EA-510; Environmental Assessment and (FONSI) High-Temperature Solid Oxide Fuel Cell (Sofc) Generator Development Project(METC)

ENVIRONMENTAL ASSESSMENT HIGH-TEMPERATURE SOLID OXIDE FUEL CELL (SOFC) GENERATOR DEVELOPMENT PROJECT

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United States Government Department of Energy MEMORANDUM DATE: December 30, 1991

Department Of Energy MEMORANDUM

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ENVIRONMENTAL ASSESSMENT HIGH-TEMPERATURE SOLID OXIDE FUEL CELL (SOFC) GENERATOR DEVELOPMENT PROJECT
DOE/EA-0510
AUGUST 1991

Prepared by

U. S. Department of Energy
Morgantown Energy Technology Center
P.O. Box 880
Morgantown, WV 26507-0880

INTRODUCTION

The Department of Energy (DOE) proposes to enter into a 5-year cooperative agreement with the Westinghouse Electric Corporation for the development of high-temperature solid oxide fuel cell (SOFC) generators. The objective of the project is to advance the SOFC technology to the point of acceptable risk for private sector commercialization. The project would be an extension of work conducted under a previous DOE contract. The proposed agreement would continue and broaden the scope of that effort by allowing for additional technology development and increased testing activities.

The proposed project involves research, development, fabrication, and testing of solid oxide fuel cells/generators. All of the work, with the exception of various SOFC generator tests, would be conducted at two existing permitted Westinghouse facilities in the greater metropolitan Pittsburgh, Pennsylvania area. On the presumption that this R&D effort will be successful, it is expected that independent field testing of development generators by various utility/industrial participants would occur. The field development generators are anticipated to be located at existing participant sites (foreign & domestic) and would be defined as the project evolves. When the sites for the field tests are known, additional NEPA review will be conducted by DOE for this proposed action.

The DOE has prepared this Environmental Assessment (EA) in compliance with the National Environmental Policy Act of 1969 (NEPA), the President's Council on Environmental Quality (CEQ) regulations, and the DOE Guidelines implementing NEPA. This site-specific analysis addresses the two existing permitted Westinghouse facilities. The sources of information for this EA include the following: the technical proposal submitted as part of the assistance application by the Westinghouse Electric Corporation; discussions with the Westinghouse staff and information provided on the sites to be utilized; and site visits during work conducted under the prior Westinghouse effort with DOE.

As required by Section 1508.9 of the CEQ regulations, the sections contained in this EA include the following:

1.0 Purpose and Need for the Proposed Action
2.0 The Proposed Action and Alternatives
3.0 Environmental Impacts of the Proposed Action
4.0 List of Agencies and Persons Contacted

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

Fuel Cells have the potential to offer highly efficient, low-cost, and environmentally benign power generation. Successful development of this technology would help to ensure a clean and adequate supply of electrical energy. Because of the ability of fuel cells to operate on either natural or coal-derived gas, development of this technology would decrease the dependence on foreign energy supplies and stimulate the use of abundant U.S. domestic coal/natural gas. Successful coal/natural gas integrated SOFC systems would play a major role in the future implementation of environmentally benign power generation technologies for commercial, industrial, and electric utility applications. This proposed development project would advance the SOFC technology to the point of acceptability for commercialization by the private sector.

2.0 THE PROPOSED ACTION AND ALTERNATIVES

2.1 The Proposed Action

2.1.1 Description of the Proposed Action

The DOE proposes to enter into a 5-year cooperative agreement with Westinghouse Electric Corporation for the development of high-temperature solid oxide fuel cell (SOFC) generators. Solid oxide fuel cells are electrochemical devices that convert the chemical energy of a reaction directly into electrical energy. Gaseous fuels (usually hydrogen and/or various hydrocarbons) are

fed continuously to the anode (negative electrode) and an oxidant (usually oxygen from air) is fed continuously to the cathode (positive electrode). Electrochemical reactions occur at the electrodes that result in the combination of oxygen and hydrogen (and/or carbon monoxide) to form water (and/or carbon dioxide). This reaction involves the transfer of electrons from the anode to the cathode through an external circuit that results in the production of electric power. Cells can be stacked in series or parallel configurations to build voltage and power for various sizes of generators.

