PN-ACC-231
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USAID/CEE Energy Assistance Review Meeting

January 5-6, 1994

Europe Bureau

Robert F. Ichord
Chief, Energy and Infrastructure

U.S. AGENCY FOR
INTERNATIONAL
DEVELOPMENT

Introductory Remarks
by

Robert F. Ichord

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January 5, 1994

This meeting is the third in our series of program implementation reviews with all the participating organizations in the Energy Assistance Program for Central and Eastern Europe. I have changed the format this time. Consistent with the Administrator's new emphasis on results and accountability, we have structured this two-day meeting to report on results and highlights of the program over the past three years. Time does not permit us to cover all the activities in the portfolio. But we have tried to include major types of activities within the three major program areas:

(1) Energy Efficiency in Industry and Buildings;

(2) Energy/Power Restructuring;

(3) Nuclear Safety

We have also added a session on Energy Information Systems that will consider the new monitoring system requirements that are being put in place and plans for formal and informal evaluations of programs.

To focus the presentations and keep the program on schedule, we have asked speakers to prepare four basic viewgraphs concerning the particular task: (1) objectives and rationale of the task; (2) description of the task that was undertaken; (3) summary results and accomplishments; and (4) significance and lessons learned.

The following proceedings contain a useful compilation of these documents. Additional materials will be produced in the future on the reports and other deliverables from these activities. These activities should also be considered in the context of the new country assistance strategies that will be distributed to all interested participants.

Although the subject orientation of this meeting cuts across countries, over the next year, I plan to call a number of country coordination meetings to ensure that various country-focused tasks are working effectively together.

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USAID
U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

USAID/CEE ENERGY ASSISTANCE REVIEW MEETING

January 5-6, 1994
Room 1105, Department of State

Agenda

Wednesday, January 5, 1994

8:45: Introductions, Purpose and Agenda -- Robert Ichord, AID

9:00: Policy and Program Context: State/EUR/EEA, Ralph Johnson
AID/ENI/EUR, Robert Nachtrieb

ENERGY EFFICIENCY IN INDUSTRY AND BUILDINGS

9:30: Strategy and Program Overview -- Robert Archer, AID

9:45: Energy Service Company Development: Hungary, Bulgaria, Romania -- David Keith, RCG/Hagler,Bailly

10:15: Demand Side Management/Integrated Resource Planning: Poland -- David Wolcott, RCG/Hagler,Bailly

10:30: Krakow Building Demonstration and Commercialization -- Larry Markel -- Electrotek Concepts

11:00: ***Break***

11:15: Comments on Relationship to Housing Program: Steve Giddings, AID

11:30: Energy Efficiency Centers and Local Networking -- Poland, Czech and Bulgaria -- W. Chandler, DOE/Battelle Lab

12:00: ***Break for Lunch***

ENERGY/POWER SECTOR RESTRUCTURING

1:30: Strategy and Program Overview -- Robert Ichord, AID

Pricing and Restructuring

1:45: Pricing Reform: Poland -- David Keith, RCG/Hagler-Bailly

2:00: Power Pricing and Contracting: Baltics Regional -- Charles Zimmerman, RCG /Hagler,Bailly

2:15: Competition and Privatization: Poland -- Robert Borlick, RCG/Hagler, Bailly

2:30: Power Sector Policy and Structural Issues: Slovakia -- Floyd Davis, Bechtel

2:45: Petroleum Restructuring: Romania -- Peter Danforth, Bechtel

3:00: Regulatory System Development: Russ Brown, US Energy Association

3:15: Comments by Mark Karns, Richard Burns, or Frank Vita on Links with Privatization Programs

3:30: ***Break***

Utility Management/Modernization

3:45: Utility Management Improvement: General/Financial -- Bulgaria Case -- Eric Haskins, USEnergy Association

4:00: Utility Management Improvement: Generation -- Polish Rybnik Case -- Roger Griffin, Bechtel

4:15: Utility Management Improvement: Transmission and Distribution -- Poland, Czech/ Slovak Training -- Charles Smith, Electrotek Concepts

4:30: Environmental Power Plant Upgrade: Poland -- Howard Feibus, Department of Energy

4:45: Comments on Links with Environmental Programs: Ron Greenberg, AID

5:00: ***Adjourn***

Thursday, January 6, 1994

NUCLEAR SAFETY

8:45: US Reactor Safety Assistance Policy, John Dobrin, State/PM

9:15: Strategy and Program Overview, Len Rogers, AID

9:30: G-7 Studies, Istan Dobozi, World Bank

9:45: DOE Operational Safety Initiative-- Dennis Meyers, DOE

10:00: Program Accomplishments/Expected Results--Ken Horton, DOE

10:30: ***Break***

10:45: Plant Analyzer Programs: Bulgaria, Slovakia, Lithuania, Bill Horak, DOE/Brookhaven

11:15: Safety Training Programs, J. Van Erp, DOE/Argonne National Lab

11:30: Nuclear Safety Regulatory Program Results, Hans Schechter, NRC

12:00: ***Break for Lunch***

INFORMATION SYSTEMS, MONITORING AND EVALUATION

1:15: Strategy and Overview, Robert Ichord/Greg Butera, AID

1:30: Current EUR/EUR/EI Energy Information System -- Bob Cantrell, Scientech

2:00: Bureau Plans for PMMS -- Joe Pastic, AID

2:15: Specific Implications for Program Managers --Thunder and Associates

2:30: ***Break and Computer System Demonstration*** -- Bob Cantrell and Heather McAleer, Scientech

3:00 Discussion of Reporting Systems

3:15 Status of Program Evaluation -- Robert Ichord, AID

3:30 Evaluation Results: Emergency Energy Program -- M. Stamatelatos/Steve Klein, Scientech

3:45: Comments by Evaluation Office -- Debra Prindle

4:00: Discussion of Other Program Management Issues

4:30: Conclusions and Recommendations

4:45: ***Adjourn***

USAID/CEE ENERGY ASSISTANCE REVIEW

PURPOSE/FOCUS OF MEETING

** REPORT ON RESULTS/ACCOMPLISHMENTS SINCE 1990

** CONSIDER SIGNIFICANCE/LESSONS LEARNED

** SHARPEN STRATEGIC FOCUS/IMPLEMENTATION APPROACHES

** IMPROVE REPORTING AND MONITORING SYSTEMS

** PROVIDE EXPERIENCES THAT MAY BE USEFUL TO NIS

** CONSIDER RELATIONSHIP TO NEW AGENCY THEMES

** IDENTIFY LINKAGES WITH OTHER SECTORS

LINKAGE TO U.S. ASSISTANCE STRATEGIC OBJECTIVES

I. SUSTAINABLE DEVELOPMENT

A. RESTRUCTURING

Energy efficiency contributes to and is a result of restructuring of the energy, industry and buildings sectors.

B. REGULATORY POLICY REFORM

Energy pricing and regulatory reform are essential for significant energy efficiency gains.

LINKAGE TO U.S. ASSISTANCE STRATEGIC OBJECTIVES (Cont.)

II. ENVIRONMENTAL IMPROVEMENT

A. AIR POLLUTION REDUCTION

Energy-related emissions are the greatest contributors to air pollution and global warming.

B. UNSAFE NUCLEAR PLANT PHASE-OUT

Energy efficiency is a strategic non-nuclear option to allow earliest phase-out of unsafe plants.

LINKAGE TO U.S. ASSISTANCE STRATEGIC OBJECTIVES (Cont.)

III. DEMOCRACY

A. PLURALISTIC INSTITUTIONAL DEVELOPMENT

Improving energy efficiency will require the development of new private sector and non-governmental organizations and new roles for existing organizations.

ENERGY EFFICIENCY PROGRAM GOAL AND OBJECTIVES

GOAL: IMPROVE ENERGY EFFICIENCY THROUGH THE ESTABLISHMENT OF THE POLICY AND INSTITUTIONAL FRAMEWORK AND STRENGTHENED LOCAL CAPABILITIES

OBJECTIVES

(1) Support a pluralistic institutional development approach, i.e., multiple organizations involved in energy efficiency

(2) Demonstrate energy efficiency gains in industrial and buildings sectors

(3) Enhance CEE-U.S. energy efficiency linkages

[(4) Improve legal, regulatory and policy framework to encourage energy efficiency]

OBJECTIVES AND STRATEGIES

OBJECTIVE 1 – SUPPORT A PLURALISTIC INSTITUTIONAL DEVELOPMENT APPROACH, I.E., MULTIPLE ORGANIZATIONS INVOLVED IN ENERGY EFFICIENCY

--Develop utility capability to implement DSM/IRP

--Train and develop local private sector energy service companies

--Establish chapters of the U.S. Association of Energy Engineers

--Support establishment of local non-governmental energy efficiency centers

[--Improve electric sector performance--restructuring and management]

OBJECTIVE 2 -- DEMONSTRATE ENERGY EFFICIENCY GAINS IN INDUSTRIAL AND BUILDINGS SECTORS

--Support energy efficiency audits and provision of equipment

- Energy service companies
- Demand Side Management (DSM) programs
- Joint ventures

--Work with World Bank on industrial and energy loans that can finance energy efficiency improvements

OBJECTIVE 3 -- ENHANCE CEE-U.S. ENERGY EFFICIENCY LINKAGES

--Support AEE chapter development

--Technology transfer through audits/equipment demonstrations and on-going linkages to U.S. manufacturers

--Support for energy efficiency-related joint ventures

[OBJECTIVE 4 -- IMPROVE LEGAL, REGULATORY AND POLICY FRAMEWORK TO ENCOURAGE ENERGY EFFICIENCY]

[--Energy efficiency laws]

[--Regulatory arrangements supportive of energy efficiency]

[--Tariff reform]

PROGRAM ACTIVITIES COMPLETED/UNDERWAY

(1) Energy efficiency audits and provision of equipment to demonstrate low-cost savings in industry. (9 countries)

(2) Training local private sector energy service companies (Hungary, Bulgaria, Romania; also Lithuania, Latvia, Estonia)

(3) Technology transfer through audits/equipment demonstrations and linkages to U.S. manufacturers (Hungary, Bulgaria, Romania)

(4) Establish of U.S. Association of Energy Engineers chapters (Hungary, Bulgaria, Romania)

(5) Establishment of local non-governmental energy efficiency centers (Poland, Czech, Bulgaria)

(6) Develop utility capability to implement DSM/IRP (Poland, Lithuania, Bulgaria)

(7) Support joint ventures to implement market-based energy efficiency measures (Krakow, Poland)

(8) Assess both demand and supply for provision of energy and pollution reduction (Poland, Czech, Slovakia, Bulgaria)

(9) Work with World Bank on industry and energy loans to finance energy efficiency (Poland, Bulgaria, Lithuania, Latvia, Estonia)

Energy Efficiency Market Development
Hungary, Bulgaria, Romania

Objectives

The three Energy Efficiency Market Development (EEMD) tasks are designed to serve as a catalyst to assist local private firms to develop a market for energy efficiency services, and to develop their capability to serve this market.

The specific objectives of each EEMD task are:

1. Foster the development and capability of local private firms to provide energy efficiency services, equipment, and financing to their clients;

2. Improve energy efficiency in specific pilot sites (especially industrial enterprises), through provision of energy audits, energy management programs, and energy-saving equipment;

3. Expand technical and commercial ties to the U.S., through linkages between energy efficiency associations, engineering and energy service companies, and equipment suppliers.

Rationale

Emerging private sector entrepreneurs are judged to have the best chance of successfully building energy efficiency services as a sustainable activity.

Energy Efficiency Market Development
Hungary, Bulgaria, Romania

Task Description

The major activities in each EEMD task are:

1. A six-month training program for private sector engineers on how to develop and market their business, energy audit techniques, energy efficiency monitoring equipment, performance contracting, industrial consulting, and a certification exam (Certified Energy Manager CEM by Association of Energy Engineers, AEE).

2. Establishment of local chapters of AEE, supply of US energy audit equipment of a total value of approximately $30,000 to the local AEE, and assistance to develop the local AEE as a sustainable market-oriented professional association.

3. Energy audits, energy management programs and energy efficiency equipment in approximately 10 facilities in each country, predominantly industrial enterprises. Each facility will cost share by hiring local CEMs and paying for equipment installation and maintenance.

4. Conference on industrial energy management and exhibition of US energy efficiency equipment.

5. Assistance preliminary to financing for selected industrial energy efficiency investment projects.

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Energy Efficiency Market Development
Hungary, Bulgaria, Romania

Results/Accomplishments

1. Private sector engineers went through competitive process and completed six-month training program (11 in Hungary, 15 in Bulgaria, 18 in Romania). Nearly all passed CEM exam (9 in Hungary, 14 in Bulgaria, 18 in Romania).

2. Established local chapters of AEE in all 3 countries and supplied US energy audit equipment for their use. They sat at the head table and were awarded their plaques at AEE World Energy Engineering Congress October 1993.

3. A competitive RFP process was successfully used to identify plants for energy management programs, rather than Government or others assigning plants.

4. CEMs successfully marketing their services and obtaining commercial contracts for audits and performance contracting. Audits now under way in all 3 countries, with plants hiring local CEMs and paying for equipment installation and maintenance. Plan to complete energy audits by April 30, 1994.

Energy Efficiency Market Development
Hungary, Bulgaria, Romania

Significance/lessons learned

1. Began to create a market for local experts - with paying clients. However, further stimulation is needed - potential clients are reluctant to accept audits because of financial difficulties.

2. The program offered a tangible result - international certification - instilling pride and hope in local professionals who face competition from Western Europeans.

3. The broad-based training program focused on market issues for entrepreneurs, not only energy but also business subjects, industrial quality, and process optimization.

4. Provided local energy engineers membership in a worldwide organization of 6,000 energy professionals, and united them in a local association which gives them greater market power.

5. Consultants now are offering not only traditional energy audits but also performance contracting, industrial management consulting for issues such as organization, pricing, restructuring, quality, maintenance and process optimization.

6. Program provides energy efficiency equipment to raise management interest and provide tangible results. It is still difficult to get duty-free importation of A.I.D.-funded equipment.

POLAND DEMAND-SIDE MANAGEMENT/ INTEGRATED RESOURCE PLANNING (DSM/IRP) TASK

OBJECTIVES/RATIONALE

THE POLAND DSM/IRP TASK HAS THE FOLLOWING OBJECTIVES:

- TO RECOMMEND AN INSTITUTIONAL AND REGULATORY FRAMEWORK IN POLAND THAT SUPPORTS THE DEVELOPMENT OF DSM PROGRAMS;
- TO IDENTIFY DSM RESOURCES IN POLAND WHICH COULD BE CONSIDERED WITHIN THE CONTEXT OF INTEGRATED RESOURCE PLANNING;
- TO EVALUATE THE COSTS AND BENEFITS OF THOSE DSM RESOURCES TO SUPPORT THEIR CONSIDERATION IN POWER SECTOR LOAN PROGRAMS;
- TO INTRODUCE IRP AS THE BASIS FOR POWER SECTOR PLANNING AT THE POLISH POWER GRID COMPANY THROUGH PROVISION OF COMPUTER MODELS, TRAINING, AND SUPPORT FOR IRP ANALYSES; AND
- TO ASSIST POLISH AUTHORITIES TO DEVELOP A LASTING INSTITUTIONAL CAPABILITY WITHIN THE GOVERNMENT, THE UTILITIES, AND THE PRIVATE SECTOR TO DESIGN, IMPLEMENT, AND EVALUATE DSM PROGRAMS.

RATIONALE: TO DETERMINE THE EXTENT TO WHICH DSM HAS A LEGITIMATE ROLE TO PLAY IN TRUE LEAST-COST PLANNING FOR POLAND'S POWER SECTOR.

POLAND DSM/IRP TASK

TASK DESCRIPTION

TASKS PERFORMED WITH THE POLISH POWER GRID COMPANY (PPGC):

1) NATIONAL DSM ASSESSMENT:

   -- DETERMINED ECONOMIC AND ACHIEVABLE POTENTIAL OF DSM
   -- DATA COLLECTED BY POLISH FOUNDATION FOR ENERGY EFFICIENCY (FEWE) AND POLISH INSTITUTE OF POWER ENGINEERING

2) IRP TRAINING: CONDUCTED EXECUTIVE SEMINARS ON IRP TOPICS AND INTRODUCING IRP COMPUTER MODELS AND ANALYTICAL TECHNIQUES

TASKS PERFORMED WITH UPPER SILESIA POWER DISTRIBUTION COMPANY:

3) DSM PILOT PROJECT DESIGN:

   -- REFLECTED RESULTS OF MARKET RESEARCH FOCUS GROUPS
   -- EMPHASIZED ROLE OF ENERGY SERVICE COMPANIES (ESCOS)

4) END-USE LOAD RESEARCH:

   -- PROVIDED POWER MONITORING EQUIPMENT AND TRAINING
   -- CONDUCTED END-USE SPOT MONITORING AT SIX FACILITIES

POLAND DSM/IRP TASK

RESULTS/ACCOMPLISHMENTS

- DSM ASSESSMENT PRODUCED QUANTITATIVE ESTIMATE OF THE IMPACT OF DSM AS AN ELECTRIC RESOURCE IN 2000:
  - -- 550 MW OF DEMAND REDUCTION
  - -- 1,740 GWH PER YEAR OF ENERGY SAVINGS
- DSM PILOT PROJECT DESIGN PROVIDES BASIS FOR FIRST SIGNIFICANT DSM DEMONSTRATION IN EASTERN EUROPE
  - -- IDENTIFIED TARGET SECTOR AND END-USES (I.E., FOCUSED ON INDUSTRIAL SECTOR; MOTORS AND PROCESSES)
  - -- ESTIMATED COST OF $5 TO 8 MILLION OVER 18 MONTHS
- END-USE LOAD RESEARCH HELPED UPPER SILESIA TO UNDERSTAND HOW ITS CUSTOMERS USE ELECTRICITY
  - -- HELPED CREATE LOAD RESEARCH DEPARTMENT
  - -- CREATED CUSTOMER SERVICE MENTALITY
- CONTRIBUTED TO THE ACCEPTANCE OF DSM/IRP CONCEPTS BY KEY ENTITIES OF THE POLISH POWER SYSTEM (PPGC/UPPER SILESIA)

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POLAND DSM/IRP TASK

SIGNIFICANCE/LESSONS LEARNED

WHY IS DSM SIGNIFICANT IN POLAND (WITH 35 PERCENT RESERVE MARGIN AND DECLINING/FLAT SALES) ?:

- REDUCES ENVIRONMENTAL COSTS OF POLLUTION DAMAGE
- IMPROVES COMPETITIVENESS OF POLISH ECONOMY
- MOVES UTILITIES TOWARD CUSTOMER SERVICE MENTALITY
- CREATES ENERGY SERVICES INDUSTRY
- PROVIDES ELECTRIC RESOURCES AT LOWER COST THAN PLANT REHABILITATION AND NEW CONSTRUCTION
- SHOULD BE FUNDED IN MDB LOAN PROGRAMS

LESSONS LEARNED ABOUT IMPLEMENTING DSM/IRP IN POLAND:

- NEED TO FIX PROBLEMS ASSOCIATED WITH THE "U.K. MODEL"
  - -- REGULATORY INCENTIVES
  - -- COMPETITIVE BIDDING
- UNEMPLOYMENT IN UTILITY AND COAL MINING POSES OPPOSITION
- UNCERTAINTY OF INDUSTRIAL FACILITY SURVIVAL CREATES RISK
- ADAPTING DSM PROGRAMS TO POLISH SITUATION
  - -- LOW LABOR COSTS MEAN MORE OPERATIONS & MAINTENANCE
  - -- INDUSTRY MORE INTERESTING THAN BUILDINGS

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Kraków Clean Fossil Fuels and Energy Efficiency Project

Conservation Demonstration

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KRAKÓW CONSERVATION DEMONSTRATION

Background

Soviet-designed and other old buildings not energy efficient
- no insulation
- high infiltration
- inefficient in-room heating systems
- cold, unhealthy indoor environment

Rising costs to heat buildings
- energy prices rising
- subsidies being phased out

Pollution
- heavy reliance on coal
- inefficient combustion

Weak incentives for energy efficiency
- district heat energy use not metered
- other energy sources metered ineffectively
- lack of infrastructure—energy savers don't pocket the savings

Motivations for energy efficiency
- Economic relief for consumers faced with rising energy prices
- Allow more efficient, less polluting sources to serve more customers
- Reduce costs of conversion to less polluting fuels (e.g., gas)

KRAKÓW CONSERVATION DEMONSTRATION

Objectives/Rationale

Identify cost-effective building energy efficiency techniques.

Quantify costs and savings.

Demonstrate savings—reality, not calculations.

Create a constituency for efficiency—demonstrate the need for energy efficiency infrastructure and incentives.

Technology transfer—nurture the commercial energy efficiency sector.

