

GAO

Report to the Ranking Minority Member,  
Committee on Commerce, House of  
Representatives

June 1995

# NUCLEAR SAFETY

## U.S. Assistance to Upgrade Soviet-Designed Nuclear Reactors in the Czech Republic



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United States  
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Resources, Community, and  
Economic Development Division

B-261096

June 28, 1995

The Honorable John D. Dingell  
Ranking Minority Member  
Committee on Commerce  
House of Representatives

Dear Mr. Dingell:

On March 10, 1994, the Export-Import Bank of the United States<sup>1</sup> approved a decision to guarantee a loan of \$317 million for the work performed by Westinghouse Electric Corporation on the Temelin nuclear power plant in the Czech Republic. The U.S. government's strong support of the Bank's loan guarantee facilitated the first attempt to integrate Western technology into a Soviet-designed VVER 1000 pressurized water reactor. U.S. officials saw the opportunity to gain more than \$330 million in U.S. exports and to make the reactors safer, but the government of Austria, a neighbor of the Czech Republic, and some Members of Congress expressed concern about the safety of the Soviet-designed reactors and the extent of potential U.S. liability in case of a nuclear accident.

To address concerns about the safety and potential liability of the project, this report provides you with information on (1) the reasons for the Export-Import Bank's loan guarantee for the Temelin nuclear power plant; (2) the actions the Export-Import Bank took to ensure the soundness of the project, including the project's safety; and (3) issues involving the U.S. government's potential liability as a result of the Export-Import Bank's loan guarantee.

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## Results in Brief

U.S. government officials believe that Western technology can make the Soviet-designed Temelin reactors safer as well as provide more than \$330 million in U.S. export earnings. As a result, U.S. officials strongly supported U.S. industry's participation in the Temelin project and worked with Westinghouse and the Czech government to help bring about the acceptance of a U.S. firm for the project. Furthermore, after the Export-Import Bank had approved a preliminary commitment, the U.S. Embassy assured Czech officials that if awarded the contract, Westinghouse would have access to competitive financing through the U.S. Export-Import Bank for the instrumentation and control systems and

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<sup>1</sup>The Export-Import Bank is the U.S. government agency that helps finance export sales of American goods and services. In its 60 years of operation, the Bank has used loan, guarantee, and insurance programs to support more than \$290 billion in U.S. exports.

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the specially designed nuclear fuel developed for the Temelin reactors. U.S. officials believe that without the U.S. government's support, Westinghouse would not have acquired the contract because competing foreign bidders were supported by their governments.

To determine whether the project complied with the administration's policies—particularly U.S. environmental policy—and to draw on the administration's expertise, the Bank's Chairman requested guidance from the National Security Council, which conducted an interagency review of the safety of the reactors' design and of the technical capabilities of the Czech regulatory authorities. The established process for an interagency review of applications for financing nuclear exports did not apply because the Temelin project was unique in that the proposed Westinghouse contract covered only the reactors' instrumentation and control system as well as the initial nuclear fuel for the plant. The standard environmental review procedures—as required of U.S. agencies to further the purposes of the National Environmental Policy Act abroad<sup>2</sup>—apply only to exports of a complete nuclear production or utilization facility or a nuclear waste management facility, not to the components of systems. The results of the National Security Council's review and the engineering and environmental evaluation by the Bank's nuclear engineer satisfied the Bank's Board of Directors, and the loan guarantee was approved. However, Bank officials recognized the shortcomings inherent in the complicated and unprecedented review of the Temelin project and are in the process of drafting review procedures that incorporate expertise from other agencies to address future exports of this type. At the time of our review, however, these procedures had not been completed.

The Bank's Office of the General Counsel examined the question of whether the Bank, since it is guaranteeing a loan for equipment and nuclear fuel to complete the reactors, could be held liable for damages in the event of a nuclear incident at the Temelin plant. The Bank's General Counsel concluded that the chances are small that the Bank would be held liable in any court for damages. This conclusion was based on an analysis of the Vienna Convention on Civil Liability for Nuclear Damage, proposed Czech law, the domestic law of the United States and other countries, and international law. On the basis of the Bank's analysis and supporting documentation, we believe that the Bank's decision is reasonable.

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<sup>2</sup>Executive Order 12114 entitled "Environmental Effects Abroad of Major Federal Actions" specifies the actions to be taken by federal agencies to further the purposes of the National Environmental Policy Act with respect to the environment outside of the United States, its territories and possessions. The unified nuclear procedures are the implementing procedures for environmental reviews of nuclear exports covered by the Executive Order.

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## Background

The Temelin nuclear power plant is located approximately 60 miles south of Prague, the Czech capital, and less than 40 miles from the Austrian border. A construction permit for four nuclear power reactors was issued in 1986 under the Communist regime, and work on the site started in 1987. In December 1989, after the Czechoslovakian "Velvet Revolution", a new government was appointed that was no longer dominated by the Communist Party. Free parliamentary elections took place in 1990, and new elections were held 2 years later. On January 1, 1993, the state of Czechoslovakia was divided, creating the Czech and Slovak republics.

In March 1993, after a 2-month discussion on the fate of the Temelin project, the Czech government passed Resolution No. 109, which allowed the Czech electric utility, Ceske Energeticke Zavody Koncern (CEZ), to complete two of the four planned Temelin reactors and to substantially upgrade and improve the design and operational safety of the reactors. Acting on recommendations from the International Atomic Energy Agency (IAEA), a U.S. consulting firm, and others, Czech utility officials chose to implement technological improvements to make the plants licensable in a manner comparable to Western standards. Contract proposals were accepted for both the Temelin nuclear fuel supply and the instrumentation and control system. Bids were received from 11 foreign suppliers, including the German firm Siemens, the French consortium Framatome, and Asea Brown-Boveri of Germany. Following extensive negotiations, Westinghouse Electric Corporation signed a contract with the Czech utility in May 1993 to supply both items.

Controversy over the project heightened when members of the Austrian government objected to the United States' involvement in completing a nuclear power plant so close to the Austrian border. Austria's Director of Nuclear Coordination and Nonproliferation told us that Austrians have a basic consensus against nuclear power and that the Chernobyl reactor accident had further strengthened this view. In February 1994, 1 month before the Bank gave final approval for the loan guarantee, a delegation representing the Austrian Chancellery came to the United States and met with about 60 groups over a 3-week period. State Department officials characterized the visit as an attempt by the Austrians to persuade U.S. officials not to guarantee the loan. A member of the Austrian delegation told us that the United States should give the Temelin reactors the same scrutiny—such as administering an environmental impact statement with public comment or providing a preliminary safety review—that it would if the reactors were located in Cuba or Mexico. The delegation's visit

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coincided with congressional hearings at which the issues of the Temelin project's nuclear safety and liability were discussed.

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## U.S. Government Supports Bank Loan Guarantee for Safety and Commercial Reasons

By supporting Westinghouse, U.S. officials promoted U.S. exports and facilitated an opportunity for the American firm to participate in future contracts to upgrade Soviet-designed reactors. U.S. officials believe that upgrading the Temelin reactors with Western technology will make the reactors safer and will comply with the shared goals of the Group of 7 (G-7)<sup>3</sup> countries to increase the safety of Soviet-designed reactors. Furthermore, in completing the Temelin reactors, Westinghouse is providing equipment and nuclear fuel designed to address the most important of the technical concerns identified by IAEA and an independent nuclear consulting firm. However, some Czech and Russian officials disagree about whether or not Westinghouse has all the Russian design information needed to develop these components.