The objective of the project is to advance the SOFC technology to the point of acceptable risk for private sector commercialization. Under the proposed project, Westinghouse would conduct market and system analysis activities to identify

SOFC user requirements and define technology development criteria. This information would guide the cell technology research and development (R&D) activities, which include cost, performance, and scale-up improvements. Process development activities would also be conducted to support future commercial manufacturing requirements beyond this effort.

A major aspect of the project involves the preparation of field test generators for future testing. It is anticipated that substantial utility/industrial participation in this activity would provide for direct customer involvement. This would aid in guiding development and in extending available project funds. Generators of increasing size ranging from 25-kWe to l00-kWe (500-1,000 cells per unit) are planned for testing to demonstrate progression of the technology and to establish commercial readiness. The overall project goal would be to improve cell performance, scale-up the technology, reduce cell fabrication costs, and aid in the testing of the technology leading to demonstration.

2.1.2 Description of the Plant Sites

All of the research, development, fabrication, and some test

activities would be conducted at two existing permitted Westinghouse facilities located in the suburbs of Churchill and Monroeville, l2 and l7 miles respectively, east of downtown Pittsburgh, Pennsylvania (Figure l). Pittsburgh is located in the southwest part of the state and is highlighted by the intersection of three major eastern rivers: Allegheny, . Monongahela, and Ohio. Topography of the area is hilly.

The majority of the R&D activities would be conducted at the Westinghouse Science & Technology Center (STC) in Churchill, PA. This facility is a multi-purpose R&D center built on a 150-acre site and currently has over l,200 employees. The remainder of the R&D and cell fabrication activities would be conducted at the SOFC Pre-Pilot Plant Manufacturing Facility (PPMF) located in Monroeville, PA. The 28,000 square foot manufacturing facility houses all the necessary equipment for the fabrication, assembly, and testing of solid oxide fuel cells/generators. This facility is capable of producing up to 10,000 cells per year. The work to be conducted at each facility is delineated as follows:

STC	PPMF
o Materials Development	o Cell Fabrication
o Analysis	o Process Modifications
o Single-cell Tests	o Cell/Generator Tests

PROJECT SITE

Figure (Page 5)

PROJECT SITE (graphics for the map)

2.2 Alternatives

Three alternatives are considered in this EA. They are No Action, Alternative Technologies, and Alternative Sites.

2.2.l No Action Alternative

Under the No Action Alternative, the project would not be conducted, and operation of less efficient systems having greater environmental impacts would be continued. Successful development of solid oxide fuel cells with the potential to offer higher efficiency, lower-cost, and environmentally benign power

generation would be delayed or not occur. Successful development of this technology would help to ensure an adequate supply of electrical energy to the American public, reduce air emissions, decrease the dependence on foreign energy supplies, and stimulate the use of abundant U.S. domestic coal/natural gas. Successful coal/natural gas integrated SOFC systems would play a major role in the future implementation of environmentally benign power generation technologies for commercial, industrial, and electric utility applications.

2.2.2 Alternative Technologies

A variety of potential alternative technologies for utility/industrial power generation were evaluated as alternative technologies. Several of them are in similar stages of research and development as the SOFC. Among these are fossil-based molten carbonate fuel cells (MCFC) and coal-fired gas turbine engine systems. MCFCs are similar in operation to SOFCs, but have different developmental issues to resolve. Coal-fired gas turbine systems are also in the developmental stage, but have projected lower system efficiencies and higher air emissions than fuel cell systems. The SOFC was selected because of its inherent and superior environmentally benign and highly efficient power generation characteristics. Selection of an alternative technology would delay or prevent the SOFC technology from inclusion among the technologies available to provide clean and efficient electric power generation. Alternative technologies were therefore eliminated from further consideration.

2.2.3 Alternative Sites

There are various alternative sites that could be utilized to conduct the basic R&D activities; however, Westinghouse is the sole developer of tubular SOFCs in the world. They have a dedicated multi-million dollar manufacturing facility and supporting corporate research center with all existing equipment necessary to conduct the effort outlined. Selection of an alternate site would involve duplicating the existing facilities at great expense and severely impact technology development

progress schedule. Alternative sites were there fore eliminated from further consideration.

