



ENERGY RISK MANAGEMENT REGULATIONS
Version 1.0

Effective:
DATE

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Objective of the Energy Risk Management Regulations

San Jose Clean Energy (SJCE) provides a variety of wholesale and retail energy services to customers within the service area. SJCE's goals regarding the provision of such services include, but are not limited to: (i) providing its customers with the lowest cost supply portfolio based on certain policies that may be adopted by the City Council from time to time (e.g., renewable energy policy goals), and (ii) maintaining reliable electric service to its customers. Inherent in these goals is the need to manage risks related to transacting in various Energy markets, and providing other wholesale Energy and transmission services on behalf its customers (e.g., resource optimization).

The purpose of these Energy Risk Management Regulations (Regulations) is to utilize the philosophies and objectives specified in the Energy Risk Management Policy, and document and describe the roles, strategies, controls, and authorities that will govern SJCE's comprehensive energy risk management program.

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Part I: Energy Risk Management

1. Scope of Regulations and Procedures

1.1. Overview

The City Council will adopt an Energy Risk Management Policy (ERMP) which addresses risks faced by SJCE arising from SJCE's procurement activities on behalf of its customers in Energy and related markets. SJCE will develop two-pronged set of metrics that guide procurement decisions that include a rigorous analysis of net open position limits by month (discussed further in Appendix 9) and a cost-at-risk which may include but not limited to total portfolio cost at risk, rate at risk, and cost per wholesale MWh at risk. The ERMP provides for oversight by the Risk Oversight Committee (ROC) and mandates adoption of these Regulations by the ROC to address specific risk management issues. Controls, strategies, and processes for managing risks outlined in the ERMP are documented in these Regulations.

1.2. Applicability, Amendments and Updates

These Regulations are initially made effective upon the City Council's adoption of the ERMP, and shall subsequently be amended and/or restated from time to time by action of the ROC, when deemed necessary, by the ROC. The Director will report to City Council annually and summarize all changes.

2. Definitions of Risk

The term "risks," as used herein, refers specifically to those categories of risk which relate to SJCE's participation in wholesale Energy markets for the purchase and sale of Approved Products, as further described in these Regulations. These risks include, but are not limited to, volumetric, price, counterparty, regulatory and political, and operational risks.

2.1. Volumetric Risk

Volumetric risk is the risk that fluctuations in supply or demand will adversely affect net revenues. Thus, if actual load demands are higher than anticipated, and market prices have increased beyond expectations, the costs to serve such load will be greater than expected. Alternately, if load demands are less than expected, then surplus supply may be sold back into the market. If market prices have declined since the Energy was originally purchased, the ability to serve load at least cost may be impacted. For SJCE, demand variability is largely attributable to three factors: (1) changes in demand related to the weather, (2) changes in demand related to economic activity, and (3) changes in demand related to customers joining and exiting SJCE service. This third portion of demand uncertainty is unique to CCA's and the risks associated with it need to be carefully considered. If supply availability is uncertain, such as when hydroelectric generation capacity is impacted by uncertain rainfall patterns, a resulting shortfall in generation may necessitate the

purchase of alternative supply through the wholesale market when prices may be rising, which may also result in increased costs. Volumetric risk also covers the possibility of the unplanned loss of generation resources, transmission curtailments, and extreme weather events that can result in insufficient resources to meet load demands.

Volumetric risk is managed by maintaining financial reserves, diversifying the resource portfolio and developing a regular update of load and resource forecasts.

2.2. Price Risk

Price risk is the risk associated with changes in the market prices of Energy and Energy related products. Price risk is the possibility that the absolute price of a given Energy related product will fluctuate in an unfavorable manner, thereby exposing SJCE to potential cost increases or loss in value to its customers. SJCE will be exposed to price risk any time its fixed-price supply does not perfectly match demand. There are a number of ways that supply and demand may be mismatched. In its simplest form, demand may exceed supply, and any unhedged demand is exposed to changes in prices. With renewable supply, it is common that the production profile of the supply resource does not match the consumption profile of customers. Since hourly prices for electricity vary greatly within the day, this creates risk. This is referred to as “shape” risk. Another mismatch results from locational differences – an entity with generation in one region serving load in another region is exposed to price differences between the two regions. This is referred to as “basis” risk. These risks can manifest themselves over different time periods ranging from sub-hourly mismatches to long term mismatches.

