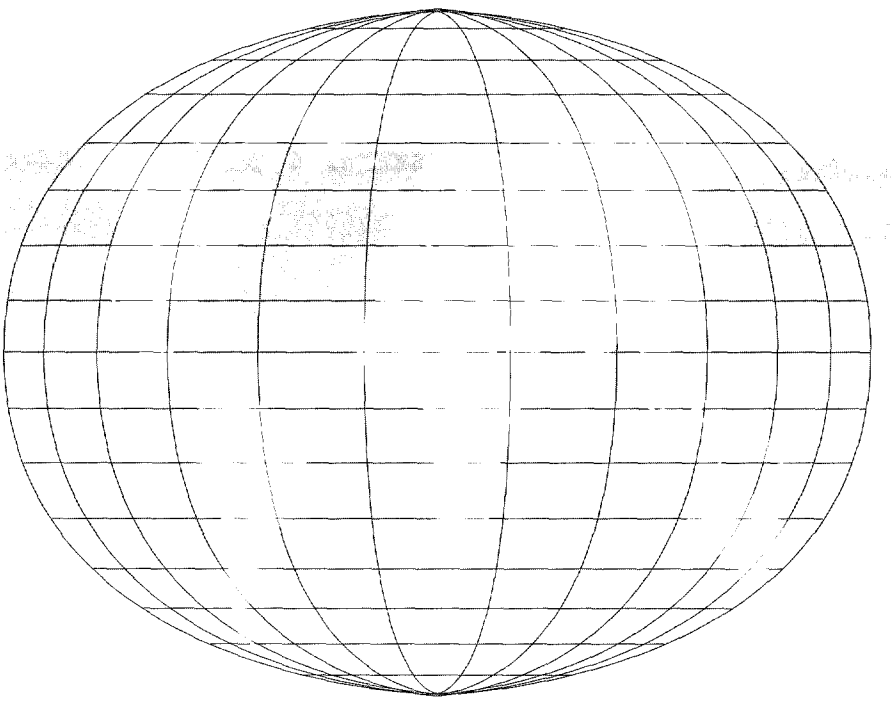
PD-ABN-127

Report of Audit

91055

AUDIT OF THE USAID-FUNDED DEPARTMENT OF ENERGY SKAWINA PROJECT NEAR KRAKOW, POLAND

Audit Report No. B-181-96-004
August 30, 1996



Regional Inspector General
Budapest, Hungary

OFFICE OF INSPECTOR GENERAL
U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
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August 30, 1996

MEMORANDUM

TO: Office of the AID Representative, Suzanne Olds

FROM: RIG/Budapest, James R. Bonnell

SUBJECT: Audit of USAID-Funded Department of Energy Skawina Project Near Krakow, Poland

This is our final report on the subject audit. In preparing the report, we considered your and the Department of Energy's (DoE) Pittsburgh Energy Technology Center comments on the draft report and included them at Appendix II. The report contains one recommendation which is considered resolved. In accordance with the Automated Directives System Guidance on performance audits, AID/M/MPI will be responsible for determining recommendation closure.

The audit found that the construction of the flue gas desulfurization system at the Skawina Power Plant was essentially completed in 1993, but it was still not operational at the end of May 1996. Two attempts to test the system in August 1994 and November 1995 failed because the lime used in the first test did not meet specifications and high oxygen levels caused gypsum scaling which halted the second test. In addition, cracks in the fan foundation were discovered in December 1995.

On July 25, 1996, subsequent to the completion of our audit work, members of the Skawina Bilateral Steering Committee unanimously voted to terminate the services of the contractor (AirPol, Inc.) because of:

- AirPol's failure to correct an improperly designed fan foundation making the flue gas desulfurization system installed at the Skawina Power Plant dangerous to operate; and

- AirPol's repudiation of DoE's direction to correct the foundation in time for a Fall start-up and testing of the desulfurization system.

U.S. ADDRESS: REGIONAL INSPECTOR GENERAL - USAID; AMERICAN EMBASSY BUDAPEST; WASHINGTON, D.C. 20521-5270

As a result of the above decision, DoE plans to send an assessment team to Skawina in late August 1996 to determine if additional funds will be needed to complete the installation of the desulfurization system at Skawina.

