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GEORGIA POWER AND GAS INFRASTRUCTURE PROJECT (PGIP)

FINAL REPORT
May 21, 2010 through April 7, 2014
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Senaki-Poti pipeline segment, welding activities.

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This final report for the Georgia Power and Gas Infrastructure Project (PGIP) covers the period from May 21, 2010 through April 7, 2014 and is the final report as required by the Task Order. It was prepared by Tetra Tech ES, Inc. (Tt) and falls under Task Order Number AID-EDH-00-08-00027 – AID-114-TO-10-00003.

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Acronyms

A/E	Architecture and Engineering
CO	Contracting Officer
COP	Chief of Party
COTR	Contracting Officer's Technical Representative
CP	Cathodic Protection
CY	Calendar year, January through December
DGA	Dissolved Gas Analyzer
DNxxx	Pipe size, for example, DN700 for ~ 700 mm pipe
DOY	Day of Year, January 1 is DOY 001
EECS	Enhanced Emergency Control System
FAT	Factory Acceptance Test
FIZ	Free Industrial Zone
FY	Fiscal Year (October 1 through September 30)
GGTC	Georgia Gas Transmission Company
GIPTP	Georgia Improved Power Transmission Project
GOG	Government of Georgia
GOGC	Georgian Oil and Gas Company
GPC	Georgia Pipeline Construction (also known as Sakmilsadenmsheni or SMSM)
GSE	Georgia State Electro system
HDD	Horizontal Directional Drilling
HICD	Human Institutional Capacity Development
HPEP	Hydro Power Energy Project
IPTT	Indicator Performance Tracking Table
km	Kilometer
KP	Kilometer Point, Kilometer Post
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt hour
LN	Local national
LOE	Level of Effort
LOP	Life of the Project
LTTA	Long Term Technical Assistance
M&E	Monitoring and Evaluation
MoE	Ministry of Energy
mm	Millimeter
MWH	Mega Watt-hour
NDT	Non-Destructive Testing
OGCT	Oil and Gas Construction Trust
OHL	Overhead Line
O&M	Operation and Maintenance
PGIP	Power and Gas Infrastructure Project
PGIOP	Power and Gas Infrastructure Oversight Program
PIRS	Performance Indicator Reference Sheets
PMP	Performance Monitoring Plan
POWER	Power Engineers, Inc.
PWC	Project Web Collaboration
Q1	First quarter of Federal fiscal year; that is, October, November and December, similarly for Q2, Q3 and Q4
QA/QC	Quality Assurance/Quality Control

ROW	Right of Way
SEL	Schweitzer Engineering Laboratories, Inc.
SER	Sakenergoremonti (also known Georgia Energy Construction)
SFP	Single-mode fiber optic part
SMSM	Sakmilsadenmsheni (also known as Georgia Pipeline Construction or GPM)
SOCAR	State Oil Company of Azerbaijan
SOW	Statement of Work
TO	Task Order
Tt	Tetra Tech
USAID	United States Agency for International Development
USG	U.S. Government
WO	Work Order

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Executive Summary

USAID's Georgia Power and Gas Infrastructure Project (PGIP) assisted the Republic of Georgia in improving its electricity and gas infrastructure, which was devastated by civil war, lack of regular maintenance, and little investment. This project supported USAID's objective of promoting energy security through greater access to electricity and natural gas supplies for households in western Georgia, promoting the development of the Poti Free Industrial Zone (FIZ) on the Black Sea, and securing power exports through in-country reliability related infrastructure improvements. The activities assigned were managed by Tetra Tech (Tt) and supported USAID's objective of fostering sustainable development.

To support USAID's objective and build sustainability in the Georgian energy sector, Tt provided: a. oversight and advisory support to the Georgian State Electrosystem (GSE) in the upgrade, reconstruction and operation of the Georgia Improved Power Transmission Project (GIPTP); and b. oversight and advisory support to the Georgian Oil and Gas Company (GOGC) in gas transit infrastructure construction and rehabilitation related activities.

Project Benchmarks:

During the reporting period, USAID and Tt supported the achievement of key benchmarks in the upgrading of both the electrical transmission line and the rehabilitation of the gas network in the Republic of Georgia.

