



**U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT**

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**The Role of the Engineering Community  
in Infrastructure-Related Trade and  
Investment in Eastern Europe**



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**Contract No. ANE-0249-I-9022-00  
Project No. 398-0249**

**FINAL REPORT**

## ACRONYMS

<b>AFBC</b>	<b>Atmospheric Fluidized Bed Combustors</b>
<b>CHP</b>	<b>Combined Heat and Power</b>
<b>COMECON</b>	<b>Council for Mutual Economic Assistance (Council of the Former Communist Bloc Nations)</b>
<b>EBRD</b>	<b>European Bank for Reconstruction and Development</b>
<b>EC</b>	<b>European Community</b>
<b>EE</b>	<b>Eastern Europe</b>
<b>EEEC</b>	<b>Eastern European Engineering Community</b>
<b>EFTA</b>	<b>European Free Trade Association</b>
<b>EI</b>	<b>Energy and Infrastructure</b>
<b>ESOP</b>	<b>Employee Stock Option Programs</b>
<b>FTEE</b>	<b>First Tier Eastern Europe</b>
<b>GATT</b>	<b>General Agreement on Tariffs and Trade</b>
<b>GOST</b>	<b>Gosstandart Standard (Russian)</b>
<b>IGCC</b>	<b>Integrated Gasification Combined Cycle</b>
<b>KFW</b>	<b>German Government Finance Arm</b>
<b>NIS</b>	<b>Newly Independent States (of the former Soviet Union)</b>
<b>OECD</b>	<b>Organization for Economic Cooperation and Development</b>
<b>OECF</b>	<b>Overseas Economic Cooperation Fund</b>
<b>OPIC</b>	<b>Overseas Private Investment Corporation</b>
<b>PEIBD</b>	<b>Private Energy and Infrastructure Business Development</b>
<b>PFBC</b>	<b>Pressurized Fluidized Bed Combustors</b>
<b>PME</b>	<b>Project Management Entity</b>
<b>USEC</b>	<b>U.S. Engineering Community</b>

# **Summary Letter**

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June 24, 1992

Mr. Fred J. Bieganski  
Agency for International Development  
ENE/DR/EI, Room 4440, NW  
320 21st Street, NW  
Washington, DC 20523-0070

Subject: The Role of the Engineering Community in Infrastructure-Related  
Trade and Investment in Eastern Europe  
Contract ANE-0249-I-9022-00, Project No. 398-0249, Delivery Order #13  
Final Report

Dear Mr. Bieganski:

In accordance with your letter of June 5th, enclosed are 20 copies of the final report which represents the last deliverable for this project.

The development of this report would not have been possible without support from a number of critical areas which we would like to acknowledge as follows:

- USEC - Particularly ASCE, ASME, and AAES in providing support and suggestions in developing the trip to Eastern Europe, and to the speakers and participants at the workshop who took time from other pressing matters and traveled at their own expense to share their experience in the development of recommendations.
- EEEC - Every meeting went off as scheduled and the participation far exceeded expectations which was a measure of the sincerity and cooperation extended by a group of marvelous people.
- A.I.D. - The attendance and participation at the workshop was greatly influenced by the fact that you and Fred Zobrist participated in the proceedings and that Dr. Adelman made time in her schedule to address the group at lunch. Successful implementation of the recommendations in this report will to a large degree be dependent on the support of the senior management from the USEC who were in attendance at the workshop.

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Mr. Fred J. Bieganski  
June 24, 1992  
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We sincerely hope we have met the objectives you envisaged for this effort and that A.I.D. will be given the budget and mandate to move forward to implement a program which has the potential to have a significant impact on Eastern Europe and U.S. business interests.

Sincerely,



Robert H. Staplin  
Senior Vice President  
Project Manager

RHS/kah

Enclosures: As noted

# THE ROLE OF THE ENGINEERING COMMUNITY IN INFRASTRUCTURE-RELATED TRADE AND INVESTMENT IN EASTERN EUROPE

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**THE ROLE OF THE ENGINEERING COMMUNITY IN  
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## EXECUTIVE SUMMARY

The purpose of this project is to develop recommendations to foster private investment and business opportunities in the energy and infrastructure sectors of Eastern Europe, specifically Czechoslovakia, Hungary, and Poland. These recommendations identify programs and projects that can be sponsored by A.I.D. and implemented through the U.S. engineering community (USEC).

The project was conducted in four phases:

1. To determine the current status of linkage between the U.S. engineering community (USEC) and the Eastern European engineering community (EEEC), questionnaires were sent to 24 U.S. engineering societies and associations. In addition, discussions were held with select U.S. organizations.
2. To establish the current situation analysis in Eastern Europe, questionnaires were sent and follow-up meetings were held with 38 different entities and more than 220 individuals during a three-week trip to Budapest, Prague, and Warsaw in January 1992.
3. A workshop was conducted in Washington, D.C., on March 5 and 6, 1992, with more than 60 senior representatives from the USEC and other interested parties to discuss the situation in Eastern Europe and enlist their support in developing recommendations for this report.
4. Recommendations were prioritized in three categories: Organization and Procedures, Programs, and Projects, and summarized in this report.

The recommendations are based on the following conclusions:

1. There is a critical need for a coordinated single-source approach for all U.S. government entities, programs, and projects in each of the three countries.
2. Modest investment in a number of *programs* can be highly leveraged into multiple benefits primarily through the establishment of personal networks.
3. *Projects* to be successful, require a total financial commitment and, therefore, available funds should be focused only on projects with the highest priority.

4. To revitalize their economies and make their products competitive in the global marketplace, the FTEE countries must solve their energy and communication problems first.
5. U.S. industry has a competitive advantage in energy-related projects as opposed to conventional infrastructure projects, which may be best sponsored in-country.

In recognition of the above, project recommendations are focused on a select number in the energy and communications areas.

A.I.D. can make a major contribution by directing efforts to a limited number of energy projects and providing the necessary leadership to make sure the projects move through feasibility, design, procurement, construction, and commercial operation.

## CHAPTER I - INTRODUCTION

### Purpose

By direction from Congress, the Agency for International Development (A.I.D.) is charged with carrying out the following three objectives in Central and Eastern Europe:

- To assist in the development and strengthening of democratic institutions;
- To assist in the transformation of centrally planned economies to market-based systems; and
- To assist in improving the basic quality of life of these nations while they undergo economic restructuring and political reform.

A.I.D. believes that the U.S. engineering community (USEC) can assist in meeting the above objectives.

The purpose of this project is to analyze the issues involved in U.S. business investment in Eastern Europe, specifically Czechoslovakia, Hungary, and Poland, and identify engineering-related energy and infrastructure programs and projects for consideration by A.I.D. This project may be used as a model for similar development in other Eastern and Central European countries and in developing ties to the Unified Countries.

### Scope of Services

The Contractor shall: (a) analyze the issues involved in promotion of EI-oriented U.S. business and investment development through stimulation of USEC activities vis-a-vis EE countries and (b) recommend PEIBD project options that A.I.D. may wish to support to encourage appropriate USEC activities and linkages with EEEC. The Contractor shall perform the following specific tasks:

1. Identify and describe key USEC entities involved or planning to become involved in EE. Conduct meetings and consultations with USEC representatives.
2. Identify and describe EEEC entities, such as EI-related EE government entities, manufacturing industries, service companies, trade associations and professional societies and their existing linkages with USEC entities. Appraise their

potential role and usefulness in the promotion of EI-oriented business and investment. Provide organization charts if possible.

3. Effectively interface with USEC and EEEEC, collect data, conduct studies and perform analyses in support of the PEIBD project design.
4. Identify and describe current and planned USEC activities in EE and develop a USEC-EEEC linkage matrix showing current and desirable linkages.
5. Identify, describe and appraise existing model activities involving USEC and/or EEEEC entities which enhance EI business and investment.
6. Identify and analyze the full range of activities that could be undertaken by USEC and recommend those that appear to be the most effective and practical. Discuss the cost implications of different types of activities, their potential business and investment benefits and the time frame for meaningful impact.
7. Develop a practical plan of effective USEC activities to enhance U.S. business and investment activities under the proposed PEIBD project. Prioritize the recommended USEC activities so their scope can later be adjusted to fit the budgetary realities.
8. Describe how each type of proposed activity supports one or more of the PEIBD objectives and promotes the EI business and investment goals.
9. Define the nature and function of a Project Management Entity (PME) which would be the center of USEC activities under the PEIBD project.
10. Provide management, work planning, documentation preparation and reporting tasks as needed to carry out contract responsibilities.

## Methodology and Approach

The project involved four phases:

1. Contacting the USEC to determine what programs are in place with the EEEEC, what programs are planned, and suggestions for future programs;
2. Visiting Czechoslovakia, Hungary, and Poland to meet with the EEEEC to collect data, establish needs, seek advice in establishing linkages with the United States, and identify potential projects for A.I.D. consideration;
3. Conducting a workshop with interested USECs to develop programs and identify projects for consideration by A.I.D.; and
4. Preparing and presenting findings in the final report.

Implementation of the above was carried out as follows:

1. The scope of work was reviewed with senior management from a number of engineering firms and engineering societies to brainstorm the overall approach. Discussions with firms already doing work in Hungary, Czechoslovakia, and Poland were very helpful. A logo was designed to give identify to this specific project. The purpose of the logo was to demonstrate a bridge between the USEC and EEEEC.
2. A letter was sent to all of the major engineering societies and trade associations in the fields of energy and infrastructure. Each organization was asked to fill out a questionnaire and to provide lists of engineering contacts in the three countries. Separate phone calls were also made to a number of engineering organizations to obtain lists of recommended contacts.
3. Participation in the ASCE annual meeting in Orlando, Florida, in October 1991 was particularly helpful because of a special section dealing with engineering issues in Eastern Europe. Personal contacts were established with senior-level personnel from each of the three countries. This also provided a broad overview of energy and infrastructure problems in each country.
4. Based on the USEC responses, personal contacts, suggestions from the engineering profession, and the contacts made in Orlando, a prioritized list of proposed con-

tacts were established for each country. Letters and a questionnaire were sent to a broad range of engineering interests in the three countries from government, engineering societies, academia, entrepreneurial organizations, and government ministries.

5. Based on responses to the letter, phone calls, and faxes, a detailed itinerary was established for January 4 through January 25, 1992, that included 38 separate meetings in the three countries.
6. All meetings occurred as scheduled and ranged in attendance from one-on-one to a meeting in Warsaw that included 26 participants. In total, approximately 220 people were contacted. The questionnaire was used as a basis for discussion, and the meetings ranged in length from 20 minutes to five hours. The reception in all instances was friendly, cooperative, and enthusiastic. Many new ideas and questions developed during these interviews, and therefore each organization was asked to provide an expanded written response to the original questionnaire. Detailed responses to the questionnaire were received from all significant contacts in the EEEEC (see Appendix II).
7. The responses from both the USEC and the EEEEC plus personal observations were used to develop a workshop, which was held in Washington, DC, on March 5 and 6, 1992. The workshop included senior management from engineering societies, trade associations, engineering companies, and representatives from A.I.D. and interested embassies. Total attendance exceeded 60. The workshop culminated in four breakout sessions focused on:
  - Engineering issues:
  - Legal/financial issues;
  - Energy issues; and
  - Infrastructure issues.

The breakout sessions were charged with developing specific recommendations for inclusion in the final report.

8. The final report is based on the recommendations from the workshop plus personal observations and includes this document plus three appendices: I. USEC Questionnaires; II. EEEEC Questionnaires; and III. Workshop Proceedings.

## **Problems and Assumptions**

In developing the criteria for this report, it was necessary to make a number of assumptions. Many of these assumptions were necessary as a result of problems encountered during the course of the study. To fully understand both the scope and the limits of this report, the following will summarize problems, assumptions, and approach.

1. **Scope.** From a detailed review of the scope of work and developing the work plan, it was apparent that the scope was much broader and all-inclusive than could be supported by the contract duration and funding. On this basis, every attempt was made to focus the approach on the critical issues that would have the most significance on the final recommendations. For example the report focuses on the first-tier Eastern Europe (FTEE) countries Hungary, Czechoslovakia, and Poland and only address other EE countries or the Unified Countries as they relate to FTEE issues. While reference is made to policy, law, and regulations, the report has centered on engineering issues. The list of suggested engineering societies included a number that are oriented primarily toward the industrial sector. Because the industrial sector could involve an unmanageable list of possible contacts, this report focuses strictly on energy and infrastructure as outlined in the introduction.
2. **Benchmark.** In order to avoid making recommendations for programs or projects that are already in place, a concerted effort was made to identify all ongoing efforts in the three countries. By far, this was the most difficult problem we dealt with because many of our individual contacts indicated that they were already involved in the three countries either on their own or through governmental programs. Even more disconcerting was the fact that various departments of government were unaware of activities within other departments, and in many instances, communication was lacking within departments. Because there was no apparent clearinghouse for all government activities and it appeared that much of the project budget could be consumed in attempting to establish a baseline, it was decided to proceed assuming there were no current programs. This was a drastic step; however, it made it possible to initiate work and focus on the in-country problems. Furthermore, if the final recommendations include projects already in place, it simply reinforces the need and may give further insight or alternate approaches to ongoing work.

3. **Communication.** The usual language and time differences presented some problems in firming up the Eastern European itinerary. Trying to confirm by telephone was particularly difficult. However, we found that almost all of our contacts had fax machines. Ultimately, we found the fax to be a very satisfactory tool that enabled us to confirm all of the major meetings prior to leaving the United States.
4. **Timing.** Here we encountered two problems. First, mentioned above, many programs and projects are already in place, and the sense was that this project could well have been conducted a year earlier. The second problem was is the rapidity of change, particularly in the political arena. For example, the natural gas supplied to Poland from the Unified Countries was cut off during our visit to Poland. The recommendations in the report, therefore, have been based on facts on hand at the time of report preparation.
5. **Assessment of Current Activities.** Many of the European contacts have been involved with various U.S. programs. While there was much appreciation for U.S. efforts, and compliments on specific programs, there was also constructive criticism, particularly in the area of implementation. There was confusion regarding overall objectives, the difference between various programs, particularly between TDP and A.I.D. In many instances, they did not know who to talk to, where to seek help, and in general there was confusion with the process itself.

The most significant observation that came up repeatedly in each county was that the United States was trying to address too broad a range of issues by conducting numerous feasibility studies rather than focusing on the most critical issues and following through with either the direction or funding to see the program or project completed. These issues are addressed in the final section on recommendations.

