



**NET4GAS, s.r.o**

# **COMPRESSOR STATION JIRKOV 73 BAR**

## **SCOPE OF WORK FOR GENERAL CONTRACTOR**

27.03.2018

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**REVISION HISTORY**

Rev.	Date	Issue, Purpose	Prepared	Checked	Approved
003	27.03.18	Re-approved	Hoz	Team	Schorling
002	07.03.18	Re-approved	Hoz	Team	Schorling
001	05.02.18	Re-approved	Hoz	Team	Schorling
000	08.11.17	Approved	Hoz	Team	Schorling
B01	17.09.17	Issue for Review	Hoz	Team	Schorling
A01	04.09.17	Issue for IDC	Hoz	Team	Schorling

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## 1 GENERAL

### 1.1 Scope of the Document

The purpose of the present document is to define the scope of work for the General Contractor.

This document shall be read in conjunction with the General Technical Requirements (C4G-JI73-ILF-KS007-GEN-MAN-800) and with the Interface Report (C4G-JI73-ILF-KS007-GEN-TZP-010).

### 1.2 Definitions

Term	Explanation
Project	Compressor Station Jirkov 73 bar
Employer	NET4GAS
Employer service company	Service organisation performing work on behalf of NET4GAS fibre optic and IT departments
Consultant	ILF Consulting Engineers
Station	Compressor Station Jirkov 73 bar
General Contractor	The entity entrusted by the Employer with Engineering, Procurement and Construction of the project.
Third Party	Any legal entity except Employer, Consultant and Contractor

### 1.3 Abbreviations

Term	Explanation
AC	Alternating Current
CCTV	Closed Circuit Television
CP	Cathodic Protection
DC	Direct Current

DCC	Document Control Center
EPC	Engineering, Procurement and Construction
EPC Contract / Contractor	Means the contract, contractor constructing the station
ICS	Instrumentation and Control System
ICT	Instrumentation, Control, Telecommunication and Security Systems
FOC	Fibre Optic Cable
MV	Medium Voltage
LLI	Long Lead Item
LV	Low Voltage
ODF	Optical Distribution Frame
ROW	Right of Way
UPS	Uninterruptible Power Supply

#### 1.4 References

No.	Number	Title
1	C4G-JI73-ILF-KS007-GEN-TZP-010	Interface Report
2	C4G-JI73-ILF-KS007-GEN-MAN-800	General Technical Requirements
3	C4G-JI73-ILF-KS007-GEN-SEZ-845	List of Required Engineering Documents for General Contractor
4	C4G-JI73-ILF-GENER-STR-SEZ-865	Scope of Supply and Interface Matrix for EMC
5	C4G-JI73-ILF-KS007-STR-DIA-130	Mechanical Interfaces for EMCS - Schematics

6	C4G-JI73-ILF-KS007- GEN-DIA-100	CIE Interfaces for EMCS - Schematics
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## 2 SCOPE OF WORK

The Scope of Work of the CS Jirkov 73 bar consists of the complete engineering, procurement and construction, testing, commissioning and start-up of a fully ready for commercial operation Station within the limits defined in the Interface Report.

Any required task including any temporarily required task to realise this fully ready for commercial operation Station is included in General Contractor's Scope of Work with the exception of:

- a) Tasks explicitly assigned in the Contract to the Employer
- b) Tasks explicitly assigned in the Contract to a Third Party

It is explicitly stated that any task resulting from any authority requirement is included in the scope of work.

The Scope of Work includes base items and optional items.

The Employer may decide to realise, or not to realise the optional items. Certain works required for these optional items are included in the base items. The limits between the base items and optional items are defined in the Interface Report.

Certain works required for future items are included in the base items. The limits between the base items and future items are defined in the Interface Report.

### **3 SYSTEMS AND OBJECTS TO BE REALISED WITHIN THE CONTRACT**

Note: Delivery of some of equipment enumerated below is excluded from the General Contractor's scope, see section 7 . For battery limits see Interface Report.

#### **3.1 Civil Systems and Objects**

Civil works include, but are not limited to full supply and installation of systems and equipment enumerated below:

##### **3.1.1 Buildings**

Buildings shall be complete with all foundations, substructure, superstructure, walls, roofs, floors, double floors, ceiling, suspended ceiling, insulation, wall finishes, windows, doors, etc.

