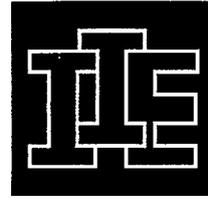


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# Armenia Energy Training Program

Program  
Completion Report

## **PROGRAM COMPLETION REPORT· ARMENIA**

Under USAID sponsorship, the Institute of International Education (IIE) recently concluded the Armenian Energy Training Program as part of Cooperative Agreement CCN-0002-A-00-3133-00, Modification 7. This work was conducted between September 30, 1997 and September 30, 1998. As a result, six (6) in-country workshops have been presented, five co-trainers have visited the U.S. to assist in the development of the workshops and learn, first-hand, about the topics being taught, and 119 government, industry and energy company professionals have participated in and benefited from the workshops.

### **I BACKGROUND**

After a period of severe energy shortages from 1991 to 1994, the electricity supply situation in Armenia has stabilized and is being regulated more by commercial principles. A decree was issued in April, 1997, establishing an independent regulatory body, the Regulatory Commission, which has hired a professional staff, acquired office space and an operating budget. It has issued several tariff decisions raising residential and commercial rates closer to cost recovery levels. Collections have improved and are now estimated to be approximately 63-70%.

The Energy Law which was passed in June, 1997, separated the policy, regulatory and operational functions of the government-owned utility and encouraged privatization. The generation, transmission and distribution companies were split into separate entities and the distribution companies have gone through two consolidations since then, the most recent in July, 1998 which has reduced the number of companies from over 60 to the present four (Yerevan and three regional companies). The generating plants were separated into individual companies (five small hydro plants were sold to private interests) and transmission and dispatch remained the responsibility of Armenergo. Armenergo was split in July, 1998 into a high voltage transmission company and a dispatch company.

The government of Armenia (GOA) wants to privatize the energy sector in order to finance needed investment, particularly rehabilitation. The World Bank has estimated the investment needs of the Armenian electrical energy sector, over the next fifteen years, to be US\$1.7 billion, the bulk of which can only be raised from private sources. The main obstacle to private financing is the sector's low reliability and high cost, which makes the sector unattractive to potential private-finance sources. Therefore, GOA has taken several steps and is taking more to make the sector more attractive to private investment. The next likely step will be to sell one of the distribution companies, probably Yerevan.

There are three major pipelines that supply gas to Armenia. The two that come from Azerbaijan have been shut off since 1992 and the other comes from Georgia. It is close to Azerbaijan and supplies were disrupted during the dispute with Azerbaijan (1992-1994). Approximately half of the high pressure pipelines are over 20 years old and are operated well below design pressure to reduce risk of failure. The gas from Georgia is also supplied at relatively low pressure. A new

pipeline has recently been completed which is expected to improve the situation. In the past, the industrial and power sectors, along with the residential sector were the major users of gas. The power sector remains as the major user of gas now and the government has reestablished supply to residential and commercial consumers.

The gas sector is also undergoing a significant restructuring. Until 1992, the gas sector consisted of Armgasprom (imports, storage and high pressure transmission), Armgas (distribution and LPG) and a few autonomous state companies all government owned. In 1993 Armgas was merged into Armgasprom and in 1993 the rest of the autonomous companies were merged into Armgasprom. In 1997, in agreement with the Armenian Ministry of Energy, RAO Gazprom and ITERA, the Armrosgasprom joint stock company was formed with the Ministry of Energy and RAO Gazprom each owning 45% and ITERA owning the remaining 10%. All the gas service companies and their subsidiaries now operate under the new structure of Armrosgasprom. A key problem that must be overcome by the new company is that there is a total absence of residential gas meters. Only the major power and industrial companies and some large commercial companies are metered.

## **II TRAINING OBJECTIVE**

The Armenia Energy Training Program was designed to support USAID's effort to assist Armenia in resolving the challenges facing the sustainable development of its energy sector, specifically the implementation of privatization, and the transformation of the sector to a competitive, economically efficient environment. The training targeted key technical and managerial personnel in the Ministry of Energy, the Energy Commission, generation and both gas and electric transmission and distribution companies and addressed the major obstacles to privatization by focusing on strengthening regulatory and financial management of the electricity and gas sector enterprises. The training was also designed to enhance and support USAID's technical assistance projects and World Bank loans.

## **III PROGRAM DESCRIPTION**

IIE's program consisted of training to support specific initiatives in management and privatization, as well as provide implementation assistance to the Ministry of Energy to continue the training to ensure the sustainability of the training efforts. One hundred and nineteen participants from the energy companies (electric and gas), the Ministry of Energy, the Energy Commission, and educational institutions completed the training sessions (see attached list).

A series of training courses covering the gas and electric sectors was developed and delivered in cooperation with the Ministry of Energy as the host organization. A Memorandum of Understanding (MOU) was signed with the Ministry to provide support including classroom and office space at the Energy Research Institute in Yerevan. A steering committee consisting of

USAID, IIE and the Ministry of Energy was also set up to review participant selection, course content and course scheduling. IIE hired an In-country coordinator to administer the training in Armenia since the courses were to be presented in Armenian and the training materials were to be translated into Armenian. This was done to facilitate the development of a sustainable training program that could be developed and delivered by the Energy Institute.

However, a sustainable training program requires the transfer of knowledge to a key group of people that must be able and willing to continue the training in the absence of IIE. Therefore, IIE worked with the Ministry of Energy to determine suitable co-trainers to work with IIE in developing and delivering the courses. As a result, IIE brought five Armenian co-trainers to the United States to work with U.S. instructors that designed and implemented the training.

