

September 8, 1995

IG-1

INFORMATION:

Report on "Audit of Bonneville Power Administration's Energy Resource Programs"

The Secretary

BACKGROUND:

Bonneville Power Administration (Bonneville) was established to market and transmit hydroelectric power produced at the Bonneville Dam. Since then, Bonneville has acquired additional resources and, today, markets the power from 30 Federal dams and 1 non-federal nuclear plant in the Pacific Northwest. In April 1994, Bonneville entered into a 20-year contract to purchase the electrical output from a natural gas fired combustion turbine facility at a total cost of about \$2.2 billion. Bonneville's resource acquisitions were to be made only after its planning process showed that demand for its electricity would exceed its available resources. In addition, when acquiring new resources, Bonneville was responsible for securing contract terms which ensured that costs were as low as reasonably possible.

DISCUSSION:

We conducted the audit to determine if Bonneville was spending excessive amounts to purchase electricity from natural gas fired combustion turbine facilities. We found that Bonneville needed to renegotiate the contract and improve its acquisition process.

Bonneville contracted to purchase the output from a natural gas fired combustion turbine facility at excessive cost, and the electricity was not needed. This occurred because Bonneville's contract did not reflect current industry conditions and Bonneville forecasted its need for new energy resources based on incomplete data. As a result, Bonneville's cost of electricity from this resource will exceed its revenue by \$20.9 million in 1997; in addition, Bonneville's excess of costs over revenues will amount to \$146.8 million by 2001. Bonneville agreed with the finding and recommendations, and stated that it would no longer need the output of the combustion turbine and several other projects. Consequently, Bonneville has taken actions to renegotiate several resource acquisition contracts.

/s/

John C. Layton
Inspector General

Attachment

cc: Deputy Secretary
Under Secretary

**This document is an ASCII formatted version of a printed **
**document. The page numbers in this electronic version may **
**not be in the same order as the printed document. The **
**printed document may also contain charts and photographs **
**which are not reproduced in this electronic version. If **
**you require the printed version of this document, contact **
**the Office of Inspector General (IG-1), Department of **
**Energy, 1000 Independence Avenue, SW, Washington, D.C. **
**20585 or call Wilma Slaughter at (202) 586-1924. **

U.S. DEPARTMENT OF ENERGY
OFFICE OF INSPECTOR GENERAL

AUDIT OF BONNEVILLE POWER ADMINISTRATION'S
ENERGY RESOURCE PROGRAMS

The Office of Inspector General wants to make the distribution of its reports as customer friendly and cost effective as possible. Therefore, this report will be available electronically through the Internet five to seven days after publication at the following alternative addresses:

Department of Energy Headquarters Gopher
gopher.hr.doe.gov

Department of Energy Headquarters Anonymous FTP
vml.hqadmin.doe.gov

Department of Energy Human Resources and Administration Home Page
<http://www/hr.doe.gov/refshelf.html>

Your comments would be appreciated and can be provided on the Customer Response Form attached to the report.

This report can be obtained from the
U.S. Department of Energy
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, Tennessee 37831

Report Number: DOE/IG-0379 Western Regional Audit Office
Date of Issue: September 8, 1995 Albuquerque, New Mexico 87185

AUDIT OF BONNEVILLE POWER ADMINISTRATION'S
ENERGY RESOURCE PROGRAMS

TABLE OF CONTENTS

SUMMARY	1
PART I - APPROACH AND OVERVIEW	2
Introduction	2
Scope and Methodology	2
Background	3
Observations and Conclusions	4
PART II - FINDING AND RECOMMENDATIONS	6
Bonneville's Energy Resource Programs	6
PART III - MANAGEMENT AND AUDITOR COMMENTS	12
PART IV - OTHER MATTERS	15
APPENDIX A	16

U.S. DEPARTMENT OF ENERGY

OFFICE OF INSPECTOR GENERAL
OFFICE OF AUDIT SERVICES

AUDIT OF BONNEVILLE POWER ADMINISTRATION'S
ENERGY RESOURCE PROGRAMS

Audit Report Number: DOE/IG-0379

SUMMARY

The Bonneville Power Administration (Bonneville) must ensure that the costs of its contracts for energy resources are as low as reasonably possible and that the resources are needed. During the audit, we reviewed Bonneville's energy resource programs and focused on its purchase of electrical output from natural gas fired combustion turbines. The objective of this audit was to determine if Bonneville paid excessive costs to acquire the electrical output from combustion turbine facilities.