Component I: Electricity Transmission Upgrade, Reconstruction and Operation

- ***Construction and Reconstruction of the Menji and Tskaltubo East-West Power Line***

The Tt team provided multi-phase oversight and advisory support to GSE and Sakenergoremonti (SER- the construction contractor) to begin the rehabilitation of the Menji-Senaki and Tskaltubo Substations. These rehabilitation activities are critical for the comprehensive functional operation of the electrical transmission network throughout and between eastern and western Georgia. As a result of the successful collaboration between GSE, SER and Tt, the Menji-Senaki and Tskaltubo Substations will become completely operational in 2014.

- ***Dissolved Gas Analyzer (DGA)***

Tt provided oversight management services for the procurement and installation of a dissolved gas analyzer (DGA) system. Under the PGIP project, the final installations and testing of the system were completed in March 2014 and GSE is now able to remotely gather data from the relevant substations and monitor the system from the National Control Center (NCC) in Tbilisi.

- ***Enhanced Emergency Control System***

Tt provided oversight management and comprehensive technical support to GSE in identifying, procuring and installing an EECS-smart grid network. In spring 2012, Tt oversaw the tendering process with the contract being awarded to Schweitzer Engineering Laboratories, Inc. (SEL) in fall 2012. SEL completed the testing and commissioning of the EECS at all GSE planned substations in March 2014, and the system became officially operational.

Component II: Gas Transit Infrastructure Construction, Replacement and Rehabilitation

- ***Poti – Senaki Pipeline (Phase I):***

The Senaki-Poti main gas pipeline was constructed to restore natural gas supply and service to the Poti area, and to ensure a reliable gas supply to the recently created Poti Free Industrial Zone (FIZ) and to the future natural gas liquefaction plant. To support Poti's energy needs and further rehabilitate Georgia's infrastructure, 30 km of new gas pipeline was installed from Senaki to Poti. This activity also built technical knowledge capacity as USAID chose GOGC to be the in – country prime contractor. As such, Tt worked with GOGC to design the pipeline and obtain the environmental and governmental approvals.

- ***Abasha-Senaki Pipeline (Phase II):***

Under this activity, Tt provided management oversight of GOGC in the survey, design, tendering, procurement and construction related activities of the new Abasha-Senaki 29 km long, 700 mm diameter pipeline.

Picture 1: Construction Activities, Abasha-Senaki Pipeline

- ***Phase III Kutaisi- Abasha Pipeline (Phase III):***

The focus of this activity was to ensure management oversight of GOGC in the survey, design, tendering and procurement related activities for the new Kutaisi-Abasha 47 km long, 700 mm diameter pipeline for usage. Tt also introduced a new technology, horizontal directional drilling (HDD), to support the construction of this pipeline segment, which proved to be more efficient and environmentally friendly than alternative technologies.

- ***Phase IV (Gori-Kareli and Zestaphoni-Kutaisi):***

The focus of this activity was to ensure management oversight of GOGC for the survey, design and tender related activities of the Gori-Kareli and Zestaphoni-Kutaisi pipeline segments. The two new pipeline segments will be 700 mm diameter pipes, lying approximately 43 km in length.

Component III: Capacity Building and Oversight

- ***Capacity Building Activity:***

As the oversight contractor, Tt provided capacity building assistance to GOGC and GSE through on-the job training, informal meetings and stakeholder workshops. Following USAID's objective of host country capacity building, Tt provided intensive technical assistance and formal mentoring to GOGC and GSE through a variety of functions such as on-the-job training, informal meetings, and stakeholder workshops.
Two such examples were: a three-day workshop, held in March, for GOGC personnel in the areas of pipeline integrity management, construction management as well as operations and maintenance; and b. an in-depth training providing to seven GSE team members in April and August 2011 regarding the proper operations, usage and applications of CAPE software.

- ***Oversight & Technical Support Activity- Power Transmission and Gas Sectors:***

Tt provided project management oversight for contracts and agreements related to gas and power infrastructure rehabilitation. Tt also provided guidance and technical assistance to USAID, counterparts and contracts in the areas of engineering, design, construction management and supervision. In addition, Tt provided technical advisory services in the preparation of bidding documents for construction and design as well as oversight of construction activities to ensure their compliance with local law.