In addition, IIE has worked closely with Hagler Bailly, the USAID technical assistance contractor, to ensure that the training was relevant and supported the technical assistance programs then being carried out. Several meetings between IIE and Hagler-Bailly were held to review training course topics, participants and relevance. In some cases Hagler-Bailly personnel attended training sessions to evaluate and advise on the impact of the training.

#### **IV SUMMARY OF ACTIVITIES**

IIE designed, developed and presented the series of courses listed below to improve the performance of the electric power and natural gas sectors and increase private sector participation. Each in-country course was one week in duration and translated in Armenian. Course instruction was interpreted into Armenian to increase the number of participants as well as improve the sustainability of the training. The training courses presented were as follows:

##### **Electric Power Sector**

- Bid Solicitation, Evaluation and Negotiation of a Power Purchase Agreement
- Electric Distribution Company Customer Service
- Management of a Transmission Company
- Management of a Generation Company

##### **Natural Gas Sector**

- Management of a Natural Gas Transmission and Distribution Company

##### **Overall Energy Sector**

- Human Resource Development and Management

In addition, five co-trainers were brought to the U.S. to work with IIE and the instructors to develop the training and observe U.S. utility methods. These were as follows:

##### **Management of a Natural Gas Transmission and Distribution Company**

Washington Gas Light Company- Washington, D C

**Human Resource Development and Management**

Dayton Power And Light Company - Dayton, Ohio  
Cinergy- Cincinnati, Ohio

**Management of a Generation Company**

Potomac Electric Power Company-Washington, D C

**Electric Distribution Company Customer Service**

Tucson Electric company-Tucson, Arizona

A detailed description of the program is as follows

**A In-country Workshops**

Power Purchase Agreements

Date April 6-10, 1998

Site Yerevan, Armenia

This training provided decision makers from the Ministry of Energy and Finance, utilities and the Energy Commission with knowledge and analytical skills to solicit and evaluate bids for electrical power supply. It covered the need for transparency, regulatory involvement, planning, bid evaluation, contract terms and conditions, and developing internal analytical methods to support selection. The workshop will also cover pricing and billing options, contract provisions, sources of external credit support, financial integrity and default. Guidelines were presented for establishing tests for capacity, efficiency and other operational parameters. The various risks borne by the lenders, developers, owners and companies were described and how these risks are handled in the agreements were discussed. Through interaction with the participants, the effect of Armenian laws on the structure of power purchase agreements and the unique aspects of bid solicitation by a government utility were addressed. The way in which the capital and energy costs are incorporated into rates was also explained. A sample power purchase agreement was presented and discussed.

Twenty-six technical, legal, financial and managerial personnel from the Ministry of Energy, the Ministry of Finance and Economy, the Energy Commission, Armenergo, Medzamor Nuclear Generating Station, the Armenian Energy Research Institute, and the local distribution companies from the regions of Tavush, Aragatsotn, Gegarkunik, Shirak, Lori and Vayots participated in this workshop.

**Management Of A Natural Gas Transmission and Distribution Company**

Date June 1-5, 1998

Site Yerevan, Armenia

This workshop was designed to equip managers and staff of natural gas transmission and distribution utilities responsible for economic and financial management of the company and Energy Commission management with conceptual and analytical skills in finance, business, planning, and operation of a natural gas transmission and distribution company. The training covered the organizational, technical, customer service and financial aspects of a natural gas company as well as specific technical topics such as gas balancing, meters, materials and engineering standards. World gas markets, acquiring secure gas sources and marketing gas were discussed. Guidelines were presented for established gas metering, gas transmission and distribution control, and pipeline construction. The establishment of gas rates was also discussed and the economic principles behind gas prices and rates were explained. Presentations by officials from the Energy Commission and Armgas on the role of the energy commission and a short description of the organization of the Armenian gas sector were also part of this workshop.

This workshop was attended by nineteen engineering, legal, financial and managerial personnel representing the Energy Commission, Armgas, Armtransgas, Armgasproject Institute and the local distribution companies Araratgas, Amavirgas, Ashtarakgas, Hrazdangas and Yerevangas.

### **Management of an Electric Transmission Company**

Date July 6 -10, 1998  
Site Yerevan, Armenia

This training was designed to provide decision-makers from the Energy Regulatory Commission, Ministry of Energy, and generation, transmission and distribution companies with an understanding of the latest developments in a competitive marketplace as it relates to operation and dispatch of a transmission company. It covered the operational, technical and financial aspects of operating a transmission company as well as the pricing and dispatching of the various types of generation. Guidelines were presented for capacity, reliability, voltage control, line ratings and other operational parameters. The special needs required when operating in a competitive environment were also discussed. The need for open communications and an effective and reliable communications network were emphasized and the role of regulation and national law with regard to the operation of a transmission company were discussed. Pricing and allocation of transmission capacity were of special interest and were discussed at length.

Twenty-two technical, financial and managerial personnel from the Ministry of Energy, the Energy Commission, Armenergo, and local distribution companies of Yerevan, Gorish, Zangezour, Kotaik, and Sunik attended the workshop.

### **Human Resource Development Management & Training**

Yerevan, Armenia,  
August 17 through 21, 1998

This workshop was designed to increase the participants' knowledge and skills that required to develop and manage complex systems of human resources development. It was an interactive workshop, consisting of instructor and participant presentations, in-class exercises and small group discussions. The training explored key components of designing and developing effective Human Resource Development systems to increase productivity and profitability within the energy sector. Organizational strategies, innovative work practices, efficient technology transfer systems, and succession planning were covered. Modern concepts of adult learning, manpower planning, and the technology and effective management of Human Resource Development systems were discussed.

Twenty-one technical, managerial, administrative and training personnel from the Ministry of Energy, Armrusgaz, Armenergo, Armtransgas, High Voltage Electricity Network (the new transmission company created in July), the Energy College (a state technical school), Armgaz, and Yerevan Distribution Company attended the workshop.