I appreciate the cooperation and courtesies extended to my staff during the audit.

Background

In 1989, President Bush pledged to assist Poland in fighting that country's air pollution problem caused in part by its dependence on coal-fired power plants that had few, if any, pollutant controls. In that same year, Congress enacted the Support for East European Democracy (SEED) Act. Section 502 of that Act directed the Secretary of Energy to cooperate with Polish officials and experts to retrofit a coal-fired commercial power plant in the Krakow region with an advanced clean coal technology that had been successfully demonstrated in the United States. Section 502 also authorized that not more than $10 million should be spent to retrofit a coal-fired plant.

In June 1990, USAID entered into an interagency agreement that transferred $9,776,000 to the Department of Energy to implement this program in Poland.

Audit Objectives

As part of the Fiscal Year 1996 audit plan and at the request of the AID Representative and U.S. Ambassador to Poland, the Office of the Regional Inspector General in Budapest audited the USAID-funded interagency agreement with the Department of Energy to retrofit a power plant near Krakow, Poland with clean coal technology to answer the following questions:

- **What were USAID Funds used for and what results were achieved?**
- **Do USAID and the Department of Energy have workable action plans to ensure completion of the project?**

Appendix I contains a complete discussion of the audit scope and methodology.

Audit Findings

What Were USAID Funds Used for and What Results Were Achieved?

The Department of Energy (DoE) used the $9,776,000 million transferred from USAID for construction of the flue gas desulfurization system at the Skawina Power Plant near Krakow, Poland. Although the construction of the system was completed in 1993, it has not been successfully tested nor was it operational at the end of May 1996. Also, the project's delays and problems have had a negative impact on the U.S. Government's reputation and may affect future business opportunities for U.S. firms operating in Central and Eastern Europe. However, experts we interviewed stated that the Skawina Power Plant will continue to provide electricity and heating, and the desulfurization system is needed to reduce air pollution.

Although provided $9,776,000 under a USAID interagency agreement, DoE planned on using the $10 million authorized for the project as shown below.

Activity	Budget ($ in 000)
AirPol, Inc. contract	$ 8,426
Baker and Associates contract	308
Burns & Roe contract	383
Lime purchase from Belgium	67
Solid Waste Study	135
DoE travel and administration	387
Contingency	294
Total	$ 10,000

In May 1991, DoE selected AirPol, Inc. after reviewing proposals from five companies, to install state-of-the-art scrubbers on a 50-megawatt coal-fired boiler at the Skawina Power Plant. In September 1991, DoE signed a fixed price contract for $7,880,410 with AirPol to install and test a desulfurization system at Skawina. Five contract modifications have added another $487,413[1] increasing the total contract price to $8,367,823 for the Skawina project. This contract price is about $58,000 less than DoE budgeted ($8,426,000) for the AirPol contract.

According to unaudited information provided by DoE, as of June 4, 1996, about $9.6 million had been obligated for the Skawina project. DoE also indicated about $8.8 million had been spent for AirPol, Baker and Associates, and Burns & Roe contractors and the Belgium lime purchase.

[1] Modifications to AirPol's contract totaled $633,413 but, according to DoE, $176,000 was for the Krakow Low Emissions project.

DoE did not provide expenditure information for the solid waste study, travel and administration, or the contingency.

The Government of Poland has made significant contributions to this project also. Estimates of the Poles' contribution ranged from $7 million to $8.5 million, including $3.8 million that the Poles provided to AirPol to retrofit a second boiler.

Appendix III contains a summary of key project events since this project began in 1990. As shown in the appendix, the construction of the flue gas desulfurization system was completed in 1993 and a dedication ceremony was held at the Skawina Power Plant in November 1993. The original schedule anticipated that DoE would transfer ownership of the desulfurization system to the Poles in September 1994 after training and shake-down testing was completed.

During 1994 and 1995 two tests were scheduled to demonstrate the operational capabilities of the desulfurization system, but both tests had to be aborted. The first test was attempted in August 1994, but the test could not be carried out because the Polish-supplied lime did not meet the specifications required for the system. DoE then requested AirPol and consultants to analyze the lime suppliers in Poland to help Skawina identify a reliable source of Polish lime. A suitable source of lime was identified at a cement manufacturer (Prevar) near Skawina, but the manufacturer could not deliver the lime for a second test scheduled in November 1995. So with the approval of Skawina, DoE purchased an initial supply of lime from Belgium to test the system.