## CHAPTER II - U.S. ENGINEERING COMMUNITY ACTIVITIES

### Introduction and Procedure

A specific and focused questionnaire (see Exhibit II-1) was developed and sent to selected U.S. engineering societies and trade associations. The purpose of the questionnaire was to determine existing USEC programs with the EEEEC, planned programs, and suggestions for future programs to establish linkages with the EEEEC. The following list of USEC organizations received the questionnaire:

- American Association for Advancement of Sciences(AAAS)
- American Association of Engineering Societies(AAES)
- American Consulting Engineers Council(ACEC)
- American Institute of Aeronautics & Astronautics(AIAA)
- American Institute of Chemical Engineers(AICHE)
- American Institute of Mining, Metallurgical & Petroleum Engineers(AIME)
- American Institute of Plant Engineers(AIPE)
- American Nuclear Society(ANS)
- American Public Power Association(APPA)
- American Society for Engineering Education(ASEE)
- American Society of Civil Engineers(ASCE)
- American Society of Mechanical Engineers(ASME)
- Edison Electric Institute(EEI)
- Electric Power Research Institute(EPRI)
- Institute of Electrical and Electronics Engineers(IEEE)
- National Academy of Engineering (NAE)
- National Academy of Sciences
- National Electrical Manufacturers Association(NEMA)
- National Institute of Ceramic Engineers(NICE)
- National Institute of Standards and Technology
- National Rural Electric Cooperative Association(NRECA)
- National Science Foundation(NSF)
- North American Electric Reliability Council (NERC)
- Optical Society of America(OSA)
- Society of Women Engineers
- United States Energy Association(USEA)

Table II-1 is a summary of total responses, both written and those received by phone. Copies of the questionnaires as received are found under Appendix I.

**QUESTIONNAIRE FOR THE U.S. ENGINEERING COMMUNITY**

1. Does your organization operate internationally? What countries?
2. If no, are you interested in establishing relationships in Eastern Europe and specifically, Czechoslovakia, Hungary, and Poland?
3. If yes, have you attempted to establish linkage with existing organizations or attempted to establish a new organization in Czechoslovakia, Hungary, or Poland?
4. Name, title, address, and telephone number of your member responsible for this activity. A copy of your organization chart would be helpful.
5. What is the status of your current program and specifically, what organizations are you dealing with in each of the three countries?
6. What are the roadblocks to implementing your program?
7. What programs would you like A.I.D. to consider in order to implement your program?
8. Would your organization be willing to participate in a workshop to develop plans to further linkage with the engineering community in Czechoslovakia, Hungary, and Poland?

**SUMMARY OF RESPONSES BY THE U.S. ENGINEERING COMMUNITY**

<u>Organization</u>	<u>Eastern Europe Relationship</u>	<u>Status of Eastern Europe Programs</u>	<u>Obstacles</u>	<u>Future A.I.D. Programs for Consideration</u>
<p>INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC. (IEEE)</p> <p><u>Contact:</u></p> <p>Mr. Melvin I. Olken, Staff Director, Field Services 445 Hoes Lane, Piscataway, NJ 08855 Tel: 908/562-5504</p>	<ul style="list-style-type: none"> <li>Organized Sections in 57 Countries Including Hungary and Poland. Currently Trying to Establish Section in Czechoslovakia</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing Programs in Hungary and Poland Consist of Local Meetings and an International Conference Held in Hungary in 1991, with Another Scheduled for 1993</li> </ul>	<ul style="list-style-type: none"> <li>Currency Conversion Deters Membership</li> </ul>	<ul style="list-style-type: none"> <li>Sponsorship of Technology Transfer Ventures</li> </ul>
<p>NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION (NRECA)</p> <p><u>Contact:</u></p> <p>Mr. Bard C. Jackson Director, Special Projects NRECA 1800 Massachusetts Avenue N.W. Washington, DC 20336 Tel: 202/857-9635</p>	<ul style="list-style-type: none"> <li>Attempting to Establish Linkages</li> </ul>	<ul style="list-style-type: none"> <li>Submitted Proposal to Estonia Ministry to Establish Distributive Cooperatives at Community Level, Waiting for Response</li> <li>Finalizing Proposal to Poland for Agreement to Rehabilitate Series of Mini Hydroelectric Projects (25-200 kW)</li> </ul>	<ul style="list-style-type: none"> <li>Soft Loan Financing</li> </ul>	<ul style="list-style-type: none"> <li>Financial Assistance to Support Rehabilitation of Series of Small Hydro Projects in Poland</li> </ul>
<p>THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)</p>	<ul style="list-style-type: none"> <li>Agreements of Cooperation with Engineering Societies in Czechoslovakia, Hungary, Poland, USSR, and Yugoslavia</li> </ul>	<ul style="list-style-type: none"> <li>Agreement of Cooperation with Gepipari Tudomanyos Egvesulet (GTE), the Scientific Society of Mechanical Engineers in Hungary since 1985. Conducted 2 Engineering Student Exchanges with GTE. Shorter Exchanges Average 2 per Year.</li> </ul>	<ul style="list-style-type: none"> <li>Lack of Funding (Soft Currency Problems) for Continued Education Programs and Publications in EE</li> </ul>	<ul style="list-style-type: none"> <li>Sending ASME Instructions to EE to Present Short Courses in All Areas of Mechanical Engineering. Includes Instruction in the Use of ASME Codes and Standards, Which Would Enable Firms to Reach New Markets</li> </ul>

## SUMMARY OF RESPONSES BY THE U.S. ENGINEERING COMMUNITY

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<u>Organization</u>	<u>Eastern Europe Relationship</u>	<u>Status of Eastern Europe Programs</u>	<u>Obstacles</u>	<u>Future A.I.D. Programs for Consideration</u>
<p>THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) (Cont.)</p> <p><u>Contact:</u></p> <p>Mr. David J. Soukup, P.E. Director, International Affairs ASME 345 E. 47th Street New York, NY 10017 Tel: 212/705-7397</p>		<ul style="list-style-type: none"> <li>• Agreement of Cooperation with Ceska Strojnicka Spolecnost, Czech Mechanical Engineering Society since 1990. Will Cohost 1993 International Waste Management Conference</li> <li>• Agreement of Cooperation with Stowarzyszenie Inzynierow Technikow Mechanikow Polskich (SIMP), Polish Society of Mechanical Engineers and Technicians. Exchange of Engineers Average One Per Year</li> <li>• Held First Major Technical Conference in EE: Cogen-Turbo Conference, Budapest 1991. ASME Hosted w/GTE and Hungarian Scientific Society of Energy Economics</li> <li>• ASME Linking U.S. Companies Interested in JV with GTE, which Acts as Link to EE Counterpart Organizations</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Funding (Soft Currency Problems) to Bring EE Engineers to Attend U.S. Conference</li> </ul>	<ul style="list-style-type: none"> <li>• Bringing Experts from EE to ASME Conferences to Visit Industry, Attend Technical Meetings, Present Papers, and Attend Exhibit Shows in Order to Establish Networks of Engineers in Their Fields</li> <li>• Conducting the Second "International Aspects of Engineering" Seminar for EE and U.S. Students</li> <li>• Hosting the Leadership of Engineering Societies for Instruction on Proving Products and Services for Their Members and to Discuss Further Joint Conference and Publishing Opportunities</li> </ul>
<p>AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)</p>	<p>Agreement of Cooperation with the Following Organizations:</p>	<ul style="list-style-type: none"> <li>• Technical Delegations of U.S. Civil Engineers have been Sent to Hungary and Czechoslovakia</li> </ul>	<ul style="list-style-type: none"> <li>• Not Knowing Which is the Most Appropriate Group to Deal with in Each Country; How Stable a Country is, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Supporting Joint Professional Engineering Society Relationships for the Purpose of Transferring Technology and Much-needed Management Expertise</li> </ul>

## SUMMARY OF RESPONSES BY THE U.S. ENGINEERING COMMUNITY

<u>Organization</u>	<u>Eastern Europe Relationship</u>	<u>Status of Eastern Europe Programs</u>	<u>Obstacles</u>	<u>Future A.I.D. Programs for Consideration</u>
<p>AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) (Cont.)</p> <p><u>Contact:</u></p> <p>Mr. George L. De Fels,            Director of International Affairs,            ASCE,            345 East 47th Street            New York, NY 10017            Tel: 212/705-7290</p>	<ul style="list-style-type: none"> <li>- Hungarian Hydrological Society</li> <li>- Hungarian Scientific Society of Building</li> <li>- Hungarian Scientific Society for Transportation</li> <li>- Hungarian Society of Surveying, Mapping, and Remote Sensing</li> <li>- Czech Institution of Civil and Structural Engineers</li> <li>- Slovak Society of Civil Engineers</li> <li>- All-Union Society of Civil Engineers (USSR)</li> </ul> <p>Also, Ongoing Points of Contact with the Following Organizations, Some of Which are in Process of Agreements of Cooperation:</p>	<ul style="list-style-type: none"> <li>• Smaller Exchange Visits by ASCE Members to Meet with EE Counterparts</li> <li>• Hungary and Czechoslovakia Representatives Attend Annual ASCE Meeting</li> <li>• Developing Future Continuing Education Courses for EE Counterparts</li> </ul>	<ul style="list-style-type: none"> <li>• Because 90% of the ASCE Membership is Domestic (in the U.S.), There is Concern About the Extent to Which ASCE Should Pursue International Affairs</li> </ul>	<ul style="list-style-type: none"> <li>• Assist ASCE in Providing Training Courses, Seminars, Workshops, and Helping These New Democracies to Strengthen Their Infrastructures, Develop Energy Sources, and Modernize Economies, with Due Regard for the Environment</li> </ul>

## SUMMARY OF RESPONSES BY THE U.S. ENGINEERING COMMUNITY

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<u>Organization</u>	<u>Eastern Europe Relationship</u>	<u>Status of Eastern Europe Programs</u>	<u>Obstacles</u>	<u>Future A.I.D. Programs for Consideration</u>
<p>AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) (Cont.)</p>	<ul style="list-style-type: none"> <li>- MTESZ - Federation of Technical and Scientific Societies, Hungary</li> <li>- Hungary Ministry of Transport, Telecomm. and Construction</li> <li>- Polish Association of Building Engineers and Technicians</li> <li>- Poland Ministry of Environmental Protection</li> <li>- Czechoslovak Academy of Sciences</li> <li>- Czech Ministry of the Environment</li> </ul>			
<p>AMERICAN CONSULTING ENGINEERS COUNCIL (ACEC)</p> <p><u>Contact:</u></p> <p>Ms. Jane E. Sidebottom                      Assistant Director,                      International Programs ACEC                      1015 Fifteenth Street, N.W.                      Washington, DC 20005                      Tel: 202/347-7474</p>	<ul style="list-style-type: none"> <li>• ACEC Works Internationally Through its Affiliation with the Federation of International Consulting Engineers (FIDIC). ACEC is Interested in Establishing Ties with EE but has not yet Done So Due to Lack of Point of Contact</li> </ul>	<p>---</p>	<ul style="list-style-type: none"> <li>• Unclear Understanding of the Degree to Which the Private Sector Consulting Engineering Organization has Developed in EE</li> </ul>	<ul style="list-style-type: none"> <li>• Private Sector/Trade Association Development Program to Educate Benefits of Trade Associations to the Consulting Engineering Community in EE</li> </ul>

## SUMMARY OF RESPONSES BY THE U.S. ENGINEERING COMMUNITY

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<u>Organization</u>	<u>Eastern Europe Relationship</u>	<u>Status of Eastern Europe Programs</u>	<u>Obstacles</u>	<u>Future A.I.D. Programs for Consideration</u>
<p>EDISON ELECTRIC INSTITUTE (EEI)</p> <p><u>Contact:</u></p> <p>Mr. Fred Denny Vice President Engineering and Fossil Fuels, EEI 701 Pennsylvania Avenue, N.W. Washington, DC 20004-2696 Tel: 202/508-5225</p>	<ul style="list-style-type: none"> <li>• EEI is Coordinating with USEA to Assist in Establishing Utility Partnerships in EE</li> </ul>	---	<ul style="list-style-type: none"> <li>• To Be Determined</li> </ul>	<ul style="list-style-type: none"> <li>• To Be Determined</li> </ul>
<p>UNITED STATES ENERGY ASSOCIATION (USEA)</p> <p><u>Contact:</u></p> <p>Mr. Eric W. Haskins Program Manager USEA 1620 Eye Street N.W. Suite 210 Washington, DC 20006 Tel: 202/331-0415</p>	<ul style="list-style-type: none"> <li>• Cooperative Agreement with A.I.D. to Implement the "U.S.-EE Utility Partnership Program" (See Appendix I)</li> </ul>	---	<ul style="list-style-type: none"> <li>• Lack of Funding</li> </ul>	<ul style="list-style-type: none"> <li>• Expanded Commitment to Current A.I.D. Project</li> </ul>

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## SUMMARY OF RESPONSES BY THE U.S. ENGINEERING COMMUNITY

<u>Organization</u>	<u>Eastern Europe Relationship</u>	<u>Status of Eastern Europe Programs</u>	<u>Obstacles</u>	<u>Future A.I.D. Programs for Consideration</u>
<p>NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL (NERC)</p> <p><u>Contact:</u></p> <p>Mr. Ronald J. Niebo            Director, Technical Services            NERC            101 College Road East,            Princeton, NJ 08540-6601            Tel: 609/452-8060</p>	<ul style="list-style-type: none"> <li>Working with USEA to Provide Assistance to Electric Utilities in EE on the "U.S.-EE Utility Partnership Program"</li> </ul>	---	---	---
<p>AMERICAN ASSOCIATION OF ENGINEERING SOCIETIES (AAES)</p> <p><u>Contact:</u></p> <p>Mr. Harry M. Tollerton            Director, International Affairs            AAES            1111 Nineteenth Street, N.W.            Suite 608            Washington, DC 20036-3690            Tel: 202/296-2237</p>	<ul style="list-style-type: none"> <li>Agreement of Cooperation with the Hungarian Federation of Technical and Scientific Societies (MTESZ)</li> <li>Agreement of Cooperation with the Union of Scientific and Engineering Societies of the USSR</li> <li>Individual Member Organizations of AAES (IEEE, ASCE, ASME, ANS) have Existing Ties with EE.</li> </ul>	<ul style="list-style-type: none"> <li>1993 Joint Meeting in Budapest (See Appendix I) to Bring Together U.S. Engineers and EE Engineers. The Meeting Will Focus on the Following Areas:               <ul style="list-style-type: none"> <li>Quality in the Management of Engineering Projects</li> <li>Quality in Engineering Education Management and Curriculum</li> <li>Creating and Operating Professional Organizations in Eastern Europe</li> <li>Conducting Business in Eastern Europe</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Lack of Funding</li> </ul>	<ul style="list-style-type: none"> <li>Assist in Funding of 1993 Conference</li> </ul>