The audit showed that Bonneville contracted to purchase the output from a combustion turbine facility at excessive cost, and that the electricity was not needed. The cost of the electricity under this contract exceeded the amount of revenue Bonneville could obtain by selling it. Bonneville estimated it would operate the generation facility for only 6 months of the year; the contract, however, required Bonneville to pay the fixed costs of the facility during the other 6 months. Consequently, the cost of the electricity plus the fixed costs in the first year of the contract would exceed revenues by \$20.9 million. The contract also contained cost escalators that exceeded the rate of inflation. These cost escalators combined with the excessive initial cost resulted in projected excessive costs of \$146.8 million in the first 5 years of the contract. Finally, the contract was not needed due to competition from similar facilities and a desire by customers to diversify their sources of electricity.

Management agreed with the finding and recommendations and is pursuing options to renegotiate the contract.

(Signed)

PART I

APPROACH AND OVERVIEW

INTRODUCTION

In 1992, the Office of Management and Budget issued a memorandum outlining its concerns about Bonneville Power Administration's (Bonneville) energy resource programs. The memorandum stated that Bonneville's energy resource programs would unnecessarily increase Bonneville's costs and may have an adverse environmental impact. Despite these concerns, in April 1994, Bonneville entered into a 20-year contract to purchase the electrical output from a natural gas fired combustion turbine facility at a total cost of about \$2.2 billion. The objective of this audit was to determine if Bonneville was

spending excessive amounts to purchase electricity from natural gas fired combustion turbine facilities.

SCOPE AND METHODOLOGY

The audit was performed from August 15, 1994, to April 5, 1995. Information about energy resource programs and combustion turbine facilities was obtained from Bonneville, the Pacific Northwest Electric Power and Conservation Planning Council (Council), and public utilities commissions. In addition, we interviewed officials at Bonneville Headquarters and the Richland, Washington Field Office to determine reasonable costs for and projected outputs of Bonneville's generating resources. Meetings were also held with officials at the Council and public utilities commissions in Washington and Oregon to discuss requirements for building electricity generating facilities and to obtain information on those generating facilities planned for the region.

The audit focused on acquisitions of electrical output from natural gas fired combustion turbines. We reviewed Bonneville's electricity supply and demand data which was derived from Bonneville management reports and its utility customers as well as laws and regulations that governed Bonneville's energy resource acquisitions. In addition, we interviewed Bonneville's management to gain an understanding of procedures for forecasting and acquiring energy resources. Further, our analysis of Bonneville's costs for acquiring electrical output from combustion turbine facilities was compared to information on similar combustion turbine facilities owned by large, privately owned utilities because these utilities are in direct competition with Bonneville.

The audit was made according to generally accepted Government auditing standards for performance audits and included tests of internal controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. Accordingly, we assessed the significant internal controls which would minimize the cost of Bonneville's energy resource acquisitions. Our assessment consisted of reviewing the internal control procedures and practices used to forecast and acquire energy resources. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. We did not rely on computer generated data to satisfy the objective of this audit.

An exit conference was held with the Manager, Non-Federal Projects on July 10, 1995.

BACKGROUND

The Pacific Northwest Electric Power Planning and Conservation Act (Power Act) of 1980 was created to help ensure that the region (Washington, Oregon, Idaho, Montana, and Wyoming) had an efficient and adequate power supply. Bonneville, which provided about half the electricity in the region, was established to market and transmit hydroelectric power produced at the Bonneville Dam. Since then, Bonneville has acquired additional resources and, today, markets the power from 30 Federal dams and 1 non-federal nuclear plant in the Pacific Northwest. Bonneville's resource acquisitions were to be made only after its planning process showed that demand for its electricity would exceed its available resources.

In 1994, Bonneville entered into a 20-year contract to purchase all the electrical output from a large natural gas fired combustion turbine facility. Combustion turbines use a jet engine fueled by natural gas to power a generator. Natural gas fired combustion turbine facilities have become an attractive source of electricity for several reasons. Decreasing natural gas prices and recent improvements in the combustion turbine technology have made them more affordable. In addition, these facilities are desirable because they can generate electricity almost continuously, requiring only a few weeks downtime for maintenance annually. These facilities can also be constructed in about 2 years, which is quicker than the construction of most generating resources presently used in the region.