The second test started on November 8, 1995, but the system was taken out of service on November 16 because of fan balancing problems. The fan was balanced and testing resumed about two weeks later. On December 8, 1995, the system was again taken out of service because of gypsum scaling on the absorber. This resulted from the failure to add a sufficient amount of an oxidation inhibitor (sulfur) to the system to compensate for the high oxygen levels in the flue gas. Attempts to clean the system were hampered by severe weather and further testing was stopped. Also, in December 1995 cracks in the concrete fan foundation were discovered that required further evaluation. A final decision on how to fix the fan foundation was still being debated in May 1996.

Thus at the end of May 1996—2 ½ years after construction of the flue gas desulfurization system—the system was not operational and a number of problems still needed to be fixed before it could be successfully tested.

Even assuming the system is finally successfully tested and made operational, the U.S. Ambassador to Poland and others have raised questions as to whether the Skawina Power Plant will be economically viable, and if the technology used in the flue gas desulfurization system will work in Poland.

All DoE and Polish officials interviewed during this audit expressed the opinion that the

Skawina Power Plant would continue to provide electricity and heating in the foreseeable future. Polish officials pointed out that Skawina has made several major capital improvements in recent years (e.g., four new turbines and boilers have been installed, and replacements are planned for the remaining turbines and boilers), and the Plant provides heating for the city of Krakow. According to a Minister of Environment official, there have been no discussions to remove Skawina from the Polish power grid. Thus, it appears that the Skawina Plant will continue to provide electricity and heating for Poland's energy sector.

DoE and Polish officials stated that the technology that was used in this project will work in Poland. A Skawina official stated that when the project is completed it should comply with Polish environmental laws. An independent expert, hired by DoE, concluded that once the desulfurization system at Skawina becomes operational, the Plant should have no difficulty meeting the contractual performance levels of removing 75 percent of the sulphur pollutants.

In addition to demonstrating clean air technology to the Poles, another purpose of this project was to create a favorable export climate for U.S. environmental technology and services. According to DoE the potential market for U.S. environmental technology in Central and Eastern Europe is about $1 billion. However, the U.S. Ambassador to Poland and DoE have stated that the Skawina project has become a negative "showcase" for U.S. technology, and U.S. firms in Poland are complaining that their business prospects are being injured by the negative Skawina publicity. One Polish official stated that because of the problems experienced with the installation of the desulfurization system at Skawina, the Ministry of Trade will not permit any new flue gas desulfurization construction by American firms until the Skawina system is operational. This official commented that the: "Poles are losing money, but the Americans are losing image."

The Skawina project has experienced both technical and management problems that negatively reflect on the U.S. Government's reputation and may affect future business for U.S. firms operating in Central and Eastern Europe. In May 1996, the U.S. Ambassador to Poland requested the assistance of the Secretary of Energy to help ensure the success of the Skawina project. In his letter, he stated that this project demonstrates American technology failures, rather than successes. We believe it is in the best interest of the U.S. Government for USAID, DoE, and Skawina to work together toward solving the problems so this project can be completed.

Do USAID and the Department of Energy Have Workable Action Plans to Ensure Completion of the Project?

Workable action plans had still not been finalized by USAID and DoE as of May 1996. In response to concerns raised by the U.S. Ambassador, the Department of Energy (DoE), in February 1996, submitted a proposal to complete the Skawina Project. Among other things, the DoE proposal provided for a new project management team, including an on-site manager, and

the inclusion of OAR/Poland as a member of the Skawina Bilateral Steering Committee—actions which will help to address prior management problems. However, our audit work identified some unresolved problems and the need for USAID to develop an estimate of the funds needed to make the Skawina project operational.

The U.S. Ambassador to Poland became involved in the Skawina project last summer when informed by OAR/Poland of numerous continuing problems, and the need to ensure a more proactive role by DOE and USAID/Poland. In August 1995, the Ambassador requested senior management of USAID and DoE to improve the management of the Skawina project because of the negative impact this project has had on the on U.S.-sponsored environmental efforts.

