



Enterprise Risk Management at Bonneville Power Administration

Case study
Reference no 308-191-1

This case was written by Assistant Professor Harvey B Lermack, Philadelphia University. It is intended to be used as the basis for class discussion rather than to illustrate either effective or ineffective handling of a management situation. The case was compiled from published sources.

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June 23, 2008

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The case is based on publicly available information.

Background

Bonneville Power Administration (BPA) is a self-financed governmental agency headquartered in Portland, Oregon.

The agency was established in 1937 by the Bonneville Project Act as an agency of the Department of the Interior. The objectives were to market the newly available power from the Bonneville and Grand Coulee Dams, and as a result to stimulate economic development in the Pacific Northwest region of the United States. Responsibility for the BPA was transferred to the Department of Energy in 1977.

The Act establishes the position of Administrator to direct the agency, and gives that person broad authority to acquire and market power; construct transmission lines and substations; acquire property; enter into contracts; and in general to approve and conduct all activities required to "... encourage the widest possible use of all electric energy that can be generated and marketed and to provide reasonable outlets therefore, and to prevent the monopolization thereof by limited groups ...".¹ The current Administrator, Stephen Wright, reports directly to the Secretary of Energy.

As a governmental agency, BPA has no shareholders, Board of Directors or other governance mechanisms that are in place in for-profit organizations. Governance oversight comes from the Department of Energy and from Congress.

According to the Records of the Bonneville Power Administration, the functions of the BPA are as follows:

"Distributes and sells hydroelectricity generated by Bureau of Reclamation and U.S. Army Corps of Engineers dams along the Columbia River and its tributaries.

Administers energy conservation, renewable resource development, and fish and wildlife enhancement provisions of the Pacific Northwest Electric Power Planning and Conservation Act of 1980.

Implements the Columbia River Treaty, in cooperation with the Corps of Engineers."²

The BPA Vision and Mission statements are shown in Exhibit 1.

The organization chart is shown in Exhibit 2.

Economic Activity

While the BPA is subject to congressional oversight, it receives no appropriation from Congress. Rather, the BPA funds its activities through sales of power that is generated by entities in the Federal Columbia River Power System. These include power generated at 31 federal dams, one nonfederal nuclear power plant, and other nonfederal power generation facilities.

Specifically, BPA markets electricity and transmission services to public and private utilities, and some large industries, throughout all of Idaho, Oregon and Washington states, and in parts of California, Idaho, Montana, Nevada, Utah, and Wyoming. A summary of their customers is Exhibit 3.

According to BPA, they provide about 40-50% of the electricity consumed in the Pacific Northwest. See Exhibit 4 for a diagram of the Columbia River system.³

At times, the Columbia River system may generate excess electricity not required by their current customers, and may then market that electricity to customers outside the region.

¹ "Bonneville Project." August 20, 1937. <<http://www.usbr.gov/power/Legislation/bonnevil.pdf>>

² "Records of the Bonneville Power Administration." The National Archives. 1936-71. <<http://www.archives.gov/research/guide-fed-records/groups/305.html#305.1>>

³ "About BPA." Bonneville Power Administration. August 27, 2007. <http://www.bpa.gov/corporate/About_BPA/>

The agency does borrow money from the U. S. Treasury. However, it repays all such borrowing with interest.

See BPA's 2006 Financial Results in Exhibit 5.

Despite its governmental status, BPA is not a monopoly. It must compete in the marketplace against other companies. On the other hand, because of its governmental, non-profit status, the agency enjoys a potential advantage in that it has no requirement to provide a return to the shareholders, as do its for-profit competitors. The BPA annual budget is reviewed and approved by Congress.

Benefits of the Agency

BPA cites the following benefits from its activities:

“Because BPA markets energy and transmission at cost, rather than at market prices, it has traditionally provided some of the lowest cost electricity in the nation. This low-cost power has been a cornerstone of the Northwest economy, stimulating growth and new jobs.

BPA also funds measures to protect and enhance fish and wildlife populations affected by hydropower development.

