საქართველოს ნავთობისა და გაზის კორპორაცია
Georgian Oil & Gas Corporation

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The standards and relevant normative documents used in the pipeline construction supervision process and the problems encountered

Gas infrastructure and European Standard EN 1594

Workshop

20 - 22 October, 2015

Tbilisi, Georgia

A BRIEF HISTORY

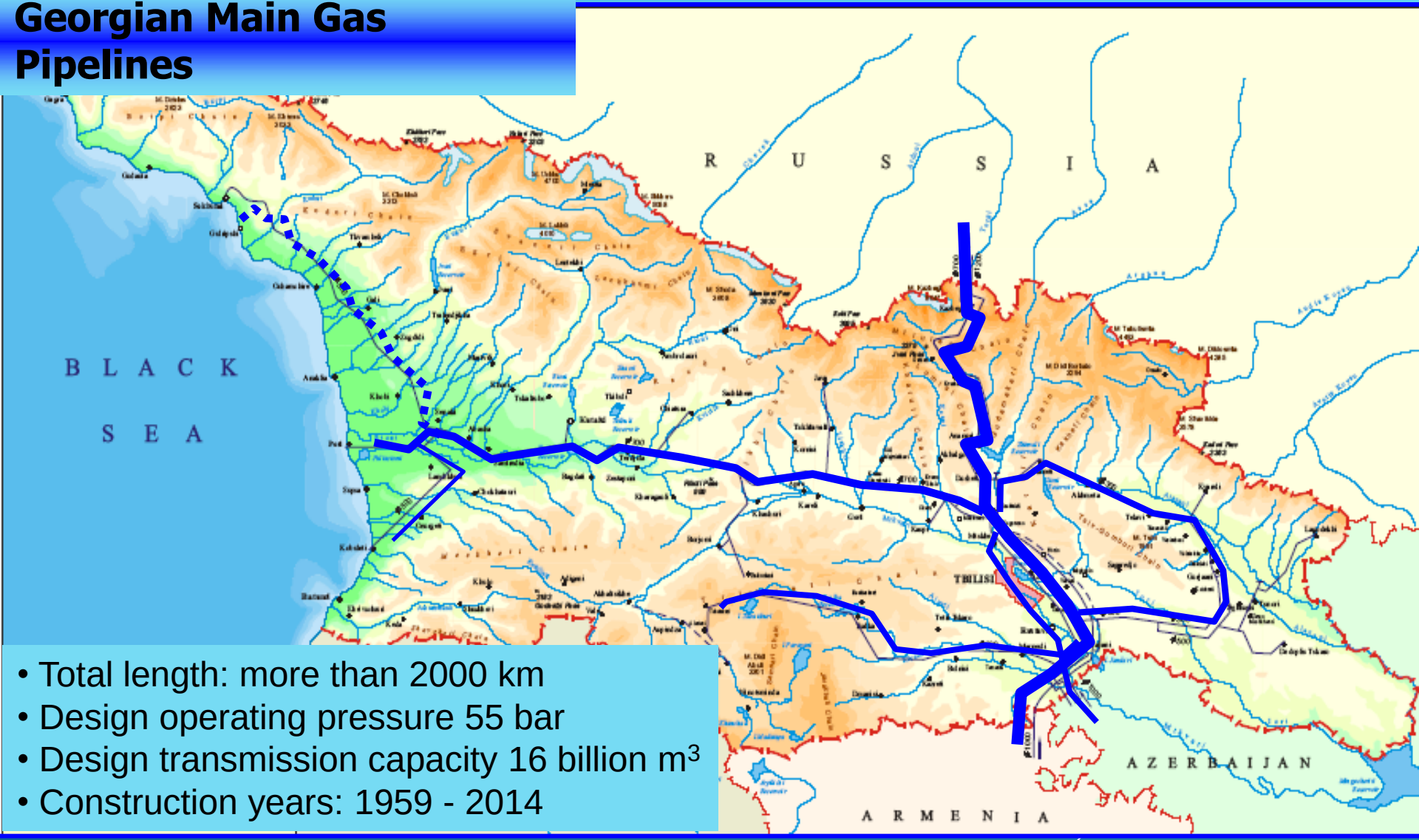
- Normative documents development and and authorization - Centralized;
- Georgian specialists participating as an individual
- Design organizations – in Ukraine and Russia;
- Construction organizations – Outside of Georgia;
- No Technical Supervision Service

A BRIEF HISTORY (CONTINUATION)

GOGC:

- Since 2007: 1st projects of the Trunk Pipelines design, Simplified processes;
- In 2008 the engineering department has been established;
- In 2011 Construction Supervisory Department has been created;
- Implementation of Western Technical norms and standards step by step;
- In parallel pipelines Construction companies have been established in Georgia.