KRAKÓW CONSERVATION DEMONSTRATION

Task Description

Four 11-story, 66-apartment buildings, 2 heating seasons

- regulated hydroelevator
- regulated heat exchanger
- pipe cleaning
- thermostats
- attic and basement insulation
- caulking and weatherstripping
- external insulation

Three 11-story, 66-apartment buildings, 1 heating season

- regulated heat exchanger
- occupant-installed efficiency measures

Several Old-City buildings (residences and offices) - attic insulation, caulking and weatherstripping

Demonstration sites - schools, offices, residences, apartment buildings

Data analysis and reporting

Technology transfer - information dissemination, tariff structure, establishment of self-sustaining enterprise

KRAKÓW CONSERVATION DEMONSTRATION

Results/Accomplishments

Demonstrated significant energy savings at affordable cost

- Approximate 2-year payback at current prices
- Cost of improvements comparable to annual cost of subsidies

Improved occupant comfort

Over 20 newspaper stories

Three television features (2 Polish TV, 1 BBC)

Assessment of Polish insulation and weatherstripping market

Market entry for U.S. companies

- Controls: Honeywell
- Insulation: Guardian Fiberglass
  DryVit Systems
- Metering: Controlotron
- Pipe Cleaning: Ferrosol
- Weatherization: various products

KRAKÓW CONSERVATION DEMONSTRATION

Significance

Contracts for insulation/weatherstripping (commercial basis)

- school
- AGH library
- Prądnik Biały Cooperative
- Additional Kraków and nearby cities' housing cooperatives
- 4-6 private buildings - Old City

Involvement of Polish Ministry for Physical Construction and Planning

Cities Planning Kraków-type projects

- Kraków
- Bielsko-Biała
- Tychy
- Bydgoszcz
- Wodzisław Sląski
- Gdańsk
- Gryfice
- Żywiec
- Nowy Sącz
- Myślenice

KRAKÓW CONSERVATION DEMONSTRATION

Significance

Polish government planning to redirect heat subsidies from direct payments to "soft" loans and grants for energy efficiency, beginning with 1994-95 heating season. The project team—FEWE-Kraków—has been asked to help draft the legislation.

Opportunity to help Poland avoid U.S. mistakes in setting energy efficiency incentives/rebates and establishing ESCO market.

Meaningful liaisons with EC programs, including Energie Cities (28 Polish cities), TEMPUS (energy efficiency and audit training), ADEME

Stimulation of Polish fiberglass/rockwool market, product re-orientation.

KRAKÓW CONSERVATION DEMONSTRATION

Significance

Presentations, Papers and Seminars

Association of Earth Sciences, Scientific Council, Poland, 12/93
Polish Thermorenovation Consortium, Poland, 12/93
Helsinki Citizens Assembly, Turkey, 12/93
Poznań Symposium—Presidents of 42 cooperatives, Poland, 11/93
National Conference on Modernization of the Heat Network, Poland, 11/93
Polish Energie Cities, Poland, 10/93
TEMPUS Courses and Lectures, Poland, 10/93 and on-going
Energy Directorate to the European Commissions, France, 9/93
INforSE Conference, Denmark, 7/93
Article in Sustainable Energy Europe, 7/93
Workshop for Models for Integrated Electricity Resource Planning, Portugal, 7/93
Staff of CEEETA, Portugal, 6/93
UN-ECZ Energy Efficiency 2000, France 5/93
Vezelay Group Meeting, Greece, 4/93
Presentation to NGO participants—SNEEZE Seminar, Czech Republic, 4/93
Convention of Mayors of Bielsko-Biała Voyevodship, Poland, 4/93
FEWE Least Cost Planning Seminar, Poland, 4/93
Conference on Sustainable Energy Development in Europe, Germany, 3/93
Energy Workshop, Mayor of Szęzcein, Poland, 2/93
Aspen Institute, Financing Environmental Reform in Eastern Europe, Germany, 2/93
IIEC Workshop on Integrated Resource Planning, USA, 11/92
Equipe Cousteau Conference—Citizens Concerned with Energy Efficient and Environmentally Respectful Society, Bulgaria, 10/92
ADEME Seminar on Demand Side Oriented Energy Policy, France, 10/92
Balaton Group, Limits to Growth, Hungary, 8/92
Central European University Students, Poland and Hungary, 7/92
French-Polish Seminar on Energy Use in Cities, Poland, 7/92
Global Forum in Rio (INforSE), Brazil, 6/92
Conference on the Ecological Reconstruction of Eastern and Central Europe, Austria 5/92

Kraków Conservation Demonstration

Lessons Learned

Appropriate technologies
- Technical factors
- Economics
- Availability

Value of demonstrations vs. calculations on academic reports

Demonstrate the incentive for infrastructure reform. (Everybody's preaching it!)

Identify appropriate early adapters and opinion setters—customs can be changed.

Need for in-country organization: expertise, initiative, incentives, infrastructure integration

U.S. companies not competing on a level playing field. Demonstrate your objectivity to host country.

Use experts who do, not just study. "Dirt under the fingernails."

Be prepared to learn. Be prepared to be proven wrong. Be flexible.

Use your ears, eyes, and heart, as well as your head.

ENERGY EFFICIENCY CENTERS
STATUS, JANUARY 1994

- POLISH FOUNDATION FOR ENERGY EFFICIENCY
  - Warsaw, Katowice, Krakow
  - Founded 1991
- SEVEn--THE CZECH ENERGY EFFICIENCY CENTER
  - Prague
  - Founded 1990
- ENEFFECT--THE BULGARIAN ENERGY EFFICIENCY FOUNDATION
  - Sofia
  - Founded 1993
- CENEf--THE RUSSIAN ENERGY EFFICIENCY CENTER
  - Moscow
  - Founded 1992

SOURCE: Battelle, PNL

ENERGY EFFICIENCY CENTERS
PROGRAM OBJECTIVES

- **SUPPORT POLICY REFORM**
  - Local experts can address policy
  - Local expertise provides continuity
- **DEVELOP PRIVATE BUSINESS**
  - Local experts know the ropes
  - Local experts are cost-effective
  - Market development cuts investment costs
- **DEMONSTRATE COST-EFFECTIVE MEASURES**
  - Technology projects provide experience
  - Institutional projects provide solutions
- **PROVIDE INFORMATION**
  - To consumers
  - To investors
  - To policymakers

SOURCE: Battelle, PNL

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ENERGY EFFICIENCY CENTERS
TASK DESCRIPTIONS

- **POLICY RESEARCH AND DEVELOPMENT**
  - Market assessments
  - Contraints analysis
  - Draft policies: IRP, DSM, Finance, Regulatory
- **PRIVATE BUSINESS VENTURE DEVELOPMENT**
  - Advice and support for American business
  - Market creation (policy and information)
- **TRAINING AND DEMONSTRATION PROJECTS**
  - Krakow buildings
  - Plzen buildings
- **PUBLIC EDUCATION**
  - Television, radio spots
  - Publications
  - Refrigerator labels

SOURCE: Battelle, PNL

ENERGY EFFICIENCY CENTERS
ACCOMPLISHMENTS, 1993

- **POLICY**
  - Polish DSM Law Passed
  - Czech Efficiency Law Agreement
  - Climate Convention
- **PRIVATE BUSINESS DEVELOPMENT**
  - ENSERV obtains $20-30 million in ESCO business
  - Over 100 companies receive assistance
  - A dozen private contracts signed
  - Twenty-schools project launched
  - IFC loan projects initiated
- **DEMONSTRATIONS**
  - Krakow project yields insulation agreements
  - Plzen defers heat supply construction
- **PUBLIC INFORMATION**
  - Energy Bus delivers audits
  - Polish training courses completed
  - 2nd Energy Efficiency Business Week held
  - Refrigerator labels published
  - Television spots produced

SOURCE: Battelle, PNL

ENERGY EFFICIENCY CENTERS
LESSONS LEARNED, 1993

- **CENTERS ARE COST EFFECTIVE**
  - Cost is low, skill is high
  - U.S. business profits from using them
- **MARKET DEVELOPMENT REQUIRES LOCAL EXPERTISE**
  - Locating investment opportunities
  - Developing institutional solutions
- **SIGNIFICANT BARRIERS REMAIN**
  - Financial "Catch-22s"
  - Weak legal basis for transactions
- **INDEPENDENCE IS INVALUABLE**
  - Flexibility for hiring experts
  - Ability to "tell the truth"
- **AN NGO PARTNER IS ESSENTIAL**
  - WWF, ACEEE
  - Foundation grants
- **CAN BECOME SELF-SUPPORTING**
  - FEWE's budget is two-thirds self-generated
  - SEVEn's budget is half self-generated

SOURCE: Battelle, PNL

ENERGY/POWER RESTRUCTURING PROGRAM AREAS

** Energy/Power System Policy and Structure

** Utility Management and Modernization

** Economic Regulatory System Development

** Privatization and Independent Power

ENERGY/POWER SECTOR RESTRUCTURING STRATEGY

** FOCUS ON POWER SECTOR

** WORK WITH MINISTRIES,COMPANIES, LOCAL AUTHORITIES AND NGOS

** ADDRESS POLICY,INDUSTRY STRUCTURE AND LEGAL/REGULATORY ISSUES

** COORDINATE/SUPPORT WORLD BANK ENERGY SECTOR LENDING

** FURTHER CEE REGIONAL COLLABORATION

Electricity Tariff Reform
Poland

Objectives/Rationale

The task objective is to assist the Government of Poland (and particularly the Polish Power Grid Co.) to reform retail and bulk power tariffs for the medium term, compatible with the goals of an economically efficient and financially self-sustainable power system.

The objective of follow-up training is to assist PPGC to use the tariff design tools provided in continued work.

Electricity Tariff Reform
Poland

Significance/Lessons Learned

1. PPGC is closely following targets established by the tariff study, as evidenced by the increase in November 1993 (to 1,016 zl/kwh) and the announced 1994 average retail tariff of 1,170 zl/kwh.

2. Results showed the feasibility of achieving a commercially viable power sector in the medium term without extreme hardship on the public and thus gave confidence to PPGC to continue in the path of pricing reform.

3. Tariff reform is a significant precondition to attracting private investment in the Polish power sector, and provide badly needed revenues to modernize the system and meet rigid pollution control standard targets for 1997.

4. The tariff study recommendations include provisions to clearly separate the heat and power sectors, simplifying the process and eliminating hidden cross subsidies.

5. PPGC staff achieved familiarity with planning concepts used in the western world, particularly economic and financial analysis principles, and received practical tools and training to periodically update the results.

Electricity Tariff Reform
Poland

Results/Accomplishments

All objectives of study were met and report was accepted by PPGC. Key findings:

- annual load growth forecast as 1.3% for 1993-95, 2% for 1996-2000
- system has adequate reserve margin until 1997 for peaking capacity and well after 2000 for baseload capacity.
- short-run marginal cost of generation is estimated as 4.73¢/kWh.
- long-run marginal costs at retail level 7.37¢/kWh - current yield is 4.04 ¢/kWh.
- The bulk LRMC is 5.29 ¢/kWh, against a current yield of 2.53 ¢/kWh.
- A ceiling of 15 percent on the annual rate of increase in tariffs from 1994 onwards was judged as the limit of public acceptance, and only a 7 percent real increase is assumed to be achieved between mid-1992 and January 1994.
- Financial projections show that the resulting average revenue requirements at the retail level are 4.65 ¢/kWh) for 1994, 5.34 ¢/kWh for 1995, and 6.07 ¢/kWh for 1996 and 1997.

Electricity Tariff Reform
Poland

Task Description

The tariff study was carried out in several major activities:

- review the load forecast and investment plans
- develop economic marginal costs
- forecast financial revenue requirements for sustainability
- develop electricity tariffs structured on the basis of economic marginal costs, and designed to meet financial revenue requirements

The first stage, carried out from June 1992 to March 1993, examined the economic structure of costs, in both the short-run and long-run. Financial revenue requirements in an unconstrained case of rapid tariff increases were also examined.

The second stage, carried out from April to July 1993, developed financial projections which took into account a practical schedule for asset revaluations, a program of gradual tariff increases designed to minimize negative public and economic impact, and the use of long and short-term debt to meet financing needs.

Training continues in 1994 with PPGC in the use of the models.

Baltic States - Regional Electricity Pricing and Contracting

Objectives/Rationale

Objectives of the regional electricity pricing and contracting project:

1. To work with all three Baltic countries on developing acceptable terms and conditions of electric power transactions among these countries.

2. To promote the development of pricing principles that are consistent with the efficient operation of the regional electrical system and consistent with economic efficiency objectives

3. To provide information to the Baltic countries regarding the choices that are available for electric power pooling arrangements, contracting arrangements, and tariff structures.

4. To help the Baltic countries reach agreement on key issues involving power contracting and pricing.

In July 1992 the three ministries signed an agreement to participate in a study of pricing and contracting. The working group was created by the Baltic Energy Council on September 10, 1992. Participants include Eesti Energia, LSPS, DC Baltija, and the three energy ministries. When the working group began, power was sold under one-month bilateral agreements consisting of one or two pages of text. There were no written contracts comparable to what we would consider to be contracts. There were verbal agreements backed up by brief notes.

Baltic States - Regional Electricity Pricing and Contracting

Significance/Lessons Learned

- AID provided support to a process initiated by the three countries, rather than trying to impose an organizational structure on these countries.

  The working group was formed by the Baltic Energy Council (i.e, the three ministries and the three power systems) and all meetings were organized by DC Baltija. Meeting agendas were revised on the basis of U.S. input but the initial draft of every agenda was prepared by DC Baltija.

- Ministry representatives did not have the technical expertise to address many of the topics covered in the seminars. Power sales agreements were negotiated by the power systems.

- The Baltic contracts in place today are probably the most detailed electric power agreements in the region encompassed by the former Soviet Union. The program sets an example that other Regional Dispatch Centers may follow.

- The Baltic countries are interested in establishing interconnections with UCPTE and Nordel. A Polish-Swedish-Finnish-Baltic analysis of interconnections should be completed in a few months. The Baltics project establishes a basis on which AID could support a broader program to facilitate interconnection of the Baltic countries with western Europe.

Baltic States - Regional Electricity Pricing and Contracting

Results/Accomplishments

In September 1992, the Baltic power system was operated without contracts. By December 1993, several agreements had been negotiated - a multilateral interconnection agreement (in draft form) and bilateral agreements (in final form).

At the final seminar, the members of the working group signed a "Resolution Concerning the Results of Technical Cooperation on Electricity Pricing and Contracting arranged by USAID Seminars in Riga 1992-1993." This resolution states:

1. Concepts used in North American power contracts are included in the draft Multilateral Agreement among Baltic countries among the State Enterprise Eesti Energia, State Enterprise Latvenergo and the Lithuanian State Power System.

2. Information about North American experience was used to prepare bilateral agreements, including the Estonia - Latvia power agreements and the Latvia - Lithuania power agreement and Lithuania and Belarus.

3. After the bilateral power agreements were negotiated between Estonia and Latvia and Latvia and Lithuania, these agreements formed the starting point for negotiation of other bilateral agreements energy interchange including Lithuania - Belarus and Latvia - Russia.

4. These agreements have increased the reliability and security of electric power supply in the Baltic countries.

Baltic States - Regional Electricity Pricing and Contracting

Task Description

1. Definitional mission in October 1992. Meetings in Vilnius with LSPS and Ministry of Energy. Initial meeting at the Dispatch Center "Baltija" with the working group on electric power pricing and contracting.

2. Seminar on reactive power, reserve capacity, and alternative methods of determining electricity prices in wholesale markets, November 19-20, 1992. Distribution of copies of sample contracts and interconnection agreements.

3. Seminar on electric transmission pricing, time of use rates, and capacity payments, December 9-10, 1992. Draft of a sample Baltic agreement.

4. Seminar on interchange agreements, capacity contracts, and joint ventures, February 17-18, 1993. Discussion of Estonia-Latvia contract.

5. Seminar on Power Sales Agreements and Reliability Agreements, May 12-13, 1993. Distribution of sample agreements on reliability standards. Discussion of Latvia-Lithuania contract.

6. Seminar on liability clauses and direct demand side management programs, November 15-16, 1993. Discussion of Estonia-Latvia-Lithuania interconnection agreement. Signing of a resolution defining project results.

7. Exchange of information: shipment of books, receipt of power system data.

Competition and Privatisation in Poland

Objectives of the Energy Restructuring Group

- Advise the Government of Poland on issues regarding restructuring and privatisation in the electric power, natural gas, coal and district heating subsectors.
- Create an indigenous base of expertise to support the continued restructuring and privatisation of the energy sector.
- Participate in a unified effort with the World Bank and the Western European community.

Competition and Privatisation in Poland

Task Description

- Provide power and lignite subsector-related advice through a full-time specialist.
- Provide functional advice in privatisation and corporate planning through two half-time specialists.
- Hire and train three Polish specialists to assist the US advisors and to carry on their functions after USAID funding ceases.

Competition and Privatisation in Poland

Major Accomplishments

- Substantially contributed to the restructuring and corporatisation of seven coal companies and three lignite mining/generating companies.
- Produced a draft Energy Law for submission to Poland's Council of Ministers in early 1994.
- Assisted the two largest power distributors with preparation of their corporate strategic plans.
- Trained three Polish specialists who can now support future privatisation and restructuring.

Competition and Privatisation in Poland

Lessons Learned

- Managers and officials in post-communist countries require patient mentoring in the concepts of competition and privatisation.
- A synergistic environment can result from a team of advisors with dissimilar cultural and national backgrounds.
- Converting the energy sector to a market basis is inherently a slow process for economic, political and cultural reasons.

POWER SECTOR POLICY AND STRUCTURAL ISSUES: SLOVAKIA

FLOYD DAVIS
TASK MANAGER
BECHTEL CORPORATION

JANUARY 5, 1994

OVERALL OBJECTIVE

PROVIDE ASSISTANCE TO ENERGY POLICY DEVELOPMENT WITH PARTICULAR EMPHASIS ON THE POWER SECTOR.

OBJECTIVES/RATIONALE

OBJECTIVE: REVIEW CURRENT OPTIONS FOR POWER SECTOR RESTRUCTURING.

RATIONALE: VIEWED BY THE MINISTRY OF ECONOMY AS A PRESSING NEED AND WAS PART OF THE LEGISLATIVE AGENDA OF THE COUNTRY.

OBJECTIVE: REVIEW THE NATIONAL ENERGY PLAN PRIOR TO SUBMITTAL TO GOVERNMENT. PROVIDE ADVICE IN KEY AREAS.

RATIONALE: BASED ON REQUEST BY THE MINISTRY OF ECONOMY IN SUPPORT OF NATIONAL ENERGY POLICY.

OBJECTIVE: STRENGTHEN ENERGY PLANNING CAPABILITIES OF MINISTRY OF ECONOMY.

RATIONALE: BASED ON RESULTS OF REVIEW OF ENERGY PLANNING PROCESS.

SLOVAKIA ENERGY POLICY AND POWER SECTOR REVIEW

TASK DESCRIPTION

POWER SECTOR RESTRUCTURING REVIEW- REVIEW EXISTING POWER SECTOR STRUCTURE, INTERVIEW GOVERNMENT, G&T, AND DISTRIBUTION UTILITY PERSONNEL, REVIEW OPTIONS FOR RESTRUCTURING, AND IDENTIFY PROS AND CONS OF OPTIONS. PRESENT RESULTS IN SEMINAR.

BECHTEL, ARTHUR ANDERSEN CO., MONTANA POWER (SUBCONTRACTOR TO ELECTROTEK CONCEPTS)

ENERGY SECTOR REVIEW- REVIEW ENERGY PLANNING PROCESS, DEVELOP STATUS REPORTS ON INDIVIDUAL ENERGY SUBSECTORS, PROVIDE SOFTWARE AND TRAINING TO STRENGTH PLANNING PROCESS.

BECHTEL, HORIZON COAL (SUBCONTRACTOR TO ELECTROTEK CONCEPTS)

SLOVAKIA ENERGY POLICY AND POWER SECTOR REVIEW

RESULTS/ACCOMPLISHMENTS

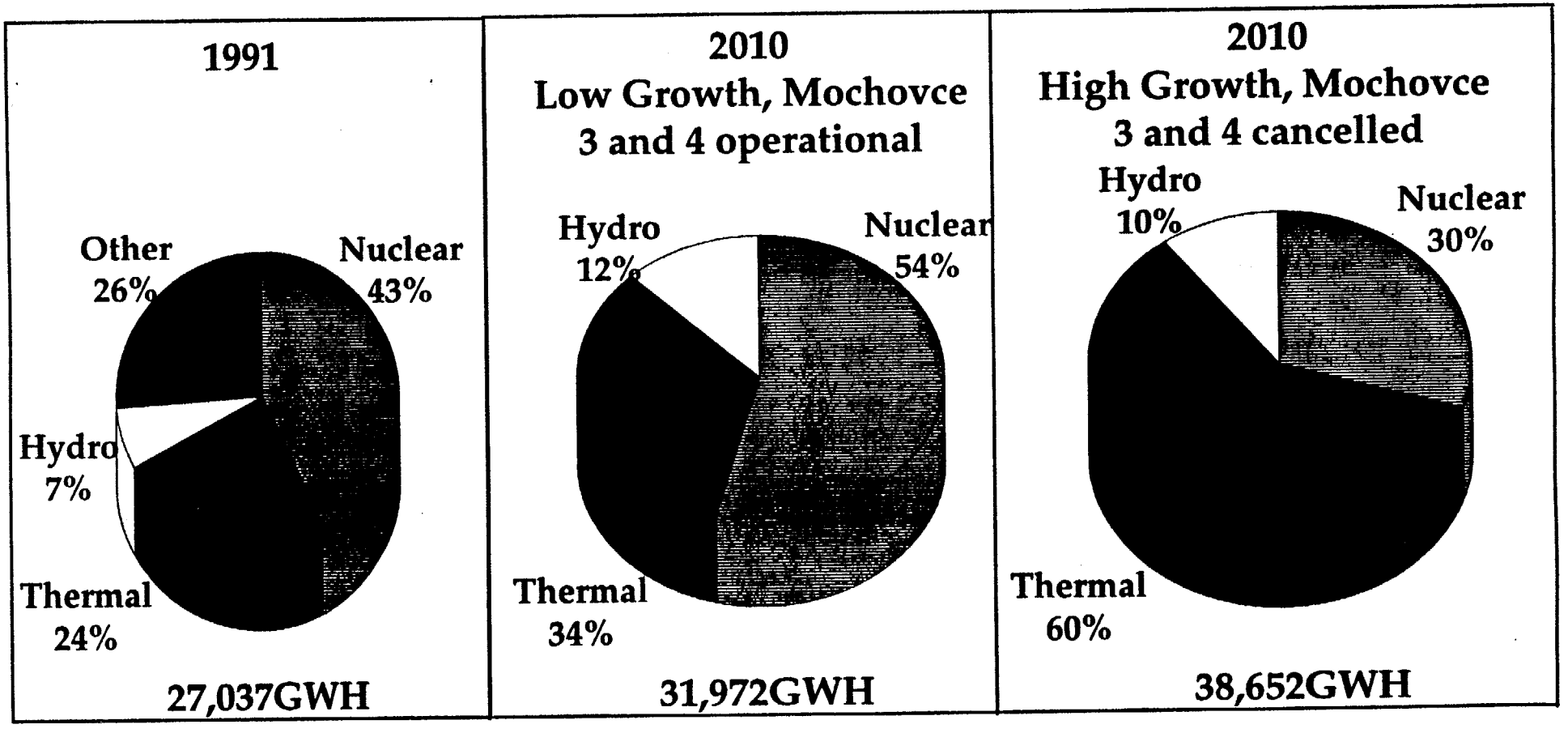
- SEMINAR ON POWER SECTOR RESTRUCTURING (APRIL).
- REVIEW OF ECONOMIC ANALYSIS OF BOHUNICE V-1 POWER PLANT OPTIONS (JUNE).
- COMPLETED REVIEWS OF COAL/LIGNITE, NATURAL GAS, AND PETROLEUM SECTORS (JULY-AUGUST).
- WORKSHOP ON ENERGY SUBSECTOR ANALYSIS AND POWER SYSTEM PLANNING (AUGUST).
- PROVIDED SOFTWARE AND TRAINING IN MULTI-SECTOR ENERGY PLANNING AND CONDUCTED CASE STUDY (SEPTEMBER-NOVEMBER).
- SEMINAR ON ENERGY PLANNING WITH EMPHASIS ON POWER SECTOR (DECEMBER).