## SUMMARY OF RESPONSES BY THE U.S. ENGINEERING COMMUNITY

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<u>Organization</u>	<u>Eastern Europe Relationship</u>	<u>Status of Eastern Europe Programs</u>	<u>Obstacles</u>	<u>Future A.I.D. Programs for Consideration</u>
<p>AMERICAN ASSOCIATION OF ENGINEERING SOCIETIES (AAES) (Cont.)</p>		<ul style="list-style-type: none"> <li>- Currently Planned and Needed Technical Training, Conferences, and Seminars</li> <li>- Organizational Contacts and Available Professional and Technical Publications</li> </ul>		
<p>ELECTRIC POWER RESEARCH INSTITUTE (EPRI)</p> <p><u>Contact:</u></p> <p>Mr. Richard Balzhiser President and C.E.O. EPRI 3412 Hillview Avenue P.O. Box 10412 Palo Alto, CA 94303 Tel: 415/855-2141</p>	<ul style="list-style-type: none"> <li>* Declined to Comment on Questionnaire Due to EPRI Board Policy that Prohibits Work with U.S. Government</li> </ul>	---		---
<p>AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS</p> <p><u>Contact:</u></p> <p>Mr. Michael Lewis Director of Communications AIAA 370 L'Enfant Promenade S.W. Washington, DC 20024 Tel: 202/646-7405</p>	<ul style="list-style-type: none"> <li>• Established Relationship with Moscow Aviation Institute</li> </ul>	<ul style="list-style-type: none"> <li>• No Aggressive Marketing Effort to Czechoslovakia, Hungary, or Poland, but do Distribute Technical Journals</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Hard Currency in EE</li> </ul>	<ul style="list-style-type: none"> <li>• Need Effective Database System to Disseminate Information (no Direct Mail Source Lists)</li> </ul>

## SUMMARY OF RESPONSES BY THE U.S. ENGINEERING COMMUNITY

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<u>Organization</u>	<u>Eastern Europe Relationship</u>	<u>Status of Eastern Europe Programs</u>	<u>Obstacles</u>	<u>Future A.I.D. Programs for Consideration</u>
<p>AMERICAN PUBLIC POWER ASSOCIATION (APPA)</p> <p><u>Contact:</u></p> <p>Mr. Larry Hobart Executive Director-APPA 2301 M. St. N.W. Washington, DC 20037 Tel: 202/775-8300</p>	<ul style="list-style-type: none"> <li>• Currently not Working with EE. Only Recently Began to Address Working in EE, but has Strong Interest in Establishing Future Ties</li> </ul>	---	---	---
<p>AMERICAN SOCIETY FOR ENGINEERING EDUCATION (ASEE)</p> <p><u>Contact:</u></p> <p>Dr. Woodrow Leake Deputy Executive Director ASEE 11 DuPoint Circle NW Suite 200 Washington DC 20036 Tel: 202/293-7080</p>	<ul style="list-style-type: none"> <li>• Ongoing Interactions with Organizations</li> </ul>	<ul style="list-style-type: none"> <li>• Participate in East-West Congress on Engineering Education with Jagiellonian University in Cracow and Techburack University in Lodz, Poland</li> </ul>	<ul style="list-style-type: none"> <li>• Insufficient Opportunity to Establish Meaningful Relationships</li> </ul>	<ul style="list-style-type: none"> <li>• Fund Activities to Establish Meaningful Relationships</li> </ul>
<p>AMERICAN NUCLEAR SOCIETY</p> <p><u>Contact:</u></p> <p>Mr. David Rossin 24149 Hillview Dr. Los Altos, CA 94204 Tel: 415/948-7939</p>	<ul style="list-style-type: none"> <li>• Agreement of Cooperation with Czechoslovakia and Hungary Nuclear Society</li> </ul>	<ul style="list-style-type: none"> <li>• Joint Exchanges and Technical Meetings with Czechoslovakia, Hungary and Poland</li> <li>• Conference in Washington to be Held on "Safety of Eastern Europe Reactors" with U.S. Council on Energy Awareness and U.S. Energy Association</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Financing in EE to Carry Out Programs</li> <li>• Lack of Training in EE on Nuclear Safety</li> <li>• Lack of Regulatory Structure in EE</li> </ul>	<ul style="list-style-type: none"> <li>• Support Visits of EE Scientists for U.S. Training and Seminars. Example Being Upcoming Conference on EE Reactions. Lack of Funds Are Restricting Representatives from Bulgaria, Lithuania, and Czechoslovakia from Attending</li> </ul>

## SUMMARY OF RESPONSES BY THE U.S. ENGINEERING COMMUNITY

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<u>Organization</u>	<u>Eastern Europe Relationship</u>	<u>Status of Eastern Europe Programs</u>	<u>Obstacles</u>	<u>Future A.I.D. Programs for Consideration</u>
<p>NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY</p> <p><u>Contact:</u></p> <p>Dr. George Sinnott                      Director for International Affairs                      National Institute of Standards and Technology                      NIST Administrative Building                      Room A603                      Gaithersburg, MA 20899                      Tel: 301/975-3089</p>	<ul style="list-style-type: none"> <li>• Existing Standards Organizations in Hungary, Poland, Czechoslovakia and the Former Soviet Union (see Appendix I)</li> <li>• Cooperates with Research Laboratories Active in Metrology (Measurement Sciences and Conformity Assessment) in EE and the Newly Independent States of the Former Soviet Union (NIS)</li> </ul>	<ul style="list-style-type: none"> <li>• Exchange of Technical Publications</li> <li>• Exchange of Personnel</li> <li>• Joint Research Projects</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Funds to Acquire Private Sector Expertise As Well As Travel-Related Costs</li> <li>• Lack of Development of the Technical Infrastructure with EE Institutions</li> </ul>	<ul style="list-style-type: none"> <li>• Support Exchange Programs of Personnel and Technical Publications</li> <li>• Support Joint Research Projects and Joint Technical Workshops</li> <li>• Support Development of Technical Infrastructure in Standards and Metrology in EE and NIS</li> </ul>
<p>NATIONAL ACADEMY OF SCIENCES</p> <p><u>Contact:</u></p> <p>Mr. Glenn Schwitzer                      Director                      Office for Central Europe and Eurasia                      National Academy of Sciences                      National Research Council                      2101 Constitution Avenue                      Washington, DC 20418                      Tel: 202/334-2644</p>	<ul style="list-style-type: none"> <li>• Current Linkages with EE Organizations and Former Soviet Union</li> </ul>	<ul style="list-style-type: none"> <li>• Exchange Workshops of Scientists</li> <li>• Policy-Oriented Workshops</li> <li>• Summer Training Programs of Postdoctoral Scientists</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Funding</li> </ul>	<ul style="list-style-type: none"> <li>• Support Policy-Oriented Bilateral Workshops</li> </ul>

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## CHAPTER III - EASTERN EUROPEAN ENGINEERING COMMUNITY ACTIVITIES

### Introduction and Procedure

A focused and specific questionnaire (Exhibit III-1) was sent to contacts established in Eastern Europe. These contacts were identified by U.S. engineering societies as well as personal contacts established at the ACEC meeting "Changes in Eastern Europe Engineering Perspectives" held in Orlando, Florida in October 1991. The questionnaire was sent prior to the January 4-25, 1992 meetings in Czechoslovakia, Hungary, and Poland to set the stage and serve as the discussion forum. The purpose of this trip was to collect data, establish needs, and seek advice in establishing linkages with the U.S. engineering community.

The following organizations received the questionnaire and were contacted in Czechoslovakia, Hungary, and Poland during the three-week trip. This list does not include a number of individual contacts related to preliminary arrangements for major meetings or gathering country specifics. Tables III-1, III-2, and III-3 are summaries of the responses received in Hungary, Poland, and Czechoslovakia. Complete addresses of the contacts are listed in Exhibit III-2. The questionnaires as received are found in Appendix II.

#### HUNGARY

Hungarian Ministry for Transport, Communication and Water Management	Mérnöki Kamara Chamber of Engineers
GRG Consultants Ltd.	Teta Kiszövetkezet Consulting Engineering
Momfort Hungarian Optical Works	VOSZ International Entrepreneurs Trade Center Ltd.
Institute of Enzymology Hungarian Academy of Sciences	A.W.E. Alternative Water-Energy Consulting, Ltd.
Department of Atomic Physics Eötvös Loránd University	Scientific Society for Building
Ministry of Industry and Trade	State Building Trade Co. No. 31 Bygging-Ungern 31.AB

**HUNGARY (cont'd)**

Asea Brown Boveri (ABB) Lang Ltd.

Hungarian Scientific Society  
for Transport

EGI-Contracting/Engineering

Vegyterv  
Hungarian Chemical Industries

Hungarian Energy Association

MTESZ  
Federation of Technical and Scientific  
Societies

Institute of Thermal Energy Systems  
Engineering  
Technical University of Budapest

Swietelsky Utvasut

National Association of Entrepreneurs

Department of International Relations,  
National Committee for Technological  
Development

Hungarian Electrotechnical Association

AMI Business Center

Transelektro Trade Co. Ltd.

Innovo Technik

Ä4GM Affiliated Company for Research  
and Development in Machine Ind.

Magyar Villamos Művek Tröszt

Scientific Society of Mechanical Engineers

Department of Environmental Technology,  
Ministry for Environment and Regional  
Policy

## CZECHOSLOVAKIA

Hydroprojekt Consulting Engineers	Priemstav
Český Svaz Vědeckotechnických Společností (Czech Assoc. of Scientific and Technical Societies)	The Building Industries Entrepreneurs Federation of Slovakia
Česká Strojnická Společnost (Czech Mechanical Engineering Society)	Stavby silnic a železnic
Škoda Praha a.s.	Vodní Stavby
The Institute of Chemical Technology	Inžinierske Stavby, š. p. Košice Marketing
Czech Building Society	Association of Building Entrepreneurs in the Czech Republic
Committee of Energetics	ZSPS - Zväz stavebných podnikateľov Slovenska
Slovak Mechanical Engineering Society	
Czech Institution of Structural and Civil Engineers	
Útvar Dopravného Inžinierstva	
Institute of Mineral Raw Materials	
Ministry of the Environment of the Czech Republic	
Federal Energy Agency, Federal Ministry of Economy	
Pragoprojekt, Design and Consulting Inc. for Highway and Bridges	

## POLAND

Ministerstwo Ochrony Środowiska,  
Zasobów Naturalnych I Leśnictwa  
(Ministry of Environmental  
Protection, Natural Resources  
and Forestry)

Power Research Institute

Instytut Energetyki  
Institute of Power Engineering

Polish Power Grid Company

Elektrim S.A.

Towarzystwo Konsultantów Polskich, TKP

Gornicwa I Energetyki  
(Ministry of Mining and Energy)

Elektrownia Chorzów

Zakład Remontów I Konserwacji Urządzeń  
Komunalnych I Ochrony Środowiska  
(Kar-Tech)

Energoprojekt

Doradztwo I Pośrednictwo

Stowarzyszenie Elektryków Polskich (SEP)

Cosmopoli Consultants

Domat Ltd.

Polish Academy of Sciences/Institute of  
Fundamental Technological Research

Budownictwo Energetyczne  
Energobudowa

Ministry of Privatization Information Centre

Polish Society of Mechanical Engineers and  
Technicians

Ministry of Industry and Trade

**QUESTIONNAIRE FOR THE EASTERN EUROPEAN ENGINEERING COMMUNITY**

1. Please describe your organization, including official name, address, and contact person, number of members, makeup of the organization, organization purposes and goals. (An organization chart would be helpful.)
2. Based on recent changes in Eastern Europe, have any of the above factors changed, or do you anticipate them to change?
3. Does your organization currently have a working relationship with a U.S. entity?
4. What is the status of your program with the U.S.?
5. If the answer to No. 3 is no, would you like to develop future programs with U.S. entities?
6. What future programs would you like to establish with U.S. entities?
7. Please list current obstacles that would hinder the development of the above programs.
8. Please list in order of importance the five major energy and infrastructure problems facing your country.
9. Please list the major obstacles preventing your country from addressing these problems.
10. Please provide a list of specific energy and infrastructure projects that could be of interest to U.S. entities.

**SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY  
Hungary**

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
ÉPÍTÉSTUDOMÁNYI EGYESÜLET THE SCIENTIFIC SOCIETY FOR BUILDING	Possible Engineering Exchange Agreement: ASCE	<ul style="list-style-type: none"> <li>• Exchange of Engineers to Foster Understanding of Hungarian Markets in U.S. and Study U.S. Methodologies by Hungarian Engineers</li> <li>• U.S. Investment in JV Agreements</li> </ul>	<ul style="list-style-type: none"> <li>• Internal Structural Change of the Society</li> <li>• Lack of Information on U.S. Potential Investors</li> <li>• Financial Limitations on Information Retrieval, Courses, Conferences, Lectures</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Modern, Environmentally Safe Energy Resources</li> <li>• Inadequate Public Roads, Railway Networks</li> <li>• Poor Telecommunication Telephone Network, Slow Process to Computerization</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of Soviet Market and Supplier of Energy Products</li> <li>• Time, Due to Reorganization with Limited Financial Resources</li> <li>• Capital Efficiency with Lack of Private Enterprises</li> <li>• Constant Increase in Price of Energy and Building Materials</li> <li>• Uncoordinated Regional Activities</li> </ul>	<ul style="list-style-type: none"> <li>• Road/Railway Network Development</li> <li>• Water and Sewerage Lines Development with Independent Economic Units</li> <li>• Construction of Atomic Reactors</li> <li>• Development of Telecommunication System</li> <li>• Transformation of Financial System</li> </ul>
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## SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY Hungary

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
EPITÉSTUDOMÁNYI EGYESÜLET (Cont.)					<ul style="list-style-type: none"> <li>Inconsistent Entrepreneurial Policy</li> </ul>	<ul style="list-style-type: none"> <li>Purchase/Transfer State-Owned Enterprises (on Privatization List of State Property Agency)</li> </ul>
HUNGARIAN CHAMBER OF INNOVATION (Promotes Joint Research)	None Currently. Would Like Future U.S. Relationship	<ul style="list-style-type: none"> <li>Exchange Information</li> <li>Organization of Courses and Symposia</li> <li>Contracts between Member Organizations and U.S. Organizations</li> <li>U.S. Contracted Research</li> </ul>	<ul style="list-style-type: none"> <li>Lack of Contacts and Information</li> <li>Lack of International Financing Cooperation</li> </ul>	<ul style="list-style-type: none"> <li>Telecommunications</li> <li>Professional Education</li> <li>Lack of International Contacts</li> </ul>	<ul style="list-style-type: none"> <li>Lack of Know-how and Special Knowledge</li> <li>Lack of Funds to Support R&amp;D</li> <li>Relative Isolation</li> </ul>	<ul style="list-style-type: none"> <li>Participate in Joint R&amp;D Programs</li> <li>Establish Databases/Information Networks to Facilitate U.S. Investment</li> <li>Establish International Technology Center to Promote Cooperation Between U.S. and Hungary</li> </ul>

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## SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY Hungary