- ***Procurement & Design Activities:***

During the course of the PGIP project, Tt managed, in a timely manner, the preparation of detailed engineering designs, plans and cost estimates for assigned USAID programs and activities. Tt ensured that all designs complied with appropriate national standards that applied to the specific project needs while always adhering to best international engineering standards. In addition, Tt also provided high-caliber, professional engineering and technical guidance in the execution of power and gas activities. These activities encompassed all aspects of energy infrastructure projects from conceptualization and analysis through approval.

During the reporting period, under USAID's objective to support energy security and sustainability in Georgia, Tt delivered extensive management oversight and advisory services to key counterparts in the Georgian energy sector. Through these collaboration and services, Tt and its counterparts worked to achieve major benchmarks in rehabilitating the gas pipeline and transmission networks in western Georgia. These activities will continue and be completed in 2014 and will go a long way in building a viable and multi-functional energy sector in Georgia.

Introduction

This final report plan describes the activities undertaken during the course of the Georgia Power and Gas Infrastructure and Project, covering the period of May 21, 2010 through April 7, 2014. It was prepared by Tetra Tech ES, Inc. (Tt) and falls under Task Order Number (TO) AID-EDH-00-08-00027 – AID-114-TO-10-00003. For reference, a comprehensive list of all project deliverables is provided in Annex I.

1.1 PGIP Scope of Work

Through the PGIP project, Tt, as the designated oversight contractor, provided engineering and technical support to ensure safe, sustainable and efficient energy infrastructure facilities in Georgia. PGIP's activities and scope directly supported USAID's assistance objective in the areas of economic growth and energy security. Specific tasks under the scope of work included, but are not limited to, the following:

- *Planning activities;*
- *Design activities;*
- *Technical support and oversight;*
- *Capacity building; and*
- *Collaboration with stakeholders*

To meet the project's needs, Tt was responsible for identifying, planning, designing and providing technical support and oversight of the PGIP project and related engineering activities. The required technical assistance included a full range of expert engineering advice, procurement and contracting guidance, capacity building expertise and the provision of analytical and technical support to the project's counterparts.

To perform all activities as necessitated by the needs of the project, Tt deployed a team of engineering professionals to Georgia to perform all the oversight, design and technical assistance activities as described below.

1.2 Detailed Work Requirements: Objectives and Components

To achieve the project's benchmarks and key results, Tt provided full construction management services and engineering design for construction activities in the areas of power transmission and natural gas infrastructural upgrades. In addition, Tt provided oversight services and technical assistance for design, procurement and monitoring and evaluation related activities.

PGIP project's mission was to provide in-country professional engineering and other technical services to support power and gas transmission improvements being undertaken by USAID on behalf of the Government of Georgia. To support this mission, the project's updated project objectives, and associated components, are:

- Objective 1: Provide Oversight and Advisory Support to Georgian State Electrical (GSE) in Electricity Transmission Upgrade, Reconstruction and Operation related issues.
- Objective 2: Provide Oversight and Advisory Support to Georgia Oil and Gas Company (GOGC) on Gas Transit Infrastructure Construction, Replacement and Rehabilitation related issues.

Tt worked to achieve these objectives by providing the following oversight and technical assistance provision components and sub-component activities:

PGIP Components		
Component	**1 Electricity Transmission Upgrade, Reconstruction and Operation**	**2 Gas Transit Infrastructure Construction, Replacement and Rehabilitation**
Component Activities	I. Georgia Improved Power Transmission Project (formerly, the Senaki 1 and 2 Power Line and Menji- Tskaltubo Substations)	Phase I. Poti-Senaki Gas Pipeline Construction
	II. System Monitoring and Preventative Maintenance	Phase II. Abasha-Senaki Pipeline Replacement and Rehabilitation
	III. Smart Grid Technology	Phase III. Kutaisi-Abasha Gas Pipeline Construction
		Phase IV. Gori-Kareli & Zestaphoni-Kutaisi Pipeline Construction
	Capacity Building and Oversight: GSE, GOGC and GGTC	