SIGNIFICANCE/LESSONS LEARNED

- RESULTS OF RESTRUCTURING SEMINAR INCLUDED IN MINISTRY OF ECONOMY RECOMMENDATIONS TO THE GOVERNMENT.
- COMMENTS ON DRAFT ENERGY PLAN INCORPORATED INTO FINAL SUBMITTAL TO THE GOVERNMENT
- REVIEW OF BOHUNICE V-1 ECONOMIC ANALYSIS LED TO STRENGTHENING OF ENERGY PLANNING CAPABILITIES, SOFTWARE TRANSFER, AND TRAINING.
- POWER SECTOR ANALYSIS CANNOT BE ISOLATED FROM OVERALL ENERGY POLICY ISSUES.
- CASE STUDY WAS A USEFUL VEHICLE FOR SKILLS TRAINING.

Use of Natural Gas

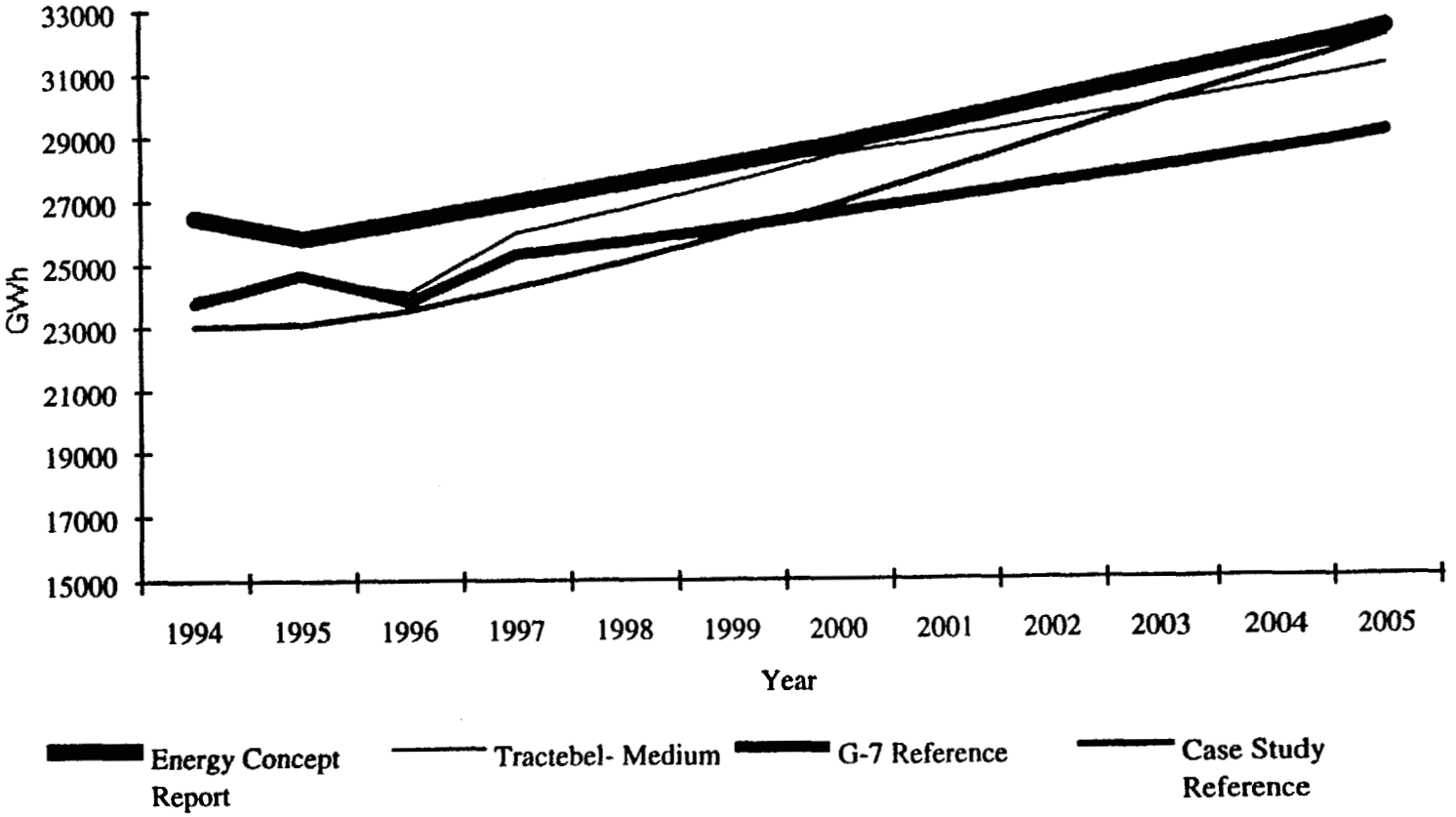
Scenarios of Generation Mix



Source:
Tractebel Study

Load Forecasts

Generation Requirements



US AID ENERGY EFFICIENCY PROJECT
OIL & GAS SECTOR

ROMANIA PETROLEUM SECTOR RESTRUCTURING

RATIONALE:

- ASSIST TRANSITION TO MARKET ECONOMY
- COLLAPSE OF TRADITIONAL MARKETS
- DECLINE IN INDUSTRIAL PRODUCTION
- HIGH PRIORITY, BECAUSE:
  - SIGNIFICANT ROLE IN ECONOMY
  - EASE OF PRIVATIZATION
  - POTENTIAL FOR IMPORT REDUCTION
- FACILITATE PRIVATE INVESTMENT
- IMPROVE EFFICIENCY & VIABILITY
- SUPPORT W.B. APPRAISAL MISSION

US AID ENERGY EFFICIENCY PROJECT
OIL & GAS SECTOR

ROMANIA PETROLEUM SECTOR RESTRUCTURING

DESCRIPTION OF AID FUNDED WORK:

- REVIEW PETROLEUM LEGISLATION
- REVIEW BUSINESS AND TAX LAW
- DETERMINE ROLE OF GOVERNMENT
- REVIEW MODEL CONTRACTS
- RECOMMEND CHANGES IN GOVERNMENT'S ROLE
- REVIEW STRUCTURE OF ENTITIES
- DETERMINE CORPORATE OBJECTIVES
- ANALYZE CORPORATE STRUCTURES & RECOMMEND CHANGES TO IMPROVE ECONOMIC STRATEGIES

US AID ENERGY EFFICIENCY PROJECT
OIL & GAS SECTOR

ROMANIA PETROLEUM SECTOR RESTRUCTURING

RESULTS AND ACCOMPLISHMENTS:

- RECOMMENDATIONS TO DEVELOP A STRATEGY FOR SECTORIAL REFORM, INCLUDING:

- PROVIDE A LEVEL OF AUTONOMY

- DELEGATE RESPONSIBILITY & AUTHORITY

- RETAIN REGULATORY AND POLICY DECISIONS

- ESTABLISH A NEW NATIONAL AGENCY (NAMR)

- IDENTIFIED SPECIFIC ENERGY EFFICIENCY PROJECTS FOR W.B. LOAN

- FOLLOW UP ACTIVITIES INCLUDE:

- ASSIST THE NEW CHAIRMAN OF NAMR

- PERFORM A REFINERY RESTRUCTURING STUDY

US AID ENERGY EFFICIENCY PROJECT
OIL & GAS SECTOR

ROMANIA PETROLEUM SECTOR RESTRUCTURING

LESSONS LEARNED:

- INEXPERIENCED IN ECONOMICS
- PRODUCTION METRICS BASED ON WRONG OBJECTIVES
- FULL EMPLOYMENT VS. ECONOMICS
- DIFFICULT TIME ACCEPTING RECOMMENDATIONS
- COMMON PROBLEMS OF ENTIRE REGION

REGULATORY SYSTEM DEVELOPMENT

UTILITY PARTNERSHIP PROGRAM
USAID/USEA

REGULATORY ASSISTANCE PROGRAM

OUTLINE

- OBJECTIVES/RATIONALE
- TASK DESCRIPTION
- RESULTS/ACCOMPLISHMENTS
- SIGNIFICANCE/LESSONS LEARNED

JANUARY 5, 1994
Russell C. Brown

OBJECTIVES/RATIONALE

• MISSION/PURPOSE

TO ASSIST THE 10 UPP COUNTRIES IN THE DEVELOPMENT, ORGANIZATION, IMPLEMENTATION AND OPERATION OF AN ELECTRIC SECTOR REGULATORY SYSTEM/PROCESS BY PROVIDING INFORMATION, ADVICE, TRAINING AND CONSULTATION.

• OBJECTIVES

GENERAL
PROVIDE AN OVERALL, GENERIC PLAN AND COUNTRY-SPECIFIC ACTION PLANS TO DETERMINE AND ADDRESS THE REGULATORY NEEDS OF EACH COUNTRY AND TO HELP THEM ENSURE THAT THE POLICY, PROCEDURES, ORGANIZATIONS, PERSONNEL AND SYSTEMS ARE DEVELOPED, IMPLEMENTED AND IN OPERATION.

USAID/UPP
~~STABILIZE~~ RATIONALIZE PRICES TO COVER COSTS AND PROFIT

IMPROVE GENERATION/TRANSMISSION/DISTRIBUTION QUALITY, RELIABILITY AND ECONOMICS

ADDRESS AND REDUCE ENVIRONMENTAL POLLUTION

INTEGRATION WITH INTERNATIONAL MARKETS

• JUSTIFICATION

PRIVATIZATION AND RESTRUCTURING ON THE PATH TO A MARKET ECONOMY REQUIRES THE ENACTMENT AND IMPLEMENTATION OF LEGISLATION TO PROVIDE POLICY, DIRECTION AND CONTROL VIA THE INSTITUTION OF A

REGULATORY SYSTEM/PROCESS

TASK DESCRIPTION

- CONDUCT AND UPDATE "NEEDS ASSESSMENTS"
- DEVELOP STANDARD PRESENTATIONS, PAPERS, WORKSHOPS, ETC., AND CUSTOMIZE
- DEVELOP AND MAINTAIN AN "EXPERTS" LIST
- PROVIDE COUNTRY-SPECIFIC ACTION PLANS PER A STANDARD FORMAT
- CONTINUOUSLY ASSESS IMPACT AND PROVIDE CORRECTIVE ACTIONS

RESULTS/ACCOMPLISHMENTS

- TWO NATURAL MONOPOLIES SEMINARS
- FOUR IN-COUNTRY OVERVIEW SEMINARS
- ONE STUDY TOUR TO THE USA INVOLVING FOUR COUNTRIES
- TWO DETAILED SEMINARS PLANNED FOR MARCH 1994
- RAP IN FINAL APPROVAL STAGES

SIGNIFICANCE/LESSONS LEARNED

- TOO EARLY TO TELL, PROGRAMMATICALLY, BUT WITHOUT ELECTRIC LAWS AND A WORKABLE REGULATORY SYSTEM/PROCESS, LITTLE PROGRESS TOWARD PRIVATIZATION WILL BE POSSIBLE

- SOME LESSONS LEARNED, HOWEVER

  ALL COUNTRIES NEED AND WANT HELP

  INTEGRATION OF GOVERNMENT AND THE UTILITIES IS IMPORTANT

  ALL ARE IN DIFFERENT STAGES

  ALL ARE PROCEEDING DOWN DIFFERENT PATHS

  CREATION OF PRICING AUTHORITY IS THE MOST DIFFICULT

  FACE-TO-FACE NEEDS ASSESSMENTS ARE MANDATORY

  INCLUSION OF OTHER MODELS IS IMPORTANT

  RATEMAKING AND RATE DESIGN HOLD MUCH INTEREST

UNITED STATES ENERGY ASSOCIATION
UTILITY PARTNERSHIP PROGRAM

REGIONAL & IN-DEPTH UTILITY MANAGEMENT TRAINING PROGRAMS

OBJECTIVES / RATIONALE

- Provide in-depth training and education for CEE utility middle and senior level managers on specific electric utility management concepts, and organizational issues.

- Utility-Specific Issues on a country-by-country basis:

  - Specific Topics, based on CEE Utility Requests to USAID/USEA
    (Examples):
    - Least-Cost Planning
    - Human Resource Management
    - Project Management
    - Financial Management/Accounting
    - Customer Service/Public Information

    - Classroom Training Programs
    - Training Programs with U.S. Utilities
    - Other U.S. Industry Resources

- Regional Issues on a coordinated, multi-country basis, utilizing U.S. industry-wide resources:

    - Regional Transmission Interconnections: Reliability & Availability
    - Environmental Issues
    - Electric Utility Regulation

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UNITED STATES ENERGY ASSOCIATION
UTILITY PARTNERSHIP PROGRAM

REGIONAL & IN-DEPTH UTILITY MANAGEMENT TRAINING PROGRAMS

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    - Customer Service/Public Information

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    - Training Programs with U.S. Utilities
    - Other U.S. Industry Resources

- <u>Regional Issues</u> on a coordinated, multi-country basis, utilizing U.S. industry-wide resources:

    - Regional Transmission Interconnections: Reliability & Availability
    - Environmental Issues
    - Electric Utility Regulation

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UNITED STATES ENERGY ASSOCIATION
UTILITY PARTNERSHIP PROGRAM

UTILITY MANAGEMENT IMPROVEMENT PROGRAMS

UTILITY PARTNERSHIP PROGRAM

GOAL

Provide a mechanism which enables the experience of U.S. electric utilities to be transferred to Eastern European electric utilities, thereby helping address institutional issues including free-market managerial challenges and technical, financial, economic, regulatory and environmental issues.

UNITED STATES ENERGY ASSOCIATION
UTILITY PARTNERSHIP PROGRAM

UTILITY MANAGEMENT IMPROVEMENT PROGRAMS

OBJECTIVES

- Develop the institutional structure to facilitate the transfer of management and technical skills, technologies and expertise in energy resource development, production and utilization from the United States to East/Central European utilities.

- Determine the interests and most urgent issues confronting the East/Central European electric utilities and provide assistance with their resolution.

- Identify U.S. and Eastern European electric utilities interested in participating in the Utility Partnership Program and develop effective working relationships with them.

- Encourage and coordinate the exchange of personnel from the U.S. and Eastern European utilities (for short time frames and through internship programs) so participants may share industry experience and improve their capability for resolving complex energy issues.

- Develop a series of extended regional seminars addressing the most urgent regional energy issues and common interests of East/Central European utilities, including Regulatory, Reliability and Environmental Issues.

- Develop an infrastructure and model for increasing the depth and quality of utility partnership initiatives, including: personnel exchanges, seminars, training, internships, and other educational and on-the-job training opportunities.

UNITED STATES ENERGY ASSOCIATION
UTILITY PARTNERSHIP PROGRAM

UTILITY MANAGEMENT IMPROVEMENT PROGRAMS

TASK DESCRIPTIONS

Management and Technical Advisory Missions
Executive Exchanges
Focused Seminars
Information Exchange Programs
Internship Programs
Regional Training Activities
In-Depth Utility Management Training

UNITED STATES ENERGY ASSOCIATION
UTILITY PARTNERSHIP PROGRAM

UTILITY MANAGEMENT IMPROVEMENT PROGRAMS

TASK DESCRIPTIONS

Management and Technical Advisory Missions

Purpose: The **Management and Technical Advisory Missions** are initiated annually in order to develop appropriate evaluation of past activities and identification of future topical areas to be addressed through the UPP program.

These missions provide both the U.S. and East/Central European "sister utilities" with an opportunity to visit face-to-face and to:

1) discuss energy issues and needs in relation to program possibilities,

2) develop activity plans, roles and schedules for activities, and

3) develop and maintain ongoing and effective working relationships.

UNITED STATES ENERGY ASSOCIATION
UTILITY PARTNERSHIP PROGRAM

UTILITY MANAGEMENT IMPROVEMENT PROGRAMS

TASK DESCRIPTIONS

Executive Exchanges

Purpose: **Executive Exchanges** provide the Sister Utilities from the U.S. and East/Central Europe with an opportunity to:

1) learn about the work of peers in the work environment within their respective countries, and

2) observe and ask specific questions about utility business practices and work methodologies.

By definition, there is a presumed two-way exchange of information and knowledge in an Executive Exchange visit.

The overall intent of this activity is to provide an opportunity for both formal and informal exchange of information, allowing interactive participation by all individuals.

UNITED STATES ENERGY ASSOCIATION
UTILITY PARTNERSHIP PROGRAM

UTILITY MANAGEMENT IMPROVEMENT PROGRAMS

TASK DESCRIPTIONS

Focused Seminars

Purpose: **Focused topical seminars** provide the Central and Eastern European Utility executives with an opportunity to obtain a broad overview and background on how U.S. Sister Utilities solve specific management issues related to

- electric utility structure and management
- financial management
- utility rates and regulation
- environmental issues
- other general management issues

Generally, two or three separate Seminars are conducted for each East/Central European utility partner each year.

UNITED STATES ENERGY ASSOCIATION
UTILITY PARTNERSHIP PROGRAM

UTILITY MANAGEMENT IMPROVEMENT PROGRAMS

TASK DESCRIPTIONS

Information Exchange Programs

Purpose: The UPP **Information Exchange Program** provides a broad range of general support mechanisms which can be utilized to supplement the managerial and technical exchange functions of the UPP as necessary and appropriate.

This activity may include providing subscriptions to appropriate professional journals, resource materials, text books, technical reports, software, membership in technical organizations and sponsorship of attendance at U.S. industry conferences and symposiums.

Energy conferences (EEI, RETSIE, EPRI, NERC, IEEE) are helpful in providing information to participants who need it in order to make informed decisions. UPP participants in Central and Eastern Europe who are responsible for energy related decisions seek to inform themselves of the options available and their comparative costs and benefits.

The UPP recognizes that information programs alone are not sufficient to overcome the market barriers to participant acquisitions and installation of efficiency technologies. These programs work best when accompanied by technical assistance provided by the UPP Sister Utilities in the U.S., i.e., in the areas of efficiency technologies, regulations, pricing strategies, financing and other general management techniques.

UNITED STATES ENERGY ASSOCIATION
UTILITY PARTNERSHIP PROGRAM

UTILITY MANAGEMENT IMPROVEMENT PROGRAMS

TASK DESCRIPTIONS

Internship Programs

Purpose: The UPP **Internship Program** provides Central and Eastern European energy officials with an opportunity to work in a U.S. electric utility industry environment where they can obtain knowledge and experience in a specific area of utility operations, and then return to their work place as a change agent.

UNITED STATES ENERGY ASSOCIATION
UTILITY PARTNERSHIP PROGRAM

UTILITY MANAGEMENT IMPROVEMENT PROGRAMS

TASK DESCRIPTIONS

Regional Training Activities

Purpose: The proposed **Regional Training Activities** will provide an opportunity for multi-country training activities to be conducted on specific technical and/or managerial issues which are being addressed on a regional basis by the utilities in Eastern European and where they lend themselves to coordinated training due to the nature of the topic. This is especially important where program efficiencies can be gained by a coordinated regional approach.

Specifically identified topics which may benefit from the Regional Training Approach include:

- Utility Regulation
- Environmental Issues
- Transmission Reliability and Availability

UNITED STATES ENERGY ASSOCIATION
UTILITY PARTNERSHIP PROGRAM

UTILITY MANAGEMENT IMPROVEMENT PROGRAMS

TASK DESCRIPTIONS

In-Depth Utility Management Training

Purpose: The UPP **In-Depth Utility Management Training** activity is designed to provide East/Central European utility industry executives with in-depth training and education and training in specific management techniques which are required to implement advanced management systems within the electric utility industry in their respective countries.

The UPP works with USAID and the UPP sister utilities to identify topics within the East/Central European utility industry where in-depth education and training will aid in the implementation of new management functions within the East/Central European electric utilities, and where such training falls within the overall scope and objectives of the Utility Partnership Program.

Specially designed in-depth training programs (modules) will be designed to address the specific needs and requirements of the European utility. USEA will work with the U.S utilities and other industry organizations to identify or design the various mechanisms necessary to provide these training elements.

