

Bonneville Power Administration  
Power Inventory Risk Management  
Risk Assessment

November 11, 2002  
Draft Copy

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**EXECUTIVE SUMMARY****BUSINESS ENVIRONMENT**

BPA is a federal agency under the Department of Energy. The agency markets energy from 31 federal hydro projects, one non-federal nuclear plant and several other smaller non-federal power plants. BPA is a self-funding agency that covers its costs by selling power wholesale to the region's public utilities, municipalities, investor-owned utilities and some large industries. Power is also sold or exchanged with utilities in Canada and the western US. Facility owners develop operating requirements based on power and non-power uses, and BPA schedules and dispatches power within these limits. BPA is dedicated to providing public service and, as a consequence, keep rates low by selling to customers at cost.

Several aspects of BPA's situation have significant implications for the agency's business model. These include:

- BPA is a largely hydroelectric-based system. The resources have limited storage, so the implications of inflow uncertainty are significant, and the agency has limited ability to transfer water from one period to another in order to mitigate risks.
- BPA has significant fisheries obligations that restrict the use of storage and are subject to change, largely outside of BPA's control.
- BPA serves the public purpose. BPA is obligated to serve as much load as its public customers ask BPA to serve. Sales to customers are at cost or according to schedules that have a cost based upper limit. BPA does not therefore pursue all economic opportunities.
- BPA is not responsible to a clearly defined single group of *shareholders*, who share a single common objective. Rather, it is responsible to multiple groups of *stakeholders*, mediated through a variety of political processes. As a consequence of the enabling statutes the agency does not have a board of directors. This agency governance structure presents some challenges with respect to governance for the risk infrastructure.

Notwithstanding these features that make BPA different from other energy transacting companies, there are many aspects of a commodity transacting and risk management infrastructure that are relevant to BPA's situation. Except in a few areas, the risks associated with a transacting function that BPA needs to manage are substantially the same as the risks managed by other energy companies. The principles of risk management have been found to be applicable across a broad range of industries and commodities including financial instruments, metals, grains and energy. The differences between organizations that transact energy and companies that transact other commodities are more striking than the factors that distinguish BPA from other energy companies. While the specifics of BPA's situation must be taken into account in development of a governance structure, methodologies for valuation and risk measurement, and for the design of the portfolio optimization function, there are many other aspects of the risk infrastructure that are independent of the nature of the agency's mission, business model and generating assets.

## SECTION ONE: INTRODUCTION

### 1.1 BACKGROUND

In July 2002, Bonneville Power Agency (BPA) engaged Deloitte & Touche (D&T) to perform an Enterprise Risk Review (ERR) over a ten-week period. The project was divided into four discrete tasks, which enabled the D&T and BPA project teams to coordinate in a manageable manner. Each task is listed below.

- **Task 1 – Enterprise Risk Management (ERM) Review of BPA**
- **Task 2 – Review of the Power Business Line’s (PBL) power inventory management function**
- **Task 3 – ERM Review of Transmission Business Line (TBL)**
- **Task 4 – Executive ERM Curriculum**

This report documents the work performed for Task 2 only.

### 1.2 SCOPE AND OBJECTIVES

D&T focused on four categories of power transacting activities related to PBL’s inventory management function:

1. *Trading Floor transactions* – the sale (purchase) of surplus (deficit) power to wholesale market participants (i.e., power marketers, out of region public utilities, out of region investor-owned utilities, independent power producers, subscription customers who purchase surplus power).
2. *Subscription sales* (i.e., preference customers) – firm energy sales contracts signed from about mid-November 1998 to about November 1999 to public utilities and investor-owned utilities (IOUs) who pay BPA’s lowest cost-based Priority Firm rate (PF rate).
3. *Long-term surplus sales* – firm and interruptible energy sales contracts greater than eighteen (18) months sold to the Northwest region’s largest industrial customers called Direct Service Industries (DSIs), after meeting the requests of public agency customers and IOUs.
4. *Augmentation purchases* – energy purchases to cover any deficit supplies to meet the energy needs of its preference customers.

The inherent commodity risks, primarily the high uncertainty around volume, price and counterparty credit, associated with these four broad categories pose a significant threat to BPA’s financial stability. PBL’s business units responsible for the operational and strategic decisions to mitigate these inherent risks include the following:<sup>7</sup>

- Generation Supply;
- Business Strategy and Assessment;

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<sup>7</sup> The risk assessment excluded an evaluation of PBL’s Energy Efficiency business unit. D&T understands that Energy Efficiency business activities are independent of the broad transacting activities mentioned above. To the extent Energy Efficiency engages in commodity transacting activities as part of the inventory management function, PBL would manage the market and credit risks associated with this transacting activity in the same manner as it would for the four broad categories mentioned above.

- Requirements Marketing; and
- Bulk Marketing and Transmission Services.

These business units were not responsible for the Credit and Back Office functions. In order to perform a complete review of the *entire* inventory management function, D&T reviewed the Credit and Back Office functions at the corporate level including:

- Credit Department in the Capital and Risk Management Group; and
- Back Office Operations in the Corporate Financial Operations Group.

The risk assessment specifically evaluated four key components of PBL's risk infrastructure:

- Roles, responsibilities, authorities, and accountabilities;
- Separation of duties;
- Reporting function; and
- Policies, processes, and controls.

The purpose of this review was to accomplish the following objectives:

- Describe the general principles that should guide BPA's risk management activities;
- Document current leading and prevalent industry practices;
- Identify and assess the strengths, weaknesses and/or gaps in BPA's risk control infrastructure;
- Identify any deficiencies and recommend opportunities for improvement; and
- Prioritize these recommendations.

It is important to note that this assessment was performed in accordance with the Standards for Consulting Services established by the American Institute of Certified Public Accountants. Classified as such, the purpose of this report is to provide observations, conclusions and recommendations for improvement of business execution to BPA senior management for their consideration. This assessment does not constitute an audit made in accordance with U.S. generally accepted accounting or auditing standards (GAAP or GAAS), the objective of which is the expression of an opinion on the elements, accounts, or items of a financial statement. Therefore, D&T is not in a position to express, and will not express, an opinion, or any other form of assurance, with respect to any matters as a result of performing this assessment. Moreover, adherence to industry prevalent or leading practices as described in this document does not provide any level of assurance that control breakdowns have not or will not occur that could result in materially significant losses to BPA.

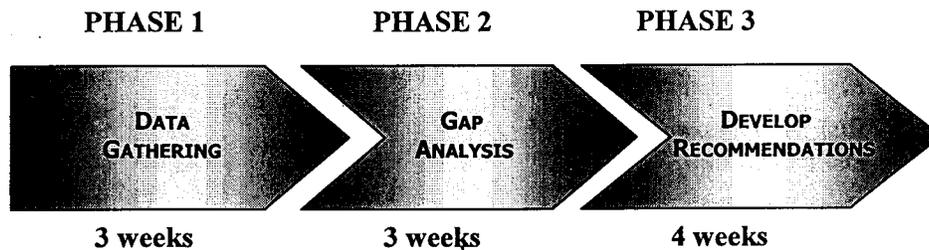
Given these limitations, our work specifically did not include the following:

- An evaluation of the appropriateness of transacting strategies;
- Benchmarking of risk and return performance;
- Performing detailed tests of compliance or transaction testing to determine that controls are operating in accordance with their design;

- Performing an independent valuation of transactions or validating quantitative methods or calculations;
- Developing process flows or procedures;
- Developing risk and management reports;
- Developing and/or evaluating tax or accounting policies for proposed transactions;
- Performing tests of system functionality or of general system general and application level controls;
- A specific evaluation of human resource skills;
- A benchmarking and review of the level or structure of compensation; and
- Implementation analysis of any comments or recommendations.

D&T assessed these risk components utilizing a three-phased approach which is graphically depicted below.

**Figure 1: Project Phases**



A brief description of the work performed in each phase is provided below.

**Phase 1 – Data Gathering**

Phase 1 represents an extensive “fact-finding” exercise to develop a deep understanding of PBL’s transacting and risk management activities. D&T gathered information through a series of extensive interviews with *fifty-four* corporate and business line personnel. The information obtained forms the foundation and basis for D&T’s recommendations. A comprehensive list of BPA individuals interviewed is provided in *Appendix Appendix 1: Interview List*.

As a result of these interviews, D&T received and examined relevant documentation (e.g., reports, process flows, policies, etc.) that served to support topics discussed during the interview sessions. D&T’s overall evaluation considered these documents, where applicable, and specific key documents are referenced throughout this report to provide meaningful context between observations and recommendations. A comprehensive list of documents D&T reviewed is provided in *Appendix Appendix 2: BPA Reference Sources*.

**Phase 2 – Gap Analysis**

Phase 2 represents the benchmarking exercise where D&T’s observations of BPA’s **current** practices are compared against leading practices. Leading Practices, by definition, are aspirational and should be viewed within the context of cost versus benefits provided. The application of Leading Practices are also subject to other limitations as well.

