



NET4GAS, s.r.o.

HP PIPELINE DN 1400, NODE KATEŘINSKÝ POTOK – NODE PŘIMDA

Geographical, Climatic and Environmental Conditions

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DVZ

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1 GENERAL

1.1 Scope of the Document

This document shall define the geographical, climatic and environmental conditions at the foreseen locations of HP gas pipeline and related stations listed in chapter 2.3. It shall be mainly taken into consideration when performing calculations regarding

- Civil Design,
- Process Design,
- Material Selection of all equipment and for Construction Planning.

1.2 Definitions

Term	Explanation
Project	HP pipeline DN1400, Node Kateřinský Potok – Node Přimda
Employer	NET4GAS
Consultant	ILF Consulting Engineers

1.3 Abbreviations

Term	Explanation
BTS	Border Transfer Station
DN	Distribution Node
HP	High Pressure
HSK	Hora Svaté Kateřiny
KP	Kateřinský Potok
LVS	Line Valve Station
Node KP	Distribution Node Kateřinský Potok
N4G	NET4GAS

1.4 References

No.	Number	Title
1	C4G-HPPL-ILF-RU006-STA-VYK-315	RU Katerinsky Potok - Cadastral Layout
2	C4G-HPPL-ILF-TU33S-STA-VYK-315	TU Jirkov - Cadastral Layout
3	C4G-HPPL-ILF-KS007-STA-VYK-315	TU Vrskman - Cadastral Layout
4	C4G-HPPL-ILF-TU51S-STA-VYK-315	TU Hrusovany - Cadastral Layout
5	C4G-HPPL-ILF-TU52S-STA-VYK-315	TU Syrovice - Cadastral Layout
6	C4G-HPPL-ILF-TU53S-STA-VYK-315	TU Malmerice - Cadastral Layout
7	C4G-HPPL-ILF-TU40S-STA-VYK-315	TU Mladotice - Cadastral Layout
8	C4G-HPPL-ILF-TU41S-STA-VYK-315	TU Hubenov - Cadastral Layout
9	C4G-HPPL-ILF-TU42S-STA-VYK-315	TU Svinomazy - Cadastral Layout
10	C4G-HPPL-ILF-TU48S-STA-VYK-315	TU Bor - Cadastral Layout
11	C4G-HPPL-ILF-RU005-STA-VYK-315	RU Primda - Cadastral Layout

1.5 Codes and Standards

No.	Number	Title
1	C4G-HPPL-ILF-GENER-GEN-SEZ-840	List of Regulation and Standards

2 GEOGRAPHICAL CONDITIONS

2.1 General

The DN 1400 HP gas pipeline between Distribution Node Kateřinský Potok and Distribution Node Přimda forms part of planned development of the NET4GAS' transmission system.

The project consists in construction of DN 1400 HP gas pipeline with the length of approximately 150 km from newly built Distribution Node Kateřinský Potok facility in Ústí nad Labem Region to Distribution Node Přimda in Plzeň Region. The pipeline route runs in general parallel with the existing pipelines. The project follows-up other planned projects which are not part of this project, in particular the BTS Hora Svaté Kateřiny Interconnection and Capacity Extension, Distribution Node Přimda facility extension - Phase I, and LVS Mladotice facility extension - Phase I, as well as CS Jirkov construction project.

2.2 Characteristic of the territory, building plot and the route of the pipeline

The beginning of the planed HP gas pipeline is located in the top part of Krušné Hory in DN Kateřinský potok.

The first 10 km of the route runs mainly through the forested mountain terrain with high altitude differences, worse geological conditions and a lot of wetlands and unfavourable climatic conditions.

Then it descends into the Podkrušnohorská pánev, which is morphologically more favourable and better from the execution point of view, because of the soil with better class of extraction.

Between km 12.7 and km 13.2, the HP gas pipeline crosses the river Bílina, the four-lane road I/13 and the double-track railway No. 130 going to Chomutov.

Then the HP gas pipeline route passes the Podkrušnohorská area around the town of Chomutov and continues southwards to Žatec. The territory has a planar character with an occasional occurrence of landslides and areas with underground coal mines, with dense road and railway networks and a large number of watercourses.

