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Georgian National Energy and Water Supply
Regulatory Commission (GNERC)

Infrastructure of Georgian Water Supply

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Review of Georgia's Infrastructure

Approach to water usage is the reflection of recent political, economic, and technical problems in Georgia, which require urgent resolution

The country's main goal is to protect and rationally use water resources



The water distribution sector underwent administrative changes in 2009.
This resulted in the unification
of several water supply companies

In Tbilisi

1. Georgian Water & Power
2. Rustavtskali
3. Mtsketatskalkanali
- United Water Distribution Company of Georgia united all water distribution companies from western and eastern regions of Georgia

In Achara

1. Batumi tskalkanali
2. Kobuleti tskalkanali
3. Kedi tskalkanali
4. Khulo tskalkanali
5. Khelvachauri water



Water customers in Georgia are:

residential
commercial
municipal

Water is provided to residential customers from water reservoirs and water processing plants. Technical, technological, and environmental characteristics of these facilities must be in compliance with modern water quality requirements.



- Contamination of water sources can cause irreversible consequences such as spreading infectious diseases among water consumers.
- Today this threat is very realistic as the water supply systems in Georgia have deteriorated and most of the collectors do not function and cannot be repaired. Used water flows directly into reservoirs.



- There were cases when sewage waters spilled to the ground surface and caused flooding in the streets. Such spills can become source of water contamination.
- It is crucial that the physical condition of sewage systems in Georgian cities, as well as observation wells located at the collectors, are examined thoroughly to assess the need for their repair.



- Physical condition of water distribution systems in Georgia is beyond satisfactory; this includes the volume as well as the quality of water.
- Contaminated water disposal to rivers cause many problems. Rivers in Georgia are not big, and even a small amount of contaminated water can change the level of river pollution.



- The main sources of chemical contamination are: drained water from factories; water contaminated by fertilizers drained from agricultural soil; warehouses, where mineral fertilizers are stored; and facilities, which store fuel and other materials.
- Fortunately, most of the Georgian cities and towns are supplied by ground water, which does not require special water purification facilities. However, there is a certain number of towns, which live on surface water. In this cases water must be filtered in special and expensive water purification facilities.



- With very few exceptions, such filtering facilities either do not function or do a poor job due to financial problems.
- Both ground and surface water need to be chlorinated after filtering. Even though chlorination facilities are available, water chlorination happens sporadically, rather than regularly, which is not acceptable.



GNERC Priorities

The following issues are most important:

- Ensuring that the technical and environmental characteristics of the water supply and sewage systems in residential areas comply with current requirements;
- Protecting water reservoirs from contamination in order to avoid threat of infectious diseases;
- Monitoring of sanitary zones;



- Evaluating functional quality of water supply and water distribution systems (pumping stations, pressure and regulating reservoirs, main and distribution pipelines, and facilities within the network);
- Comparing actual quality of water against regulatory standards in residential areas (24 hour water supply and scheduled water supply);



- Evaluating the extent of losses through leakage in outside and inside pipelines due to aged and damaged pipes, and developing measures for reducing loss;
- Evaluating delivered and distributed drinking water to residents;
- Improving water metering system;
- Monitoring proper operations of water cleaning facilities and protecting reservoirs from contamination;



- Financial and economic issues confronting water companies; evaluation of expenses related to energy, acquiring new technologies, and system rehabilitation and development;
- Infiltration and exfiltration. When there is water in a pipe, it leaks from the pipe; when a pipe is empty as scheduled, ground water goes into the pipe. It is particularly dangerous if a leaking sewage collector is located near a ground water reservoir, as it might result in a pandemic of infectious disease among the local residents;



- Decontamination; evaluating chlorine and coagulant content;
- It is very important to determine the prices for new customers who are connecting to the network.