Large natural gas fired combustion turbines generate about 240 average megawatts (aMW) of electricity. The term aMW refers to a unit of electrical production over a year. It is equivalent to the continuous use of 1,000 kilowatts of energy for a year or 8,760,000 kilowatt hours. (A typical home in the Pacific Northwest consumes about 20,000 kilowatt hours of electricity per year.)

Although this facility could technically produce 240 aMW, Bonneville currently plans to operate the facility for 6 months per year, thus producing only 120 aMW. For the remaining 6 months, the facility's available extra capacity would allow Bonneville to charge higher rates for hydroelectric power that has historically sold for less. However, the timing and quantity of that hydroelectric power is uncertain, so it has historically been sold on the spot market as surplus. The excess capacity of the combustion turbine could be combined with this cheap hydroelectric power allowing Bonneville to sell the power on a firm contract at a considerably higher price.

OBSERVATIONS AND CONCLUSIONS

While the extra generating capacity made available by the new combustion turbine facility will increase revenues, the audit disclosed that Bonneville's costs will increase by an even greater amount. In the contract's first year, 1997, for example, Bonneville's revenues will be about \$49.1 million greater than if the turbine facility were not available. The contract, however, will require Bonneville to pay about \$70 million for the additional capacity. The net difference represents excessive costs of \$20.9 million in the first-year. Built-in annual cost increases that far exceed expected inflation rates will almost certainly produce additional excessive costs, perhaps as much as \$146.8 million by 2001. Moreover, excessive annual costs and increases will continue for the life of the 20-year contract. These excessive costs will occur because Bonneville signed the contract more than 2 years after completing most of its financial analyses and because it forecasted its need for this facility using incomplete data. During that 2-year period, market conditions had changed dramatically. These market changes made other low cost resources available to Bonneville's customers and caused some customers to reduce their demand for Bonneville's power.

We recommended that Bonneville base its future resource acquisition decisions on up-to-date analyses of expected project revenues and costs, and on comprehensive market analyses. This recommendation is especially important in light of Bonneville's Resource Contingency Programs which are options to purchase the output from five similar combustion turbine facilities. We also recommended that Bonneville continue to explore the possibility of renegotiating the current contract to achieve at least break-even terms. By implementing these recommendations, Bonneville's future

contracts should be more fiscally responsible. In addition, if Bonneville successfully renegotiates the current contract, at least some of the expected \$146.8 million in excessive costs could be avoided.

Bonneville has recognized the problems with its resource acquisition and is currently re-examining the contract. During the audit, Bonneville initiated a review of its energy resource acquisitions in an effort to cut costs. The officials who reviewed this contract agreed that the costs of the electricity will exceed the expected revenue. These officials are currently pursuing various options for renegotiating the contract.

Our finding relating to Bonneville's energy resource acquisitions disclosed material internal control weaknesses that management should consider when preparing its yearend assurance memorandum on internal controls.

PART II

FINDING AND RECOMMENDATIONS

Bonneville's Energy Resource Programs

FINDING

The Pacific Northwest Electric Power Planning and Conservation Act required that Bonneville Power Administration's contracts for the acquisition of needed resources contain terms and conditions that would ensure that costs were as low as reasonably possible. However, Bonneville contracted to pay excessive costs for electrical output that was not needed from a natural gas fired combustion turbine facility. This occurred because the terms of the contract did not reflect current industry conditions and Bonneville forecasted its need for new energy resources based on incomplete data. We estimated that in 1997, the first year of turbine operations, the cost of the electricity bought will exceed the revenue Bonneville can obtain from marketing it by \$20.9 million, and Bonneville's excess of costs over revenues will amount to \$146.8 million by 2001.

RECOMMENDATIONS

We recommend that the Administrator and Chief Executive Officer, Bonneville Power Administration:

1. Require that future resource acquisition decisions are based on up-to-date analyses of expected project revenues and costs;
2. Require, prior to the acquisition of future resources, current comprehensive market analyses, including a determination of resources planned for the region and their effect on the demand for Bonneville's electricity; and,
3. Attempt to renegotiate the terms of the contract so that the price paid for electrical output from the turbine facility does not exceed expected revenues from the sale of that electricity.

MANAGEMENT REACTION

Management concurred with the finding and recommendations, and began taking corrective actions. Part III of the report provides detailed management and auditor comments.