In addition, the agency provides a number of public benefits including incentives for energy conservation programs and research and development of renewable resources and promising technologies, such as fuel cells. BPA also works with other federal agencies to coordinate operations of the Federal Columbia River Power System to ensure maximum efficiency in the system and minimum environmental impacts.”⁴

Power Deregulation and the California Crisis

In 1996, California was the first state to deregulate its electric industry.

“The California Assembly voted unanimously in 1996 to deregulate the state's electric industry and to dismantle what it considered a government-regulated monopoly. The state created incentives for the utilities to sell their generating plants to unregulated private companies. They were required to transfer operational control of transmission lines and power grids to a private nonprofit organization. But they retained control and ownership of the distribution system.”⁵

This meant that the electric utilities sold their power generation activities, and were then forced to buy power back on the open market at current competitive prices.

While the objective was to reduce energy prices to Californians, which was initially achieved, the prices soon turned upward due to competitive conditions in adjoining states and the entry of companies into the deregulated marketplace.

Additionally, new and innovative competitive initiatives by these new market participants began to upset the supply and demand balance within the marketplace.

During 2000, high levels of power demand required the utilities to seek sources of additional power. This offered significant opportunities for the new market competitors to raise prices substantially. However, the utilities were unable to pass the increased costs to their customers, resulting in significant financial repercussions. The most significant blow was a series of rolling blackouts throughout the state in order to preserve the limited available electricity.

This period had significant direct and indirect impacts on BPA's financial situation.

⁴ About BPA.” Bonneville Power Administration. August 27, 2007.
<http://www.bpa.gov/corporate/About_BPA/>

⁵ “Deregulating California’s Electric Utilities.”
<<http://www.cnn.com/SPECIALS/2001/power.crisis/comp.html>>

Impacts on BPA and Trigger for Enterprise Risk Management at BPA

Customers of BPA may contract for any volume of power they require. After the collapse of some independent operators in the energy marketplace during the early 2000's, customers were attracted back to BPA. However, two events occurred almost simultaneously that impacted BPA's ability to service those contracts.

First, the California market began to disintegrate, due to the failure of certain market participants. Second, a drought during 2001 in the Pacific Northwest caused the supply of electricity from Columbia River hydroelectric facilities to be highly constrained.

As a result, the financial results were significantly impacted.

At about the same time, scandals throughout American industry resulted in passage of the Sarbanes – Oxley legislation. Although this legislation did not directly impact BPA as a governmental agency, as with many other American organizations it acted as a trigger, so that BPA began to look more closely at the need to improve overall governance practices, including the use of ERM.

ERM at Bonneville Power Administration

BPA Takes Action to Establish Risk Management Organization

BPA Administrator Stephen Wright summarized the impact of this situation in the agency's 2002 Annual Report.

“In the broader area of risk, it is abundantly clear that the entire industry has changed in ways no one anticipated. Up until two or three years ago, a hydro-based utility system such as BPA appeared to have a limited number of readily identifiable risks – primarily water conditions. Our power supply is free by highly variable. The continuing West Coast energy crisis demonstrates that no one in the electric utility industry has fully understood the ramifications of wholesale industry restructuring made possible by the National Energy Policy Act of 1992.

We realized that we have to broaden our view of what constitutes risk ... including operations, market, credit, regulatory, cyber and physical. Those risks have also taken business concerns and regional responsibilities into account. We will soon produce a decision document on organizing and running our efforts to better manage risks of all kinds.”⁶

BPA took action to determine how to proceed to improve their operations. A task force was appointed to review the recent and changes to the business environment.

As a result, an Internal Management Plan was published as a roadmap to implement ERM. The Plan established several organizational components, including:

- Enterprise Risk Management Committee (ERMC) – Their objective was to effectively aggregate the various key risks faced by the BPA, and to understand their overall impact on the organization.
- Transacting Risk Management Committee (TRMC) – Their objective was to move the trading function toward industry best practices.
- Office of the Chief Risk Officer – Including a new post of Chief Risk Officer, as well as staff positions, their role was to advance implementation of ERM throughout the organization.
- Middle Office for Transacting Risk – This group, reporting to the CRO, was established to oversee and confirm that risk management processes and procedures are being followed.
- Credit Risk Management.

