# INFRASONIC LEAKS DETECTION SYSTEMS FOR PRODUCTS PIPELINE

## S.I. IVANOV, GENERAL DIRECTOR OOO GAZPROM DOBYCHA ORENBURG

Orenburg oil, gas and condensate field (Orenburg field) has been operating continuously since 1974. It is one of the largest fields where pipelines transporting H2S containing gas and condensate are used. H2S and CO2, which produced and transported products contain, raise their corrosive characteristics, what causes Orenburg field's pipelines and shutoff valves' damage and destruction. Even minor damage and destruction may result in sufficient ecological and economic consequences, sometimes even people's death. Even more, such damages and destructions may affect accidents, which are followed by gas emission or soil contamination by liquid hydrocarbons.


DNV

DET NORSKE VERITAS

MANAGEMENT SYSTEM CERTIFICATE

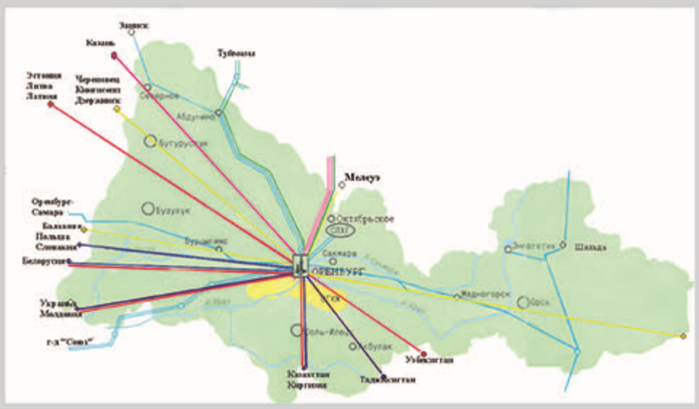
ООО «ГАЗПРОМ ДОБЫЧА ОРЕНБУРГ»

ISO 14001:2004

ДОБЫЧА И ТРАНСПОРТИРОВКА УГЛЕВОДОРОДНОГО СЫРЬЯ; ПРОИЗВОДСТВО ТОВАРНОЙ ПРОДУКЦИИ ИЗ ПРИРОДНОГО ГАЗА, ГАЗОВОГО КОНДЕНСАТА В СМЕСИ С НЕФТЬЮ; ДОСТАВКА ТОВАРНОЙ ПРОДУКЦИИ ПО ПРОДУКТОПРОВОДАМ; ОКАЗАНИЕ УСЛУГ ПО ПРИЕМКЕ, ХРАНЕНИЮ И ОТПУСКУ МАТЕРИАЛЬНО-ТЕХНИЧЕСКИХ РЕСУРСОВ.

Gas production and processing are core activity of OOO «Gazprom dobycha Orenburg», at that the Company pays much attention to ecological safety of pipeline, transporting hydrocarbons. So, the Company assumed a commitment to arrange all nature conservative activities in accordance with international ISO 14000, which provide for regular faithful discharge of all requirements of ecological legislation as well as maximum transparency and cooperation with all interested parties.

ООО «Gazprom dobycha Orenburg»