### **Managing a Generating Company**

September 14-18, 1998

Aghavanadzor, Armenia,

This training was designed to provide decision-makers from both the Energy Regulatory Commission and generation companies with an understanding of the technical and financial operations of a competitive generation company. The training covered the operational, technical and financial aspects of operating a generating company. Much of the instruction was devoted to the business aspect of running a generating company. A simple business example was used to show how money (debt and equity) is raised and how energy is priced to return both fixed and variable costs. Stock offerings (IPOs) were discussed as a means of raising money for expansion and debt repayment. Competitive pricing techniques were also discussed along with break-even points and incremental and marginal pricing. Operational strategies to enhance profitability were also discussed. There was a lot of interest shown in direct contracting between generators and distributors, so this topic was also discussed at length along with the standard methods of pricing transmission services. As part of the workshop, the participants visited the Hrazdan TPP where the Chief Engineer discussed the economics of generation.

This workshop was the first to be held outside of Yerevan and this facilitated discussions about power plant operations in the U.S. and Armenia and helped the instructors tailor their presentations to the specific needs of the Armenians.

Eighteen technical, financial, regulatory, and management personnel from the Ministry of Energy, the Energy Commission, the Energy Institute, the Hrazdan Thermal Power Plant, the Sevan/Hrazdan Cascade, the Armenian Nuclear Power Plant and the Hrazdan Hydro Power Plant attended the workshop.

## **Managing Distribution Company Customer Service**

Date September 22 -25, 1998

Site Yerevan, Armenia

This workshop was designed to provide distribution company managers with the skills and knowledge to establish modern customer service functions for their distribution companies. Setting up a modern billing system, establishing equitable billing and collection procedures, establishing customer connect and disconnect procedures, establishing and maintaining service restoration standards and trouble reporting systems were all topics covered in the workshop.

The training covered the customer service operations of a typical distribution company, especially the functions of metering, billing, credit and collection, and cash management. Business ethics were discussed at length using Tucson Electric Power Company's code of ethics. Tucson Electric Power Company (TEP) is a utility that avoided bankruptcy in the early 1990's by undertaking some major overhauls and was used as an example to illustrate many other aspects of distribution company operation since Tucson Electric serves a metropolitan area similar in size to that of Yerevan. Other topics covered during the training workshop included elements of business planning, financial issues, operations, and organizational matters, personnel, salaries, incentives, benefits, rate making, tariffs, income statements, balance sheets, and community affairs. Consumer safety and community relations materials used by a typical small to medium sized utility were distributed to the participants who expressed a desire to translate them into Armenian and use them in their own programs.

Thirteen technical, financial, regulatory, and management personnel from the Ministry of Energy, the Energy Commission, the Energy Institute, the Yerevan Electric Network, the Southern Electric Network, and the Northern Electric Network attended the workshop.

## **V RESULTS/IMPACT**

It is too early to assess the results and impact of the energy training program in a meaningful way. Armenia elected a new president and the government passed some additional laws affecting the energy sector. There were several significant changes in the number of distribution and Armenergo's functions were split. Several of the energy training courses were directly related to transmission and distribution companies and addressed many of the activities that were affected by these changes.

One of the most significant events that occurred during this period was the investigation of corruption in Armenergo. It underscored the urgent and continuing need for business ethics training. Almost all of the courses presented by IIE had a section on business ethics and including sample codes and standards for business ethics. Participant interest was very high regarding this topic and several of the lawyers from the Energy Regulatory Commission questioned the instructors closely regarding this matter. The Energy Regulatory Commission has adopted a code of ethics for themselves and it is anticipated that the other power enterprises will follow suit. As

a result of the training USAID and IIE have provided, they now have the knowledge, sample documents and examples of U S experience to implement and enforce ethical standards

The other major event that occurred in July this year was the consolidation of the electric distribution companies from eleven into four and the split of Armenergo into two companies a national transmission company and a central dispatching company Again, the course in operating an electric transmission company was especially timely and useful in assisting participants with new duties as well as helping Energy Commission staff members analyze their role in regulating this sector in the new environment There was a lot of discussion about the contracting of power supplies, the obligations of the various parties and the various ways to price transmission and related services Again, sample contracts, legal ramifications and the experience in other parts of the world were especially useful to the participants, again with high interest being shown by the participants from the Energy Regulatory Commission The Power Purchase Agreement course presented earlier was also relevant and useful in defining the different types of contracts between buyer and sellers and was especially useful to both the distribution and generating companies, especially as to the effects of the ways that transmission fees would be calculated and passed on to the contracting parties This was also an issue in the Generating Company course as the participants thought out the ways that would contract with either the distribution companies and the transmission companies Again various pricing options with their advantages and disadvantages in the Armenian situation were described and discussed

The course concerning management of the customer service function of a distribution company was also very timely and had significant impact on the participants The focus of this course was the metering and billing practices of a distribution company and its relationships with its customers This again was of very great interest to the participants , especially the way in which the social responsibilities of a U S distribution company were carried out Consumer safety and welfare programs were discussed in length especially programs to help the poor and disadvantaged Many samples of utility communications were distributed and several participants indicated that would these translated into Armenian and begin to use them in their companies especially the ones directed to children that related to safety concerns Several of the participants indicated that they would be implementing some of the ideas and practices discussed in the workshop when they returned to their companies the following week

For the short period covered by these courses, the impact was great and we can expect to see more of what was presented show up in how these companies are operated Many of the participants were looking for new and better ways to operate their companies and regulate the industry to improve service That is what they heard, saw, and left the courses with

## **VI RECOMMENDATIONS REGARDING FUTURE TRAINING PROGRAM**

Based upon meetings with USAID ENI/EEUD/EI Mission officials in Yerevan, other technical assistance contractors, The Ministry of Energy, the World Bank, and participants in our programs

IIE sees a need to continue the energy training program to support and consolidate Armenia's recent progress in energy sector reform

Our recommendations consist of training activities which support specific initiatives in management, privatization, and contracting, as well as provide implementation assistance to the Ministry of Energy to continue the training to ensure the sustainability of the training efforts

The series of courses listed below will improve the performance of the electric power and natural gas sectors and increase private sector participation. Each in-country workshop is proposed to be 1-2 weeks in duration.

