to a working day is of 10 man-hours per day.

- 1.3. At any time during the Contract Period, the Company may, at its sole discretion (but in no way is obligated to) instruct the Consultant to provide the any of the Services or any part thereof to the tasks/Projects designated by the Company by giving the Consultant a prior notice. All Services rendered under this Contract are subject to a prior written order from the Company and to the extent provided therein.

## 2. **The Services**

The Consultant shall provide, *inter alia*, the following services within the scope of the Services under the Agreement:

- 2.1. Review and update (if necessary) of the System's conceptual and basic design.
- 2.2. Provide signed approvals for the design and construction specifications according to section 26.3 of the License.

- 2.3. Perform reviews and provide signed approvals for all engineering plans and specifications provided by INGL before submission of such plans to the authorities (see **Annex C1** - examples for table of content of such Engineering plans for Offshore piping, Onshore piping and PRMS).
  - 2.4. Perform reviews and provide signed approvals for construction, production and operation procedures and for hot and cold commissioning tests.
  - 2.5. Completion certificates (see **Annex C2** for example), signed and approved by the Consultant.
  - 2.6. Perform reviews and provide signed approvals for the gassing-up procedures before submission to the NGA.
  - 2.7. Perform reviews and provide signed approvals for any reports/plans/documents/technical queries/waiver requests etc. as may be required by INGL.
  - 2.8. Review of procurement, certification and general consultancy regarding tender processes and procurement activities, including cost evaluation (if required).
  - 2.9. Issue approved and signed operation, gassing-up and emergency procedures for INGL's various facilities.
  - 2.10. Option to perform Project Management and close on-site supervision of offshore projects.
  - 2.11. Issue status reports regarding planning process and construction for offshore Projects in which the Consultant is in charge for supervision and management.
  - 2.12. Establish and implement an overall training program for INGL's engineering, construction, and O&M employees, for the on-going activities and other specific issues, as may be required by INGL.
  - 2.13. Provide signed approvals prior to the gassing-up and commencement of operation of the System.
  - 2.14. Provide engineering and supervision support as an owner engineer of the Company during Company's Projects.
  - 2.15. Any other relevant consultancy, supervision and design support services which may be required by INGL in relation to INGL's engineering, design, construction, and operation activities, including providing expert support reports and ancillary documents. The Services may also include other energy related activities including projects, underground storage, energy feasibility studies etc., as determined by the Company.
3. **Consultant's Key Personnel**
- 3.1. **General Engineering and Design - Senior Consultant**

The Services provided to INGL will be managed by the Senior Consultant, who shall act as the Project Manager and will be responsible for execution of the Services. The Senior Consultant will be the formal point of contact for all communication with INGL and shall be authorized in all matters relating to the Services.

During execution of the Services the Senior Consultant will be responsible for overall supervision of the Services; for the review and approval of the design of any new project prepared by INGL; issuance of certificates such as a mechanical completion certificate for any new sections after cold commissioning; issuance of a report after hot commissioning regarding the readiness of the system; progress monitoring and cost control for offshore projects; and shall issue progress and status reports on a regular basis and in accordance with the demands of INGL.

The Senior Consultant will maintain a close working relationship with INGL in order to facilitate communication, promote the exchange of ideas and make timely decisions. He will perform the quality assurance function as well as the engineering and planning support. He will endorse the engineering plans as well as implement corrective action, if required.

The Senior Consultant shall perform all management, coordination and supervision activities that are necessary to achieve the Project objective.

The Senior Consultant, who shall have at least 15 years of experience in design of high pressure gas transportation systems, pressure regulating and metering stations as well as in procurement of materials (as provided in the ITB), shall perform all necessary support, coordination and supervision activities that are necessary to achieve the Project objective. This will include the following:

- Establishing of administrative requirements, guidelines and instruction;
- Mobilization of qualified personnel, to INGL's request;
- Mobilization and availability of all tools and systems, as required;
- Communication and reporting to INGL;
- Establishment of work programs and direction/delegation of work;
- Review and acceptance of Services;
- Acting as point of contact and/or a representative of INGL in relation to the NGA and/or other authorities, at the request of INGL
- Know how transfer in all areas of engineering and Services management.
- Evaluation of Project team requirements;

- Perform and check calculations, simulations for the gas systems;
- Perform material and equipment definitions for the gas systems;
- Guide the engineering team in designing gas distribution systems for industrial areas;
- Establishment of work programs and direction/delegation of work;
- Review and Checking of Services;
- Updating of the Basis Design and other INGL technical documentation such as procedures, specifications and technical part of tenders.

### 3.2. Construction Supervision of Gas Facilities - Construction Advisor

The Construction Advisor assigned by Consultant will be part of a management team together with the INGL Construction Manager.

The INGL Member will be “Primus inter Pares” and will cover all projects aspects with the emphasis on organization, costs and time impacts. He will be guided and supported by Consultant's Personnel specifically on technical aspects like pipeline standards, pipeline construction technology and all questions in connection to the supervision of a construction site for a high-pressure gas transmission system. Within this team Consultant member will be responsible for the technical issues.

The Construction Advisor (CA) is responsible for the supervision and monitoring of the Contractor(s) and the other activities regarding the Pipeline, PRMS, and installations including the cold-commissioning and handing over to the Operation and Maintenance Department of INGL and is jointly and severely responsible.

The CA reports directly to the INGL's Head of Construction Department and will be supported by the Supervisors, the General Coordinating Manager of the dedicated Israeli supervision company and as well by the head of the Third-Party Inspection Company in charge.

