

RESTRICTED

ENERGY/WP.3/GE.3/R.10/Add.1/Rev.1
16 March 1993

Original: ENGLISH

COMMITTEE ON ENERGY

WORKING PARTY ON GAS

Meeting of Experts on the Transport
and Storage of Gas
Twenty-fourth session,
7-8 September 1993

MAINTENANCE OF THE GAS TRANSPORTATION PIPELINE SYSTEMS

(Revised questionnaire transmitted by the
Government of the Czech Republic)*

State the method and frequency of maintenance works performed on gas pipelines transport system. In case an activity is not performed, strike out the question. In case maintenance activity is performed, indicate it in the questionnaire. In case any other (in questionnaire not mentioned) activity is performed, please indicate it at the end of questionnaire.

* In accordance with the decision of the Meeting of Experts at its twenty-third session, held in September 1993 (ENERGY/WP.3/GE.3, para. 4 (a)).

1. Regular pipeline maintenance

General part

1.1 Philosophy

- 1.1.1 Do you have any system of checking and/or maintenance of pipelines based on the age of the line? If yes, which one?
- 1.1.2 Is there any relationship between economical and technical factor in considering on operating life of pipeline?
- 1.1.3 Is there any regulations (by law, by State-official order ...) for checking/maintaining/repairing/reconstructing system?

Part maintenance systems and intervals

State intervals in conducting maintenance [times per year, times per month, respectively].

1.2 Maintenance of pipeline

- 1.2.1 Survey of the right of way (r.o.w.)
 - .1 Walking
 - .2 Driving
 - .3 Using of helicopter (state the type and importance of line)
 - .4 Clearing of the r.o.w. and accesses to the plants
 - .5 Detection of leakages (which instruments are used)
- 1.2.2 Survey of landslides areas, how is it performed:
 - .1 Geodetical measurements
 - .2 Measurements on pipeline (for example, measurements of stress) and methods used for such measurements
 - .3 Regular system of stabilization of landslide area
- 1.2.3 Survey of inundated areas
- 1.2.4 Checking and maintenance of river and/or road crossings
 - .1 Bridges (corrosion protection, steel material check-ups)
 - .2 Underwater crossing
 - .3 Casings
- 1.2.5 Keeping of records on computers
 - .1 Statistics
 - .2 Working orders

1.3 Cathodic protection (CP) and insulation of the pipelines

- 1.3.1 Measurements of CP potential (method used)

1.3.2 Survey of insulation status (method used)

1.3.3 Provision made if error is found on:

- .1 Pipeline and casing in touch
- .2 Influence or interference of another facility
- .3 Interruption or reduction of CP current
- .4 Diode breakdown in the draining installations
- .5 Significant insulation damage (what criterion)

1.4 Maintenance of section and branch-off valves (SBV)

1.4.1 Regular checking of SBV operation

- .1 Local control
- .2 Remote control
- .3 Line damage automatic shut-off system check-up

1.4.2 SBV instrumentation equipment checking

1.4.3 Checking of tightness (method used)

1.5 Special winter operations on distribution facilities

1.5.1 Cleaning (pigs, balls, ...) - frequency, purpose

1.5.2 Measurement of dew-point of water in gas (method used, tolerable limit)

1.5.3 Control of hydrate formation (drying/inhibiting/other method)

1.5.4 Inhibition of hydrate formation (if is used - which system and inhibitor)?

1.6 Maintenance of electric installations and grounding

1.6.1 Control of electric installations

1.6.2 Measurements of the grounding system of the above-ground installations

1.6.3 Check-up of the gas ramp in a boiler room and control of the pump drive

1.7. On-line inspection (pigging operation)

1.7.1 Regular/random system used

1.7.2 If regular system is used, what is frequency and purpose

1.7.3 Type of intelligent pig used

2. Maintenance of technological equipment

2.1 Gas dehydration plant

- 2.1.1 Measurement of dew-point
- 2.1.2 Chromatographic analysis
- 2.1.3 Check-up of glycol regeneration equipment
- 2.1.4 Servicing of glycol pump
- 2.1.5 Control of working parameters of compressors and equipment