#### **Natural Gas Sector Training**

- 1 Natural gas transmission and distribution loss reduction
- 2 Natural gas pricing structure and tariffs
- 3 Gas meter selection and modern meter reading techniques
- 4 Natural gas transmission and distribution operational costs
- 5 Natural gas company asset valuation

#### **Electric Sector Training**

- 1 Wholesale and retail tariff structures
- 2 Demand side management
- 3 System planning
- 4 Economic dispatch
- 5 Power system control and protection
- 6 Generator and distributor relations and communications
- 7 Transmission and distribution loss reduction
- 8 Selling a local electric company (LEC)
- 9 Managing the transition to a privatized distribution company

#### **Business Training**

- 1 Specification, Solicitation, and Evaluation of International Invitations to Bid

#### **Executive seminars**

- 1 Latest technology and business practices in the electric industry
- 2 Latest technology and business practices in the gas industry

In addition to continue the training of mid-level participants, a portion of the training should target senior personnel in the energy companies and the Ministry of Energy. Due to the level of activity in the sector when the current course were presented, senior level participants could not attend and the length of the course had to be limited to one week. Two 2 to 3 day executive seminars are proposed to update these senior executives on the latest management and technical

practices in the electric and gas sectors. In addition, they can also receive synopses of the course presented in their respective fields. This will not only ensure that modern business and technical practices are known, but that the human resources have been trained and are available to carry them out.

## ARMENIA ENERGY TRAINING PROGRAM PARTICIPANTS

### COURSE BID SOLICITATION, EVALUATION AND NEGOTIATION OF PPA'S April 6-10 1998

PARTICIPANT NAME	EMPLOYER
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ABAZYAN, ROBERT	ARMENERGO STATE ENTERPRISE
ABRAHAMYAN, ARA	MINISTRY OF ENERGY OF RA
AGHABEKYAN, VAHAGN	GEGARKUNIK REGIONAL ELECTRICAL NTWK
ARABAGYAN, SAMVEL	ENERGY COMMISSION OF RA
ARSHAKYAN ARMEN	ENERGY COMMISSION OF RA
BABAYAN ASTGHIK	VAYOTS DZOR REGIONAL ELECTRIC NETWK
BADALYAN, GOR	LORI REGIONAL ELECTRICAL NETWROK
BAGHDASARYAN, ARMEN	MINISTRY OF FINANCE AND ECONOMY RA
GHOSALMYAN, HAYK	ENERGY COMMISSION OF RA
GULKANYAN GAGIK	TAVUSH REGIONAL ELECTRIC NETWORK
HAYRAPETYAN, VARAZDAT	VAYOTS DZOR REGIONAL ELECTRIC NETWK
KHECHUMYAN, KAREN	ARMENERGO STATE ENTERPRISE
KOCHARYAN, VAHAN	LORI REGIONAL ELETRICAL NETWORK
KOKOBELYAN GAGIK	TAVUSH REGIONAL ELECTRICAL NETWROK
KURDYAN, EDUARD	SHIRAK REGIONAL ELECTRICAL NETWORK
MARTIROSYAN, VARAZDAT	ARAGATSOTN REGIONAL ELECTRICAL NTWK
MESROPYAN, MESROP	GEGARKUNIK REGIONAL ELECTRICAL NTWK
MKHITARYAN AHARON	TAVUSH REGIONAL ELECTRICAL NETWORK
MURADYAN, ARAM	SHIRAK REGIONAL ELECTRICAL NETWORK
MURADYAN, GRIGOR	SHIRAK REGIONAL ELECTRICAL NETWORK
PETROSYAN ROLAND	ENERGY COMMISSION OF RA
POGHOSYAN, LEVON	MINISTRY OF ENERGY OF RA
SARGISYAN, GAGIK	LORI REGIONAL ELECTRICAL NETWORK
TOROSYAN, ARAIK	ARMENIAN NUCLEAR POWER PLANT
VARDANYAN, KHACHIK	MINISTRY OF FINANCE AND ECONOMY
VARDANYAN VAHE	ARMENIAN ENERGY RESEARCH INSTITUTE

### COURSE MANAGEMENT OF NATURAL GAS TRANSMISSION & DISTRIBUTION COMPANY June 1-5 1998

PARTICIPANT NAME	EMPLOYER
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ABRAHAMYAN, SAMVEL	ARMAVIRGAS BRANCH ENTERPRISE
AIVAZYAN, FRUNZIK	ARMGASARD STATE CONCERN
ARAKELYAN, MIKAEL	ARARATGAS BRANCH ENTERPRISE
AZATYAN, HAKOB	ASHTARAKGAS BRANCH ENTERPRISE
EGHIAZARYAN, ASHOT	ARMTRANSYGAS STATE CLOSED STOCK CO
HAKOBYAN, ASHOT	ARMGASPROJECT INSTITUTE
HAKOBYAN, LYOVA	ARMAVIRGAS BRANCH ENTERPRISE
HARUTIUNYAN, ANAHIT	HRAZDANGAS BRANCH ENTERPRISE
HOVHANNISYAN, NIKOGHOS	ARMGASARD STATE CONCERN
MAILYAN, ARTAK	ARARATGAS BRANCH ENTERPRISE
MARTIROSYAN, SAMVEL	ARMAVIRGAS BRANCH ENTERPRISE
MATEVOSYAN, VAHAGN	ARMGASARD STATE CONCERN
MHERYAN, SAMVEL	YEREVANGAS STATE CLOSE STOCK CO
NAZARYAN, SAMVEL	TECHNICAL EXPERT DEPARTMENT
PAPIKYAN ARMEN	ARMTRANSYGAS STATE CLOSED STOCK CO
PETROSYAN ROLAND	ENERGY COMMISSION OF RA
PILIPOSYAN GAGIK	YEREVANGAS STATE CLOSE STOCK CO
POGHOSYAN SAMVEL	ASHTARAKGAS BRANCH ENTERPRISE
SHAHAZARYAN, ARMEN	ARMGASPROJECT INSTITUTE