CA reports on a weekly basis to INGL's Head of Construction Department and is responsible for the monitoring, control and fulfilment of INGL's main contractor's project construction, installation and mechanical completion activities, its duties are as follows:

- To update construction management policy and ensure its ongoing implementation in the field;
- To update all necessary construction interfaces with all departments, INGL's main contractor for the project construction INGL and authorities etc;
- The supervision and administration of construction teams based on all project

sites (lots) via the site construction Supervisors;

- The CA has to assure that the Site Supervisors documents the induction training of all members of the Site Supervision;
- To supervise the monitoring, witnessing and approval of the qualification of the main contract's construction procedures i.e.: welding, NDT and coatings etc, as requested by the Company;
- To liaise with all discipline leaders concerning the ongoing engineering and construction activities;
- To take all necessary actions to prevent, halt or minimise variations in time, cost, quality, performance and completion of the scope of work;
- To ensure in conjunction with applicable personnel that the project requirements for documenting and controlling the construction works are being maintained and implemented through deliverable documentation, documented communications, meetings, and presentations etc.

### 3.3. Operation and Maintenance - Operation and Maintenance Consultant

The Consultant for operation and maintenance is the assistant to the head of the department with the duty to assist handling the day to day operation and maintenance of the entire transmission system including the PRMS / BVS (ball valve stations) and the SCADA (control) system as well as the necessary repairs. The Department is also responsible for the availability of the necessary spare parts, tools and maintenance equipment.

The Consultant covers mainly the organization, technical aspects as well as the planning impacts. The cost impact and the local issues will be handled by INGL. Both – the consultant and the head of the department- are jointly and severally responsible.

He will be also supported if required by the Construction Advisor in case of repairs.

The Department shall be also supported by the Team of QA/QC, HSE and the Security Officer.

The duties of the Consultant for operation and maintenance are as follows:

- To assist in establishing and to participate in the induction training of the maintenance personnel;
- To supervise the monitoring, witnessing and approval of the qualification of the operation, maintenance and repair procedures;
- Work out and proposing all necessary work execution plan and procedures for all operation, maintenance and repair activities;
- Monitor the implementation of the work execution plans and procedures

covering all operation, maintenance and repair activities;

- Monitor the availability of all necessary spare parts and equipment and support the stock management;
- To ensure that all equipment and spare parts etc. are delivered, stored, preserved, maintained and used in the correct manner;
- To be responsible for the documenting and control of all operation, maintenance and repair activities and in conjunction with the engineering department;
- To ensure that all necessary standards are met and the personnel is trained and educated in yearly intervals.

#### **4. Additional Optional Services (Onshore Personnel)**

##### **4.1. Cathodic Protection Engineer**

Engineer/Technician, having experience in Cathodic protection design, installation and maintenance works in high pressure natural gas pipeline projects designed in accordance with European Standards and/or NEN 3650 Dutch code.

##### **4.2. Welding Engineer for Stations and Pipeline**

Engineer with special certificate as Welding Engineer, having experience in pipeline and stations construction works in high pressure natural gas projects designed in accordance with European Standards and/or NEN 3650 Dutch code.

##### **4.3. Process Engineer**

Engineer having experience in high pressure natural gas systems with focus on the aspects of design, operation, control systems and has utilized tools and methods including process flow diagram (PFD), storage equipment (tanks), material properties (flowrates, pressures, temperatures). etc.

##### **4.4. Mechanical Engineer for compressor stations**

Engineer having experience in design, construction and operation and maintenance in high pressure natural gas compressor station (minimum 90 bar) projects (minimum 3 projects).

#### **5. Additional Optional Services (Offshore Pipeline Personnel)**

##### **5.1. Senior Consultant, Project Sponsor & Client Interface**

A Senior Project Manager with experience in structural and O&G engineering and significant experience in the design and delivery management of complex subsea and export systems. The Consultant shall serve as a Technical Lead, Project Manager and



Client Representative during the engineering, procurement and construction phases of the INGL offshore Projects. Having experience in project works of high pressure natural gas, designed in accordance with European Standards and/or DNV F101 code.

**5.2. Engineering Manager**

A Senior Consultant within the contractor's subsea engineering team who has worked in a variety of Engineering and Project Management roles, with extensive experience gained in subsea riser systems and pipelines, in the areas of design, verification, package management and operational support. Having experience in project works of high-pressure natural gas, designed in accordance with European Standards and/or DNV F101 code.

**5.3. Pipeline & Landfall Lead**

A Consultant Pipeline Engineer with over extensive experience in offshore pipeline engineering. Has played a lead role on a wide variety of offshore projects ranging from feasibility studies, FEED, detailed design to installation and construction management projects for major clients. Having experience in project works of high-pressure natural gas, designed in accordance with European Standards and/or DNV F101 code.

**5.4. Structural Lead**

A Consulting Engineer with experience in structural and offshore engineering. Has worked in various roles, including Project Manager and Senior Structural Engineer. The experience of a Structural Lead shall include detailed design and design consultancy on subsea structures and marine terminals projects. He shall also be experienced in piping design, geotechnical design, cathodic protection design, installation procedures and HSEQ. Having experience in project works of high-pressure natural gas, designed in accordance with European Standards and/or DNV F101 code.