- a) Administration and control building
- b) Electrical building
- c) Compressor building

##### **3.1.2 Building Installations**

- a) Sanitary Installations (complete package incl. hot and cold water supply, plumbing works, sanitary equipment, etc.)
- b) HVAC (complete package incl. boilers, chillers, ventilators, pipes, ducts, pumps, vessels, supports and trays, etc.)
- c) Furniture and accessories
- d) Workshop equipment and machinery
- e) Equipment of fire protection system (portable extinguishers, hoses, reels, hydrants, etc.)

##### **3.1.3 Structures and Equipment Foundations**

- a) Transformer foundations
- b) Filter foundations
- c) Gas cooler foundation
- d) Vent Stack foundations
- e) LV diesel generator foundation
- f) Firewater reservoir (incl. pumping area)

- g) Pipe sleepers and valve supports
- h) Platforms, stairs and crossovers
- i) Fire protection equipment foundations
- j) Valve and cable shafts
- k) Electrical equipment and ICT supporting structures and foundations
- l) Sewage sump pit
- m) Pits for piping, valves and instrumentation including cover
- n) Waste collection installation
- o) Harmonic filters foundation (option)

#### 3.1.4 Systems

- a) Roads and traffic areas
- b) Walkways and sidewalks
- c) Gravel areas
- d) Green areas
- e) Fences and gates
- f) Stormwater system (incl. renovation/upgrade of existing channels, drainages, culverts, etc. in an extend necessary to avoid flooding of the station or third party properties/structures)
- g) Sanitary sewer system
- h) Potable water system, incl. supply line and tie-in into public network
- i) Cable routes, ducts and trenches
- j) Health and safety signs
- k) Access road
- l) Temporary roads
- m) Temporary fencing
- n) Technical and biological re-cultivation including planting and seeding
- o) Trenches for pipes, cables, earthing, etc. (incl. backfilling, compaction, marking and protection if applicable)
- p) Pipe yards and stock yards

### **3.2 Pipeline Systems and Objects**

Pipeline works mainly consist of replacement of two existing pipeline sections DN 900 with defined lengths, except equipment excluded in the section 7 of this document (replacement of pipelines with all associated design and construction works up to final re-cultivation).

- a) Line pipes DN 900
- b) Induction bends (if required)
- c) Mainline valves with by-pass valves and associated equipment
- d) Station isolation valves with by-pass valves and associated equipment
- e) T-pieces

### **3.3 Mechanical Systems and Objects**

Mechanical works include, but is not limited to full supply and installation of systems and equipment enumerated below, except equipment excluded in the section 7 of this document:

#### **3.3.1 Mechanical Systems**

- a) Compressed gas system
- b) Vent gas system
- c) Instrument air distribution system
- d) Fire protection system (indoor and outdoor)

#### **3.3.2 Main Mechanical Materials/Equipment**

- a) Station piping
- b) Ball valves with combined sealing
- c) Safety shut - off ball valves
- d) Hot pressed bends (1.5D)
- e) T-pieces, reduction pieces, caps
- f) Flanges
- g) Gate valves
- h) Insulation joints
- i) Check valves

- j) Filter units
- k) Gas coolers
- l) Cranes
- m) Instrument air unit
- n) Vent stacks
- o) Fire extinguishers

### 3.3.3 Other Mechanical Materials

- a) Cold bends
- b) Insulation, coating and painting
- c) Connection material (screws, bolts, nuts, washers, etc.)
- d) Gaskets
- e) Pipe supports
- f) etc.

## 3.4 Electrical Systems and Objects

Electrical works include, but are not limited to full supply and installation with any additional works & material of systems and equipment enumerated below:

Commissioning and commissioning support is included in the scope of work for General Contractor.

- a) Construction site facilities power supply
- b) MV switchgear (incl. termination of power supply line to public grid)
- c) Distribution transformer (incl. weather protection enclosure, etc.)
- d) LV switchgear
- e) UPS system 230V AC (incl. batteries, battery rack, etc.)
- f) UPS System 110V DC (incl. batteries, battery rack, etc.)
- g) Electrical installation in buildings (lighting, surge protection, socket outlets, switches, cables, junction boxes, etc.)
- h) Earthing and lightning protection system for the whole station (incl. earth resistance measurement, main earthing grid, building earthing system, building lightning protection, station lightning protection, etc.)
- i) LV Diesel generator set (incl. first fill of fluids, tanks, etc.)