3.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED PROJECT AND NO ACTION ALTERNATIVE

3.1 The Proposed Action

This project would involve the research, development, fabrication, and testing of SOFCs at two existing, permitted facilities (STC & PPMF).

3.1.1 Air Quality

The R&D project to be conducted at STC laboratory would not generate air emissions that would deviate from the current conditions. Based upon consultation with appropriate authorities (see Section 4.0), it has been determined that this project would require no additional air quality permits.

Work conducted at the PPMF facility would involve the use of electrochemical vapor deposition (EVD) process. In EVD, metal chlorides react in a humidified environment (reactor vessel) to form metal oxide coatings. The gaseous waste streams calculated for the PPMF plant assumes a maximum cell production at full capacity of l0,000 cells per year. Listed below are the estimated annual emissions for maximum cell production at full capacity:

Component	Quantity (lbs.)
Nitrogen	6,940,000
Oxygen	1,400,000
Carbon Dioxide	509,000
Water	382,000
Chlorine	112
Hydrochloric Acid	797

Chlorine and hydrochloric acid are included in the list of hazardous pollutants contained within the Clean Air Act

Amendments of l990 (Pub. L. 101-549) The average daily concentrations of chlorine and hydrochloric acid emissions from cell production would be approximately 12 ppm and l00 ppm, respectively.

The Allegheny County Bureau of Air Pollution Control reviewed the impact of the calculated emissions for manufacturing SOFCs in 1987. It was determined at that time that no air pollution control permits would be necessary for the operation of the PPMF. Subsequent review indicates that no additional air quality permits are required. It is recognized that carbon dioxide represents one of the potential `greenhouse' gases. Based on the

National Energy Strategy estimation of carbon dioxide emission in the U.S. in 1990, the amount of release from the PPMF as a result of this project is 0.0032 percent.

3.1.2 Water Quality Impacts

At the STC, a maximum of 100,000 gallons of treated wastewater would be produced from material and process R&D activities for the SOFC project. Quantities of water needed for the R&D activities would not be above the capacity already available at the laboratory facility from the public supply system. The standard laboratory operating procedures at the existing STC facility are fully adequate to handle any water quality changes resulting from the SOFC project. Therefore, no water quality impacts are anticipated at STC as a result of conducting this project.

Water requirements for the SOFC fabrication process would not exceed the capacity readily available to the existing PPMF facility from the public supply system. A maximum of 3.8 million gallons of treated wastewater would be produced during the fabrication of the fuel cells. The main contaminant constituents of the wastewater are nickel and chromium. Quantities generated on a monthly average have been 0.19 mg/l of nickel and 0.005 mg/1 of chromium, which are far below the federal categorical limits of 3.98 mg/l and 2.77 mg/l respectively. According to current

practice, liquid waste streams are treated to remove regulated contaminants and the resultant supernatant liquor is released to the sewer. The additional work to be conducted for this project would not generate wastewater streams in excess of the current treatment capacity. The facility is permitted and monitored by the local county agency, Allegheny County Sanitation (ALCOSAN), for water quality and wastewater disposal.

3.1.3 Solid Waste Disposal

The R&D effort at the STC facility would generate solid wastes that could be readily handled by the existing, standard laboratory operating procedures. Actual bench-scale testing of a SOFC is anticipated to produce no solid wastes. Any solid wastes produced would be incidental to the R&D effort. Therefore, no solid waste disposal impacts are anticipated at STC as a result of conducting the proposed project.

At the PPMF, a maximum of 450,000 pounds of solid waste could be produced during the processing of the fuel cells. The wastewater treatment sludge (nickel and chromium) and contaminated pump oil from the EVD are considered hazardous wastes. These would be collected in separate drums and shipped off site by a certified disposal service organization to a licensed disposal facility in accordance with Resource and Conservation Recovery Act (RCRA) regulations for a small quantity generator. The facility is permitted for waste disposal through the Pennsylvania Department

of Environmental Resources (DER) Bureau of Solid Waste Management.