## ARMENIA ENERGY TRAINING PROGRAM PARTICIPANTS

### COURSE MANAGEMENT OF AN ELECTRIC TRANSMISSION COMPANY

July 6-10 1998

PARTICIPANT NAME	EMPLOYER
ABRAHAMAN, ARA H	MINISTRY OF ENERGY
ARAKELYAN, ARSHAK	WEST ELECTRICAL NETWORK
BALYAN ARTUR	YEREVAN ELECTRICAL NETWORK
GEVORKYAN KATTEN	EAST ELECTRICAL NETWORK
GHALUMYAN YURY	ARMENERGO STATE CLOSE STOCK CO
GHAZARYAN GAGIK	YEREVAN ELECTRICAL NETWORK
GHOSALMYAN, HAYK	ENERGY COMMISSION OF RA
GRIGORYAN GEVORG	ENERGY COMMISSION OF RA
HAIRAPETYAN, VARDAN	SOUTHERN ELECTRICAL NETWORK
HAKOBYAN, GURGEN	ARMENERGO STATE CLOSED STOCK CO
ISPIRYAN, STEPAN	YEREVAN ELECTRICAL NETWORK
KARAKHANYAN, VAZRİK	KOTAİK ELECTRICAL NETWORK
MAKARYAN, LEVON	YEREVAN ELECTRICAL NETWORK
MARTIROSYAN, HENRIK	YEREVAN ELECTRICAL NETWORK
MAZMANYAN, RUZANNA	VANADZOR NORTH ELECTRICAL NETWORK
NAVASARDYAN, MAKEDON	YEREVAN ELECTRICAL NETWORK
PAPYAN, RITA	ZANGEZUR ELECTRICAL NETWORK
PETROSYAN, ARAM	ARMENERGO STATE CLOSED STOCK CO
PETROSYAN, YURA	YEREVAN ELECTRICAL NETWORK
SRAPYAN, SERGEI	CENTRAL ELECTRICAL NETWORK
TOKHANTS, VAHE	GORIS ELECTRICAL NETWORK
ZAKARYAN, RUBEN	HIGH VOLTAGE ELECTRICAL NETWORK

### COURSE HUMAN RESOURCES DEVELOPMENT AND MANAGEMENT

August 17-21 1998

PARTICIPANT NAME	EMPLOYER
ABOVYAN ZINA	YEREVAN ELECTRICAL NETWORK
ABOYAN VASIL	ENERGY RESEARCH INSTITUTE
ABRAHAMYAN ARA	MINISTRY OF ENERGY
AGHEKYAN LEVON	ENERGY RESEARCH INSTITUTE
AMERIKYAN, SUZANNA	MINISTRY OF ENERGY OF RA
AREVSHATYAN, MUSHEGH	ARMGAS STATE CLOSED STOCK CO
AVAKOVA, ANGELA	ARMENERGO STATE CLOSED STOCK CO
EGHIAZARYAN, ASHOT	ARMTRANSYGAS STATE CLOSED STOCK CO
GEVORGYAN, HOVIK	HIGH VLOTAGE ELECTRICAL NETWORK
GHARIBYAN, HAJKANDUKHT	ENERGY RESEARCH INSTITUTE
GRIGORYAN, SHUSHANIK	HIGH VOLTAGE ELECTRICAL NETWORK
HAIRAPETYAN, GAYANE	YEREVAN ELECTRICAL NETWORK
HARUTUNYAN KARINA	ARMTRANSYGAS STATE CLOSED STOCK CO
JANVELYAN, MARINA	ARMGAS STATE CLOSED STOCK CO
KHARAKHANYAN ARTHUR	ARMTRANSYGAS STATE CLOSED STOCK CO
MARGARYAN ANAHIT	MINISTRY OF ENERGY OF RA
MEHRABYAN KARINE	GASKAPSHIN STATE CLOSED STOCK CO
PATIRYAN ROSA	YEREVAN ELECTRICAL NETWORK
POGHOSYAN SAMVEL	ARMGAS STATE CLOSED STOCK CO
SARGSYAN NARINE	ARMGAS STATE CLOSED STOCK CO
SIMONYAN, GOHAR	ARMGAS STATE CLOSED STOCK CO