Price risk is managed by closely monitoring and measuring the supply portfolio against estimated demand. The supply portfolio should be constructed to match resources against load obligations taking into account the various risks. Supply portfolios can benefit from resource and fuel source diversification, start dates, duration, pricing terms, types of products, geographic location, and by actively managing portfolios and assets.

Example of Price Risk

SJCE will focus on the price risk of its entire portfolio which is comprised of many individual transactions. When managing risk, SJCE will care about the impact of all of the transactions in the portfolio rather than a single transaction. That said, the portfolio is comprised of a series of individual transactions, and the examples below illustrate how the value of an individual transaction can be impacted by changes in prices.

For example, assume SJCE needs to buy 10,000 MWh of electric power for the last quarter of the coming year (October through December). On January 15th, the market price for that power was \$28.90/MWh, for a total cost of \$289,000. On March 15th, the market value was \$39.00/MWh, or \$390,000. If the budget was set as of the January 15th market price, but the product was not purchased until March 15th, then the cost would be \$101,000 more than budgeted.

Price risk can be viewed as the possibility of a change in the MTM value of a transaction. To illustrate this definition, assume as above that the 10,000 MWh for October – December was purchased on March 15 for \$390,000. If the price for that product drops to \$25/MWh or \$250,000 on September 15th, the MTM of the transaction is negative \$140,000 as of September 15th.

2.3. Counterparty Credit Risk

Counterparty credit risk means risks which SJCE incurs as the result of transacting Approved Products with other entities. It must be understood that in the context of wholesale electric utility operations, both buyers and sellers may be exposed to counterparty credit risks. These risks are of five general types:

- a. Transacting counterparties may fail to render payment for Energy related products delivered, or otherwise default under the terms of the transaction;
- b. Transacting counterparties may fail to deliver Energy related products;
- c. Transacting counterparties may fail to take delivery of Energy related products sold to them, necessitating a resale elsewhere (potentially at a loss) of the Energy related products;
- d. Counterparties may refuse to extend credit to SJCE; and
- e. A counterparty or its guarantor may seek bankruptcy protection.

Counterparty credit risk can be mitigated through counterparty diversification, credit risk premium, covenants, and insurance. Credit derivatives (credit default swaps) are not permitted.

2.4. Regulatory and Political Risk

Regulatory and political risks are the risks that regulatory agencies, courts and legislatures may take actions or adopt measures which:

- a. Result in fines, assessments or other unrecoverable costs;
- b. Make a transaction unlawful or adversely change the its economic benefit;
- c. Adversely affect market prices or liquidity, leading to trading losses and stranded asset costs;
- d. Impair the capability or willingness of SJCE's trading counterparties and wholesale suppliers to perform;
- e. Prevent SJCE from performing to its own contractual obligations;
- f. Interfere with operation of SJCE's generation or related assets; or
- g. Negatively impact SJCE's ability to finance capital projects.

Regulatory and political risks are difficult to measure and manage. SJCE has an active legislative and regulatory strategy which monitors and influences the outcome of legislative and regulatory actions for the benefit of SJCE and its customers. The City of San Jose seeks a robust and active legislative advocacy function. A team of key City Department staff developed, reviewed, and updated

legislative priorities which are consolidated under the City's Legislative Guiding Principles. This document provides a framework for directing the City's support, opposition, or sponsoring, or co-sponsoring of State and Federal legislation.

2.5. Operational Risk

Operational risk consists of the potential failure to act effectively to plan, execute and control business activities. Operational risk includes the potential for:

- a. An organizational structure that is ineffective in addressing risk (i.e., the lack of sufficient authority to make and execute decisions, inadequate supervision, no internal controls, incomplete and untimely reporting, failure to separate incompatible functions, etc.);
- b. Absence, shortage or loss of key personnel;
- c. Lack or failure of facilities, equipment, systems and tools such as computers, software, communications links and data services;
- d. Inability to meet financial obligations incurred in the course of wholesale operations;
- e. Exposure to litigation or sanctions as a result of violating laws and regulations, not meeting contractual obligations, failure to address legal issues and/or receive competent legal advice, not drafting and analyzing contracts effectively, etc.; and
- f. Errors or omissions in the conduct of business, including failure to execute transactions, violation of guidelines and directives, etc.

Operational risk can be managed by adequate oversight and the existence of and adherence to contracts, policies, regulations, and procedures. Operational risk is reduced by streamlined and well defined simple processes managed by skilled and competent staff with appropriate supporting physical and technological resources and appropriate oversight.

2.6. Market Risk

Market risk is manifested by the interdependencies of a market where the failure of a single entity or cluster of entities that may or may not be counterparties can cause a cascading failure which could affect an entire market.