**5.5. Pipeline Welding Lead**

An offshore pipeline welding lead Engineer with experience in offshore welding including but not limited to DNV F101- 2017. Has been involved in all aspects of offshore pipeline and sub-sea structures welding in large offshore projects from detailed design of deep-water pipeline projects to qualifications, procurement, and delivery management of system components. Has significant offshore experience acting as client representative. Having experience in project works of high-pressure natural gas, designed in accordance with European Standards and/or DNV F101 code.

**5.6. Senior Survey & Positioning Consultant**

An offshore Survey and positioning Consultant with experience in offshore Surveys including but not limited to MBES, SSS, SBP, MAG. Has experience with various survey datums and transformations (mainly WGS84 UTM and ING512). Has been involved in all aspects of offshore pipeline and sub-sea structures surveying in large offshore projects from detailed design of deep-water pipeline projects to qualifications, procurement and delivery management of system components. Has significant offshore experience acting as client representative. Having experience in project works of high-pressure natural gas, designed in accordance with European Standards and/or DNV F101 code.

5.7. Senior Geotechnical Consultant

An offshore Geotechnical Consultant with experience in offshore Geotechnical Surveys. Has experience with various survey has been involved in all aspects of offshore geotechnical aspects of pipeline and sub-sea structures surveying and analysis in large offshore projects from detailed design of deep-water pipeline projects and delivery management of system components. Has significant offshore experience acting as client rep. Having experience in project works of high-pressure natural gas, designed in accordance with European Standards and/or DNV F101 code.

6. Background and Experience of Consultant's Personnel

	<b>Position</b>	<b>Education/Background</b>	<b>Experience (years)</b>
1.1	<b>Senior Consultant</b>	As required in the ITB.	
2.1	<b>Construction Advisor</b>	As required in the ITB.	
3.1	<b>Operation and Maintenance Consultant</b>	As required in the ITB.	
4.1	<b>Cathodic Protection Engineer</b>	Engineer/Technician, having experience in Cathodic protection design, installation and maintenance works in high pressure natural gas pipeline projects designed in accordance with European Standards and/or NEN 3650 Dutch code.	>10
4.2	<b>Welding Engineer for Stations and Pipeline</b>	Engineer with special certificate as Welding Engineer, having experience in pipeline and stations construction works in high pressure natural gas projects designed in accordance with European Standards and/or NEN 3650 Dutch code.	>10

4.3	<b>Process Engineer</b>	Engineer having experience in high pressure natural gas systems pipeline projects designed in accordance with European Standards and/or NEN 3650 Dutch code.	>10
4.3	<b>Mechanical Engineer for Compressor Stations</b>	Engineer having experience in design, construction and operation and maintenance in high pressure natural gas compressor stations (minimum 90 bar) projects (minimum 3 projects)	>10
5.1	<b>Senior Consultant, Project Sponsor &amp; Client Interface</b>	Mechanical/Process/Civil Engineer with University degree, having work experience in offshore high pressure natural gas projects of transmission systems in European including pipelines, sub-sea structures. The experience shall be for high pressure (at least 80 bar) NG facilities designs, construction & installation and knowledge regarding transmission.	>15
5.2	<b>Engineering Manager</b>	Mechanical/Process/Civil Engineer with University degree, having experience in designs of high pressure (at least 80 bar) NG facilities of transmission systems projects which have been designed in accordance with European Standards and the DNV F101 code. The experience will include design of pipelines stations sub-sea structures.	>10
5.3	<b>Pipeline &amp; Landfall Lead</b>	Mechanical/Process/Civil Engineer, having experience in construction works of high-pressure natural gas projects designed in accordance with European Standards and/or DNV F101 code.	>10
5.4	<b>Structural Lead</b>	Mechanical/Process/Civil Engineer, having experience in construction works of offshore high pressure natural gas projects designed in accordance with European Standards and/or DNV F101code.	10-15
5.5	<b>Pipeline Welding Lead</b>	Engineer with special certificate as Welding Engineer, having experience in offshore pipeline and sub-sea structures construction works in offshore high pressure natural gas projects designed in accordance with European Standards and/or DNV F101 & relevant ASME code.	>10
5.6	<b>Senior Pipeline Installation Consultant</b>	Mechanical/Process/Civil Engineer, having experience in construction works of offshore high pressure natural gas projects designed in accordance with European Standards and/or DNV F101 code.	10-15

5.7	<b>Senior Geotechnical Consultant</b>		>10
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**7. Working days & hours**

- 7.1. While performing the Services in Israel the Services shall be performed consecutively and during all working hours in the Projects (days and nights according to the Company needs).
- 7.2. While performing the Services in Israel Consultant's personnel working days shall be according to the working days in Israel and the Jewish calendar (Sunday to Friday).

**8. Vacations & Holidays**

- 8.1. While performing the Services in Israel Consultant's personnel shall be entitled to up to a total of 10 vacation calendar days (travel time is included) every 3 months.
  - Such vacation days shall be subject to the prior written approval of the Company's Representative.
  - The Consultant shall submit to Company Representative's approval a planned vacation calendar for its Key Personnel at the beginning of each calendar year.
  - Such vacation's plan shall be required to conform with the working days on Site, taking into consideration the Jewish holidays. The implementation vacation's plan shall not delay the works on Site.
- 8.2. Company Representative may withhold approval to a vacation plan or withdraw approval previously granted or condition any such approval with other professional requirements including the Consultant providing an adequate substitute personnel.

**9. Flights, Travel, and Accommodation**

The Consultant is responsible to provide its Personnel located in Israel, at Consultant's sole expense, with all the means required to perform the Services, including without limitation, flights to and from Israel, accommodation, travel expenses, health-care insurance, and all other requirements that shall enable the Services to be performed properly.