- j) Trace heating
- k) Station lighting (incl. poles, lighting fixtures, junction boxes, fuses, etc.)
- l) Cathodic protection (incl. rectifier, anodes, cables, connection boxes, etc.)
- m) Cable trays and ladders or other transport systems (incl. supports, hangers, edge protection, penetration sealing, filling blocks for modular cable transits, etc.)
- n) Cable trays and ladders for functional integrity purpose (incl. tested supports, hangers, edge protection, penetration sealing, filling blocks for modular cable transits, etc.)
- o) Cable trenches (incl. laying and completion)
- p) Cables and cable laying (incl. delivering and laying power supply line to public grid)

### 3.5 Instrument and Control Systems and Objects

ICS works include, but are not limited to full supply and installation of systems and equipment enumerated below:

- a) Station control and emergency shut down system
- b) Fire & Gas detection system
- c) Instrumentation

ICS installations shall be in accordance with ISO 27001.

### 3.6 Telecommunication Systems and Objects

Telecommunication works shall include, but not limited to full supply and installation of systems and equipment enumerated below:

- a) Telecommunication cabinets
- b) Structured cabling and Office LAN network('passive part')
- c) Preparation of all cable routes, the provisioning of FOC HDPE cable conduits calibrated and pressure tested, FOC HDPE cable conduit ready for installation of FOC , the provisioning of optical distribution frames ODF, the provisioning of NYY signal cables measured according to TP\_D02\_00\_01\_01, marking tapes, etc. and support to Employers service companies for the connection to the existing FOC network installed along the Gazelle pipeline.
- d) FOC connections inside the stations (incl. FOC cables, boxes, HDPE conduits and couplers, optical distribution frames ODF and marking tapes )

### **3.7 Integrated Security System and Objects**

Integrated Security System works shall include, but not limited to full supply and installation of systems and equipment enumerated below:

- a) Alarm and emergency alarm system (PZTS)
- b) Access control system
- c) CCTV
- d) Perimeter intrusion detection system
- e) Intercom system

## **4 WORKS TO BE EXECUTED**

### **4.1 General**

The General Contractor shall execute the complete detail design documentation, procure, construct, test and commission the systems and objects in his scope of work.

If not explicitly otherwise stated in the Contract the scope of work always includes the complete construction of the buildings, objects, systems, etc. It includes all supplies and services required to complete the buildings, objects and systems with the exception of those supplies and services which are explicitly assigned in the Contract as tasks of the Employer, or of a Third Party.

For the purpose of the present scope of work description the term “construction” also includes the necessary engineering and design work, shop drawings, supplies, tests, commissioning, permits, etc. required for the complete construction unless specifically exempted.

The extent of works and supplies are not limited by lists in this document. All works and supplies necessary for completion, testing, commissioning of the Station are included in the General Contractor’s scope, if not explicitly excluded.

Fulfilment and compliance with all requirements imposed by authorities or third parties resulting from permitting process are also included in the General Contractor’s scope.

### **4.2 Scope of Preparatory and Early Works**

The scope of the general works includes, but is not limited to the following services:

- a) Mobilisation, demobilisation, supply of materials, machinery, personal incl. necessary permits
- b) Temporary facilities for the needs of the General Contractor
- c) Provision of temporary fencing, roads, storage areas
- d) Geotechnical investigation
- e) Topographical survey and stake out according to Employer’s specification MP\_T01\_05\_01\_01
- f) As-built survey according to Employer’s specification MP\_T01\_05\_01\_01
- g) All other surveys which are necessary for the Project and are not provided by the Employer
- h) Surveys required by Authorities before/during commencement of earthworks, such as archaeological, pyrotechnical, etc.

- i) Working strips setting out
- j) Access road/ road slip construction
- k) ROW and third party facilities marking
- l) Site cleaning and trees cutting (incl. disposal)
- m) Dewatering works, lowering of underground water table (incl. negotiation with Third Parties and Authorities if required for permit of discharge of water)
- n) Site installations (incl. waste storage facility, sanitary installations, etc.)
- o) Provision of water and energy for the needs of the General Contractor, Employer, or Third Party (NDT Contractor, Inspection Contractor, etc.)
- p) Provision of temporary office and site facilities for the needs of the General Contractor, Employer, or Third Party (NDT Contractor, Inspection Contractor, etc.) which mainly consist of:
  - q) Containerised office facilities, fully equipped
  - r) Telecommunication facilities
  - s) Provision of stock yards and pipe yards for the needs of the General Contractor, Employer, or Third Party (NDT Contractor, Inspection Contractor, etc.)
  - t) etc.