In February 1996 DoE submitted a proposal to continue the Skawina project. This proposal contained four elements: 1) reaffirming contractual responsibilities between DoE and AirPol and the agreement between Skawina and AirPol; 2) developing a team approach toward restarting and testing the flue gas desulfurization system; 3) restructuring the DoE management team; and 4) defining the fiduciary and oversight responsibilities of the U.S. Embassy and USAID for the Skawina project. Both DoE and USAID have been working toward implementing this proposal.

DoE restructured its management team, and a new team from DoE's Pittsburgh Energy Technology Center was formed to complete the Skawina project. In addition, DoE assigned an on-site project manager to start work in June 1996 at Skawina. We believe that the new DoE management team and the on-site project manager will help foster a better working relationship between the contractor and Skawina and demonstrate a more collaborative attitude that is needed to finish this project.

Also, in April 1996, OAR/Poland was added to the Skawina Bilateral Steering Committee. The Steering Committee is responsible for oversight of all phases of project implementation. The addition of OAR/Poland will provide USAID with an in-country representative that will allow USAID to take a more active role in project management and to more closely monitor the project's progress in accordance with legislative and the Bureau for Europe and New Independent States (ENI) requirements.

While the above actions will help address prior management problems and better ensure the successful completion of the project, some significant problems remain. For example, DoE now estimates that the desulfurization system could be transferred to Skawina by December 31, 1996. However, as a contingency in case further delays are experienced, DoE proposed a second "winter schedule" calling for the transfer to be completed by July 1997. However, project completion after 1996 may pose problems for Skawina.

In a June 3, 1996 letter to DoE, a Polish member of the Committee stated that he could not sign the proposed schedule because system implementation after 1996 will result in the loss of a $500,000 grant from the ECOFUND. The ECOFUND is a nonprofit foundation that was established in 1992 to support environmental protection activities in Poland. In 1995, Skawina

requested a grant from the ECOFUND to repair and to make changes in the desulfurization system. The ECOFUND approved the grant with the condition that the money would not be given to Skawina until after desulfurization system was operational. According to USAID, the ECOFUND has extended the deadline for the system to become operational to the end of 1996. In addition, Skawina's emission level permit will be canceled at the end of 1996, and the Plant will have to start paying fines beginning January 1, 1997, if the pollution levels are not reduced. Thus, the Skawina plant may face substantial monetary losses should the project completion date extend beyond December 1996.

Another unresolved problem was whether the fan foundation[2] should be repaired or replaced. In May 1996, AirPol recommended repairing the foundation rather than replacing. An independent expert hired by DoE to review AirPol's proposal stated that the repair proposal was theoretically sound and feasible. However, this expert also identified several concerns with AirPol's design and recommended that the design be modified. The Poles, however, disagreed with AirPol's proposal and believed repair of the foundation was not possible.

While USAID and DoE are working with the Poles to resolve the project completion scheduling and the foundation repair issues, we believe that USAID needs to determine how much additional money will be needed to make the desulfurization system operational. At the Bilateral Steering Committee meeting on April 30, 1996, neither DoE, USAID, nor the Poles seemed to have a firm estimate on how much money was needed to complete the Skawina project. As indicated on page 3 of this report DoE has obligated $9.6 million and depending on how much money is needed to complete the project, the $10 million authorized by Congress for this project may be exceeded. If the authorized funding level is exceeded, Congress will have to be notified. Accordingly, we are making the following recommendation.

<u>Recommendation No. 1:</u> We recommend that OAR/Poland and the Bureau for Europe and New Independent States:

1.1 work with the Department of Energy and the Government of Poland to develop a detailed estimate of the funds needed to complete the project; and,

1.2 notify Congress if the cost to complete the Skawina project will exceed the $10 million authorized.

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[2] Cracks in the fan foundation were discovered in December 1995 after the second test was attempted.

Management Comments and Our Evaluation

Both DoE and OAR/Poland agreed with the findings and recommendation, and their comments are included as Appendix II of this report.

DoE commented that the report provides a good summary of the project's background and the key issues necessary to successfully complete the project. They stated that during the past several weeks, DoE and the Skawina Power Plant have terminated their respective agreements with the project's prime contractor, AirPol. They also stated that the anticipated project costs are expected to exceed the $10 million originally authorized and that it is critical that DoE, USAID, and the Government of Poland cooperate to develop a plan and an accurate cost estimate to successfully complete the project.