- Leading Practice offers insight into market participant’s capabilities, and a directional compass for subsequent infrastructure development. Leading Practices however are, by definition, continuing to evolve. Furthermore, the development and implementation of such practices does not assure that control objectives will be achieved.
- Many Leading Practices reflect the capabilities of financial institutions that primarily transact and manage risk in the more traditional financial markets. Our representation of Leading Practice, in this circumstance, reflects an interpretation that we believe provides meaningful benchmarks relevant to developing prospective capabilities in the energy markets.

The sources for leading practices are diverse. In performing our work, D&T utilized the following sources for leading practices to benchmark PBL’s inventory function:

- D&T experience with its established energy and financial services clients who manage risk as a core competency;
- Committee of Sponsoring Organizations of the Treadway Commission (COSO) – “Internal Control Issues in Derivatives Usage” (1996);
- Basel Committee Capital Accord (1988);
- Derivative Practices and Principles, Global Derivatives Study Group, Group of Thirty (1993);
- U.S. Office of the Comptroller of the Currency (OCC) Banking Circular and Comptroller’s Handbook (1994); and
- Board of Federal Governors Trading and Capital Markets Activities Manual (aka “Federal Examiner’s Handbook”) (2000).

### **Phase 3 – Develop Recommendations**

Phase 3 represents the documentation of observations and identification of meaningful opportunities for improvement. Careful analysis is performed to identify the differences between significant and innocuous issues. Significant issues are aggregated and prioritized before high level recommendations are proposed.

## **1.4 REPORT STRUCTURE**

This report is divided into four main sections – *Executive Summary*, 1) *Introduction*, 2) *Organization Structure* and 3) *Observations and Recommendations*.

### **Executive Summary**

The Executive Summary is intended to provide BPA executive management a clear understanding of the “common causes” that require immediate attention. The Executive Summary is divided into two sub-sections to accomplish this underlying objective:

- BPA Business Environment; and
- Key Findings – “Common Causes”.

### **Introduction**

The Introduction presents an overview of Task 2. The Introduction is divided into the following sections:

- Background;
- Scope and Objectives;
- Approach; and
- Report Structure.

### **Organization Structure**

An effective organization structure is a key driver in the successful implementation of a risk management infrastructure. This report section presents the strengths and weaknesses of two alternative organizational

structures to accomplish independence and separation of duties. Additionally, leading practices for Front, Middle and Back Office roles and responsibilities are presented in this section.

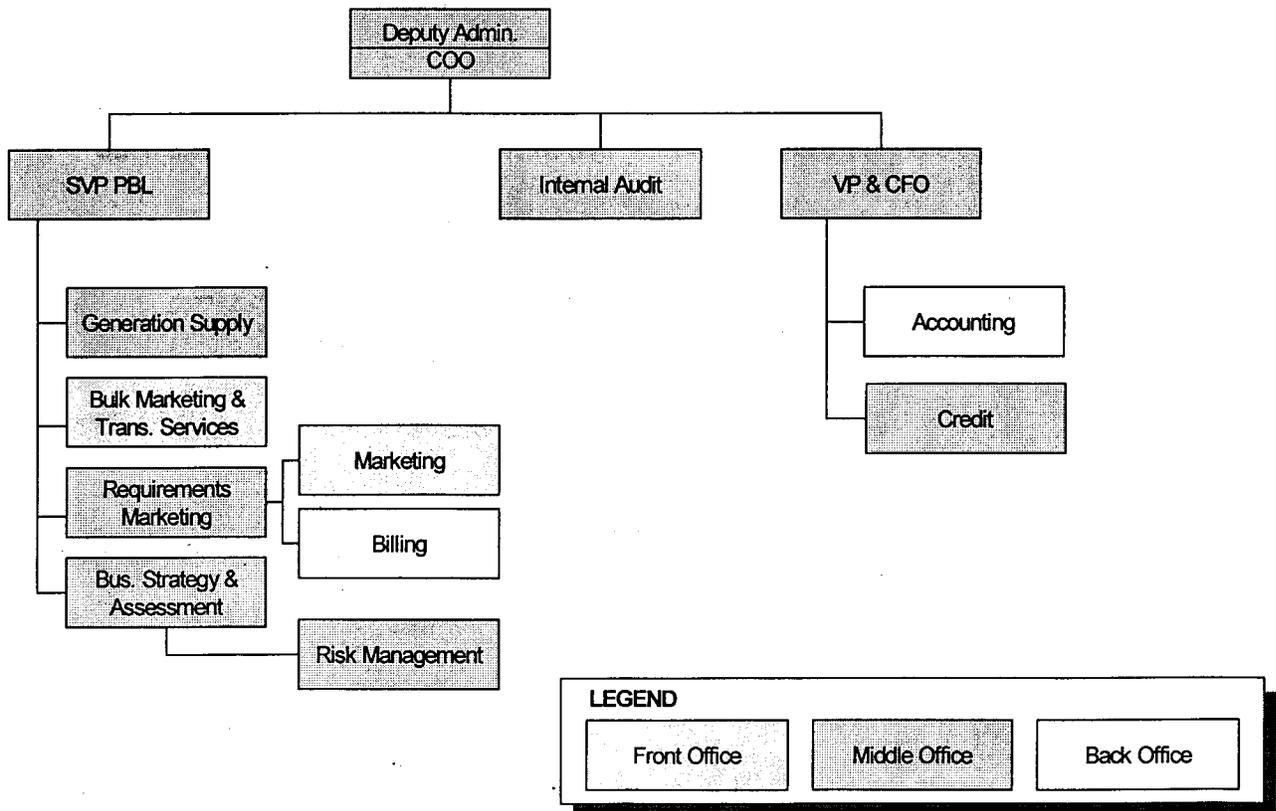
**Observations and Recommendations**

Observations and Recommendations presents the detailed observations and recommendations for each control category at the risk component level. D&T utilized a proprietary risk matrix as guidance to compare PBL's practices against leading practices. This section is the culmination of the matrix results and provides granular recommendations addressing specific control point weaknesses.

In order to present observations and recommendations in a clear and concise manner, each control component is presented using the following format:

- Leading Industry Practice;
- BPA Practice; and
- Recommendations.

**Figure 2: Current Organization Structure**



**BPA Practice**

At an agency level, BPA defines risk in terms of the probability of making treasury payments as they come due. The measure utilized is Treasury Payment Probability (“TPP”). In its most common definition, TPP is an estimate of the probability that BPA will be able to make its year-end payments to Treasury in each year of a rate period (or each of the remaining years if the rate period has already

started). Although TBL and PBL do not have separate cash funds, the TPP methodology is often used as an analytical tool to measure the probability that one business line will be able to make its planned contribution(s) to BPA's Treasury payment(s). TPP has three main drivers:

1. The amount of financial reserve on hand at the beginning of the time period;
2. The expected value of annual net revenues; and
3. The variability of annual net revenues.

Within PBL, other measures of risk than TPP are also used, but none has been selected as the sole measure of a specific type of risk.

The Hedging Policy provides a description of the risk tolerance for financial instruments as follows:

- (a) It is BPA policy not to speculate with financial instruments on commodity prices.
- (b) Such speculative transactions have no place in BPA's risk management program and are prohibited by this Policy.

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**BPA Practice**

BPA has a Risk Management Steering Committee that meets on a regular basis. The responsibilities and constitution of the committee are defined in its charter, dated June 11, 1999 (proposed revision). According to this document, the mission of the committee is to:

“Review and approve Corporate and Business Line risk management strategies, programs, policies, and control procedures. Review implementation and monitor results on an ongoing basis. Ongoing education on risk management principles, methods, and applications.”

The committee consists of the Chief Operating Officer, the Deputy Administrator, CFO, General Counsel, VP Strategic Planning, SVP PBL, SVP TBL (permanent designate appointed).

**BPA Practice**

BPA has a number of policies in effect including:

- Hedge Policy;
- Option Policy;
- Financial Risk Management Policy (draft); and
- Credit Risk Policy.

The scope and topics covered by these policy documents is briefly described below. (Credit Policy is described in Section 3.3.2 *Credit Policy*).

**BPA Practice**

BPA's book structure does not include requirements sales.

Books that have been used include:

1. System;
2. Blue Plate;
3. Options;
4. Augmentation;
5. Load Reduction;
6. Remarketing and Sleeves;
7. Transmission Spreads;
8. Load Factoring; and
9. Trader.

**BPA Practice**

Transacting limits are defined in the Hedge Policy which limited transacting in NYMEX forward and option contracts. The document also specified limits for OTC transactions (swaps 500 MW/month and options 500 MW/month). The policy also creates a limit on “total hedge portfolio limit” of 50% of year to date bulk hub portfolio and 100% for any month.

