



Ukrainian Risk Assessment and Standards of Conduct for the gas year 2017-2018

O. Lisnichenko

Ministry of Energy and the Coal Industry
of Ukraine



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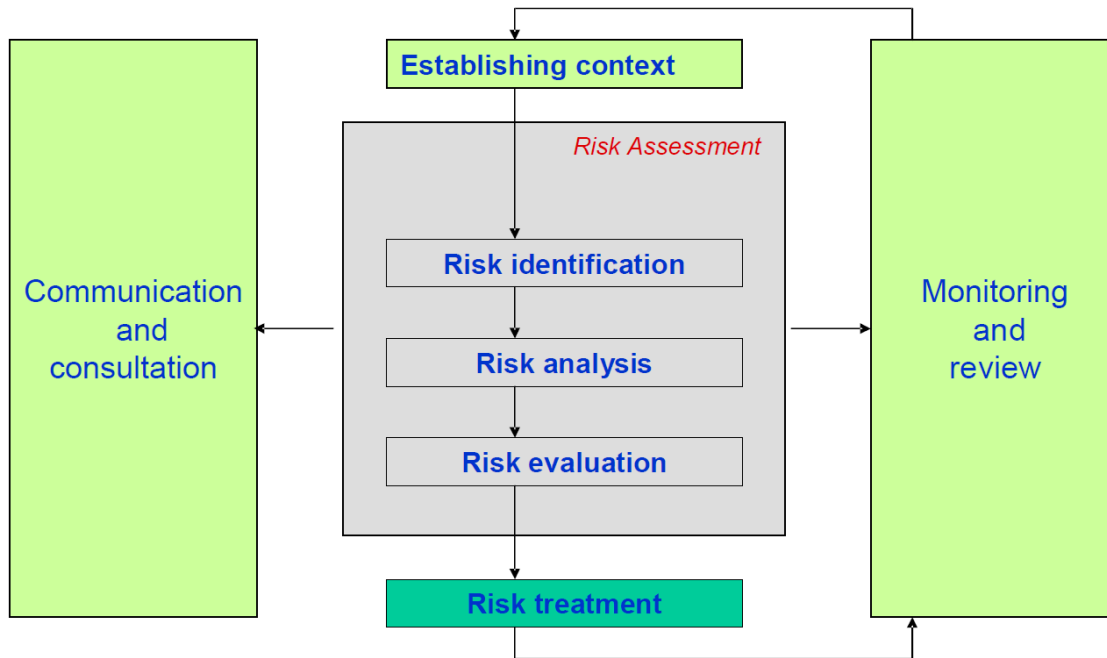
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Introduction

- Work developed in the context of the obligations imposed by the Law of Ukraine on the Natural Gas Market:
 - Update of the Risk Assessment for next heating season
 - Update of the Standards of Conduct for next heating season
 - Update of the National Action Plan (equivalent to EU Emergency Plan)
- On-going collaboration with the EU DG Joint Research Centre concerning ***“Further refinement of Ukrainian security of gas supply legislation” (2016-2018)*** which already produced the *first Risk Assessment and Standards for gas years 2016-2017 and 2017-2018 (recently finished)*

Methodology of the RA

- Based on the approach of the ISO 31000, ISO 31010 and DG-JRC Guidelines;



ISO 31000:2009 Risk Management



JRC SCIENTIFIC AND POLICY REPORTS

Best practices and methodological guidelines for conducting gas risk assessments

Ricardo Bolado-Lavin
Francesco Gracceva
Peter Zieniewski
Pavel Zastera
Lenhard Vanhooen
Anna Mengolini

2012



Methodology and Tools of the RA

- Based on the approach of the ISO 31000, ISO 31010 and DG-JRC Guidelines;
- It is the joint effort of a group of expert from the Competent Authority (Ministry of Energy and the Coal Industry of Ukraine), Naftogaz and UTG, supported by EC DG-JRC
- Modelling tools have been developed by DG-JRC:
 - a hydraulic model (in collaboration with UTG);
 - a statistical model for demand based on extreme value theory and linear regression (in collaboration with Naftogaz);
- The time horizon is next heating season (winter 2017-2018).

Sources of risk:

- Critical sources of risk are:
 - Treats/Hazards to the functioning of the most important Underground Storage facility (UGS);
 - Supply disruption originated by the Russian Federation (no transit gas to the EU across Ukraine).
- Other important sources of risk are:
 - Unavailability of pipelines for explosion/ digging/ terrorism/ flooding;
 - Underinvestment in production;
 - Problems at cross-border points (e.g., extreme weather/high demand, commercial problems, political leverage);
 - Problems in key compressor stations.

Risk Scenarios

A total of 12 scenario variants were considered with differences in duration, demand profile, UGS level and imports.