**10. Equipment and vehicle**

For the purpose of providing the Services, Consultant shall, at Consultant's sole expense, allocate for and provide to each of the Consultant's personnel located in Israel with office space and equipment required for the performance of the Services, including lap top computers, mobile phones and other communication equipment, fast and remote internet connections, suitable vehicles, and every other mean that shall enable the Services to be performed properly.

## **11. Reporting**

All findings must be reported by the Consultant to the Company Representative. The Consultant shall provide the Company Representative with the following reporting:

- 11.1. The Consultant shall prepare a weekly periodical reporting to Company and Company's representative, which shall highlight the findings, concerns and proposals for improvement.
- 11.2. Daily basis reporting by the Consultant to the Company's Representative shall be performed on according the project progress and requirements.
- 11.3. A monthly report as defined by Company's representative at the commencing and during the Services.
- 11.4. Non-Conformity Report (NCR), to describe and localize a non-conformity from the standard / specification / procedure, shall be issued by the Consultant if necessary. As well, verification that a satisfied corrective action required (CAR) took place and closure of NCR.
- 11.5. A final close out report shall be prepared by the Consultant at the end of the project.
- 11.6. The Key Personnel, if requested by the Company's representative, shall be present in any meeting in regarding to the relevant project.

## **12. Special Conditions**

- 12.1. All reports such as inspection reports, daily reports, weekly report, NCR's and CAR's, as well as all certificates shall be submitted by the Consultant to the Company or to the Company's representative in original form with an electronic backup. The Consultant shall submit, in advanced, a typical format of reports for the Company's representative, for review and approval.
- 12.2. The Services shall be provided in the English language. All Consultant's Personnel performing the services shall be capable to speak, read and write English at an internationally fluent acceptable level.
- 12.3. The Consultant shall provide a technically responsible person to attend during the execution of "Hot Tie-in's" activities, without additional costs.
- 12.4. The supervision of the System as well the gassing up will be carried out by the Company or the Company's representative.

**ANNEX C1 – EXAMPLES FOR TABLE OF CONTENT FOR ENGINEERING PLANS FOR OFFSHORE PIPING, ON SHORE PIPING, ONSHORE STATIONS AND PRMS**

**TENDER No. INGL/TENDER/2023/09**



**Project No.:** XXXX  
**Doc No:** XXXX  
**Rev:** XX  
**Date:** XX.XX.XX

**OFFSHORE PIPELINE**

**Example of Content of Engineering Plan**

<b>Chapter A: Design Basis</b>					
<b>Document No. or Drawing</b>	<b>Description, Remarks</b>	<b>Rev</b>	<b>Date</b>	<b>Checker</b>	<b>Signature</b>
<b>A.1 GENERAL / MANAGEMENT</b>					
XXXX	SCOPE OF WORK FOR MWS				
XXXX	PROJECT HSE PLAN				
XXXX	EMERGENCY RESPONSE PLAN (ERP)				
XXXX	WASTE MANAGEMENT PLAN				
XXXX	OIL SPILL CONTINGENCY PLAN				
XXXX	HAZARD IDENTIFICATION & RISK ASSESSMENT FOR ONSHORE/LANDFALL/CIVIL WORKS				
XXXX	HAZARD IDENTIFICATION & RISK ASSESSMENT FOR TBM REMOVAL				
XXXX	HAZARD IDENTIFICATION & RISK ASSESSMENT FOR COFFERDAM INSTALLATION				
XXXX	HAZARD IDENTIFICATION & RISK ASSESSMENT FOR DREDGING ACTIVITIES				
XXXX	HAZCON WORKSHOP REPORT FOR OFFSHORE ACTIVITIES				
XXXX	PROJECT QUALITY PLAN				
XXXX	36" LAYING QUALITY CONTROL PLAN				

XXXX	QUALITY CONTROL PLAN FOR WELDERS QUALIFICATIO				
XXXX	ONSHORE SITE ACCEPTANCE PROCEDURE AND REPORT (AS APPLICABLE FOR ONSHORE WORKS)				
<b>A.2 ONSHORE PIPELINE - DESIGN &amp; INSTALLATION</b>					
XXXX	SPECIFICATION FOR ONSHORE PIPELINE CONSTRUCTION				
XXXX	ONSHORE P/L STRESS ANALYSIS				
XXXX	ONSHORE P/L STRESS ANALYSIS				
XXXX	ONSHORE P/L ROUTE AND GENERAL LAYOUT				
XXXX	ONSHORE P/L ALIGNMENT SHEET				
XXXX	TRENCH LAYOUT & PROFILE				
<b>A.3 OFFSHORE PIPELINE DESIGN</b>					
XXXX	OFFSHORE AND SHORE APPROACHES INSTALLATION METHOD STATEMENT				
XXXX	INSTALLATION MINIMUM REQUIREMENTS DEFINITION				
XXXX	P/L SYSTEM - DESIGN PREMISES				
XXXX	PIPELINE WALL THICKNESS VERIFICATION				
XXXX	PIPELINE ON BOTTOM STABILITY REPORT				
XXXX	PIPELINE UPHEAVAL BUCKLING ANALISYS REPORT				
XXXX	PIPELINE ALLOWABLE FREE SPAN ANALYSIS REPORT				
XXXX	PIPELINE ON-BOTTOM STRESS ANALYSIS REPORT				
XXXX	FLOW ASSURANCE STUDY - STEADY STATE ANALYSIS REPORT				
XXXX	FLOW ASSURANCE STUDY - TRANSIENT STATE ANALYSIS REPORT				
XXXX	PIPELINE CATHODIC PROTECTION DESIGN REPORT				
XXXX	MTO FOR OFFSHORE PIPELINE				
XXXX	PIPE-SOIL INTERACTION STUDY REPORT				
XXXX	OFFSHORE P/L SEISMIC ANALYSIS & SOIL LIQUEFACTION REPORT				
XXXX	INTERNAL MATERIAL CORROSION VERIFICATION				
XXXX	PIPELINE - PRE COMMISSIONING PHILOSOPHY				
XXXX	ANTICORROSION COATING VERIFICATION AND FIELD JOINT MATERIAL SELECTION REPORT				