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
HUNGARIAN CHAMBER OF INNOVATION (Cont.)		<ul style="list-style-type: none"> <li>Organize Joint R&amp;D Programs</li> </ul>				
A.W.E. CONSULTING LTD. (ALTERNATIVE WATER-ENERGY LIMITED LIABILITY COMPANY) <i>(Consulting Engineering Services in Energy Development, Water Management, Environmental Protection)</i>	None Currently. Would Like Future U.S. Ties	<ul style="list-style-type: none"> <li>Various Cooperation Agreements with U.S.</li> <li>Study Overall Modelling Program of Country's Energy System</li> <li>Organization of Consulting Services, General Contract, JVs, Financing (Training in the Business Side of Engineering)</li> </ul>	<ul style="list-style-type: none"> <li>Lack of Capital</li> <li>Unable to Change Energy Industry Structure</li> <li>Incomplete Legislation</li> </ul>	<ul style="list-style-type: none"> <li>Loss of Energy Supply from Transmission Connection to Soviets</li> <li>Inflexibility of Overall Energy System</li> <li>Restructuring of Energy Production to Market</li> </ul>	<ul style="list-style-type: none"> <li>Lack of Capital for Development (Interest Rates on Bank Loans Soaring)</li> <li>Lack of Individual Company Decision Making</li> <li>No Guarantee to Return of Foreign Capital</li> </ul>	<ul style="list-style-type: none"> <li>Participate in Preparing a more Flexible Energy System</li> <li>Reconstruction of Operating Plants, Barrages, Pumping Stations</li> <li>Environmental Projects Resulting from Energy Industry</li> </ul>

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## SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY Hungary

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
A.W.E. CONSULTING LTD. (ALTERNATIVE WATER-ENERGY LIMITED LIABILITY COMPANY) (Cont.)			<ul style="list-style-type: none"> <li>Lack of Investment Sources</li> </ul>	<ul style="list-style-type: none"> <li>State Limitations using Local Energy Sources</li> <li>Treatment of Environmental Problems</li> </ul>		
SCIENTIFIC SOCIETY OF MECHANICAL ENGINEERING	Working Relationship: ASME	<ul style="list-style-type: none"> <li>Increase Future Participation w/U.S. Organizations</li> <li>Lack of Understanding of ASME Standards</li> <li>Lack of Technical Literature</li> <li>Lack of Information on Direction of Development/Demands of U.S. Markets</li> </ul>	---	<ul style="list-style-type: none"> <li>Energy-Intensive Production Infrastructure</li> <li>Poor Drinking Water Supply in Rural Areas, Poor Drainage</li> <li>Obsolete and High-Energy Consumption of Plants and Lack of Tech. for Env. Protection, Education, and Training</li> <li>Obsolescence/ Pollution of Env. from Power Plants, Treatment of Nuclear Waste, and Biopollution</li> </ul>	<ul style="list-style-type: none"> <li>Lack of Capital</li> <li>Lack of National Investment</li> <li>Lack of Technical Know-how</li> </ul>	---

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**SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY  
Hungary**

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
SCIENTIFIC SOCIETY OF MECHANICAL ENGINEERING (Cont.)				<ul style="list-style-type: none"> <li>• Old Machinery and Vehicles</li> </ul>		
ERŐTERV POWER STATION AND NETWORK ENGINEERING COMPANY	---	---	---	---	---	<ul style="list-style-type: none"> <li>• Study In-Country Resources for Repowering of Existing Power Plants over 40 MW (see Appendix II)</li> <li>• Conduct Feasibility Study for New Power Plants (1,200-1,500 MW) Using Existing Lignite Resources (see Appendix II)</li> <li>• Upgrading of Cogeneration Municipal Heating Systems (see Appendix II)</li> </ul>

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**SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY  
Hungary**

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
ERŐTERV POWER STATION AND NET- WORK ENGINEERING COMPANY (Cont.)						<ul style="list-style-type: none"> <li>• Installation of Desulphurizing Removal Equipment (see Appendix II)</li> <li>• Updating Process Control Systems of Power Plants (see Appendix II)</li> <li>• Study Long-Range Generation/Transmission Strategy (see Appendix II)</li> <li>• Efficient Upgrade of Transmission and Distribution System (see Appendix II)</li> <li>• Study Possible Repositories for Hazardous/-Radioactive Waste (see Appendix II)</li> </ul>

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## SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY Hungary

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
FEDERAL CHAMBER OF TECHNICAL AND SCIENTIFIC SOCIETIES	Cooperative Agreement: AAAS "Ecology, Economy, Technology, and the Changing Eastern Europe, Conference and Exhibition, Spring 1993" (see Appendix II)	<ul style="list-style-type: none"> <li>Continued Conference/Seminar Programs</li> <li>Increase Transfer of Technical Publications</li> </ul>	<ul style="list-style-type: none"> <li>Lack of Financing for Continued Conferences</li> <li>Lack of Financing for Technical and Scientific Newspapers</li> </ul>	---	---	---

**SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY  
Czechoslovakia**

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
SLOVAK SOCIETY OF CIVIL ENGINEERS	Agreement of Cooperation: ASCE	<ul style="list-style-type: none"> <li>Expand Cooperative Agreements to Other Organizations</li> </ul>	<ul style="list-style-type: none"> <li>Lack of Information on U.S. Contracts</li> <li>Capital Problems</li> <li>No Coordination Center</li> </ul>	<ul style="list-style-type: none"> <li>Energy Production Emphasis on Coal</li> <li>Env. Problems Burning Coal</li> <li>Lack of Transportation and Highway Construction</li> <li>Poor Telecommunications</li> </ul>	<ul style="list-style-type: none"> <li>Lack of Capital</li> <li>Poor Information</li> <li>Need Consulting Services</li> <li>Outdated Technology</li> <li>Need for International Training</li> </ul>	<ul style="list-style-type: none"> <li>Restructure Coal Power Plant</li> <li>Highway Development</li> <li>Telecommunications Programs</li> </ul>
CZECH INSTITUTION OF STRUCTURAL & CIVIL ENGINEERS	Agreement of Cooperation: ASCE	<ul style="list-style-type: none"> <li>Expand Cooperative Agreements</li> </ul>	<ul style="list-style-type: none"> <li>Current Economic Situation</li> </ul>	<ul style="list-style-type: none"> <li>Reduce Inefficient Energy Consumption</li> </ul>	<ul style="list-style-type: none"> <li>Low Industry Productivity</li> </ul>	<ul style="list-style-type: none"> <li>See Ranked Problems</li> </ul>
	Possible Agreement of Cooperation: AAES	<ul style="list-style-type: none"> <li>Direct Relationship w/Consulting Contracting Firms</li> </ul>	<ul style="list-style-type: none"> <li>Move from Strictly Technical Focus to Practical/Economic Focus</li> </ul>	<ul style="list-style-type: none"> <li>Energy Production</li> <li>Air Pollution</li> <li>Railway Network</li> <li>Land Decontamination</li> </ul>	<ul style="list-style-type: none"> <li>Insufficient Investment Capital</li> <li>Collapse of EE Market</li> </ul>	

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**SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY  
Czechoslovakia**

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
ČESKÁ STAVEBNÍ SPOLEČNOST CZECH BUILDING SOCIETY	None Currently. Would Like Future Ties	<ul style="list-style-type: none"> <li>• Exchange Programs in Building Technology, Management, Finance, Building Processes</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Resources and Capital to Host International Conferences</li> <li>• Lack of Funds to Participate Abroad</li> <li>• Lack of Capital to Purchase Foreign Publications for Members</li> </ul>	<ul style="list-style-type: none"> <li>• Old Technological Equipment in Production Units</li> <li>• Little Internal Investment/Financial Restrictions</li> <li>• Low Level of Production Mgmt.</li> <li>• Poor Knowledge of Foreign Languages</li> <li>• High Energy Consumption</li> </ul>	---	---
SDIC-ASSOCIATION FOR INVESTMENT SUPPLIERS <i>(Society of manufacturers and suppliers of machinery and equipment)</i>	None Currently. Would Like Future Ties	<ul style="list-style-type: none"> <li>• Cooperative Investment Projects in Third World Countries</li> </ul>	<ul style="list-style-type: none"> <li>• Differences in Technical Standards</li> <li>• Members Lack Exposure/Contact with Developing Countries</li> </ul>	<ul style="list-style-type: none"> <li>• Financial</li> <li>• High Energy Consumption in Industry</li> </ul>	<ul style="list-style-type: none"> <li>• Financial Assistance to Energy Investors</li> <li>• Change of Industry Structure</li> </ul>	<ul style="list-style-type: none"> <li>• Specific Projects have been Identified by Federal Ministry of the Economy in Area of Energy</li> </ul>

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## SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY Czechoslovakia

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
INSTITUTE OF MINERAL RAW MATERIALS <i>(Applied research for mineral raw materials treatment and processing)</i>	None Currently. Would Like Future Ties	<ul style="list-style-type: none"> <li>• Research in Desulfurization and Biomass</li> </ul>	<ul style="list-style-type: none"> <li>• Administration Problems w/International Cooperative Agreements</li> <li>• Communication Problems w/International Cooperative Agreements</li> </ul>	<ul style="list-style-type: none"> <li>• State of Environment, Air/Water Quality, Urban and Industrial Wastes</li> <li>• Electric Energy Production by Burning Brown Coal</li> <li>• Poor Level of Nuclear Energy Technology</li> <li>• No Disposal Facilities for Radioactive Waste</li> <li>• Lack of Energy Efficiency in both Production and Utilization</li> </ul>	<ul style="list-style-type: none"> <li>• Economy</li> <li>• Emphasis on Internal Political Problems by Government</li> <li>• Lack of Complete Legislation</li> <li>• Lack of Foreign Investment (Foreign Investment in Market Penetration Only)</li> </ul>	<ul style="list-style-type: none"> <li>• Dry Gravitic Desulfurization of Brown Coal</li> <li>• Super Conducting Magnetic Separation</li> <li>• Biomass Utilization for Energy Cogeneration (For Specific Details see Appendix II)</li> </ul>
INŽINIERSKE STAVBY <i>(Construction company)</i>	None Currently. Would Like Future Ties	<ul style="list-style-type: none"> <li>• Cooperative Agreements with Various Building Companies</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Financial Resources</li> </ul>	<ul style="list-style-type: none"> <li>• No Relationship Between State Price Policy for Fuels and Cost of Energy</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Financial Resources</li> </ul>	<ul style="list-style-type: none"> <li>• Road Network</li> </ul>

## SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY Czechoslovakia

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<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
INŽINIERSKE STAVBY (Cont.)		<ul style="list-style-type: none"> <li>• Cooperative Agreements in Building Highways</li>   <li>• Modernization of Construction Technologies to Preserve Environment and Save Energy</li> </ul>	<ul style="list-style-type: none"> <li>• Unfavorable Exchange Rates</li> </ul>	<ul style="list-style-type: none"> <li>• Dependency on Coal</li>   <li>• Reconstruction of Heat Supply Networks by Lower Power Loss from Building Industry</li> </ul>	<ul style="list-style-type: none"> <li>• Building-Related Technology Problems:               <ul style="list-style-type: none"> <li>- Heat Distributors</li> <li>- Waste water Treatment Plants</li> <li>- Treatment of Industrial Waste</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Railway Network</li>   <li>• Heating Supply Reconstruction</li> <li>• Waste water Treatment Plants</li> <li>• Treatment of Industrial Waste</li> </ul>
PRIEMSTAV (Construction company)	None Currently. Would Like Future Ties	---	<ul style="list-style-type: none"> <li>• Obsolete Equipment</li> <li>• No Capital</li> </ul>	<ul style="list-style-type: none"> <li>• Obsolete Equip. and Process</li> <li>• Poor Technology and Labor Disciplines</li>   <li>• Control/Regulation Problems</li> <li>• Heat Escape in Structures</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Capital Investment</li> <li>• Changes of Proprietary Relations</li> </ul>	<ul style="list-style-type: none"> <li>• Thermal Protection of Buildings</li> <li>• Energy Reduction in Construction Appliances</li> </ul>

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## SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY Czechoslovakia

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
PRJEMSTAV (Cont.)				<ul style="list-style-type: none"> <li>• High Energy Demand of Transport</li> </ul>		
SKODA PRAHA <i>(Power plant/power systems, design through to construction services)</i>	<ul style="list-style-type: none"> <li>• Contacts with Westinghouse for Clean Coal Combustion Technology (Gasification and Combined Cycle)</li> <li>• Future Cooperation in Nuclear Field Possible unless Excluded by Siemens</li> <li>• Contacts with Shell to Acquire ICGCC Technology</li> <li>• Initial Contact with GE for Purchase of Desulphurization License (To Be Determined)</li> </ul>	<ul style="list-style-type: none"> <li>• Desulphurization and De-NO<sub>x</sub> of Existing Power Plants</li> <li>• Coal Gasification Process</li> <li>• Env. Programs: Communal Waste Incineration Plants, and Toxic Waste Incineration Plants</li> </ul>	<ul style="list-style-type: none"> <li>• Current Joint Venture Agreement with Siemens May Preclude future JVs with U.S.</li> <li>- Top Management/Govt. Controversial Approaches to Czch. Enterprises</li> </ul>	<ul style="list-style-type: none"> <li>• High Primary Power Consumption Per GNP</li> <li>• Environmental Problems from Surface Mining and Power Generation Using Equipment with Low Efficiency/High Pollution</li> <li>• Need to Retrofit Existing Plants and Build New Plants</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Gov. Focus for Future Power Generation</li> <li>• Lack of Financing</li> <li>• Lack of Decision Making Based on Executed Studies</li> </ul>	<ul style="list-style-type: none"> <li>• Env. Program for N.W. Bohemia (Study Proposal Registered Under Code F1.1 at Federal Ministry of the Environment)</li> <li>• Clean Coal-Based Power Generation (250-500 MW)</li> <li>• Control, Regulation, and Warning system for Temelin Nuclear Power Plant - Units 1 and 2</li> </ul>

**SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY  
Czechoslovakia**

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<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
SKODA PRAHA (Cont.)		<ul style="list-style-type: none"> <li>• Lower Energy Consumption Process Technology</li> <li>• Combined Heat and Power Generation to Increase Efficiency and Reduce Pollution</li> </ul>	<ul style="list-style-type: none"> <li>• Preference to German Capital at Certain Governmental Levels</li> <li>• Personal Preferences Ruling Over Objective Benefits to Country</li> <li>• Underdeveloped Market</li> <li>• Lack of Legislative Laws</li> <li>• Bureaucracy at Various Administrative Levels</li> </ul>	<ul style="list-style-type: none"> <li>• Nuclear Safety</li> <li>• Power Generation Project: Gabčíkovo-Nagymaros</li> </ul>	<ul style="list-style-type: none"> <li>• Mgmt. by Old Inefficient Structures combined with Incomplete Legislation Together with Undefined Competencies</li> </ul>	<ul style="list-style-type: none"> <li>• Desulphurization and De-No<sub>x</sub> at Selected Power Plants (100 to 200 MW)</li> <li>• Develop Safe Nuclear Units (600- to 1,000-MW Ratings)</li> </ul>