#### 4.3 Scope of Construction Works

- a) Top soil stripping (handling with top soil as per authority requirements)
- b) Site grading
- c) Site grading includes, but is not limited to excavation, filling, compaction, temporary surface drainage system, embankments and retaining walls where necessary.
- d) Elevation proposed on Coordination Layout shall be followed.
- e) Earthworks (incl. excavation, filling, compaction, soil replacement, surplus soil disposal, soil improvements, sheeting, bracing, shoring, sheet piling, etc.)
- f) Foundation works (incl. piling or stone columns if required)
- g) Supply of all materials required to completely construct the systems and facilities within the Contract limits with the exception of those materials which are explicitly included in the Employer's services (see Interface Report)
- h) Complete construction and/ or installation of all objects, systems and facilities within their limits
- i) Welding
- j) Field coating and painting

- k) Demolitions and disposal/ liquidation of existing systems, objects, networks, etc. if required for the Project
- l) Relocations of existing systems, objects, networks, etc. if required for the Project
- m) Temporary and permanent protection of existing objects, networks and facilities.
- n) Reconstruction/relocation of existing drainages influenced by the Project.
- o) Storage and maintenance of equipment and materials supplied by the Employer or a Third Party
- p) Coordination with Supplier of Compressor Package
- q) etc.

#### **4.4 Scope of Finishing Works and Testing**

- a) Testing of all systems and facilities, incl. hydro tests, cleaning and drying
- b) Training of the Employer's personnel for the operation and the maintenance of all items supplied by the General Contractor. The training includes formally organised sessions with all relevant paperwork so that the trainees can quickly understand
- c) Painting and corrosion protection
- d) Installation of casing pipes seals
- e) Backfilling
- f) Tagging of all equipment
- g) Complete clean-up of the construction site after erection and testing
- h) Complete technical re-instatement of all facilities damaged by the General Contractor such as for instance roads
- i) Complete biological re-instatement, incl. top soil spreading and seeding and planting of trees
- j) Disposal of surplus top soil (as per authority requirement)
- k) Management and handling of surplus and disposal of waste material
- l) Pipeline marking

#### **4.5 Scope of General Works, Reporting and DCC**

- a) All activities required to be in conformity with the Employer's procedures (such as document numbering, corresponding numbering, document approval procedures, etc.) are part of the Scope of Work

- b) Weekly and monthly reporting and participation in monthly/weekly progress and site meetings with Employer and Third Parties
- c) Following all applicable standards, codes, regulations and design documentation. In case of discrepancy the General Contractor is responsible to inform the Employer before works commencement

#### 4.6 Scope of Design and Detail Design Works

The Tender Design shall be endorsed by the General Contractor. Required updates of the documentation during execution of the project shall be provided by the General Contractor. The General Contractor shall then develop the tender design into a constructible design. The General Contractor shall supply all design and detail design documents related to his scope of work. This holds also true for any temporary work.

All design documentation shall follow decree no. 499/2006 Sb. with all relevant amendments, further all internal procedures and guidelines of the Employer and provided tender documentation.

The General Contractor shall submit his design and detail design documents for Employer's Review.

The General Contractor will provide a list of deliverables for Employer's Review.

Obtaining Employer's Review for the design and detail design documents is part of General Contractor's scope of work.

The documentation provided by the Employer shall be authorized as per legislative requirements.

For minimum list of deliverables see document no. C4G-JI73-ILF-KS007-GEN-SEZ-845 List of Required Engineering Documents for General Contractor.

Relevant documentation by Employer's service companies and Vendors of Long Lead Items shall be incorporated by General Contractor into the As Built Design.

## 5 HSE, QA/QC AND QUALIFICATION REQUIREMENTS

### a) HSE Requirements

- An approved Safety Management System shall be employed, accredited and in accordance with:
- OHSAS 18001:1999 — Amendment 1:2002: Occupational Health and Safety Management Systems
- ISO 14001:2004: Environmental Management Systems
- A project specific HSE Management Plan shall be developed relevant to the scope of work described under this specification.
- All construction equipment used for the execution of the project works shall be fit for purpose and carry valid inspection certificates and insurance required under state law

### b) QA/QC Requirements

- A Quality Management System shall be employed, that has been accredited in accordance with ISO 9001
- The Quality Management System shall include supporting procedures and processes as described by ISO 9004-1
- A project specific Quality Plan shall be developed that is relevant to the scope of work described under the specifications