OAR/Poland stated that the report findings accurately reflected the status of the project and major problems up to the date of the draft report. They advised that at a July 1996 Bilateral Steering Committee Meeting the members unanimously voted to ask DoE to terminate the services of AirPol because of: (1) AirPol's failure to correct an improperly designed fan foundation making the installed flue gas desulfurization system dangerous to operate; and (2) AirPol's repudiation of DoE's direction to correct the foundation in time for a Fall 1996 start-up and testing of the desulfurization system. According to OAR/Poland after consultations by DoE with representatives of AirPol (and its parent company), DoE, on August 2, 1996, sent a termination letter for default of the contract to AirPol. OAR/Poland stated that the U.S. Steering Committee members informed the Polish members that additional funds would probably be required to finish the project, and that Congress would have to approve any additional funding requirements above the $10 million that was approved for the Skawina project. The U.S. members also informed the Polish members that they could not guarantee a positive response by Congress.

According to OAR/Poland, DoE plans to send an assessment team to Skawina in late August 1996 to determine if additional funds will be needed to complete the desulfurization system. In the interim, OAR/Poland advised that, in expectation of possible minimal additional contingency cost requirements, a Technical Notification of $899,341 was sent to Congress.

Based on the actions taken by USAID and DoE, the recommendation is resolved. It can be closed once USAID and DoE develop a detailed cost estimate of funds needed to successfully complete the project and notify Congress of the additional funds needed and provide appropriate documentation to AID/M/MPI evidencing this.

SCOPE AND METHODOLOGY

We audited the Department of Energy's (DoE) Skawina Power Plant project funded under an interagency agreement with USAID, in accordance with generally accepted government auditing standards. The audit was conducted during the period April 15, 1996 to June 6, 1996. We conducted our audit at the Office of the AID Representative (OAR) and the American Embassy in Warsaw and the American Consul General in Krakow. We also conducted field work at the DoE's prime contractor office in Skawina and the Skawina Power Plant.

We reviewed available project documentation at the OAR office in Warsaw and the Consul General's office in Krakow to: (1) determine the specific objectives of the USAID-funded project; (2) determine the various roles and responsibilities of USAID, DoE, the prime contractor (AirPol), and the Government of Poland; and (3) determine the problems that have been encountered to date and actions being taken to address these problems. We interviewed USAID/ENI, OAR/Poland, American Embassy, contractor, and Government of Poland officials to obtain their views on the problems being experienced by the project and the adequacy of actions being taken to address the problems. In addition we reviewed the limited financial information provided by DoE, but we did not review USAID's financial records that are maintained in Washington.

We did not visit DoE's Pittsburgh Energy Technology Center, DoE's new project manager for Skawina. However, we did interview officials of this organization during their visit to Poland. Also, although we did not review project files maintained by USAID's ENI Bureau in Washington, we interviewed ENI Bureau officials having responsibilities for the project in both Washington and Poland.

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

ALEJE JEROZOLIMSKIE 56C
00-803 WARSAW, POLAND

DATE: August 14, 1996

TO: RIG/Budapest, James Bonnell

FROM: Office of the AID Representative, Suzanne Olds

SUBJECT: Comments on USAID/IG "Audit of USAID-Funded Department of Energy Skawina Project near Krakow, Poland"

Thank you for the opportunity to comment on the July 15 draft report of the USAID-funded Department of Energy implemented Skawina project.

Before commenting on the report, OAR/Warsaw wants to thank your office for responding promptly to our request for an audit of this project and for the thoroughness and sensitivity with which your office conducted the audit. The observations and suggestions made by your office were invaluable to OAR/Warsaw and the Embassy during a critical phase of the implementation of this project. OAR/Warsaw highly commends your office for agreeing to participate in the attempt to find a reasonable solution to a seriously troubled project rather than merely chronicling the problems at the completion of the project.

From OAR/W's perspective, we believe that the report findings accurately reflect the status of the project and major problems up to the date of the draft report, April 30, 1996.

The report recommended that OAR/Poland and the Bureau for Europe and the New Independent States:

1.1 work with the Department of Energy and the Government of Poland to develop a detailed estimate of the funds needed to complete the project; and,

1.2 notify Congress if the cost to complete the Skawina project will exceed the $10 million authorized.