UNITED STATES ENERGY ASSOCIATION
UTILITY PARTNERSHIP PROGRAM

UTILITY MANAGEMENT IMPROVEMENT PROGRAMS

RESULTS / ACCOMPLISHMENTS

September 9-11, 1992	**Nuclear Safety Seminar** - Washington, D.C.
September/Oct., 1992	**Executive Advisory:** Baltics, Romania, Bulgaria
Sept 20 - Oct 2, 1992	SEP Executive Exchange/Seminar - Atlanta, Ga.
October 4-11, 1992	MVMRt Customer Relations Seminar
October 6-11, 1992	CEZ Executive Exchange Visit to HL&P
October 24-31, 1992	Boston Edison Co. Exec Exchange Visit to RENEL
October 26-30, 1992	NEK Executive Exchange Visit to CMP
Late October, 1992	CEZ Seminar: U.S. Utility Management Techniques
November 7-14, 1992	HL&P Executive Exchange Visit to CEZ
November 9-16, 1992	PPGC Seminar: Least-cost/Power Contracts
November, 1992	Baltic Executive Exchange Visit - U.S. to Baltics
November 17-19, 1992	**PowerGen '92 Conference** - Orlando, Fl.
November 22-25, 1992	MVMRt Executive Exchange Visit to U.S.
November 22-24, 1992	RENEL Executive Exchange Visit to Boston Edison
November 22-24, 1992	SEP Executive Exchange Visit to SEI
November 22-25, 1992	NEK Executive Exchange Visit to CMP
December 14-16, 1992	SEP Financial Seminar
Nov/Dec, 1992	PPGC Executive Exchange Visit to U.S.
January/February, 1993	RENEL Seminar: Utility Organization & Management
March 8-12, 1993	PPGC Power Plant Ops & Maintenance Seminar
March 8-12, 1993	NEK Financial Management Seminar
March 23-26, 1993	**EPRI/EEI/DOE Demand-Side Management**-Miami, Fl.
March, 1993	CEZ Executive Exchange Visit (HL&P to CEZ)
March 22-28, 1993	PPGC Executive Exchange Visit to CWE
March 28-April 3, 1993	SEP Executive Exchange Visit to U.S.
March 29-April 2, 1993	NEK Regulatory Seminar
March/April, 1993	RENEL Executive Exchange Visit to U.S.
April 5-8, 1993	MVMRt Joint Ventures Seminar
April 12-15, 1993	**American Power Conference**
April 20-22, 1993	**EEI International Power Forum**
April/May, 1993	PPGC Seminar: Power Plant Ops & Maintenance
May 10-14, 1993	RENEL Regulatory Seminar
May 17-21, 1993	RENEL Financial Management Seminar
May 16-22, 1993	CEZ Executive Exchange Visit to HL&P
May 17-19, 1993	SEP Regulatory Seminar
May 20-21, 1993	CEZ Regulatory Seminar
May 24-28, 1993	**Power Gen Europe-Paris**
June 6-9, 1993	**EEI Annual Convention**
June 10-11, 1993	**NERC General Meeting**
June 16-19, 1993	SEP Executive Exchange Visit to SEI
June 11-17, 1993	**APPA Annual Meeting**
June 25-27, 1993	CEZ Executive Exchange Visit to U.S.
June 29-July 9, 1993	**Vienna Natural Monopolies Seminar**
July 31-Aug 22, 1993	Czech Legislators & Mayors Visit to Houston
August 21-27, 1993	Latvenergo Ad Mission and Utility Management
August 30-Sept 3, 1993	MVMRt Human Resources & Personnel Management
Aug. 30-Sept. 10, 1993	CEZ Contracting & Procurement Seminar
September, 1993	MVMRt Executive Exchange Visit to U.S.
September, 1993	PPGC Executive Exchange Visit to U.S.
September 5-18, 1993	DOE/Southern States Energy Board Clean Coal
September 6-11, 1993	Financial Management Seminar - Riga, Latvia
September 12-17, 1993	MVMRt to IEEE/PES ESMO-3 Conference
September 14-17, 1993	PPGC Human Resources & Personnel Management
September 13-17, 1993	SEP Executive Exchange Visit to SEI
September 20-23, 1993	MVMRt Executive Exchange Visit to NEES
September 20-24, 1993	RENEL Human Resource Seminar
September, 1993	NEK Executive Exchange Visit to Central Maine
September, 1993	PPGC Executive Exchange to Commonwealth Edison
September, 1993	SEP Executive Exchange Visit to Southern Company
September, 1993	SEP Strategic Planning Seminar
September, 1993	SEP Plant Waste Handl'g Seminar
September, 1993	SEP Quality Assurance Seminar
Sept 28-Oct 3, 1993	**RETSIE/ECO Expo, Boston, MA**

UNITED STATES ENERGY ASSOCIATION
UTILITY PARTNERSHIP PROGRAM

UTILITY MANAGEMENT IMPROVEMENT PROGRAMS

SIGNIFICANCE / LESSONS LEARNED

- (7) ACTIVE PARTNERSHIPS ESTABLISHED:

BULGARIA (NEK)- CENTRAL MAINE POWER
CZECH REPUBLIC (CEZ) - HOUSTON LIGHTING & POWER
HUNGARY (MVMRt) - NEW ENGLAND ELECTRIC SYSTEM
LITHUANIA - CENTRAL VERMONT PUBLIC SERVICE
POLAND (PPGC) - COMMONWEALTH EDISON COMPANY
ROMANIA (RENEL) - BOSTON EDISON COMPANY
SLOVAKIA (SEP) - SOUTHERN COMPANY SERVICES

- Over 120 Separate Activities Conducted during 14 month period (October 1, 1992 - December 15, 1993)
- Over 500 CEE Electric Utility Executives involved in UPP
- Regional-Level of Involvement(s)
- Strategic Planning Required to Maintain Appropriate Focus for Ongoing Programs
- Budapest - November, 1993

Specific Programmatic Results
Bulgaria NEK / Central Maine Power

CENTRAL MAINE POWER COMPANY

PARTNERSHIP WITH

NATSIONALNA ELECTRICHESKA KOMPANIA

Central Maine Power

OBJECTIVES / RATIONALE

To transfer management and technical skills, technologies and expertise to NEK in order to improve its operating effectiveness within a free-market economy.

TASK DESCRIPTIONS

Seminars:

* Corporate Planning
  - Financial Planning
  - Budgeting
  - Least Cost Planning
* Utility Regulation
* Procurement
* Public Relations

TASK DESCRIPTIONS

Executive Exchanges:

1993

* Organizational Issues
* Power Plant Operations
* Least Cost Planning
* Financial Planning

1994

* Accounting
* Procurement
* Public Relations
* Transmission & Distribution

Results / Accomplishments

- Strong Professional and personal relationships between NEK and CMP staff.

- NEK's management has gained an overview of how US utilities are organized and managed.

- Along with other AID consultants, CMP has helped identify NEK systems that need to be improved.

Results / Accomplishments

- NEK has prioritized its needs for assistance and developed a workplan for the next two years.

- Significant progress is being made on improving two NEK systems.

    * Least Cost Planning - Installation of the ELFIN model

    * Financial Planning - Completion of NEK's first five year corporate finance plan.

- Program has provided a challenging experience for CMP employees.

Significant / Lessons Learned:

- Need to follow up programs that provide general overviews and seminars for large groups of employees with more focussed and detailed training for smaller groups of experts.

    * UPP Training Program

    * Utility Consultancy Program

- The advantage of the Utility Partnership Program is that it builds the in-house skills and expertise that NEK and the other Eastern European utilities will need to operate and manage their companies successfully in a free-market economy.

USAID/CEE ENERGY ASSISTANCE REVIEW MEETING

ENERGY/POWER SECTOR RESTRUCTURING

UTILITY MANAGEMENT IMPROVEMENT: GENERATION

POLISH RYBNIK CASE

Roger Griffin
Project Director
Bechtel Corporation

January 5, 1994

RYBNIK GENERATING COMPANY MODEL MASTER PLAN

STUDY OBJECTIVES/RATIONALE

- *DEVELOP A MASTER PLAN FOR A SELECTED POLISH GENERATING COMPANY, TO BE USED AS A MODEL FOR OTHER GENERATING COMPANIES AND GROUPS*

- *MODEL MASTER PLAN INTENDED TO:*
  - *IMPROVE GENERATING COMPANY ORGANIZATION, MANAGEMENT, PERFORMANCE*
  - *SUPPORT POWER SECTOR PRIVATIZATION AND MARKET ECONOMY OBJECTIVES, INCLUDING ENERGY RESTRUCTURING GROUP (ERG) PROGRAM*
  - *REFLECT GOVERNMENT-DEFINED GENERATING COMPANY GROUPINGS, PLANNED NEW ENERGY LAW*

- *PROVIDE EXPERIENCE AND TRAINING TO GENERATING COMPANY PARTICIPANTS*

RYBNIK GENERATING COMPANY MODEL MASTER PLAN

TASK DESCRIPTION

- *RYBNIK PLANT (GROUP) SELECTED BY GENERATING CO. ASSOCIATION AS "TYPICAL"*

- *RYBNIK PERSONNEL TO ACTIVELY PARTICIPATE IN DATA COLLECTION & EVALUATION, HAVE PRIMARY RESPONSIBILITY FOR PROCEDURE PREPARATION & IMPLEMENTATION*

- *MODEL MASTER PLAN TO INCLUDE:*

  - *CORPORATE STRUCTURE*
  - *CORPORATE ORGANIZATION AND RESPONSIBILITIES*
  - *FINANCIAL MANAGEMENT PRINCIPLES AND PROCEDURES*
  - *PERSONNEL MANAGEMENT PRINCIPLES AND POLICIES*
  - *MARKETING AND GENERATION PLANNING PROCESSES*
  - *FIVE-YEAR BUSINESS PLAN, TEN-YEAR FINANCIAL PROJECTIONS*

- *PRINCIPAL PARTICIPANTS:*

  - *BECHTEL TEAM (BECHTEL, ARTHUR ANDERSEN, MODELPOL)*
  - *RYBNIK TEAM (PLANT DIRECTOR, PROJECT MGR, GROUP LEADERS)*
  - *OTHERS (PROGRAM COMM, RYBNIK GROUP PLANT DIRECTORS)*

RYBNIK GENERATING COMPANY MODEL MASTER PLAN

RESULTS/ACCOMPLISHMENTS TO DATE

- ***ORGANIZATION AND DATA COLLECTION***
  - ***PROGRAM COMMITTEE, RYBNIK PROJECT MGR, WORKING GROUP LEADERS ASSIGNED***
  - ***34-PAGE QUESTIONNAIRE DEVELOPED, COMPLETED BY 4 RYBNIK GROUP PLANTS***
  - ***SWOT ANALYSES PREPARED FOR 4 RYBNIK GROUP PLANTS***
  - ***DATA COLLECTION AND PROGRESS REVIEW MEETINGS HELD***

- ***DRAFT REPORTS UNDER REVIEW OR IN PREPARATION:***
  - ***ALTERNATE CORPORATE STRUCTURE OPTIONS***
  - ***THE ELECTRICITY HOLDING COMPANY - OUTLINE OF MAIN ISSUES***
  - ***PROJECT APPRAISAL***
  - ***NON-CORE ACTIVITIES - ASSESSMENT OF RESTRUCTURING OPTIONS***
  - ***CASH MANAGEMENT - AN ASSESSMENT OF BENEFITS***
  - ***PLANNING AND BUDGETING GUIDELINES***
  - ***MANAGEMENT REPORTING PACKAGE***
  - ***FINANCIAL PROJECTIONS***

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ISSUES TO BE RESOLVED

- *FORMAT AND CONTENT OF FINAL "MODEL MASTER PLAN"*
- *FORM OF CORPORATE STRUCTURE TO BE ASSUMED*
- *GENERATING COMPANY GROUP ISSUES*
- *EXTERNAL CONSTRAINTS TO BE ASSUMED*
- *NEED FOR ADDITIONAL TRAINING AND SUPPORT*
- *COMPLETION DATE*

SIGNIFICANCE/LESSONS LEARNED TO DATE

- ***ACTIVE PARTICIPATION OF RYBNIK TEAM HAS PROVIDED THEM A SIGNIFICANT LEARNING EXPERIENCE***
- ***AREAS FOR MAJOR IMPROVEMENT IDENTIFIED & QUANTIFIED; RYBNIK PLANT ALREADY IMPLEMENTING SOME PRELIMINARY RECOMMENDATIONS (e.g., CASH MANAGEMENT, PROJECT APPRAISAL)***
- ***METHODOLOGIES & PROCEDURES APPLICABLE BOTH TO RYBNIK GROUP AND TO INDIVIDUAL PLANTS***
- ***DELAYS IN GOVERNMENT DECISIONS DELAYING COMPLETION, MAY LIMIT SOME RESULTS (e.g., GENERATING CO. GROUPINGS, STRUCTURE, REGULATION, PRICES)***
- ***THIS AND RELATED ACTIVITIES (e.g., ERG, TARIFF STUDY, DIST. CO. MASTER PLAN) TOGETHER SHOULD GREATLY ASSIST IN IMPROVING POWER SECTOR PERFORMANCE***

Utility Management Improvement

- Transmission and Distribution -

Poland, Czech, and Slovak Training

AID/EUR/DR/EI Program Review
January 5-6, 1994

J. Charles Smith
Program Manager
Electrotek Concepts, Inc.

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Objectives/Rationale

- **Promote energy sector efficiency, restructuring, and privatization by:**
  - **Developing a model Master Plan including an organizational structure for a typical Polish distribution company.**
  - **Providing recommendations for a transition plan to the future.**
  - **Providing exposure to Western T&D technology and management practices.**
- **Improve system efficiency, quality of electrical service, and customer service to meet the needs of a modern industrial society after 50 years of neglect.**

Task Description

- Select a Host Utility
- Identify Master Plan Requirements
- Define the Current Situation
- Examine Alternative future Scenarios
- Develop Outline of Master Plan
- Conduct a Strategic Planning Workshop
- Prepare Joint First Draft of Master Plan
- Prepare Final Draft of Master Plan
- Conduct Distribution Management Training Program in United States

Results/Accomplishments

- Completed Management Training for (12) Polish, Czech, and Slovak Distribution Company management personnel in United States.
- Conducted follow-up training seminar in Czech Republic and Slovakia.
- Completed assessment of ZE Torun as representative of Polish Distribution Companies.
- Facilitated Strategic Planning Seminar for ZE Torun.
- Developed mission statement and corporate objectives for Master Plan.
- Introduced concepts of strategic thinking and business planning.
- Completed outline and first draft of Master Plan.

Significance/Lessons Learned

- Provided first exposure to Western organizational, management, design and operational practices and technology options to the participants.
- Identified numerous practices and technology of immediate applicability.
- Metering, billing, and customer service practices need significant improvement.
- Average level of understanding of Western finance, accounting, and budgeting practices is low.
- Engineers are well trained in fundamentals, but lacked access to modern tools.
- Transition from a socialist state organization to a private company is difficult.
- The same words mean different things to different people.
- One of the greatest problems is changing peoples attitudes. Personnel attitudes are limiting factors for change.

Distribution System Training Topics

1. Distribution System Management:
   - Organizational Structure (ownership and regulation)
   - Employee Administration (motivation and evaluation)
   - Management Information System
   - Regulatory and Financial Reporting
   - Accounting and Finance
   - Rates and Contracts
   - Third Party Access
2. Distribution System Engineering and Operations
   - Distribution Operation Center
   - Distribution System Design Practices
   - Distribution Communication Systems
   - Distribution Loss Evaluation
   - Cable Fault Finding and Repair
   - Mapping System
   - Integrated Customer Information/Mapping System
   - Distribution SCADA Systems
   - Line and Substation Maintenance
3. Customer Service
   - Metering and Billing
   - Customer Information System
   - Remote Meter Reading
   - Energy Utilization Assistance
   - Energy Conservation
   - Customer Applications Center
   - Promotional Rate Structures

SKAWINA CLEAN COAL RETROFIT PROJECT

OBJECTIVES: TO DEMONSTRATE A U.S. TECHNOLOGY--THAT HAD BEEN PREVIOUSLY OPERATED AT A COMPARABLE SCALE--TO CONTROL AIR POLLUTION FROM A COAL-FIRED UTILITY POWERPLANT IN THE KRAKOW REGION OF POLAND, THAT CAN BE REPLICATED THROUGHOUT POLAND

- PROJECT WAS FORMALLY OFFERED BY PRESIDENT BUSH DURING HIS VISIT TO POLAND IN JULY 1989
- THE OBJECTIVE WAS SPECIFICALLY AUTHORIZED IN THE SEED ACT OF 1989
- PROJECT IS THE FIRST COMMERCIAL FLUE GAS DESULFURIZATION UNIT CONSTRUCTED IN EASTERN EUROPE

METHODOLOGIES

- PROJECT WAS CONDUCTED UNDER A BILATERAL STEERING COMMITTEE; DECISIONS (SITE SELECTION, PERFORMANCE SPECIFICATIONS, PREPARATION OF SOLICITATION, EVALUATION OF PROPOSALS, SELECTION OF PROPOSAL) WERE MADE JOINTLY.

- PROJECT WAS PUT OUT FOR COMPETITIVE BID; PERFORMANCE AND MAXIMUM COST WERE SPECIFIED; FIXED PRICE BIDS WERE REQUESTED

- SOLICITATION WAS PRECEDED BY PUBLIC MEETINGS IN THE U.S. (TO ALERT U.S. INDUSTRY TO THE OPPORTUNITY) AND IN POLAND (TO ALERT POLISH POWERPLANT DIRECTORS TO U.S. CAPABILITY

- PROJECT SELECTED WAS A DUAL ALKALI SCRUBBER, PROVIDED BY AIRPOL, OF TETERBORO, NJ

- ALTHOUGH THE PROJECT WAS A GIFT OFFERED BY THE U.S. GOVERNMENT, THE POLISH SIDE WAS ENCOURAGED TO CONSIDER DOUBLING THE SCOPE OF THE PROJECT - AT THEIR INCREMENTAL COST - TO IMPROVE THE COST EFFECTIVENESS OF THE POLLUTION REDUCTION

- DURING THE COURSE OF THE PROJECT, DOE ALSO INTRODUCED AN ANALYTICAL TOOL-POWERPLANT UPGRADE MODEL TO ENABLE POLISH ENGINEERS TO EVALUATE COMPETING TECHNOLOGIES AND SYSTEMATICALLY COMPARE THE COST EFFECTIVENESS ON A CONSISTENT BASIS

- DOE ALSO ORGANIZED A POWERPLANT UPGRADE CONFERENCE TO SHOWCASE U.S. TECHNOLOGIES AND ENCOURAGE POLISH GOVERNMENT TO CREATE CONDITIONS NEEDED TO FINANCE UPGRADE PROJECTS

RESULTS

- CONSTRUCTION HAS BEEN COMPLETED; PROJECT IS VIEWED POSITIVELY IN POLAND - 30% LESS COSTLY THAN CURRENT OFFERINGS BY OTHER COUNTRIES (MAINLY, GERMANY) AND FOR A PROJECT OF SIMILAR COMPLEXITY) WAS CONSTRUCTED ON A MUCH FASTER SCHEDULE

- AS A RESULT OF PARTICIPATING IN THE DECISION-MAKING PROCESS, POLISH SIDE PERCEIVED THE PROJECT POSITIVELY AND DECIDED TO DOUBLE THE SCOPE OF THE PROJECT, AT THEIR EXPENSE; PROJECT TREATS 100 MW OF FLUE GAS

- POWERPLANT UPGRADE CONFERENCE WAS WELL ATTENDED BY POLISH AND U.S. INDUSTRY; IT WAS FOLLOWED BY A 'REVERSE MISSION' OF ENGINEERS AT POLISH POWERPLANTS WHO ARE RESPONSIBLE FOR SPECIFYING AND PROCURING SO_2 CONTROL EQUIPMENT

LESSONS LEARNED/POLICY ISSUES

- THE USE OF A "SHOWCASE PROJECT" WAS A VERY EFFECTIVE WAY TO DEMONSTRATE U.S. INTEREST IN HELPING POLAND TO MOVE TOWARD A MARKET ECONOMY

- POLISH INDUSTRY AND GOVERNMENT RESPONDED VERY FAVORABLY TO KEY INNOVATION:

  - THE USE OF A COMPETITIVE SOLICITATION
  - USE OF PERFORMANCE SPECIFICATIONS (INITIALLY THEY WANTED TO CREATE A COMMISSION TO SELECT A TECHNOLOGY)
  - THE INTRODUCTION OF A COMPUTER-BASED TECHNIQUE TO COMPARE LIFE CYCLE COST OF COMPETING APPROACHES; THE CONCEPT OF LIFE CYCLE COST IS NEW

- THE USE OF A "SHOWCASE PROJECT" HAS BEEN VERY SUCCESSFUL AS A MEANS TO FOCUS THE ATTENTION OF U.S. INDUSTRY ON THE POTENTIAL OF THE POLISH UTILITY UPGRADE MARKET - AND TO DEMONSTRATE THE POLISH NEED TO RATIONALIZE THE PRICING OF ELECTRICITY TO ATTRACT FOREIGN INVESTMENT AND FOREIGN TECHNOLOGY

POWER PLANT UPGRADE

1) STATUS OF SKAWINA (100 MW) FGD UNIT
   - FIRST IN EASTERN EUPROPE (11/18/93)

2) POWER PLANT UPGRADE CONFERENCE
   - JUNE 93

3) PC BASED UPGRADE MODEL
   - TRAINING POLISH PP OPERATORS

4) FUTURE PLANS
   - E. EUROPEAN PP UPGRADE DEMONSTRATION

ENVIRONMENTAL ACTION PLAN -- THE LUCERNE AGREEMENT

As the first follow up to the Rio Environmental Conference, the Lucerne Conference was held in April 1993. At Lucerne, the environmental ministers of the US; Western Europe; Central and Eastern Europe (CEE), and the industrialized republics of the New Independent States (NIS) agreed to:

- expansion of global and regional cooperation on environmental issues in CEE and NIS countries;
- endorsement of an Environmental Action Plan (EAP) for the CEE and NIS countries.