Approaches to Problem Solving

Our foremost priority is to study and analyze:

- Actual costs of sewage systems and water delivered to cities and towns
- Physical conditions of pipelines, collectors, observation wells, and other facilities to determine if they need repairs



- Solving these technical problems will require significant financial and other resources, which the inspection departments unfortunately do not possess. The main reasons for the problems are those named in the previous slide, as well as very low revenues from water services, except, to a certain extent, in the City of Tbilisi
- Installing water meters can significantly reduce water waste to its reasonable consumption levels. It would be very effective if we could install meters in each house or apartment.



- Until recently there was no agency that had complete information on financial, economic, and physical condition of water pipelines collected by technical and inspection departments of different companies. Physical condition of pipelines were inspected and reported by water companies at the local governments' requests.
- Since all water supply companies are now regulated by GNERC, GNERC has the data on the financial, technical, and physical condition of water pipelines, which is provided by companies (although the data is incomplete).



- Based on this data and other information, GNERC is planning to develop a database of all water companies in the country. Such database will facilitate monitoring and planning of future projects.
- GNERC has developed and adopted regulations for drinking water delivery and consumption that help regulate relationship between water companies and their customers. GNERC has also developed a methodology for calculating water use tariffs.



- Connecting new facilities to main pipelines must not overload street water pipelines and sewage collectors. Guidelines for increasing pipeline capacity must be developed.
- It is necessary to determine the cost of connecting new facilities, which will include the cost of project development and construction.



- Old network facilities should undergo reconstruction to increase their capacity. To resolve these problems, Georgian Academy of Engineering has been performing intensive research and development.
- “Agreement on developing a methodology for calculating standard losses in water supply systems and pipelines and determining a one-time cost of connecting new facilities” was signed between GNERC and Georgian Academy of Engineering.



- When connecting new facilities to technical systems and water companies, issues arise that need immediate resolution.
One such important issue is building an extension and determining the cost of its connection to existing network.
- Two parties participate in resolving this issue:

Customer – owner of the extension to be connected to the main network (legal entity or an individual)

Contractor – a water company, which provides engineering and technical services



- The main factor which determines the cost is the volume (m^3) and the price of requested water.
- Considering that building extensions and connecting them to existing networks is performed in residential neighborhoods with different characteristics, we believe that the cost of the development of the entire system will be used as the basis when determining the price.



- The cost of technical work to be performed by the contractor will depend on the scope of work and the projected duration of the project until its completion.
- To begin work on this technical project, information is required about the network's current condition, topography, and geology of the neighborhood, district, or street, where this work will be done. Determining the optimal diameter of the connection point, projected consumption, and connection lines require time and resources.



- According to technical terms, the cost of construction in each individual case is determined by the architectural firm or the contractor based on their agreement with the customer.
- The cost of construction and repairs depends on the type of work and its duration and is determined by the construction firm or contractor (if the latter performs the actual work) based on the agreement with the customer



- The cost of permission to connect to the network and register as a subscriber depends on the unit price of consumed water during connection, which fluctuates based on the volume of requested water.
- For calculating unit price the annual cost is divided by the annual volume of delivered water.
- We believe that the first priority for the country's development should be resolving the issues discussed above.



Renovating Water Supply Systems

- Millions of laris are spent on renovating water supply systems in Georgia. For many years now renovation has been going on in Poti, Batumi, and Kobuleti, but the water supply problems still exist in there.
- Renovation is planned in thirty regions throughout the country.
- The following funds are allocated for these projects :
 1. 35 mln laris from Georgia's budget, and
 2. 40 mln Euros from the European Investment Bank



- Based on preliminary estimates, \$3 billion will be spent on renovation of regional water supply systems. Funds will be raised by the Georgian government from international agencies incrementally.
- Thirty five municipalities have been selected for urgent renovations.
- Part of the renovation of water supply systems throughout Georgia is done through the Municipal Development Fund, while the other part is conducted by a newly formed Joint Water Supply Company of Georgia.