⁶ “2002 Annual Report of the Bonneville Power Administration.”
<http://www.bpa.gov/corporate/Finance/A_Report/02/ar2002.pdf>

Implementing Enterprise Risk Management

Once the decision was made to implement ERM at Bonneville, the team went about identifying the key implementation processes and behaviors that needed to be developed in order for the initiative's success. They identified certain "generic" change management issues, as well as certain items that were unique to successful implementation of ERM initiatives, as identified by the experiences of others.

Standard Model and Terminology

BPA decided to adopt the popular Australia / New Zealand model ⁷ as their roadmap.

The first task was to teach everyone in the newly formed Risk Management Department to understand the new model and the terminology, which took about a year. Then, they set about educating the rest of the organization in the same way.

The team promptly recognized that the ERM initiatives would require not only technical knowledge, but would also require a change in the organizational culture to accept the concept of making risk-adjusted decisions that take into consideration their impact on stakeholder value.

Key Risks

Based on their reviews, the teams identified the key risks facing BPA.

The Market Risks outlined in the 2006 Annual Report are reproduced as Exhibit 6.

Finally, the overall business risk environment within which the agency operates is Exhibit 7.

⁷ "Australia / New Zealand Standard 4360:2004: Risk Management."
<<http://www.riskmanagement.com.au>>

Exhibit 1. BPA Vision and Mission Statements

BPA Vision

BPA will be an engine of the Northwest's economic prosperity and environmental sustainability. BPA's actions advance a Northwest power system that is a national leader in providing:

- High reliability
- Low rates consistent with sound business principles;
- Responsible environmental stewardship; and
- Accountability to the region.

We deliver on these public responsibilities through a commercially successful business.

BPA Mission

The Bonneville Power Administration's mission as a public service organization is to create and deliver the best value for our customers and constituents as we act in concert with others to assure the Pacific Northwest:

- An adequate, efficient, economical and reliable power supply;
- A transmission system that is adequate to the task of integrating and transmitting power from federal and non-federal generating units, providing service to BPA's customers, providing interregional interconnections, and maintaining electrical reliability and stability; and
- Mitigation of the Federal Columbia River Power System's impacts on fish and wildlife.

BPA is committed to cost-based rates and public and regional preference in its marketing of power. BPA will set its rates as low as possible consistent with sound business principles and the full recovery of all of its costs, including timely repayment of the federal investment in the system.

Source: "BPA Fast Facts."

<http://www.bpa.gov/corporate/about_BPA/Facts/FactDocs/BPA_Facts_2005.pdf

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Exhibit 3. BPA Customers

Cooperatives	57
Municipalities	41
Public Utilities Districts	29
Federal Agencies	7
Investor-owned utilities	6
Direct-service industries	5
Port district	1
Tribal	1
Total	147
Power marketers	36
Transmission customers	376