Despite efforts undertaken in the CEEC and NIS, the EAP recognizes that numerous environmental situations exist that require immediate and urgent action. Recognizing that financial resources are limited, the EAP assigns highest priority to environmental degradation that directly endangers human health. Specific health threats are identified as:

- heavy metal pollution in air, solid waste and soil;
- airborne particulates;
- sulfur dioxide and other gases;
- nitrate contamination of drinking water;
- heavy metal and toxic chemical contamination of water supplies and food sources.

To address these issues, the EAP calls for priority action in these three areas:

- policy reform to insure the effective and consistent environmental policies;
- strengthen domestic institutions to more effectively address environmental issues;
- stimulate investments that reduce these identified, pollution related health threats.

To implement the EAP, the Ministers established:

- a Task Force to coordinate implementation of policy and institutional reforms addressed in the EAP;
- a Project Preparation Committee to facilitate environmental investments.

THE PROJECT PREPARATION COMMITTEE (PPC)

The PPC was set up under the Lucerne Agreement to stimulate environmental investments to support the EAP. The PPC consists of the most active donor countries plus the International Financial Institutions (IFIs).

The US has committed $10 million and other donors an additional $30 to $40 million. These monies are for assistance in the pre-investment analysis of projects so that they may obtain financing. Investments promoted by the PPC will:

- directly support the environmental priorities set forth in the Lucerne Agreement;
- incorporate least cost solutions and have high benefit to cost ratios;
- be projects which can be financed from domestic or international sources;
- be supportive of economic restructuring.

Specific actions taken by the US to support the PPC include:

- the placement of advisors at the IFIs to help identify and develop EAP environmental investments for financing (One US advisor is now at the EBRD with another to be at the IBRD. Other donor countries will sponsor two other advisors.);
- the sponsoring of missions to work with the host countries to identify and develop EAP projects (The first mission, to Poland, is scheduled for January 1994.);
- the providing of technical assistance to host countries to aid in preparation of pre-investment analysis of projects (The first mission is to Estonia in January 1994).

BUREAU FOR EUROPE
AND NEWLY INDEPENDENT STATES
DIVISION OF ENERGY AND INFRASTRUCTURE
PROGRAM IN NUCLEAR SAFETY

Strategy

1. Support G-7 emphasis on Nuclear Safety of Soviet designed reactors.

2. Support emphasis on accelerated shut down.

3. Support implementation of alternatives to nuclear generation in restructuring energy sector.

4. Support implementation of new technologies to ensure environmentally benign utilization of indigenous energy resources.

5. Support implementation of energy efficient alternatives in generation, transmission and distribution.

6. Support improved safety of operating NPP's through training of managers, operators and inspectors and supply of low cost safety equipment.

BUREAU FOR EUROPE
AND NEWLY INDEPENDENT STATES
DIVISION OF ENERGY AND INFRASTRUCTURE
PROGRAM IN NUCLEAR SAFETY

Program Development

1. Review of existing assessments by IAEA, WANO, INPO, etc., of safety deficiencies in operating NPP's.

2. Discussions with responsible managers in country's ministry, power plants, regulatory agency.

3. Develop a consensus program within the country, with country selected principals, addressing all levels of management, operation and inspection.

4. Prioritize needs with country principals.

5. Finalize program with country principals immediately prior to implementation.

6. Conduct in-country project reviews semi-annually. Modify program where necessary.

BUREAU FOR EUROPE
AND NEWLY INDEPENDENT STATES
DIVISION OF ENERGY AND INFRASTRUCTURE
PROGRAM IN NUCLEAR SAFETY

Participants

1. Eastern Europe: Bulgaria, Czech Republic, Hungary, Lithuania, Slovak Republic.

2. US: Agency for International Development funding via Interagency Agreements

   A. US Department of Energy

      - Brookhaven National Laboratory

      - Argonne National Laboratory

   B. US Nuclear Regulatory Commission

      - Idaho Nuclear Energy Laboratory

G-7 STUDIES

Istvan Dobozi

World Bank

January 6, 1994

MUNICH G-7 SUMMIT (JULY 1992) PROCESS

- **G-7 EXPRESSED CONCERN ABOUT NUCLEAR SAFETY IN EASTERN EUROPE AND FSU (VVER 440/230 & RBMK in six countries: Armenia, Bulgaria, Lithuania, Russia, Slovakia and Ukraine)**

- **G-7 CALLED FOR PROGRAM OF ACTION, INCLUDING EXAMINATION OF THE**

  - **Scope for replacing less safe plants by alternative energy sources and more efficient energy use**

  - **Potential for upgrading nuclear plants of more recent design (VVER 1000 & 440/213)**

  - **International organizations (WB, IEA, EBRD) prepare required energy studies, including**

    * **Replacement sources of energy**
    * **Cost implications**
    * **Potential financing needs**

- **WB/IEA/EBRD SET OUT TO ANSWER FOLLOWING MAIN QUESTION:**

  "What are the alternative supply sources, associated costs and financing requirements to enable shutting down high-risk plants as soon as possible, given resource and other constraints, while meeting future electricity demand reliably and economically?"

- **MAIN ASSUMPTIONS**

  - **Demand**
  - **Costs**
  - **Nuclear scenarios**
    - **Low**
    - **Moderate**
    - **High**

- **MAIN FINDINGS:**

  - **Low Nuclear Scenario: Technically feasible to replace high risk plants with alternative supplies by 1995-97, but:**
    - **Not least cost (high fuel costs, adverse BOP impact)**

* Difficulty to get country agreement (demand uncertainty; different views about safety; preference to retire older/costly thermal plants)

- High Nuclear Scenario: Least cost in narrow economic terms (higher capital cost offset by lower fuel cost) and preferred option in some countries (Russia), but:

  * Does not address safety concerns aggressively enough (despite some safety upgrade investments)

- Moderate Nuclear Scenario: In-between case cost-wise

  * Downside: higher risk reactors would possibly operate for another half decade (albeit with safety upgrades)

  * Upside: country agreement may be less difficult to get than under low nuclear scenario

♦ FINANCING PLAN: MAIN ELEMENTS FOR EACH COUNTRY

- Foreign costs of short-term safety upgrades
  - * Nuclear Safety Account (EBRD)
  - * Bilateral Programs

- Local cost financing primarily from utilities' cash generation (need for price adjustment)

- Foreign cost of longer-term safety upgrades
  - * ECAs * EBRD
  - * EIB

- Foreign costs of completing low risk nuclear plants
  - * ECAs * EBRD
  - * EIB * Commercial Banks

- Foreign costs of conventional plant
  - * ECAs * World Bank
  - * EBRD * EIB
  - * Commercial Banks
  - * Private Investment

- BOP support: Consultative Group frameworks

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TOKYO G-7 SUMMIT (JULY 1993) PROCESS: TRANSITION FROM WB/IEA/EBRD STUDY RESULTS TO COUNTRY DIALOGUE AND IMPLEMENTATION

- **G-7 INVITES WB/IEA/EBRD TO DEVELOP COORDINATED ENERGY STRATEGY FOR EACH COUNTRY WITH MEASURES TO ENSURE ADEQUATE NUCLEAR SAFETY IN THE LONGER TERM, INCLUDING EARLY CLOSURE OF HIGHER RISK REACTORS**
  - **Based on WB/IEA/EBRD report**
  - **Take into account work of G-24 and major bilateral donors on implementation of safety measures**
  - **Aim at coordinating lending policies of IFIs for effective mobilization of funds (including lending conditionality on nuclear safety)**

- PRESENTLY, THE POST-TOKYO G-7 PROCESS FOCUSES ON ESTABLISHING THE MECHANISM FOR DEVELOPING AND IMPLEMENTING LONGER TERM COORDINATED COUNTRY STRATEGIES/ ACTION PLANS FOR NUCLEAR SAFETY.

  IN FORMULATION OF THE STRATEGY, DRAMATIC DIFFERENCES BETWEEN THE SIX COUNTRIES MUST BE RECOGNIZED IN TERMS OF WIDELY DIFFERING RESOURCE NEEDS, THE STATUS OF ANALYSIS AND DIALOGUE, AND RECEPTIVITY OF THE AUTHORITIES CONCERNED: THE SPECTRUM RUNS FROM BULGARIA (A STRATEGY IS ALREADY EMERGING) TO RUSSIA (THE DIALOGUE HAS BARELY COMMENCED).

  OVERALL, KEY STAGES AND ACTORS OF DESIGNING AND IMPLEMENTING A COUNTRY NUCLEAR SAFETY STRATEGY CAN BE:

- Preparation of and country commitment to an overall energy sector strategy taking nuclear safety into account.

  * Actors may include, inter alia, WB and EBRD, in addition to country authorities.

- Negotiating and agreeing a nuclear plan closure/upgrade schedule and related steps to enable this.

  * Actors: The EBRD, acting for the NSA, or other suitably mandated international agencies can carry out this step with the country concerned.

- Mobilizing a financing plan for the power sector, including for safety investments. While emphasis should be on investment financing in the power sector context, possible macro-economic linkages (BOP impact, debt capacity) must also be recognized.

  * Actors may include IFIs and Consultative Groups.

BULGARIA: A MODEL CASE FOR COORDINATED STRATEGY?

- **STEP 1: THERE IS A GENERALLY AGREED SECTOR STRATEGY WHICH ROUGHLY CORRESPONDS TO THE MODERATE NUCLEAR SCENARIO OF THE G-7 STUDY (JOINTLY PREPARED BY THE COUNTRY AND WB).**

- **STEP 2: FORMAL AGREEMENT EXISTS ON A NUCLEAR PLANT CLOSURE/UPGRADES SCHEDULE WITH EBRD UNDER NSA, WITH ALTERNATIVE CONVENTIONAL POWER INVESTMENTS AND REHABILITATION REQUIREMENTS IDENTIFIED.**

  CLOSE IFI COORDINATION REQUIRED TO IMPLEMENT NSA PROJECT.

  - **Under NSA, Bulgaria receives ECU 24 million ($30M) for short-term safety improvement project for Kozloduy Units 1-4.**

- As part of the grant agreement, the Government agreed to the shutdown of Units 1-2 as soon as the Chaira pumping station (financed by WB) is put on line, and rehabilitation is completed on either of the more modern 1000MW Units 5 & 6 at the Kozloduy NPP or the Varna Power Station, which is expected to happen not later than April 1997. (The WB has been discussing financing for the rehabilitation of the Varna power plant).

- Units 3 & 4 will operate until both Units 5 & 6 at Kozloduy are rehabilitated and conversion of Sofia, Kostov and Republika district heating plants to combined cycle co-generation of heat and power is completed. Subject to the necessary financing being available, the Government expects this to be feasible by end of 1998.

- Subject to the necessary financing being available, the Government considers that rehabilitation of Kozloduy Units 5 & 6 is feasible by end of 1995. The EBRD will explore possible support from its ordinary resources.

- **STEP 3: GIVEN COMMITMENT OF BULGARIA TO SECTOR STRATEGY AND THE FORMAL AGREEMENT ON NUCLEAR CLOSURE SCHEDULE, EFFORTS CAN PROCEED TO MOBILIZE FUNDING POSSIBLY UNDER THE CONSULTATIVE GROUP (CG) FRAMEWORK (ENERGY SUB-GROUP?).**

  - **Next CG meeting (chaired by WB) scheduled for June 1994.**

  - **Detailed sector development program, including project sequencing, should be in place to consider coordinated project-level financing.**

SLOVAKIA

- **STEP 1: AN OVERALL SECTOR STRATEGY EXISTS IN COUNTRY'S NEW LONG-TERM ENERGY PLAN TO 2005. PLAN SHOWS WILLINGNESS/FLEXIBILITY TOWARD CLOSING BOHUNICE UNITS 1 & 2 (VVER 440/230). ONE PLAN VARIANT IS THE SHUTDOWN OF BOHUNICE 1 & 2 BY MID-1990s WHEN MOCHOVCE NPP UNITS 1 & 2 GO INTO COMMERCIAL OPERATION.**

- **STEP 2: BOHUNICE CLOSURE SCHEDULE PENDING EBRD/WESTERN INVESTORS READINESS TO CONCLUDE A DEAL FOR COMPLETION OF MOCHOVCE 1 & 2, INCLUDING SAFETY ENHANCEMENTS TO MEET INTERNATIONAL STANDARDS.**

  Possible outcomes:

  * **Mochovce completion funded by EBRD/EIB/Western investors;**

  * **Mochovce completion based on internal cash generation and Russian support.**

- **STEP 3: INTERNATIONAL EFFORTS PLANNED IN THE CONVENTIONAL POWER SECTOR:**

  - **WB is preparing a power transmission project ($120 million) and is considering a future rehabilitation project (Vojany) which might involve private joint venture capital participation.**

  - **The EBRD may consider co-financing for CCGT power unit, Bratislava 2, and a demand-side management program.**

LITHUANIA

- **STEP 1: THERE IS A GENERALLY AGREED ENERGY SECTOR STRATEGY (PREPARED WITH ASSISTANCE FROM THE WB AND WEST-EUROPEAN CONSULTANTS UNDER THE EU-PHARE PROGRAM).**

- **STEP 2: THE EBRD HAS REACHED A TENTATIVE AGREEMENT WITH LITHUANIA ON AN NSA PROJECT (ECU 33 MILLION) FOR SHORT-TERM SAFETY IMPROVEMENTS OF IGNALINA UNITS 1 & 2 (RBMK, 1500 MW).**

  SHUTDOWN OF UNIT 1 IN 1998 PENDING THE OUTCOME OF A SAFETY ASSESSMENT UNDER INTERNATIONAL SUPERVISION.

  RESULTS OF THE ASSESSMENT ARE EXPECTED BY END OF 1995. IN PARALLEL, GOVERNMENT DEVELOPS AN ACTION (INVESTMENT) PROGRAM FOR THE POWER SECTOR WHICH IS TO INCORPORATE RESULTS OF ASSESSMENT.

- **STEP 3: PENDING CONTINUED COUNTRY COMMITMENT TO AGREED SECTOR STRATEGY AND A FORMAL AGREEMENT ON IGNALINA CLOSURE/UPGRADE SCHEDULE, EFFORTS CAN PROCEED TO MOBILIZE FUNDING FOR CONVENTIONAL INVESTMENTS IN THE SECTOR UNDER FORMAL OR INFORMAL FRAMEWORK. (THERE IS NO CONSULTATIVE GROUP.)**

  - **A WB power and district heating rehabilitation project under preparation.**

Share of Nuclear Power in Total Electricity Generating Capacity, 1991

	Total Electricity Generating Capacity (MW)	Nuclear Generating Capacity (MW)	Generating Capacity of RBMKs and VVER 440/230s (MW)	Nuclear Generating Capacity as % of Total Generating Capacity	RBMKs and VVER 440/230s as % of Total Generating Capacity
Armenia	3,614	815	815	23	23
Bulgaria	12,074	3,760	1,760	31	14
Lithuania	5,178	2,500	2,500	48	48
Russia*	217,244	20,244	11,300	9	5
Slovakia	6,300	1,632	816	25	12
Ukraine	53,569	12,880	2,000	24	3
Total	297,879	41,831	19,191	14	6

* For all of Russia: the Northwest and Center power regions, which account for 30% of total generating capacity, have all the RBMK and VVER 440/230 nuclear plants, which form 17% of total capacity in these regions.

Costs and Characteristics of Alternative Nuclear Scenarios

	Low Nuclear	Moderate Nuclear	High Nuclear
Higher Risk Plants closed by:	1995-97	2000	2010 +
Risk of Nuclear Incidents:	Lowest Risk	Higher Risk	Highest Risk
Investment Cost ($ billion, 1993-2000)	21	23	28
Of which:			
Nuclear upgrades and completions (%)	25	33	63
Conventional (%)	75	67	37
Annual Fossil Fuel Cost ($ billion, 1995-2000 average)	12.9	11.6	9.8
Annual Fossil Fuel Import Cost ($ billion, 1995-2000 average)	3.2	2.8	2.3
Country Viewpoints	Resistant	Might consider	Preferred

Briefing for
USAID/CEE Energy Assistance Review Meeting

DOE Operational Safety Initiative

Dennis Meyers
Office of Nuclear Energy

January 6, 1994

Objectives/Rationale

The operational safety improvement program is perhaps the most important element of our nuclear safety initiative.

Goal: To improve the safety of Soviet designed reactors by incorporation of US experience and approaches. To communicate to the recipient power plants:

- How we operate, manage, and maintain plants.

- Symptom-based emergency operating instructions.

Symptom Based Emergency Operating Instructions (EOIs)

- Result of TMI lessons learned.
- Implemented at all US plants.
- Symptom-based is preferred over event-based
  - Maintains focus on key safety aspects (subcriticality, core cooling, containment) in response to one or several events.
  - Gives guidance when the problem is not evident.

Task Description

- Novovoronezh Program
  - EOIs have been developed over last three years for VVER-440/230 design.
- Current program for Russia/Ukraine and Eastern Europe
  - Adapt the Novovoronezh procedures to other plants.
  - Adapt the Novovoronezh improvements in management and operational controls to other plants.
  - Indoctrination visits to US plants.

Expert working groups (EWGs)

- Established by Management Committee.
- US, Russian, and Ukrainian co-chairs.
- INPO and representatives from several US utilities involved.
- Meetings of the EWGs held since 1992.
- Initial draft procedures prepared.

US Role

- o Explain US approaches
- o Demonstrate approaches
- o Review work product
- o Observe sample uses of products at plants or simulators

Recipient Country Role

- o Decide on what products to be developed
- o Perform actual development work
- o Verify and validate EOIs
- o Conduct training
- o Implement at pilot plants

Pilot Plants

Reactor Type	Russian Pilot Plant	Ukrainian Pilot Plant
VVER-440/213	Kola	Rovno
VVER-1000	Balakovo	Zaporozhye
RBMK	Smolensk	(Chernobyl)

EOI development process:

- For pilot plant for each design in each country:
  - Technical bases documents
  - Draft EOIs
  - Verification and validation
  - Training of instructors and then operators
  - Regulatory approval
  - Implementation
- Then:
  - Adapt EOIs to remaining plants

Results/Accomplishments

Russia

Pilot project at Novovoronezh is a successful example.

- Russian Institute (VNIIAES) has in-house capability to produce symptom-based EOIs.
- EOIs are written (39) for VVER-440/230, and distributed to Slovakia and Bulgaria.
- Verification and validation, development of training programs, and most training is completed.
- Operator rounds, watch turnover, logkeeping, shift manning improvements implemented.

- All Russian plants have been directed by executive order to develop symptom-based EOIs.

- Recipients have learned a lot, and have told us so.

Eastern Europe

- Several visits to US nuclear power plants (ex. Comanche Peak and St. Lucie)

- VVER-440/230 - Bohunice, Slovakia and Kozloduy, Bulgaria - contract with VNIIAES

- Observers at four EWGs:

  - VVER-440/213.
  - VVER-440/1000.
  - RBMK.
  - Management and Operational Controls.

Next Steps for Eastern Europe

- For VVER-440/230, continue to meet to transfer the Novovoronezh procedures.

- For 213, 1000, RBMK: Engage Eastern Europeans as full members of the EWGs.

  - Identify pilot plants
  - Choose approach (development led by a single institute, different groups lead in writing different sections, private sector assistance)
  - Develop schedule

Significance/Lessons Learned

Partnership

- Plant operators and trainers must be involved early. At Novovoronezh, many comments on procedures required a major revision. Plant personnel are being involved early in efforts at other pilot plants.