2.7. Legal Risk

Legal risk arises when a counterparty is not capable of entering into, or has procedurally failed to obtain appropriate approvals to enter into, a contract. Legal risk is managed externally by ensuring counterparty representatives are authorized by the counterparty. Regarding long-term contracts, SJCE will manage legal risk by rigorously vetting and reviewing wholesale electricity contracts with appropriate legal and market experts.

2.8. Concentration Risk

Concentration risk denotes the overall spread of exposures over the number or variety of

counterparties. Concentration risk is calculated using the percentage of outstanding exposures each counterparty represents. Concentration risks may result from an uneven distribution of exposures to an individual counterparty, or an uneven distribution of exposures to particular sectors or regions.

Concentration Risk is managed pursuant to Section 18.3 of Part II of these Regulations which requires staff to document the business reasons for awarding Energy contracts to counterparties to whom SJCE has high concentrations of credit exposure.

2.9. Liquidity Risk

Liquidity risk is financial risk due to uncertain liquidity. Liquidity risk may include the risk of insufficient net cash flows on a short term basis, lack of access to credit facilities, the inability to liquidate an asset or position on short notice, and the risk of maintaining explicit liquidity reserves.

SJCE mitigates counterparty liquidity risk with regular, up-to-date credit evaluations; mitigates internal liquidity risks with adequate deposits from customers (if required); and mitigates asset liquidity risk by utilizing contractual instruments (e.g., approved enabling agreements).

2.10. Custodial Credit Risk

Custodial credit risk is the risk that, in the event of the failure of a custodial asset holder, an entity would not be able to recover the value of its deposits, investments or collateral securities that are in the possession of the custodian.

Custodial credit risk is mitigated by keeping deposits at FDIC insured institutions below insurance thresholds and actively monitoring the creditworthiness of the custodian.

2.11. Business Risk

Business risks are the risks inherent in SJCE's operations and environment that may impair its financial sustainability. These risks include the risks listed in this Section 2, in addition to the risks of creating and maintaining production and administrative facilities.

Business risks are mitigated by adequate planning and budgeting, training of staff and maintaining appropriate insurance coverage.

3. Risk Management Strategies

An important aspect of implementing an overall energy risk management program is the development of related strategies to mitigate all of the related risks associated with Energy product trading activities. The key strategies used by SJCE are outlined below.

3.1. Balanced Portfolio

SJCE shall strive to maintain an integrated and balanced portfolio of resources to cover its customers' load serving obligations, and maintain the value of SJCE's assets, and manage resources within SJCE's financial requirements and within a dual volume and cost-at-risk framework, integral to SJCE's risk management strategy. The "cost at risk" will be designed to capture all of the volume mismatches, basis risk, shape risk, and other balancing risks associated with a given wholesale electricity contract.

3.2. Minimum Coverage Requirements

3.2.1. Minimum Coverage Requirements for Energy

SJCE shall strive to manage price and volatility risk by implementing a diversified procurement strategy that involves purchasing energy products to hedge costs for serving load. SJCE shall strive to purchase amounts of energy based on defined minimum coverage thresholds as set forth in the Time-Price Coverage Matrix (Recommended Coverages) of these Regulations. The Time-Price Coverage Matrix, along with the cost-at-risk metric will be used as a guide for SJCE's short term and long-term procurement strategies. The objective of the dual framework is to develop a procurement strategy focused on hedging against the risk of open load positions, as measured over time, and to mitigate SJCE's exposure to market price volatility and other pricing risk. The actual covered positions taken by SJCE, reflected as a percentage of forecasted load, may deviate from the recommended coverages contained in the dual framework based upon SJCE's staff evaluation of current market conditions and other applicable requirements (e.g., regulatory requirements).

3.2.2. Minimum Coverage Requirements for Capacity

SJCE is required to acquire certain types and amounts of Resource Adequacy capacity, as further set forth in applicable requirements. Such rules, including the CPUC Decisions, establish minimum Resource Adequacy requirements in accordance with policies adopted by SJCE's respective Local Regulatory Authority. SJCE shall acquire the types and amounts of capacity required to comply with the Resource Adequacy requirements established by its respective Local Regulatory Authority.

3.3. Diversification of Portfolio

SJCE shall strive to develop an integrated resource portfolio that includes a minimum level of diversification in fuel type, contract duration, geographic location, counterparties, pricing terms, cash reserves and types of products.