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## SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY Czechoslovakia

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
ČESKÉ PLYNÁRENSKÉ POD- NIKY (Gas Company)	<ul style="list-style-type: none"> <li>• None Currently. Would Like To Develop Future Ties</li> </ul>	<ul style="list-style-type: none"> <li>• Natural Gas - Purchase, Sales, Storage, Distribution, Usage</li> </ul>	<ul style="list-style-type: none"> <li>• Excessive Distance</li> </ul>	<ul style="list-style-type: none"> <li>• Privatization and Dissent on an Energy Policy</li> </ul>	<ul style="list-style-type: none"> <li>• Interpolitical and Economic Problems</li> </ul>	<ul style="list-style-type: none"> <li>• Diversification of Energy Sources</li> <li>• Utilization of Natural Gas</li> <li>• Cogeneration</li> </ul>
JIHOMORAVSKÉ LIGNITOVÉ DOLY, STÁTNÍ PODNIK HODONÍN SOUTH MORAVIAN LIGNITE MINES, STATE ENTERPRISE, HODONÍN	<ul style="list-style-type: none"> <li>• None Currently. Would Like Future Ties On A Commercial Status</li> </ul>	<ul style="list-style-type: none"> <li>• Future Working Relationship in Preparation of Coal For Customers (Ecologization of Final Product)</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Financial Resources</li> </ul>	<ul style="list-style-type: none"> <li>• Use of Technology</li> <li>• Lack of Environmentally Safe Fuels</li> </ul>	<ul style="list-style-type: none"> <li>• Legislation of New Rules and Regulations</li> </ul>	<ul style="list-style-type: none"> <li>• Preparation of Combustion Chambers</li> <li>• Improving Composition of Fuels</li> </ul>

## SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY Czechoslovakia



<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
OSTRAVSKO-KARVINSKÉ DOLY (Hard coal, coking coal, and coke production)	<ul style="list-style-type: none"> <li>• Cooperation with U.S. Partners on Limited Basis</li> </ul>	<ul style="list-style-type: none"> <li>• Negotiations with McKenzie and Cen-Gaz Companies from U.S. for Consultation on Coal Seam Methane Recovery from Surface</li> </ul>	---	<ul style="list-style-type: none"> <li>• Inefficient Operating Plants</li> <li>• Labor Productivity</li> <li>• Price Liberalization</li> </ul>	---	<ul style="list-style-type: none"> <li>• Seam Methane Recovery</li> <li>• Utilization of Advanced Techniques in Production, Heat Production, Distribution, and Utilization</li> <li>• Application of Computers, Including Software, for Control of Energy Operational Units</li> <li>• Heat and Electric Energy Savings</li> <li>• Replacement of Supply System of Compressed Air for Underground Mines</li> <li>• Labor Organization in Area of Machinery and Equipment Repairs and Maintenance</li> </ul>

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**SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY  
Czechoslovakia**

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
OSTRAVSKO-KARVINSKÉ (Cont.)						<ul style="list-style-type: none"> <li>• Renovation of Small Boiler Plants for Solid Fuels with Emphasis on Environmental Operation</li> </ul>

Table III - 3

**SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY  
Poland**

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
STOWARZYSZENIE INSYNIEROW I TECH- NIKOW MECHANI- KOW POLSKICH, POLISH SOCIETY OF MECHANICAL ENGIN- EERS AND TECHNI- CIANS	Cooperation Agree- ment: ASME  Cooperation Agree- ment: American Welding Society	<ul style="list-style-type: none"> <li>• Specific Program Entitled "Engineer's Work" (See Appendix II)</li> <li>• Specific Program Entitled "Engineer - Professional Industrial and Commercial Intermediator" (See Appendix II)</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Domestic and International Markets</li> <li>• Lack of Capital for Modernization of Manufacturing Process</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Access to Markets</li> <li>• Lack of Capital for Modernization of Manufacturing</li> </ul>	<ul style="list-style-type: none"> <li>• Blockade of Markets</li> </ul>	---
STOWARZYSZENIE ELEKTRYKÓW POLS- KICH (SEP), ASSOCIATION OF POLISH ELECTRICAL ENGINEERS <i>(Promotion of electrical science, engineering, and technology)</i>	Cooperative Agree- ment: IEEE  Polish Branch of IEEE  Cooperative Agree- ment: Optoelectronic Engineers Association SPIE	<ul style="list-style-type: none"> <li>• Training Program for Polish Engineers to Learn US Approach to Engineering, US Work Org., US Technology Covering: <ul style="list-style-type: none"> <li>- English Technical Terminology</li> <li>- Power System Operation, Maintenance, and Development</li> </ul> </li> </ul>	---	---	---	---

**SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY  
Poland**

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
ASSOCIATION OF POLISH ELECTRICAL ENGINEERS (Cont.)		<ul style="list-style-type: none"> <li>- Economical Principles of Power Generation/Supply Under Free Market Conditions</li> <li>- Training of Polish Engineers in U.S. Power Companies</li> </ul> <p>(For Details See Appendix II)</p>				
POLISH ENERGY COMMITTEE (PEC) OF THE POLISH FEDERATION OF ENGINEERING ASSOCIATIONS	None Currently. Would Like Future Ties	<ul style="list-style-type: none"> <li>• Methodology of Energy Pricing</li> <li>• Methodology of Energy Investment Costing</li> <li>• Creation of Energy Efficiency Policy in Scale with Country/Region</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Experience with Programs Mentioned in Previous Column</li> <li>• Changing Economic Conditions</li> <li>• Unclear Goals for Future Social and Economic Development</li> </ul>	<ul style="list-style-type: none"> <li>• Energy Policy/Decision Making at State Level</li> <li>• Methodology of Energy Pricing and Energy Investment Costing</li> <li>• Environmentally Safe Energy Technology Development (Clean Coal)</li> </ul>	<ul style="list-style-type: none"> <li>• Unclear National Energy Policy</li> <li>• Lack of Coherent Plan for Large Energy Producers</li> <li>• No State Energy Research Program</li> </ul>	<ul style="list-style-type: none"> <li>• Clean Coal Technologies</li> <li>• Education for Employers in Energy Planning, Costing, Mgmt., Energy Marketing, Energy Audits, Energy Utilization in Public Schools and Society at Large</li> </ul>

## SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY Poland

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
POLISH ENERGY COMMITTEE (PEC) OF THE POLISH FEDERATION OF ENGINEERING ASSOCIATIONS (Cont.)	---	<ul style="list-style-type: none"> <li>• Environmentally Safe Energy Technologies (Clean Coal Technologies)</li> <li>• Energy Research and Development</li> <li>• Organization of Regional Energy Utilities</li> <li>• Energy Efficiency Education (Scholar and Society)</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Governmental Central Energy Policy</li> </ul>	<ul style="list-style-type: none"> <li>• Organization, Targets, Rights of Regional Utilities</li> <li>• Energy Efficiency Education</li> <li>• Lack of Financing for Energy Research</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of National Energy Policy</li> </ul>	<ul style="list-style-type: none"> <li>• Elaboration of Baseline Environmental Policy for Energy Systems and Large Industrial Consumers</li> <li>• Rules of Urban/Regional Energy Mgmt. Including the Institution of Energy Utilities</li> </ul>

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## SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY Poland

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
INSTYTUT ENERGETYKI Institute of Power Engineering	---	---	---	<ul style="list-style-type: none"> <li>• Precombustion Coal Cleaning or Flue Gas Desulphurization in Fired Utility Power Plants with 200-MW, 360-MW and 500-MW units</li> <li>• Repowering Several Coal-Fired Power Plants that are too old to be Retrofitted but are located in an area of increasing demand.</li> </ul>	---	<ul style="list-style-type: none"> <li>• Assistance in Repowering Study Consisting of Investigating the Technical Feasibility and Cost of Clean Power Generation Technologies From Coal. Precombustion Coal Cleaning is an Important Option.</li> <li>• Equipping Modern Pulverized Coal-Fired Boilers with Flue Gas Cleanup Devices.</li> <li>• Assistance to Investigate:               <ul style="list-style-type: none"> <li>- Atmospheric fluidized bed combustors (AFBC)</li> <li>- Pressurized fluidized bed combustors (PFBC)</li> <li>- Integrated gasification combined cycle (IGCC)</li> </ul> </li> </ul>

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## SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY Poland

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
<p>ENERGOPROJEKT - CONSULTING ENGINEERS POWER ENGINEERING STUDY AND DESIGN COMPANY <i>(Power industry related to generation, transmission, and distribution of electric and heat energy)</i></p>	<p>None Currently. Would Like Future Ties</p> <p>Past Relationships:</p> <ul style="list-style-type: none"> <li>N. American Energy Co. (Prefeasibility Study of 3 Power Plants)</li> <li>TRW (Research Applying New Kind of Burner to Coal Combustion in Power Boilers)</li> <li>Possible Future Venture w/Westinghouse (7 Power Plants, 200 MW)</li> </ul>	<ul style="list-style-type: none"> <li>Cooperative Agreements w/U.S. on Power Investments (Energoprojekt has Documented Most Power Systems in Poland and Would Like to Study Individual Projects and Complete Energy System with U.S. Counterparts.)</li> </ul>	<ul style="list-style-type: none"> <li>Lack of Financial Resources Deters Ventures Taking into Consideration Price of Energy and Forecasted Growth</li> </ul>	<ul style="list-style-type: none"> <li>Lack of Capital</li> <li>Lack of a Single Organization Dealing with Power Industry</li> <li>Lack of Industry and Public Opinion for Future Energy Development due to Current Energy Surplus vs. Industrial Demand</li> <li>Extensive Operating Time of Existing Power Plants</li> </ul>	<ul style="list-style-type: none"> <li>Current Government Administration (Individual Organizations Have Little/No Decision Making Authority)</li> </ul>	<ul style="list-style-type: none"> <li>Modernization of existing power plants (Brown and Hard Coal Fired)</li> <li>Extension of Existing Combined Heat and Power Plants and New Plants</li> </ul>

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**SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY  
Poland**

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
ENERGOPROJEKT - CONSULTING ENGINEERS POWER ENGINEERING STUDY AND DESIGN COMPANY (Cont.)				<ul style="list-style-type: none"> <li>• Current Fuel Gas Cleaning Installations Do Not Meet Air Protection Rules.</li> <li>• Poor Utilization of Combined Energy Production (Combined Heat and Power Plants)</li> </ul>		
DOMAT COMPANY LTD. (Energy Consulting)	None Currently. Would Like Future Ties	<ul style="list-style-type: none"> <li>• Joint Ventures with U.S. Companies to Study Energy</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Knowledge and Interest of U.S. Firms</li> <li>• Lack of Financing, High Interest Rates for Credit, Unstable Economy</li> <li>• Low Level of Understanding of Energy Problems in Industry</li> </ul>	<ul style="list-style-type: none"> <li>• Search for Natural Gas and Oil Including Future Production</li> <li>• Energy Conservation (Housing Insulation)</li> <li>• Modernization of Coal Industry (Includes Coal Cleaning)</li> </ul>	<ul style="list-style-type: none"> <li>• Financial Constraints</li> <li>• Lack of Understanding of Energy Problems</li> </ul>	<ul style="list-style-type: none"> <li>• Desulphurization for Large Power Stations</li> <li>• Desulphurization of Coal-Cleaning Plants</li> </ul>

## SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY Poland

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
DOMAT COMPANY LTD. (Cont.)				<ul style="list-style-type: none"> <li>• Modernization of Heating Systems (Large Towns Currently Use Power Stations and Heat Pipeline Networks)</li> <li>• Modernization of Electricity Transmission Lines and Grid</li> </ul>		
POLSKIE SIECI ELEKTROENERGETYCZNE S.A. POLISH POWER GRID COMPANCY (PPGC) <i>(Joint stock company owned by Polish Treasury, represented by Ministry of Industry)</i>	<ul style="list-style-type: none"> <li>• Working Relationships w/AID (Includes Partnership Program, Seminars, Consulting)</li> <li>• Joint-Stock Companies with U.S. Capital: Destec Energy Company</li> </ul>	<ul style="list-style-type: none"> <li>• Future Relationship w/AID</li> <li>• Consulting Services with U.S. Firms</li> <li>• U.S. Suppliers and the Impact of International Tendering Rules</li> </ul>	<ul style="list-style-type: none"> <li>• Language Barriers</li> <li>• Knowledge of the Market Economy</li> </ul>	<ul style="list-style-type: none"> <li>• Organization of Entire Electrical Sector</li> <li>• Interconnection of Polish Power System to the UCPT System, Upgrading Customer's Service Quality</li> <li>• Development of Transmission Capabilities</li> </ul>	<ul style="list-style-type: none"> <li>• Change to Market Economy</li> <li>• Control by Government of Fuel and Electricity Prices</li> </ul>	<ul style="list-style-type: none"> <li>• Refurbishment of Particular Power Plants</li> <li>• Upgrading Transmission System</li> </ul>

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## SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY Poland

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
POLSKIE SIECI ELEKTROENERGETYCZNE S.A. POLISH POWER GRID COMPANY (PPGC) (Cont.)	<ul style="list-style-type: none"> <li>• Various Consulting Services with U.S. Consulting Firms</li>   <li>• Suppliers: CD-Empros-Dyster Alcoa Fujikura</li>   <li>• U.S. Partners in Polish Power Sector Investments (United Energy Partners, ENRON)</li> </ul>			<ul style="list-style-type: none"> <li>• Improvement of Generation Efficiency</li>   <li>• Reduction of Environmental Impact</li>   <li>• Pricing</li> </ul>		
ELEKTRIM POLISH FOREIGN TRADE COMPANY FOR ELECTRICAL EQUIPMENT LTD.	<ul style="list-style-type: none"> <li>• Power Project Division has Host Site Agreement on behalf of Skawina Power Plant with AirPol Inc. (Polish Retrofit Installation under U.S. D.O.E. Program)</li> </ul>	<ul style="list-style-type: none"> <li>• Develop Lower Vistula Cascade Project (7 Hydroplants, Total Output 1,000 MW)</li>   <li>• Joint Venture</li>   <li>• Public Offering of Shares</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of Financial Resources</li> </ul>	<ul style="list-style-type: none"> <li>• 98% of Power Plants have Hard Coal- and Lignite-Fired Boilers</li>   <li>• Small Number of Pumped-Storage Hydroelectric Power Plants</li> </ul>	<ul style="list-style-type: none"> <li>• Change of Polish Economy and Lack of Stabilization</li> </ul>	---



## SUMMARY OF RESPONSES FROM THE EASTERN EUROPEAN ENGINEERING COMMUNITY Poland

<u>Organization</u>	<u>Current U.S. Relationship</u>	<u>Potential Programs with U.S.</u>	<u>Obstacles to Programs</u>	<u>Ranked Problems Facing Country</u>	<u>Obstacles to Solving Problems</u>	<u>Potential Projects for U.S.</u>
ELEKTRIM POLISH FOREIGN TRADE COMPANY FOR ELECTRICAL EQUIPMENT LTD. (Cont.)				<ul style="list-style-type: none"><li>• Power Plants Need to be Retrofitted (20-30 Years Old)</li> <li>• Lack of Highways</li> <li>• High Density of Pollution in Lower Vistula's Water</li></ul>		

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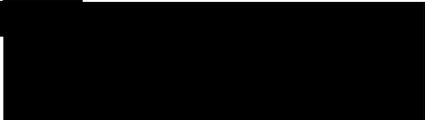
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## CHAPTER IV - WORKSHOP RECOMMENDATIONS

### Introduction

A workshop was conducted in Washington, DC, on March 5 and 6, 1992, with more than 60 senior representatives from the USEC and other interested parties to discuss the situation in Eastern Europe and develop recommendations for this report.