3.1.4 Noise

The two proposed projects sites are subject to the Occupational Safety and Health Act (OSHA) standards for noise. All operations would be within enclosed structures. No increase in noise within the boundaries of either site is anticipated due to the project. Hearing protection for workers is not presently required and is not anticipated for the proposed project. The PPMF was surveyed for noise exposure by Westinghouse and is in compliance with OSHA

occupational noise exposure regulations. Noise level evaluations will be performed for all subsequent new or modified equipment installed in the facility.

3.1.5 Floodplains or Wetlands

The SOFC project would be conducted within existing research/fabrication facilities. Because no construction, excavation, or earthmoving would occur, no impacts to floodplains or wetlands are anticipated.

3.1.6 Historical, Archeological, and Cultural Resources

The SOFC project would be conducted within existing research/fabrication facilities. Because no construction, excavation, or earthmoving is necessary, no impacts to historic landmarks, archeological sites, or cultural places are anticipated.

3.1.7 Ecological Resources

The SOFC project would be conducted within existing research/fabrication facilities. Because no construction, excavation, or earthmoving is necessary, no impacts to flora and fauna, or threatened and endangered species would occur.

3.1.8 Socioeconomic Resources

This project would be conducted at existing R&D and manufacturing facilities. No additional workers would be required for the proposed project. These facilities routinely receive shipments of materials and have delivery systems/transportation networks in place. No impacts are anticipated on the current transportation resources.

3.1.9 Worker Health and Safety

Both sites at which the proposed project would be conducted are fully permitted, existing facilities and subject to Occupational

Safety and Health Administration regulations, as well as the

safety procedures of Westinghouse. Workers are trained in the proper use of the equipment. The research, fabrication, and testing required by the proposed project do not represent new health and safety hazards at these facilities, nor do they represent conditions not generally associated with such industrial and manufacturing facilities.

Chlorine and hydrochloric acid would be produced during operation of the EVD reactor at the rate of 12 ppm and 100 ppm as stated in Section 3.1.1. The reactor is totally automated and requires only the supervision of an operator in the control room. The reactor would operate at vacuum conditions; therefore, no gas can escape the reactor in the event of a leak or rupture. Pressure monitors are installed on the EVD reactor. If a leak or rupture should occur, the reactor would shut down and no further chlorine or hydrochloric acid would be produced. The gas in the reactor at the time of pressure increase would be forced upward and out through the exhaust vent by the influx of air into the vacuum conditions of the reactor, thereby protecting the safety of project workers in the vicinity.

3.1.10 Summary of Impacts

The environmental effects associated with the High-Temperature Tubular Solid Oxide Fuel Cell Generator Development Project with Westinghouse Electric Corporation have been reviewed. This proposed project is expected to have no impacts on noise levels, floodplains, wetlands, ecological resources, historic areas, or socioeconomic resources. Impacts on air quality, water quality, and solid waste management are expected to be minimal.

3.2 No Action Alternative

Under the No Action Alternative, electricity generation would continue under current technology. There would be no improvement in current emission levels. The potential benefits of cleaner, more efficient technologies would not be realized.

4.0 LIST OF AGENCIES AND PERSONS CONSULTED

Arthur M. Tamilia
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Allegheny County Sanitary
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Protection Agency
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J.D. Graham
Air Pollution Manager
Allegheny County Health Board
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Pittsburgh, PA 15201

J. Haluszczuk
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Ms. Joann Kein
Pennsylvania Historical &
Museum Commission
Bureau for Historic Preservation
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Harrisburg, PA 17108-1026

Finding of No Significant Impact
Westinghouse Electric Corporation -- High-Temperature Solid Oxide Fuel Cell Generator Development Project

AGENCY: U.S. Department of Energy (DOE)

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: The DOE has prepared an Environmental Assessment (DOE/EA-0510) that analyzes the potential impacts for conducting

research, development, and testing of high-temperature solid oxide fuel cells/generators. Westinghouse would conduct the project at two existing facilities located in Churchill and Monroeville, Pennsylvania. Based on the analysis in the EA, DOE has determined that the proposed action is not a major Federal Action significantly affecting the quality of the human environment, within the meaning of the National Environmental Policy Act (NEPA) of 1969. Therefore, the preparation of an Environmental Impact Statement is not required and the Department is issuing this FONSI.