3.4. Purchases to Cover Load Serving Obligations (No Speculation)

SJCE's primary objective for energy product procurement activities is to cover the load serving obligations of its customers. In the course of performing these activities, SJCE shall not engage in

activities that expose SJCE to speculative trading risks, and shall only utilize approved products and transaction parameters as approved by the ROC, and defined in these Regulations.

3.5. Authority to Transact Approved Products

The type of Energy related products SJCE may transact will have a direct impact on the amount of risk SJCE assumes as a result of such activities. The types of Energy related products that SJCE is authorized to transact (herein after referred to as “Approved Products”) are specifically identified in Appendix 6 of these Regulations.

4. Roles and Responsibility for Energy Risk Management

4.1. City Council

The Council has the ultimate oversight over SJCE operations and is responsible for establishing an organizational-wide framework for risk management and ensuring that risk management results are achieved as planned. The Council shall approve and establish organizational policies for risk management and delegate to the City Manager the responsibility for implementing the ERMP. With responsibility for the ultimate oversight over SJCE operations, the Council shall be responsible to insure the risk management results are achieved in accordance with the ERMP.

4.2. City Manager

The City Manager serves as the chief administrative officer of the City . The City Manager is responsible for administering City operations and staff, advising the City Council, managing the day-to-day delivery of public services, and implementing Council policies. The Council acknowledges that the City Manager shall establish the ROC and may delegate certain functions to the ROC, which delegation is ratified by the ERMP.

4.3. Director of Community Energy

The Director of Community Energy (“Director”) has overall responsibility for implementing the ERMP and for communicating risk management issues to the City Manager and Council. The Director shall be responsible for delegating specific duties for carrying out the policy and insuring compliance with it by all affected SJCE employees or contractors.

Risk Oversight Committee

The Risk Oversight Committee (ROC) is responsible for overseeing compliance with risk management policies within SJCE. The ROC serves as the highest level of organizational risk management. The ROC shall consist of seven voting members: the City Manager, the Director of Community Energy, the Director of Finance, the City’s Risk Manager, the Budget Director, the Community Energy Department’s Deputy Director of Power Resources, and the Community Energy

Department's Division Manager for Administration and Finance. The City Attorney will provide legal advice to the ROC. A quorum for the ROC to do business shall be not less than five ROC Committee members, or their designees.

Each ROC member shall have one vote, and shall appoint a voting alternate. All correspondence shall be provided to the ROC members and alternates. The ROC will meet at least quarterly, to act on the responsibilities mentioned above. Minutes to each meeting will be maintained per SJCE policy. The Director of Community Energy shall make annual reports to the Council regarding business transacted by the ROC.

The ROC shall have the responsibility for ensuring that business is conducted in accordance with the ERMP. The City Manager's ROC shall adopt and keep current "Energy Risk Management Regulations," which shall define in detail the internal controls, strategies, and processes for managing risks covered under the ERMP.

ROC responsibilities and delegated authorities are:

- a. Establishing overall risk tolerances related to Approved Product transactions and counterparty credit risk;
- b. Reviewing and approving Exception Reports to the ERMP and these Regulations;
- c. Setting, changing and approving the design of all internal control processes related to energy risk management and Approved Product transactions;
- d. Assessing the adequacy and functioning of the system of controls over volumetric, price and counterparty credit risks;
- e. Reviewing all statistical modeling parameters, risk tolerances, risk factors and/or risk weights associated with all Approved Product transaction strategies;
- f. Reviewing and recommending changes to ERMP policies, the types of Approved Product transactions and controls (e.g., limits, risk/performance methodology, etc.), including the addition of new products and instruments as described in these Regulations;
- g. Recommending appropriate cash reserve levels to support SJCE's Approved Product transaction activities;
- h. Reviewing the ERMP, and recommending any amendments to the City Council;
- i. Reviewing and assessing the adequacy of the risk reports generated by the risk management function;
- j. Ensuring that the results of risk management activities are reported to the City Council, and all risk management reports are provided to the City Council in accordance with Appendix 7 of these Regulations, or as necessary;
- k. Reviewing and recommending appropriate transaction authority levels and delegation of authority to SJCE personnel, related to Approved Product transactions; and
- l. Reviewing, recommending and approving changes to these Regulations, as needed.

Specific responsibilities of the ROC members and advisors are described in Appendix 2 of these Regulations.