DETAILS OF FINDING

Bonneville is responsible for taking actions consistent with the Power Act. The Power Act was adopted to ensure that the Northwest had an efficient and economical power supply and authorized Bonneville to acquire energy resources to meet the region's needs. After receiving approval from the Pacific Northwest Electric Power and Conservation Planning Council and demonstrating compliance with applicable environmental regulations, Bonneville was allowed to enter into contracts to acquire additional electricity resources. However, the Power Act required that Bonneville's resource acquisition contracts contain terms and conditions ensuring that costs were as low as reasonably possible and that the additional power was needed.

CONTRACT TERMS

Bonneville contracted for electrical output from a natural gas fired combustion turbine facility at terms that were not as low as reasonably possible. The terms will, in fact, cause Bonneville to incur excessive costs in the first year and incur increasing amounts of excessive costs in future years. Furthermore, Bonneville did not need the additional electricity.

Electricity Costs and Fixed Costs

Contract terms required Bonneville to pay costs for electricity that exceeded expected revenues from selling that electricity. In 1997, Bonneville would pay approximately \$44 million for an estimated 120 aMW of electrical output from the combustion turbine facility over a 6-month period. At proposed 1996 rates, which we used to estimate 1997 rates, Bonneville would sell this electricity for about \$29.8 million. Operating costs for the 6-month period, therefore, would exceed revenues by \$14.2 million.

Additional excessive costs would be incurred during the estimated 6-month period when the turbine facility was not operating. During this period, the turbine facility's available extra capacity would allow Bonneville to charge higher, "guaranteed" rates for its hydroelectric power - power that is normally sold at lower rates because its availability is not entirely predictable. Accordingly, Bonneville concluded it could increase hydroelectric revenues by \$19.3 million, the difference between selling 120 aMW of hydroelectricity at guaranteed rates versus non-guaranteed rates. The turbine facility contract, however, required Bonneville to pay fixed costs of approximately \$26 million during the 6-month period. Bonneville's excessive costs during the period when the turbine facility would not operate, then, will total \$6.7 million.

Increasing Costs

Contract costs for electricity were unreasonably high in two ways. First, the contract contained an electricity cost escalator that averaged 5.2 percent per year -- about twice the rate of inflation -- during the first 5 years of the contract. Second, over the same 5-year period, the contract called for fixed costs to increase at about 6.4 percent per year. This fixed

cost escalator far exceeded economic inflation, as measured by the Consumer Price Index (CPI), which was only 2.4 percent when the contract was signed. The combination of the two factors caused electricity costs to be high in 1997 and increasingly escalate in future years.

Contract Not Needed

Bonneville did not need any of the electrical output from this facility because the demand for its electricity is decreasing. For example, Bonneville had about 130 utility customers and sold about 8,460 aMW of electricity in 1994. During the audit, however, seven of Bonneville's utility customers announced that they wanted to buy electricity from other suppliers. These seven customers purchased about 1,330 aMW of Bonneville's electricity (about 16 percent of sales) in 1994. In fact, two of the largest of these utility customers announced that they would buy about 215 aMW less from Bonneville in 1995. Furthermore, one independent power producer in the region recently offered 5-year contracts to sell electricity to five additional Bonneville customers at prices below Bonneville's guaranteed rates. Some of these customers were reportedly seeking to diversify their sources of electricity rather than continue the practice of relying primarily on a single source for all their electricity.

Bonneville's customers may also have wanted to avoid rising costs. In October 1993, Bonneville increased its rates by about 15 percent and, in October 1995, will again increase them by another 4 percent. These increases have brought Bonneville's rates to the point where they are roughly equivalent to those of the competition. Any future increase, therefore, would give even more of Bonneville's competitors a price advantage over Bonneville.

REASONS FOR INCURRING EXCESSIVE COSTS

Bonneville incurred these excessive costs because it neither revisited nor updated contract terms to reflect current industry conditions and trends before signing the contract. Industry conditions had changed significantly from the beginning of negotiations until the contract was signed. In addition, Bonneville's need for the facility was based on incomplete data because it did not identify the construction of similar facilities by competitors. To its credit, Bonneville has recognized that this contract contained excessive costs and has taken steps to renegotiate the terms.