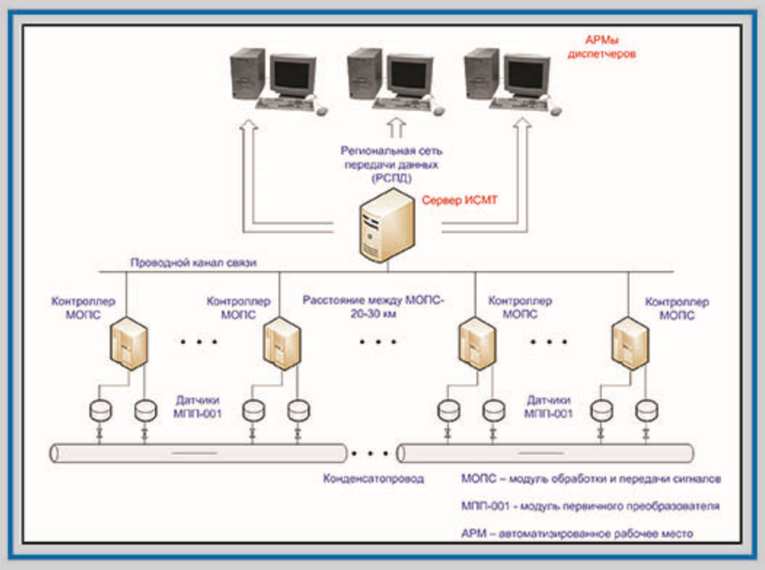

From technical point of view, pipelines are complicated engineering facilities which, beside the pipe itself, include protection units, cathodic protection stations, pumping stations, aerial, automotive and railway crossings; the pipelines, located near to settlements and industrial facilities, need even more serious attention in order to be run safely.

That is why one should solve such challenges as safe pipelines' exploitation, control over technological parameters of transporting regime and leakages detection in complex and in proper time. Technical and ecological aspects of safe hydrocarbons transportation are to be solved simultaneously.

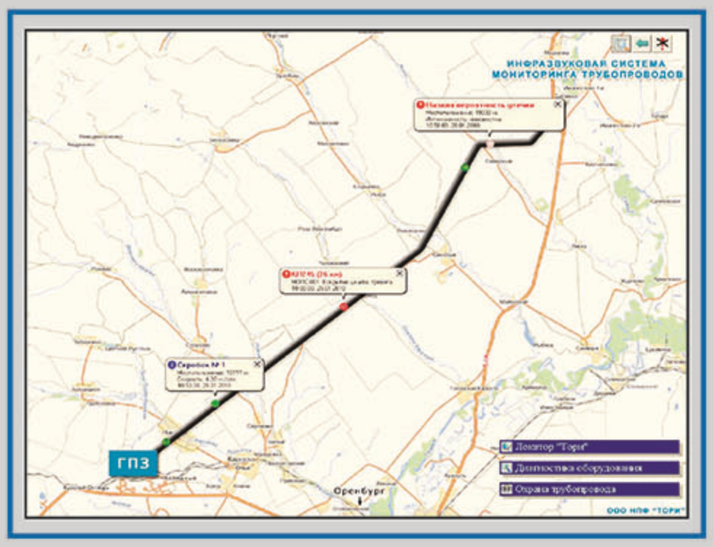
Pipelines' threats are:
- technological regime's failure;
- terrorist act;
- natural occurrences, such as lightning, storms;
- outside interference.

The main threats are low intensity leakages, which cannot be detected by linear remote control devices after pressure drop. Such leaks may result in technical and ecological subsequences and create risk of anthropogenic catastrophe.

## GAZPROM DOBYCHA ORENBURG'S SPECIALISTS BELIEVE THAT THE PIPELINES WHICH HAVE WORKED OUT RATED RESOURCE NEED TO BE RECONSTRUCTED AND EQUIPPED WITH LEAKS DETECTION SYSTEMS (LDS)








IPMS is a pipeline complex monitoring and leak detection system. It secures:
- leak detection, including long branch pipes with small diameter;
- locating of internal devices;
- detection of mechanical effects;
- detection of damages (without pigging);
- pressure measurement;
- guarding and diagnostics;
-easy sensors setting, near to existent automatic remote control points up to 30 km. from each other. No additional cable is needed along with pipeline; sensors don't prevent pigs to pass by;
- low amount of false response;
- message log.

Conclusion: safety of pipelines is so large-scale financial, ecological and social problem that it goes beyond responsibility of the separate companies and becomes a state problem which needs urgent solving.

Test types:
- leaks simulation by real products withdrawal from condensate pipeline;
- control over a scraper's motion in the pipeline;
- control over operation of IPMS program-technical devices by integrated self-diagnostics means;
- alarm simulation of unauthorized interference;

Tests results:
- technical and operational performance of IPMS and results of trial operation confirmed its reliability while securing safe operation of the segment of the condensate pipeline equipped with the system.