4.4. Front Office

The Front Office staff is responsible for the provision of wholesale energy services, which include, but are not limited to, planning and portfolio management, Approved Product transacting, contract origination, schedule coordination and real-time dispatch operations. The Front Office provides recommendations for load and resource balances, and portfolio optimization. These activities are conducted in order to meet the physical, financial and contractual requirements of SJCE. As part of these functions, the Front Office is responsible for transacting Approved Products on behalf of SJCE, in accordance with certain transactional limits, as further defined in these Regulations. All Approved Products that the Front Office is authorized to transact are identified in Appendix 6 of these Regulations. The Front Office is responsible for ensuring that the procedures and processes needed to transact business within the requirements and guidelines of the ERMP and these Regulations are fully implemented, and shall perform all duties related to actual transacting in the wholesale Energy markets. The Front Office is the primary interface with potential wholesale transacting counterparties. The Deputy Director of Power Resources is responsible for managing the Front Office. The Front Office may also utilize support from SJCE's Wholesale Energy Services Provider and consultants to carry out the duties described herein.

The Front Office is primarily responsible for:

- a. Day-to-day purchases and sales of Approved Products for SJCE;
- b. Developing transaction strategies that are consistent with SJCE's ERMP and established risk tolerances;
- c. Ensuring infrastructure (hardware/software) is in place to support accurate and timely measurement and reporting of risk;
- d. Ensuring that procedures and systems can effectively and efficiently support the Front Office activities;
- e. Ensuring training is completed by Front Office staff, as required by CAISO, to comply with minimum participation requirements for participation in CAISO markets;
- f. Conducting needs analysis for meeting load forecasts, optimizing the value of resources, and satisfying regulatory and/or compliance requirements;
- g. Recommending transactions for authorization and approval;
- h. Proposing modifications to commercial provisions of City Council approved contracts to the Director for consideration and approval;
- i. Purchasing and/or selling Approved Products and services based on meeting the load forecast, optimizing the value of SJCE assets, and satisfying regulatory and/or compliance requirements;
- j. Conducting sales transactions for surplus resources;
- k. Nominating and managing CRRs in the annual and monthly allocation processes;
- l. Preparing and submitting bids in the CRR annual and monthly auction processes;
- m. Transacting Approved Products to satisfy applicable regulatory and compliance requirements (e.g., renewable Energy requirements, emission compliance obligations, etc.);
- n. Development and maintenance of Renewable Energy Products tracking and allocation;
- o. Competitively shopping and negotiating transactions in accordance with the ERMP;

- p. Generating trade confirmations (as needed);
- q. Ensure transactions are recorded timely and accurately, and that valuation and risk measurement are performed according to approved methodologies;
- r. Working with the Middle Office to develop and implement risk measurement methodologies and quantitative applications, where appropriate;
- s. Identifying new products and markets that may add value to SJCE;
- t. Prepare reports as outlined in Appendix 7 of these Regulations;
- u. Initiate requests for new counterparty reviews; and
- v. Prepare and maintain written Front Office procedures.

4.5. Middle Office

The duties of the Middle Office staff are conducted by SJCE's Administration and Finance Division. Its primary purpose is to manage risk oversight and controls. The Middle Office provides independent oversight of the risks assumed by the Front Office in the course of transacting Approved Products and services. The Middle Office must be independent from the Front Office functions. The Division Manager of Finance and Administrative Services is responsible for managing the Middle Office. The Middle Office may also utilize support from SJCE's Wholesale Energy Services Provider and consultants to carry out the duties described herein.

The Middle Office is responsible for oversight, reporting and training; including:

- a. Managing and overseeing risk, including reviewing controls and reviewing valuation and risk management methodologies;
- b. Developing and implementing counterparty credit risk policies, procedures and limits in collaboration with the Finance Department and as approved by the ROC;
- c. Reviewing and approving changes and provisions to enabling agreements (including all credit terms);
- d. Monitoring SJCE's current and potential risk exposures and ensuring compliance with the ERMP and these Regulations;
- e. Ensuring Middle Office training is completed;
- f. Verifying that Approved Product transactions are authorized and executed based on the requirements of the ERMP and these Regulations, and are properly recorded in the deal capture systems;
- g. Monitoring the effectiveness of the internal control structure, including the segregation of duties and independence of oversight;
- h. Maintaining a list of individuals who are authorized to approve and execute Approved Product transactions;
- i. Ensuring timely and accurate collection of market data for risk measurement and reporting;
- j. Conducting necessary stress test on portfolio exposure and CVaR models;
- k. Preparing, reviewing and distributing all risk management reports;
- l. Processing and verifying market data provided by the Front Office;
- m. Maintaining independent market forward price data;

- n. Evaluating performance of Approved Product procurement and hedging transactions relative to market indices and approved budget;
- o. Notifying the ROC of credit limit exceptions;
- p. Working with the Front Office to develop and implement risk measurement methodologies and quantitative applications;
- q. Serving as secretary of the ROC, developing ROC agendas, taking and compiling meeting minutes, and distributing meeting materials;
- r. Maintaining archives of risk management program documents;
- s. Monitoring and ensuring compliance with the Commercial Compliance Policy;
- t. Coordinating risk management education and training;
- u. Various credit management duties as outlined in these Regulations; and
- v. Prepare and maintain written Middle Office procedures.