**BPA Practice**

The responsibility for sourcing settlement and forward prices is centralized within the Pricing & Transaction Analysis (PTP) group (i.e., Front Office). Volatilities and correlations, on a historical basis, are sourced within Risk Management (PMM) (i.e., Middle Office) and used as inputs for the following three purposes:

- 1) PTP price forecasting;
- 2) Risk Management Net Revenue at Risk (NRaR) calculation (See 3.2.5 *Probabilistic Risk Measures*); and
- 3) Back Office MTM calculation using Epsilon;

PBL transacts in two primary delivery / receipt locations in the block forward power markets:

- 1) Mid-Columbia (Mid-C); and
-

2) California Oregon Border (COB)

PBL utilizes the following market data sources (listed by delivery source) to build its forward curves:

- **Broker Squawk Boxes**
  - Amerex;
  - Tradition Financial Services (TFS);
  - Prebon Yamane;
  - APB Energy Inc.; and
  - Natsource.
- **Electronic (B2B) Exchange**
  - Intercontinental Exchange (ICE)
- **Dow Jones Wire**
- **Energy Market Report**
- **Platts**

Settlement prices are updated manually by the KW3000 database (db) Manager who reports directly to the Manager, PBL Financial Management. Settlement prices are updated on an as-needed basis.

**BPA Practice**

The only activity occurring at an illiquid point of delivery / receipt is at the Nevada-Oregon Border (NOB) on a day-ahead and real-time basis. These transactions are strictly intended for load resource balancing purposes.

Even at relatively liquid trading locations (i.e., Mid-C and COB), illiquidity is indicated as a function of time where monthly forward prices are readily available for only the nearby six (6) months. Quarterly and annual quotes are available for the next six months and thereafter, respectively. Construction of monthly forward curves greater than six months relies on interpolation of results from PBL's price forecasting model called AURORA. AURORA is maintained and operated by the PTP group in the Bulk Hub business unit.

Asset valuation is performed in a different manner by two business units - 1) Risk Management and 2) Back Office operations. Each function obtains market forward prices prepared in a spreadsheet titled "mtom" by PTP. The "mtom" spreadsheet is stored in a shared drive as a "read-only" file for access by Risk Management and Back Office Operations to perform their respective duties described below.

Risk Management is responsible for reviewing MTM calculations prior to distribution during the weekly Trading Strategy Meeting. Market drivers affecting MTM changes in the Options Book are documented in the "Near-Term Risk Report" and presented to front office personnel in the Trading Strategy Meeting, accordingly.

**Back Office Operations (performed at the corporate level)**

Physical forward and all residual option positions are marked-to-market to calculate counterparty credit exposures (i.e., replacement cost). The Back Office relies on the same forward pricing inputs from PTP (i.e., AURORA and the "mtom" spreadsheet) in addition to volatility curves from Risk Management to calculate its MTM.

Table 2 below summarizes the differences in the MTM practices performed by the Middle and Back Offices for each system sub-book with open positions.

**Table 2: MTM of System Sub-books**

MTM by instrument and system sub-book*:	Middle Office	Back Office
Physical Forwards – System Book	No	Yes
Options – Options Book	Yes	Yes
Physical Forwards – Augmentation Book	No	Yes
Options – Augmentation Book	No	Yes

The valuation methodologies utilized by the Back Office are Epsilon "in-the-box" algorithms. A conventional Black model is included in the Epsilon application for option valuation. Epsilon's existing configuration maps the forward curve to the corresponding transaction. Review, evaluation and independent testing, (by Risk Management), of Epsilon's valuation methodologies are performed periodically.

The Back Office is not involved with the preparation of MTM reports for distribution to front office personnel.

**BPA Practice**

Risk Management is responsible for calculating a measure known as Net Revenue at Risk (NRaR), which is a probabilistic measure utilizing correlation and volatility inputs and assumptions in a manner similar to a conventional VaR calculation. A sample PBL NRaR statement may appear as the following:

“5% Net Revenue at Risk for the 2002 fiscal year equals \$21,176,789.”

This statement can be translated as: “There is a 5% likelihood that PBL’s net revenue shall decrease by \$21,176,789 for the 2002 fiscal year under adverse price and / or inventory event combinations which are based on **normal** market conditions. Conversely, PBL is 95% confident that net revenue will **not** decrease more than \$21,176,789 for the 2002 fiscal year.”<sup>14</sup>

Risk Management conveys NRaR in the following seven different categories:

- 1) 5% FY Price-Volume;
- 2) 5% Price-Volume (rolling 12 months);
- 3) 5%, 5-day System (Expected inventory is held constant through fiscal year);
- 4) 5%, 5-day System (Expected inventory is held constant for next 12 months);

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<sup>13</sup> Mean reversion is a commonly observed tendency of price behavior where energy prices gravitate to the “normal” equilibrium price level that is usually governed by the cost of production and level of demand. This is a unique attribute of energy prices and is an important assumption when applying modern portfolio theory principles such as the ‘random walk’ assumption that price changes are independent from one another.

<sup>14</sup> It is also important to note the relationship between net revenue and NRaR to understand PBL’s risk profile relative to power price movements. There is an inverse relationship between NRaR and net revenue. In other words, higher power prices increase PBL’s potential net revenues (favorable impact) but also increase PBL’s NRaR (unfavorable impact) because of BPA’s tendency to be net long power. This relationship would be inverse when BPA is net short power.

- 5) 5%, 5-day Blue Plates;
- 6) 5%, 5-day Options (through FY); and
- 7) 5%, 5-day Options (through December 2006).

The volatility inputs are the historical volatilities for Mid-C flat prices. The historical volatility is based on the last ten days of forward Mid-C prices.

Correlation is measured by looking at the relationship between two variables – 1) Mid-C prices and 2) expected inventory levels relative to a rolling twelve (12) month period. Correlation inputs are obtained from the following matrices:

- Spot-Hydro Correlation – measures the likely magnitude of Mid-C spot prices changing relative to changing inventory levels from month-to-month;
- Hydro-Hydro Correlation – measures the likely magnitude of change in inventory levels from month-to-month;
- Spot-Spot Correlation – measures the likely magnitude of Mid-C spot prices changing from month-to-month; and
- Forward-Forward Correlation – measures the likely magnitude of forward HLH Mid-C prices changing from month-to-month.

All volatilities and correlations are calculated using @Risk, (Excel add-in tool from Palisade). The NRaR distribution is calculated using Risk Drive. Both applications are spreadsheet-based and operate on a stand-alone basis.

All seven NRaR figures are based on the inventory curves prepared by Power and Operations Planning every Wednesday. Risk Management reports all seven NRaR figures in the “Near-Term Risk Report: Executive Summary” and distributes the report in the weekly Risk Coordination Meeting held every Tuesday.

**BPA Practice**

Risk Management performs two discrete sensitivity analysis studies which analyze the sensitivity of the 5% Net Revenue at Risk (NRaR) and 5% Net Revenue (NR) over a rolling twelve (12) month period given shocks to two market variables – 1) price and 2) volatility.

The price shock analysis assesses the impact to NRaR and NR with respect to a  $\pm 25\%$  parallel shift of the nearby 3-month forward curve for Mid-C flat prices. The price sensitivity analysis reveals an inverse relationship between NRaR and NR. In other words, positive price spikes result in favorable net revenue outcomes (increases) but unfavorable NRaR outcomes (increases). This observed trend holds under BPA's generally long inventory position, but not when BPA is short.

The price volatility shock analysis assesses a similar impact to NRaR and NR with respect to a  $\pm 25\%$  parallel shift of the nearby 3-month volatility curve for the Mid-C delivery location.

Inventory is not shocked but the sensitivity analysis looks at four (4) general event combinations that lead to a 5% condition over the remaining fiscal year:

- 1) Low Price, Low Inventory;
- 2) High Price, Low Inventory;
- 3) Low Price, High Inventory; and
- 4) High Price, High Inventory.

Risk Management performs sensitivity analysis on an as-needed basis and the results are reported in the "Near-Term Risk Report."

**BPA Practice**

The RMSC has delegated its credit risk oversight responsibilities to the Credit Risk Committee (CRC) with jurisdiction over the Power and Transmission Business Line transacting activities (PBL and TBL, respectively). The CRC is currently comprised of the following positions:

- Credit Manager – Committee Chairperson (non-voting member);
- Corporate Risk Manager (voting);
- Manager of Financial Operations (voting);
- PBL Risk Manager (voting); and
- TBL Risk Manager (voting).

The Credit Manager establishes the meeting agenda and facilitates the CRC meeting as Committee Chair, but is not a voting member. The CRC meetings are scheduled to occur weekly but are often postponed and rescheduled as necessary. Any important agenda items are addressed one on one by the Credit Manager and committee members for resolution. Occasionally, the PBL or TBL Risk Manager is asked to excuse themselves from the meeting when issues not related to their specific business line are discussed.

Decision-making is based on majority vote. However, in actual meeting proceedings, any dissention among CRC members is resolved before a vote is taken. A consensus is usually reached so that decisions are made on a unanimous basis. Meeting minutes are documented by the Credit Manager.

Although there is no explicit provision in the credit policy, no CRC member retains the right to veto any decision. It is implicitly understood that the RMSC retains the right to veto any CRC decision although there is no explicit provision in the credit policy for this authority.