## ARMENIA ENERGY TRAINING PROGRAM PARTICIPANTS

### COURSE MANAGEMENT OF A GENERATION COMPANY

September 14-18 1998

PARTICIPANT NAME	EMPLOYER
ABRAHAMYAN, ARA	MINISTRY OF ENERGY OF RA
ABRAHAMYAN, HAIKAZ	HRAZDAN THERMAL POWER PLANT
ANTONYAN HAKOB	HRAZDAN THERMAL POWER PLANT
AVAKYAN VAHAN	SEVAN HRAZDAN HYDRO POWER PLANT
GALOYAN ALEXSANDR	ARMENYAN NUCLEAR POWER PLANT
GALSTYAN LEV	ARMENYAN NUCLEAR POWER PLANT
HAKOBYAN KAREN	ENERGY COMMISSION OF RA
IVANYAN, SUREN	HRAZDAN THERMAL POWER PLANT
KHACHATRYAN, VASILY	HRAZDAN THERMAL POWER PLANT
MEKHAKYAN, LIUDMILA	ARMENYAN NUCLEAR POWER PLANT
MNATSAKANYAN, LYUDVIK	HRAZDAN THERMAL POWER PLANT
PETROSYAN, MARIANA	MINISTRY OF ENERGY OF RA
POGHOSYAN, LEVON	MINISTRY OF ENERGY OF RA
SAMVEL ARABAJYAN	ENERGY COMMISSION OF RA
TARAKHCHYAN, MARIAM	SEVAN HRAZDAN HYDRO POWER CASCADE
TATIKYAN, SUREN	HRAZDAN THERMAL POWER PLANT
UNANYAN, HOVANES	HRAZDAN THERMAL POWER PLANT
VARDANYAN, VAHE	ENERGY RESEARCH INSTITUTE

### COURSE ELECTRIC DISTRIBUTION COMPANY CUSTOMER SERVICE

Septemeber 21-25, 1998

PARTICIPANT NAME	EMPLOYER
ABRAHAMYAN, ARA	MINISTRY OF ENERGY OF RA
AGHEKYAN, LEVON	ENERGY INSTITUTE, SSCC
GHUKASYAN, HRACHIA	YEREVAN ELECTRICAL NETWORK
KHACHATRYAN, GRIGOR	SOUTHERN ELECTRICAL NETWORK, SSCC
MANUKYAN, HAKOB	SOUTHERN ELECTRICAL NETWORK, SSCC
MKHITARYAN ARTUR	MUSH BRANCH, NORTHERN EL NETWORK
NADOYAN ASHOT	YEREVAN ELECTRICAL NETWORK, SSCC
NAZARETYAN, ARMEN	YEREVAN ELECTRICAL NETWORK, SSCC
SAMVELYAN, HAMAZASP	KUMAIRI BRANCH YEREVAN EL NETWORK
STEPANYAN, ARMEN	SOUTERN ELECTRICAL NETWORK, SSCC
TSATURYAN, ARMEN	YEREVAN ELECTRICAL NETWORK, SSCC
VARDANYAN, ARAM	SOUTHERN ELECTRICAL NETWORK, SSCC
VARDANYAN, GAGIK	SOUTHERN ELECTRICAL NETWORK, SSCC

**ARMENIA ENERGY TRAINING PROGRAM**  
**Yerevan Power Purchase Agreement (PPA) Bid Solicitation, Evaluation and Negotiation Workshop**

A *Power Purchase Agreement (PPA) Bid Solicitation, Evaluation and Negotiation Workshop* was presented in Yerevan, Armenia, for twenty-six technical, legal, financial and managerial personnel from April 6 through 10, 1998, by the *Armenia Energy Training Program* sponsored by USAID Mission to the Caucasus. Participants represented the Ministry of Energy, the Ministry of Finance and Economy, the Energy Commission, Armenergo, Medzamor Nuclear Generating Station, the Armenian Energy Research Institute, and the local distribution companies from the regions of Tavush, Aragatsotn, Gegarkunik, Shirak, Lori and Vayots Dzor. The workshop was undertaken in close cooperation with the Armenian Ministry of Energy and the Armenian Research Institute of Energy. Dr. Areg Galstyan, Head of the Department of Technical Policy for the Ministry of Energy, opened the workshop and welcomed the participants.

Instruction was provided by Catherine R. Connors, a partner with Pierce Atwood of Portland, ME, and Joseph D. Leblanc, President of Leblanc Associates, Inc. of Boston, MA, and Orrs Island, ME. Both of the instructors have experience with the energy sector in eastern Europe and Armenia. Since these experts were available during the course, they were invited to attend meetings at the Ministry of Energy and the Hydrological Institute. Ms. Connors was invited to attend a meeting at the Ministry of Energy to advise on international contracts, and Mr. Leblanc was invited to advise the hydrological institute about the operation of the hydroelectric plants in the lake Sevan region.

The workshop was presented in English and translated into Armenian. The text for the workshop, including a sample power purchase agreement, was also translated into Armenian. Training covered the legal, technical and financial aspects of power purchase agreements as well as the solicitation, evaluation and negotiation. The training covered operational and legal specifications and guarantees. Guidelines were presented for establishing tests for capacity, efficiency, and other operational parameters. The various risks borne by the lenders, developers, owners and companies were described, and how these risks are handled in the agreements were discussed. Through interaction with the participants, the effect of Armenian laws on the structure of power purchase agreements was discussed. The unique aspects of bid solicitation by a government utility were also addressed. The way in which the capital and energy costs are incorporated into rates was also explained.

Dr. Galstyan and Dr. William Smith of USAID spoke at closing ceremonies on Friday. Participant evaluations indicated that the participants were generally pleased with the level and content of the training and found it relevant to their work.

This is the first workshop in a series of six covering the management of privatized gas and electric utilities to be presented in Armenia over the next six months. The Ministry of Energy is supporting this program by providing logistical and technical support.

**ARMENIA ENERGY TRAINING PROGRAM**  
**Yerevan Management Of A Natural Gas Transmission and Distribution Company**  
**Workshop**

The *Management Of A Natural Gas Transmission and Distribution Company* Workshop was presented in Yerevan, Armenia, for nineteen engineering, legal, financial and managerial personnel from June 1 through 5, 1998, by the *Armenia Energy Training Program*, sponsored by USAID Mission to the Caucasus. Participants represented the Energy Commission, Armgasard, Armtransgas, Armgasproject Institute and the local distribution companies Araratgas, Amavirgas, Ashtarakgas, Hrazdangas and Yerevangas. The workshop was undertaken in close cooperation with Armenian Ministry of Energy and the Armenian Research Institute of Energy. Dr. Areg Galstyan, Head of the Department of Technical Policy for the Ministry of Energy opened the workshop and welcomed the participants.