4.6. Back Office

The Back Office staff is primarily responsible for settlement of invoices, verifying transactions, bookkeeping and accounting, and ensuring Approved Product transactional activities are consistent with contract authorities and requirements. The Back Office is responsible for providing assurance of accurate transaction records and settlements. *The Division Manager of SJCE's Finance and Administration Group is responsible for managing the Back Office.* The Back Office may also utilize support from SJCE's Wholesale Energy Services Provider and consultants to carry out the duties described herein.

The Back Office is responsible for the following duties:

- a. Crosschecking counterparties confirmation documents for individual trade transactions to SJCE's own records of those transactions, and investigating and resolving exceptions;
- b. Ensuring settlements are made timely and in accordance with contract terms;
- c. Verifying and reporting compliance with procedures as reflected in the transaction tracking documentation;
- d. Ensuring that operations and systems can effectively and efficiently support the processing of approved transactions;
- e. Performing and supporting transaction allocations, invoicing and settlements;
- f. Development and maintenance of GHG Compliance Instrument tracking and allocation;
- g. Monitoring accounts receivable and payable;
- h. Verification of transaction data entry; and
- i. Preparing and maintaining written Back Office procedures.
- j. Disputing any charges from the ISO.

4.7. Auxiliary Functions

Other functions in support of and relevant to risk management are conducted by SJCE staff who are not directly including within the Front Office, Middle Office and Back Office functions. These include some contract administration functions, load forecasting and managing financial reserves.

Long term planning and forecasting of Energy supply requirements (long term supply plans) are developed by SJCE staff and analytical support personnel.

SJCE's Finance and Administrative Services Division is responsible for preparation of the budget in collaboration with the City Managers Budget Office, and amounts billed for Approved Product transactions. SJCE's Finance and Administrative Services Division staff in collaboration with the Finance Department and the City Manager's Budget Office also establish necessary financial reserve levels related to counterparty credit requirements for SJCE in general. These auxiliary functions may also be supplied to SJCE by SJCE's Wholesale Energy Services Provider and other consultants.

5. Authorities, Limits and Prohibitions

5.1. Individual Trading Authority and Transaction Limits

All executed transactions shall conform to the policies set forth in the ERMP and these Regulations. It shall be the responsibility of the ROC, to establish appropriate individual trading authority limits for the various staff involved in the Front Office function. All Middle Office and Back Office staff are strictly prohibited from executing any Approved Product transactions. The Middle Office shall confirm that the Front Office has informed SJCE's counterparties of changes in Front Office staff authorized to trade within seven (7) business days. Unless or except as recommended by the ROC from time to time, trading authority limits for individual transactions shall be as outlined in Appendix 4 of these Regulations.

5.2. Permitted Transactions and Approved Products

The ROC is responsible for authorizing and approving all Approved Products that may be transacted by SJCE. Transacting Energy related products that are not authorized as Approved Products by the ROC is strictly prohibited, unless the ROC grants an exception in advance.

All transactions shall conform to the following general principles:

- a. Be for an Approved Product;
- b. Be duly authorized and within risk limits, and shall not cause either aggregate or individual counterparty credit limits to be exceeded;
- c. Be executed with a counterparty with an approved credit limit;
- d. Shall utilize contract terms intended to minimize the risk of loss if a counterparty fails to deliver, take delivery or pay for transactions provided;
- e. Be executed and documented following standardized procedures; and
- f. Be in compliance with applicable laws, regulations and court orders.

Approved Products that have been authorized by the ROC are listed in Appendix 6 of these Regulations. Appendix 6 also contains certain limitations for each authorized Approved Product.

5.3. Unauthorized Transactions

Any member of staff who enters into an unauthorized transaction may be subject to disciplinary action up to and including termination of employment.