Georgian Main Gas Pipelines



- Total length: more than 2000 km
- Design operating pressure 55 bar
- Design transmission capacity 16 billion m^3
- Construction years: 1959 - 2014

GEORGIAN MAIN GAS PIPELINES (1959-1994 YEARS), PN 5,4 MPA, WORKING PRESSURE - LESS

- North-South Caucasus GP. - 132,65 km, 1988-1994 Years, DN1200;
- Kazakh-Saguramo – 90 km, 1980-2000 Years, DN1000;
- Karadakh-Tbilisi - 2 Line, 62.25 km, 1959 y, DN800, 700, 500;
- Vladikavkaz-Tbilisi - 232 km, 1963 y, DN700, 500;
- Saguramo-Kutaisi-Sokhumi (EWGP)- 455,8 km, 1975, 1986 y, DN800, 700, 500;
- Kobuleti branch 67,7 km, 1990 y, DN500;
- Kakheti GP - 252 km, 1970-1982 and 2014 years, DN500, 300, 200;
- Southern GP- 268,1 km, 1978-2014 y, DN500, 300, 200;
- Gomi-Bakuriani GP - 52,8 km, 1975-1989 y, DN500, 300;
- Total length ≈1620 km. (without looping and SCP)

GEORGIAN MAIN GAS PIPELINES (2007-2006 YEARS), PN 5,4 MPA, WORKING PRESSURE - LESS

- Akhalkalaki outlet -20,4 km, 2007 y, DN300;
- Gardabani-Navtlugi GP - 30 km, 2007 y, DN700;
- Akhaltsikhe outlet -50,5 km, 2009 y, DN300;
- Navtlugi-Saguramo GP -50,4 km, 2010-2012 y, DN700
- Akhaltsikhe-Arali GP- 22 km, 2012 y, DN300, 200;
- Zestafoni-Kutaisi-Abasha-Senaki-Poti GP- 129 km, 2011-2014 y, DN700;
- Gori-Qareli GP - 30 km, 2014 y, DN700;
- Rustavi-Sagarejo GP - 25 km, 2014 y, DN300;
- Tsiteli khidi-Marneuli GP - 24 km, 2014 y, DN500;
- Total length ≈380 km.

GEORGIAN MAIN GAS PIPELINES. MAIN ELEMENTS AND NODES

- **Crane assembly: Total** 352, **among them lines** 182, **Interconnectors** 38, **branches** 132;
- **Natural gas measuring stations: Total** 9, **Among them: the commercial** 4 (2 **check**), **technological** 5;
- **Gas pressure regulating stations : Total** 166, **the number of consumers** 250;
- **Underground gas storage : not available, The design stage** 1.

Selection, adoption and use of ND

Typical Stages:

1. Strategic Goal.

2. Selection of a minimum set of priority standards.

3. Selected standards and study.

4. Implementation of selected standards in Georgia.

5. Using standards.

1. Strategic Goal

1. European integration for the purpose of modernization of the legal framework of the segment.
2. Modernization of gas transport infrastructure to the up-to-date international level.

2. Selection of a minimum set of priority standards

European and international standards:

- **INOGATE previous project**

(Harmonisation of Gas and Oil Technical Standards & Practices in Eastern Europe and the Caucasus»);

- **INOGATE current project**

(INOGATE Technical Secretariat and Integrated Programme in support of the Baku Initiative and the Eastern Partnership energy objectives);

- **Selection activities within the Technical Committee.**

Own (GOGC) Initiative:

- **API, ASME, DIN Standards.**

3. Familiarization of the Selected standards and training

1. Working on stndards within the projects.
2. TC working process - For Technical Committee Members.
3. INOGATE projects (Some specialists).
4. Trainings and seminars.