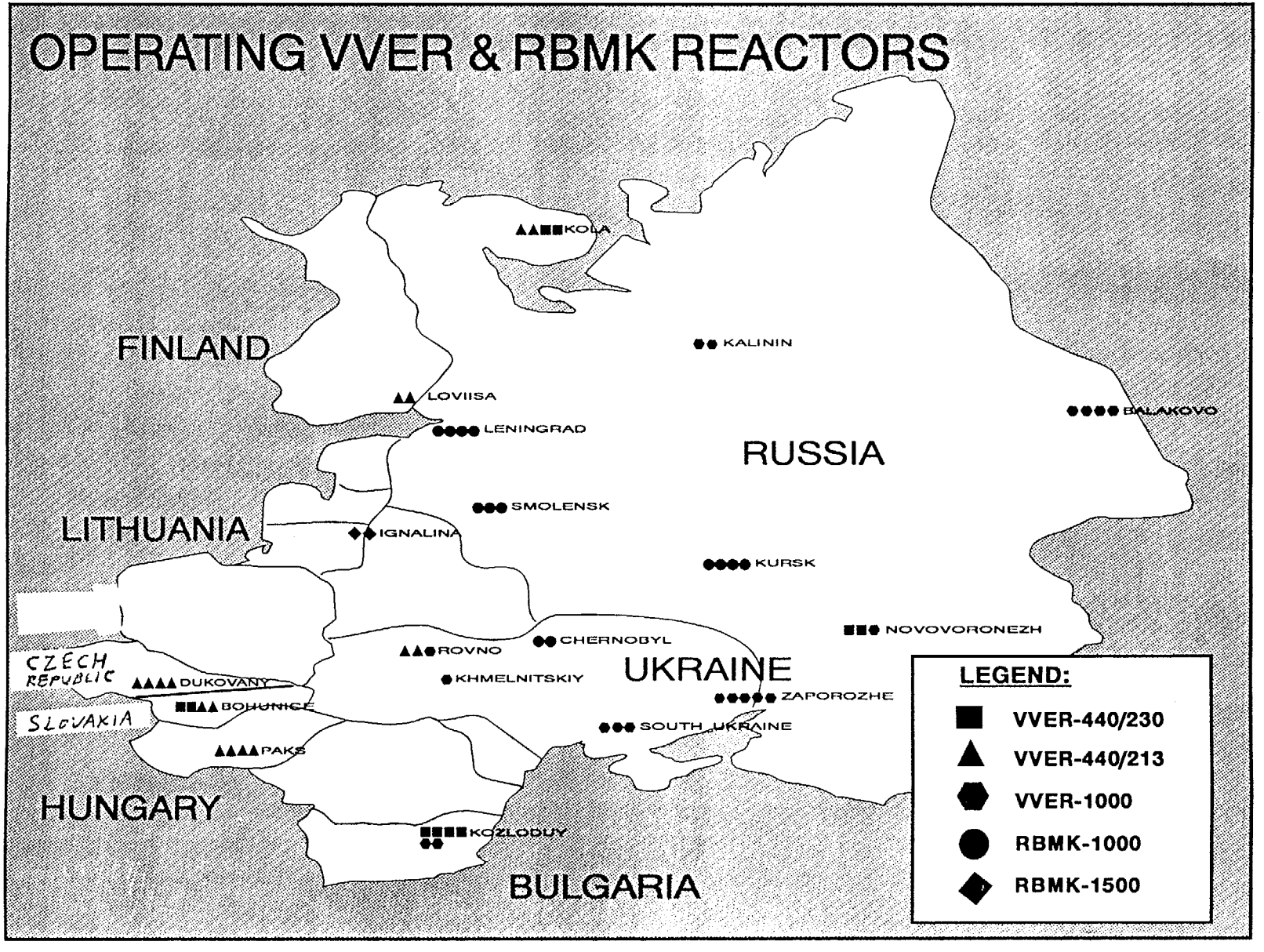
- The role of the design organizations and institutes needs to be established early on.

- Regulatory involvement - Process is being done for the first time at Novovoronezh. This will be a model for other plants. Earlier involvement by the regulator may streamline the process.

- Build upon the experience and lessons learned from Novovoronezh.

- Multilateral approach - better procedures, continued sharing of safety-related information among countries with similar reactors.

- Russian VVER and RBMK design groups and research institutes may be needed to provide technical assistance.


OPERATING VVER & RBMK REACTORS
KOLA
FINLAND
KALININ
LOVIISA
BALAKOVO
LENINGRAD
RUSSIA
SMOLENSK
LITHUANIA
IGNALINA
KURSK
NOVOVORONEZH
CHERNOBYL
ROVNO
CZECH REPUBLIC
KHMELNITSKIY
UKRAINE
DUKOVANY
ZAPOROZHE
BOHUNICE
SLOVAKIA
SOUTH UKRAINE
PAKS
HUNGARY
KOZLODUY
BULGARIA
LEGEND:
VVER-440/230
VVER-440/213
VVER-1000
RBMK-1000
RBMK-1500

US AID SPONSORED

NUCLEAR SAFETY ASSISTANCE

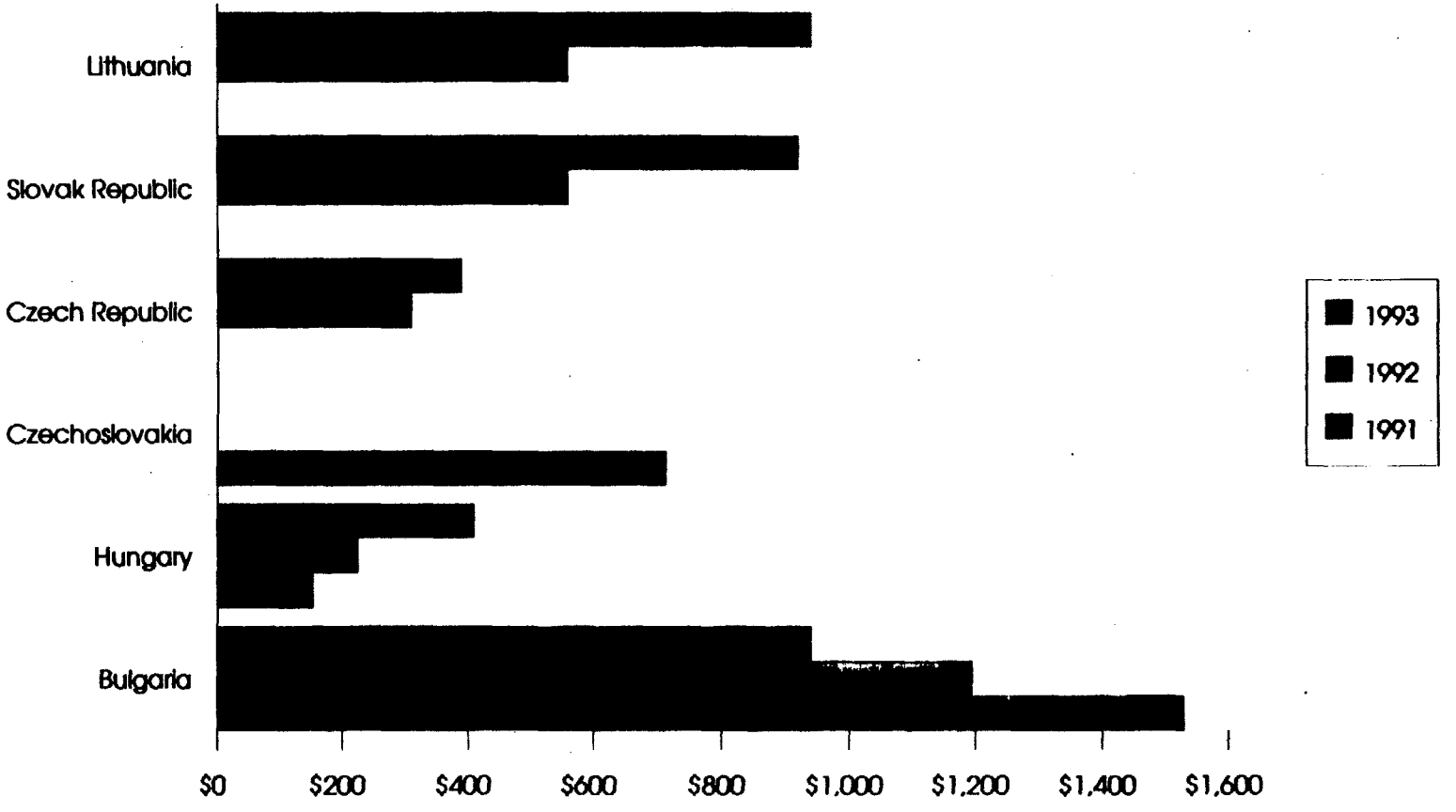
TO

CEEC

PRESENTED BY KEN HORTON, DOE
JANUARY 6,1994

PROGRAM FRAMEWORK
CENTRAL AND EASTERN EUROPE PROGRAMS

- FUNDING LEVEL (~ $ 9 MILLION) INCONSISTENT WITH LARGE NUMBER OF HIGH RISK PLANTS (8) IN THE REGION
- EC PROGRAM OF ABOUT $ 55 MILLION IS FOCUSED ON STUDIES, ON-SITE AND REGULATORY ASSISTANCE (LARGE FRACTION HAS GONE TO BULGARIA)
- EBRD HAS ONLY MAJOR EFFORT DIRECTED AT SYSTEM UPGRADES
- NEED TO ASSURE THAT FIRE SAFETY AND SYSTEM IMPROVEMENTS ARE ADDRESSED AT HIGH RISK REACTORS


Lithuania
Slovak Republic
Czech Republic
Czechoslovakia
Hungary
Bulgaria
$0
$200
$400
$600
$800
$1,000
$1,200
$1,400
$1,600
1993
1992
1991

NUCLEAR SAFETY OF SOVIET DESIGN REACTORS

Objectives:

- Provide Risk Reduction Measures
- Improve Operational Safety
- Foster Western Safety Culture/U.S. Industry Involvement

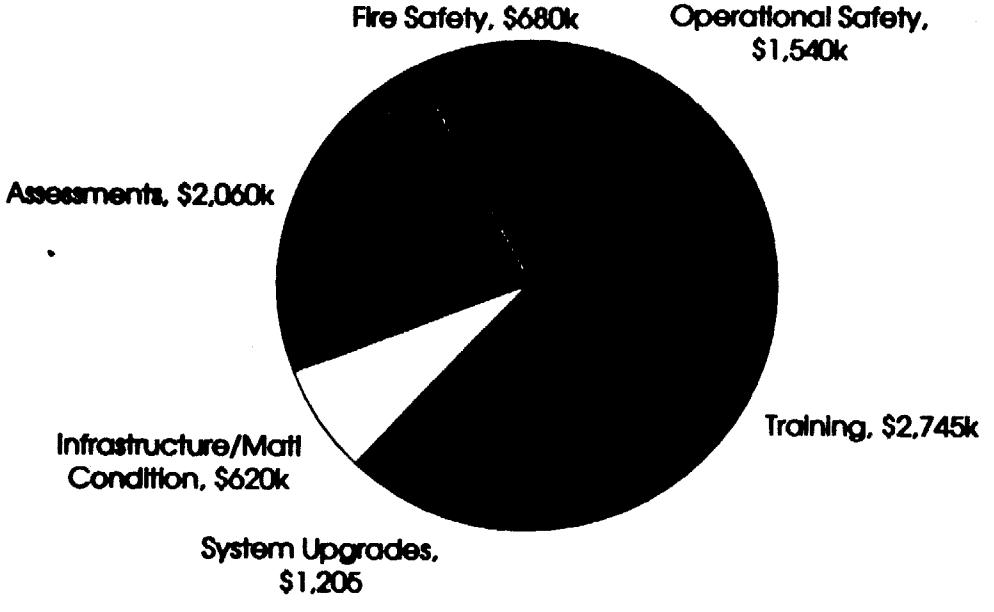
Tasks:

- Operational Safety
- Training
- Fire Safety
- Infrastructure/Material Conditions
- System Upgrades
- Assessments

Results:

U.S. Assistance Praised (important, timely, lack of bureaucracy)

CEEC Safety Breakdown, 1991-93



NUCLEAR SAFETY

RESULTS / ACCOMPLISHMENTS

CEEC	U.S. NUCLEAR UTILITY ONSITE WORKSHOPS ADVANCED CONTAINMENT EXPERIMENTS (ACE) PROGRAM FELLOWSHIPS
BULGARIA	KOZLODUY PLANT ANALYZER (KPA) - DELIVERED AND IN USE TRAINING CENTER EQUIPMENT - PROVIDED THROUGH IAEA STRESS ANALYSIS CAPABILITY - DELIVERED AND IN USE FIRE-FIGHTING EQUIPMENT - ON HIGH SEAS (DELIVERY 1/18/94) DIESEL GENERATORS - IN PROCUREMENT PROCESS MANAGEMENT TRAINING - AWAITING DOE CH ACTION
CZECH REP.	EQUIPMENT MAINTENANCE DATABASE - AWAITING DOE CH ACTION
HUNGARY	ACCIDENT LOCALIZATION SYSTEM ANALYSIS - ALMOST COMPLETE (ANL STOPPED WORK - LIABILITY CONCERNS)

NUCLEAR SAFETY

RESULTS / ACCOMPLISHMENTS

CEEC	U.S. NUCLEAR UTILITY ONSITE WORKSHOPS - 8 COMPLETED ADVANCED CONTAINMENT EXPERIMENTS (ACE) PROGRAM - COMPLETED / CONTINUATION REQUESTED FELLOWSHIPS - 3 PLACED / 2 PENDING
BULGARIA	KOZLODUY PLANT ANALYZER (KPA) - DELIVERED AND IN USE TRAINING CENTER EQUIPMENT - PROVIDED THROUGH IAEA STRESS ANALYSIS CAPABILITY - DELIVERED AND IN USE FIRE-FIGHTING EQUIPMENT - ON HIGH SEAS (DELIVERY 1/18/94) DIESEL GENERATORS - IN PROCUREMENT PROCESS MANAGEMENT TRAINING - AWAITING DOE CH ACTION
CZECH REP.	EQUIPMENT MAINTENANCE DATABASE - AWAITING DOE CH ACTION
HUNGARY	ACCIDENT LOCALIZATION SYSTEM ANALYSIS - ALMOST COMPLETE (ANL STOPPED WORK - LIABILITY CONCERNS)

NUCLEAR SAFETY

RESULTS / ACCOMPLISHMENTS

LITHUANIA	VOID COEFFICIENT EXPERT ASSISTANCE - COMPLETED RELAP5 MODEL OF RBMK 1500 - NEARING COMPLETION BARSELINA PSA PEER REVIEW - NEARING COMPLETION IRRAS COMPUTER CODE CAPABILITY - SOFTWARE (NRC) HARDWARE ON ORDER, TRAINING TO BE SCHEDULED RBMK 1500 SOURCE BOOK - IN PUBLICATION PROCESS
SLOVAK REP.	PC-BASED SIMULATOR UPGRADE - HARDWARE ALMOST READY FOR DELIVERY SOFTWARE - COLLABORATIVE EFFORT TO BEGIN SHORTLY

NUCLEAR SAFETY
LESSONS LEARNED

NEED FOR RECIPIENT COUNTRY INTERNAL COORDINATION

SIGNIFICANT TECHNOLOGY TRANSFER REQUIRES CONTINUING PRESENCE/SUPPORT

* e.g. PLANT ANALYZERS

AVOID PLACING RECIPIENT COUNTRY ACTION IN CRITICAL PATH WHENEVER POSSIBLE

NEED FOR CONTINUING COLLABORATION BETWEEN U.S. AND RECIPIENT COUNTRY REPRESENTATIVES

* PERIODIC FACE TO FACE MEETINGS (EVERY SIX MONTHS)

* KEEP THEM WELL INFORMED (WHAT/WHY/STATUS)

MAINTAIN FLEXIBILITY

* PRIORITIES CHANGE

* RESPOND TO "FIRE DRILLS"

NUCLEAR SAFETY

LESSONS LEARNED

INVOLVE RECIPIENT COUNTRY PERSONNEL

* RECEIPT INSPECTION OF FIRE TRUCKS
* DATA GATHERING
* TRAINING COURSES
* PC-BASED SIMULATOR UPGRADE

OBJECTIVES/RATIONALE

OBJECTIVE: To significantly improve the ability of the Bulgarian nuclear community to perform transient analyses of Kozloduy Units I-IV.

RATIONALE: As identified in IAEA TECDOC-640, "Ranking of Safety Issues for WWER-440 model 230 nuclear power plants", the scope of accident and transient analysis is insufficient to ensure plant safety and to provide a basis for development of plant procedures and operator training. The issue was ranked Category III, immediate corrective action necessary.

TASK DESCRIPTION

1. Adapt Existing U.S. Computer Codes to Soviet Designed Reactors

2. Provide Bulgaria with two state-of-the-art workstations.

3. Basic and advanced training for a core group of Bulgarians in operational safety analysis: modeling, verification and validation, and computer systems management.

RESULTS/ACCOMPLISHMENTS

Two Advanced RISC-Based Workstations Operational in Bulgaria

Core Group of Bulgarians Trained in Operational Safety Analysis

Bulgarians Willingness to Share Results and Training with Other VVER Users (Ukraine, Slovakia).

Standard RELAP-5 VVER-440 Computer Model

SIGNIFICANCE

KPA corrects a major safety deficiency identified in IAEA TECDOC-640.

U.S. Computer Codes and Models successfully adapted to Soviet Designed Reactors.

Significant improvements to several areas of the Bulgarian Nuclear Safety Infrastructure (Operational, Design, and Regulatory).

LESSONS LEARNED

Follow-up, on-call assistance needed.

Co-operation and coordination with NRC programs is essential.

Co-operation and coordination with non-U.S. programs is difficult, but needed.

Delays will happen because of the relatively small technical community.

Eastern Europeans have a strong need to develop a nuclear infrastructure independent of the FSU.

Equipment maintenance is not a significant problem.

US-AID / CEE Energy Assistance Review Meeting

January 5-6, 1994

US State Department

Washington, DC

Viewgraphs

on

US-Sponsored Workshops / Expert Missions

to Improve Operational Safety for Nuclear Power Plants in

Central and East European Countries

By

Jan B. van Erp

Argonne National Laboratory

Argonne, Illinois, 60439

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US-SPONSORED WORKSHOPS / EXPERT MISSIONS

to Improve Operational Safety for Nuclear Power Plants in

Central and East European Countries

Objectives

- **Improve Operational Safety of NPPs in Central / East European Countries (CEECs)**
- **Familiarize CEEC Operational Personnel and Regulatory Staff with US Practices and Procedures, which have been found to be Effective in Promoting / Maintaining High Standards of Operational Safety**
- **Assist in Expanding the Knowledge Base of CEEC Operational Personnel and Regulatory Staff, thus Increasing their Awareness of Areas Requiring Special Attention**
- **Assist in Prioritizing Operational Safety Concerns, sothat the Limited Resources can be Directed to Critical Areas where Maximum Improvement can be Obtained**

Rationale

- **A very Large Fraction of the Risk associated with NPPs is due to Human Factors (65 - 85 %), which can be strongly improved by Expanding the Knowledge Base and by Adherence to Good Operational Procedures**
- **Workshops / Expert Missions constitute a Relatively Low-Expense Means to Improve Safety, compared with the relatively High Expense associated with Plant Hardware Improvements (Backfitting)**

US-SPONSORED WORKSHOPS / EXPERT MISSIONS

to Improve Operational Safety for Nuclear Power Plants in

Central and East European Countries

Task Description

- **Leading Experts from US Utilities and/or other US Organizations are invited to serve as Lecturers / Instructors in the Workshops / Expert Missions**

- **The Workshops are given in the Immediate Vicinity of a NPP to Facilitate Attendance by the NPP Personnel, and to Promote Interaction between the US Experts and the NPP Managerial Staff**

- **The Workshops are Cosponsored by the NPP and one or more National Organizations in the Host Country (e.g. Ministry, Nuclear Regulatory Organization, Atomic Energy Commission, and/or Research Institute)**

- **The Workshops are Regional in Character, allowing Attendance by Participants from other Central / East European Countries**

- **The Workshops / Expert Missions are conducted in Cooperation with IAEA in order to Avoid Overlap and Time Conflicts with Ongoing IAEA Programs**

US-SPONSORED WORKSHOPS / EXPERT MISSIONS

to Improve Operational Safety for Nuclear Power Plants in

Central and East European Countries

Task Description (cont.'d)

- **Topics for the Workshops are Chosen for their Immediate Potential to Improve Operational Safety; this Choice is made in Cooperation with the Host Country, and in Consultation with IAEA**

- **Lasting Contacts are promoted between Operational Personnel of NPPs in CEECs and Personnel of Organizations in the US, resulting in many Requests for Additional Information Subsequent to the Mission**

- **Technical Visits of Personnel of NPPs in CEECs to NPPs and other Organizations in the US are promoted, either through IAEA Programs and/or (where possible) through Bilateral Programs**

- **These Workshops / Expert Missions make Extensive Use of Personal Contacts developed through the Program of USA / IAEA - Sponsored Training Courses, offered during the last 18 Years. Many Persons belonging to the Upper and Middle Managerial Level of Technical Personnel in the CEECs were trained under this Program.**

US-SPONSORED WORKSHOPS / EXPERT MISSIONS

to Improve Operational Safety for Nuclear Power Plants in

Central and East European Countries

Results / Accomplishments

- **Nine Workshops / Expert Missions were Conducted in 1992-'93, in the following Countries: Bulgaria (3), Czech + Slovak Republics (2), Hungary (2), Lithuania (2)**

- **In Total about 350 Participants attended, of which most were of Managerial / Supervisory Level**

- **Each Workshop / Expert Mission was concluded with an Exit Meeting with the Top Management of the NPP, during which a Summary was presented of the Most Important Points**

- **Excellent Working Relations were Established with the Leading Technical Personnel in the Recipient Countries, permitting Fast Consultation and resulting in Good Cooperation**

- **The General Reaction of the Recipient Countries has been very Appreciative: "Help Us to Help Ourselves"**

- **Many Requests for Additional Workshops have been received from all Recipient Countries as well as from Countries not covered by the SEED Program (e.g. Ukraine, and Russian Federation)**

US-SPONSORED WORKSHOPS / EXPERT MISSIONS

to Improve Operational Safety for Nuclear Power Plants in

Central and East European Countries

Significance

- **The Program can be judged to make a Significant Contribution towards Improving the Operational Safety of NPPs in CEECs at a relatively Modest Expense**

- **The Program creates Considerable Goodwill because the US Experts are willing to Share their Experience with their CEEC Colleagues**

- **A Relationship of Trust is developed between the US Experts and their CEEC Colleagues, which is conducive to Open Discussions and a Beneficial Exchange of Ideas**

Lessons Learned

- **It is important to Clarify at the Beginning of each Workshop / Expert Mission that the Objective is to Achieve Improved Operational Safety, which is in the Interest of all Parties. The US Experts are to Refrain from making Critical Observations, and will not give Advice unless specifically Invited to do so.**

- **Recipient Countries have shown a Keen Interest in this Program; many Requests have been received for Additional Workshops / Expert Missions**

US-SPONSORED WORKSHOPS / EXPERT MISSIONS

to Improve Operational Safety for Nuclear Power Plants in

Central and East European Countries

Lessons Learned (cont'd)