The following provides the minimum procedures for managing unauthorized transactions:

- a. If a transaction is unauthorized, the Director shall determine the course of action. If the transaction involves market risk, the Director may elect to either enter into a risk neutralizing transaction, or attempt to unwind the transaction with the original counterparty. However, the first alternative (offsetting transaction) only offsets market price; operational and credit risk may still exist. Unwinding the transaction would likely remove all risk from the trade.
- b. Once the corrective steps have been taken, the Director shall review the transaction to ensure all risks have been offset and report the results in the Exception Report.

5.4. Process for Adding New Approved Products

All requests to add a new Approved Product to Appendix 6 must be analyzed by the Front Office, Middle Office, Back Office staff, and SJCE's legal counsel to determine what risks such product may create for SJCE, and what business needs exist that provide the basis for adding the new product to the Approved Products list. All requests to add a new Approved Product to these Regulations must be presented to the ROC for consideration, and if approved by the ROC shall be added to Appendix 6 as an Approved Product. Any product not listed as an Approved Product in Appendix 6 of these Regulations is considered to be a new product.

A report to the ROC recommending approval of a new Approved Product shall address the issues described in the New Product Approval Checklist contained in Appendix 5 of these Regulations. The New Product Approval Checklist is a guideline for activities that should be performed in evaluating and mitigating the market and credit risks associated with use and deployment of new products.

Front Office staff have primary responsibility for developing the report to identify the business needs for the new Approved Product being requested, and an assessment of risks that SJCE may be exposed to by transacting the new Approved Product. Front Office staff are responsible for presenting the report to the ROC for consideration and approval. Primary responsibility may be delegated by Front Office staff to those individuals having special knowledge or expertise of the activity or new product type.

6. Systems, Tools and Training

SJCE employees (or supporting suppliers) who are authorized to perform energy risk management functions on behalf of SJCE shall be provided the necessary systems and tools to support all risk management processes, including:

- a. Access in real time to market activity, prices and other data;
- b. Systematically evaluating the financial condition, credit standing and ability to perform of other entities with whom SJCE does business;
- c. Analyze the trends of supply, demand, market prices and costs of service;
- d. Record transactions accurately and completely;
- e. Measure key indicators and risk parameters; and
- f. Generate complete and accurate management and financial reports.

Provision of funding shall be requested in the budgets submitted for the Department that performs market risk management functions on behalf of SJCE, for the acquisition and maintenance of computer systems, software, communications equipment, data services and other analytical, measurement and reporting tools. Provision of funding shall also be requested in the budgets submitted for SJCE, which performs market risk management functions on behalf of SJCE for managers and staff to attend seminars and courses in risk management as required to comply with the ERMP and these Regulations.

7. Compliance Exceptions and Reporting

7.1. Compliance Exceptions

Compliance exceptions are actions which violate the provisions and/or requirements as set forth in the ERMP and these Regulations, and/or the procedures developed and approved by the ROC.

The following types of occurrences shall not be considered compliance exceptions:

- a. Losses incurred on wholesale transactions which were undertaken in compliance with the ERMP and these Regulations;
- b. Adverse changes in credit standing, financial condition or ability to perform of a wholesale trading counterparty which occur subsequent to the execution of a transaction or contract;
- c. Adverse changes in capital asset valuations, MTM exposures, or CVaR resulting from fluctuations in prices subsequent to the execution of a transaction or contract; and
- d. Actions compelled by order of regulatory authorities or by legislation, which are otherwise in violation of the ERMP, these Regulations, and/or related Procedures.

7.2. Exception Reporting

In the event a compliance exception occurs, the Director is responsible for notifying the ROC within 48 hours after it is identified and ensure that the Front Office prepare a report (Exception Report) for the ROC at its next meeting. The Report shall identify the issue or violation, and discuss the alternative remedial actions, document the action taken in response, and describe the steps that will be taken to prevent a reoccurrence of the event. A summary of all exceptions shall be reported annually to the City Council by the Director, unless the City Manager decides they should be reported more frequently.

8. Risk Management Methodologies

8.1. Measurement of Risks

SJCE measures risk by estimating how high or low future supply costs and revenues could be, given a particular portfolio position and specific confidence level of market price movements. These estimates apprise management as to the risks inherent in a particular position and are used to make decisions to accept that risk or to reduce the risk by changing the position or the portfolio management strategy going forward.

Volumetric variability is estimated as part of the load and resource forecasting process. Normal, High and Low scenarios are provided as part of the annual budget process. An updated load and resource forecasted balance is provided each month. Volumetric uncertainty shall be incorporated in the quantitative risk measures that SJCE tracks and reports on a regular basis. The financial consequences of volumetric risk depend upon both how actual loads and supplies compare to forecasts, and on market price variations.