XXXX	ROUTING REPORT	
XXXX	PRE-LAY INTERVENTION WORKS ASSESSMENT REPORT	
XXXX	MTO FOR CATHODIC PROTECTION	
XXXX	TRAWL GEAR INTERACTION ANALYSIS REPORT	





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## ONSHORE PIPELINE

### Example of Content of Engineering Plan

<u>Chapter A: Design Basis</u>				-	-
Document. No. or Drawing	Description, Remarks	Rev	Date	Checker	Signature
<b>A.1 System Overview &amp; Description</b>					
XXXX	Pipeline System Overview & Description				
<b>A.2 Soil Investigation and Hydrology and Erosion Reports</b>					
XXXX	Soil Investigation and Hydrology and Erosion Reports				
<b>A.3 Civil Basis of Design</b>					
XXXX	Civil Basis of Design				
<u>Chapter B: Land and Ownership ( Separate File )</u>					
<u>Chapter C: Engineering Design</u>					
<b>C.1 General Design</b>					
<b>C.1.1 Process Flow Diagram</b>					
XXXX	Process Flow Diagram				
<b>C.1.2 Venting Calculations</b>					
XXXX	Venting Calculations				
<b>C.1.3 Pipe Wall Thickness</b>					
XXXX	Pipe Wall Thickness Calculation				
<b>C.2 Pipeline Design</b>					
<b>C.2.1 Area Classification</b>					
XXXX	Area Classification				
<b>C.2.2 Route and Pipe Layouts and Cross Sections</b>					



XXXX	Railway XX Crossing Stress Analysis				
XXXX	Road XX HD Crossing Stress Analysis				
XXXX	Road XX HD Crossing Stress Analysis				
XXXX	Railway HD Crossing Stress Analysis				
XXXX	Road XXX HD Crossing Stress Analysis				

**Project No.:** XXX  
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**Date:** XX.XX.XX

## PIPELINE XXX STATION

### Example of Content of Engineering Plan

Document No. or Drawing	Description, Remarks	Rev	Date
<b>Chapter A: Design Basis</b>			
<b>A.1 System Overview &amp; Description</b>			
XXXX	Stations System Overview & Description		
<b>A.2 Soil Investigation and Hydrology and Erosion Reports</b>			
XXXX	Soil Investigation and Hydrology and Erosion Reports		
<b>A.3 Civil Basis of Design</b>			
XXXX	Civil Basis of Design		

**Chapter B: Land and Ownership ( Separate File )**

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**Chapter C: Engineering Design**

<b>C.1 General Design</b>			
<b>C.1.1 Process Flow Diagram</b>			
XXXX	Process Flow Diagram		
<b>C.1.2 Wall Thickness Calculations</b>			
XXXX	Pipe Wall Thickness Calculation		
<b>C.2 Stations Design</b>			
<b>C.2.1 Venting Calculations</b>			
XXXX	Venting Calculations		
<b>C.2.2 P&amp;ID</b>			
XXXX	Afula Station P&ID		

<b>C.2.3 Piping layout &amp; Sections</b>			
XXXX	Afula Station layout & Sections		
<b>C.2.4 Electrical Design</b>			
XXXX	ONE LINE DIAGRAM		
XXXX	Station Earthing Plan		
<b>C.2.5 Hazardous Area &amp; QRA</b>			
XXXX	HAZARDOUS AREA CLASSIFICATION		
XXXX	HAZARDOUS AREA CLASSIFICATION LAYOUT & SECTIONS		
XXXX	HAZARDOUS AREA CLASSIFICATION SECTIONS		
XXXX	QUANTITATIVE RISK ASSESSMENT		
<b>C.2.6 MTO</b>			
XXXX	MTO		
<b>C.2.7 Stress Analysis</b>			
XXXX	AFULA VALVE STATION STRESS ANALYSIS CALCULATIONS		
<b>C.2.8 Civil Design</b>			
XXXX	AFULA VALVE STATION SUPERPOSITION		
XXXX	AFULA VALVE STATION VIEWS & SECTIONS		
XXXX	AFULA VALVE STATION DETAILS		
XXXX	AFULA VALVE STATION ELECTRICAL PILLAR		
XXXX	AFULA VALVE STATION CATHODIC PROTECTION ROOM		
XXXX	AFULA VALVE STATION FOUNDATIONS ARRANGEMENT		
<b>C.2.9 Cathodic protection report &amp; design</b>			
XXXX	CORROSION PROTECTION DESIGN REPORT		