The CRC roles and responsibilities in relation to the credit policy include the following:

- Reviewing the credit reports and recommendation from the Credit Department and making the final determination of counterparty credit status and accompanying limit for new and existing counterparties;
- Evaluating the effectiveness of the credit risk management program through regular discussions on credit oversight activities and determining areas for improvement;
- Ensuring counterparty credit exposures are monitored against limits;
- Evaluating the effectiveness of procedures in achieving policy objectives and reporting these results to the RMSC; and
- Establishing a response management team if BPA suffers a major adverse credit event.

**BPA Practice**

An updated Credit Risk Policy was recently approved by the RMSC on August 20, 2002 and will be subject to annual review and approval. The Credit Risk Policy documents BPA's "official" credit risk management process and related controls governing both the Power and Transmission Business Lines (i.e., PBL and TBL) transaction activities. The CRC is responsible for policy maintenance and administration, although in practice this activity is performed by the Credit Manager. The Credit Risk Policy is available to all BPA personnel, in hard copy or electronic format on a shared drive. Hard copies are distributed to selected BPA personnel and those who do not receive a copy can request one on an individual basis. Amended copies are distributed by the Credit Department, as necessary. It is unclear whether all relevant BPA personnel have a current credit policy version.

BPA's Credit Risk Policy includes the following items:

- Credit Policy scope and objective;
- Process description for requesting an exception (e.g., an approved exception to a credit limit violation);
- Statement of twelve (12) credit principles that govern the qualitative components of credit related activity (e.g., business conduct, regular review, timely gathering of information, documentation requirements, minimum standards requirements);
- Roles and responsibilities of participants in the credit process including the RMSC, CRC, Credit Department, Credit Manager, Business Line Account Executives, Office of General Counsel, Accounts Receivable;
- The credit approval methodology, credit rating criteria, credit status determination (e.g., the approval and limit setting activity), and credit status monitoring (e.g., ongoing review of creditworthiness);
- Prescriptive steps to address limit adjustment due to an "urgent" event (e.g., significant news or event, recent downgrading of a counterparty);
- Permitted forms of credit enhancements and the process for obtaining enhancements;
- Procedures addressing counterparty bankruptcy and default;

- Approach for evaluating contractor and vendor creditworthiness; and
- Credit exposure measurement methodology, netting requirements and limit allocation methodologies.

A separate set of credit procedures are currently in development to supplement the credit policy. A completion data has not been finalized.

**BPA Practice**

BPA creates and maintains a credit file for each counterparty.

Each file contains the credit evaluation including a written summary, approval signatures, PBL and TBL limits, credit application, financial information and ratio analysis, correspondence, current news and articles, and copies of legal documents (e.g., letters of credit, parental guarantees). The credit file is created upon receipt of the credit application and is subject to annual review for completeness, or more frequently, if necessary, as mandated in the Credit Policy<sup>16</sup>. Credit files are stored and backed-up daily on the shared drive automatically with the exception of annual reports and counterparty correspondence.

Original legal documents are stored in a locked non-disaster proof cabinet near the Long-Term Contracts (LTC) Group in Account Services.

Most of PBL's wholesale power counterparties are bound by the Western States Power Pool (WSPP) master agreement with standard netting language. Therefore, not all credit files will contain a master enabling agreement. If a counterparty is not subject to the WSPP terms and conditions, the Credit Department is responsible for ensuring a proper master agreement with enforceable netting provisions is in place for that counterparty.

The Credit Department will directly negotiate letters-of-credit with counterparty credit personnel, including the determination of acceptable banks and amounts. Sample parental guarantees and netting agreements are included in the credit application and mailed to potential counterparties by the AEs and Traders. These applications are managed by either the AE, Trader or Credit. Once credit support documents are finalized, the LTC Group logs the effective date, expiry, agreement type, contact person, customer, amount/limits, and comments onto the "Enabling Agreements with Active Netting and Guarantee Agreements" report. This report is distributed to Account Executives, Trading Floor, Credit Department, Finance Operations, and Risk Management personnel.

The Credit Department performs a counterparty assessment to determine a credit limit prior to executing any transaction, as required by policy. The counterparty credit rating process is independent of the front office and performed by the Credit Analyst upon receipt of a credit application from the Account Executive or Trader.

BPA's current assessment methodology is based on the evaluation of the following five factors:

- Financial strength;
- Competitive position;
- Quality of management;
- Viability of stated strategies; and
- Current news and events.

If the information is available or disclosed, the Credit Department also assesses the counterparty's risk management infrastructure including existence of risk policy, governance, risk limits and controls.

In practice, the Credit Analyst exercises discretion over the weighting impact of various factors during the counterparty assessment. Credit Analysts are instructed to consider financial strength as a significant driver in determining the counterparty's rating.

The Credit Manager is responsible for evaluating all of the completed credit reviews and approves the final credit rating decision.

The Credit Manager attempts to establish some consistency across analyst ratings by routinely meeting with them, both as a group and individually, to discuss the credit evaluation write-up.

Counterparties who do not have a stand-alone rating and are subsidiaries of companies with a rating are reviewed in the same manner as the parent company subject to a parental guarantee. The rating process is consistently applied whether the parent or subsidiary is a counterparty with both the PBL and TBL.

All existing counterparties are to be re-rated annually, regardless of credit rating, as required by policy. The Credit Manager has commented that an effort to comply with policy is ongoing, but has been slowed by the recent credit events occurring in the energy industry.

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**BPA Practice**

The CRC is responsible for approving PBL and TBL counterparty credit limits recommended by the Credit Department (See 3.3.1 *Credit Oversight*). The Credit Manager has the authority to approve credit limits up to \$2.0 million in the event of an “urgent” event (e.g., imminent spill scenarios, volatile market prices, limited market liquidity), but must receive a second approval from the CRC. Counterparty credit limits are considered temporary and valid only until the next CRC meeting to (dis)approve the temporary increase. CRC approval of initial credit limits and temporary increase can be delayed between two to three weeks due to postponed CRC meetings.

The Credit Department is a “corporate” function and is responsible for setting limits for both the TBL and the PBL business lines. A counterparty that transacts with both the TBL and PBL is subject to one aggregate limit established by the Credit Department. The Credit Manager allocates portions of this aggregate limit to the PBL and TBL based on each business line’s anticipated transacting volume. For example, if Counterparty A has a credit limit of \$5.0 million and transacts mostly with the PBL, the counterparty may be allocated a \$4.0 million credit limit to transact with the PBL and a \$1.0 million credit limit to transact with the TBL.

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<sup>19</sup> It should be noted that energy credit departments typically consider parental guarantees in assigning counterparty limits. Collateral and margin deposits are considered “cash flow” credit enhancements and are used as an offset in the current credit exposure calculation, **not** in the limit setting process (See 3.3.8 *Credit Enhancements for further details*).

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The Credit Department has established *monthly* credit limits for eligible Trading Floor counterparties. Counterparties are eligible for a monthly limit when the total credit exposure does not exceed the total credit limit. The monthly limit is half of the total credit limit and represents the maximum dollar amount of net sales that can be transacted in each and every month on a current and forward basis. “Trade room” (i.e., limit availability) is the difference between the monthly credit limit and the net amount of transactions in that month. Traders may transact business only in months where trade room is available.

Monthly credit limits with Trading Floor counterparties can also be increased by 25% if the total credit exposure is negative by 25% or more of the total credit limit. Examples of how monthly limits are determined and applied for Trading Floor transactions are provided in Table 4 below.

**Table 4: Limit Examples**

**Example of Monthly Limit Methodology**

Total Credit Limit \$8,000,000 (a)	Total Exposure \$7,000,000 (b)	Monthly Credit Limit \$4,000,000 if (b) < (a), then (a)/2 (c)	October Sales \$1,000,000 (d)	October Limit Availability \$3,000,000 (c) - (d)
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**Example of Monthly Limit 25% Increase Methodology**

Total Credit Limit \$8,000,000 (a)	Total Exposure (\$3,000,000) (b)	Monthly Credit Limit \$5,000,000 if (b) > .25*(a), then (a)*1.25/2 (c)	October Sales \$1,000,000 (d)	October Limit Availability \$4,000,000 (c) - (d)
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Credit limits for **PBL only** are entered into the Epsilon (the Risk Management software application used for mark-to-market accounting and credit risk management by the Corporate Back Office) by the Credit Manager. Credit limits and changes to credit limits are communicated through the “Daily Credit Report” and distributed to the Trading Floor personnel on a daily basis.

Limit setting for TBL transactions is a relatively new initiative (i.e., begun three (3) months ago) to manage credit exposure at the enterprise level. An effort to manage and administer credit limits for TBL in Epsilon and reported in the Daily Credit Report is in progress. An estimated completion date is not known at the time of this review.

Existing credit limits are subject to an annual review and either business line may request the CRC to reconsider credit limits at any time.