The breakout sessions of the workshop were held the morning of March 6, 1992. The participants were organized into four separate groups of 10 to 12 people as follows:

- Engineering;
- Legal and financial;
- Energy; and
- Infrastructure.

Each group was assigned to address the relevant issues and recommend programs that could be funded by A.I.D. for the USEC to undertake in achieving the overall objectives. The process that was used to lead to the recommended programs involved:

- Identifying and defining the issues and problems;
- Developing ideas for USEC/A.I.D. involvement;
- Prioritizing the issues and ideas; and
- Defining the recommendations.

Breakout session worksheets that outlined this process are found in Appendix III. Three hours were available for the breakout session process as opposed to the one to two days normally allocated for similar programs. The groups were therefore encouraged to arrive at recommendations and eliminate much of the reiteration that normally occurs in more structured brainstorming sessions.

While each session had its own list of issues and agenda, the recommendations often are complementary and at times they coincide and are presented with only minor editing for purposes of this report.

## **Recommendations of Breakout Sessions**

### **Engineering**

The engineering group identified the following priority issues:

#### **Priority Issues**

1. Access to engineering information;
2. Stronger business alliances;
3. Need for international standards in testing and certification;
4. Development of professional and technical societies;
5. Human resource development; and
6. Sponsorship of research and development of technology.

These priority issues were further developed to include the following recommendations.

#### **Recommendations**

##### **1. Provide Access to Engineering Information**

- Support U.S. professional/technical societies in carrying out courses and seminars in EE;
- Establish ongoing system of distributing technical publications, books, and videos. This could be done in cooperation with USIA, the Commerce Department, and individual U.S. engineering/technical societies. Utilization of electronic transfer should be studied;
- Establish and strengthen the transfer of USEC subscriptions to libraries and institutions;

- Support exchange programs to attend U.S. conferences and train in U.S. industries and universities;
- Support and strengthen accreditation program; and
- Support the transfer of educational information for curriculum development.

## **2. Establish Business Alliances**

- Mandate the use of EE professionals, establishing percentage requirements for their participation;
- Strengthen technical/trade associations and their linkages; and
- Support industrial societies.

## **3. Assist EEEEC to develop International Standards in Testing and Certification**

- Establish product and materials standards specialists in the standards organizations in EE;
- Establish/test prototypes upgrade; and
- Develop testing/training facilities to demonstrate U.S. interests.

## **4. Assist in Establishing and Maintaining Professional and Technical Societies**

- Train association management;
- Support U.S. societies to provide training in EE in RFP/proposals, project management, peer review/evaluation;
- Support alliances among societies in EE; and
- Support information transfer among societies.

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## **5. Assist in Human Resource Development**

- Develop new exchange programs that focus on administrative skills, management practices, and curriculum reform; and
- Develop programs in language training, especially in technical English.

## **6. Support Research and Development of Technology**

- Encourage and support private and public cooperation on R&D for applied technology and technology transfer from lab to production line and commercialization;
- Involve private companies in training process from R&D to management production and marketing; and
- Support USEC technology transfer to EEEEC.

This group summarized its overall solutions in five points:

1. Establish regional training centers in EE;
2. Transfer U.S. personnel to study needs analysis;
3. Assign embassies and A.I.D. missions to identify business opportunities;
4. Encourage professional societies to get involved; and
5. Translate needs assessment into viable programs.

## **Legal and Financial**

The legal and financial group identified the following priority issues.

### **Priority Issues**

1. Need for premarketing efforts to identify potential U.S. investment;
2. Lack of partnering between U.S. organizations and EE interests;

3. Need for mixed funding support and leveraging of projects;
4. Need for promotion of U.S. service industry in EE; and
5. Need for monitoring of legal risks and changes in public priorities to assist U.S. firms concerned about entering the EE Market.

These priority issues were further expanded to include the following recommendations.

## **Recommendations**

### **1. Promote Premarketing Efforts to Identify Potential U.S. Investment**

- Aid in the early identification of potential markets for each country;
- Link experienced engineers (possibly retired engineers) to foreign commercial service;
- Fund visits by teams of engineers to become acquainted with business needs followed by broad dissemination of findings; and
- Assess whether there is a market for the training of U.S. engineering service companies to conduct business in EE.

### **2. Assist in Matching Interested U.S. Organizations with EE interests**

- Coordinate between A.I.D. and the Commerce Department to enhance databanks on service opportunities involving a single point of responsibility between A.I.D. and the Commerce Department for the activity;
- Retain a private service organization to take responsibility for gathering and disseminating information on service opportunities; and
- Measure the performance of the partnering activity by measuring the volume of transactions and the creation of trade. A.I.D. should consider retaining a private organization for this purpose. This will inevitably require coordination and assistance of existing governmental bodies engaged in these activities.

### **3. Promote Mixed Financing of EE Projects**

- Segregation of A.I.D. funds to be made available to the World Bank and EBRD for small engineering studies on feasibility, which would lead to larger opportunities for U.S. firms;
- A.I.D. could co-finance the engineering portion of a World Bank-funded project;
- U.S. Government should promote application of international funds to environmental problems in EE where engineering services would be applicable and workable; and
- A.I.D. should provide a clearinghouse for available funds from both U.S. and international agencies.

### **4. Promote U.S. Service Industry in EE**

- Establish a public relations program that emphasizes U.S. services in EE, stressing the user-friendliness of U.S. engineering firms and their acceptability in EE. This program should be linked to the "partnering program" discussed under Recommendation 1.

### **5. Assess and Monitor Legal Risks and Changes in Public Priorities To Assist U.S. Firms Concerned about Entering the EE Market**

- In addition to general/commercial surveillance, U.S. intelligence networks should provide current intelligence on changes in EE public priorities that affect engineering service markets; and
- Assist EE governments to communicate current legal arrangements in all aspects relevant to engineering service company participation. (This effort could be coordinated through the American Bar Association).

## **Energy**

The energy group identified the following priority issues.

## Priority Issues

1. Lack of national integrated energy planning based on new and changed conditions;
2. Inefficient generation and utilization;
3. Serious air pollution due to low-grade coal and insufficient generation;
4. Nuclear plant safety;
5. Lack of focus on priority projects by U.S. government agencies;
6. Lack of expertise in organization, management, economics, procurement, construction management, and training;
7. A.I.D. programs not competitive with other countries providing "tied funding"; and
8. Review of transmission and distribution efficiency and reliability. This should be coordinated with Recommendation 1 (below).

## Energy Overview

Much work is needed in the energy sector in the EE countries, and the United States can help through the USEC. The U.S. assistance would be visible and permanent with the development of successful capital projects that are desired in the host countries and supported internationally. The United States would benefit most if such projects were initiated and led by the United States and were leveraged financially with the participation of the World Bank and other country donors such as Canada and Japan. Ideally an important U.S.-funded project would be found in each EE country.

Projects with high returns and other environmental benefits, such as efficiency improvements and emissions controls should receive high priority (as the United States is already doing).

Specific energy recommendations follow.

## **Recommendations**

1. Fund a U.S. private sector review of overall energy planning for each country;
2. Select one coal-fired plant for repowering in each country, utilizing different emerging technologies to permit comparison;
3. Develop an overall program to coordinate and implement ongoing individual programs directed at nuclear plant safety;
4. Evaluate alternative emission controls for the industrial and district heating sectors;
5. Provide training in management, organization systems, economics of engineering decision making, competitive procurement procedures, and sales and marketing;
6. Evaluate alternate clean coal technologies under development in Eastern Europe; and
7. Follow-up the institutional/regulatory development process from an engineering standpoint.

## **Infrastructure**

The infrastructure group identified the following priority issues.

### **Priority Issues**

1. Need for improved in-country coordination and communications;
2. Lack of data, baseline survey, and master plans;
3. Lack of clearly communicated in-country programs;
4. Need for a mechanism to promote U.S. technology;
5. Inadequate A/E procurement policies and practices;
6. Lack of enforcement of established regulations; and

7. Need for U.S. donor coordination.

These priority issues were developed to the following recommendations.

## **Recommendations**

### **1. Promote Information Exchange, Both Internal and External**

- Provide infrastructure information systems to the EEEEC of the host countries;
- Provide trade journals, newsletters; and membership information to the EEEEC and government of the host countries;
- Support exchange of technical professionals;
- Educate government officials about the importance and utility of information exchange through the use of seminars and exchanges. Show how EPA and the Department of Energy share information between the agencies and with the local authorities;
- Describe how U.S. regulatory bodies on the federal and local levels communicate;
- Provide regular descriptions of what A.I.D. is accomplishing in each of the host countries to the other countries of the region;
- Provide already developed public domain information systems, i.e., E. Mail, databases on infrastructure history and hire appropriate USEC to install the systems; and
- Provide technical journals and texts to the relevant government agencies and academia.

### **2. Initiate an Ongoing Master Planning Process, Including Baseline Surveys and Needs Assessments**

- Collect and study existing infrastructure information to formulate a master plan;
- Conduct an updated master plan process through coordination of the USEC and host country engineering talent;

- Introduce U.S. engineering practices for adaptation to host country needs and social values; and
- Evaluate the separate inputs by country governments and engineering practices to develop and fund appropriate A.I.D. programs.

### **3. Finance Missions to Assist Local Agencies in Establishing Defined Country Programs and Priorities**

- Assemble a panel of experts from each of the infrastructure fields to be available to A.I.D. to provide advice or review services as required;
- Identify the major infrastructure constraints to each country's development in transportation, telecommunications, water, and waste. Identify all agencies involved;
- Set up host country interagency meetings for overall infrastructure planning;
- Educate host country in the planning process by bringing missions to U.S. public agencies responsible for infrastructure development; and
- Fund the hiring of experts to be located in host country agencies responsible for infrastructure planning.

### **4. Serve as Catalyst for Providing Complete U.S. Infrastructure Project Packages**

- Market comprehensive U.S. infrastructure project packages. These "packages" would include:
  - a) Complete definitions of project requirements;
  - b) Solutions to operational and institutional constraints, such as employment and environmental issues;
  - c) Term/rate-competitive, creative, total financing packages;
  - d) Reverse trade missions to demonstrate the advantage of U.S. capital goods;

- e) Management training in construction management, start-up, and operations; and
- f) USEC training sessions in host countries on conducting business in EE.

**5. Provide Technical Assistance in Implementing a Procurement Process**

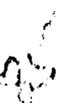
- Support individual contacts with host country officials to alert EE on procedure processes, stressing the benefits of competitive bidding;
- Distribute FDIC or IBRD procurement documents to missions and agencies;
- Conduct seminars on the procurement process, and identify in-country agents to attend these seminars;
- Assign a U.S. procurement officer on a project-by-project basis to work with host country officials in a supervisory role; and
- Support on-the-job training.

**6. Provide Assistance in Enforcement Methodologies**

- Familiarize EEEEC with U.S. zoning and other regulations. Provide written materials to EEEEC on examples of U.S. codes and regulations;
- Provide assistance to EEEEC in the development of institutions and programs to assure effective enforcement of existing and future regulations by drawing on U.S. experience along with A.I.D. experience in other countries; and
- Develop specific examples and promotional materials to illustrate the specific benefits associated with the enforcement of regulations.

**7. Promote Interagency Cooperation for Project Implementation**

- Monitor infrastructure projects in the host countries and report on the effectiveness;
- Conduct semiannual review of projects, plans, and expected results;



- Open dialogue with other agencies to leverage projects allowing flexible participation and interagency cooperation; and
- Contract an independent facilitator from the nonprofit engineering agencies to support cooperation between agencies in infrastructure project.



**THE ROLE OF THE ENGINEERING COMMUNITY IN  
INFRASTRUCTURE-RELATED TRADE AND INVESTMENT IN EASTERN EUROPE**

**Madison Hotel, Washington, D.C.**

**March 5-6, 1992**

**Workshop Agenda**

- MARCH 5, 1992**                    **EXECUTIVE CHAMBERS 1,2,3**
- 7:30-8:00**                        **REGISTRATION**
- 8:00-8:15**                        **WELCOME AND INTRODUCTION**  
*Mr. Robert H. Staplin, Senior Vice President  
Harza Engineering Company*
- 8:15-8:25**                        **OVERVIEW OF A.I.D. PROJECT OBJECTIVES**  
*Mr. Fred Bieganski, Infrastructure Development Officer  
U.S. Agency for International Development, Bureau for Europe*
- 8:25-8:45**                        **A.I.D. CAPITAL PROJECTS PROGRAM**  
*Mr. Fred Zobrist, Director, Office of Capital Projects and Engineering  
U.S. Agency for International Development*
- 8:45-9:15**                        **CURRENT SITUATION ANALYSIS IN HUNGARY, CZECHOSLOVAKIA,  
AND POLAND**  
*Dr. John P. Hardt, Associate Director, Senior Specialist, Soviet Economics  
Congressional Research Service*
- 9:15-10:00**                        **CURRENT ENGINEERING ASSESSMENT:  
SUMMARY OF EASTERN EUROPEAN MEETINGS  
CONDUCTED JANUARY 4-25, 1992**  
*Mr. Robert H. Staplin, Senior Vice President  
Harza Engineering Company*
- 10:00-10:15**                        **BREAK**

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**THE ROLE OF THE ENGINEERING COMMUNITY IN  
INFRASTRUCTURE-RELATED TRADE AND INVESTMENT IN EASTERN EUROPE**

**Madison Hotel, Washington, D.C.  
March 5-6, 1992**

**Workshop Agenda (Cont.)**

**10:15-11:45**

**PANEL DISCUSSION:**

**"THE ROAD TO PRIVATIZATION - INSTITUTIONAL ISSUES"**

**Privatization of Infrastructure in Eastern Europe:  
Defining the Opportunity**

*Mr. Roger Feldman, Partner and Head, Project Finance Group  
McDermott, Will & Emery*