2.2 Gas preparation and compressor plant

- 2.2.1 Check-up of valves
- 2.2.2 Lubrication of valves
- 2.2.3 Check-up of regulation valves
- 2.2.4 Check-up of vessels under pressure
- 2.2.5 Safety valves control
- 2.2.6 Alarm equipment control
- 2.2.7 Fire protection system check-up
- 2.2.8 Anti-pumpage protection system of compressor check-up

2.3 Cooling system

- 2.3.1 Visual investigation
- 2.3.2 Working parameters control
- 2.3.3 Pressure drop measurement
- 2.3.4 Cooling system cleaning
 - .1 External surface
 - .2 Internal surface
- 2.3.5 General repair (criteria applied)

2.4 Compressor units

General part

2.4.1 Philosophy

System used or producer's instruction based on operational time of compressor or on-condition system (based on defectoscopy):

Part maintenance and intervals

2.4.2 Lubrication system check-up

2.4.3 System of check-up and maintenance if time-based

- .1 Intervals
- .2 Extent

2.4.4 Regular diagnostic system (which type is used, intervals)

2.4.5 Statistics of disturbances

- .1 Is it used for servicing coordination? How?
- .2 Is it used for discussion with producer?

3. Regular maintenance on measurement and regulation system (MRS)/SCADA

3.1 Maintenance of MRS

3.1.1 Check-up of MRS and telemetric lines, checking of interconnection with local MRS

3.1.2 Adjustment of regulation and protection system

3.1.3 Restoration of vital parts of MRS

3.1.4 Measuring equipment control (interval, range, is there any State-official order)?

- .1 Orifice
- .2 Turbine meter
- .3 Rotating piston meter
- .4 Vibration gas meter
- .5 Ultrasonic gas meter
- .6 Mechanical corrector
- .7 Electronic corrector
- .8 Control and calibration of pressure, temperature and other instrumentation equipment and transducers

3.2 Checking and adjustment of the station telemetry indicators

Intervals

3.3 Checking and adjustment of MRS of heating system and heat exchangers

Intervals

3.4 Border station control

3.4.1 Visual check-up of installation

3.4.2 Control and adjustment of measuring equipment

3.4.3 Comparative control of the measured gas quantities (other data source - which one)?

4. General information of system used for registration and statistics of maintenance and damages

Please write main system-information

4.1 Do you use any system of planning and control of the maintenance works on PC with specially adapted software?

4.2 What is the frequency of damages on your pipeline system in a

.1 1-year period

.2 10-year period

4.3 Sources of damage of high pressure main gas pipelines

.1 Damages of cathodic protection, defective CP system

.2 Mechanical by "third party"

.3 Agricultural activities

.4 Natural causes (landslides, earthquakes, etc.)

4.4 Gradual improving of pipelines and MRS gravity of checking (with ageing of them - state the contents of modification of control system)

4.5 Elimination of disturbances and damage

4.5.1 Technological programmes for elimination of damages

4.5.2 Design system modification on operation and maintenance knowledge

4.5.3 Safety instruction for the gas pipelines systems

4.5.4 Training of damage repair team

4.5.5 On-duty at home

4.5.6 Responsibility of chief on duty

- 4.5.7 Information system for the officials
- 4.5.8 Cooperation with public organizations in the case of pipeline breakdown (police, firemen, etc.)
- 4.6 Repairs on the pipelines under pressure (methods used for temporary and for stable repair)
- 5. Exchange of experiences
 - 5.1 Systems of regular pipelines and MRS check-up
 - 5.2 Causes and statistic frequency of damages affecting the pipelines
 - 5.3 Hazard elimination programmes
 - 5.4 General remarks