Changes in Industry Conditions

Over 2 years passed from the beginning of negotiations until the contract was signed. According to management officials, Bonneville began negotiating the contract in 1991 and, in July 1992, issued a Letter of Intent to purchase the output of the generating facility. The Letter of Intent was necessary because, before Bonneville could sign the contract, it needed to obtain approval from the Council and demonstrate compliance with applicable environmental requirements. By April 1994, these actions were completed and Bonneville signed the 20-year power purchase contract with terms that were essentially unchanged since 1992.

Market conditions, however, had changed significantly. Electricity rates had decreased because natural gas fuel costs, which comprise about 66 percent of the costs of generating electricity, had decreased. Combustion

turbine facilities of this size use about 45 million cubic feet of natural gas per day. The market price for natural gas when Bonneville signed the contract was about \$1.65 per thousand cubic feet. At that time, industry analysts forecasted annual price increases of about 3 percent which would have resulted in natural gas prices of approximately \$1.80 per thousand cubic feet in 1997. However, Bonneville agreed to pay \$2.23 per thousand cubic feet in 1997, and agreed to escalate gas costs at an average rate of 5.5 percent during the contract's first 5 years. The following chart shows how the difference between the industry forecasts and Bonneville's contract affects costs:

INDUSTRY
BONNEVILLE

EXCESS COST

YEAR
FORECASTS
CONTRACT
DIFFERENCE
PER DAY

1997
\$1.80
\$2.23
\$0.43
\$19,350

1998
\$1.85
\$2.35
\$0.50
\$22,500

1999
\$1.91
\$2.48
\$0.57
\$25,650

2000
\$1.97
\$2.61
\$0.64
\$28,800

2001
\$2.03
\$2.76
\$0.73
\$32,850

If Bonneville had availed itself of these projections, it would have recognized that the contract prices were not as low as reasonably possible.

During the negotiation period, both electricity costs and fixed costs for combustion turbine facilities also decreased because of technological and production improvements. For example, combustion turbines became more efficient so that they used less natural gas and therefore, produced cheaper electricity. Additionally, from 1991 through 1994, the initial capital cost of a completed combustion turbine facility decreased by about 30 percent. Furthermore, economic inflation, as measured by the CPI, decreased from an average of 4.6 percent in 1990 and 1991 to about 2.4 percent in 1994.

Competition from Similar Facilities

Bonneville also did not fully consider the effect of its competitors' actions on the demand for its electricity. Bonneville's forecasts did not reflect the extent to which competitors were planning and building similar facilities. As combustion turbines became more affordable, large utilities and independent power producers planned and built their own generating facilities. These large utilities and independent power producers were also offering inexpensive electricity to Bonneville's customers. Bonneville, however, did not adequately account for five of these combustion turbine facilities which were either planned or under construction. Bonneville believed, for example, that one proposed facility had no customer for its electricity and, therefore, would not be built. However, we visited the construction site and found that the facility was, in fact, under construction.

Current Status

To its credit, Bonneville has recognized that the turbine facility contract contained excessive costs and is currently re-examining the contract. When Bonneville began negotiating in 1991, it anticipated an increasing demand for electricity throughout the region and expected to be the sole supplier of its customers' portion of those increases. During the audit, however, Bonneville came to realize that, as an electricity supplier, it had competition and its customers had choices. Accordingly, Bonneville officials acknowledged that Bonneville now needs to carefully consider how resource costs will affect electricity sales revenue. These officials agreed that the costs of the electricity from this facility will exceed the revenue it will generate and are currently pursuing various options for renegotiating this contract.

IMPACT OF THE COMBUSTION TURBINE FACILITY

Bonneville will pay excessive costs under this contract which will increase annually. In 1997, Bonneville will pay \$20.9 million in excessive costs. With annual electricity and fixed costs increasing 5.2 percent and 6.4 percent, respectively, these excessive costs will increase significantly. During the first 5 years of this contract, for example,

Bonneville will pay a total of \$146.8 million in excessive costs (see Appendix A). Also, as shown below, Bonneville will incur excessive costs for the duration of this 20-year contract.

Bonneville initially agreed with our recommendation to renegotiate the contract so that the cost of the combustion turbine facility did not exceed the revenues produced by it. However, as conditions changed and Bonneville became aware of the magnitude of its load loss, a decision was made that the output of the combustion turbine was no longer needed and that price was not the issue.

PART III

MANAGEMENT AND AUDITOR COMMENTS

Bonneville management agreed with our recommendations and the estimated monetary impact of the report. Management's comments and our responses follow.