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## U.S. Officials Gave Early and Strong Support to Win Temelin Contract for U.S. Firm

U.S. officials strongly supported Westinghouse's participation in the Temelin project and worked with Westinghouse and the Czech government to help bring about the acceptance of a U.S. firm for the project. In supporting Westinghouse, U.S. officials saw the opportunity to gain more than \$330 million in U.S. export earnings and to strengthen U.S. influence in important safety matters related to Soviet-designed reactors. The Czech Minister of Industry and Trade and the Chairman of the Board of the Czech utility told us that the successful completion of the Temelin reactors could lead to future contracts for Westinghouse to upgrade other Soviet-designed reactors throughout Eastern Europe. Because other interested bidders, such as Germany's Siemens Corporation and France's Framatome consortium, were strongly supported by their governments, U.S. officials believe that without U.S. government support, Westinghouse would not have acquired the contract.

In June 1991, Westinghouse submitted an application to the Export-Import Bank for a preliminary commitment on a loan guarantee for its proposed sale of an instrumentation and control system to be exported to the Czech Republic. Westinghouse officials believed that the government's financial backing was necessary to attain the contract to supply this equipment for use in the Temelin nuclear power plant. The Export-Import Bank approved this preliminary commitment in September 1991. Earlier, in

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<sup>3</sup>The seven major industrialized countries that make up the G-7 are Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.

November 1990, Westinghouse had applied to the Nuclear Regulatory Commission (NRC) for an export license for the instrumentation and control system. According to Bank officials, requesting an export license and arranging for financial support at this early stage are typical steps in the international bidding process.

As early as October 1991, the U.S. Ambassador to the Czech Republic assured Czech officials that if awarded the bid, Westinghouse would have access to competitive financing for the project through the U.S. Export-Import Bank. In February 1992, letters from the Departments of State and Commerce to Czech officials further encouraged the selection of Westinghouse to promote increased cooperation between Czech and U.S. firms in nuclear energy and other industries. In March 1992, Westinghouse followed up its earlier application to the Bank with a request for a preliminary commitment on a loan guarantee for the initial supply of nuclear fuel to Temelin. This preliminary commitment was approved in July 1992. The Bank amended the preliminary commitments on both requests in October 1992.

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### Temelin Project Attempts to Integrate Western Technology Into Soviet-Designed VVER 1000 Reactors

In 1990, IAEA reviewed the Temelin plant's design and between 1990 and 1993 sponsored a series of meetings of nuclear safety experts from Western countries as well as Russia and Ukraine to review the design, operational safety, and licensing aspects of VVER 1000 reactors. IAEA review teams recommended modernizing VVER 1000 plants by using more advanced Western technology to improve performance and safety. A 1991 audit by a U.S. consulting firm assessed the potential licensability of the Temelin reactors in accordance with Western standards and concluded that although Temelin could be licensable to Western standards, its licensability could not be ensured unless the audit team's technical and programmatic recommendations were implemented. (For additional information on the studies' recommendations, see app. I.)

In late 1994, IAEA convened a meeting of consultants in Vienna, Austria, to exchange information on the design modifications and safety improvements being implemented at the Temelin plant. CEZ officials and independent experts discussed how some of the concerns raised by the U.S. consulting firm have been addressed. (For information on the results of the meeting, see app. II.)

In July 1992, at the Munich Summit, the G-7 countries endorsed a nuclear safety assistance program to address the problems of Soviet-designed

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reactors. U.S. experts concluded that the least safe Soviet-designed reactors—the RBMKs and VVERs 440/230—should be shut down as soon as is practicable but that the West should explore the feasibility of upgrading the VVER 440/213 and VVER 1000 models to acceptable safety standards. The VVER 1000 reactor has greatly improved safety features, including full physical containment, emergency core cooling systems similar to those in Western plants, and significant safety system redundancy. By completing the newer models with safer Western technology, U.S. officials believe that it is more likely that the older, less safe Soviet-designed models will be taken out of service.

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### Disagreements Continue on the Availability of Russian Information Needed to Complete Temelin Reactors

Because the Temelin reactors were designed by engineers in the former Soviet Union, some experts have questioned whether Westinghouse has been able to obtain all the information it needs to adequately design the instrumentation and control systems and nuclear fuel for the two reactors. Both Westinghouse and CEZ officials told us that they had obtained all needed information from the Russians. A Westinghouse official told us that the company had received enough information from Russia, Bulgaria, and Ukraine to adequately predict the behavior of the reactors and that Westinghouse had purchased data from operating Soviet-designed plants. Furthermore, Westinghouse officials developed safety analyses for the Temelin plant incorporating plant data that they believe are sufficient to indicate that safety acceptance criteria were met. (For information on Westinghouse's safety analyses of VVER 1000 reactors, see app. III.)

Concerning CEZ's contract with the Russians, the utility's officials told us that they paid for the design information but were not permitted to provide the information to a third party. Now they have approval from the Russians to turn the data over to Westinghouse, and CEZ officials are negotiating with Russian officials to obtain information on the VVER 1000 reactors. Westinghouse and the Russian Ministry of Atomic Power signed an agreement for information exchange whereby Westinghouse paid the Russians directly for information. According to CEZ officials, by the end of 1992, all requests for information from the Russians had been filled. These same officials told us later that they met with the Russians in 1994 to request additional documents but were not successful in obtaining all of them.

CEZ officials told us that the Czechs have had substantial experience with Soviet-designed reactors. Czech workers at the Temelin site include personnel from the Czech Republic's Dukovany nuclear power plant,



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which consists of four Soviet-designed VVER 440/213 reactors. The Czech company, Energoprojekt, provided secondary design work for three other Soviet-designed nuclear power plants located in the Czech Republic and Slovakia, as well as for the Temelin plant. In addition, the officials noted that six or seven Russian workers have remained on-site.

According to the Director of Administration for the Czech nuclear regulatory authority, Russian officials were unhappy with the Czechs' decision to purchase nuclear fuel from Westinghouse. He told us that although Czech officials believe that the choice was a good one, they regret the loss of cooperation with the Russians. He also explained that the decision to integrate a Western instrumentation and control system was based largely on an earlier experience when the Czechs tried to acquire an advanced system from the Russians for two other Soviet-designed reactors. The Russians were unable to supply the system, and the Czechs had to obtain it from the Germans.

An official with a Russian firm that designs selected reactor parts and has provided consulting services to the Czechs for the Temelin project told us that the Russians were concerned that they were no longer participating in the project, even though they were the original designers of the Temelin reactors. Russian officials fear that if an accident occurred at the plant, they would be blamed as the original designers. Furthermore, since Russian involvement has been eliminated, they cannot ensure that the original design integrity has been maintained. He also told us that the Russian consultants onsite were not involved in day-to-day decisions and do not have the freedom or responsibility to get help from other Russian specialists on questions for which the consultants may not have expertise.