**Current Status of Privatization:**

- **Legislation**
- **Valuation**
- **Taxes**
- **Currency and Repatriation**

*Mr. Charles E. Hussey II, Partner and Head of International Practice  
McDermott, Will & Emery*

**Intellectual Proprietary Rights**

*Mr. Ian D. Hughes, Partner  
KPGM Peat Marwick*

**Sources of Project Financing**

*Mr. Peter Ridder, Consultant  
Consultant to Coopers & Lybrand*

**12:00-1:30**

**LUNCHEON - ARLINGTON ROOM**

*Featured Speaker: Dr. Carol C. Adelman, Assistant Administrator  
U.S. Agency for International Development, Bureau for Europe*

**1:30-3:00**

**PANEL DISCUSSION:**

**"THE ROAD TO PRIVATIZATION - ENGINEERING ISSUES"**

**THE ROLE OF THE ENGINEERING COMMUNITY IN  
INFRASTRUCTURE-RELATED TRADE AND INVESTMENT IN EASTERN EUROPE**

**Madison Hotel, Washington, D.C.  
March 5-6, 1992**

**Workshop Agenda (Cont.)**

**International Registration and Education**

*Mr. Harry J. Parker, Executive Vice President  
Cullinan Engineering Company*

**Education, Training and Technology Exchange**

*Dr. Woodrow Leake, Deputy Executive Director  
American Society for Engineering Education*

**Standards and International Trade**

*Dr. Stanley I. Warsaw, Director Office of Standard Services  
National Institute of Standards & Technology*

**Quality and Productivity:**

**A Manufacturer's Point Of View**

*Mr. Mark Miller, Director Central and East Europe  
McDermott Incorporated Babcock & Wilcox*

**3:00-3:15**

**BREAK**

**3:15-4:45**

**CASE STUDIES**

**Environmental Projects in Czechoslovakia and Poland**

*Mr. David Burack, Director of International Affairs*

*Mr. Timothy Van Epp, Technical Manager, Industrial/Hazardous Waste  
CH2M Hill International Ltd.*

**Telecommunications Engineering and Planning Project in Poland**

*Mr. Mark Burke, Marketing Director, Eastern Europe  
Teleconsult*

**Budapest Office Acquisition and Ownership Transfer**

*Mr. Stephen C. Mitchell, President and Chief Operating Officer  
Lester B. Knight & Associates, Inc.*

**5:00-6:30**

**RECEPTION HOSTED BY HARZA - MT. VERNON SALON A**

**THE ROLE OF THE ENGINEERING COMMUNITY IN  
INFRASTRUCTURE-RELATED TRADE AND INVESTMENT IN EASTERN EUROPE**

**Madison Hotel, Washington, D.C.  
March 5-6, 1992**

**Workshop Agenda (Cont.)**

**MARCH 6, 1992**

**DRAWING ROOMS 1,2,3,4**

**8:00-11:00**

**BREAKOUT SESSIONS IDENTIFYING SPECIFIC RECOMMENDATIONS  
TO A.I.D.:**

Breakout groups will be determined by issues identified by leaders during the previous day's Panel Discussions such as:

- **Engineering**  
*Moderator: J. Harry Parker, Principal and Partner, Cullinan Engineering Co.*  
*Reporter: Woodrow Leake, Deputy Executive Director, ASEE*
- **Legal/Financial**  
*Moderator: Roger Feldman, McDermott, Will & Emery*  
*Reporter: Mr. Harry Tollerton, Director, International Affairs, American Association of Engineering Societies*
- **Energy**  
*Moderator: Henry H. Chen, Vice President, Harza Engineering Company*  
*Reporter: Mark W. Miller, Director, Central & East Europe, McDermott Incorporated Babcock & Wilcox*
- **Infrastructure**  
*Moderator: Mr. Robert N. Janopaul, President-Infrastructure Group, ICF Kaiser Engineers, Inc.*  
*Reporter: Christopher V. Oot, Vice President, Camp Dresser & McKee International, Inc.*

**11:00-11:15**

**BREAK**

**11:15-11:45**

**FINAL PLENARY**

Summary of Breakout Group Recommendations

**11:45-12:00**

**CLOSING**

*Mr. Robert H. Staplin*

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# CHAPTER V - SITUATION ANALYSIS AND RECOMMENDATIONS

## Situation Analysis

### Introduction

The following engineering assessment is based on meetings held in Budapest, Prague, and Warsaw between January 4 and January 25, 1992.

### General Observations

- 1. Many EEEEC Organizations Already Have Linkage with the USEC and All Are Interested in Establishing or Expanding Ties.**

Existing ties range all the way from formal agreements to informal discussions to attend conferences both in the United States and Eastern Europe. Many of the EEEEC societies are extremely large and multidisciplinary, which makes direct matching with a USEC society difficult. Also, many of the organizations are in transition due to the political changes.

- 2. No Lack of Engineering Expertise Except on High-End. Abundance of Engineering Manpower.**

In all three countries a major resource is the technical capability of their engineers. While they may lack familiarity with some of our recent high-end technical tools, their basic engineering capability is excellent. With recent reduction in economic activity, many are underutilized or out of work. The section on Recommendations will address the issue of utilizing this capability, opposed to competing with it.

- 3. Intense Competition from EEC Trying To Get in Early and Cheap. Most EE Engineers Prefer To Establish Ties to United States.**

The EEC, particularly the Germans, is aggressively pursuing opportunities in all three countries. While the investment is welcome, the general feeling is that the motive is to control the market. There appears to be a sincere preference to establishing ties to the United States. The example of Siemens winning out over Westinghouse in the nuclear competition over the objection of the technical community was cited in many

discussions. The European approach, in many instances, is based on spreading the risk over a number of different investments at minimum cost.

#### **4. Confusion Regarding Different U.S. Programs and Their Implementation.**

In all sectors there was considerable confusion as to the overall U.S. strategy regarding aid to the individual countries. Questions were raised as to whether the United States was interested in projects or just dealing with social issues. A recurring question was the difference between A.I.D. and TDP and whether either program had strings attached. Some of the organizations already involved with U.S. programs indicated that there seemed to be more concern with mechanics and procedures rather than the overall program objective. Eastern European engineers noted the difficulty in coordinating with project managers located in Washington, DC. Assistance from U.S. agencies in-country is perceived as inaccessible.

#### **5. Concern that the United States is Putting Too Much Emphasis on Studies and Not Providing the Means To Move Critical Projects Forward.**

The EEEEC expressed great concern about the need to carry out projects beyond initial study through to construction. Current programs use consultants to do feasibility studies in critical areas. However, there is a lack of follow-up to provide either the direction or, more importantly, the financing to move the most critical projects forward. The message was to focus on the most critical areas and to make them happen.

### **Legal/Financial/Institutional Issues**

#### **1. Lack of Capital for Major Projects.**

This was clearly the overriding issue in all discussions. Other countries are taking a much more aggressive posture on this, and are not only providing the funding for the initial studies, but construction funding as well. The United States needs a coordinated program to address projects from inception through to start-up.

#### **2. Price of Goods and Services Not Related to Cost of Production.**

This is an extremely complex issue because the previous managed economy did not require establishing a cost of production or the setting of prices in a competitive situation. Historical information on the cost of production either is not available or has no basis in fact. Selection of projects was not based on economic considerations.

For example, just prior to the European visit, retail power costs in Poland were increased about sevenfold but were still low by our standards.

**3. Lack of Skilled Managers.**

This is particularly true in the area of operations, financial and economic planning, and marketing and sales. In the previous controlled economy, the operations personnel were told how to operate; cost accounting was nonexistent; and with a controlled market there was no need to sell. There is a great need for training in all of these areas.

**4. Need for Network Planning Tools and Development of a Staged Affordable Approach.**

Hand-in-hand with the lack of skilled managers is the lack of planning tools to carry out the work. There are pressing needs in both energy and infrastructure and top-level management is attempting to establish priorities and select projects many times without proper training or programs.

**5. Whole Legal and Financial System in Transition.**

This introduces a large element of risk for any U.S. entity considering entering the marketplace in Eastern Europe. This runs the whole gamut of legislation, evaluation, taxes, currency and repatriation, proprietary rights and project financing, all which are addressed in the Workshop Proceedings in Appendix III.

## **Engineering Issues**

**1. Shifting from Straight Technical Activities to the Business of Running an Engineering Society or Organization.**

The size of some of the engineering organizations matches those in the United States, and some are even larger. All of the emphasis has been on the technical side or academic approach. They need to learn about the business of running an engineering society if they are to grow and establish relationships with the USEC. Training is needed in how our engineering societies conduct their business.

## **2. Need for Publications of All Types.**

This was a common theme in almost every meeting. The EEEEC does not have hard dollars to access our publications, including journals, technical papers, and trade magazines. This is particularly crucial in the high-end technologies.

## **3. Need for Exchange Visits and Conference Support.**

As in the case with publications there is little funding to send engineers to our conferences and training sessions. The importance of such exchanges was illustrated by ASCE arranging for Drs. Sanc from Czechoslovakia, Scharle from Hungary, and Sitnicki from Poland to attend the ASCE Annual Convention in October 1991. Not only did this provide our engineers with a better understanding of the situation in Eastern Europe, it established a linkage to coordinate the visits to the three countries. One-on-one relationships are probably the single most important element in establishing a program.

## **4. Need for Common Standards.**

Neither manufacturers in the United States, nor manufacturers in Eastern Europe can competitively export their products if they are faced with double testing, first in their own country and then again at the final destination. Electrical manufacturers must meet NEMA standards in the United States and then face a different set of standards in Eastern Europe. This was dramatically illustrated by President Bush's recent visit to Japan where the issue of double emissions testing received considerable press. A separate section on standards is included in the Workshop Proceedings due to the importance of this issue.

## **Energy Issues**

### **1. Old, Dirty, and Inefficient Power Plants Contributing to Major Air Pollution.**

Air pollution is not only the most recognizable environmental problem but, perhaps, the most serious. There are days when some children must stay at home because of the SO<sub>2</sub> problem. Much of this is caused by burning brown coal in old, inefficient, generating plants. The economics are against building all new plants, but serious consideration should be given to repowering existing plants, not only to increase efficiency but to reduce SO<sub>2</sub>.

## **2. Reliability and Availability.**

There is no accurate historical data on availability and reliability because this data was fudged by prior plant management. It is obvious, however, that both reliability and availability is low and will get worse due to the inability to purchase replacement parts.

## **3. Nuclear Plant Safety.**

Many of the nuclear reactors are of Russian design, and there is great concern about Chernobyl-type accidents. This is being addressed by the international community, but the sense is that there is a lack of overall direction.

## **4. Dependency on Imported Energy.**

A number of the Eastern European countries were highly reliant on imported electrical energy, natural gas, and oil that came from the former Soviet countries to the east. In many instances, these supplies have been cut off or are not reliable. Hungary, in particular, depended on a major transmission line to the east to supply peaking energy. It is no longer available.

## **5. Loss of Industrial Electrical Load.**

A high percentage of heavy industrial exports went to the former Soviet countries. With the loss of that market, electrical loads have been declining instead of increasing.

## **6. No Current Overall Integrated Generation and System Planning.**

While several of the countries had national energy strategies in place, most of this work was done prior to termination of supply from the east and loss of industrial load. This would suggest that new integrated plans should be developed for each of the countries. This should also take into consideration requirements that will undoubtedly be imposed by connecting to the European grid.

## **7. Design of the New Generation, Transmission, Distribution Entity. Regulation versus Market Forces.**

All of these functions were previously handled by the state. New organization structures have to be created to deal with the whole electrical system. Decisions must be made relative to selecting the model on which the new organizations will be based.

## **8. Inefficient End Use. Cannot Compete in Global Markets.**

Previously, the cost of energy was not a factor in overall production cost. On this basis, there was no incentive to install efficient processes or equipment. When energy is priced at the cost of production, the majority of the Eastern European companies will be unable to compete in a global market. As in the electrical system, there was no incentive to install efficient central heating systems. In Warsaw, for example, the location of the distribution pipes was evident because all of the snow had melted from the right-of-way.

## **Infrastructure Issues**

### **1. Communication.**

Transition to a viable market-based economy will be highly dependent upon substantial improvement, particularly in telecommunication. Current service is poor and unreliable, for example, there are less than 80 telephones per 1,000 population in Poland. Considerable interest has been shown by international telecommunication organizations and sufficient profit incentive may be in place to encourage private development. The ongoing telecommunications program in Poland was covered during a case study portion of the workshop (see Appendix III).

### **2. Crumbling Infrastructure in All Areas.**

Substandard design, poor construction practices, and lack of maintenance is evident in transportation, buildings, and water supply and treatment. Buildings are poorly designed from an energy-efficiency standpoint. Most solutions lack profit incentive and do not require high-tech solutions. While serious, these issues are not quite as pressing as others and therefore may be addressed by local engineering organizations.

### **3. Air, Water, and Ground Pollution.**

All of these issues should be on a critical list. Air pollution is addressed under energy, and serious international attention has been given to both the water and ground pollution issues. The matter of water and ground pollution was addressed by one of the workshop case studies (see Appendix III).

#### **4. Potable Water Needs.**

Again, this is a critical issue and has sufficient international attention to warrant investment in solutions.

#### **5. Heavy Dependence on Outdated Rail Transportation.**

To serve heavy industries, transportation had been rail-dominant following the Soviet example. Future production may be more consumer-oriented and, therefore, transportation may shift to a more road-dominant system, as in Western Europe. There is substantial room for more efficient use of the existing rail systems.

## Recommendations

### Introduction

The following recommendations are based on input from the USEC, the EEEEC, workshop recommendations, and personal observations from discussions in both the United States and Eastern Europe.

The same techniques used by the private sector to evaluate the operation of corporate entities and to rank competing projects have been used in evaluating current activities and prioritizing proposed programs and projects.

The various organizations suggested many programs and projects. To encourage implementation, the recommendations are limited to the ones that are practical under current constraints and designed to provide the greatest benefit to U.S. interests and the greatest economic impact on the host countries.

One of the primary goals of this project is to encourage further U.S. private sector involvement in the three FTEE countries. On this basis, the overall objective has been partially achieved. Many of the participants in the workshop have indicated they were intended either to expand their current operations in Eastern Europe or to initiate new ventures partially as a result of participating in the workshop. To encourage this positive development, the workshop speeches were recorded and have been transcribed. The completed workshop proceedings are included as Appendix III of this report and provide valuable background information to assist U.S. interests in developing strategic plans for each of the three countries.

The first recommendation of this report is, therefore, to authorize preparation of additional copies of the workshop proceedings to permit distribution to those entities seriously interested in initiating or expanding their participation in the Eastern European market.

Recommendations are presented in the following order:

- Organization and Procedures;
- Programs; and
- Projects.