COPIES OF THE EA ARE AVAILABLE FROM:

Wennona A. Brown, Environmental Protection Specialist
Clean Coal Projects Division
Morgantown Energy Technology Center
P.O. Box 880
Morgantown, WV 26505
(304) 291-4294

FOR FURTHER INFORMATION CONTACT:

Carol Borgstrom, Director
Office of NEPA Oversight
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585
(202) 586-4600

BACKGROUND: The Department of Energy (DOE) proposes to enter into a 5-year cooperative agreement with the Westinghouse Electric Corporation for the development of high-temperature solid oxide fuel cell (SOFC) generators. The objective of the project is to advance the SOFC technology to the point of acceptable risk for private sector commercialization. The project would continue research and development (R&D) work conducted under a previous DOE contract. The proposed agreement would continue and broaden the scope of that effort by allowing for further technology R&D and testing activities.

The DOE has prepared this FONSI and the Environmental Assessment (EA) upon which the FONSI is based in compliance with the National Environmental Policy Act of l969 (NEPA), the President's Council on Environmental Quality (CEQ) regulations, and the DOE Guidelines implementing NEPA.

DESCRIPTION OF THE PROPOSED ACTION: The proposed project involves the use of solid oxide fuel cells as electrochemical devices to convert the chemical energy of a reaction directly into electrical energy. Gaseous fuels (usually hydrogen and/or various hydrocarbons) are fed continuously to the anode (negative electrode) and an oxidant (usually oxygen from air) is fed continuously to the cathode (positive electrode). Electrochemical reactions occur at the electrodes that result in the combination of oxygen and hydrogen (and/or carbon monoxide) to form water (and/or carbon dioxide) . This reaction involves

the transfer of electrons from the anode to the cathode through an external circuit that results in the production of electric power. The cells would be stacked in series or parallel configurations to build voltage and power, as appropriate, for various sizes of generators.

Under the proposed project, Westinghouse would conduct market and system analysis activities to identify user requirements and define technology development criteria. This information would guide the cell technology R&D activities, which include cost, performance, and scale-up improvements. Process development activities would also be conducted to support future commercial manufacturing requirements beyond this effort.

Generators of increasing size ranging from 25-kWe to l00-kWe (500-1,000 cells per unit) are planned for testing to demonstrate progression of the technology and establish commercial readiness. The overall project goal would be to improve cell performance, scale-up the technology, reduce cell fabrication costs, and aid in the testing of the technology

leading to demonstration capability.

All of the research, development, fabrication, and some test activities would be conducted at two currently permitted Westinghouse facilities located in the suburbs of Churchill and Monroeville, 12 and 17 miles respectively, east of downtown Pittsburgh, Pennsylvania. The majority of the R&D activities would be conducted at the Westinghouse Science & Technology Center (STC) in Churchill, PA. This facility is a multi-purpose

R&D laboratory built on a l50-acre site and currently has over l,200 employees. The remainder of the R&D and cell fabrication activities would be conducted at the SOFC Pre-Pilot Plant Manufacturing Facility (PPMF) located in Monroeville, PA. This 28,000 square foot manufacturing facility houses all the necessary equipment for the fabrication, assembly, and testing of solid oxide fuel cells/generators. The facility is capable of producing up to 10,000 cells per year.

ENVIRONMENTAL IMPACTS: Potential environmental impacts of the proposed action were analyzed for the two existing sites to be used. The project would not require any new construction, but it would involve minor modifications to equipment within the existing laboratory/manufacturing facilities. Analysis of air emissions, water effluent, and solid waste discharges for each site was conducted.