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## The Export-Import Bank's Review Process for the Temelin Loan Guarantee

Because the proposed exports for the Temelin nuclear power plant did not constitute the entire nuclear reactor or nuclear steam supply system, the unified procedures established for the interagency review of projects were not triggered. Historically, U.S. suppliers had exported complete nuclear power reactors or nuclear steam supply systems for new plants, but the Temelin project was unique in that the scope of the proposed Westinghouse contract covered only the reactors' instrumentation and control system as well as the initial nuclear fuel for the plant. As a result, the Bank used its standard internal procedure to review the environmental and safety effects of the project. (For information on the Bank's standard review process, see app. IV.)

During the review of the Temelin application, the Bank had one engineer who was a licensed nuclear engineer. He was assigned the responsibility for the evaluation of the environmental and safety effects of the application for the Temelin project. Evaluations of proposed Export-Import Bank financing are based on the following five criteria: (1) Is the project technically and commercially feasible? (2) Are the known project participants qualified in their respective fields? (3) Is the capital cost estimate for the project reasonable? (4) Is the schedule for completion of the project realistic? (5) Are the environmental effects of the project acceptable? In addition, for the review of nuclear power transactions, the engineer evaluates safety issues associated with the nuclear project, including the competence and structure of the nuclear regulatory body of the involved country. The engineer requests NRC's assistance in the evaluation of the nuclear regulatory body.

In nuclear applications for which the proposed scope of supply by a U.S. firm includes the complete nuclear steam supply system, the State Department will typically arrange for the preparation of an environmental document, which includes a review of the significant environmental effects of the proposed project. However, in the Temelin case, because the proposed export did not encompass the complete nuclear steam supply system, State Department officials determined that the unified procedures applicable to nuclear exports did not apply. Bank officials realized that the evaluation of the project's environmental and safety issues would have to be undertaken internally and began collecting information sufficient to conduct the evaluation to provide the Board of Directors with the information necessary to make a decision on whether or not to provide financial support for the project. To provide such support, the Board of Directors had to find reasonable assurance of repayment and had to be confident that the project was environmentally sound. (For information on how Czech officials are addressing some environmental concerns, see app. V.)

From March 1993 to June 1994, the Bank's nuclear engineer spent the majority of his working hours reviewing the Temelin project, according to the Bank's records. His work represented the largest portion of the Bank's efforts to determine that the project was technically feasible and to assess technical, including safety and environmental, risks. According to other Bank officials we spoke with, the large amount of research and review time spent on the Temelin evaluation was unprecedented compared to other projects financed by the Bank. For example, Bank officials said that during fiscal year 1994, the Bank received 650 applications that had to be

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addressed by its five engineers. Because of the high ratio of applications to staff, the amount of time devoted to each application is limited.

In reviewing the Temelin project, the Bank's nuclear engineer met with officials from the Department of Energy (DOE) and NRC to determine the safety of the VVER 1000 reactors and the adequacy of the Czech regulators as an independent regulatory agency, respectively. He consulted IAEA's Assistant Director General for Nuclear Safety to learn more about Soviet-designed reactors, reviewed the study of the Temelin reactors made by the Czech utility's consultant, and discussed the findings with the consultant's audit team. The engineer relied heavily on this study as well as on DOE's study of VVER reactors for his analysis of the reactors' safety and then met with Czech officials to discuss what was being done to correct the problems identified.

In July 1993, before the final commitment application was received, the Bank's nuclear engineer visited the Czech Republic for a week, including 1-1/2 days at the Temelin site. He was not accompanied by any other nuclear experts or Bank officials. According to the engineer, he walked through the plant and talked to the workers about what they were doing to ensure the safety of the plant. He was impressed by the plant's "housekeeping" and told us that if a plant is neat and well kept, it looks as though people know what they are doing and indicates quality workmanship. He also visited the Czech manufacturing plant to assess the quality of the Temelin reactor vessel. He also met with Czech regulators to assess their regulatory abilities and to confirm NRC's assessment of the agency.

On March 10, 1994, the Export-Import Bank's Board of Directors authorized final commitments for the Bank's guarantees of private loans to be made to the Czech utility and provided by a group led by Citibank International. Repayment of the loans supporting the sale of the Westinghouse equipment and nuclear fuel was to be guaranteed by the government of the Czech Republic.

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## The National Security Council Conducted an Interagency Technical Review of the Temelin Reactors

To determine whether the Temelin nuclear power project met with the administration's policies, particularly U.S. environmental policy, and to garner governmentwide expertise, the Bank's Chairman requested that the National Security Council conduct an interagency review of the reactors' design and the capabilities of the Czech regulatory authorities. According to Bank officials, they knew that other agencies in the U.S. government

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possessed more information about the VVER 1000 reactors and in May 1993, asked the National Security Council to coordinate the agencies' responses. The Bank asked for the best information and for the opinion of the National Security Council on how the Temelin project conforms with the G-7's policy. Bank officials did not ask for a complete technical analysis, but they wanted to determine whether any other agency had problems with the project.

On September 29, 1993, the National Security Council submitted to the Bank a memorandum that contained guidance supporting U.S. involvement in the Temelin upgrade. The memorandum stated that DOE and IAEA had concluded that the VVER 1000 design can be improved to meet a level of safety acceptable to Western countries. It also said, according to NRC, that the Czech Republic's nuclear regulatory body meets the criteria for regulatory competence that are currently under consideration at IAEA. The National Security Council included an interagency technical paper presenting the administration's current body of knowledge about the design of the VVER 1000 reactor being used at the Temelin site and the technical capabilities of the Czech regulatory authorities.

In discussions with DOE officials, we were told that DOE's judgment on the Temelin project was based on years of experience dealing with Soviet-designed nuclear power plants. According to DOE officials, they are very familiar with the plants' generic design strengths and weaknesses and relied on IAEA's reports on Temelin in forming their views. DOE's then-Director of the International Program Division said that he had visited a number of Soviet-designed reactors but that neither he nor his staff visited Temelin during the review process.

To ensure that the Czech nuclear regulatory authority could perform the required studies to license the Westinghouse hardware, NRC contracted with the Idaho National Engineering Laboratory to provide 2-1/2 years of training to the Czech regulators. NRC officials estimate that the training will cost approximately \$1.5 million to \$1.6 million. Funding for the training is being provided by the U.S. Agency for International Development under its regional energy efficiency project. (For additional information on NRC's training for Czech regulators, see app. VI.)

## Absence of Procedures Spurs Debate Over Review Process for Future Nuclear Exports

As a result of the controversy over the Temelin project, Bank officials told us that they paid a high price for guaranteeing the loan. Specifically, the Bank's General Counsel told us that responding to the many requests for information was quite costly in terms of the staff time needed to gather and reproduce documents. It was also the first time that an adjoining country, Austria, had objected to the Bank's involvement in a project and also quite unusual for the Bank's Chairman to request that the National Security Council get involved in a project. Bank officials told us that they wanted to ensure to the greatest extent possible that the Temelin loan guarantee review would stand up to public scrutiny. The National Security Council's review provided additional assurance of credibility and accountability.