1.3 Activities Undertaken to Achieve Program Objectives

Component I: Electricity Transmission Upgrade, Reconstruction and Operation

The activities in this component focused on the design and reconstruction of the 220kV Senaki twin chain power lines, the full and partial reconstruction of new power substations to support the Senaki line, as well as the implementation of design controls to improve efficiencies and reduce risks in transmission management. Under this component, Tt worked to achieve the following three key activities and all key benchmark achievements are detailed in the "Results Section" below:

I. ***Reconstruction and Construction Activity:*** Under the PGIP project, Tt began providing oversight management and technical advisory services for the design and construction of the twin chain Senaki power transmission line. This line, an estimated 58.8 km, is intended to connect the East-West power transmission network through the Menji 220 kV Substation and the Tskaltubo 220 kV Substation. These construction activities were based on preliminary designs prepared by GSE and will include the installation of 220 kV bays in Tskaltubo and Menji Substations, including requisite breakers, disconnectors, transformers, surge arrestors, control/protection/alarm systems and buildings.

II. ***Dissolved Gas Analyzer (DGA) System:*** Tt provided oversight management services for the procurement and installation of a DGA system. This monitoring system maximizes the service life of transformers by monitoring the gas concentrations in dielectric transformer fluids in real time across the network and benchmarking those concentrations against industry standards to predict potential failures before they occur. As such, USAID's assistance to GSE was intended to support the prolonged and productive life of transformers and critical substation equipment.

Picture 2: Old tower designated for rehabilitation, Senaki I & II Line

III. ***Emergency Enhanced Control (EECS) System:*** Through this activity, Tt provided oversight management and comprehensive technical support to GSE in identifying, procuring and installing an EECS-smart grid network. This new technology is intended to increase the reliability and efficiency of the Georgia transmission grid by eliminating redundancies in power production and dispatch.

Component II: Gas Transit Infrastructure Construction, Replacement and Rehabilitation

The major activities under this component included the construction of the new 30.6 km, 700 mm pipeline from Senaki to Poti, the replacement of 12 km of undersized pipeline sections with new 700 mm pipeline as well as the rehabilitation of 48.3 km of leaking 700 mm pipeline between Abasha to Kutaisi. This component is comprised of the following four activities and, with the exception of the Phase I activities, all pipeline construction and rehabilitation works became part of the PGIOP Task Order. The project close-out for the Senaki-Poti line will also be done during the PGIOP project. All achieved benchmarks are detailed in the "Results Section" below.

I. ***Phase I Senaki-Poti Pipeline Construction Activity:*** The focus of this activity was to provide oversight management and technical assistance provision to GOGC in the construction and installation of a new 30.6 km 700 mm gas pipeline between Senaki to Poti.

Picture 3: Abasha-Senaki Pipeline Construction Activities

II. ***Phase II Abasha- Senaki Pipeline Construction Activity:*** The focus of this activity was to provide management oversight of GOGC in the survey, design, tendering, procurement and construction related activities of the new Abasha-Senaki 29 km long, 700 mm diameter pipeline.

III. ***Phase III Kutaisi- Abasha Pipeline Construction Activity:*** The focus of this activity was to ensure management oversight of GOGC in the survey, design, tendering and procurement related activities for the new Kutaisi-Abasha 47 km long, 700 mm diameter pipeline for usage.

IV. ***Phase IV (Gori-Kareli and Zestaphoni-Kutaisi) Pipeline Segment:*** The focus of this activity was to ensure management oversight of GOGC for the survey, design and tender related activities of the Gori-Kareli and Zestaphoni-Kutaisi pipeline segments.

The two new pipeline segments will be 700 mm diameter pipes, lying approximately 43 km in length.

Component III: Capacity Building and Oversight

Tt provided extensive capacity building functions, oversight and technical support services as well as technical assistance to its counterparts, GSE and GOGC, throughout the PGIP project cycle. This component focused on implementing the following three activities and all key benchmarks are detailed in the "Results Section" below:

I. ***Capacity Building Activity:*** As the oversight contractor, Tt provided capacity building assistance to GOGC and GSE through on-the job training, informal meetings and stakeholder workshops. During the course of the project, Tt also evaluated each organization for capacity assistance needs and proposed interventions to USAID for approval.