## **Example of Content of Engineering Plan for PRMS**

<b>1. TECHNICAL SPECIFICATION</b>
1.1. General Technical Description & Functional Units
<b>2. PROCESS</b>
2.1. General Legend
2.2. P&ID + Process Flow Diagram
2.3. Heat Exchangers
2.3.1. Water Heat Exchangers Drawings, Reports
Water Heat Exchangers Mechanical Calculations
Water Heat Exchangers Thermal Calculations
2.3.2. Electrical Heat Exchangers Drawings, Reports
Electrical Heat Exchangers Mechanical Calculations
Electrical Heat Exchangers Thermal Calculations
2.4. Dust/Liquid Separators
2.4.1. Dust/Liquid Separators Drawings, Reports
2.4.2. Dust/Liquid Separators Calculations
2.4.3. Orifice calculation
2.4.4. <u>Quick opening closure</u>
2.5. Boilers and Hot Water System
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**ANNEX C2 – EXAMPLES FOR COMPLETION CERTIFICATE**  
**TENDER No. INGL/TENDER/2023/09**

## COMPLETION CERTIFICATE

Dated: XXXX

For Israel Natural Gas Lines (INGL) Project; INGL Project Number XXXX  
(Hereinafter - "the Project")

### **Section 1: XXX valve station expansion, from the tie-ins to existing grid, up to inlet connection to XXX PRMS including the following sub-sections:**

- 1.1 Existing XXX Valve Station modification and expansion including new scraper launcher, from tie-ins to existing grid – 24" and 12" golden welds marked 2042-ASH-YG-24-GW03, and 2042-ASH-YG-12-GW05; to golden welds 2042-ASH-YG-10-GW10 – supply to Rotenberg 1, and 2042-ASH-YG-24-GW12 – supply for Chevron metering station.
- 1.2 Existing XXX valve station expansion from golden weld marked 2042-24-YG-GW03, up to the following future connections: 36" supply line for XXX ending with a welded cap marked B.L.1, future 36" supply line ending with a welded cap marked B.L.2, future 36" supply line ending with a welded cap marked B.L.3.
- 1.3 Future connection for the 'Offshore Southern Loop', from the Scraper launcher – part of the ASH expansion, and golden weld 2042-ASH-YG-10-GW01, to welded cap marked B.L.4.

### **Section 3: From outlets of XXX PRMS, including the following sub sections:**

- 3.1 Natural gas supply line for XXX PP, from 24" golden weld marked 2042-ASH-YG-30-GW07, to blow-off vent marked B.O.10, and to 30" welded cap marked B.L.5, future connection to Rutenberg PP (IEC)
- 3.2 Natural gas supply line connection to existing grid XXX, from 24" golden weld marked 2042-ASH-YG-24-GW13NR, to connection point to existing grid marked B.L.6

**1.4 This is to certify that the \_\_\_\_\_ (the Contractor) has successfully completed the installation of aforementioned sections of the high pressure natural gas project as follows:**

1. All works of the Project have been performed according to the design, NEN 3650 and INGL specs and approved for construction (AFC) drawings.
2. All materials have been purchased and supplied by INGL and fabricated and constructed by XXX in accordance with the design and in accordance with the relevant standard and to (AFC) drawings.
3. All welds in the above mentioned sections have been welded, checked, approved and accepted in accordance with project specifications, NEN 3650 and INGL specs.
4. Holiday Detection was performed according to the standard and accepted.
5. All hydrostatic tests and leak tests, dewatering and drying of the pipe sections have been performed according to the standard and specification. Pressure test, gauging, dewatering and drying of the pipe sections were completed and accepted.
6. All Golden Welds in the above sections were performed according to the project specification, NEN 3650 and INGL specifications checked, approved and accepted by all parties.

7. Permanent Cathodic protection has been installed as per AFC design, relevant standards and accepted by all parties.
8. No NCR's/CAR'S have been issued for this section.
9. Cold commissioning checks to sections executed by the XXX has taken place successfully and accepted by all parties.
10. Sections installed by XXX. are ready for gassing up as per the design and relevant specifications.

Technical data relating to this Completion Certificate is specified in the Mechanical Completion Certificate issued by XXX. (doc. ref. no. XXX) attached herewith

For and on behalf of Construction Contractor, _____.: (_____, Project Manager)		
Acknowledged by, for and on behalf of :		
_____ (Third Party Inspection Company)	_____ (Supervision and Management Company)	_____ (Professional Company)



\_\_\_\_\_, CEO, INGL  
Israel Natural Gas Lines Ltd.  
Floor 33, Atidim Tower 8  
Kiryat Atidim, Tel Aviv 58177  
Israel

T +972-3-6270-233

Our reference  
XXXXXXXXXXXX

Date : \_\_\_\_\_

Dear Sir,

**INGL project number XXXX: XXX Valve Station, PIPELINE AND PRMS**

## **Mechanical Completion Certificate**

In Accordance with NEN 3650:2003/EN12186

**For the following Natural Gas High Pressure transmission sections, including the relevant XXX PRMS and Line valve and scraper stations, according to the below structure**

**Section 1: XXX valve station expansion, from the tie-ins to existing grid, up to inlet connection to XXX PRMS, and XXX PRMS including the following sub-sections:**

- 1.5 Existing XXX Valve Station modification and expansion including new scraper launcher, from tie-ins to existing grid – 24” and 12” golden welds marked 2042-ASH-YG-24-GW03, and 2042-ASH-YG-12-GW05 – **battery limit for gassing up**; to golden welds 2042-ASH-YG-10-GW10 – supply to XXX, and 2042-ASH-YG-24-GW12 – supply for XXX PRMS.
- 1.6 Existing XXX valve station expansion from golden weld marked 2042-24-YG-GW03, up to the following future connections: 36” supply line for XXX ending with a welded cap marked B.L.1, future 36” supply line ending with a welded cap marked B.L.2, future 36” supply line ending with a welded cap marked B.L.3.
- 1.7 Future connection for the ‘XXX, from the Scraper launcher – part of the XXX expansion, and golden weld 2042-ASH-YG-10-GW01, to welded cap marked B.L.4.