During the review process, Bank officials had occasional difficulties in acquiring the information needed for a review of Temelin. Internal memorandums among Bank officials involved in the Temelin review expressed concern about the difficulties in obtaining information pertinent to the review. One official noted that

[I]t is absolutely unacceptable to have a situation where we don't get a document or are not otherwise informed of something because we didn't ask exactly the "right" question in the "right" way. We are to be treated as full partners in this operation with direct access to everything we need to know in order that the Board can reach a final decision based on all the facts. As far as I'm concerned, this message should be communicated directly to CEZ, the Czech Embassy, State Dept. and U.S. Embassy Prague, NSC [National Security Council], NRC, and all of the various law firms and PR [public relations] firms now engaged in this undertaking. They must be fully apprised of the gravity of this request.

Memorandums also revealed that the Bank's General Counsel believed that the unified nuclear procedures directing environmental assessments of nuclear exports should be amended so that they apply to the export of major parts of nuclear power plants, such as instrumentation and control systems. If projects like Temelin were placed under the unified nuclear procedures, the issue would be addressed by the federal agencies with expertise in nuclear matters. Officials from DOE, NRC, and the State Department disagreed with this proposal, which they saw as "poorly conceived and unnecessary" and which would not "affect the basic decision on whether the foreign project would go forward."

Another Bank official continued, noting that

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I am not persuaded by State's counterarguments. The fact that there will be many more nuclear power upgrades in the future supports the need for environmental review. To the extent that the work done on Temelin is applicable to future upgrades, then it can be turned into a "generic assessment" which will reduce the workload in future upgrade transactions. It's not that we want a higher comfort level than we have received on Temelin. Although we are not dissatisfied with the amount of support we ultimately received from other agencies to assist us in reviewing Temelin, we think that there should be an established process for conducting such reviews. In Temelin, there was no procedure and we had to exert a lot of effort to push the other agencies to deal with the issue.

A May 1994 State Department cable quotes an NRC official as saying that extensive U.S. government efforts were needed to persuade the Export-Import Bank Board to hold fast to its earlier commitment to provide the necessary loan guarantees in the face of concerted efforts by antinuclear groups, requests for information pertaining to the Temelin project filed by opposition groups under the Freedom of Information Act, and the decision of NRC's Chairman to recuse himself from voting on the export license because of his well-known pro-Temelin views. Earlier, in a draft letter to the Vice President of the United States dated November 17, 1993, to be signed by officials from DOE, NRC, and the State Department, it was noted that "efforts to upgrade Soviet-designed nuclear reactors could be undermined by . . . the protracted and increasingly sterile review of Export-Import Bank financing guarantees . . . for the Temelin nuclear power plant." In addition, the draft letter refers to "informal indications that the Export-Import Bank may not be satisfied with the approach taken by the Executive Branch in Temelin, and may seek a different approach for future nuclear-related cases."

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### Bank Officials Draft New Environmental and Safety Procedures for Nuclear Exports

In March 1995, Bank officials told us that the Bank is in the process of drafting procedures to address nuclear safety and environmental concerns for nuclear exports that do not fall under the State Department's unified nuclear procedures. The draft procedures are currently undergoing internal review, and Bank officials expect the new procedures to be completed by early fall 1995.

Bank officials expect that these procedures will facilitate the review process by alerting applicants of information requirements and establishing a list of elements that will be evaluated against proposed guidelines. The Bank's procedures will apply to all categories of eligible nuclear exports. In cases where the unified procedures apply, the Bank's procedures will incorporate the environmental review conducted under

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the unified procedures. Thus, the Bank's procedures will not substitute for the unified procedures.

The Bank's General Counsel told us that she no longer views the unified procedures as the best way of addressing environmental concerns for the components of nuclear power plants. According to Bank officials, the Bank's procedures are more flexible and allow the Bank's engineers to focus on those environmental and safety issues most relevant to specific exports. Although these procedures are internal to the Bank, Bank officials feel confident that other agencies will be responsive to their requests for information and believe that the Bank is now seen as an important player in facilitating nuclear reactor upgrades abroad. According to Bank officials, pending bids by U.S. suppliers to upgrade reactors in China, Hungary, and the former Soviet Union may require Bank financing.

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## Export-Import Bank Satisfied That Risk of Legal Liability for Any Damage Caused by Temelin Plant Is Remote

According to the Bank's General Counsel, Bank officials have carefully examined the question of whether the Bank could be held liable for damages in the event of a nuclear incident at the Temelin facility. (See app. VII for a photograph of the Temelin power plant.) On the basis of an analysis of the Vienna Convention on Civil Liability for Nuclear Damage, proposed Czech law, the domestic law of the United States and other countries, and international law, the Bank's Office of the General Counsel concluded that the chances are very small that the Bank would be held liable in any court for such damages.

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## Czech and International Law Support Operator's Liability in Case of Nuclear Accident

The Vienna Convention is an international treaty that channels exclusive liability for nuclear damage to the operator of the nuclear facility that caused the damage. Before the Bank's Board of Directors considered the Temelin case for referral to the Congress on January 27, 1994, the Czech government had adopted a resolution supporting adherence by the Czech Republic to the Vienna Convention and had submitted the appropriate legislation to the Czech Parliament. As recommended by the Bank's staff, the Board of Directors adopted a special condition that the Bank's legally binding guarantee would not be furnished until after the Czech Parliament consented to the Czech Republic's adherence to the Vienna Convention. This condition was subsequently satisfied when the Czech Parliament voted unanimously on February 15, 1994, to ratify the Vienna Convention.

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On March 24, 1994, the instruments of ratification were duly deposited with IAEA in Vienna, and after a 3-month period set forth in article XXIV(3) of the Vienna Convention, the Czech Republic became a party to the Convention. Accordingly, the Czech Republic has committed itself to impose liability for any nuclear incident at the Temelin facility exclusively on the operator of the facility.

As a signatory to the Vienna Convention, the Czech Republic is obligated to adopt appropriate implementing legislation. In a letter dated March 3, 1994, Prime Minister Vaclav Klaus assured the Bank's Chairman that the Czech government will use its best efforts to ensure prompt passage of such implementing legislation. This legislation is now being prepared. The principles of the law were considered by the appropriate ministries of the Czech government in early 1995. Recently, the principles have been submitted for approval to the Czech Cabinet. Once approved the principles will serve as a basis for the final language of the law, which should be passed by the Parliament by the end of 1995. The Czech government expects that the law will be in force before the scheduled completion of the Temelin facility. Even in the absence of implementing legislation, any attempt by the Czech Republic to impose liability on a party other than the nuclear facility's operator would be inconsistent with the country's treaty obligations.

Subsequent to the Bank's approval of the Temelin guarantee, CEZ and the Czech government agreed in principle to indemnify the Bank and the commercial lenders for an amount governed by the Vienna Convention for any losses relating to or arising out of design, manufacture, use, or operation of the Westinghouse products or of the Temelin facility as a whole. The Czech utility and the Czech government have also agreed that in the event that the Czech Republic withdraws from the Vienna Convention or repeals the domestic law implementing the Vienna Convention, the Export-Import Bank and the commercial banks will have the right to accelerate the loan and require immediate repayment of all outstanding amounts.