### c) Welding procedure qualification and welder qualification

## 6 PERMITS, APPROVALS, MANAGEMENT AND COORDINATION

- a) The General Contractor shall provide permits, management and coordination of all activities related to the Project, except those which are excluded below.
- b) The Employer will provide the construction permit as required by the law.
- c) The Employer will also provide contracts and agreements with owners of land plots influenced by the Project.
- d) The Employer will further provide all statements and requirements from the authorities resulting from the permitting process.
- e) The General Contractor has to respect all conditions and requirements written in the provided contracts/agreements with land plot owners, as well as all requirements from authorities.
- f) Any other permits/approvals have to be acquired by the General Contractor. This especially includes:
  - permit for trial operation
  - permit for intake/discharge of the water for/from hydro test
  - temporary closure of roads (if applicable)
  - permit for temporary pipeyards/stockyards
  - permit for temporary power and potable supply lines if required
  - approval from Notified Body (e.g. TIČR) on electrical installation
  - permit for final operation
  - etc.
- g) The General Contractor also needs to coordinate the works with the owners of Third Party facilities, as well as with the land owners, or authorities.

## 7 SERVICES PROVIDED BY THE EMPLOYER

For battery limits of supplies/works see document no. C4G-JI73-ILF-KS007-GEN-TZP-010 Interface Report

### 7.1 Equipment Supplied and Installed by EMCS Contractor

- a) Electric Motor Compressor Sets (EMCS)
- b) Variable Speed Drives (VSD)
- c) VSD Coolers
- d) VSD Transformers
- e) LV Switchgear Panels (MCC) for EMCS
- f) Control System for EMCS
- g) Operating and Engineering Workstations for EMCS
- h) EMCS Package Cables

For detailed work split matrix see document no. C4G-JI73-ILF-GENER-STR-SEZ-865 Scope of Supply and Interface Matrix for EMC, C4G-JI73-ILF-KS007-STR-DIA-130 Mechanical Interfaces for EMCS – Schematics and C4G-JI73-ILF-KS007-GEN-DIA-100 CIE Interfaces for EMCS – Schematics.

### 7.2 Equipment and Materials Supplied by the Employer/Third Party and Installed by the General Contractor

- a) Line pipes DN900
- b) Station piping  $\geq$ DN 300
- c) Ball valves, incl. SSV ball valves  $\geq$ DN300
- d) Hot pressed bends  $\geq 1.5D$ ,  $\geq$  DN 300
- e) Fittings  $\geq$  DN300 (Tees, reducers, caps, etc.)
- f) Flanges  $\geq$  DN 300
- g) Gate Valves  $\geq$  DN 300
- h) Insulation joints  $\geq$  DN 300
- i) Pig signallers
- j) Check Valves  $\geq$  DN 300

### 7.3 Other Works Provided by Third Parties

- a) Provisioning of FOC and establish the connection to the existing FOC network installed along the Gazelle pipeline by Employer's service company.
- b) Provisioning of active telecommunication equipment (routers, switches, firewalls, WIFI access points, etc.) by Employer's service company.
- a) Configuration and network setup for the active components (routers, switches, firewalls, WIFI access points, etc.) by Employer's service company.
- b) Provisioning of telecommunication equipment – IP phones by Employer's service company.
- c) Configuration and network setup for IP phones by Employer's service company.
- d) Provisioning of telecommunication equipment– Personal computers and printers for Office LAN by Employer's service company.
- e) Configuration and network personal computers and printers for Office LAN by Employer's service company.
- f) Provisioning of security equipment (Local NVR and Operator workplace, etc.) by Employer's service company.
- g) Configuration and setup for the security components (Local NVR and Operator workplace, etc.) and integration into N4G security dispatching centre in Breclav by Employer's service company.
- h) NDT works (NDT)
- i) Inspection Works (INW)

General Contractor is aware and shall accommodate that Third Parties construction and installation works will take place during the construction works of General Contractor. Site coordination activities and HSE supervision of these activities is in Scope of Work of General Contractor.

### 7.4 Design Works Delivered by the Employer or Third Parties

On the General Contractor's request, the Employer will provide available as-built documentation of existing facilities influenced by the Project, further internal guidelines, procedures and specifications (available mainly in Czech language).

Beside tender documentation, the Employer will provide documentation for building permit, on which basis the building permit was/will be obtained.

On the General Contractor's request, the Employer will provide available vendor documents of equipment/material supplied by the Employer/Third Party.

Specifically for the Permitting documentation for the Trial Operation Permit and the Final Operation Permit: Documentation for the EMCS will be provided by the EMCS, General Contractor shall include this information into his application dossiers.

## **8 OPTION –LOCATION OTVICE**

Employer has not finally decided the location of the Compressor Station. Realization of the Compressor Station may be at the location Vrskman (base case) or Otvice (optional).

The tender contains the technical documentation for both locations. For differences between both locations reference is made to C4G-JI73-ILF-KS007-GEN-MAN-800.