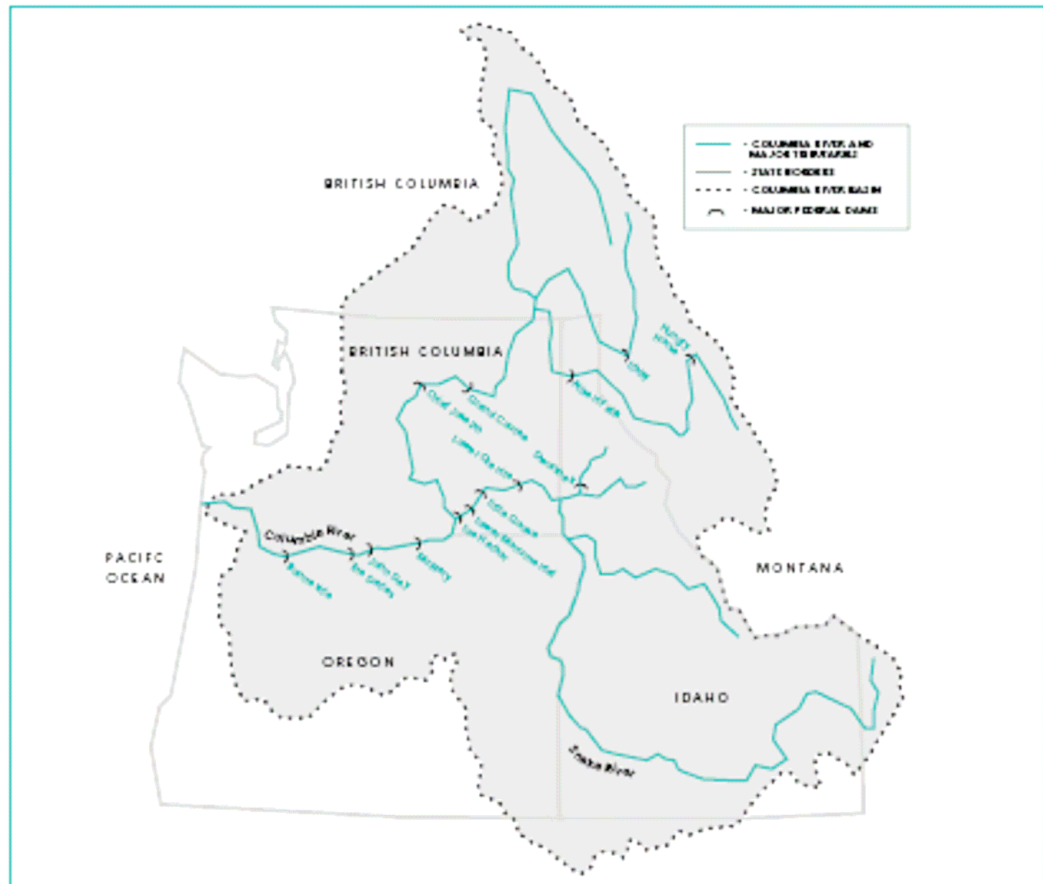
Source: "BPA Fast Facts."

<http://www.bpa.gov/corporate/about_BPA/Facts/FactDocs/BPA_Facts_2005.pdf>

Exhibit 4. Columbia River System

The Columbia River Basin

Major Federal Dams



The Columbia drains 258,500 square miles in the United States and Canada.

Source: "The Columbia River System Inside Story".

<www.bpa.gov/corporate/Power_of_Learning/docs/columbia_river_inside_story.pdf

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Exhibit 5. BPA 2006 Financial Results

Revenues by Customer Class

Federal Columbia River Power System
For the years ended Sept. 30 — thousands of dollars

	2006	2005	2004
Sales of electric power:			
Sales within the Northwest region			
Northwest publicly owned utilities	\$1,711,889	\$1,717,063	\$1,737,895
Direct-service industries	80,021	82,454	92,424
Northwest investor-owned utilities	502,601	390,511	363,201
Sales outside the Northwest region			
Bookouts	(220,911)	(238,847)	(212,155)
Total sales of electric power	2,765,108	2,551,946	2,470,428
Transmission	641,132	527,383	535,936
Other revenues	(63,224)	131,054	114,547
U.S. Treasury credits for fish	76,353	57,700	77,000
Total operating revenues	\$3,419,369	\$3,268,083	\$3,197,911

Source: "Bonneville Power Administration 2006 Annual Report."
<http://www.bpa.gov/corporate/Finance/A_Report/06/AR2006.pdf>