At the July 25, 1996 Skawina Bi-lateral Steering Committee Meeting, the members unanimously voted to ask DOE to terminate the services of the contractor, Airpol, because of (1) Airpol's failure to correct an improperly designed fan foundation making the flue gas desulfurization (FGD) system installed at the Skawina Power Station dangerous to operate; and, (2) Airpol's repudiation of DOE's direction to correct the foundation in time for Fall 1996 start-up and testing of the FGD system. Note: The August 2, 1996 "Notice of Termination for Default" letter from DOE to Airpol cited these reasons as the basis for default. It was further agreed by Skawina that after DOE notified Airpol of this action,

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Skawina would initiate the action required of it to remove Airpol. After consultations by DOE with representatives of Airpol and its parent company, FLS, DOE sent a termination letter for default of the contract to Airpol on August 2, 1996. It is expected that Skawina will also send a similar letter to the contractor.

The US members of the BSC at the July meeting had informed the Polish members that it was most likely that additional funds would be required to finish the project if the current contractor was removed, and that Congress would have to approve any additional funds required over and above the $10 M already approved for Skawina. Further, the US members informed the Polish members that we could not guarantee a positive response by Congress.

In the interim, in expectation of possible minimal addition contingency cost requirements (such as a possible need to cover costs to satisfy local Polish safety and health regulations prior to eventual transfer of the equipment to the Polish Government), a Technical Notification of $899,341 was sent to Congress under 180-0004. In order to assess whether any further funds will be required to complete the installation at Skawina, DOE plans to send an assessment team to Skawina between the dates of August 25,1996 to August 31, 1996. USAID's ENI/EEUD will be represented on the team. Once this assessment is completed and reviewed by DOE, USAID, and the Polish side, a decision will be made regarding any additional funding needs and any further notification of Congress.

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Department of Energy
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AUG 20 1996

Mr. James R. Bonnell
United States Agency for International Development
Office of the Regional Inspector General
Nyar Utca 3Z Budapest, Hungary 1071

Dear Mr. Bonnell:

At your request, DOE/PETC staff reviewed the draft audit report prepared by the USAID Office of the Regional Inspector General/Budapest for the Skawina Retrofit Project. The report provides a good summary of the background of the project, its status as of July 15, 1996, and the key issues necessary to successfully complete the project. We are in agreement with the recommendations of the report.

We would, however, like to point out the following items for accuracy:

1. Information on page 5 and in the first chronological entry of Appendix III indicates that USAID joined the Bilateral Steering Committee (BSC) for the Skawina Retrofit Project in February 1996. In fact, from the beginning of the project, two of the four U.S. members of the BSC were USAID representatives from Washington, D.C. In February, the USAID membership was modified to replace one of the Washington, D.C. members with a representative from the Warsaw Mission of USAID.

2. In the first full paragraph on page 4, the third sentence should read:

   On December 8, 1995, the system was again taken out of service because of gypsum scaling on the absorber. This resulted from the failure to add sufficient oxidation inhibitor (sulfur) to the system to compensate for the high oxygen levels in the flue gas..."

3. In the second full paragraph on page 4 it states that at the end of May 1996, "...several problems still needed to be fixed before it could be successfully tested." To be more accurate it should read *"a number of problems..."* A lot of the problems were minor, but the list was extensive.

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4. With regard to the third bullet on page 2 of Appendix 2, we are not aware that anyone ever determined why the bearing failed. We recommend that the second sentence read as follows:

   "The system was started on November 8, but it was shut down on November 16 because the fan bearing failed."

5. The first sentence of the fourth bullet on page 2 of Appendix III should read:

   "The bearing was replaced and the unit was put back into service on December 1."

   The second sentence on the same page should read:

   "On December 8, 1995, the system was again taken out of service because of gypsum scaling on the absorber. This resulted from the failure to add sufficient oxidation inhibitor (sulfur) to the system to compensate for the high oxygen levels in the flue gas..."

