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DIAGNOSTICS OF GAS TRANSMISSION LINES AND RISK MANAGEMENT*

(Draft questionnaire, prepared by the delegation of Czech Republic)

Note by the secretariat: This document is prepared in accordance with the decision of the fifth session of the Ad Hoc Group of Experts (ENERGY/WP.3/GE.5/2004/2, para 8 (b), held in Geneva in January 2004.
You are kindly requested to review the draft questionnaire and send your comments to General Rapporteurs, Messrs. Jiri FILIPPI and Josef ANTOŠ, Ministry of Industry and Trade, Ministry of Industry and Trade, Na Frantisku 32, 110 15 PRAGUE 1, Czech Republic. Tel: +420 224 853 442 and 852 440, Fax: +420 224 853 345 and e-mail filippi@mpo.cz and antos@mpo.cz, with a copy to the secretariat, by 31 December 2004.

* Late submission of the document due to editing problems.

I. INTRODUCTION

1. The dependence of Europe on remote sources of natural gas and the necessity of gas transportation via international pipeline system presents a problem of safety and reliability of transportation with respective non-discriminating and controlled process of active transportation. For this reason, it is necessary to investigate the legislative, technical and, in some cases, also trading rules. At the same time the risks in operating transportation systems should be minimized while meeting the requirements of an open gas market. The main objective is to ensure the reliable and safe transportation of natural gas. It is important to harmonize the approaches of respective countries in solving the problems of international transportation.

2. The development of national transportation systems in the past and their gradual interconnection are currently creating an extensive international transportation system. All pipeline parts and installations fulfil their function within the system. The respective operators are responsible to react flexibly to emergency situations (breakdowns etc.) and to market requirements according to market rules and agreed contracts.

3. For this reason, a survey will be carried out by UNECE in the form of a questionnaire, which would provide for information and characteristics of international gas pipelines, including their third-party-access (TPA) conditions and risk management policy and rules. Although changes might be expected due to further regulation of the European gas market, it is necessary, for the safety of international gas transportation, to map all relevant parts of installations and how they are integrated, as for example in power engineering (UCTE).

4. The purpose of the questionnaire is to identify the existing methods of diagnostic of major gas transportation pipelines which are part of an international transportation system, and also to consider and identify a methodology in the field of risk management of those pipelines.

5. The questions are focused on identification of relevant legislation and regulation, system of operations (including safety regulations) and risk management of internationally connected high-pressure transportation lines with a designed pressure higher than 16 bars, including its installations.

II. SITUATION IDENTIFICATION – CHARACTERISTICS OF GAS PIPELINES

6. For reasons of safety of long-distance international gas transportation (transit), it is necessary to map the main transit systems, including all connections and range of capacity/operating pressure. The transit pipelines are indicated according to the following schedule:

Country:

Operation pipeline(s) or system controlled by a single operator.

Name of operator (TSO).

Pipeline route(s) and position: undersea, underground, on the ground.

Inlet points:

Iin/number – points (inlet) starting within the territory of the country where TSO has its headquarters, (hereinafter country only)

Bin/number- points (inlet, starting on the state border) (Border)

Up int/number – inlet points connected to upstream gas pipelines on the country territory, (Upstream)

Up S/number – inlet points connected to upstream gas pipelines on territory of another country S

T int/number – inlet points connected to terminal on the country territory (Terminal)

T S/number – inlet points connected to terminal on territory of another country S

Sour int/number – inlet points connected directly to extracted source on the country territory, (Source)

Sour S/number- inlet points connected directly to the source on the territory of another country S

Col.Hub/name explicitly (Collector)

Notes:

1. The numeral gives total number of these points.

2. Points of connection to the collector – junction with apossibility of direct connection to various sources of natural gas or to the system of another operator - all are given in names.

Outlet points:

O out/number – points (outlet) within the country territory

O out S/number – outlet points on the territory of another country

B out/number – outlet points ending on the state border

LS out/number – outlet points ending in a liquefying station of natural gas on the country territory

LS out S/number- outlet points on the territory of another country (Liquefying Station)

Ocol.Hub/name - state all points where the system is connected to the collector at the outlet-hub.

In the case where the transportation system is connected to an underground gas storage tank(s), Store X should be stated where the number X gives the number of storage tanks. The Annex should list names of underground tanks and their storage capacity in thousands/millions m3.

The Annex should list the topographical names, where they exist, of points and the name of the connected gas pipeline and operator of this gas pipeline (system), and also specify "with" or "without" a measuring device; here, the measuring device should be considered at this point or in its vicinity without a possibility of branching between this point and the measuring device.

The number following the specification indicates the number of these characteristic points:

2.1. Are there transportation gas pipelines in operation in your country which serve exclusively for the transit of natural gas to: (to be answered by state administration)

- One neighbouring country (indicate with 1)
- Two countries (indicate with 2)
- More than two countries (indicate with transit 3)

2.2. Are pressure losses of natural gas in the transportation system compensated by:

- Natural pressure drop (pressure difference) and initial energy of the gas bed? (mark with PD)
- Compressor stations situated in this transportation system (CS/total number)
- Compressor stations of preceding transportation system? (CSFin/total number)
- Compressor stations of linked-up transportation system? (CSFout/total number)

2.3. Does the transportation system serve exclusively for transit across the country territory (mark with TR) and/or also for inland transportation (mark with TRI)?

2.4. Give the ratio of the annual volume of transit transportation and inland transportation, e.g. 3.5: 1.

2.5. Is the transportation system connected to gas storage tanks or liquefying stations enabling a return supply of natural gas? If yes, state names of these storage tanks and their capacities in the Annex.