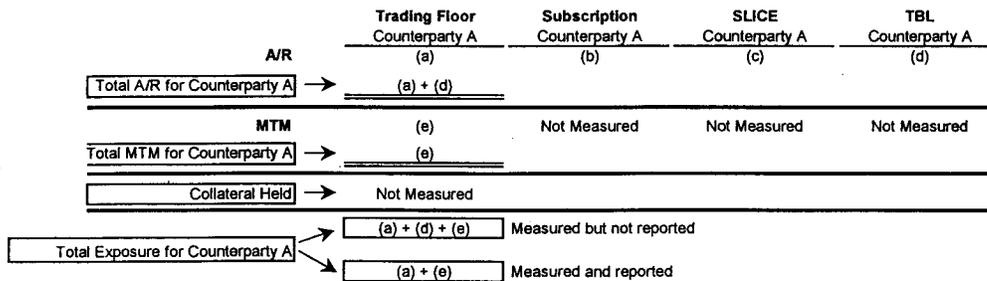
**BPA Practice**

The Credit Department measures credit exposure against total limits and monthly limits for its Wholesale Market Participants *only* (i.e., transactions executed in the Bulk Marketing and Transmission Services business unit). Total exposure is equal to the sum of 60 days of accounts receivables plus current MTM. Total exposure is compared against a total credit limit on a daily basis. A monthly exposure consisting of the month’s net sales (both current month and forward delivery) is compared against a monthly limit, if eligible, on a daily basis (See 3.3.5 *Limit Setting* for monthly limit example).

Credit has established a “maximum limit exposure” methodology for each transaction category across the PBL and TBL. While credit limits for Trading Floor transactions manage accounts receivables *and* MTM exposure; Subscription, Slice, and Transmission customer accounts are managed *only* with respect to a maximum accounts receivables exposure over a specified billing period. The exposure methodology for each transaction category is documented in the Credit Policy.

The Credit Department does not aggregate receivables exposures of subscription and Slice customers who also transact with the Trading Floor for surplus power. The Credit Department does aggregate receivables exposures for counterparties that transact with the Trading Floor and the TBL. The figure below summarizes how exposure is calculated differently for PBL and TBL transactions.

**Figure 8: BPA Exposure Methodology**



**BPA Practice**

The Credit Department requests credit enhancements when a counterparty is deemed not creditworthy on a stand-alone basis. Acceptable forms of credit enhancement include the following:

- Parental guarantees;
- Letters-of-credit;
- Surety instrument;
- Prepayment;
- Cash margin, or shorter billing cycle; and
- Credit sleeving<sup>22</sup>.

All forms of credit enhancement are subject to BPA General Counsel approval and signed by the Credit Department prior to conducting business. If BPA requests a parental guarantee, the Credit Department performs a financial review of the guarantor

During the limit setting process, the face value of credit enhancements is incrementally added to the current credit limit of the counterparty. For example, a counterparty with a monthly \$2.0 million credit limit and a total exposure of \$2.0 million would require an enhancement prior to executing a deal. If the counterparty submits a \$1.0 million letter-of-credit from an acceptable financial institution, the credit limit is increased to \$3.0 million and the limit increase is reflected in the Daily Credit Report through the

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<sup>22</sup> Credit sleeving is considered a form of credit enhancement offered to counterparties that do not satisfy credit requirements of the contracting counterparty. BPA must understand that credit sleeving on behalf of qualified counterparties is a form of accepted credit enhancement (i.e., BPA guaranteed) and limits should be established in consideration of this credit enhancement.

life of the letter-of-credit. The Credit Department is responsible for tracking the letter of credit's expiration date and adjusting the limit back to \$2.0 million at expiry.

In the case of parental guarantees, the Credit Department considers the corporate parent's creditworthiness in determining the amount of credit BPA will extend. For example, if the parent provides a guarantee of \$2.0 million and the financial analysis reveals the counterparty's creditworthiness meets minimum thresholds, only \$1.0 million of the guarantee value will be added to the credit limit.

The Credit Manager is responsible for updating credit limits in Epsilon due to enhancement changes (e.g., initiation, expiration, change in value) and is the only authorized person who has "edit" rights to this information.

The Credit Department utilizes a spreadsheet called "Enabling Agreements with Active Netting and Guarantee Agreements" produced by the Long-term Contract Group to monitor and track credit enhancements (See 3.3.3 *Credit Documentation*). This spreadsheet is updated on an ongoing basis and is available to Credit, Front, Middle and Back Offices on an as-needed basis.

**BPA Practice**

Credit limit monitoring is the responsibility of the Credit Department for both the PBL and TBL. The following describes limit monitoring activities for each business line:

**Power Business Line**

The "Daily Credit Report" identifies PBL counterparty exposures against approved limits as of the previous closing business day. The "Daily Credit Report" is generated from position data residing in the Epsilon risk management system.<sup>23</sup> This report is distributed to PBL Trading Floor personnel the following business day.

Once a limit is breached, the counterparty name, amount, and delivery month(s) is highlighted in the report. Further transacting activity is suspended indefinitely unless prior approval is obtained from the Credit Manager. It is important to note that limit violations are discovered the business day following the date of occurrence.

Trading Floor personnel are expected to check available credit limit in the "Daily Credit Report" before executing a deal and to inform the Trading Floor Manager if an executed transaction exceeds a limit.

**Transmission Business Line**

Approved limits are communicated to the TBL Account Executive via email. The Credit Department relies on the TBL Account Executive's responsibility to transact within the assigned TBL limit.

**BPA Practice**

All invoices are released with a “due date” of the 20th day. A/R schedules are tracked by Accounting Operations until payment is received by collections. Daily reports identifying the status of outstanding invoices are generated daily. Dedicated Accounting Operations staff contact counterparties if payments are not received by the 20th day. Accounting tracks all communication with the counterparty manually (including: contact names, time/date and the result, details of calls and follow up dates). “Demand” letters for overdue balances are manually produced in MSWord.

Collections are handled by the Accounts Operations group, which is lead by the Manager of Financial Operations. Collections are updated in PeopleSoft on a daily basis. BPA's Credit Policy requires that Accounts Receivable, which is part of Accounting Operations, contact Credit if the counterparty is past due by over 10 days. Accounts receivable provides Credit with daily Aging Reports on an ongoing basis.

Epsilon will recalculate its estimated accounts receivable, or accounts payable amount daily, based upon an estimate of the “total transactions in the previous month” plus “the total transactions in the current month.” The previous month is defined as the 1st through the 20th day of the month. After the 20th day Epsilon assumes that all transactions are paid and only looks at the current month.

**BPA Practice**

BPA management reporting is a decentralized function with the reporting responsibilities dispersed throughout PBL and corporate functions depending on the information being reported. In order to gain an understanding of the various reports BPA management relies on for inventory management decision-making, a matrix has been developed to highlight the key features of reports received by BPA executive and line management. Table 6 below highlights the following features of BPA's current [and proposed] management reports:

- Report name – official report title;
- Description – description of contents;
- Purpose – management actions based on information reported;
- Preparer – the party / function responsible for preparing report;
- Distribution – authorized recipients of report;
- Frequency – the periodic rate the report is produced;
- Production Method – the reporting environment is either manual or automated;
- Data inputs – the various sources of data used to prepare the report; and
- Report software – the software application(s) utilized to develop the report.