II. ***Oversight & Technical Support Activity- Power Transmission and Gas Sectors:*** Tt provided project management oversight for contracts and agreements related to gas and power infrastructure rehabilitation. Tt also provided guidance and technical assistance to USAID, counterparts and contracts in the areas of engineering, design, construction management and supervision. In addition, Tt provided technical advisory services in the preparation of bidding documents for construction and design as well as oversight of construction activities to ensure their compliance with local law.

III. ***Procurement & Design Activities:*** During the course of the PGIP project, Tt managed, in a timely manner, the preparation of detailed engineering designs, plans and cost estimates for assigned USAID programs and activities. Tt ensured that all designs complied with appropriate national standards that applied to the specific project needs while always adhering to best international engineering standards. In addition, Tt also provided high-caliber, professional engineering and technical guidance in the execution of power and gas activities. These activities encompassed all aspects of energy infrastructure projects from conceptualization and analysis through approval.

2 Results Achieved By Component

2.1 Component I: Electricity Transmission Upgrade, Reconstruction and Operation

Activity I: Construction of the Senaki I and II Transmission Lines

Under the PGIP project, Tt began providing oversight management and technical advisory services for the design and construction of the twin chain Senaki power transmission line. The survey and design work for the Senaki I and II electrical power transmission lines began in FY 2010 with the design work being performed by POWER Engineers, Inc. The tender document preparation was completed in FY 2012 and the direct tendering by USAID began in January 2012. USAID awarded the contract for construction in mid-October 2012 (FY 2013), to Sakernergoremonti (SER) a Georgian electrical construction firm.

The construction oversight responsibilities were handed over to the PGIOP project, which commenced on November 2, 2012. Therefore, the construction of the Senaki I & II lines as well

as the rehabilitation of the Menji and Tskaltubo Substations became part of the PGIOP project. The results and final status of these activities will be reported accordingly during the PGIOP project.

Activity II: Dissolved Gas Analyzer (DGA) Project

In March 2012, the DGA project commenced when GSE began the tendering process for the necessary DGA equipment. LumaSense, a US based company, won the tender and the contract was awarded in August 2012.

The Tt's PGIOP team continued to oversee the DGA project to ensure its successful implementation while PGIOP team members also provided technical assistance to GSE.

Picture 4: DGA equipment installed in Gardabani Substation

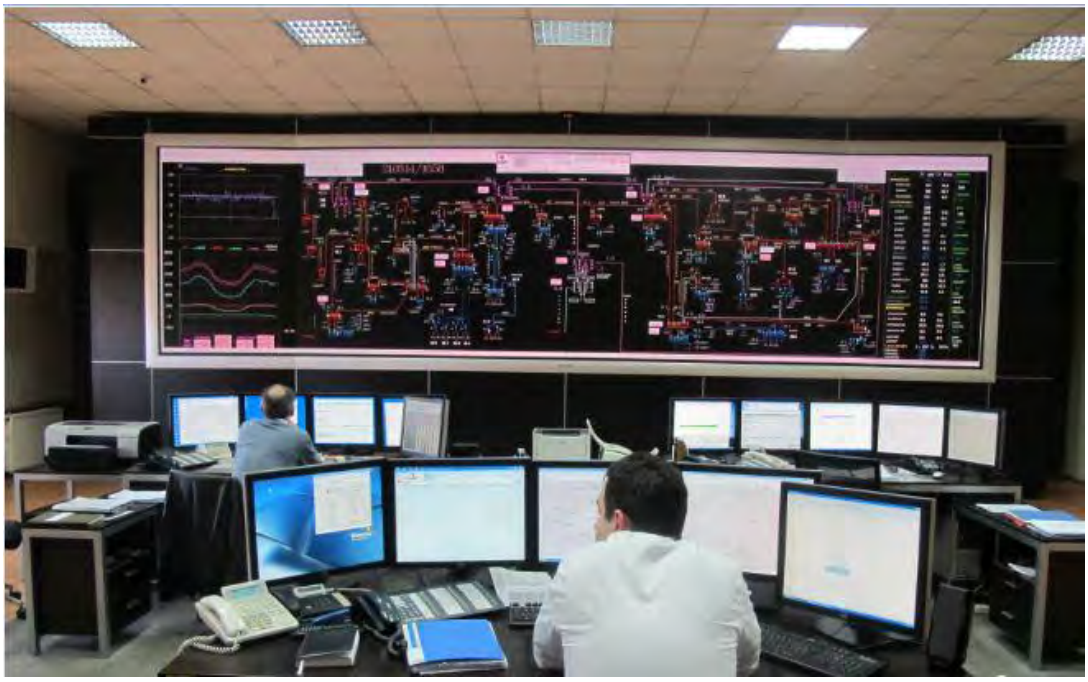
As a result of Tt's management, the final installations and testing of the DGA system were completed and GSE is now able to remotely gather data from the relevant substations and monitor the system from the National Control Center (NCC) in Tbilisi. As such, GSE is now able to utilize the DGA for monitoring and maintenance planning of the transformers to prevent the loss of transformer units.