- **93.794** mln Laris are allocated for the project, including:
 1. 30.540 from the federal budget, and
 2. 63.254 as a low interest loan (European Investment Bank)

The funds for water supply renovation are distributed among regions as follows:

- Batumi – 105 mln. Euros
- Poti – 15.870 mln. US Dollars
- Kutaisi– 20.499 mln. US Dollars
- Kobuleti – 22.180 mln. US Dollars
- Borjomi – 26.980 mln. US Dollars
- Bakuriani – 9.860 mln. US Dollars



- According to the Agreement, signed in 2008, The Multiplex Energy Company will do the following in Tbilisi, Rustavi, Mtskheta, and Gardabani:
 1. Invest no less than 200 million laris in water supply systems
 2. Beginning in 2011, ensure uninterrupted, round-the-clock, water supply to old districts of the cities
 3. Beginning in 2015, ensure uninterrupted water supply to newly constructed districts
 4. No later than 2012, stop drainage of sewage waters to the Mtkvari River
 5. No later than 2012, install water meters in residential buildings
 6. Ensure that water quality corresponds to WHO standards



Calculating Losses

- Deficit of drinking water is related, in particular, to inefficient water consumption and significant amount of leakage, which is caused by wear and tear of pipelines and equipment.
- High volume of losses imply leakage and waste of water, which is preventable.



- There are two types of losses:
 1. Losses in the outside pipelines in residential neighborhoods, and
 2. Losses in the inside pipelines of residential buildings
- Losses in the inside pipelines are covered by the facility/building. Estimating the volume of losses is very important as it has a significant impact on the normal functioning of the outside pipelines.
- Losses in the outside pipelines in excess of allowable losses are covered by the water company; the allowable losses are recaptured through tariffs.



- The following is an action plan, which will help manage excessive water consumption and eliminate deficit of drinking water:
 1. Timely repairs
 2. Eliminating leakage
 3. Avoiding excessive pressure

Also using:

1. Modern faucets
2. Lockers
3. Protectors
4. Regulating equipment
5. Measuring tools



- In addition to developing water consumption standards for residents, maintenance standards are also developed
- In developing standards for water consumption, different consumption levels in different seasons, times of the day etc. must be accounted for. For this reason, differential coefficients are calculated. There are seasonal, monthly, 24 hour, and hourly differential coefficients.



Large Volumes of Water

Consumption can be:

- Minimal – for maintaining normal lifestyle, including necessary amount for industrial purposes
- Reasonable – consumption of more than necessary amounts of water due to increase in quality of life
- Excessive – consumption of more than reasonable amount



Visible and invisible leakage

Visible leakage:

- Fountains, fire hydrants, and other types of water flow equipment (excessive, drop by drop, “pipe sweating” etc.) in the connection points caused by defective fixtures/couplings, which are installed in wells or cells and are easily accessible for inspection.
- Visible leakage also includes water losses caused by the pipeline damage or during emergency situation, when water comes up to the ground surface and floods basements and other ground floor constructions and communications.



- Currently the cost of consumed water, including losses in both inside and outside pipelines, is paid by the customers. In the future, the customers will pay only for the cost of the inside losses, while the cost of excessive outside losses will be paid by the supplier company. That is why it is very important to timely and accurately calculate standards for outside losses for each residential neighborhood.



It is important to determine the volume of consumed water and the factors that cause losses, in particular,

- length and age of pipelines, their diameter, and material they are made of
- size of couplings
- pressure volume
- number and condition of reservoirs and pumps
- emergency situations and time for their elimination
- leakage in outside networks and main pipelines discovered during systematic inspection



5. Protection of Customer Interests

GNERC's main function here is to regulate and stabilize relationships between customer and company, review complaints, and provide customer with general information. In case of a dispute, GNERC reviews the matter and mediates between the customer and the company. In case a dispute resolution cannot be achieved, the committee reviews the matter in a special session and takes a binding decision.



Thank you for your attention!