At the km 31.5, the HP gas pipeline crosses the river Ohře. The route continues southwest towards Podbořany through a hilly area with more complex but geologically more favourable terrain character. On the route the HP gas pipeline bypasses villages Blatno, Žihle and Mladotice. Almost the whole section of HP gas pipeline runs alongside the existing DN 1400 gas pipeline.

At the km 84, the route of HP gas pipeline crosses the river Střela and passes the high slope on its right bank and continues in the southwest direction. The route is locally complicated with a high density of a recreational area. The route from the km 78 is also complicated by converging with existing HP gas pipelines, communication cables, product pipelines of Čepro and Mero and their protective zones.

The route can be further characterized by rising altitudes, terrain differences, deteriorated geological conditions and climatic conditions, with long forest sections.

At the km 127, the HP gas pipeline crosses the river Mže and 5 kilometres further crosses the highway D5. The route runs alongside existing gas pipelines and Mero pipeline. The HP gas pipeline project ends at RU Přimda.

The HP gas pipeline is planned as an underground line construction (except stations). The gas pipeline shall be located at least 0.8 m under the terrain. The HP gas pipeline route is planned in the way to use the right-of-way of existing pipelines as much as possible in order to save a forest and non-forest vegetation.

2.3 Characteristic of the location and building plot of the stations

DN Kateřinský Potok (RU 006)

The Distribution Node Kateřinský Potok is located close to the crossing of the existing northern transit branch lines with road No. III/25218. The Node Kateřinský Potok station is located on the north side of this road.

A reference is made to document C4G-HPPL-ILF-RU006-STA-VYK-315 RU Kateřinský Potok - Cadastral Layout

LVS Jirkov (TU33 S)

The existing Line Valve station Jirkov (TU33 S), close to the road No. III/0135 connecting Jirkov with Vysoká Pec, shall be extended to accommodate Line Valve (with by-pass) of HP gas pipeline. The Line Valve station is located on the north side of the road.

A reference is made to document C4G-HPPL-ILF-TU33S-STA-VYK-315 TU Jirkov - Cadastral Layout

Note: The Line Valve for HP gas pipeline DN 1400 shall be installed only at one location, either at LVS Jirkov (TU33 S) or at LVS Vrskmaň (KS007), the decision shall be made in the later stages of project.

LVS Vrskmaň (KS007)

The Line Valve station Vrskmaň is located next to the existing Compressor Station Jirkov (KS007), close to the crossing of the railway No. 130 leading from Klášterec nad Ohří to Most with the road No. III/25118 connecting Jirkov with Zaječice. The Line Valve station is located on the south east side of this crossing.

A reference is made to document C4G-HPPL-ILF-KS007-STA-VYK-315 TU Vrskmaň - Cadastral Layout

Note: The Line Valve for HP gas pipeline DN 1400 shall be installed only at one location, either at LVS Jirkov (TU33 S) or at LVS Vrskmaň (KS007), the decision shall be made in the later stages of project.

LVS Hrušovany (TU51S)

The existing Line Valve station Hrušovany located on the road No. III/22531 connecting Hrušovany with Střezov, shall be extended to accommodate Line Valve (with by-pass) of HP gas pipeline. The Line Valve station is situated on the northwest side of this road.

A reference is made to document C4G-HPPL-ILF-TU51S-STA-VYK-315 TU Hrušovany - Cadastral Layout

LVS Sýrovice (TU52 S)

The existing Line Valve station Sýrovice located on the road No. III/2211 connecting Sýrovice with Libořice, shall be extended to accommodate Line Valve (with by-pass) of HP gas pipeline. The Line Valve station is located on the south side of this road.

A reference is made to document C4G-HPPL-ILF-TU52S-STA-VYK-315 TU Sýrovice - Cadastral Layout

LVS Malměřice (TU53 S)

The existing Line Valve station Malměřice situated close to the road No. E46 connecting Lubenec with Černčice shall be extended to accommodate two Scraper Traps and Line Valve (with by-pass) of HP gas pipeline. The Line Valve station is located 100 m north from this road.