4. Selected standards by Georgian standards REGISTER (17.07.2015)

Joined by GEOSTM:

- **72 EN (is being prepared EN 12186:2000/A1 Gas pressure regulating stations for transmission and distribution, EN Georgian translation);**
- **239 ISO standards (among them 1 in Georgian, ISO 14532 Natural gas — Vocabulary;**
- **5 API;**
- **10 ASME;**
- **1 DIN.**

5. Standards Implemented in the following Processes:

1. Design;
2. Materials and equipment purchase;
3. Construction and/or reconstruction of the existing pipelines;
4. Operation and maintenance (GGTC).

Remarkable Results (Expart's opinion)

- **HDD river Rioni: Length 655 m, DN700;**
- **The cable suspensed bridges**

(On the river Devdoraki, Length 238 m, DN700;

On the river Kuro- Length 335 m, DN1200 (design stage);

- **GP Senaki-Poti - Heavily watered and swampy ROW - 30 km, DN700;**
- **Airial crossings: river Rioni - 2; river Kvirila – 1; river Lochini -1.**

New Georgian regulation: establishing Pipelines protection and safety zones

The document elaborated based on SST ASME B 31.8, SST EN 1594, SST EN 14161 and SST ISO 13623 standards.

For the protection and safety of the following areas.
Pipelines for maximum operating pressure over 16 bar:

- Protection Zone I- 0-4 m From both sides of the pipe axis;
- Protection Zone II - 4-25 m From both sides of the pipe axis;
- Safety Zone III - 25-200 m From both sides of the pipe axis;
- Consultation Zone IV - 200-500 m From both sides of the pipe axis.

New Georgian regulation (Continuation)

- I and II zone of protection of buildings can not be constructed;
- Security III zone construction (buildings points) is permitted: the location of the class, the safety design factor and pressure testing of the pipeline based on size;
- Consultation IV zone virtually no restrictions;
- There are many other nuances.

Complications

- Functional standards of a general nature and a large number of interrelated standards;
- Companies in the services do not exist or their weakness;
- Language barrier;
- Specialist training;
- Regular and forced mobility of Staff.

TC's functions

Within its competence:

- Standardization Program Project Review;
- Drafting standards;
- Discussion of draft standards;
- Preparation of recommendation for Adoption of standards;
- Revision of standards according to International experience;
- International / regional standards harmonization and standardization process at the national level to support the development.

Technical committee to work on improving matters

- The Technical Committee has a significant support from the agency (GEOSTM), but it is not enough to succeed;
- European Committee for Electrotechnical TC can’t be mirrored;
- Independent TC for the natural gas industry (or enlargement of the existing);
- Training of TC members and specialists by means of internship in the well-known international centers,, but not through short-term workshops and seminars

Thank you for your attention

API, ASME Standards

- **API 102:2014/2014 Steel Pipelines Crossing Railroads and Highways.**
- **API 1110:2013/2014Recommended Practice for the Pressure Testing of Steel Pipelines ...**
- **ANSl/API 6D:2012/2014 Specification for Pipeline Valves**
- **API 1104:2013/2014 Welding of Pipelines and Related Facilities**
- **API 598:2009/2014 Valve Inspection and Testing**
- **ASME B16.25:2012/2014 Buttwelding Ends**
- **ASME B16.34:2013/2014 Valves Flanged, Threaded, and Welding End**
- **ASME B16.49:2012/2014 Factory-Made, Wrought Steel, Buttwelding Induction Bends for Transportation and Distribution Systems**

API, ASME Standards

- **ASME B16.5:2013/2014 Pipe Flanges and Flanged Fittings**
- **ASME B16.9:2012/2014 Factory-Made Wrought Buttwelding Fittings**
- **ASME B31.4:2012/2014 Pipeline Transportation Systems for Liquids and Slurries**
- **ASME B31.8:2012/2014 Gas Transmission and Distribution Piping Systems**
- **ASME B31G:2012/2014 Manual for Determining the Remaining Strength of Corroded Pipelines**
- **ASME B36.10M:2010/2014 Welded and Seamless Wrought Steel Pipe**
- **ASME BPVC VIII:2013/2014 Rules for Construction of Pressure Vessels . Division 1 - 3**
- **DIN 30670:2012/2014 Polyethylene coatings on steel pipes and fittings-Requirements and testing**