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Georgian Oil and Gas Trunk Pipelines

Part I. Technological, Economical, Legislative and Geopolitical Aspects of Functioning of Trunk Pipelines

Part II. Fundamentals of Oil and Gas Pipelines Design and Construction

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BRIEF SUMMARY

The role of the South Caucasian countries, their political and cultural progress was predetermined by bordering with the Caspian, the Black and Mediterranean Sea basins and the shortest trade bridge between Asia and Europe to exchange goods, spread cultural values, religious ideas, scientific and technical achievements.

Under the Soviet Empire, the economy of Caucasian republics, the energy and transport infrastructure between them, belonged only to the outermost, dead-end and/or domestic facilities and did not have any practical value in terms of economic development and global integration with the rest of the world.

After collapse of the Soviet Union, Georgia was given the opportunity to settle economic processes and start political integration by its own. Transition of Georgia from the Empirecenterplanned economy to market economy, from totalitarian regime to democracy, appeared to be rather painful against the background of economic sabotage and military-political hostility caused by the former metropolitan country which resulted in the development of a dire economic and social crisis at the initial stage of the country's independence . Recently the situation has significantly changed. Neither more severe economic blockage, nor the direct military agression of Russia, with occupation of around 20% of the country's sovereign territory, hindered restoration and gradual progress of economy.

Functioning of one of strategic industries – energy sector- has dramatically improved in the country which is based primarily on usage of local resources and maximal utilization of transit potential preconditioned by favourable geo-strategic location of the country.

Energy policy of Georgia, along with advantageous usage of local resources, is oriented towards integration into regional and international structures, supporting full utilization of transit potential predetermined by favorable geostrategic location of the country. Proceeding from political aspiration for accelerated integration of Georgia into European structures and NATO, the efforts are directed at maximum facilitation of establishment and development of the East-West unified energy corridor, which is a priority for Georgia and its strategic partners, as well as integration of

the energy sector into regional and European energy markets. One of the necessary conditions for successful implementation of this strategy is to harmonize the energy market governing legislation and technical regulations for design, construction and operation of transit and other new trunk pipelines with European legislation and regulatory documents.

Proceeding from the above mentioned, particular emphasis in the monograph is given to the potential of supply of hydrocarbon resources of the region (Azerbaijan and Central Asia) to the European market, development of the Georgian and regional transport infrastructure, construction and operation of main pipelines. Also, the situation created in the Georgian energy sector and possible development scenarios depending on probable changes in the regional market are analyzed, including brief review of issues of institutional and legislative framework, the main transport infrastructure, transit mainlines, participation in potential international projects, energy market security, further development prospects and other significant issues.

The first chapter reviews the current trends of global energy sector and pricing mechanisms for primary energy resources. Brief history of main pipeline development, particularly, in the region, is also provided.

The second chapter is dedicated to description of the Georgian energy sector, history of its development and analysis of the situation established in the current period. Energy resources and their utilization potential are characterized; their consumption tendencies and prognosis evaluations are reviewed.

The current challenges faced by the Georgian energy sector related to the problem of integration of the country's energy market into the regional market, in terms of harmonization of corresponding legislative principles and drawing the institutional arrangement model closer to the European one are emphasized.

The EU 3rd Energy Package Directives and Regulations are thoroughly analyzed, challenges related to their implementation in the Georgian energy market are evaluated.

Organizational structure, composition and legislative-regulatory documentation of the European Energy Community are discussed. Problems connected with full integration of Georgia into this structure are analyzed. Assessment of expectable positive results is presented.

Urgent issues of Georgia's energy security and energy resource transit-related projects are reviewed; further directions of energy policy are set.

The third chapter of the monograph provides the review of oil and gas regional market. Energy resources and export potential of Azerbaijan and Central Asian oil and gas producing countries, as well as Russia and Iran, are analyzed.

The issues of demand and supply of energy markets of the consuming countries of the region: Turkey, Ukraine, Armenia, Romania, Bulgaria and other countries of the European Community are reviewed. Demand of the South-East European counties on additional oil and gas and supply opportunities from Caspian fields through Georgia are thoroughly reviewed.

The fourth chapter is dedicated to oil and gas transportation infrastructure and underground storages. Transportation means and methods are reviewed; all main oil and gas pipelines operating in the region, as well as prospects of implementation of pipeline projects stipulated by the Europe's Southern Gas Corridor Concept are described.

The second section of the monograph covers general issues of main pipeline system design and engineering, as well as development of recommendations considering the international expertise in design.

The fifth chapter provides a brief overview of main oil and gas pipeline design rules and methodology, technical parameters used for their construction; the major structures of main pipeline systems are described.

Separate section of the book is dedicated to brief review of regulations and methodology of main pipeline engineering, including development of applicable to local conditions recommendations for implementation of technical regulations (Norms, Standards) utilized in the international practice.

The issues of testing pipelines for strength and stability, technological calculations, design of linear part and natural and artificial obstacles (rivers, roads etc.), as well as environmental protection and security are reviewed. For the first timethe international experience of design, construction and operation of offshore pipelines and main pipelines located in mountainous regions applicable to the Georgian reality is also presented

The sixth chapter of the work describes general practices of main pipeline construction and operation, including construction processes and procedures, construction project management.

Such specific aspects of main pipeline operationas their supervision, monitoring and diagnostics as well as maintenance and measurement, recording of transported flowsare thoroughly covered.

Land usage issues during the main pipeline construction and operation are accentuated. Large reference information required for design (energy terms, dimensions and their conversion factors, calculation diagrams and formulas etc.) is provided in the annexes.

The monography is intended for experts interested in issues of main pipeline planning, design, construction and operation and students of high schools and universities.

The analyses done in monography, cover comprehensive issues of the significant problem of integration of the country into European and regional energy communities, showing economic and legal grounds and expected geopolitical results. This will be of invaluable assistance to experts and public institutions concerned with issues of regional economy and geopolitics, as well as politicians in drafting objective strategic decisions beneficial for the country in relation to prospects of development of main gas pipelines passing through Georgia and other transit main pipelines of the region.

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ATTACHMENTS

Abbreviations Glossary of terms Conversion Factors Case Studies