As a practical matter, Westinghouse has assured the Bank that if the Czech Republic does not adopt national legislation implementing the principles of the Vienna Convention, it has no intention of making nuclear fuel shipments under the supply contracts that would allow the Temelin plant to be operated. Westinghouse has reserved the contractual right to withhold such shipments in order to protect its own interests.



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## Conclusions

Export-Import Bank officials believe that the loan review process must be facilitated if future nuclear exports like the Temelin project are to be financed, especially since the Bank may be asked to finance reactor upgrades in China, Hungary, and countries of the former Soviet Union in the near future. In reviewing the Temelin project, Bank officials were responsible for addressing environmental issues because the established procedures requiring State Department review did not apply to the exports proposed by Westinghouse. Although Bank officials received guidance from the National Security Council and other U.S. agencies, they had occasional difficulty in obtaining some information pertinent to the Temelin project. At the same time, Bank officials had to respond to the concerns of environmental groups, the Austrian government, and some Members of Congress that the Bank's review was not sufficient to determine the environmental and safety impacts of the Temelin project. Our analysis found that the actions taken by Bank officials in reviewing the Temelin project appear reasonable, and we believe that new procedures addressing exports of nuclear reactor parts may facilitate future transactions.

The Export-Import Bank's Office of the General Counsel has assured its Board of Directors that the risk of legal liability for any damage caused by the Temelin plant is remote. On the basis of an analysis of the Vienna Convention, proposed Czech law, the domestic law of the United States and other countries, and international law, the Bank concluded that the chances are very small that it would be held liable in any court for such damages. On the basis of the Bank's analysis and supporting documentation, we believe that the Bank's decision is reasonable.

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## Agency Comments

We provided a draft of this report to the Export-Import Bank for its review and comments. On May 31, 1995, we met with Export-Import Bank officials, including the Bank's General Counsel, to discuss the Bank's comments. In general, Bank officials agreed with the facts and analysis presented. They gave us additional clarifying information, and we revised the text as appropriate. Representatives of the State Department, including the Deputy Office Director, Office of the Senior Coordinator for Nuclear Safety; NRC, including the Senior Program Manager, Office of International Programs; and DOE, including the Director of the Office of Nuclear Energy, also reviewed a copy of the draft report and gave us clarifying information, and we revised the text as appropriate. In addition, representatives of the Czech Republic's Embassy in Washington, D.C., also reviewed a copy of the draft report and suggested some technical revisions regarding the

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status of their proposed nuclear legislation. We made changes to the text where appropriate.

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## Scope and Methodology

To determine why the U.S. government supported the Bank's loan guarantee for the completion of the Temelin reactors, we interviewed officials and reviewed documents from DOE, NRC, the National Security Council, and the State Department. To determine what actions the Bank took to ensure the soundness of the project, we interviewed officials from the Bank, Westinghouse, and the engineering consulting firm that audited the Temelin reactors and reviewed the Bank's documents relating to the Temelin project. We also reviewed appropriate provisions of the Vienna Convention on Civil Liability for Nuclear Damage, domestic law of the United States, international law, and the Bank's Office of the General Counsel's analysis of potential liability to the United States.

In addition, we visited the Temelin nuclear power plant site in the Czech Republic and interviewed Czech officials, including the Chairman of the Board of the Czech utility, CEZ; the former Prime Minister of the Czech Republic; the Minister of Industry and Trade; the Deputy Minister of the Environment; the Director of Administration of the Czech regulatory body; and two resident regulatory inspectors at the Temelin plant. In Vienna, Austria, we interviewed several officials from the Federal Chancellery of Austria, the Director of the Austrian Energy Utilization Institute, an official from the Austrian Research Center, a nuclear physicist from the University of Vienna, and several officials from the International Atomic Energy Agency's Division of Nuclear Safety.

We performed our review between June 1994 and May 1995 in accordance with generally accepted government accounting standards.

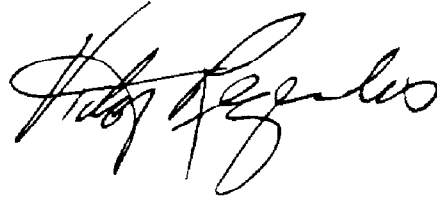
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We plan no further distribution of this report until 15 days from the date of this letter unless you publicly announce its contents earlier. At that time, we will send copies to the Chairman, U.S. Export-Import Bank; the Secretaries of State and Energy; the Chairman, Nuclear Regulatory Commission; the Director, Office of Management and Budget; and other interested congressional committees. We will also make copies available to others on request.

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Please call me at (202) 512-3841 if you or your staff have any questions.  
Major contributors to this report are listed in appendix VIII.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Victor S. Rezendes". The signature is written in a cursive style with a large, stylized initial "V".

Victor S. Rezendes  
Director, Energy and  
Science Issues

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**Abbreviations**

CEZ	Ceske Energeticke Zavody Konzern
DOE	Department of Energy
IAEA	International Atomic Energy Agency
NRC	Nuclear Regulatory Commission
NSC	National Security Council

# Studies of the VVER 1000 Reactor Recommend Technical Changes

In 1990, the International Atomic Energy Agency (IAEA) reviewed the Temelin plant design and in 1992 sponsored a meeting of nuclear safety experts from Western countries as well as Russia and Ukraine to review the design, operational safety, and licensing aspects of VVER 1000 reactors. Recommendations made by the IAEA review teams centered on modernizing VVER 1000 plants by using more advanced Western technology to improve performance and safety. The most important of the recommendations, not all of which apply to the Temelin reactors, were the following:

- Enhancements to the fuel and control rod designs should be made to improve performance.
- An improved core control strategy should be used to improve the plant's operability.
- The instrumentation and control systems are based on "old" technology, and the feasibility of replacing or upgrading the systems hardware to improve the reactors' reliability and the plant's performance should be evaluated.
- Specific changes in the reactors' control and protection system designs should be implemented to enhance the plant's safety.
- A systematic and comprehensive safety analysis using state-of-the-art technology should be done consistent with typical Western licensing practices.
- The control room design should be modernized to improve the quality and quantity of information available to the plant's operators.

In 1991, Ceske Energeticke Zavody Koncern (CEZ) officials requested an audit by a U.S. consulting firm to assess the potential licensability of the Temelin reactors in accordance with Western standards and regulations expected to be in effect in the mid-1990s, the anticipated commissioning date of the reactors. While the principal focus was on nuclear safety and licensability, the audit also included other technical, economic, and management aspects of the Temelin project. On the basis of the scope and results of its reviews, the audit team concluded that Temelin can be licensable to Western standards in the mid-1990s but that its licensability cannot be ensured unless the audit team's technical and programmatic recommendations are implemented. Although the Temelin reactors are not being licensed to Western standards, CEZ officials have made or are making several changes that address some of these concerns.