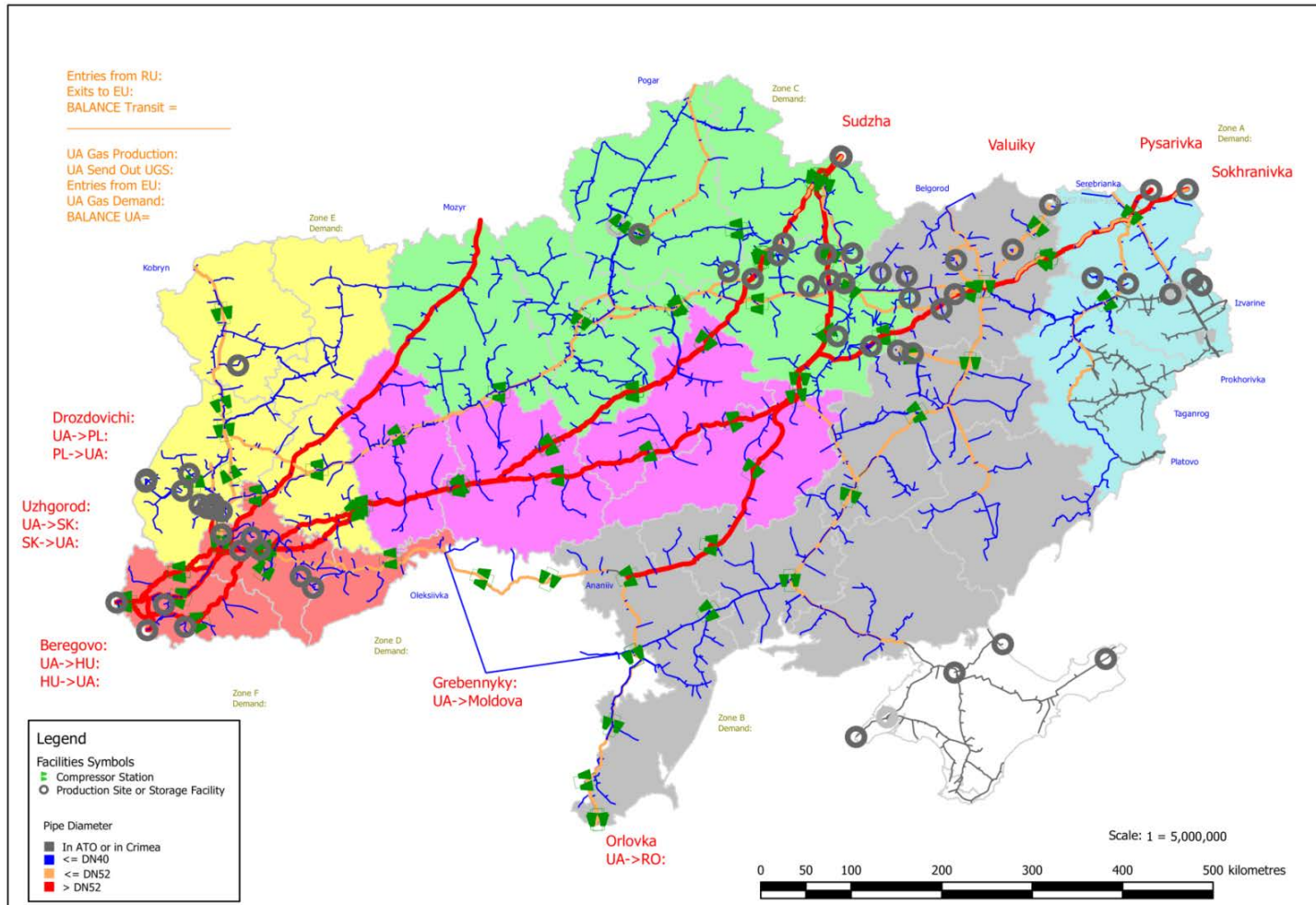
Scenario	Variant	Name	Duration of event (days)	Demand
S.01		No import from RU	7	Peak 7 day 1-in-20
S.02	a	Commercial dispute after new winter package 2017-2018	14	Peak 14-day 1-in-20
	a2		14	Peak 14-day 1-in-20
	b		28	Peak 30-day 1-in-20
	b2		28	Peak 30-day 1-in-20
S.03	a	March cold spell	6	Peak 6 day demand
	b		6	Peak 6 day demand
S.04		Regional crisis	7	Peak 7 day 1-in-20
S.05		Unavailability of UGS	30	Peak 30-day 1-in-20
S.06		Unavailability of Interconnection point with EU	7	Peak 7 day 1-in-20
S.07	a	Production failure	7	Peak 7 day 1-in-20
	b		6	Peak 6 day demand



European
Commission

Quantification of potential impacts

Hydraulic model





Quantification of likelihood of risk scenarios

Events likelihoods are derived either by expert's judgment – based on figures provided in the questionnaire of the sources of risk - or by calculating a figure based on the recent history of the Country or other general assumptions.