**Section 2: Pressure Reducing & Metering Station, XXX PRMS**

**Section 3: From outlets of XXX PRMS, including the following sub sections:**

6.1 Natural gas supply line for XXX PP, from 24" golden weld marked 2042-ASH-YG-30-GW07, to blow-off vent marked B.O.10, and to 30" welded cap marked B.L.5, future connection to XXX PP – **Battery limit for gassing up of sub-section 3.1.**

6.2 Natural gas supply line connection to existing grid XXX, from 24" golden weld marked 2042-ASH-YG-24-GW13NR, to connection point to existing grid marked B.L.6 – **Battery limit for gassing up of sub-section 3.2.**

**1. Owner**

State of Israel  
Licence Owner I.D. Number: 51343694  
Israel Natural Gas Lines Ltd. (INGL)  
Atidim Bld. 33<sup>rd</sup> Floor  
Tel Aviv, 6158101 – Israel

**2. Expert Company**

XXXX (name and Adress)

**3. Supervision Company**

XXXX (name and Adress)

**4. Third Party Inspection**

TÜV Rheinland Industries Service GmbH  
Am Grauen Stein  
51105 Köln  
Germany

**5. Contractors**

XXXX (name and Adress)

**6. Reference Drawing Numbers**

Overall

PFD:	XXXXXXX
P&ID:	XXXXXXX

XXX Valve Station

General layout: XXXXXXXX

XXX PRMS:

P&ID: XXXXXXXX

PFD: XXXXXXXX

## **7. Technical Data**

### **7.1 Design Data**

**Section 1** XXX valve station expansion, up to inlet connection to XXX PRMS including the following sub-sections:

**Sub Section 1.1:** Existing XXX Valve Station modification and expansion including new scraper launcher, from tie-ins to existing grid – 24” and 12” golden welds, to future connection for metering station.

Design data

*Q max for sub section 1.1:*

- *Supply for PRMS XXX 1: Q max = XXX,XXX Nm<sup>3</sup>/hr*

*Design pressure, MOP: 80 barg*

*Temperature: -10 / 50 C*

**Sub Section 1.2:** Existing XXX valve station expansion from golden weld marked 2042-24-YG-GW03, up to the following future connections:

- A) 36” supply line for XXX, ending with a welded cap marked B.L.1,
- B) future 36” supply line ending with a welded cap marked B.L.2,
- C) future 36” supply line ending with a welded cap marked B.L.3.

Design data for sub section 1.2

**A)** supply line for XXX:

*Q max: 480,000 Nm<sup>3</sup>/hr*

*Design pressure, MOP: 80 barg*

*Temperature: -10 / 60 C*

**B)** future 36” supply line 1: *Q max = TBD*

**C)** future 36” supply line 2: *Q max = TBD*

*Design pressure, MOP: 80 barg*

*Temperature: -10 / 50 C*

**Sub Section 1.3:** Future connection for the ‘XXX, from the Scraper launcher – part of the XXX expansion – to welded cap marked B.L.4.

Design data

*Q max for sub section 1.3: XXX,XXX Nm<sup>3</sup>/hr*

*Design pressure, MOP: 80 barg*

*Temperature: -10 / 50 C*

**Section 2**

Pressure Reducing & Metering Station, XXX PRMS, and Chevron Metering Skid, containing the following elements:

- Motor Operated Valves (MOV's)
- Safety Shut down Valves (SSv's)
- Pressure Safety Valves (PSV's)
- Pressure Reduction Valves (PCV's)
- Pressure- Temperature Transmitters
- Filters / Separators
- Heat Exchangers
- Pressure Reduction Runs
- Flow Meters
- Gas Chromatograph
- Control Room

**Section 3**

Starting from XXX outlet, to XXX Powerplant, including the following sub sections:

Natural gas supply line for XXX PP, future connection to XXX PP

Natural gas supply line connection to existing grid XXX to connection point to existing grid

Design data

*Q max for sub section 3:*

- *Supply for Rutenberg PP: Q max = XXX,XXX Nm3/hr*
- *Supply for EMG Skid: Q max = XXX,XXX Nm3/hr*

*Design pressure, MOP: 80 barg*

*Temperature: -10 / 50 C*

**7.2 Golden Welds / Battery Limits**

General:

All Golden Welds carried out as Tie-in butt welds that have not been pressure-tested, have been 100% NDT tested by means of Radiographic (RT), Ultrasonic (UT) or Magnetic particles (MPI) testing.

For ease identification of Golden Welds locations, refer to drawing IEN-OME-DRG-0212 Attached.