The consulting firm's audit team found that a number of the initial Temelin design concepts, criteria, or analyses fell short of modern Western

practices but that these shortcomings could be largely eliminated through design improvements that are expected to make the plant comparable with contemporary facilities in the West. These include the addition of a modern instrumentation and control system, an improved fuel and core design, improvements resulting from VVERs' and Western nuclear power plants' operating experience, and improvements resulting from the audit team's recommendations. The audit team also found that the Czech plant managers needed to more fully develop the "safety culture" in which one approaches plant safety with a questioning attitude that avoids complacency. In addition, the audit team found an inadequate amount of information from the original Soviet reactor supplier about the technical basis and underlying analyses of the plant's design.

The audit team concluded that the Temelin plant's design includes a number of important features that equal or, in some cases, exceed Western practices. These areas of strength include, for example, good physical separation between trains of safety-related components and a large degree of safety-related system redundancy, including three independent spray ponds that are each capable of accepting the plant's maximum heat loads.

In October 1992, the audit team prepared a progress report on its audit findings and subsequent follow-up tasks, including an action plan listing tasks and the priority in which they should be accomplished. The audit team found that implementation progress on these tasks had been and continued to be slow and concluded that implementation must be accelerated if the plant's current schedule is to be maintained.

In a March 1994 position paper, Czech officials noted that they had worked closely with the audit team to draft a corrective action plan based on the findings and recommendations of the initial audit. The officials said that the plant's general designer and the original Russian designer have participated in the action plan implementation, that many tasks in the plan have been accomplished, and that the remaining ones are proceeding on schedule. They concluded that implementation of the action plan invalidates negative findings about the Temelin project made by previous reviews, such as IAEA's 1990 review and the consulting firm's audits, and that all references to these findings are no longer valid.

# Design-Related Recommendations by Private Nuclear Consultant Audit Team and Status of Improvements

First Priority Actions	IAEA Meeting Discussion*
Complete the evaluation of the new fuel/core bids and ensure the continued availability of necessary design information from the original Soviet designers. This effort should be integrated into the overall assessment of Temelin.	<p>In response to an IAEA technical and design review mission of the Temelin nuclear power plant, CEZ officials adopted a modified core and fuel design for the reactors to improve safety, fuel cycle cost, and overall economy and to increase operational flexibility.</p> <p>The audit team found that substantial technical information from the original Soviet designers would be needed to design the new fuel and core. It recommended that negotiations for obtaining such information from the Soviet designers be accelerated. According to CEZ and Westinghouse officials, the need for Soviet assistance has not been extensive, but they have been able to get what they need.</p>
Complete the evaluation of the replacement instrumentation and control equipment bids and ensure the continued availability of necessary design information from the original Soviet designers. This effort should be integrated into the overall assessment of Temelin.	<p>Because Russian instrumentation and control equipment has a record of unreliability and does not incorporate digital technology such as what is now being used in Western plants, CEZ officials chose to replace Temelin's instrumentation and control system to improve the reactors' performance and safety.</p> <p>The system being supplied is similar to those used on other Westinghouse-designed nuclear power plants. One exception, however, is that CEZ officials specified that a Diverse Protection System be added. Its addition is intended to give greater assurance that core damaging accidents will be avoided.</p> <p>According to CEZ and Westinghouse officials, the need for Soviet assistance has not been extensive, but they have been able to get what they need.</p>
Conduct Level 1 and 2 probabilistic safety assessments (PSAs) using an entity independent of the design organizations. This activity should begin as soon as possible to be of maximum use in the design.	CEZ officials contracted with a U.S. consulting firm to perform Level 1 and 2 probabilistic safety assessments of the Temelin reactors. Work began in September 1993. It is expected that the PSA Level 1 for internal events will be completed by March 1995, and the PSA Level 2 will be done by September 1995.
Conduct a Western fire hazards analysis. This activity should be completed as soon as possible to enable results to be factored into the design.	The presentations made at the consultants meeting in Vienna did not include fire hazards analysis.
Critically examine the equipment qualification program and take the actions necessary to ensure its adequacy.	The consulting firm's audit emphasized the need for a program to ensure that safety-related equipment would operate in case of an accident. Some equipment might be required to operate under severe pressure, temperature, and humidity conditions. A program to qualify equipment for the expected service conditions is common for U.S. plants and is needed for Temelin. The presentations made at the consultants meeting in Vienna did not include discussions of an equipment qualification program.
Complete the seismic reanalysis of safety-related structures and systems.	The presentations made at the consultants meeting in Vienna did not include discussions of seismic analysis.
Conduct a comprehensive design review to determine the adequacy of safety train separation in the detailed plant and system designs.	The presentations made at the consultants meeting in Vienna did not include discussions of safety train separation.

(continued)



**Appendix II  
Design-Related Recommendations by  
Private Nuclear Consultant Audit Team and  
Status of Improvements**

**First Priority Actions**

**IAEA Meeting Discussion<sup>a</sup>**

Conduct and document comprehensive containment subcompartment analyses under post-loss of coolant accident conditions.

The presentations made at the consultants meeting in Vienna did not include discussions of post-loss of coolant accident containment analyses.

Collect/create Temelin design basis documentation and supporting design information.

The presentations made at the consultants meeting in Vienna did not include discussions of design basis information.

Provide single failure protection for critical piping leading from the containment sump.

The Temelin containment sump design has been redesigned to prevent clogging due to debris collection and to prevent the formation of a vortex that could interrupt suction from the sump. Presentations at the Vienna consultants meeting said that these changes and modifications solved the sump concerns.

Conduct a detailed review of all aspects of containment sump and connected systems design.

Make provisions to facilitate adding a filtered vent to containment.

As reported at the Vienna consultants meeting, the Czech Nuclear Research Institute has analyzed severe accidents, i.e., accidents that are more severe than the accident scenarios that form the basis of the plant's safety systems design. Czech regulations do not require that measures be taken to cope with severe accidents. However, the Nuclear Research Institute has investigated ways to manage severe accident consequences. One possibility is to install a filtered vented containment, but design modifications to add a filtered vented containment had not been completed as of December 1994.

Reevaluate the need for a boric acid tank heating system.

The discussion of design modifications to the Temelin nuclear power plant's emergency core cooling system at the consultants meeting did not make mention of any changes to boric acid tank heating.

Establish a defensible coping time criteria for loss of all off- and on-site AC power and demonstrate the design can meet it.

The consulting firm's audit raised a concern about the adequacy of the direct current power system needed between loss of outside power to the Temelin site and the startup of emergency generating equipment on the Temelin site. Temelin officials said that a source of direct current power is provided for each safety system, but the capacity and duration of the power supply, the basis of the consulting firm's concern, was not discussed.

Conduct a comprehensive review of the adequacy of the DC battery system and make any necessary design changes.

Review the safety system designs relative to the potential effects of non-safety-related component failures on the safety-related systems.

The consultants meeting discussions did not include the effects on non-safety-related component failures on the safety-related systems.

Complete the liquid radwaste evaporator design study and make any necessary design changes.

The consultants meeting discussions did not include liquid radwaste evaporator design.

Explore the advantage of not regenerating depleted resin beds in the liquid radwaste design.

<sup>a</sup>The scope of the IAEA meeting was not designed to include discussion on all of the design-related recommendations made by the consultant's audit team.