STC: The STC laboratory is a currently permitted R&D facility. The R&D work to be conducted at this facility would not generate any new air emissions and would be within the existing permit limits for, the facility. An estimated 100,000 gallons of water would be required for material and process R&D activities. A small amount of solid waste could be produced from the proposed bench-scale R&D; subsequent testing of the fuel cell would not produce solid waste. Water needed for the R&D activities is within the capacity readily available to the laboratory facility. The project would not present new solid or

liquid effluent contaminants in quantities above the capacity readily handled by the exiting, routine laboratory operating procedures.

PPMF: Work conducted at the PPMF facility would involve the use of electrochemical vapor deposition (EVD) process. In EVD, metal chlorides react in a humidified environment (reactor vessel) to form metal oxide coatings. The project associated gaseous emissions for the facility are nitrogen, oxygen, carbon dioxide, chlorine, and hydrochloric acid. The largest volume of emissions are attributed to elemental nitrogen (6,940,000 lbs/year) and oxygen (1,400,000 lbs/year). Water is also a chemical byproduct of the reaction. The Allegheny County Bureau of Air Pollution Control determined that, based on the calculated emissions, no air pollution control permits would be necessary for the operation of the PPMF.

A limited amount of wastewater, the main contaminant constituents of which are nickel and chromium, would be produced during the fabrication of the fuel cells. Quantities generated on a monthly average have been 0.19 mg/l of nickel and 0.005 mg/l of chromium, which are far below the federal categorical limits of 3.98 mg/l and 2.77 mg/l respectively. According to current practice, liquid waste streams are treated to remove regulated contaminants and the resultant supernatant liquor is released to the sewer. The small quantity of wastewater treatment sludge (nickel and chromium) and contaminated pump oil from the EVD (hazardous wastes) would be collected and temporarily stored in

separate drums. These would be shipped off site by a certified disposal service organization to a licensed disposal facility in accordance with Resource and Conservation Recovery Act (RCRA) regulations for a small quantity generator.

The environmental effects associated with the High-Temperature Tubular Solid Oxide Fuel Cell Generator Development Project with Westinghouse Electric Corporation have been reviewed. This project is expected to have no impact on noise levels, floodplains, wetlands, ecological resources, historic areas, or socioeconomic resources. Impacts on air quality, water quality, and solid waste management are expected to be minimal.

ALTERNATIVES CONSIDERED: Alternatives to the proposed action were considered in the EA. A "No Action Alternative" would result in continued operation of less efficient, higher environmentally impacting systems. There are no alternative sites that are adequate to conduct the proposed project. Westinghouse is the sole developer of tubular SOFCs in the world, thus, selection of an alternate site would involve duplicating the existing facilities at great expense and severely impact technology development progress. Potential alternate utility or industrial power generation technologies such as fossil-based molten carbonate fuel cells (MCFC) or gas turbine engine systems are at a similar stage of development as the SOFC. Selection of alternative technologies would delay or prevent availability of

the SOFC technology to provide clean and efficient electric power generation.

PUBLIC AVAILABILITY: Copies of the EA and the FONSI will be distributed to all persons and agencies known to be interested in or affected by the proposed action or alternatives including appropriate agencies within the State of Pennsylvania. Additional copies of the EA and FONSI are available on request from the DOE directly and from the Morgantown Energy Technology Center at the address given above.

DETERMINATION: The proposed action, the Westinghouse Tubular SOFC Generator Development Project, does not constitute a major federal action normally requiring the preparation of an environmental impact statement. Based on the analysis provided in the EA, DOE determines that this action will not significantly affect the quality of the human environment within the meaning of the National Environmental Policy Act, 42 U.S.C. 4321 et seq. Therefore, an Environmental Impact Statement is not required.

ISSUED IN WASHINGTON, D.C. ON _____, 1991.