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## Organization and Procedures

1. A.I.D. should establish trade and investment program offices in Budapest, Prague, and Warsaw. The program offices should be a clearinghouse for all related U.S. activities in each of the three countries. The program office should be managed, staffed, and operated by the private sector under a long-term, renewable contract administered by A.I.D. This office should be charged with the following specific responsibilities:
  - Provide a coordinated single-source approach for all related U.S. government entities and programs in-country;
  - Interface directly with the people, organizations, institutions, agencies, and companies in the host countries;
  - Provide marketing and commercial intelligence to U.S. entities wishing to establish or expand their Eastern European operations.
  - Maintain a database of all FTEE companies and U.S. companies seeking joint development; and
  - Provide a fully staffed business center for U.S. interests, including training facilities as outlined under program recommendations.
2. A.I.D. should establish a Project or "Program" Management Entity (PME) in Washington, DC to coordinate the activities of the three program offices and provide a single contact point for USEC entities interested in initiating or expanding operative in Eastern Europe.
3. A.I.D. should support business development by providing seed capital for new EE engineering enterprises. A.I.D. should support capital projects to provide opportunities for the new enterprises to develop their technical and managerial work forces.
4. A.I.D. should promote cooperative funding with EIB, EBRD, and the World Bank to ensure U.S. participation on projects.
5. A.I.D. should also sponsor contracting to enterprises associated with U.S. firms for cooperative involvement. For example, allowing U.S. foreign subsidiaries to work on A.I.D. projects in other regions such as Cairo.

6. The USEC should capitalize on the large inventory of underutilized technical capability in the FTEE by establishing local offices and utilizing in-country personnel. The Lester B. Knight case study is a relevant example. The USEC long-range strategy should consider using these offices for initial participation in the NIS market as opposed to dealing with the risk associated with establishing an office in the NIS.

## Programs

1. A.I.D. should establish a program to enable EEEEC engineers to attend annual meetings and select conferences of the major USEC engineering societies. At a minimum, this should include ASCE, ASME, and IEEE functions. Specifically, it is suggested that this include  $\pm 15$  engineers from each discipline - mechanical, civil and electrical -  $\pm 5$  from each discipline from each of the three countries (total of  $\pm 45$ ). A.I.D. should request proposals from ASME, ASCE, and IEEE outlining specific recommendations relative to appropriate meetings, invitation criteria, mechanics, and cost.
2. A.I.D. should establish a program to make U.S. publications, including journals, technical papers, and trade magazines, available to the EEEEC. A proposal should be requested from ASME, ASCE, and IEEE regarding selection of publications, distribution, and cost. Emphasis should be placed on the emerging technology areas. Consideration should be given to a two-way exchange to permit USEC to also benefit from EEEEC technical developments.
3. A.I.D. should sponsor training sessions in each of the three countries to instruct the EEEEC in the following areas:
  - The business side of running an engineering society or trade association;
  - The business side of running an engineering practice in a market-based economy;
  - Economics of project evaluation in a market-based economy; and
  - Training in U.S. procurement practices and U.S. standards.

Training sessions should be held at the program offices recommended above. Design and coordination of the programs could be done by AAES or as a possible extension to the "Utility Partnership Program," currently being conducted by USEA for A.I.D.

4. A.I.D. should establish a program to expand USEC efforts in the development of international standards and specifications. Standards and specifications, particularly in electronics and telecommunications, can either enable or prevent U.S. participation in the development of the region. Specifically, independent U.S. engineering firms should be retained to provide assistance to the standards bodies, frequency allocation, and regulatory agencies of the Central and Eastern European countries.
5. A.I.D. should sponsor a program to help the EE electric utility entities revise their organizational structure to reflect the change to a market-based economy. This should take into consideration conditions that will be imposed by becoming members of the EC grid system. This program could best be implemented by expanding the current "Utility Partnership Program" being conducted by USEA.
6. A.I.D. should provide funding to make the benefits of the AAES "Quality in the Management of Engineering Projects" conference scheduled for 1993 in Budapest available to more EEEEC members, as well as providing direct conference support to AAES. This follow-up to the June 1991 conference in Budapest, jointly sponsored by AAES and the Hungarian Federation of Technical and Scientific Societies (MTESZ), has objectives that closely parallel the objectives of this project. A proposal should be requested from AAES.
7. A.I.D. should sponsor a program directed at coordinating the design of safety programs for the Soviet-designed 440-MWe reactors. Due to the critical nature of this issue, A. David Rossin, the incoming President of ANS was requested to prepare recommendations in this area. The following is Dr. Rossin's response:

There is a widespread concern about the safety of the 440-MWe reactors of Soviet design in the several republics. The designs do not include certain safety features that are mandatory in the West. There are so many organizations trying to help, that there is confusion at the plants. Some of the regular staff have left. The personnel, resources, and facilities for training are simply not available.

There is a need for qualified personnel, with language capability, and with the dedication to work with plant staff. A.I.D. should consult with IAEA, USNRC, and INPO (Institute for Nuclear Power Operations), and then with the East Bloc nations, to assess the needs and potential sources of trained personnel who would be willing to work at these plants for one to three years. It would be a challenging placement effort with important diplomatic implications. It is vital to work with the nations themselves and current plant management.

One critical problem is that the republics and the former East Bloc countries do not have a well-established regulatory structure. The former Soviet Safety Agency was reorganized after Chernobyl, but was still in the process of being established. They need something more appro-

appropriate than just copying Western organizations. With cooperation from the IAEA, well-directed financial support could succeed in developing regulatory structures and basic codes of safety regulations for the VVER's (440-MWe PWRs without containment) and the RBMK (Chernobyl-type) reactors.

I believe that with limited financial support and volunteer help from the U.S. and other Western nations, a regulatory structure could be put in place, hopefully before a serious accident occurs.

A.I.D. should request ANS to prepare recommendations to address these issues.

## **Projects**

### **Energy Projects**

The Situation Analysis identified the fact that electrical loads are temporarily depressed at present due to the unsettled political and economic conditions. Anticipating recovery and recognizing the long lead time for central station modification and additions, the following projects are recommended in the energy area.

1. A.I.D. should sponsor three full-size repowering projects at existing coal-fired central stations.

Ideally these projects would be at plants of comparable size in the 100-MW to 400-MW range, with one plant located in each of the three countries. Advanced competing U.S. technologies should be used at each location to permit direct comparison of performance and cost of advanced systems under development in the United States. Alternate technologies for consideration should include, but not necessarily be limited to:

- Atmospheric Fluidized Bed Combustors (AFBD);
- Pressurized Fluidized Bed Combustors (PFBC); and
- Integrated Gasification Combined Cycle (IGCC).

Considerable research has been conducted by Mr. J. Rakowski of the Institute of Power Engineering in Warsaw, and he should be consulted in selecting the competing technologies and possible plant locations.

Top priority has been given to this project for the following reasons:

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- It addresses both air quality and generation efficiency issues in facilities that produce electricity, a marketable commodity.
  - The fact that there is a potential return on investment through the sale of power opens up many possible privatization alternatives not present in other projects, such as those involved with rebuilding infrastructure.
  - There is an opportunity to advance U.S. technology, and obtain cost and performance data on competing systems that will be applicable to air quality and efficiency problems at older U.S. coal-fired plants.
  - Eastern European factories are geared up for heavy industry. With the loss of the NIS market, many factories are idle or operating at low capacity. These factories are suited to the production of the heavy equipment utilized in repowering projects. Identification of the most cost-effective technology could open up a market for repowering many other plants in Eastern Europe. Faced with a potential market, a heavy industry manufacturing facility would be a candidate for U.S. investment.
2. A.I.D. should sponsor a program in each of the three countries to conduct new long-range Integrated Resource Plans.

Previous planning was based on import/export relationships with the NIS, which no longer exist. For example, each country needs to look at its own resources prior to making a major switch to alternate sources of imported natural gas and oil. In addition to past conventional alternatives, the new programs should also include Energy Storage and Demand-Side Management. U.S. industry has developed sophisticated modeling programs ideally suited to take a fresh and independent look at this important issue.

3. In parallel to point 3 above, A.I.D. should sponsor a program to conduct Integrated River Basin Planning and Management Studies on the Danube and Vistula rivers.

These two rivers represent major underutilized, nonpolluting natural resources available to the three countries.

Major hydro development was underway at the 1,300-MW Gabcikovo-Nagymaros Project on the Danube, which would serve both Czechoslovakia and Hungary. This project was stopped due to environmental and political concerns.

The Lower Cascade Project on the Vistula in Poland represents a potential of 1,100 MW of nonpolluting generation. After completion of the 160-MW first-phase plant in 1970, further development was stopped on this project because of political and financial considerations.

Historical justification for both projects was based primarily on hydro considerations. Because these are major resources, both river basins should be reexamined on an overall basis to include, in addition to hydro, environmental, flooding, navigation, municipal and industrial water supply, pollution control, recreation, social, and institutional issues. Sophisticated models are now available to balance all of the above issues. Prior to developing a major dependence on imported gas for future energy requirements, it is suggested that domestic resources be fully explored to see if further development is practical from a political, technical, and economic standpoint.

4. A.I.D. should sponsor a feasibility study to determine if biomass-fueled cogeneration plants are a practical and economical approach to meet industrial and central heating energy needs.

Biomass, in the form of forestry and agriculture waste, represents a major renewable resource that should be considered along with modernization of cogeneration facilities. If this approach proves feasible, it would assist in reducing dependence on imported fuels, reduce air pollution, and provide means of disposing of a major waste stream.

This concept has been investigated by Dr. Ivo Sanc of the Research Institute of Mineral Resources in Kutna Hora, Czechoslovakia, and he should be consulted for assistance in developing the scope of work for this study.

### **Telecommunications Projects**

Program and project implementation can be greatly influenced by the efficiency of the telecommunications system. Due to the critical nature of this issue, Mr. Mark Burke, Marketing Director of Eastern Europe for Teleconsult, was requested to prepare recommendations to complement ongoing work in this area. His recommendations follow.

1. A.I.D. should sponsor an extensive Demand and Market Forecast for telecommunications services for the countries of the region, particularly Poland, Hungary, and Czechoslovakia. The assessment will determine the demand and the ability of the market to support services, and this will serve as the basis for investments in network development. Although some efforts concerning demand have been completed in the

capitals of the regions, modern, reliable demand and market forecasts have not been completed for most of the population centers and rural areas.

The demand assessment should include the current demand for direct exchange lines (DELs) of current subscribers, those on waiting lists, and unrecorded demand. Demand records in the region under the former centrally planned administrations do not represent accurate requirements for telecommunications services. Waiting lists were developed for expressed demand for lines; however, unrecorded demand is quite high because service installation exceeded 13 years in most cases. To include unrecorded demand in a true assessment of the demand for telecommunication services, a statistically managed survey of business and residential services should be done, coupled with the application of econometric modelling of demand associated with economic activity and demographics. New services should be included in the study to project prospective opportunities for business-oriented and enhanced services.

The study should include basic as well as value-added services, incorporating public as well as private service provisions. The breakdown of services should include:

- Basic Telephony
- Public Telephony
- Telex
- Facsimile
- Telegraph
- Voice Information Systems
- Mobile Radio
- Electronic Mail
- Paging
- Videotext
- Maritime Communications
- Metropolitan Area Networks (MANs)
- Data Services
- Packet Switched Networks
- Cellular Telephony
- Centrex
- Special Access Calling
- Message Handling Systems
- Integrated Services Digital Networks (ISDNs)
- Teleports
- Teleconferencing
- VSAT Networks
- PCN

2. Coordinated with the Demand and Market Forecast, A.I.D. should sponsor the development of regional and rural networks, as well as private and value-added networks in the urban areas of Central and Eastern Europe. Basic telephony in the urban areas has attracted considerable attention from the national telecommunications authorities, and financing support from multilateral institutions such as the World Bank (IBRD) and the European Bank for International Development (EBRD). However, regional, rural, and private development has not received adequate support. Economic develop-

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ment is dependent upon extensive telecommunications expansion. This situation offers considerable opportunity for U.S. participation in the development of the new growth areas. Due to the cost and associated risk of regional and rural development, investment has been slow to materialize. A.I.D. sponsorship would increase confidence among the private entities, allowing considerable leverage of A.I.D. resources. Network design and engineering economy efforts should be completed in those regions not sufficiently attracting multilateral development.

3. A.I.D. should sponsor a leasing fund to finance a medium-sized acquisition of telecommunications and information technology equipment. The purpose of the fund is to assist engineering firms of the regions in acquiring the hardware and software systems necessary for their participation in telecommunications and informatics development projects. A.I.D.'s support can be leveraged with vendor and private investment bank participation in order to provide the newly formed private engineering community with a way to make technical equipment purchases.
4. A.I.D. should support the development of an International School for Communications and Information Technology. The school will train and develop a new generation of technical and business leadership that will spearhead telecommunications advances.
  - A. Location and Association. The main part of the school should be located in the Warsaw metropolitan area. The school should be formed in cooperation with the Warsaw University of Technology (WUT) with the assistance of the Ministry of National Education and the Ministry of Post and Telecommunications.

The available technical infrastructure of the WUT and other schools governed by the two ministries can be used. New infrastructure will need to be developed as well.

- B. Academic Staff. The teaching and research staff would be international, encompassing experts from the United States, Poland, and also other Eastern European countries. The official language should be English.
- C. Student Body. The student body should be made up of graduates of accredited universities in the United States, Poland, and other Eastern European countries, as well as open to global participation, particularly by corporate executives and business professionals.

D. Education Profile. The school should be a professional school offering postgraduate study and professional training in the areas of Communications Engineering, Information Technology, and Management. Also, continuing education courses should be offered.

The school should offer M.S. and M.B.A. degrees in:

- Communications Engineering
- Computer Science
- Information Technology
- Communications Management
- Management Information Systems
- Marketing and Finance

Ph.D.s and equivalent courses also should be available.

E. Research Profile. The school should do research projects in the area of communication and information technology sponsored by government grants and private organizations.

F. Financial Support. The school should be a private organization founded jointly by the U.S. government and the government of Poland and financed by a foundation supported by contributions from U.S. and Polish agencies, private corporations, as well as other participating agencies, corporations, and private donors from other countries.

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## Conclusions

The above recommendations were based on the following conclusions:

- There is a critical need for a coordinated single-source approach for all U.S. government entities, programs, and projects in each of the three countries.
- Modest investment in a number of *programs* can be highly leveraged into multiple benefits primarily through the establishment of personal networks.
- *Projects* to be successful, require a total financial commitment and, therefore, available funds should be focused only on projects with the highest priority.
- To revitalize their economies and make their products competitive in the global marketplace, the FTÉE countries must solve their energy and communication problems first.
- U.S. industry has a competitive advantage in energy-related projects as opposed to conventional infrastructure projects, which may be best sponsored in-country.

Based on these conclusions, a select number of carefully chosen energy and communications recommendations have been presented.

**A.I.D. can make a major contribution by directing efforts to a limited number of energy and telecommunications projects and providing the necessary leadership to make sure the projects move through feasibility, design, procurement, construction, and commercial operation.**