COMMENTS ON RECOMMENDATIONS

Recommendation 1. Require that future resource acquisition decisions are based on up-to-date analyses of expected project revenues and costs.

Management's Comments. Management concurred. Bonneville said that effective immediately, it required a comprehensive cost-benefit analysis process for all new resource purchases that includes a forecast of expected market conditions. If there is a significant time period between initiating contract negotiations and signing contracts, the original assumptions will be revisited prior to entering into the contract to determine whether the projects remain cost-effective.

Auditor Comments. Management was responsive to our recommendation.

Recommendation 2. Require, prior to the acquisition of future resources, current comprehensive market analyses, including a determination of resources planned for the region and their effect on the demand for Bonneville's electricity.

Management's Comments. Bonneville concurred and stated that they now require a comprehensive cost-benefit analysis process for all new resource purchases that includes a forecast of expected market conditions. If there is a significant time period between initiating contract negotiations and signing contracts, the original assumptions will be revisited to determine whether the projects remain cost-effective.

Auditor Comments. Management was responsive to our recommendation.

Recommendation 3. Attempt to renegotiate the terms of the contract so that the price paid for electrical output from the turbine facility does not exceed expected revenues from the sale of that electricity.

Management's Comments. Management concurred. Bonneville initially notified the developer and other project developers that it was interested in renegotiating price to reduce the costs of the project to bring it more in line with current market realities in the manner in which you recommend. However, as conditions changed and we became aware of the magnitude of load loss and the new constraints on firming non-firm energy we were forced to revisit our decision.

As a result, a decision was made that Bonneville could no longer use the output of the projects and that price was not the issue. On the basis of these new facts we have taken more drastic action than your recommendation on the Project.

Due to the potential for litigation, we are unable to provide a more detailed response to this recommendation.

Auditor Comments. Management was responsive to our recommendation.

Monetary Impact

The report states that Bonneville would incur about \$146.8 million in excessive costs during the first 5 years of this contract if the contract had proceeded without change.

Management's Comments. Bonneville agreed that the assumptions used in the report were reasonable. However, the exact amount depends on specific assumptions. Bonneville's cost savings as a result of its recent action will not be known until either a settlement or litigation is concluded.

Comments on the Report

Bonneville Power Administration would like to state for the record that management began a review of all its acquired generating resources in late January and began discussions with the developer's management shortly thereafter.

Although Bonneville did not perform a new analysis prior to signing the combustion turbine contract, we were receiving proposals under our Resource Contingency Program at the time the contract was signed and these proposals were comparable in price as analyzed by Bonneville. It is now our goal that all new resources should provide a small positive margin for Bonneville.

As you note in your report, there was a period of more than two years between the start of negotiations until the contract was signed. During this period Bonneville was statutorily required to: (a) obtain approval for the project from the Northwest Power Planning Council as our intent was to be in accordance with the Council's resource plan and load forecasts; and (b) to obtain environmental approval under NEPA. Bonneville has a statutory requirement to meet the load growth of its customers, and the project was contracted for this purpose. Although the cost of the project was more expensive than Bonneville's priority firm rate, it was our position that the cost could be averaged with the cost of hydropower generation and our rates would have remained among the lowest cost sources of firm power in the region. During the period since this contract was signed, market conditions for Bonneville have gone through what is probably the most dramatic change in the Agency's history. However, shortly after the power purchase agreement was signed, both natural gas prices and the cost of combustion turbines began a dramatic and unexpected decline and resources became available to Bonneville's customers at prices even lower than Bonneville's priority firm rate. As a result, a number of Bonneville's customers have transferred their power purchases to these less expensive resources, reducing the total load on Bonneville and eliminating the need for new resources. In addition, the most

recent Biological Opinion has severely constrained Bonneville's ability to firm non-firm energy as it had planned to do with the project.

As you recommend, we now require a comprehensive cost-benefit analysis process for all new resource purchases that includes a forecast of expected market conditions. If there is a significant time period between initiating contract negotiations and signing contracts, the original assumptions will be revisited prior to entering into the contract to determine whether the projects remain cost-effective.