On March 17th, 2014, GSE signed the DGA acceptance letter, marking the completion of the project and handover of the DGA system to GSE. However, LumaSense will continue to monitor the DGA system through March 2015, and will provide support and guidance to GSE as needed during the twelve months warrantee period.

Activity III: Enhanced Emergency Control System (EECS)

Under the PGIP project, USAID decided to enhance GSE's existing emergency control system to allow it to handle the transmission network expansions associated with the Black Sea Transmission Network (BSTN). Tt provided oversight management and technical advisory services to GSE to identify several candidate projects with all relevant parties deciding to implement an EECS system in fall of 2011. The tendering process began in the spring of 2012 with the contract being awarded to SEL in fall 2012.

As with the DGA project, full implementation responsibility of the EECS was also handed over to the Tt team. Under Tt's oversight management, SEL completed the testing and commissioning of the EECS at all GSE planned substations. On March 27th, 2014, the EECS system became officially operational, and an acceptance act was signed between GSE, Tetra Tech, and SEL.



Picture 5: Tbilisi National Control Center, Operating with Functional EECS

2.2 Component II: Gas Transit Infrastructure Construction, Replacement and Rehabilitation

Activity I: Senaki- Poti Pipeline Construction

Tt provided management oversight and technical assistance to GOGC for the construction and final preparation of the Senaki-Poti pipeline segment. In September 2010, construction began on the pipeline segment and by September 2011 the old pipeline was excavated and a new 700 mm pipeline was purchased and installed on the pre-existing easement to Poti. In addition, corrosion protection measures, including coatings and cathodic protection was employed, to prevent deterioration and increase the service life of the pipeline. The pipeline went into service in the fall of 2011.

Picture 6: Senaki-Poti Pipeline, Heat Shrinking Filed Joint Coating Process

Activity II: Abasha-Senaki Pipeline Construction

Tt provided comprehensive support services in the tendering, procurement, and equipment delivery and construction preparation of the Abasha-Senaki pipeline. GOGC awarded the construction of this segment to the Oil and Gas Construction Trust (OGCT) and construction began in late June 2012. Tt's oversight activities for this section included reviewing and commenting on tender documents for various materials while also reviewing the bids for the construction activities. In addition, Tt's field coordinators monitored the construction activities through regular site visits and appraisal reports. The construction and final preparations of this pipeline segment was handed over to the PGIOP team and will be reported upon accordingly.

Activity III: Kutaisi- Abasha Pipeline Construction

For this activity, Tt provided extensive technical advisory services by reviewing and commenting on the various tender documents for the pipeline segment. The contract was signed between the GOGC and Saqmilsadenmsheni in the fall of 2012. To support GOGC, Tt evaluated and assessed the tender documents for the pipeline construction materials and checked the delivered equipment. Tt also introduced a new technology, horizontal directional drilling (HDD), to support the construction of this pipeline segment, which proved to be more efficient and environmentally friendly than alternative technologies. The construction and final preparations of the Kutaisi-Abasha pipeline were handed over to the PGIOP team and will be reported upon accordingly.

Activity IV: Phase IV Gori-Kareli & Zestaphoni-Kutaisi Pipeline Segments

Per USAID's request, Tt started providing oversight management and technical assistance to GOGC for the construction of the Phase IV gas pipeline projects in September 2012. The Phase IV activity involved replacing existing gas pipelines with new gas pipe lines from Gori to Khashuri, and from Zestaphoni to Kutaisi. By the end of September 2012, Tt had reviewed and commented on various design documents as well as the technical requirements for needed constructions materials such as pipes, fittings and bends, valves and regulators. The tendering and procurement, and all construction activities of the Phase IV pipeline segments were handed over to the PGIOP team and will be reported upon accordingly.