- **Recipient Countries are willing to make a Substantial Effort and Contribution in Support of the Program (e.g.,Local Transportation, Translation / Interpretation Services, Reproduction of Printed Materials, Meeting Room with Audio / Visual Equipment, Arrangements for Technical Visits, Assistance for US Experts and Foreign Participants,etc.)**

- **Notwithstanding severe Financial Constraints, Recipient Countries are willing to sent Participants at their Own Expense to Workshops outside their own Borders**

- **Recipient Countries are very interested in Short-Duration Technical Visits to US Installations and Plants for a Small Number of CEEC Experts, to supplement the Information gained from in the Workshops**

- **US Utilities and other US Organizations have been willing to Support this Program by making available the time of the Experts; in most cases only the costs of Travel and Per Diem for the US Experts are carried by the Program**

- **US Utilities and other US Organizations appear to be willing to support Short-Duration Technical Visits, if the Expenses of the CEEC Experts for Travel and Per Diem are covered**

US-SPONSORED WORKSHOPS / EXPERT MISSIONS

to Improve Operational Safety for Nuclear Power Plants in

Central and East European Countries

List of Workshops / Expert Missions Conducted in 1992-'93

1. **Safety Review / Inspection in NPP Operation, 13-17 January 1992, Trnava, Slovakia**

2. **Risk-Based Optimization of Tasks and Procedures in NPP Operation, 9-13 March 1992, Paks, Hungary**

3. **Safety Review / Inspection in NPP Operation, 18-22 May 1992, Kozloduy, Bulgaria**

4. **In-Plant Accident Management in NPP Operation, 22-26 June 1992, Trnava, Slovakia**

5. **In-Plant Accident Management in NPP Operation, 10-14 August 1992, Kozloduy, Bulgaria**

6. **Planning and Preparedness for Radiological Emergencies, 21-25 September 1992, Paks, Hungary**

7. **Safety Aspects of Preventive Maintenance in NPP Operation, 12-22 January 1993, Kozloduy, Bulgaria**

8. **Safety Inspection / Self-Assessment in NPP Operation, 17-22 May 1993, Ignalina, Lithuania**

9. **Safety Aspects of Preventive Maintenance in NPP Operation, 6-10 December 1993, Ignalina, Lithuania**

US-SPONSORED WORKSHOPS / EXPERT MISSIONS

to Improve Operational Safety for Nuclear Power Plants in

Central and East European Countries

Companies / Organizations which provided Experts during 1992-'93

1. Commonwealth Edison Company
2. Texas Utilities
3. EG&G
4. US-Nuclear Regulatory Commission
5. Argonne National Laboratory
6. Science Applications International Inc.
7. JBF Associates
8. Northeast Utilities
9. Arizona Public Service Co.
10. Yankee Atomic Electric Co.
11. ABB-CE, Inc.
12. Westinghouse Electric Corp.
13. Carolina Power and Light Co.
14. North Atlantic Energy Services Corp.
15. Illinois Deparment of Nuclear Safety
16. Illinois Power Co.
17. Entergy Corp.
18. Northern States Power Co.
19. Wisconsin Electric Power Co.
20. Wisconsin Public Sertvice Corp.
21. American Electric Power Service Corp.
22. International Atomic Energy Agency

US-SPONSORED WORKSHOPS / EXPERT MISSIONS

to Improve Operational Safety for Nuclear Power Plants in

Central and East European Countries

Proposed Topics / Locations for 1994

1. **Optimization of Maintenance in NPP Operation, Kozloduy, Bulgaria**

2. **In-Plant Accident Management in NPP Operation, Ignalina, Lithuania**

3. **Risk-Based Prioritization of NPP Modifications and Upgrades, Bohunice, Slovakia**

4. **PSA Optimization of Tasks, Procedures, and Limiting Conditions of Operation, Dukovany, Czech Republic**

5. **Safety Aspects of Preventive Maintenance in NPP Operation, Paks, Hungary**

6. **Planning and Preparedness for Radiological Emergencies, Kozloduy, Bulgaria**

7. **Identification of Fire Vulnerabilities and Remedial Actions, Bohunice, Slovak Republic**

8. **Evaluation and Feedback of Safety-Related Operational Experience, Dukovany, Czech Republic**

9. **Operational Safety Assessment Techniques for NPPs, Bohunice, Slovakia**

US-Sponsored Workshops/Experts Missions on

Enhancement of Operational Safety for Nuclear Power Plants in Central/Eastern Europe

Number of Participants by Country and Total

		Bulgaria	Czech Rep. + Slovakia	Hungary	Lithuania	Romania	Poland	Russia	Totals
1.	"Safety Review/Inspection in NPP Operation," 13-17 January, 1992, Trnava, Czechoslovakia.	4	30	6	0	0	0	0	40
2.	"Risk-Based Optimization of Tasks and Procedures in the Operation of NPPs," 9-13 March, 1992, Paks, Hungary.	2	15	24	0	0	0	0	41
3.	"Safety Review/Inspection in NPP Operation," 18-22 May, 1992, Kozloduy, Bulgaria.	39	3	4	0	0	0	0	46
4.	"Accident Management in NPP Operation," 22-26 June, 1992, Trnava, Czechoslovakia.	0	28	6	0	0	1	0	35
5.	"Accident Management in NPP Operation," 10-14 August, 1992, Kozloduy, Bulgaria.	48	0	1	0	0	0	1	50
6.	"Planning and Preparedness for NPP-Caused Radiological Emergencies," 21-25 September, 1992, Paks, Hungary.	3	8	21	0	1	0	0	33
7.	"Safety Aspects of Preventive Maintenance" 12-22 January, 1993, Kozloduy, Bulgaria.	41	1	1	0	0	0	0	43
8.	"Safety Inspection and Self-Assessment in NPP Operation," 17-21 May, 1993, Ignalina, Lithuania.	0	0	0	30	0	0	0	30
9.	"Safety Aspects of Preventive Maintenance in NPP Operation," 6-10 December, 1993, Ignalina, Lithuania.	0	0	0	35	0	0	0	35
TOTALS		137	85	63	65	1	1	1	353

NUCLEAR REGULATORY COMMISSION

OVERVIEW OF NRC'S AID-SUPPORTED NUCLEAR REGULATORY ASSISTANCE PROGRAM TO CEE COUNTRIES

Hans B. Schechter

PROGRAM OBJECTIVES

KEY ACTIVITIES

RESULTS/ACCOMPLISHMENTS

LESSONS LEARNED

OBJECTIVES OF REGULATORY ASSISTANCE PROGRAM

- ASSIST IN THE DEVELOPMENT OF AN EFFECTIVE REGULATORY ORGANIZATION
- ADVANCE SAFETY CULTURE AWARENESS AND PRACTICES
- STRENGTHEN THE LEGAL FRAMEWORK AND REGULATORY CAPABILITY GOVERNING NUCLEAR SAFETY
- IMPROVE ANALYTIC CAPABILITIES FOR PERFORMING SAFETY ANALYSES (COMPUTER CODES)
- STRENGTHEN INSPECTORATES THROUGH INTENSIVE TRAINING IN NRC REGULATORY INSPECTION PHILOSOPHY, PROCEDURES, AND TECHNIQUES.
- EMPHASIZE REGIONAL APPROACH BY INVITING REPS. FROM ALL CEE COUNTRIES

DESCRIPTION OF KEY ACTIVITIES

NUMEROUS BILATERAL AND MULTILATERAL DISCUSSIONS FOCUSING ON RATIONALE AND SPECIFIC APPROACHES USED BY NRC IN DEALING WITH A RANGE OF REGULATORY ISSUES.

<u>Illustrative list of topics:</u>

- **Processing of Licensee Amendments Requests from initial staff review to final dispatch.**
- **Part 52 Design Certification - New plant licensing**
- **NRC actions in connection with incidents and accidents**
- **Seismic hazards (Unresolved safety issues, generic implementation procedure, etc.)**
- **NRC guidance and information tools: generic letters and bulletins**
- **Plant decommissioning**

DESCRIPTION OF KEY ACTIVITIES (cont'd)

LEGAL / REGULATORY TRAINING -- two-week courses (H, SI. B)

EXPLAIN THE US LEGAL (STATUTORY) FRAMEWORK AND NRC'S REGULATORY PROCESS ASSOCIATED WITH LICENSING AND OTHER REGULATORY ACTIVITIES, AND TRY TO RELATE TO THE SITUATION IN THE RECIPIENT COUNTRY.

Illustrative list of topics:

- Structure of USG and NRC; US Legislative Process and Nuclear Legislation
- Overview of NRC Regulatory Process; Rulemaking issues; Third party liability
- Public participation in reactor licensing hearings; Public participation in rulemaking
- Licensing enforcement principles and practice
- Nuclear materials regulation
- License renewal and reactor safety
- Inspections, Maintenance, and Systematic Assessment of Licensee performance
- High Level Waste disposal issues
- Transportation of nuclear materials, etc.

DESCRIPTION OF KEY ACTIVITIES (cont'd)

COMPUTER CODES

- Release of latest versions of principal NRC-developed computer codes and participation in periodic user groups information exchange meetings.

- Assistance and training in the use of these codes. (L, CR, SR, H, B have actively participated in selected activities listed below)

DESCRIPTION OF KEY ACTIVITIES (cont'd)

COMPUTER CODES (cont'd)

- Key computer codes and associated user groups by category:

Severe Accident: CONTAIN, VICTORIA, SCDAP/RELAP, MELCOR, CORCON
User group: CSARP (Cooperative Severe Accident Research Program)

Thermal Hydraulics: RELAP5/MOD3 and NPA. TRAC/PWR only upon further request.
User group: CAMP (Code Application and Maintenance Program)

Probabilistic Safety Assessment (PSA): IRRAS, SARA, MAR-D, FEP
User group: SAPHIRE (System Analysis Programs for Hands-on Integrated Reliability Evaluation)

Materials Integrity Research: Various analytic tools and techniques for evaluating NPP piping integrity
User group: IPIRG-2 (International Piping Integrity Review Group)

DESCRIPTION OF KEY ACTIVITIES (cont'd)

INSPECTOR TRAINING PROGRAM: Two-part program

A. Supervisory Inspectors (2 weeks, 6/7 - 19/93)

Primary emphasis on safety culture principles and on planning and managing inspection activities.
Specific subjects included: inspection report preparation, team inspections, enforcement policy: panels, conferences, sanctions; Preparation for site visits, and site visits: Vermont Yankee (OSTI- Operational Safety Team Inspection), Millstone (MOV- Motor Operated Valve) Team Inspection, Peach Bottom EPE (Emergency Plan Exercise), Nine Mile Point EPE: -- discussions with NRC resident inspectors and with licensee staff and management.

DESCRIPTION OF KEY ACTIVITIES (cont'd)

INSPECTOR TRAINING PROGRAM: Two-part program

B. Resident Inspectors (2 months, 8/9 - 10/1/93)

Primary emphasis on hands-on OJT, participation in previously scheduled NRC inspection activities, attendance at training courses, and exposure to a balanced and representative cross section of NRC inspection duties and activities.

TTC training courses: Westinghouse EOP simulator course and West. simulator refresher course for examiners; Regional courses: PRA basics for inspection; Operator requalification exams, others; Site visits to NPPs and participation in plant activities: Beaver Valley, Ginna, Oyster Creek, Limerick, Calvert Cliffs (plant management meeting), etc; Participation in team inspections, and SALP (Systematic Assessment of Licensee Performance) Board Observations, etc.

DESCRIPTION OF KEY ACTIVITIES (cont'd)

PREPARATION FOR TEMELIN SAFETY REVIEW ASSISTANCE

- Participate with Idaho National Engineering Laboratory (INEL), and in consultation with Czech regulatory authority SONS, in the preparation of a suitable Statement of Work (SOW) for this training program.

- Training will aim at transferring knowledge to prepare SONS staff to evaluate the safety of Temelin (backfitted with Westinghouse I&C and fuel), in accordance with NRC licensing procedures, and to write a final SER (Safety Evaluation Report).

- The scope of training will consist of selected chapters in 10CFR50 (i.e. Ch. 4 (fuel), Ch. 7 (I&C), and Ch. 15 (design basis accidents); NRC Regulatory Guide 1.70; and other related documents such as NUREG 0800 (Standard Review Plan)

- Training will include classroom lectures and hands-on analyses and documentation reviews.

- Period of training expected to be about 18 months to 2 years

RESULTS / ACCOMPLISHMENTS

- A GREAT AMOUNT OF INFORMATION (TECHNICAL, ORGANIZATIONAL, REGULATORY PRINCIPLES & PROCEDURES, ETC.) HAS BEEN TRANSFERRED.

- THE ASSISTANCE IS WELL RECEIVED, AS ATTESTED BY THE FAVORABLE COMMENTS MADE BY ALL CEE CHIEF REGULATORS IN MEETINGS WITH CHAIRMAN SELIN LAST FALL, AND THE CLAMOR FOR MORE NRC SUPPORT.

- THE ASSISTANCE HAS HAD A POSITIVE IMPACT ON SAFETY CULTURE AWARENESS AND PURSUIT BY THE RECIPIENT COUNTRIES. (New requests have moved from general orientation to specific licensing actions -- e.g. Hungary (Seismic), CR (Temelin), SR (LLW))

RESULTS / ACCOMPLISHMENTS (cont'd)

- THE INSPECTOR TRAINING PROGRAM APPEARS TO HAVE RESULTED IN THE IMPLEMENTATION OF A MORE FORMAL/STRUCTURED INSPECTION SYSTEM (BASED ON NRC PHILOSOPHY AND PROCEDURES) IN HUNGARY, SLOVAK REPUBLIC, AND CZECH REPUBLIC. STATUS IN BULGARIA IS STILL UNCLEAR.

- FOLLOW-UP NRC INSPECTOR TEAM VISIT NEXT SUMMER WILL ASSESS ACCOMPLISHMENTS.

- IMMEDIATE PRACTICAL IMPACT OF LEGAL/REGULATORY TRAINING IS UNCLEAR SINCE MANY OTHER MINISTRIES AND ORGANIZATIONS, BESIDES THE REGULATORS, HAVE A MAJOR SAY IN THIS MATTER.

LESSONS LEARNED

- THE LARGE NUMBER OF REGULATORY ASSISTANCE REQUESTS PENDING, AND THE CONTINUED LIMITATION OF NRC STAFF RESOURCES (THE FTE PROBLEM) AVAILABLE TO SUPPORT INTERNATIONAL WORK, PUT A PREMIUM ON LONG RANGE PLANNING OF ASSISTANCE ACTIVITIES.

- FREQUENT REQUESTS FOR ACCELERATED ATTENTION TO NEW HIGH PRIORITY PROBLEM AREAS COMPLICATES THE TASK OF LONG RANGE PROGRAM EXECUTION.

LESSONS LEARNED (cont'd)

- USG PROCUREMENT REGULATIONS MAKE IT DIFFICULT TO TURN READILY TO CONTRACTORS OR INDIVIDUAL CONSULTANTS WHO HAVE THOROUGH, PROVEN, FAMILIARITY WITH NRC LICENSING AND OTHER REGULATORY PRACTICES. WHAT ABOUT ACCESS TO SUCH SOURCES VIA A BNL TASKING ARRANGEMENT UNDER SOME BOA (BASIC ORDERING AGREEMENT) ??

- MORE ATTENTION NEEDS TO BE PAID TO ASSISTANCE PAY-OFF, I.E. TRACKING IF, AND HOW, INFORMATION TRANSFERRED IS BEING UTILIZED.

SCIENTECH, INC.

INFORMATION SYSTEMS, MONITORING AND EVALUATION

Jan. 6, 1994

CURRENT EUR/DR/EI ENERGY INFORMATION SYSTEM

BOB CANTRELL
SCIENTECH, INC.

RTC-94-01

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OBJECTIVES

- PROVIDE A COHERENT SYSTEM FOR RECEIPT, STORAGE AND RETRIEVAL OF DIVERSE TYPES OF ENERGY RELATED DATA
- ACCOMODATE LOCAL (USAID) AND REMOTE USERS
- PROVIDE A MEANS TO DISSEMINATE TIMELY INFORMATION TO AID/EUR/DR/EI CONTRACTORS AND OTHER INTERESTED PARTIES
- PROVIDE A ROLLODEX (PHONE AND ADDRESS)FUNCTION AND A SCHEDULING UTILITY

RTC-94-02

SCIENTECH, INC.

DATABASE FEATURES..

THE DATA BASE CONSISTS OF THE FOLLOWING THREE TYPES OF DATA:

- "BULLETIN BOARD" DATA
  (EVENTS, TRAVEL NOTICES, ETC.)
- OBJECTIVES AND INDICATORS DATA
- BIBLIOGRAPHIC DATA

RTC-94-03

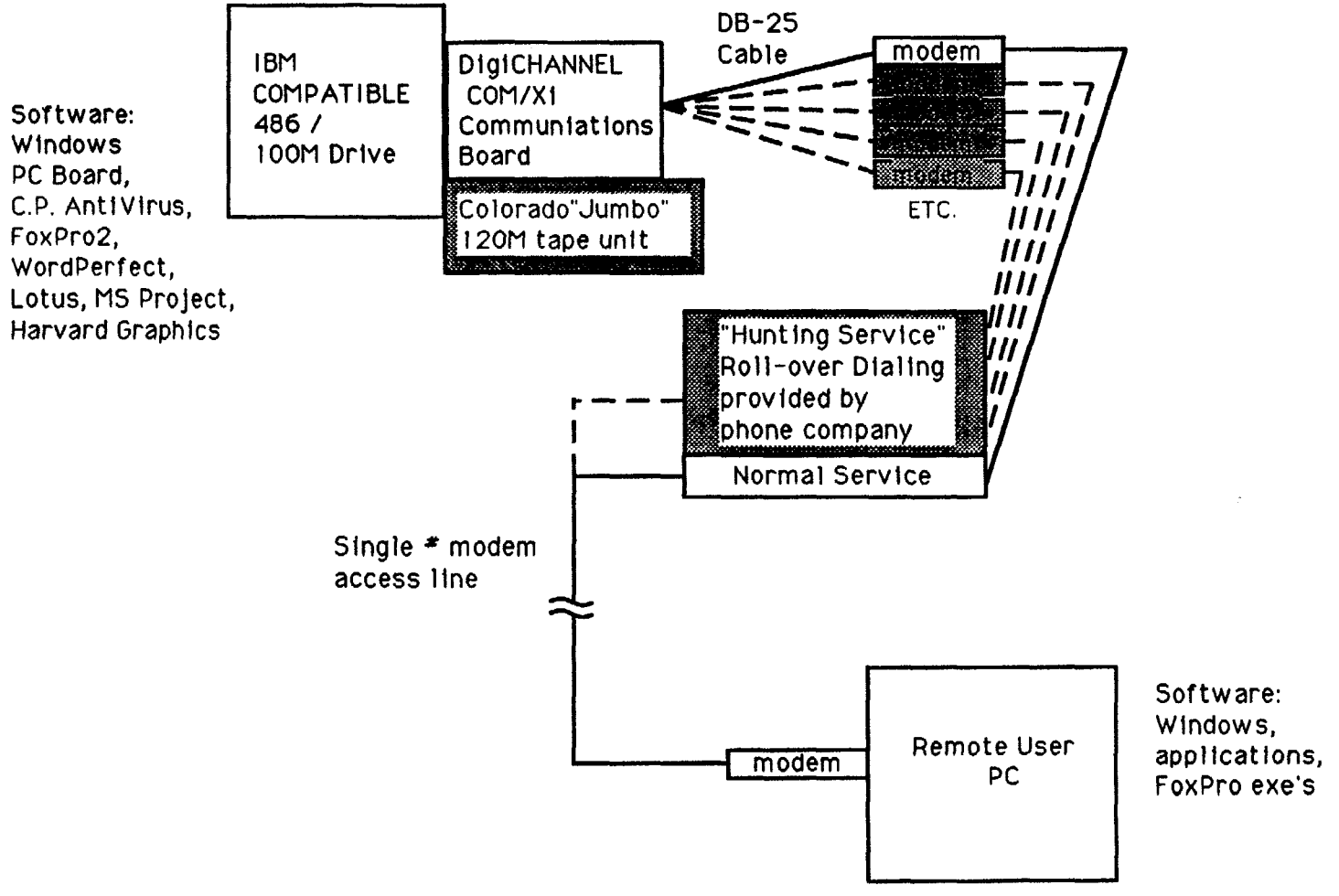
SCIENTECH, INC.

TASK DESCRIPTION

- DESIGN FOR AUTONOMOUS OPERATION
- UTILIZE THE EXISTING USAID 486 PERSONAL COMPUTER AS CENTRAL STORAGE, DATA BASE AND REMOTE USER SERVER
- USE COMMERCIAL SOFTWARE WITH USER FRIENDLY INTERFACE

SCIENTECH, INC.

TASK RESULTS



USAID Energy Data Base Hardware/Software Structure

RTC-94-05

SCIENTECH, INC.

System Attributes

- System similar to computerized public library
- Meta-data = computerized card catalog (data names)
- Data = book stacks
- PC Directories = Dewey Decimal System
- Sys Admin maint tasks = Librarian's duties
- Remote usage = Microfiche reader + fiche

RTC-94-06

SCIENTECH, INC.

Bulletin Board Functionality

- Runs in non-attended mode
- Set-up and maintained by Sys Admin
- Bulletins are Read-only to users
- Monthly submittals (uploads) are made to Sys Admin for proper filing
- Retrievals (downloads) are security level and/or password protected

RTC-94-07

SCIENTECH, INC.

Bibliographic Data Base Functionality

- Fox Pro 2 Data Base for Meta-data
- Support documents stored as compressed files
- Data base "reader" sent to remote users
- Meta-data files sent to remote users
- Data retrieval done through Bulletin Board system

RTC-94-08

SCIENTECH, INC.