Instruction was provided by Mohsen M. Shirazi, consultant and former World Bank energy specialist in the gas sector and Steven Ward of Advanced Metering Technologies, a gas industry consultant in meters and gas control who has done work for the World Bank in Russia, Moldova and Azerbaijan. Mr. Shirazi was instrumental in the establishment of a national gas company and the development of the natural gas industry in a middle eastern country. In addition, both of the instructors have experience with the gas sector in the Caucasus region. The workshop was presented in English and translated into Armenian. The text for the workshop, was also translated into Armenian.

Training covered the organizational, technical, customer service and financial aspects of a natural gas company as well as specific technical topics such as gas balancing, meters, materials and engineering standards. The training covered world gas markets, acquiring secure gas sources and marketing gas. Guidelines were presented for established gas metering, gas transmission and distribution control, and pipeline construction. The establishment of gas rates was also discussed and the economic principles behind gas prices and rates were explained. There were two presentations by Mr. Roland Petrosyan of the Energy Commission on the role of the energy commission and as short description of the organization of the Armenian gas sector by Mr. Vahagn Matevosyan of Armgasard.

Dr. Galstyan also spoke at closing ceremonies on Friday. Participant evaluations indicated that they were very pleased with the level and content of the training and found it relevant to their work.

This is the second workshop in a series of six covering the management of privatized gas and electric utilities to be presented in Armenia over a period of six months. The Ministry of Energy is supporting this program by providing logistical and technical support.

As part of this program a co-trainer has been selected to come to the U.S. to participate in an internship with a local gas utility.

## **ARMENIA ENERGY TRAINING PROGRAM**

### **Yerevan Management of an Electric Transmission Company Workshop**

*A Management of an Electric Transmission Company workshop* was presented in Yerevan, Armenia, for twenty-two technical, financial and managerial personnel from July 6 through 10, 1998, by the *Armenia Energy Training Program*, sponsored by USAID Mission to the Caucasus. Participants represented the Ministry of Energy, the Energy Commission, Armenergo, and the following local distribution companies Yerevan, Gorish, Zangezur, Koptaik, and Sunik. The workshop was undertaken in close cooperation with Armenian Ministry of Energy and the Armenian Research Institute of Energy. Dr. Areg Galstyan, Head of the Department of Technical Policy for the Ministry of Energy, opened the workshop and welcomed the participants.

Instruction was provided by Hyde M. Merrill, Ph.D., PE of Merrill Energy, LLC and formerly a principal of Power Technologies Inc. of Schenectady, N.Y. and John E. Koehler, Manager of Operations Engineering - New York Power Pool also of Schenectady, NY. Both of the instructors have experience with the energy sectors in the NIS as well as developing countries. Since these experts were available during the course, they were invited to attend meetings at the Energy Commission and Armenergo where they consulted regarding metering and metering points for operation of the transmission system. Class participation was very good and a number of questions were asked and answered. The workshop was especially timely since it was announced on July 4, 1998 that Armenergo would split into a Dispatch Group and a Transmission Group.

The workshop was presented in English and translated into Armenian. The text for the workshop, was also translated into Armenian. Training covered the operational, technical and financial aspects of operating a transmission company as well as the pricing and dispatching of the various types of generation. Guidelines were presented for capacity, reliability, voltage control, line ratings and other operational parameters. The special needs required when operating in a competitive environment were also discussed. The need for open communications and an effective and reliable communications network were emphasized and the role of regulation and national law with regard to the operation of a transmission company were discussed. Pricing and allocation of transmission capacity were of special interest and were discussed at length.

Dr. Galstyan also spoke at closing ceremonies on Friday. Participant evaluations indicated that the participants were generally pleased with the level and content of the training and found it relevant to their work.

This is the third workshop in a series of six covering the management of privatized gas and electric utilities to be presented in Armenia this year. The Ministry of Energy is supporting this program by providing logistical and technical support.

## **ARMENIA ENERGY TRAINING PROGRAM**

### **Yerevan Human Resource Development Management & Training Workshop**

A **Human Resource Development Management & Training Workshop** was presented in Yerevan, Armenia, for twenty-one technical, managerial, administrative and training personnel from August 17 through 21, 1998, by the *Armenia Energy Training Program*, sponsored by USAID Mission to the Caucasus. Participants represented the Ministry of Energy, ArmRusGazard, Armenergo, ArmTransGas (a gas transmission company), High Voltage Electricity Network (a transmission company), the Energy College (a state technical school), Armgaz (a gas distribution company), and Yerevan Electric Network (a local electric distribution company). The workshop was undertaken in close cooperation with Armenian Ministry of Energy and the Armenian Research Institute of Energy. Dr. Areg Galstyan, Head of the Department of Technical Policy for the Ministry of Energy, opened the workshop and welcomed the participants.

Instructions were provided by Donald Willig and Carl Morey of Management Concepts, Inc. Mr. Willig has extensive experience in organization development, training intervention, and work system modification. Mr. Morey was the former Group Vice-President of Dayton Power & Light Company, where he developed and managed the first Management Development Training Program, designed to improve the management skills of middle and upper level managers. Class participation was lively and engaging -- motivating participants to become good leaders and agents of change. Participants actively raised questions pertinent to their own situations, and willingly voiced their opinions. The instructors were praised for their knowledge and expertise, as well as the style of their delivery.