2.3 Component III: Capacity Building and Oversight

Activity I: Capacity Building

During the course of the PGIP project, Tt provided comprehensive capacity building efforts including: strategic planning, organizational structure and performance, engineering analysis and forecasting, least-cost planning, electrical grid and gas pipeline network organization, operational efficiency, and assistance to GOGC and GSE in attracting funds for the rehabilitation and construction of the remaining infrastructural needs.

A demonstrated model of Tt's intensive on-the-job training was a work-shop provided to seven GSE team members in April and August 2011 regarding the proper operations, usage and applications of CAPE software. CAPE software provides a fast, efficient and reliable method for calculating relay settings as well as the current conditions of a transmission grid and relevant generating plants.

Picture 7: CAPE Software Training to GSE Personnel, Tbilisi National Control Center

In addition, Tt oversaw and coordinated an in-depth work-shop for GOGC personnel in the areas of pipeline integrity management, construction management as well as operations and maintenance. This three day course, held in March 2012, was provided by Gulf Interstate Engineering and provided critical institutional knowledge building and technical skills development for the various pipeline segment construction activities.

As relates to partnership building with USAID funded partners, in 2011 Tt began a survey of capacity development needs at GSE and GOGC. These surveys were compiled into a white paper report, which was then forwarded to USAID and its Human and Institutional Capacity Development (HICD)-Plus Project in December 2011. In FY 2012, Tt continued to support HICD Plus by reviewing and commenting on some of their draft reports and presentations.

Activity II: Oversight & Technical Support Activity- Power Transmission and Gas Sectors

To meet project needs, Tt examined available studies, reports and other documents relating to the power transmission network and gas infrastructural upgrade and rehabilitative activities. Tt also provided comprehensive monitoring and evaluation activities, such as health, safety and environment site visits to all gas pipeline construction sites.

Examples of Tt's technical advisory support services included, but were not limited to, the following:

- Monitoring the adequacy and acceptability of delivered equipment and services under approved activities through field inspections. Tt's staff members visited equipment warehouses to ensure the relevant equipment pieces for pipeline construction and the power transmission rehabilitation had arrived as ordered.
- Providing quality control/quality assurance (QA/QC) services, including materials measurement and analysis, and limited testing of equipment to ensure design specifications have been adhered to, as required.

- Reporting functions; for example, Tt collected, on a monthly basis, the number of customers registered with gas distribution companies in Poti, Samtredia, Abasha and Senaki. Tt began submitting these reports to USAID in May 2012 and continues to do so under PGIOP project.

Activity III: Procurement and Design

In this activity, Tt provided advisory services to GSE in the preparation of engineering designs, plans and cost estimates for the power transmission network rehabilitation as well as DGA and EECS projects. For these GSE projects, Tt analyzed and evaluated final designs, drawings, specifications, schedules, cost estimates and list of equipment requirements. If Tt found all documentation to be in order, it issued official letters of no-objection for USAID's review and approval. Tt also prepared tender documents in accordance with GSE's, and when necessary Power's, designs for USAID to procure required equipment and materials.

As regards to GOGC, Tt reviewed GOGC's engineering designs and specifications for the east-west gas supply project, and its various pipeline segments. In addition, after comprehensively reviewing and commenting on these designs, Tt provided official letters of no-objection for USAID's usage. For instance, Tt reviewed, commented upon and provided a letter of no objection for the engineering designs of HDD of the Rioni River.

Other examples of Tt's technical advisory support services for this activity are listed below:

- Providing technical support for procurement processes, including evaluation of bidding specifications, invitations for bid, bid evaluation, commodities procurement and contract modifications. Tt provided these services comprehensively for all activities in the PGIP project.
- Administrative functions such as drafting implementation letters, preparing action memoranda and reports, estimating expenditures, reviewing and commenting upon vouchers, providing letters of no-objection, responding to audits, assessing claims and performing other related activities.

ANNEX I: PGIP Project Deliverables