**Table 6: Summary of BPA Management Reports**

Report Name	Description	Purpose	Preparer	Distribution	Frequency	Production Method	Data Inputs	Report Software
"Near Term Risk Report"	Describes how the Trading Floor portfolio has affected the financial risk indicators and other metrics.	Understand revenue uncertainty associated with surplus/deficit inventory position.	Risk Management	- RMSC - PBL Managers - Corporate Managers	Weekly	Manual	- mtm spreadsheet - KW3000 trade positions - Inventory Spreadsheet	- Word - Excel
"Exceptions Report" (to be developed)	Describes the following: - limit excessions - parameters exceeded - how they were exceeded	Develop appropriate management action plan to correct limit violations	Risk Management	TBD	As needed	Manual	TBD	TBD
"Compliance Report" (to be developed)	Describes Business Unit compliance with policies, procedures, and controls established by the Risk Program.	Monitor business unit compliance and address incidents of non-compliance.	Risk Management and Business Unit Manager(s)	TBD	Quarterly	Manual	TBD	TBD
"Year-End Risk Report" (to be developed)	Assessment of the Risk Program's effectiveness including statistics on the Program's performance, overall trends, ongoing risk mitigation activities, ways to improve the Program, Senior Executive and Business Unit feedback throughout BPA, and plans for the coming year.	Identify risk program improvement opportunities and design stronger control environment, where appropriate.	Internal Audit or external consultant	TBD	Annual	Manual	NA	NA
"PBLMC Financial Update" (portion of PBLMC Report Package)	Describes the financial performance over the current rate case period including summary of PBL financial indicators, forecasted revenue, balanced scorecard	Discuss financial agency's financial condition relative to base case and the impact to TPP and CRAC. Develop appropriate business strategies to manage and optimize net revenue to meet financial indicator targets.	Financial Management	- PBLMC	Monthly	Manual	- AURORA prices - LARIS loads - 50-yr Hydro Generation - KW3000 trade positions	- Powerpoint - Excel
"PBL Financial & Operations Report"	Highlights the following: - Trading Floor current month P&S - Market price outlook - Trading Floor "beat spot" revenue performance - Aluminum Price Trends - River operations and Drivers - Streamflow update - Six month inventory projections	Monitor Trading Floor current month financial performance, market outlook, river operations, streamflow update and inventory projections	Financial Management	- Administrator/CEO - Deputy Administrator - General Counsel - PBL Senior VP - PBL VPs - PBL Managers	Weekly	Manual	- KW3000 trade positions - mtm spreadsheet - Forecasted spot prices - ESP Streamflows - Inventory Spreadsheet	- Powerpoint - Excel
"Monthly Net Revenue and Expense Memo"	Net revenue and expense forecast for the East, West, Bulk Hubs, and Trading Floor for the current and next fiscal year. Also reports the monthly change in net revenue and expense forecast.	Monitor financial PBL net revenue performance and monthly changes. Understand primary drivers affecting forecasted revenue and expense figures.	Financial Management	- PBL Senior VP - PBL VPs - PBL Managers - General Counsel	Monthly (last reported in July 2002, other initiatives have re-prioritized this report)	Manual	- Inventory Spreadsheet - KW3000 trade positions - Rqmts Mkt rev projections - Expense forecasts from PBL, Corp, and Shared Services	- Word - Excel
"Weekly Operations and Marketing Report"	Highlights the following: - Last 30-days P&S - Market Price Outlook - Streamflow update - Review of any operational current constraints - Next three quarters of inventory projections - KW3000 strategy testing results and recommendations - Summary of Near Term Risk Report	Formulate operational planning strategy and decisions to manage the hydro system. Provide inventory projections for trading and marketing purposes.	Operations Planning	- PBL VPs - PBL Managers - Traders - Risk Management	Weekly	Manual	- KW3000 positions - AURORA price forecasts - ESP streamflows - Inventory Spreadsheet	- Word - Excel
"30-Day Study"	Power operation plan identifying net surplus / deficit inventory position for a rolling 30-day period.	Provides traders and marketers the available <i>daily</i> surplus inventory (aMW) for marketing for the next 10 days.	Schedule Planning	- Short term planners - Traders	3x/Daily	Automated	- Single streamflow condition - Single draw of loads - Single thermal operations	- RODS
"90-Day Study"	Power operation plan identifying net surplus / deficit inventory position for a rolling 90-day period.	Provides traders and marketers the available <i>weekly</i> surplus inventory (aMW) for marketing for the next 90 days.	Schedule Planning	- Mid term planners - Traders	Weekly	Manual	- Single streamflow condition - Single draw of loads - Single thermal operations	- Word - Excel
"Credit Summary Report"	Identifies counterparty current credit exposures versus monthly credit limits	Ensure traders transact with approved counterparties with available limits	Financial Operations	- CRC - Traders - BPA Credit Mgr - Back Office Mgr	Daily	Automated	- SCS positions - mtm spreadsheet	- Access

**BPA Practice**

The pre-deal process begins with the "Weekly Trading Strategy Meeting" meeting is attended by representatives from the following PBL functions:

The

- Bulk Marketing and Transmission Services;
- Trading Floor;
- Pricing and Transaction Analysis;
- Risk Management; and
- Power Operations & Planning.

The purpose of the meeting is to develop the current strategy for optimizing inventory flexibility and value through real-time, day-ahead, balance of the month, and forward purchases and sales. Target price ranges associated with different power blocks (e.g., HLH and LLH) and tenor (i.e., contract duration) are discussed and proposed as action triggers for the upcoming trading week. Occasionally, Risk Management is asked to provide an opinion on volatility and comment on forward market conditions during these meetings.

Informal daily meetings between the short-term traders (i.e., real-time and day-ahead) and Power Operations & Planning occur *daily* to discuss and formulate the intra-day and day-ahead strategies for ensuring load resource balancing.

Before traders can consummate Bulk Hub marketing transactions, they verify counterparty status and credit limits. Traders verify counterparty status and limits in the "Daily Credit Report" generated by the Corporate Back Office.<sup>25</sup> Counterparty credit information is not available in KW3000. This information is available in the Epsilon system that is accessible by Middle and Back Office and credit personnel.

**BPA Practice**

Traders have the flexibility to execute transactions both on and off-premise (i.e., off the Trading Floor). If the trader executes an off-premise trade, the trader is required to complete a paper trade ticket within ten minutes of execution and record the transaction over a taped phone line in accordance with the Trading Floor Procedures (See Appendix 5 in the "PBL Financial Risk Management Program").

**BPA Practice**

PBL trader deal capture responsibilities include recording Balance of the Month (BOM) and monthly forward transaction (<18 months) details on a paper deal ticket. The trader records the following information on the deal ticket :

- Trade book reference;
- Strategy number;
- Price;
- Location;
- Volume;
- HLH, LLH, or Flat (i.e., Product);
- Counterparty name;
- Trader name;

- Trade date; and
- CCIS# (Central Contract Information System).

PBL utilizes three systems to capture all power transactions – 1) KW3000, 2) PCIA/SCS, and 3) LARIS. Each system captures specific deal types based on origination (i.e., Bulk vs. East/West Hub) and transaction type (e.g., Slice, DSI, Bulk Marketing). Limited system integration requires deal entry redundancy to ensure deal information flows to key PBL stakeholders. The systems for recording transactions by PBL business unit are identified in Table 7 below.

**Table 7: BPA Systems**

<b>System Name</b>	<b>Transaction Type Captured</b>	<b>PBL Business Unit Responsibility</b>
KW3000	Physical Forward	Trading Floor
	Balance of Month (BOM)	Trading Floor
	Day-ahead	Trading Floor
PCIA / SCS <sup>26</sup>	Physical Forward	Trading Floor
	BOM	Trading Floor
	Real-time	Trading Floor
	Day-ahead	Scheduler
LARIS <sup>27</sup>	Slice, DSI	Requirements Marketing

A nine-digit ID number is assigned by CCIS of which the last five digits (trade series number) are captured on each paper deal ticket. This CCIS# is manually entered into KW3000 and PCIA/SCS by the Utility Contract Specialist. The physical confirmation is generated out of KW3000, which imprints the nine-digit CCIS #.

generate an error message if left blank. However, the CCIS# is a required field as part of the deal entry process. The CCIS# is considered a document management number and serves as a cross-reference between trade and confirmation. Any revised confirmations will retain the original CCIS# along with pertinent notations.

Deal entry into KW3000 and PCIA is performed by the Utility Contract Specialist who is located on the Trading Floor. Day-ahead transaction details are recorded into transaction logs (i.e., “The Daily Report”) and entered into KW3000 and SCS (“Scheduling Computer System”) by the Utility Contract Specialist and Scheduler, respectively, at the close of business. Real-time transactions are entered directly into the SCS by the Real-time traders, given the operational time constraints related to real-time deals.

<sup>26</sup> PCIA is the deal entry user screen that interfaces with the SCS system. The PCIA screen is currently configured for entry of physical forward and BOM deals only. Real Time and Day-ahead transactions are directly entered into the SCS system.

Traders are assigned “read only” access to trade details in KW3000. Utility Contract Specialists have exclusive “edit” rights and are responsible for entering trades and modifications. Trade edits can occur up to the point where the Corporate Back Office “locks” the trades that have been “authorized” (i.e., Approved) by the Trading Manager. The Corporate Back Office (i.e., Financial Operations) “locks” the trades on a daily basis.

If deal amendments occur **prior** to the confirmation step in the same business day, the corrections are documented on a deal ticket and the Utility Contract Specialists update KW3000 and PCIA accordingly. If a deal amendment occurs **after** a signed BPA confirmation is issued, traders have the authority to amend / reverse deals with signature approval required by the Trading Floor Manager. The entire deal revision process is performed by Utility Contract Specialist (i.e., front office).

All KW3000 trade changes / revisions are recorded in a system audit log (i.e., automated) with a unique audit record ID. All trade changes resulting in a revised confirmation retain the original CCIS# and KW3000 trade ID #. The system audit log is in tabular format, which can be viewed online.

The deal amendment process is clearly understood by those responsible for performing this duty but documented procedures are moderate in detail.

**BPA Practice**

Once a deal is entered into KW3000, the Utility Contract Specialist returns the deal ticket along with an attached confirmation to each respective trader for review. The extent of validating the deal ticket to KW3000 varies from trader to trader. At a minimum, the trader will reconcile the confirmation to the trade ticket to ensure the confirmation is accurate. If the confirmation is accurate, it is assumed that the deal was entered into KW3000 accurately.

**BPA Practice**

The confirmation process is performed by three Utility Contract Specialists (UCS) who are members of the Trading Floor business unit and report to the Trading Floor Manager. The Trading Floor Manager reviews and approves every confirmation prior to the close of business day. Upon approval, the confirmation generated from KW3000 is forwarded to the trader and Trading Floor Manager for signature

approval and faxed to the counterparty. BPA has adopted the practice of sending written confirmations as both buyer and seller.

If a discrepancy is identified in the outgoing written confirmation by the counterparty, the UCS notifies the trader to review and (dis)agree to any changes. If outgoing written confirmations are returned to BPA with counterparty changes, the UCS passes the deal ticket and confirmation to the trader for verification and/or legal review, if necessary. Legal review requests are initiated by the trader or Trading Floor Manager and are their responsibility to ensure resolution.