2.6. Is the transportation system controlled exclusively by a TSO dispatching or is its control subject to another, e.g. central – national dispatching? (Specify its location)

2.7. With what linked-up transportation systems of the transit type does the TSO of the transportation system cooperate on inlet (inlets) and outlet (outlets) in confirmation of the volume of transported natural gas for transit and import, and in checking-up of contracts fulfilling? (Give the TSO – name(s) in the Annex).

2.8. Are there any reserves in the transport capacity of the transportation system for safety and reliability of transportation? (Yes, No). If yes, state maximum month reserve during wither season with full transportation load and a ten-year temperature minimum.

2.9. Can the direction of the gas flow be changed in the transportation system? Give the number of compressor stations which have the possibility of making such a change.

3. Risk analysis

3.1. The following parts are classified as a source of serious potential emergency conditions:

3.1.1. Whole pipeline system.

3.1.2. Metering stations.

3.1.3. Transfer stations.

3.1.4. Underground gas storage tanks.

3.1.5. Compressor stations.

3.2. Which executive body orders the elaboration of emergency plans?

3.3. For what purposes and by whom are the Safety reports and Risk analyses utilized?

3.4. Does the TSO have a methodology for identification and assessment of risks?

3.5. What is the method of risk assessment used by the TSO:

3.5.1. Qualitative

3.5.2. Semi-quantitative

3.5.3. Quantitative

3.5.4. Risk-Based Inspection

3.6. How are stand-by capacities for works with natural gas under pressure secured by the TSO?

3.7. Is the transportation system operated by the TSO depicted in the Geographic Information System (GIS) and to what extent?

3.8. Are TSO employees systematically informed of operational risks and how?

3.9. Is information on measures taken for securing risks required by competent body of state administration? In what form?

3.10. Does the TSO have defined objects of increased danger HCA (High Consequence Area) in the routes of the transportation system?

3.11. What procedures are used by the TSO for identification of risks in HCA areas:

3.11.1. Additional inspections.

3.11.2. Intensification.

3.11.3. On-line monitoring systems.

3.11.4. Other, specify.

3.12. Does the TSO have implemented information system of risk management? How is this IS linked to the Geographical Information System and to process control and maintenance IS?

3.13. Who provides the IS on gas transportation with neighbouring countries?

3.13.1. TSO

3.13.2. Market operator.

3.13.3. Other organization, specify?

4. Legislation

4.1. Does any special national legislation exist in the area of breakdown prevention and risk management in the transportation and storage of natural gas? Specify.

4.2. Is documentation of the safety and reliability of the process system a binding condition for granting a license to operate the transportation system?

4.3. Does the legislation include a requirement for obligatory insurance of the transportation system?

4.4. What legal act defines the responsibilities and authorities in the management of risks and emergency conditions?

4.5. Does legislation include a requirement for elaborating a Safety report and Risk analysis (QRA)?

4.6. What legal form is used by the state to ensure the safety of gas transportation across its territory?

4.6.1. On a legislative basis.

4.6.2. On a contractual basis.

4.7. Is there any legal difference between multinational gas transportation (transit) across the country territory and inland transportation?

4.8. Is the Energy Charter Treaty binding on your state?

4.9. Do you consider it appropriate that countries sign an agreement with relevant TSOs?

4.10. Is there any state monitoring system laid down by legislation on the inspection of imports, transit and exports of natural gas?

4.11. Who in your state is legally authorized to execute this function?

4.12. Is there any way of comparing and declaring transit, import and export in a link-up to declaration of neighbouring interconnected systems on inlet and outlet? Is this declared duty laid down in legislation? If so, in what way?

5. Diagnostics, operation, prevention

5.1. Has the TSO implemented a formal system of planning and evaluation of preventative maintenance?

5.2. Does TSO have implemented minimum standards for running the transportation system (maintenance, operation, emergency conditions)?

5.3. Does TSO have implemented information system of maintenance control?

5.4. Does the IS of maintenance include automatic planning of prescribed inspections and tests?

5.5. Does the TSO carry out systematic regular inspections of the technical conditions of specified/selected facilities of the transportation system? What are the time intervals?

5.6. How often does the TSO carry out registered checks of cathodic protection of the pipeline system?

5.7 To what extent and at what technical level does the TSO make an internal inspection of the pipeline system conditions?

5.7. To what extent and at what intervals does the TSO carry out inspections of the external insulation of the transportation pipeline system?

5.8. How does the TSO ensure prevention (organization, technical aspects) of damage to the transportation system caused by third party intervention?

5.9. Are aerial inspections of the transportation system carried out regularly and at what intervals?

5.10. Does the TSO carry out pressure tests (stress-tests)? To what extent?

5.11. Does the TSO use procedures of RCM (Reliability Centred Maintenance)? At what intervals?

5.12. Does the gas transportation system include automatic protection systems, which, in the case of damage to the facility, acts to close the system at the nearest points?

5.13. Is there any prescribed volume of standby capacity of the gas transportation system for the sake of safety and reliability? Specify volume of the standby capacity.

5.14. On what objects is there continuous monitoring of the possible leakage of natural gas?

5.15. Does the TSO monitor the sulphur content in natural gas and its impact on material? What method is used?

5.16. What standards exist for building the gas transportation system?

5.17. In what way is the quality of supply services ensured and monitored (certification ISO, others)?

5.18. Is a system of certifying companies carrying out works on the transportation system implemented in your country?

5.19. Are there any supervisory authorities under the law, the duty of whom is to monitor safety of the gas transportation system operation? Specify.

5.20. What methods do they use for inspection:

5.20.1. External audits.

5.20.2. Revisions.

5.20.3. Internal inspections.

5.20.4. Other, specify.