The estimated "Total likelihood" is a combination of four components: an "Event likelihood", a "Duration likelihood", "Demand likelihood" and a "Transit likelihood".

Total Likelihood =

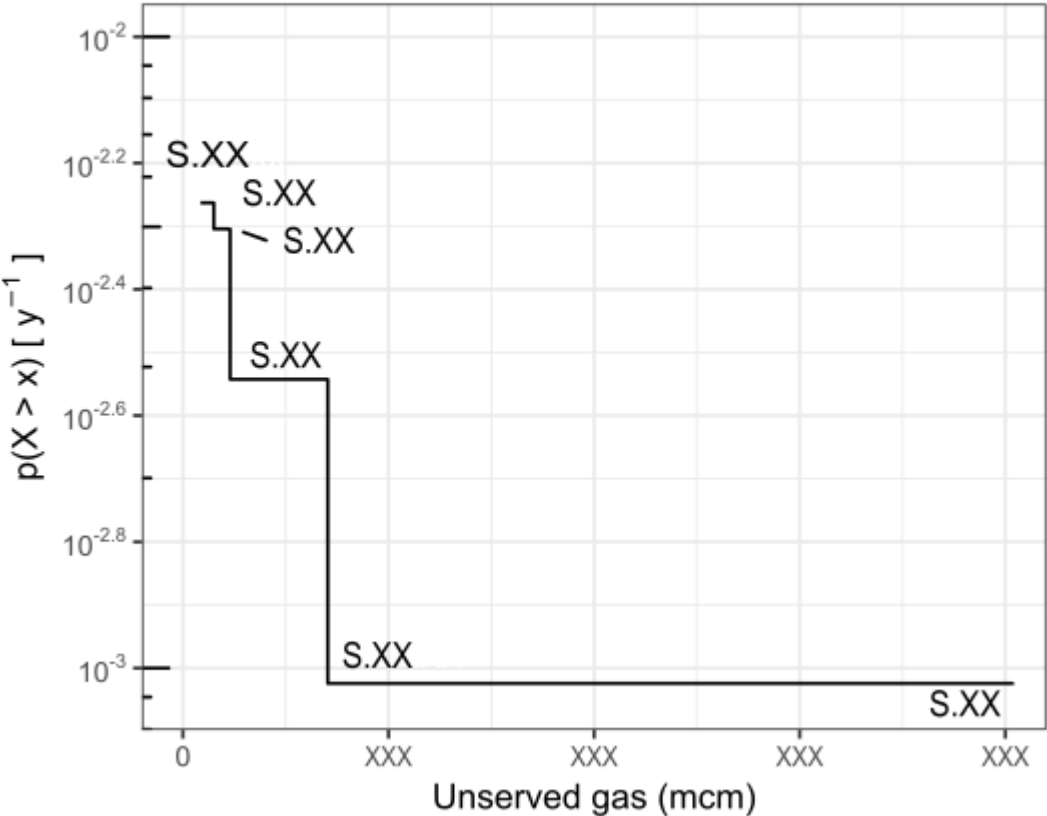
Event Likelihood * **Duration** Likelihood * **Demand** Likelihood * **Transit** Likelihood



Risk Evaluation

Six out of the 12 scenarios analyzed have consequences in terms of unserved gas to final users. Three of these scenarios are the most important ones, contributing roughly 99% of the global risk for the gas year 2017 - 2018.

CCDF chart - All risk Scenarios
Gas year 2017-2018



N.B. Values are masked to anonymize results

Articles 6 of the Law of UKRAINE on the natural gas market

** Development and yearly updates of the National Action Plan (NAP), equivalent to an EU Emergency Plan (EP)*

The NAP is an operational plan →

*+ must be ready for full, immediate
implementation when needed*

+ must be as free of uncertainty as possible

*- almost no room for hesitation or big
doubts*

*- All actors must know obligations,
responsibilities and degrees of freedom*

→ *convenience of testing*

Means for testing →

Table-top exercise

Simulation of a crisis

- gas flows
- random events (weather, infrastructure failures, market issues, etc.)
- implementation of NAP
 - actors (including crisis committee)
 - information flows
 - decisions and their effects

Results analysis

Identification of weaknesses in the NAP

Proposal of NAP modification if needed

Conclusions & next steps

EC DG-JRC in cooperation with the Ministry of Energy and the Coal Industry of Ukraine, UTG and NAFTOGAZ have updated the RA and the Standards of Conduct for the gas year 2017-2018.

A wider diversity of scenarios have been analysed this year in comparison with next year

An improved hydraulic model has been used to analyse all scenarios considered in the RA, including scenarios with no transit gas to EU

The RA identifies most critical risk (importance of storage, for example)

Next steps:

Importance of next year (2018) to transfer all know-how to Ukrainian organisations.

Importance of the table-top exercise to be developed until December this year to identify weaknesses in the NAP and propose improvements for next year.