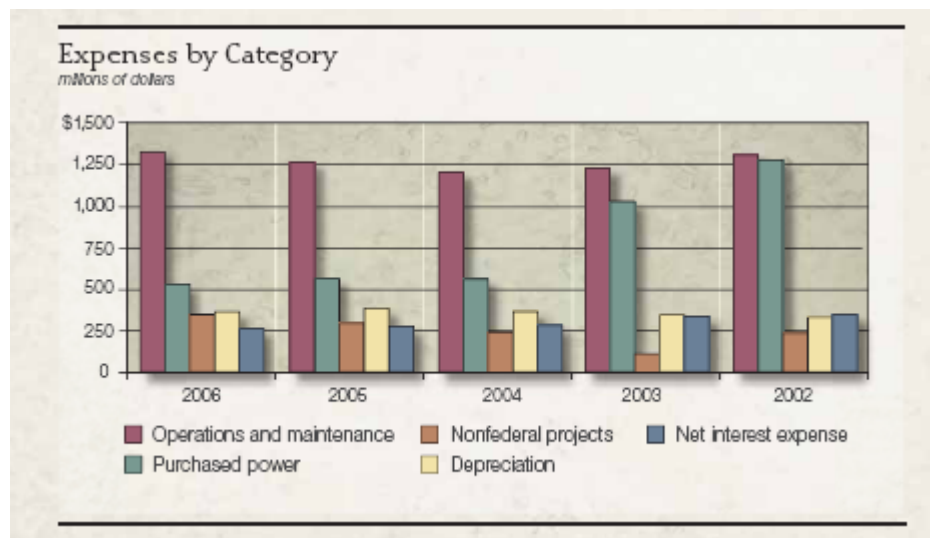


Exhibit 6. BPA's Market Risk

Market Risk

Risk Management

BPA's Transacting Risk Management Committee has responsibility for the oversight of market risk and determines the risk policy and control environment at BPA. Experienced business and risk managers use the results of the hydro supply scenario and simulation analyses and the market price risk measures in conjunction with their professional judgment to capture additional market-related risks, including credit and event risk.

Due to both the operational risk posed by fluctuations in river flows affecting the hydro-electric generation supply capability and the commodity price risk, net revenues effects from underlying surplus or deficit energy positions are inherently uncertain.

Commodity Price Risk and Volumetric Risk

Primarily due to the periodic variation in the available energy from its hydroelectric generation capacity, BPA enters into short-term and forward sales and purchase agreements for electricity in the wholesale markets to balance its energy supply and demand. Fluctuations in the electric market prices in the Pacific Northwest can affect the value of energy inventory being bought and

sold as well as the value of prior purchase and sale contracts. This is referred to as commodity price risk. In fiscal year 2006, there was a net surplus and sale of energy, which was in excess of that needed to serve firm load obligations in the region.

BPA measures the market price risk in its portfolio on a daily, weekly and monthly basis using net revenue at risk (NRaR), mark-to-market, value at risk (VaR), Monte Carlo simulation and other methodologies depending on the portfolio segment in question. The quantification of market risk using these methods provides a consistent measure of risk across the energy market in which BPA buys and sells. The use of these methods requires a number of key assumptions including hydro/price correlations, the selection of a confidence level for expected losses, the holding period for liquidation and the treatment of risks outside the methodology, including credit risk and event risk. These methods provide an estimate of reasonably possible net revenue outcomes that could be recognized on its portfolios assuming hypothetical movements in future market prices. In response to market price risk, futures, forwards, swaps and options may be used to alter BPA's exposure to price fluctuations.

Besides using market price risk measures, BPA measures the effects of volumetric risk using both scenario analysis and Monte Carlo simulation to estimate the economic impact of a sudden change in supply or price. Unlike many of its industry counterparts, BPA's principal market activity is the sale of surplus inventory rather than the purchase and sale of electricity

Source: "Bonneville Power Administration 2006 Annual Report."
<http://www.bpa.gov/corporate/Finance/A_Report/06/AR2006.pdf>

Exhibit 6. BPA's Market Risk (Continued)

to earn trading revenues. Therefore, the tests critical to trading organizations (i.e., amount of risk to carry over very short time frames) are considered less important than regular and rigorous analysis of the consequences of a range of hydro supply conditions and prolonged holding periods.

Credit Risk

Credit risk relates to the risk of loss that might occur as a result of non-performance by counterparties of their obligations to make or take delivery of electricity. BPA's counterparties are generally large and stable and do not represent a significant concentration of credit risk. During fiscal year 2006, BPA experienced no significant losses as a result of any customer defaults or bankruptcy filings. Credit risk is mitigated at BPA by reviewing counterparties for creditworthiness, establishing credit limits, and monitoring credit exposure on a daily basis, and performing Credit Value at Risk (CVaR) measurements for forward power transactions on a weekly basis. In order to further manage credit risk, BPA obtains credit support such as letters of credit and third-party guarantees from some counterparties. Counterparties are monitored closely for changes in financial condition and credit reviews are updated regularly.