In the past several weeks, USDOE and the Skawina Power Plant have terminated their respective agreements with the project's prime contractor, AirPol. It is now especially critical that USDOE, USAID, and the Government of Poland cooperate, as recommended in the audit report, to develop a plan and an accurate cost estimate to successfully complete the project. In accordance with the second recommendation of the audit report, USDOE and USAID anticipate requesting additional funds from Congress as the project costs with a new project performance team are expected to exceed the $10 million originally authorized. Both USDOE and USAID are already acting upon the recommendations of the report.

When the final version of the audit report has been prepared, please send a copy to my office.

Sincerely,

J. P. Strakey

Joseph P. Strakey
Associate Director

cc:
S. Olds, USAID/Warsaw
J. Bever, USAID/Washington
W. Gibson, DOE IG-33
D. Wittenburg, DOE/PETC

Key Project Events and Dates

- **March 1990.** An agreement was signed between the Department of Energy (DoE) and the Polish Ministry of Environmental Protection, Natural Resources and Forestry to demonstrate clean coal technology and to introduce air protection technology in Poland. This agreement established a Bilateral Steering Committee composed of Polish, DoE and USAID/Washington representatives that would (a) select a power plant in the Krakow region to be used for the project, and (b) oversee all phases of the project's implementation in Poland. This committee subsequently selected the Skawina Power Plant as the site for the project.

- **June 1990.** An interagency agreement was signed between USAID and DoE to implement the Fossil Fuels Program in Poland. The purpose of this agreement was to define the procedures for USAID to reimburse funds to DoE for implementing this program.

- **May 1991.** DoE announced that it had selected AirPol, Inc., as the contractor to install a state-of-the-art scrubber on a coal boiler at the Skawina Power Station. AirPol was one of five bidders for the Skawina project.

- **July 1991.** AirPol and Skawina signed a "Host Site Agreement" which described the roles and responsibilities of AirPol and Skawina. This agreement indicated that shake-down testing would be finished in March 1994, and the completed flue gas desulfurization system would be turned over to the Poles in September 1994.

- **September 1991.** DoE signed a fixed price contract with AirPol to install a retrofit flue gas desulfurization system on Unit 11 of the Skawina Power Plant. As general contractor, AirPol was responsible for leading all efforts required for the execution of the project. The contract also required AirPol to abide by all applicable laws and construction codes of Poland.

- **March 1992.** The AirPol contract was modified to expand the retrofit to include Unit 10 at the Skawina Power Plant. The Government of Poland agreed to fund the additional $3.8 million for this change.

- **November 1993.** The construction of the desulfurization system was completed and a dedication ceremony was held at the Skawina Power Plant.

- **August 1994.** Flue gas was introduced to test the system after the first delivery of lime. However, the test was aborted because the lime obtained by Skawina did not meet

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contract specifications.

- **October 1994.** DoE issued a unilateral contract modification that directed AirPol to shutdown the desulfurization system and to winterize it.

- **January 1995.** The AirPol contract was modified again to extend the period of performance and to cover the cost of repairing equipment damaged as a result of using non-specified lime. The contract was extended until October 31, 1995 to allow time to make the necessary repairs and to provide Skawina time to secure a suitable source of lime.

- **November 1995.** A second test was attempted with lime purchased by DoE from Belgium. The system was started on November 8, but it was shut down on November 16 because the fan bearing failed.

- **December 1995.** The fan was replaced and the unit was put back into service on December 1. However, on December 8 the system was again taken out of service because of gypsum scaling on the absorber. This resulted from the failure to add a sufficient amount of an oxidation inhibitor (sulfur) to the system to compensate for the high oxygen levels in the flue gas. Attempts to clean the scrubbers were hampered by severe weather, so the testing was delayed again. In addition, cracks in the concrete foundation that supports the fan were discovered. Further testing was postponed until an evaluation of the fan foundation structure could be completed.

- **February 1996.** DoE submitted a proposal to complete the Skawina project. This proposal contained four elements: 1) reaffirming contractual responsibilities between DoE and AirPol and the agreement between Skawina and AirPol; 2) developing a team approach toward restarting and testing the flue gas desulfurization system; 3) restructuring the DoE management team; and 4) defining the fiduciary and oversight responsibilities of the U.S. Embassy and USAID for the Skawina project.

- **May 1996.** The interagency agreement between USAID and DoE was amended to extend the project completion date to September 30, 1998.