PART IV

OTHER MATTERS

Cost of Environmental Effects

The Office of Management and Budget expressed concern in its 1992 memorandum that Bonneville's energy resource programs, which relied on natural gas fired generation, could have an adverse environmental impact. Natural gas fired combustion turbines may harm the environment because they emit potentially hazardous substances such as methane, carbon dioxide, nitrogen oxides, and sulfur dioxide. Also, both carbon dioxide and nitrogen oxides are greenhouse gases; some scientists believe that increases in greenhouse gases are leading to global warming. Bonneville's combustion turbine will release approximately 432,000 tons of carbon dioxide assuming it operates for only six months a year.

Carbon dioxide may soon be taxed or regulated to mitigate the environmental damage it causes. Industry officials stated that a "carbon tax" could be imposed on carbon dioxide emissions. Accordingly, these industry officials estimated that, for planning purposes, an additional \$10 to \$40 per ton of carbon dioxide emissions should be added to the cost of combustion turbine facilities. Even at \$10 per ton, Bonneville could pay an additional \$4.3 million in unnecessary costs annually for taxes or mitigation expenses on carbon dioxide emissions.

APPENDIX A

EXCESSIVE COSTS

Bonneville will pay excessive costs of about \$20.9 million in 1997 for output from this combustion turbine facility. The contract's high natural gas prices will lead to electricity costs of about \$.042 per kilowatt hour in 1997. Bonneville, however, can only sell this electricity for its guaranteed rate of about \$.028 per kilowatt hour. These costs per kilowatt hour equate to total costs of about \$44 million for electricity that can be sold for about \$29.8 million; the net effect of this transaction is excessive costs of \$14.2 million in 1997. In addition, the requirement to pay fixed costs of about \$.025 per kilowatt hour in order to sell hydroelectricity for an additional \$.018 per kilowatt hour equates to fixed costs of about \$26 million and offsetting hydroelectric revenues of \$19.3 million; the net effect is an additional \$6.7 million in excessive costs. Therefore, total excessive costs will equal \$20.9 million in 1997. With annual cost increases, Bonneville will pay a total of about \$146.8 million in excess costs during the first 5 years as shown below.

Electricity Costs in Millions

COSTS FOR

6 MONTHS &
REVENUES AT
EXCESSIVE

INCREASING
GUARANTEED
COSTS FOR

AT 5.2 %
RATES
6 MONTHS

1997
\$44.0
\$29.8
\$14.2

1998
\$46.3
\$29.8
\$16.5

1999
\$48.7
\$29.8
\$18.9

TOTAL

2000
\$51.3
\$29.8
\$21.5

ELECTRICITY

2001
\$54.0
\$29.8
\$24.2

AND FIXED

COSTS

Fixed Costs in Millions

\$20.9

COSTS FOR

\$24.9

6 MONTHS &
INCREASED
EXCESSIVE

\$29.1

INCREASING
REVENUES
COSTS FOR

\$33.6

AT 6.4%
FOR HYDRO
6 MONTHS

\$38.3

1997
\$26.0
\$19.3
\$ 6.7

\$146.8

1998
\$27.7
\$19.3
\$ 8.4

1999
\$29.5
\$19.3
\$10.2

2000
\$31.4
\$19.3
\$12.1

2001
\$33.4
\$19.3
\$14.1

IG Report No. DOE/IG-0379____

CUSTOMER RESPONSE FORM

The Office of Inspector General has a continuing interest in improving the usefulness of its products. We wish to make our reports as responsive as possible to our customers' requirements, and therefore ask that you consider sharing your thoughts with us. On the back of this form, you may suggest improvements to enhance the effectiveness of future reports. Please include answers to the following questions if they are applicable to you:

What additional background information about the selection, scheduling, scope, or procedures of the audit or inspection would have been helpful to the reader in understanding this report?

What additional information related to findings and recommendations could have been included in this report to assist management in implementing corrective actions?

What format, stylistic, or organizational changes might have made this report's overall message more clear to the reader?

What additional actions could the Office of Inspector General have taken on the issues discussed in this report which would have been helpful?

Please include your name and telephone number so that we may contact you should we have any questions about your comments.

Name_____

Date _____

Telephone_____

Organization_____

When you have completed this form, you may telefax it to the Office of Inspector General at (202) 586-0948, or you may mail it to:

Office of Inspector General (IG-1)
Department of Energy
Washington, D.C. 20585
ATTN: Customer Relations

If you wish to discuss this report or your comments with a staff member of the Office of Inspector General, please contact Wilma Slaughter at (202) 586-1924.

-2-

16