# Application of Westinghouse's Safety Technology to Russian-Designed VVER 1000 Nuclear Power Plants

The Temelin VVER 1000 nuclear power plant is the most advanced Russian-designed pressurized water reactor. The VVER 1000 plant's design is a four-loop pressurized water reactor similar to the Westinghouse pressurized water reactor for which extensive safety analyses methods have been developed and accepted by the U.S. Nuclear Regulatory Commission and other regulatory bodies throughout the world. According to Westinghouse officials, the physical behavior, characteristic response, and modeling of the VVER 1000 nuclear power plant's design may be readily represented by the Westinghouse safety analysis technology because of the fundamental similarity in designs. The safety analysis methods used for Temelin required qualification and verification only for the unique design features of the VVER 1000 design, and this qualification was accomplished by comparisons to data from VVER 1000 plants, comparisons to separate effects tests representing the unique VVER plants' design features, and comparisons to integral facility tests that incorporated unique features of the VVER 1000 design. Temelin-specific geometric and physical data for the plant's design obtained in cooperation with the plant owner, CEZ; the plant's general designer, Energoprojekt; and the plant's general contractor, SKODA, as well as original Russian design documentation and the Czech Technical University, were used to calculate conservative safety analyses results using the qualified and verified methods. The safety analyses results indicated that the safety acceptance criteria had been met.

According to Westinghouse officials, the safety analysis approach applied to the Temelin nuclear power plant is the same approach that is utilized and accepted by regulatory authorities to support nuclear power plant licensing throughout the world. In this approach, unacceptable consequences resulting from faults are defined, depending upon the frequencies of the event. Unacceptable consequences include fuel failures and off-site radiation releases. Once unacceptable consequences have been defined, limits are established on the plant's operations; exceeding these limits could lead to unacceptable consequences. The required protection system functions and actions based upon the events and consequences are established. Safety analyses are performed for a complete range of plant conditions and accident scenarios to demonstrate that acceptable results are obtained for the spectrum of initiating events.

# Export-Import Bank's Standard Review Process at the Time of the Temelin Review

The Export-Import Bank is an independent agency with a five-member Board of Directors who are appointed by the President and confirmed by the Senate. Under the Bank's charter, most recently reauthorized by the Congress in 1992, the Bank's decisions on transactions may be based only on commercial, financial, and environmental grounds, not on foreign policy considerations.

All long-term projects—those over \$10 million or with a repayment period of more than 7 years—are assigned to a team consisting of a loan officer, an engineer, an economist (in certain cases), and an attorney. The loan officer performs a financial analysis of the proposed transaction to determine whether there is a reasonable assurance of repayment and makes recommendations on the financial structure of the transaction. The engineer prepares a technical evaluation and an environmental evaluation. (Since the Temelin transaction, the Bank has hired an environmental specialist to oversee environmental evaluations.) The economist analyzes the foreign country's economic conditions to assist in determining whether there is a reasonable assurance of repayment. The attorney is responsible for legal issues and for preparing the legal documentation for the transaction. After completing its analysis, the team presents its report and recommendation to the Board of Directors for consideration. At the Board meeting, members of the Board usually ask questions about the proposed transaction before making a determination.

The Bank's Board of Directors considered the Temelin transaction at two different stages: preliminary commitment and final commitment. A U.S. exporter or commercial bank may apply to the Bank for a preliminary commitment when the exporter needs a financing offer in order to compete for a contract award. Before recommending a preliminary commitment, the staff analyzes the financial and technical feasibility of the transaction, performs an environmental evaluation, and examines any legal issues that may arise. If the request for a preliminary commitment is approved by the Board of Directors, the Bank sends the applicant a letter specifying the interest rate and the terms and conditions of the financing offer (usually an option for either a direct loan or a loan guarantee). The exporter then uses the Bank's financing offer to complement its commercial and technical proposal to the foreign buyer, which is typically the borrower.

If the contract is awarded to the U.S. exporter, the foreign borrower—or the guaranteed lender—may submit an application seeking conversion of the preliminary commitment to a final commitment. The assigned

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**Appendix IV  
Export-Import Bank's Standard Review  
Process at the Time of the Temelin Review**

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transaction team, usually consisting of the same individuals who worked on the transaction at the preliminary commitment stage, conducts a further review of the financial, technical, environmental, and legal issues presented by the finalized transaction. In some cases, the review at this stage is substantially more extensive than at the preliminary commitment stage, because more comprehensive information is available from the foreign buyer. After completing its review, the staff then submits a recommendation to the Board of Directors.

If a transaction involves exports of technology, fuel, equipment, materials, or goods or services to be used in nuclear facilities, the Board of Directors votes initially to approve a final commitment and submits the transaction to the Congress for review, as required by statute. A detailed statement describing and explaining the transaction must be submitted to the Congress in at least 25 days of a continuous session of the Congress, or 35 calendar days if either the House or the Senate is in adjournment for a period which continues for at least 10 days after the date of the Bank's submission of the statement. After this period has terminated, the transaction may be finally approved by the Board of Directors. After the Board's action, the Bank's staff negotiates the terms of a credit agreement and (in the case of a loan guarantee) a guarantee agreement with the borrower and other parties to the transaction.

# Czech Officials Address Radiation and Long-Term Spent Fuel Storage Concerns

## The Czech Ministry of Environment Conducts Radiation Studies

The Czech Ministry of Environment was established on December 19, 1989. At that time, one-third of the construction on the Temelin nuclear power plant had already been completed. As a result, the Ministry had no influence over site selection. During the time of the site selection, a Section of Environment was located in the Ministry of the Interior. Officials from this office assessed the site on the basis of the rules and by-laws for the construction of buildings that were in effect at that time. An environmental impact statement was not performed for the reactor site.

According to the Deputy Minister of the Environment, the Ministry has evaluated the impact of the Temelin plant on water resources only. A hydrological study was conducted on the migration of radionuclides released from the Temelin plant into the system of dams on the Vltava River. The study concluded that planned releases of the radionuclides will not affect the water resources in any outstanding way. According to Ministry officials, the study also evaluated probable tritium releases, and even then the results were acceptable.

Ministry officials told us that in case of an accidental release, it will take many weeks for the contamination to reach Prague. Three dams lie between the plant site and the city, and according to Ministry of Environment officials, most of the radionuclides would sink into the sediment. After the plant is operating, Vltava River laboratory authorities will constantly monitor and analyze the radiation levels in the sediment and ground water. Soil analyses will be performed at an external dosimetry laboratory. Quarterly reports and yearly summaries will be published by CEZ and the Temelin laboratories. In case of any problems, the Vltava River Authority will report directly to the Minister of Environment.

Before the start-up of the Temelin plant, Czech officials plan to have a program in place to monitor radiation levels. Acceptable levels of radioactive releases are being set by the Ministry of Health with the cooperation of the Ministry of Environment. The Ministry of Health has expertise in this area through its Water Research Institute, which has worked on radiation detection in the past and will set up special laboratories to research radiation levels. Acceptable standards of release will be developed to meet international standards.

Ministry of Environment officials have no authority to limit or stop the operation of a nuclear power plant or to inspect within the plant itself.

These responsibilities belong to the Czech nuclear regulatory authority. Ministry of Environment officials inspect air and water outside of the plant; in case of a problem that falls under the responsibility of the regulatory authority, officials would contact either the inspector responsible for that particular area of operations or nuclear regulatory headquarters in Prague.