The workshop was presented in English and translated into Armenian. The text for the workshop, was also translated into Armenian. It was an interactive workshop, consisting of instructor and participant presentations, in-class exercises and small group discussions. Training covered topics in manpower planning, hiring and promotion plan, performance evaluation, career planning, compensation and salary administration and training plan.

Dr. Galstyan also spoke at closing ceremonies on Friday. Participants gave this workshop an excellent rating. They found all the topics interesting and applicable to their day-to-day work. Suggestions for future workshops include targeting their supervisors or more senior personnel to attend this course. Participants also expressed interest in future courses focusing more on leadership training, computer programs applicable to HRD, organizational/document management, career development, salary and compensation, and business and financial planning.

This is the fourth workshop in a series of six covering the management of privatized gas and electric utilities to be presented in Armenia this year. The Ministry of Energy is supporting this program by providing logistical and technical support.

**ARMENIA ENERGY TRAINING PROGRAM**  
**Aghavanadzor Managing a Generating Company Workshop**

A *Managing a Generating Company workshop* was presented in Aghavanadzor, Armenia, for eighteen technical, financial, regulatory, and management personnel from September 14 through 18, 1998, by the *Armenia Energy Training Program*, sponsored by USAID Mission to the Caucasus. Participants represented the Ministry of Energy, the Energy Commission, the Energy Institute, the Hrazdan Thermal Power Plant, the Sevan/Hrazdan Cascade, the Armenian Nuclear Power Plant and the Hrazdan Hydro Power Plant. The workshop was undertaken in close cooperation with Armenian Ministry of Energy and the Armenian Research Institute of Energy.

Instruction was provided by Mr. Joseph D. Leblanc, President of Leblanc Associates, Orrs Island ME, and Mr. Carl R. Morey, retired Sr. Vice President of Electric Production for the Dayton Power and Light Company, Dayton OH. In addition to extensive U.S. based power plant experience, both of the instructors have experience with the electric power plant operations in the NIS. Class participation was very good and the class visited the Hrazdan TPP where Mr. Haikaz Abrahamyan, Chief Engineer, discussed the economics of generation at Hrazdan TPP. The instructors and some of the participants also visited one of the hydro electric power plants of the Sevan/Hrazdan Cascade.

The training covered the operational, technical and financial aspects of operating a generating company. However, most of the instruction was devoted to the business aspect of running a generating company. A simple business example was used to show how money (debt and equity) is raised and how energy is priced to return both fixed and variable costs. Stock offerings (IPOs) were discussed as a means of raising money for expansion and debt repayment. Competitive pricing techniques were also discussed along with break/even points and incremental and marginal pricing. Operational strategies to enhance profitability were also discussed. There was a lot of interest shown in direct contracting between generators and distributors, so this topic was also discussed at length along with the standard methods of pricing transmission services.

This workshop was the first to be held outside of Yerevan and offered the opportunity for discussion after class hours. This facilitated discussions about power plant operations in the U.S. and Armenia and helped the instructors tailor their presentations to the specific needs of the Armenians. The workshop was presented in English and translated into Armenian. The text for the workshop, was also translated into Armenian.

Dr. Areg Galstyan, Head of the Department of Technical Policy for the Ministry of Energy, spoke at closing ceremonies and participant evaluations indicated that they were highly satisfied with the level and content of the training and gave it one of the highest ratings received.

This is the fifth workshop in a series of six covering the management of privatized gas and electric utilities to be presented in Armenia this year. The Ministry of Energy is supporting this program by providing logistical and technical support.

**ARMENIA ENERGY TRAINING PROGRAM**  
**Yerevan Managing Distribution Company Customer Service Workshop**

A *Managing Distribution Company Customer Service workshop* was presented in Yerevan, Armenia, for thirteen technical, financial, regulatory, and management personnel from September 22 through 25, 1998, by the *Armenia Energy Training Program*, sponsored by USAID Mission to the Caucasus. Participants represented the Ministry of Energy, the Energy Commission, the Energy Institute, the Yerevan Electric Network, the Southern Electric Network, and the Northern Electric Network. The workshop was undertaken in close cooperation with Armenian Ministry of Energy and the Armenian Research Institute of Energy.

Instruction was provided by Mr. George Branscombe, Principal of Branscombe & Associates, a financial consulting company in Manchester, NH, and Mr. Norman B. Johnsen, retired Vice President of Planning and Pricing for the Tucson Electric Power Company, Tucson, AZ. In addition to extensive U.S. based utility experience, both of the instructors have experience with the electric utility operations in the NIS. Class participation was very good with many questions.

The training covered the customer service operations of a typical distribution company, especially the functions of metering, billing, credit and collection, and cash management. Business ethics were discussed at length using Tucson Electric Power Company's code of ethics. Tucson Electric Power Company (TEP) is a utility that avoided bankruptcy in the early 1990's by undertaking some major overhauls and was used as an example to illustrate many other aspects of distribution company operation since Tucson Electric serves a metropolitan area similar in size to that of Yerevan. Other topics covered during the training workshop included elements of business planning, financial issues, operations, and organizational matters, personnel, salaries, incentives, benefits, rate making, tariffs, income statements, balance sheets, and community affairs. Consumer safety and community relations materials used by TEP were distributed to the participants who expressed a desire to translate them into Armenian and use them in their own programs.

Open question and answer sessions were held to allow the participants an opportunity to ask questions related to the program or to any other related issues. The workshop was presented in English and translated into Armenian. The text for the workshop, was also translated into Armenian.

Participant evaluations indicated that they were highly satisfied with the level and content of the training and gave it one of the highest ratings received. Several of the participants indicated that they would be implementing some of the ideas and practices discussed in the workshop when they returned to their companies, next week.

This is the sixth workshop in a series of six covering the management of privatized gas and electric utilities to be presented in Armenia this year and thus completes the present Energy Training Program.