If changes are required, BPA will send a revised confirmation only if the counterparty has not signed off the original confirmation. Original and revised confirmations are filed chronologically to ensure BPA affirms, disputes, or responds to changes within **five (5) business days**.

In the matching-off process, incoming written confirmations from the counterparty are compared to the BPA outgoing written confirmation. If discrepancies are identified, corrections are handwritten directly on the confirmation and faxed back. If the counterparty does not respond to the changes within **five (5) business days**, the incoming confirmation is deemed enforceable.

PBL accepts "negative" confirmations when counterparties do not respond or acknowledge outgoing written confirmations within **five business days**. The administrative assistant who maintains the confirmations file is responsible for regularly checking confirmations that are overdue (aged confirmations). If an overdue confirmation is identified, it is noted on a "green" log sheet and forwarded to the CCIS Operations ("CCIS Ops") group for entry into CCIS.

Completed confirmations are photocopied and distributed to the Account Services and Regional Coordination groups. Traders receive electronic *unsigned* copies of original and revised confirmations for their records. The original confirmation is scanned into CCIS by CCIS Ops and the hard copy is filed. The original hard copy confirmations are retained in CCIS during the life of the transaction. Hard copy confirmations of completed transactions are moved into an off-site storage for up to 3 years. The electronic copy is maintained in CCIS indefinitely.

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**BPA Practice**

Energy scheduling begins with the receipt of new transactions or the identification of unmatched or unscheduled transactions. Each schedule is entered into SCS and given a unique identification number. This number is matched with a CCIS number to cross reference the schedule with the contract. PBL schedulers book-out as many transactions as possible. When a book-out is agreed, PBL personnel communicate with the upstream and downstream counterparties to ensure that the path and book-out are recognized. For schedules that are not booked-out, transmission services are reserved through the appropriate OASIS node or another mechanism. If any unmatched deals are discovered, the appropriate scheduling desk is notified.

Once the necessary transmission services have been reserved, schedulers apply for NERC tags and pass the information up/down the chain or verify tags that are obtained by other parties. A visual comparison is performed to reconcile the NERC tag and the PBL "Daily Sheet" as well as the NERC tag and the customer's verbal confirmation (which is relayed through email, fax and phone conversations). PBL also ensure that paths fall within contracted limits with each counterparty. Final scheduled path information is maintained in the SCS. Schedulers receive incoming NERC tags and match them to schedules verifying the MW and shape. The unique SCS identifier is added to each tag as a local reference. If the NERC tag is from Canada (e.g., BC Hydro), the Canadian tag number is entered in the system.

PBL's goal is to complete scheduling before the close of the business of the day-ahead period and well before the mandatory 11:00 PM "cut-off" time. In some cases, PBL has missed the former target deadline and has submitted unbalanced schedules in order to meet the latter mandatory deadline. These results can be traced back to missed deadlines by customers, high scheduling volumes, and inadequate information systems. All scheduling desks perform verbal checks with counterparties. Schedulers run a report in RODS to verify that transmission is assigned and the system is in balance and identify any information not properly recorded in SCS. When PBL cannot meet its obligations, it may have to purchase power from a third party's system. These transactions are set up as in SCS as a "memo schedule" to ensure that the customer can be billed. The memo also enables PBL to verify that delivery is scheduled and ensures that no adverse operational impact is left unchecked (e.g., PBL has to cover a shortfall and needs to purchase additional electricity).

Real-time schedulers transact power and check the "Left-Over Reserved Transmission" report to determine the amount of reserved transmission that is not scheduled and enter the power into SCS. If sufficient transmission inventory is available, the energy schedule is adjusted appropriately. If sufficient transmission inventory is not available, real-time schedulers reserve transmission services and enter the appropriate transaction/schedule information in the SCS under that transaction. As a result, the energy and transmission scheduling information is entered into SCS separately.

Pre-scheduling personnel notify the real-time schedulers about customers who have not scheduled prior to the end of the business day, but before the 11:00 PM deadline. Pre-scheduling communicates with the real-time desk by two log systems. The first is a MS Word log that is maintained by pre-scheduling on the shared server (the "O" drive). Real-time has access to this log. A second method is to use the log feature in RODS to pass this information. Real-time schedulers are responsible for checking the RODS log throughout their shift.

Scheduling practices at BPA are complex and involve several manual activities, multiple points of data entry, and diffuse information system(s). The ongoing TSS project has suffered from delays and cost-cutting measures and is not anticipated to come on-line for several months. Concern has been expressed about the lack of a suitable back-up or emergency scheduling center. BPA has voluntarily implemented Standards of Conduct to comply with FERC's functional separation requirements. This action has resulted in the separation of scheduling activities and information systems in most situations.

**BPA Practice**

BPA divides its settlement practices into two categories. Requirements contracts, which are not scheduled and are based on customer meters and non-requirements Bulk Hub transactions. The following describes how the invoices for these customers are generated:

**Requirements Contracts**

PBL Power Billing's primary focus is to bill for power delivered on requirements contracts. Upon initiation of a requirements contract, PBL Power Billing sets up the agreement in the Wholesale Billing System (WBS). This entails both identifying the customer meters to be linked in the WBS and connecting SCS scheduling information for the contract to the WBS to calculate billing amounts. After settlement each month, the WBS uses scheduled information to create an initial power invoice for the customer. Revenue Analysts match schedules and contracts and review the billing information to ensure that the invoice is an accurate reflection of the delivered volume to the counterparty. PBL has identified "Priority 1" customers and works to send these customer invoices in the first 5 days of the month.

PBL Power Billing will use a combination of automated remote meters and manual meters to collect "actual" delivered amounts. PBL Power Billing will create a second "adjustment" invoice, called a "Final Invoice", which represents a true-up of deliveries and any variance from the original invoice is highlighted. Negative balances, where PBL owes the customer, may either be paid in cash to the customer or applied to a subsequent invoice. Payments for these balances are executed in Accounting Operations upon receipt of the amount in PeopleSoft.

**Bulk Hub Contracts**

PBL Power Billing invoices Bulk Hub transactions based on scheduled volumes. After a transaction has settled, the After-the-Fact group, which is part of the Scheduling Coordination business unit, will forward spreadsheets showing the contracts and schedules for each counterparty to the Revenue Analyst. The Revenue Analyst verifies the amounts and manually enters this information into the WBS.<sup>29</sup> Purchases and sales are identified for each counterparty and with applicable netting.

The Revenue Analyst also reviews invoices to ensure line-items for any other debits/credits are applied correctly (e.g., adjustments from a previous invoice).

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<sup>29</sup> PBL is in the process of replacing the WBS with Power Billing System (PBS) on October 1, 2002. The PBS will also require manual matching of schedules and contracts for non-requirements customers prior to uploading billing information.

Incoming invoices (i.e., payables) are received by the After-the-Fact Group, which confirms that the counterparty's invoice matches PBL credit balance. If PBL owes the counterparty money, the spreadsheet indicates the amount to be paid so the data can be uploaded into PeopleSoft for disbursement.

If a discrepancy is discovered between SCS and the spreadsheet from the After-the-Fact Group, the Revenue Analyst contacts the After-the-Fact desk to verify the variance. If the error is in the scheduling system, a change is made in SCS manually. The SCS system logs the identity of the person making the change and the time, but version changes are not captured.

Power marketer invoices are considered "final". If a variance between scheduled and actual delivered volumes exist, the After-the-Fact Group refers to the KW3000 confirmation, CCIS information, and contract details and reconciles these information sources to the scheduling system (i.e., SCS). This process is referred to as the "Check-Out" process. Once all the discrepancies are identified and resolved, a "Customer Sheet" is sent to the Revenue Analyst to begin preparation of the invoice..

Revenue Analysts are authorized to forward invoices to the counterparty without any additional authorization. Currently, the Revenue Supervisor verifies that the process for creating the invoice was performed correctly prior to sending.

At the end of each day, all new invoice information is uploaded automatically into PeopleSoft for collections. Accounting Operations is a "shared" function and monitors payment/collections for both the PBL and TBL. Daily A/R Aging reports are generated by Accounting Operations and distributed within Accounting Operations and to Credit. Aging reports detail the date of the invoice, the amount of the receivable and the date of payment. PeopleSoft has the capability to produce a variety of reports and Accounting Operations is working to develop additional reports to support the tracking of overdue invoices and separate data for both PBL and TBL activity. Payment forecasts are forwarded to Treasury based upon anticipated inflows/outflows of cash. PeopleSoft also provides BPA with comprehensive tracking logs and full audit capabilities.