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**No Final Decision Made on  
Long-Term Spent Fuel  
Storage**

CEZ officials are searching for a site to build a permanent waste storage facility but have not made a final decision. A facility for permanent storage will be needed by the year 2030, and 10 potential sites have been pre-selected. Interim facilities at the Dukovany nuclear power plant allow spent fuel to be temporarily stored and cooled on site, and spent fuel from the Temelin reactors could be temporarily stored inside the Temelin containment itself.

The Czech Minister of Environment has expressed concern about the lack of a permanent waste storage facility and wants a legal guarantee of permanent storage and decommissioning defined by standards in the law that would deny operating licenses until spent fuel disposal plans are completed. Specifically, he would require that CEZ and the Ministry of Industry and Trade develop a long-term concept on plans for decommissioning a plant and permanently storing spent fuel. In the case of the Temelin plant, the building permit has already been issued, and current Czech by-laws and regulations do not require input from the Ministry of Environment in assessing storage sites. However, internal Ministry directives require the Ministry to prepare a report concerning the environmental impacts of radioactive waste storage at the selected sites. When a site is selected, the Ministry of Environment will report on the environmental impacts of the facility.

# NRC Provides Training for Czech Nuclear Regulatory Agency

Because Westinghouse is providing the instrumentation and control system and specially designed nuclear fuel for the Temelin reactors, NRC's contractor is training the Czech regulators to perform regulatory tasks on these components as well as in all other interfaces of the reactors. The contractor is also teaching the Czech regulators NRC's approach and methodology for licensing nuclear power plants, but officials stress that they will not comment on the licensability of the Temelin reactors. An NRC official will receive periodic reports from the contractor to confirm that the subject matter being taught conforms to the agreed-upon methodology. Most of the training is taking place at the Idaho National Engineering Laboratory at Idaho Falls, Idaho; some activities are taking place in the Czech Republic.

Training for the Czech regulators includes a Temelin safety analysis of the Westinghouse components to be performed at the same level of competence and technical capability as if it were being done in the United States. The contractor will provide the training and monitor the Czechs' execution of the safety review. NRC officials told us that they maintain a close technical exchange with the Czech regulators, and if something unacceptable occurs during the review, they will contact the regulators and remind them that certain agreed-upon items have not been followed. In case of a conflict, NRC officials may point out that this practice would be unacceptable in the United States; however, the Czech regulators must make the final decision. NRC officials are concerned only with how regulatory decisions are being made and, because they have no authority to enforce their own decisions, will not accept responsibility for the safety of the Temelin reactors.

According to the contractor, the Czech regulators have a good level of knowledge about certain NRC requirements—particularly in the instrumentation and controls area—but need examples of how NRC evaluated compliance with these requirements. NRC officials told us that currently the Czech nuclear regulatory structure does not have enough staff and needs to be strengthened in some areas, but NRC officials expect these changes to occur this year. NRC officials believe that because the Czech regulators have greater autonomy and independence than either Russian or Ukrainian regulators, the Czechs have a stronger regulatory authority. They also believe that Westinghouse won the Temelin contract partially because the Czech regulators had confidence in NRC's licensing approach.

# View of Temelin Nuclear Power Plant



Source: Westinghouse Electric Corporation.



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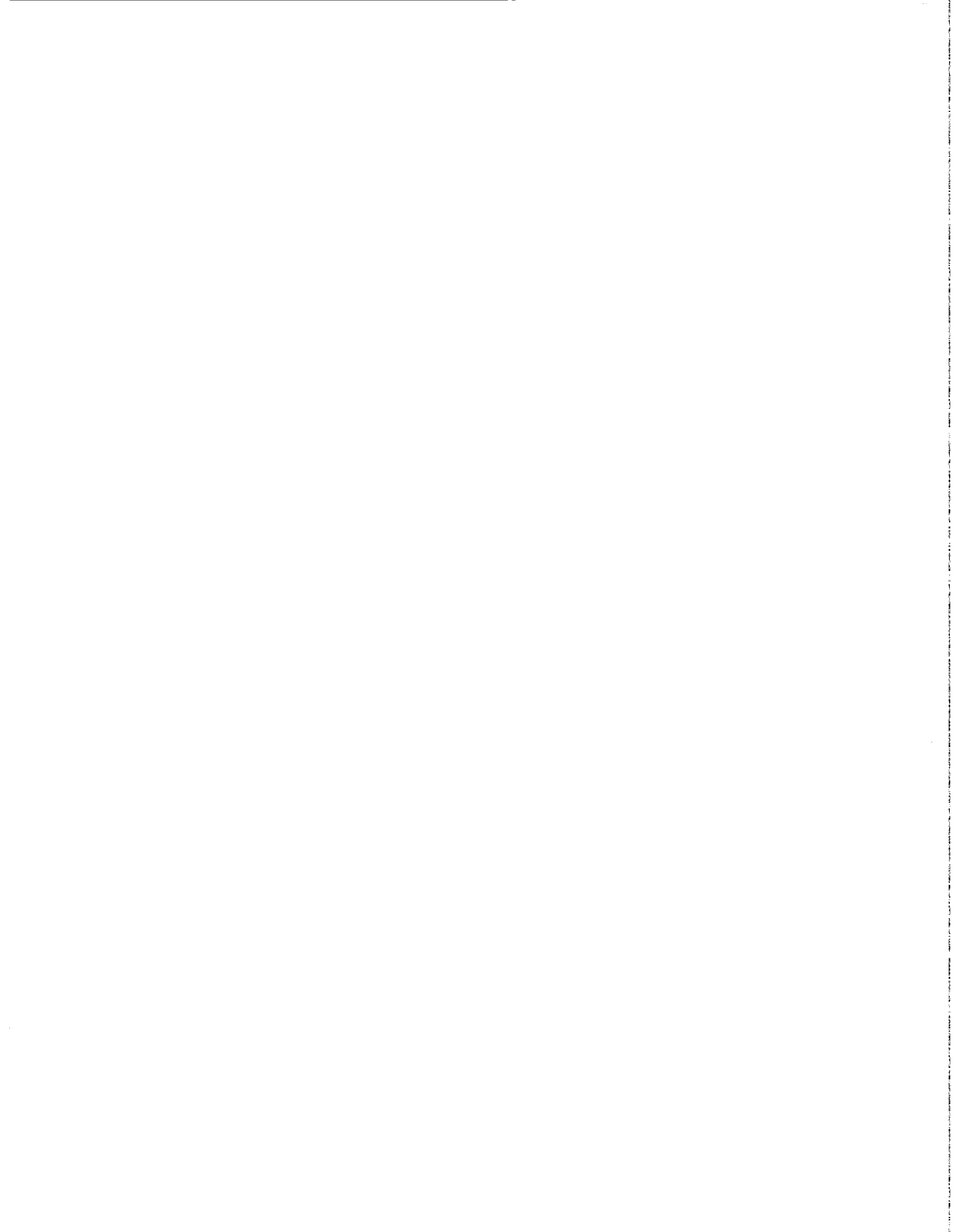
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