Paul L. Ziemer, Ph.D
Assistant Secretary
Environment, Safety and Health

High-Temperature Solid Oxide Fuel Cell Generator Development Project Environment, Assessment and Fonsi Distribution List

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Allegheny Valley Hospital
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Mr. Paul W. Hess
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Mr. Gordon Kirkland, Jr.
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Arthur M. Tamilia

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December 16, l991

Dr. Robert F. Carline
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Dear Dr. Carline:

The U.S. Department of Energy (DOE) is entering into a cooperative agreement with the Westinghouse Electric Corporation

(Westinghouse) to continue the research, development, fabrication, and testing of solid oxide fuel cells/generators. The project, entitled ""High-Temperature Solid Oxide Fuel Cell Generator Development Project," would be conducted at two existing facilities owned by Westinghouse, which are located in the greater Pittsburgh, Pennsylvania metropolitan area. The first facility, Westinghouse Science and Technology Center, is located in Churchill, Pennsylvania. The second facility, Westinghouse Solid Oxide Fuel Cell Pre-Pilot Plant Manufacturing Facility, is located in Monroeville, Pennsylvania. The objective of the project is to further the development of the solid oxide fuel cells as an efficient, environmentally beneficial technology for future power generation.

The DOE has prepared an Environmental Assessment (EA) to analyze the potential environmental consequences of this proposed action and its alternatives. This EA has been prepared in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA), as amended (Public Law 91-190, 42 U.S.C. 4321, et.seq.), the Council on Environmental Quality regulations implementing the NEPA, and the DOE NEPA guidelines. Based on the analysis in the EA, DOE has determined that the High-Temperature Solid Oxide Fuel Cell Generator Development Project is not a major Federal Action significantly affecting the quality of the human environment, within the meaning of NEPA and; therefore, will have no significant environmental impacts.

A copy of the final EA and the Finding of No Significant Impact are enclosed for your information.

Sincerely,

Madhav R. Ghate
NEPA Compliance Officer

2 Attachments

United States Government Department of Energy
MEMORANDUM

DATE: December 30, 1991

REPLY TO
ATTN OF: METC/NCO

SUBJECT: Final Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the High-Temperature Solid Oxide Fuel Cell (SOFC) Generator Development Project

TO: James G. Randolph, Assistant secretary for Fossil Energy, FE-1, Forrestal

THRU: Paul Bailey, Acting Director, Office of Planning and Environment, FE-4, Forrestal

According to the directions given in Paul Ziemer's memorandum of November 5, 1991, the distribution letter and distribution list for the High-Temperature SOFC Generator Development Project EA and FONSI plus five copies of each document are attached.

Please forward these to Paul Ziemer, Assistant Secretary of Environment, Safety and Health. The distribution of these documents was completed on December 16, 1991, thus completing the National Environmental Policy Act process for the High-Temperature SOFC Generator Development Project.

A copy of the distribution list is attached for your file. I have also included three copies of the final EA and FONSI for your records.

If you have any questions, please call me at FTS 923-4511.

Thomas F. Bechtel
Director, METC

5 Attachments

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Index of Attachments
Attachment l, Letter to Paul Ziemer, 1 original
Attachment 2, Distribution Letter, 2 copies
Attachment 3, Mailing List, 2 copies
Attachment 4, Environmental Assessment, 8 copies
Attachment 5, Finding of No Significant Impact, 8 copies

2

Index of Attachments
Attachment 1, Distribution Letter, 1 copy
Attachment 2, Mailing List, 1 copy
Attachment 3, Environmental Assessment, 5 copies
Attachment 4, Finding of No Significant Impact, 5 copies

3

bcc w/attachments:
D. A. Berry
W. A. Brown
NEPA File 27.113

bcc w/o attachments:
R. A. Bajura
M. J. Mayfield
J. E. Notestein

Department Of Energy
MEMORANDUM

DATE :

REPLY TO
ATTN OF: METC/NCO

SUBJECT: Final Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the High-Temperature Solid Oxide Fuel Cell (SOFC) Generator Development Project

TO: Paul L. Ziemer, Ph. D., Assistant Secretary for Environment, Safety and Health, EH-1, Forrestal

According to the instructions in your memorandum of November 5, l991, five copies of the final EA and FONSI are attached for your records. I have also attached a copy of the distribution letter and distribution list for these documents. The distribution of these documents was completed on December l6, 1991, thus completing the National Environmental Policy Act process for the High-Temperature SOFC Generator Development Project.

If your have any questions, please do not hesitate to call.

James G. Randolph
Assistant Secretary for Fossil Energy

4 Attachments

cc w/o attachments:
J. C. Johnson, FE-4
M. R. Ghate, METC