At Sept. 30, 2006, BPA had \$79.7 million in credit exposure to purchase and sale contracts taking into account netting rights. BPA uses internally developed, commercially appropriate rating methodologies, credit scoring models, publicly available information and external ratings from major credit rating agencies to determine the public rating equivalent grade of counterpar-

ties. At Sept. 30, 2006, BPA's credit exposure, net of collateral, to sub-investment grade counterparties was less than 1 percent of total outstanding credit exposures. The agency's top five credit exposures were \$63.2 million, or 80 percent, of the total credit exposure. The majority of this exposure is mark-to-market exposure arising from a term transaction with an "A" rated municipality with ratemaking authority.

Interest Rate Risk

BPA does not issue variable rate debt to the U.S. Treasury and is not exposed to substantive risk resulting from changes in interest rates as a result of its backing of the variable-rate debt issued by Energy Northwest. Of the \$758 million of Energy Northwest variable rate debt outstanding at Sept. 30, 2006, \$500 million has been effectively swapped into fixed rate debt as described in Note 1, Summary of Significant Accounting Policies. Under these swap agreements, BPA pays the counterparties a fixed rate and receives a variable rate which is 68 percent of LIBOR. Although not a perfect match, the amount BPA receives is intended to offset the variable rate paid on the \$500 million in bonds issued by Energy Northwest. The remaining variable rate debt of approximately \$258 million is partially matched against variable rate assets.



Exhibit 7. BPA Business Risk Framework

Strategic	Operational		Financial
<p>Customer Demand Competitors Economy Fuel Switching New Technology</p> <p>Reputation Customer Favoritism Excessive Outages Service Quality Fraud</p> <p>Competitiveness Skill Deficit Fixed Cost Lack of Investment Business Model</p> <p>Political Environment State Regional Federal Loss of Allies</p>	<p>Generation and Transmission Owned Asset Failure 3rd Party Asset Failure Availability</p> <p>IT and Systems Design Flaws Poor Implementation Data Loss Data Hacking Analysis & Decision Systems</p> <p>Human Performance Manual Process Errors Skill Deficits Loss Key Employees Unethical Behavior</p> <p>Administrative Processes Unrealistic Budget Internal Reporting Error External Reporting Error Errors in Reports to Mgt Lack of Clear Mgt Dir. Inadequate Emergency Preparedness</p>	<p>Suppliers Supplier Performance Supply Market Cost Increases</p> <p>Energy Trading Prohibited Transactions Errors in Tracking Trading or Risk Mgt Models</p> <p>Transmission Marketing Prohibited Transactions Errors in Inventory Mgt. Scheduling System Failure</p>	<p>Financial Markets Interest Rates & Liquidity</p> <p>LT Energy Prices & Liquidity Bulk Power Gas Coal Nuclear Fuel Other Fuel</p> <p>ST Energy Price & Liquidity Bulk Power Gas Coal Nuclear Fuel Other Fuel</p> <p>Credit Customer Default Supplier Default</p> <p>Liquidity Own Credit Rating Margin Calls Access to Capital</p>

Source: "An Introduction to Enterprise Risk Management." Presented by Roy Fox, Enterprise Risk Manager, at RIMS 2007 Education Day, June 6, 2007.

Exhibit 7. BPA Business Risk Framework (Continued)

Regulatory/Legal	Hazards
<p>Regulatory New Environmental Rules New System Rules New Accounting Rules New Taxes New Governance Rules</p> <p>Contractual Counter Party Performance Counter Party Liability Inappropriate Contracts BPA Failure to Perform</p> <p>Compliance Regulations Environmental Reqmts. Debt Covenants Security Reqmts.</p> <p>Governance Governance Protocols</p>	<p>Acts of Nature (fire, flood, storm, earthquake, etc.) Harm to People Harm to Equipment Business Interruption Customer Outages</p> <p>Accidents Harm to People Harm to Environment Harm to Equipment Business Interruption Customer Outage</p> <p>Theft, Vandalism, Assault, Terrorism Theft Harm to People Damage to Equipment Business Interruption Customer Outage</p>