Safety and Security of Main Gas Transit Infrastructure in Eastern Europe and the Caucasus

Project Presentation

Safety and Security Seminar
Brussels 11 February 2009
“Safety and Security”

Definition of Security of Gas Supply:

According to the Report of the GTE Security of Supply Working Group, Security of Supply touches on three key aspects:

- **Gas availability**: The availability of adequate and diverse gas supplies (including from storage) to meet firm demand for gas under both average and extreme weather conditions;

- **Adequacy of the gas network**: The availability of adequate transportation capacity to transport gas from entry points to demand locations under both average and extreme weather conditions;

- **System integrity**: i.e. safeguarding the operational integrity of the system, covering residual balancing over operational timescales and cases of system failure.
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Safety Regulations in Europe:

European Level
- First Gas Directive 98/30/CE in 1998

International/European Standardization (ISO, CEN)

National Legislation

National Standards

Technical Working Groups

Detailed specifications
- Company Codes of Practice
The contents of Directive 2003/55/EC:

Scope: common rules for transmission, distribution, supply and storage

Article 5: Monitoring of security of supply:
• Supply/demand balance on the national market
• Future demand and available suppliers, planning of and construction of additional capacities, if necessary
• Quality and level of maintenance of the networks
• Measures to cover peak demand and to deal with shortfalls
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Article 6: Technical rules
- Technical safety criteria
- Minimum technical design and operational requirements

Articles 8.1. and 12.1
Each transmission and distribution operator shall operate, maintain and develop under economic conditions secure, reliable and efficient systems
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Definition of Safety of gas transmission infrastructure:

Safety means safe operation of pipeline, including safety of employees, public and environment; in a simplified way avoidance of any incidents or accidents. Safety performance is a combination of design, technical standards, manufacture of components, construction, operation and maintenance practices, oversight and regulations enforcement. Conventionally it has been considered that adequate safety is achieved by detailed standards, detailed instructions and supervision by authorities.
Definition of Security of gas transmission infrastructure:

Security means protection of gas infrastructure from external threats.

If security fails the consequences may turn into a safety issue, a threat to health of the employees, the public or to the environment (first of all the ignition of escaping gas). Another, broader concern is the potential loss of gas supply to the near-by consumers, and the potential outage of gas transmission and transit.
“Safety and Security of gas transmission infrastructure”

Source: Marcogaz report
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Certificate: welder

Pressure test

Certificate of competent Authority

Source: Marcogaz report

Standard EN 1954:2000 is the base safety standard for design and construction of the gas pipelines in Europe
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Maintenance-Operation

Surveillance by car by helicopter by walking.

Source: Marcogaz report
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Cathodic protection

Intelligent pigging

Source: Marcogaz report
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Standards addressing operation and maintenance:

CEN/TS 15173:2005 – Gas supply systems. Frame of references regarding Pipeline Integrity Management System (PIMS)

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Geographic Information System

Pipeline Integrity Management System

Source: Rosen material
Pipeline Integrity Management System (PIMS) whose core concept is pipeline integrity. PIMS, exercised in the company, shall cover all the relevant functions, procedures etc. of pipeline operation and maintenance, such as: policies, hazard identification, operations, monitoring and diagnostics, mitigation (preventive and corrective actions), emergency response, training, communication, reviews. An essential part of the application of the Pipeline Integrity Management approach should also be that of classification of risks, criticality assessment, and planning of actions taking into account the criticality of facilities (risk based maintenance).
Safety and Security of gas transportation infrastructure

EGIG Incident Statistics (for transmission only)

Source: www.egig.nl
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Project’s overall objective:

The overall objective of the project is to improve the security of gas supply to (and in) the beneficiary countries (Caucasus, Eastern NIS countries) as well as to the EU through the implementation of automated security, safety and maintenance systems for gas transit.
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Project countries:
Ukraine, Belarus, Moldova, Azerbaijan, Georgia, Armenia

Project schedule:
Dec 2007… Dec 2009
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Two main topics of the Project:

Support for establishment and implementation of a Pilot Excellence System (to be supplied under a separate contract)

Verification of gas losses in the countries participating in the Project
"Pilot Excellence System"

Definition of the Pilot Excellence System (1)

The **Pilot Excellence System** (host country Ukraine) has two components:

- **Security Surveillance System (Lot 1)**
- **Pipeline Integrity Management System (PIMS IT System) (Lot 2)**

**Security Surveillance System** shall have main two parts:

- Preventive intrusion detection in pipeline right-of-way with underground location of detectors.
- Perimeter surveillance system for aboveground facilities.
Definition of the Pilot Excellence System (2)

Software and Hardware for PIMS IT, IT application (set of modules) supporting the implementation of PIMS

Modules for:
- analysis of stresses and deformations in the pipeline
- analysis of in-line-inspection results
- analysis of data from direct assessment processing and analysis of cathodic protection
- risk assessment
- assessment of threats caused by defects
- processing and analysis of diagnostic information
- repair programme preparation
“Pilot Excellence System”

Why PIMS IT:

Computerized processing of all data related to construction, operation, maintenance and repair of pipeline

Optimization of maintenance and repair activities by the operator of the gas transportation infrastructure

Cost saving and resource targeting on the section with increasing risk

Life extension of the pipelines and reporting to the external authorities
Results of the Tender

Lot 1 for Security Surveillance System was cancelled due to lack of technically compliant proposals

Lot 2 for PIMS IT was awarded to ROSEN Europe BV and the Supply Contract was signed with this company. A notification was published on the EU web-site on 28 October 2008.
Two main European organizations defining the practice for collection and processing the respective data

Gas pipeline incidents

EGIG – European Gas Incident Data Group (EGIG) established in 1982.

Document:
Guideline: Using or Creating Incident Databases for Natural Gas Transmission Pipelines
Two main European organizations defining the practice for collection and processing the respective data (2)

Technology gas losses

Marcogaz – the Technical Association of Natural Gas Industry in Europe.

Methodology for the estimation of methane emissions from gas systems (2005)

Guidelines for choosing methane emissions factors (2006)
Other activities of the Project

First Inter Regional Seminar in October 2008, 46 participants from 13 countries and 14 companies

First Study Tour in December 2008, 14 participants from 6 beneficiary countries. Organizations visited: Gasunie, EGIG, Rosen Europe BV, Marcogaz

Gas Infrastructure operators from the countries participating in the Project received invitation for membership in the EGIG and Marcogaz.

Study tours and other activities continue to the end of the Project