#	Gold Weld No.	Dia [inch]	Location
1	2042-ASH-YG-30-GW07	30	XXX Valve Station to PRMS Outlet
2	2042-ASH-YG-30-GW08	30	XXX Valve Station to PRMS Outlet
3	2042-ASH-YG-10-GW09	10	XXX Valve Station to PRMS Inlet
4	2042-ASH-YG-10-GW10	10	XXX Valve Station to PRMS Inlet
5	2042-ASH-YG-24-GW11	24	XXX Valve Station to Metering Inlet
6	2042-ASH-YG-24-GW12	24	XXX Valve Station to Metering Inlet
7	2042-ASH-YG-10-GW01	10	Connection from existing station to XXX 1 (T.P. 1)
8	2042-ASH-YG-10-GW02	10	Connection from existing station to XXX (T.P. 1)

9	2042-ASH-YG-24-GW03	24	Connection from existing station to XXX (T.P. 2)
10	2042-ASH-YG-24-GW04	24	Connection from existing station to XXX (T.P. 2)
11	2042-ASH-YG-12-GW05	12	Connection from existing station to XXX (T.P. 3)
12	2042-ASH-YG-12-GW06	12	Connection from existing station to XXX (T.P. 3)
13	2042-ASH-YG-24-GW13NR	24	XXX Valve Station to Metering Outlet
14	2042-ASH-YG-30-GW14R	30	XXX Valve Station to Metering Outlet
15	2042-ASH-YG-30-GW15R	30	XXX Valve Station to Metering Outlet

**Tests Executed**

**Sections 1&3**

The Natural Gas High Pressure pipeline system has been successfully tested for Strength and Tightness according to NEN 3650 / EN 12327 / DVGW G 469 Contractor’s procedure: XXX Procedure Nr. XXXXXXX.

**Section 2**

The Natural Gas High Pressure Regulation and Metering Station (PRMS) has been successfully tested for Tightness according to NEN 3650 / EN 12327 / DVGW G 491, Contractor procedure: XXXXXXX.

The water heating system has been successfully tested for Tightness according to NEN 3650 / EN 12327 / DVGW G 469, Contractor procedure: XXXXXXX.

The safety devices listed were installed, functionally tested in accordance with the Pressure Regulation and Metering Station Test Procedure, document number XXXXXXX, XXXXXXX and certified without any objections.

**The results of the functional test reports are summarized in the following table:**  
**(Note: all figures are in Barg)**

**XXX-PRMS-XXXX**

No.	Tag	required value (Barg)	range	Test 1	Test 2	Test 3	date	Certificate No.	tested by
<b>FILTERING SECTION</b>									
1	PSV-0116	88 Barg	85.25-90.75 Barg				2020/01/11	0200-0000	Check by: T&T
2	PSV-0116	See Power Check							
3	PSV-0116	See Power Check							
<b>GAS HEATING SECTION</b>									
1	PSV-0117	88 Barg	85.25-90.75 Barg				2020/01/11	0200-0170	Check by: T&T
2	PSV-0117	See Power Check							
3	PSV-0117	See Power Check							
<b>GAS REDUCTION SECTION</b>									
1	PSV-0101	8.7 Barg	8.48-8.92	8.76	8.74	8.72	16.05.20		
2	PSV-0101	See Power Check							
3	PSV-0101	See Power Check							
4	PSV-0101	See Power Check							
5	PSV-0101	See Power Check							
6	PSV-0101	See Power Check							
7	PSV-0101	See Power Check							
8	PSV-0101	See Power Check							
9	PSV-0101	See Power Check							
10	PSV-0101	See Power Check							
11	PSV-0101	See Power Check							
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83	PSV-0101	See Power Check							
84	PSV-0101	See Power Check							
85	PSV-0101	See Power Check							
86	PSV-0101	See Power Check							
87	PSV-0101	See Power Check							
88	PSV-0101	See Power Check							
89	PSV-0101	See Power Check							
90	PSV-0101	See Power Check							
91	PSV-0101	See Power Check							
92	PSV-0101	See Power Check							
93	PSV-0101	See Power Check							
94	PSV-0101	See Power Check							
95	PSV-0101	See Power Check							
96	PSV-0101	See Power Check							
97	PSV-0101	See Power Check							
98	PSV-0101	See Power Check							
99	PSV-0101	See Power Check							
100	PSV-0101	See Power Check							



Specified above are fit for purpose.

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Professional Company

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XXXX (2<sup>nd</sup> Party)

Site Supervision

Third Party Inspection

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## COMPLETION CERTIFICATE

Dated: \_\_\_\_\_

**For Israel Natural Gas Lines (INGL) Project Number: XXXX**

**XXX PRMS;**

(Hereinafter - "the Project")

➤ **Section 2**  
**XXX PRMS**

This is to certify that the **Contractor name**, have completed the installation of aforementioned segments of the high pressure natural gas project as follows:

1. All works of the Project have been performed according to the design, the NEN 3650, EN 12186 and INGL specification.
2. All gas spools have been manufactured and checked according to design, the NEN 3650, EN 12186 and have been verified by third party inspection.
3. The instrumentation and electrical works have been performed according to the design, specifications and standards.
4. All pressure tests, Leak tests for the entire system has been performed and accepted according to the NEN 3650, INGL specifications and relevant standards.
5. Cold commissioning has taken place successfully and accepted by all.
6. No NCR's / CAR's issued for this section.
7. System installed by **Contractor name** is ready for gassing up as per the design and relevant specifications.
8. The fire detection and firefighting system has been constructed as per the design and relevant specifications and is ready for startup of the facility.

The technical data relating to this Completion Certificate is specified in the Mechanical Completion Certificate issued by XXX(doc. ref. no. IEN-CSE-CER-0071) attached herewith.

<b>For and on behalf of Construction Contractor, _____</b>  (_____, Project Manager)		
<b>Acknowledged by, for and on behalf of:</b>		
_____ (Third Party Inspection Company)	_____ (Supervision and Management Company)	_____ (Professional Company and Supervision)