Objectives and Indicators Functionality

- Fox Pro 2 Data Base for Meta-data (data names)
- Support documents stored as compressed files
- Maintained by Sys Admin
- Statistics possible

RTC-94-09

SCIENTECH, INC.

Scheduling Functionality

- Commercial software package - On Target
- Easy Windows user interface
- Generates standard Gantt (time) and PERT (order) charts
- Generates wall calendars

SCIENTECH, INC.

SIGNIFICANCE/LESSONS LEARNED

- SYSTEM IS IN PLACE, USER-FRIENDLY AND FUNCTIONAL
- CONNECTION VIA A NETWORK IS HARDER THAN STAND-ALONE OPERATION, BUT CAN AND IS BEING DONE
- FOXPRO CODE PACKAGES ARE MODULAR AND EASY TO UPDATE OR ADD
- BULLETIN BOARD IS ROBUST AND EASY TO USE

SCIENTECH, INC.

BULLETIN BOARD SCREENS

1. Bulletin Board Log-in

(Error Correcting Modem Detected)

USAID Energy Bulletin Board
PCBoard (R) v14.5a/10 - KFE102C3D8D9F

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

WELCOME TO THE USAID ENERGY BULLETIN BOARD

YOUR SYSTEM OPERATOR IS LYNN FENDELL 202-647-4484

NEW USERS TYPE "NEWS" FIRST AT THE MAIN BOARD

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

What is your first name?

TTY

Password (Dots will echo)? ...

SCIENTECH, INC.

2. New User Screen

Welcome New User!

To start your USAID Energy Information System continue to the main board and D)ownload the three files:

STARTER.WP - in WordPerfect
PKZ204G.EXE
START.ZIP

The first will tell you how to use the others.

The total time needed (at 1K-XModem) is 50 min.

thanks,
the SysOp

Scan Message Base Since 'Last Read' (Enter)=yes?

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3. Remote User Main Menu

```
Scan Message Base Since 'Last Read' (Enter)=yes? n

                    USAID Energy Bulletin Board Main Menu

                          B)ulletin Listings

          U)pload a File                UB Upload Batch
          D)ownload a File              DB Downnload Batch
          C)omment to SysOp             R)ead Messages
          V)iew Settings                W)rite User Info
          NEWS file display

                                G)oodbye
(59 min. left) Main Board Command?
```

RTC-94-14

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4. Bulletin Selections

(59 min. left) Main Board Command? b

USAID Energy Bulletins Select by Number

Events
1. Dec.93
2. Jan.94
3. Feb.94

Contractor Travel
4. Jan.94
5. Feb.94
6. Mar.94
7. Apr.94

(H)elp, (1-7), Bulletin List Command?

RTC-94-15

SCIENTECH, INC.

5. Bulletin #1 Contents

File Edit Setup Connect TTY 9600-8-N

****

JANUARY 1994

****

****

1/5/94: ALL MONTHLY REPORTS ARE DUE TO LYNNE DOORES-FENDELL EITHER BY THIS SYSTEM; E-MAIL OR FEDERAL EXPRESSED NO LATER THAN THE 5TH OF EVERY MONTH. IF YOU HAVE ANY QUESTIONS PLEASE CONTACT MRS. FENDELL ON 202-736-4484. THANK YOU FOR YOUR COOPERATION.

****

1/5-6/94: AID/CEE Energy Assistance Review Meeting
address: 2201 C Street, N.W. Washington, D.C.
ROOM 1105

PLEASE BRING A PHOTO ID WITH YOU. SHOULD YOU HAVE ANY QUESTIONS PLEASE CONTACT DR. MICHAEL STAMATELATOS, SCIENTECH ON 619-755-4535.

****

(H)elp, (1-7), Bulletin List Command?

RTC-94-16

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SCIENTECH, INC.

6. Bulletin Board Log-off

USAID Energy Bulletin Board Main Menu

B)ulletin Listings

U)pload a File	UB Upload Batch
D)ownload a File	DB Downnload Batch
C)omment to SysOp	R)ead Messages
V)iew Settings	W)rite User Info
NEWS file display	

G)oodbye

(58 min. left) Main Board Command? g

Minutes Used: 1

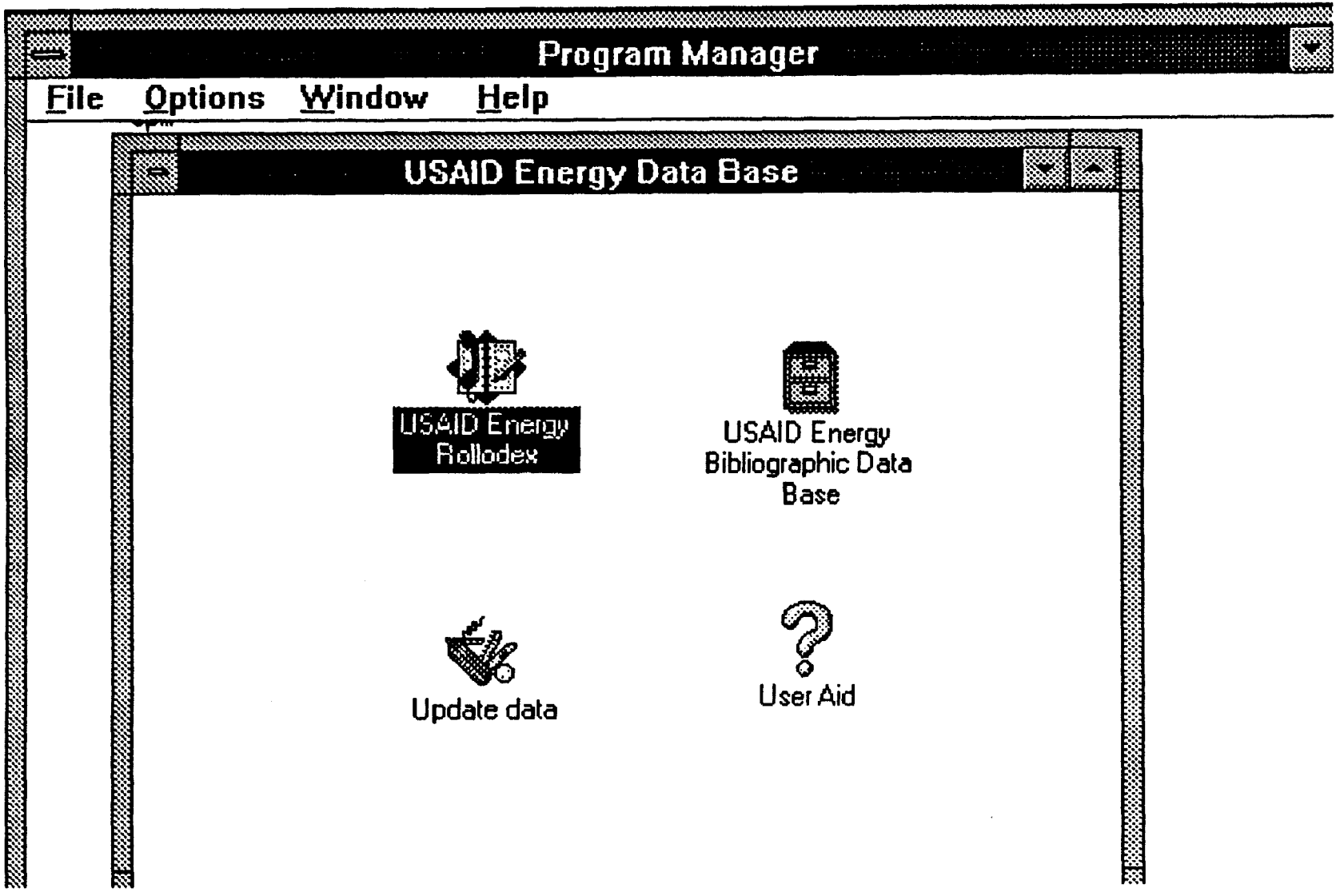
Thanks for calling, Ken!

NO CARRIER

RTC-94-17

SCIENTECH, INC.

Windows Icons for Bibliographic and Rollodex Functions



RTC-94-18

SCIENTECH, INC.

Bibliographic Search Screen

USAID Energy Bibliographic Data Base

Type in your search parameters below: < EXIT >

Title.....

Subject...

Author's name.....

Keywords.....

<SEARCH>

RTC-94-19

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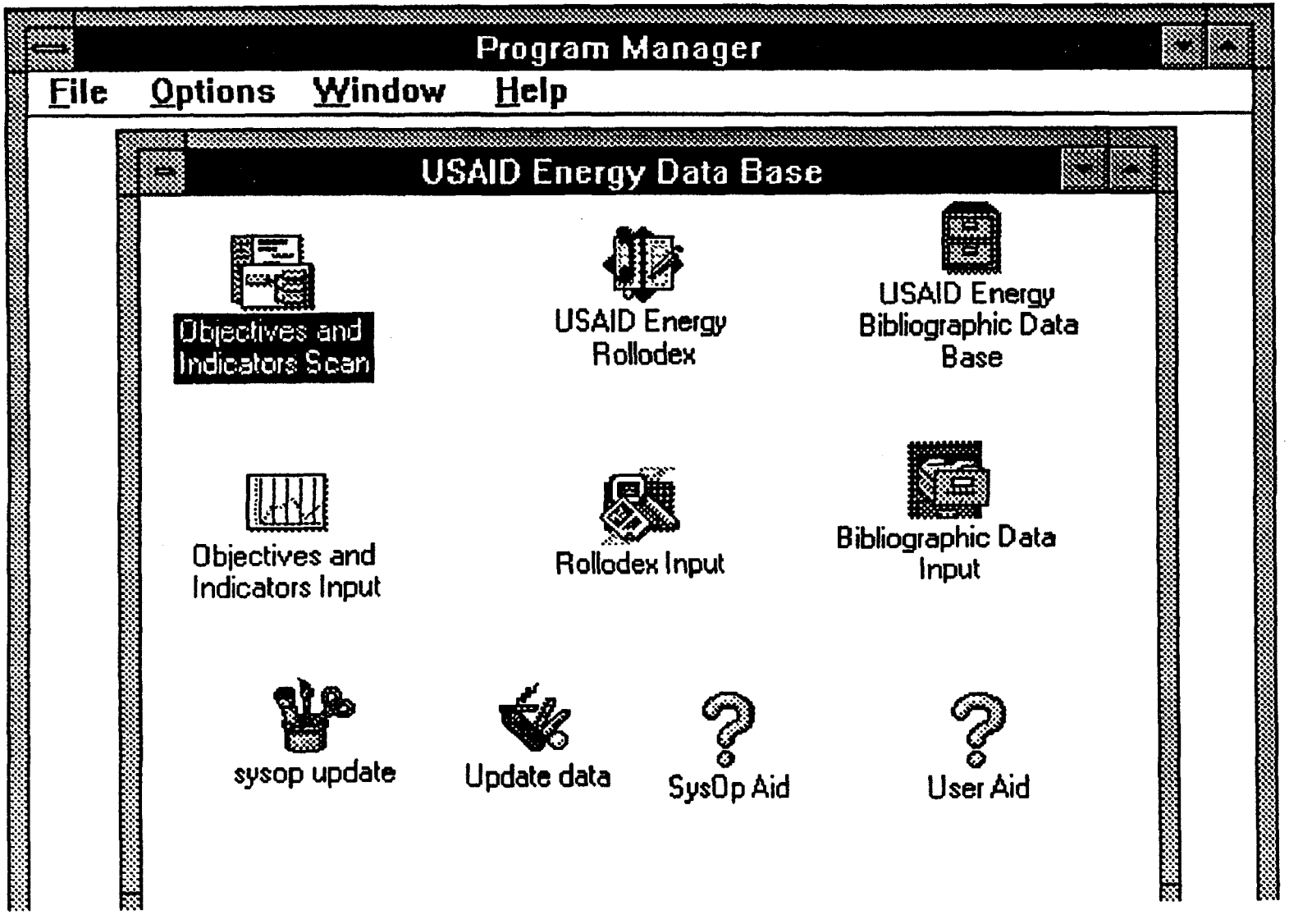
SCIENTECH, INC.

System Operator Icons



RTC-94-20

SCIENTECH, INC.

Scheduling Calendar Example

AID/SEE Tasks

January 1994

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1 New Years
2	3 Prepare for Review Mtg.	4	5 Monthly Reports AID/CEE Review Mtg.	6	7	8
9	10	11	12	13	14	15
16	17	18	19 Robt. E. Lee Day	20 Inaug. Day	21	22
23	24	25	26	27	28	29
30	31					

Printed: 08/Dec/93
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SCIENTECH, Inc.

EEP TASK DESCRIPTION

INDUSTRIAL ENERGY EFFICIENCY COMPONENT ACTIVITIES

- ENERGY AUDITS IN VARIETY OF INDUSTRIAL PLANTS IN EIGHT COUNTRIES (52 PLANTS TOTAL)
- ENERGY MANAGEMENT TRAINING FOR PLANT PERSONNEL AND LOCAL SUBCONTRACTORS
- ENERGY SAVINGS THROUGH LOW-COST EQUIPMENT INVESTMENT AND IMPROVED MANAGEMENT
- PREPARATION OF COUNTRY PROFILES AND POLICY AND INSTITUTIONAL ANALYSES

SCIENTECH, Inc.

TASK DESCRIPTION

THREE FIRMS CONTRACTED TO PROVIDE TECHNICAL ASSISTANCE

INTERNATIONAL RESOURCES GROUP, LTD.

BULGARIA, POLAND

RCG/ HAGLER, BAILLY, INC.

HUNGARY, YUGOSLAVIA,

RESOURCE MANAGEMENT ASSOCIATES OF MADISON, INC.

CZECHOSLOVAKIA, ROMANIA, LITHUANIA

SCIENTECH, Inc.

OBJECTIVES OF THE EVALUATION

1. DETERMINE EFFECTIVENESS OF THE TECHNICAL ASSISTANCE, TRAINING, AND EQUIPMENT SUPPLIED

2. DETERMINE LESSONS LEARNED RELEVANT TO FOLLOW-ON WORK THAT HAS BEEN INITIATED

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SCIENTECH, Inc.

EVALUATION TEAM TASKS

INTERVIEW USAID EEP CONTRACTORS

REVIEW EQUIPMENT PROCUREMENT PROCESS

CONDUCT HOST COUNTRY INTERVIEWS (Czech Republic, Hungary, Romania, Bulgaria)

- DETERMINE EQUIPMENT STATUS AND PERFORMANCE
- COLLECT DATA ON ENERGY SAVINGS
- IDENTIFY CHANGES IN MANAGEMENT AND CULTURE
- INTERVIEW LOCAL USAID AND USEMB PERSONNEL, LOCAL HOST COUNTRY OFFICIALS , PLANT PERSONNEL, AND LOCAL SUBCONTRACTORS
- VISIT REPRESENTATIVE NUMBER OF PLANTS (SIX PER COUNTRY)

SCIENTECH, Inc.

EVALUATION TEAM TASKS - cont'd

INTERVIEW EQUIPMENT SUPPLIERS

SUMMARIZE ENERGY SAVINGS

SUMMARIZE FINDINGS AND CONCLUSIONS

IDENTIFY LESSONS LEARNED

DEVELOP RECOMMENDATIONS

SCIENTECH, Inc.

RESULTS/ ACCOMPLISHMENTS

- PROJECT INITIATION AND IMPLEMENTATION
- ENERGY EFFICIENCY AWARENESS
- EQUIPMENT STATUS AND PERFORMANCE
- COUNTRY AND POLICY-RELATED FINDINGS

SCIENTECH, Inc.

RESULTS/ACCOMPLISHMENTS
INITIATION AND IMPLEMENTATION

- QUICKLY IDENTIFIED AND IMPLEMENTED LOW COST (APPROX. 30K$/PLANT) ENERGY EFFICIENCY MEASURES
- MOST EQUIPMENT RESULTED IN RAPID PAYBACKS (MONTHS)
- SELECTION OF PLANTS GENERALLY WELL DONE
- INTRODUCED U.S. MONITORING AND MEASURING EQUIPMENT INTO REGION
- PLANT STAFF QUICKLY ABSORBED TECHNICAL ASPECTS; MORE ASSISTANCE NEEDED FOR ECONOMIC ASPECTS

SCIENTECH, Inc.

RESULTS/ ACCOMPLISHMENTS
ENERGY EFFICIENCY AWARENESS

- AID PROGRAM FOCUSED PLANT MANAGEMENT ON BENEFITS OF ENERGY EFFICIENCY
- ENERGY EFFICIENCY NOT YET HIGH PRIORITY IN EASTERN EUROPEAN PLANTS
- ENERGY EFFICIENCY INFORMATION NOT WIDELY AVAILABLE AND PROGRAMS NOT EXTENSIVE
- LIMITED ENERGY EFFICIENCY SERVICES AVAILABLE; STRONG TECHNICAL BASE TO BUILD ON IS PRESENT
- HOST COUNTRY GOVERNMENTS OPEN TO PRIVATIZATION OF ENERGY EFFICIENCY SERVICES BUT SLOW GROWTH EXPECTED

SCIENTECH, Inc.

RESULTS/ ACCOMPLISHMENTS

EQUIPMENT STATUS AND PERFORMANCE

- TEAM VERIFIED INSTALLATION AND OPERATION OF AID-SUPPLIED EQUIPMENT IN PLANTS VISITED
- MOST EQUIPMENT WELL ACCEPTED AND UTILIZED; SOME COMMISSIONING AND SPARE PARTS PROBLEMS
- MONITORING EQUIPMENT LEFT IN COUNTRY NOT FULLY UTILIZED
- PLANT PERSONNEL VERY APPRECIATIVE OF EQUIPMENT
- EEP AIDED US SUPPLIER PENETRATION OF EASTERN EUROPEAN MARKET

SCIENTECH, Inc.

RESULTS/ ACCOMPLISHMENTS

COUNTRY AND POLICY-RELATED FINDINGS

- RELATIONSHIP BETWEEN INVESTMENT TODAY AND SAVINGS TOMORROW NOT ABSORBED IN BUSINESS COMMUNITY
- PRIVATIZATION CREATED BARRIERS TO EXCHANGE OF INFORMATION AMONG PLANTS
- ENERGY PRICE INCREASES TO WORLD LEVELS STARTING TO FOCUS ATTENTION ON ENERGY EFFICIENCY
- CHANGES IN PLANT ORGANIZATION VARIABLE

SCIENTECH, Inc.

SIGNIFICANCE/LESSONS LEARNED

- LOW COST ENERGY EFFICIENCY MEASURES CAN BE PUT IN PLACE QUICKLY AND WORK WELL
- SUCCESS IS STRONG FUNCTION OF PLANT MANAGEMENT
- PROVISION OF EQUIPMENT MULTIPLIES PROGRAM IMPACT;

  "NOT JUST ANOTHER PAPER STUDY"
- DISSEMINATION OF PROGRAM RESULTS SHOULD BE WELL DIRECTED TO MAXIMIZE IMPACT
- SERVICING AND SPARE PARTS IS IMPORTANT PART OF EQUIPMENT SUPPLY
- FULL ACCEPTANCE AND IMPLEMENTATION WILL TAKE TIME

SCIENTECH, Inc.

SIGNIFICANCE/ LESSONS LEARNED
RECOMMENDATIONS

- CONTINUE PROGRAMS TO ENCOURAGE ENERGY EFFICIENCY
- CONTINUE TO STRENGTHEN PRIVATE SECTOR ENERGY EFFICIENCY SERVICES CAPABILITY
- ASSURE EXPANDED USE OF EQUIPMENT SUPPLIED TO HOST COUNTRY GROUPS
- PROVIDE SERVICING AND SPARE PARTS ALONG WITH EQUIPMENT SUPPLY
- SEEK OPPORTUNITIES TO IMPROVE COORDINATION WITH OTHER DONORS

SCIENTECH, Inc.

THE IMPACT OF THE EMERGENCY ENERGY PROJECT (EEP) INDUSTRIAL ENERGY COMPONENT

PRESENTATION TO USAID/CEE

JANUARY 6, 1994

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SCIENTECH, Inc.

OBJECTIVES/ RATIONALE

EEP PROJECT OBJECTIVE

ASSIST CENTRAL AND EASTERN EUROPE WITH IMMEDIATE MEASURES TO IMPROVE ENERGY EFFICIENCY

FOUR PROJECT COMPONENTS

- LOW-COST INDUSTRIAL ENERGY EFFICIENCY MEASURES
- IMPROVED OIL REFINERY OPERATIONS
- STRENGTHENED OIL PURCHASING ABILITY
- NEW DOMESTIC PRICE STRUCTURES

SCIENTECH, Inc.

PROJECT RATIONALE

EEP INITIATED NOVEMBER 1990 IN RESPONSE TO ENERGY AND ECONOMIC CRISES

- REDUCED OIL DELIVERIES FROM SOVIET UNION
- SHIFT TO HARD CURRENCY PAYMENTS FOR ENERGY
- MIDEAST OIL SUPPLY UNCERTAINTY

SCIENTECH, Inc.

EEP ENVIRONMENT

- ECONOMIC AND POLITICAL FACTORS CHANGING RAPIDLY
- DECLINE OF CENTRALIZED PLANNING/ RISE OF PRIVATIZATION
- LIMITED EXPOSURE TO WESTERN TECHNICAL PERSONNEL AND TECHNOLOGY IN MANY PLANTS
- LARGE, OVERSTAFFED PLANTS WITH OUTDATED TECHNOLOGY
- LOW ENERGY EFFICIENCY AWARENESS - RESULT OF SUBSIDIZED ENERGY AND EMPHASIS ON PRODUCTION
- WASTED ENERGY AND HIGH POLLUTION LEVELS
- RISING ENERGY PRICES AND DEVELOPMENT OF MARKET ECONOMIES