Epsilon trade positions are the source of information for the BPA general ledger which resides in PeopleSoft. Reconciliation between Epsilon and PeopleSoft is performed daily by the Back Office. The PeopleSoft accounting system is also reconciled against the billing system by Accounting Operations, which gets its data from SCS, on a daily basis. -

**APPENDICES**

**APPENDIX 1: INTERVIEW LIST**

<b>ID</b>	<b>Name</b>	<b>Department</b>	<b>Discussion Topic</b>
1	Brenda Anderson	Trading, Account Executive	Front office controls
2	Claudia Andrews	Acting Corporate Risk Manager	Governance
3	Dave Armstrong	Trading Floor Manager	Front office Controls
4	Katherine Beale	Generation	Risk Management
4	Debbie Becker	Utility Contract Specialist	PCIA deal entry
5	Juergen Bermejo	Risk Management	Risk Analytics, Net Revenue@Risk
6	Bill Berry	Team Lead, Schedule Planning	Short-term planning
7	Ed Bleifuss	Manager, Risk Management	Risk Management
8	Suzanne Bome	Administrative Assistant	
9	Allen Burns	VP, Requirements Marketing	LT subscription contracts
10	Carl Buskuhl	Risk Management	DSI, Risk Management
11	Michael Cocks	Pricing & Transaction Analysis	Forward Prices
12	Scott Coe	Scheduling Coordination	Scheduling and After-the-fact settlement
13	Jim Curtis	Chief Financial Officer	RMSC, Governance
14	Lon Deforest	Trading Floor	Risk Management
15	Greg Delwiche	VP, Generation Supply	Generation Supply Risk
16	Anne Draper	Transmission & Reserve Services	Transmission Acquisition
17	Kevin Farleigh	Financial Analyst (Credit)	Credit Risk Management
18	Eric Federovitch	Pricing & Transaction Analysis	KW3000
19	Chuck Forman	Account Executive	Subscription contracts
20	Nancy Hagen	Manager, Accounting Operations	Counterparty Invoices
21	John Hairston	Requirements Marketing	Slice contracts
22	Steve Hickok	Deputy Administrator	RMSC, Governance
23	Gary Insley	Manager, Account Services	Contract Management
24	Mary Johannis	Regional Coordination	Treaty Ops, Load Resource Balancing
25	Ronda Kadow	Utility Contract Specialist	Confirmation
26	Steve Kerns	Power & Ops Planning	Re: Ops Planning
27	Nelson King	Project Management	Efficiency Programs
28	Bena Kluegel	Accounting Operations	Collections / Accounting
29	Therese Lamb	Power & Operations Planning	Hydro Models and Reports

**Appendix 1: Interview List (Cont'd)**

<b>ID</b>	<b>Name</b>	<b>Department</b>	<b>Discussion Topic</b>
30	Bill Lamb	Trader, Account Executive	DA and BOM Trading
31	Terry Larson	Scheduling Coordination	Scheduling controls
32	Craig Larson	Account Executive (Real-Time Trader)	Real-Time trading
33	Kim Leathley	Business Strategy, Finance & Risk Management	Risk Governance and Policy
34	Byrne Lovell	Strategic Planning	Rate Case TPP, Risk Mod
35	Bruce MacKay	Manager, Generation Scheduling	Generation Planning
36	Elliot Mainzer	Manager, Pricing & Transaction Analysis	Market Data Sourcing
37	Paul Majkut	Legal	New Product Process
38	Sanford Menashe	Manager, Back Office Operations	Credit MTM, Accounting
39	Pam Marshall	VP, Strategic Planning	RMSC, Governance
40	Preston Michie	Independent Contractor	RTO West
41	Tim Misyey	Regional Coordination	LARIS, Contracting
42	Paul Norman	Senior VP, PBL	RMSC, Governance
43	Jane O'Leary	Scheduling	Counterparty Invoices
44	Steve Oliver	VP, Bulk Marketing	RMSC, Risk Measures
45	Rick Pendergrass	Power & Operations Planning	LT Generation Planning
46	Rob Petty	Pricing & Transaction Analysis	AURORA
47	Theresa Pirie	Billing Supervisor	Billing Process
48	Kristina Rohe	Pricing & Transaction Analysis	KW3000 db practices
49	Rodney Ross	Corporate Credit Manager	Credit Risk Management
50	Gary Sanford	System Streamlining Project Manager, Generation Supply	Efficiencies Projects
51	Arnold Wagner	Risk Management	Long-term Revenue Forecasting
52	Steve Wright	Administrator	RMSC, Governance
53	Marilyn Yates	Information System Services	PCIA/SCS system admin
54	Sharon Zenner	Manager, Billing	Billing Process

**APPENDIX 2: BPA REFERENCE SOURCES**

D&T requested and received various forms of documentation from BPA personnel to gain an understanding of its current business procedures and risk control infrastructure. Documents received by D&T were considered and evaluated to substantiate both our observations and recommendations, when applicable. D&T did not validate or test the accuracy of any documentation received. This appendix itemizes all the documents considered in this risk assessment for easy reference.

Source	ID	Document Description
<b>Power &amp; Operations Planning</b>	1	D30 Study
	2	D90 Study
	3	Weekly Operations and Marketing Report dtd 4-11-02
	4	Summary: 90-Day Study dtd 8-23-02
<b>Risk Management</b>	5	PBL Financial Risk Management Program dtd 7-3-02
	6	PBL Interim Policy for Short-term Physical Options dtd 2-12-02
	7	Bonneville Power Administration Hedging Policy Revised 8-23-99
	8	Long-term Risk Assessment flowchart
	9	Short-term Risk Quantification flowchart
	10	Bonneville Power Administration Appendix A Hedging Policy
	11	Near-term Risk Report dtd 8-1-02
	12	Near-term Risk Report dtd 8-29-02
	13	Golden Northwest Aluminum Market Purchase Request Presentation dtd 8-1-02
	14	GNA Restart Phase 1B.xls
	15	Sample Rho Matrix dtd 8-28-02
<b>Financial Management</b>	16	July Monthly Net Revenue Memo for FY '02-03
	17	Weekly PBL Financial & Operations Report dtd 9-13-02
<b>Requirements Marketing</b>	18	Subscription Contract Status Report dtd 2-26-02
	19	PBL Contract Handbook Revision #2 dtd 1-23-02
	20	Block Power Sales Agreement Prototype dtd 10-31-00
	21	Block and Slice Power Sales Agreement Prototype dtd 10-10-00
	22	IOU Firm Power Block Draft Prototype Exhibit A dtd 4-20-00
	23	Actual Partial Service-Complex Draft Prototype dtd 9-5-00
	24	Functional Statements [for Requirements Marketing] dtd 9-27-00

**Appendix 2: BPA Reference Sources (cont'd)**

Source	ID	Document Description
<b>Requirements Marketing</b>	25	Actual Partial Service-Simple Draft Prototype dtd 9-5-0
	26	Full Service Draft Prototype dtd 9-5-00
	27	Priority Firm Power Block Draft Prototype dtd 9-5-0
<b>Project Management</b>	28	Core Process Optimization Initiative Executive Summary
	29	Columbia Vista Project Charter
	30	Generation Management Draft Project Charter
	31	PBL Information Factory Program Project Charter
	32	Load Forecasting Phase One (South Idaho Pilot) Project Charter
	33	Near Real-Time Optimizer Project Charter
	34	Transaction Scheduling System Project Charter
	35	PBL Efficiencies Program Scope Document
<b>Credit</b>	36	BPA Credit Policy dtd 7-25-02
	37	Daily Credit Report with Netting (A/R + MTM) dtd 8-7-02
<b>Pricing &amp; Transaction Analysis</b>	38	KW3000 User Manual
	39	KW Book Structure Documentation
	40	Procurement of KW3000 memo (undated)
	41	Trading Floor Total Net Sales and Purchases for FY 2002 (undated)
	42	Mark-to-Market.xls
<b>Power Billing</b>	43	Informal Agreement Documentation Billing Change Request Form
	44	End of Month Check for July 2002 form
	45	Bad Debt Collection Strategies
	46	Overdue Accounts Receivable Executive Summary
	47	PeopleSoft Receivables Aging Report
	48	Debt Collection Policy Draft dtd 8-2-02

**Appendix 2: BPA Reference Sources (cont'd)**

<b>Source</b>	<b>ID</b>	<b>Document Description</b>
<b>Trading Floor</b>	49	Sample Trade Ticket
	50	Sample Confirmation Agreement
	51	Memo-Delegation of Contract Authority for Power Sales, Purchase, and Certain Other Sales-Related Contracts and Agreements
	52	RIS Codes for Trading Floor Contracts
	53	Current Trading Floor Strategies (dtd 8-2-02)
	54	Enabling Agreements with Active Netting and Guaranty Agreements (dtd 8-1-02)
	55	Processing Trading Floor Confirmations.doc
	56	The "Daily" Report (dtd 8-14-02)
<b>Scheduling Coordination</b>	57	PBL Scheduling Coordination SW/NW Prescheduler Position GS-9
	58	PBL Efficiencies Program – System Streamlining Project
<b>Strategic Planning</b>	59	Risk Management Steering Committee Charter
<b>Back Office Operations</b>	60	Bonneville Power Administration Policies and Procedures for Accounting for Derivatives and Hedging Activities in Accordance with Statement of Accounting Standards No. 133 (FAS 133) as Amended by FAS 138 Including DIG Guidance – Final Version Second Edition
	61	2002 Annual Report

**APPENDIX 3: DATA SOURCES FOR MANAGEMENT REPORTS**