A reference is made to document C4G-HPPL-ILF-TU53S-STA-VYK-315 TU Malměřice - Cadastral Layout

LVS Mladotice (TU40 S)

The existing Line Valve station Mladotice situated close to the road No. III/0274 connecting Mladotice with Horní Hradiště shall be extended to accommodate Line Valve (with by-pass) of HP gas pipeline. The Line Valve station is located on northern west side of this road.

A reference is made to document C4G-HPPL-ILF-TU40S-STA-VYK-315 TU Mladotice - Cadastral Layout

LVS Hubenov (TU41 S)

The existing Line Valve station Hubenov situated close to the road No. III/204 leading to the North direction from Hubenov shall be extended to accommodate Line Valve (with

by-pass) of HP gas pipeline. The Line Valve station is located 200 m north from Village Hubenov.

A reference is made to document C4G-HPPL-ILF-TU41S-STA-VYK-315 TU Hubenov - Cadastral Layout

LVS Sviňomazy (TU42 S)

The existing Line Valve station Sviňomazy situated close to the road No. III/19326 connecting Kšice with Trpísty shall be extended to accommodate Line Valve (with by-pass) of HP gas pipeline. The Line Valve station is located 400 m northern west from this road.

A reference is made to document C4G-HPPL-ILF-TU42S-STA-VYK-315 TU Sviňomazy - Cadastral Layout

LVS Bor (TU48 S)

The existing Line Valve station Bor situated close to the road No. II/200 connecting Bor with Boječnice shall be extended to accommodate Line Valve (with by-pass) of HP gas pipeline. The Line Valve station is located 600 m southern west from this road.

A reference is made to document C4G-HPPL-ILF-TU48S-STA-VYK-315 TU Bor - Cadastral Layout

DN Přimda (RU 005)

The end of HP gas pipeline is located in the Phase I. / extension of existing Node Přimda located near the road No. II/198 connecting Přimda with Malkov. The Line Valve station is located 200 m west from this road.

A reference is made to document C4G-HPPL-ILF-RU005-STA-VYK-315 RU Přimda - Cadastral Layout

2.4 Coordinates of the HP gas pipeline

The Project Coordinate System is S-JTSK (World System).

EPSG Code 5514

The Project Elevation System is BPV

EPSG Code 5705

The local Coordinate System is defined as [HOLD]:

3 CLIMATIC AND ENVIRONMENTAL CONDITIONS

3.1 Environmental Conditions

The following the most unfavourable values were taken into consideration which are expected at the place of DN Kateřinský Potok (Most). The exception is minimum design temperature which is considered -20°C along the whole HP gas pipeline.

Snow region: VII (characteristic value of load $s_k = 4,0 \text{ kN/m}^2$)

Wind region: IV (basic wind speed $v_{b,0} = 30,0 \text{ m/s}$)

Seismicity: reference peak ground acceleration $a_{gR} = (0,06 \div 0,08) \cdot g \rightarrow$ low seismicity

Maximum value of design ground acceleration $\approx 0,78 \text{ m/s}^2$

Number of storm days per year: 25-30

Radon: medium risk

3.2 Ambient Design Conditions for Outdoor Facilities

For the design of the stations mentioned in the chapter 2.3, the following design ambient conditions shall be used:

Summer Case $T_{\max} = + 35^\circ\text{C}$

Winter Case $T_{\min} = - 20^\circ\text{C}$

All components shall be protected against high pressure and against high or low temperatures. Stations and the pipeline are designed according to the following design parameters:

Design Pressure:

Pipeline downstream Distribution Node Kateřinský Potok (RU KP)	P design = 85 barg
Stations and Distribution Nodes	P design = 100 barg

Design Temperature:

Mechanical regular service (piping, valves, ...)	Tmin = -20 °C Tmax = 50°C
Pipeline (underground part)	Tmin = -5 °C Tmax = 15°C
Electrical & Instrumentation	Tmin = -20 °C Tmax = 40 °C

Table 2 - 1 Design Temperatures