Market price risk is measured by calculating forward price volatility (either using recent historical data for forward prices or market prices for options), and applying that volatility to the future to see how costs and revenues could change if there were an adverse market price movement.

Counterparty credit risk measures are captured in reporting of counterparty exposure and transaction limits.

Appendix 8 of these Regulations provides a more detailed description of SJCE's risk measurement methodology. Risk management reports that are presented to management and the ROC are described in Appendix 7 of these Regulations. Each member of the ROC is responsible for raising significant issues that could impact SJCE or the City of San Jose more broadly. Each member of the ROC can call a special meeting to discuss significant issues.

9. Risk Limit Structure

SJCE sets risk limits in order to mitigate risk exposure within the broad objectives of optimizing the value of SJCE's assets, and serving customer loads at cost effective and stable prices. Transaction limits authorized in Appendix 4 shall comply with the requirements described in this Section 9.

Portfolio risk limits are expressed based on volume, duration, dollar value, and CVaR. SJCE will develop a path towards setting (1) volume limits and (2) VAR limits. Risk limits include: (1) qualification criteria for counterparties, including creditworthiness and required contractual provisions, (2) counterparty credit limits, and (3) preferred contractual terms. Counterparty credit risk limits are intended to monitor and contain potential losses due to counterparty default. This Section 9 also includes a brief discussion of risk monitoring and reporting requirements.

Risk limits may be employed to indicate either:

- a. An exception, which requires an Exception Report to the ROC;
- b. A warning, which indicates that a risk measure is outside of an acceptable tolerance band, and should be reported to the ROC promptly; or
- c. A standard, such as minimum qualifications or contract provisions.

Risk limits are subject to regular review and adjustment by the ROC as market conditions change. Risk limit metric methodologies and limits are further explained in Part II of these Regulations.

9.1. Basic Principles for Setting Risk Limits

The following set of basic principles shall guide the general approach to setting risk limits (including but not limited to credit exposure limits, contract duration, volume, and transaction limits):

- a. Enable staff to conduct required business effectively
 - 1) Volume and dollar limits adequate to reliably meet physical and financial requirements at prevailing prices
- b. Reflect the risk-reward tradeoffs consistent with SJCE's risk tolerance
 - 1) Duration, volume, dollar and exposure limits appropriate for associated risks
- c. Favor strong counterparty attributes
 - 1) Creditworthiness and financial strength
 - 2) Favorable contractual terms
 - 3) Demonstrated performance
- d. Promote fair and competitive transacting process
 - 1) Should not narrow field to a single supplier or unduly favor any supplier
- e. Promote diversification
 - 1) Avoid too great a concentration of supply or exposure with any single supplier
- f. Facilitate operational flexibility
 - 1) Allow for load uncertainty, resource uncertainty, and other contingencies
- g. Facilitate conformance to the ERMP and Regulations
 - 1) Clear, measurable, consistent and enforceable
- h. Balance burden of monitoring and enforcing limits with value
 - 1) Not so complex and cumbersome that it takes too many resources to manage

9.2. Portfolio Risk Limit Guidelines

Portfolio limits facilitate: (1) adhering to policies and procedures, (2) quantifying risk tolerance levels for risk monitoring, reporting and control, and (3) reducing operational risks.

Portfolio limits must take into account:

- a. Load and resource balance variability – monthly and seasonal variation;
- b. Load and resource balance uncertainty – confidence intervals around expected values;

- c. Minimum feasible wholesale transaction size – Approved Products are traded in large discrete package sizes; and
- d. Operational flexibility and constraints – customer responsiveness, system reliability.

Risk limits shall be reviewed and updated by the Middle Office and Front Office in conjunction with development of the long-term power supply forecast, as part of the annual budget process, or more frequently as deemed necessary.

9.3. Net Position Guidelines

Purpose: Net position guidelines specify the physical load and resource balance tolerance levels within which SJCE staff shall recommend transactions to comply with these Regulations, and to ensure that Approved Products are transacted to meet physical and financial load and resource balance requirements.

Applicability: Net position guidelines apply to Approved Product transactions that are one month in duration or longer. These transactions include all must-take, fixed-priced contracts, index-priced contracts¹, , and the long-term contracts. Fixed-priced Call Options are not approved products.

For all other transactions:

1. Within-the-month Approved Product transactions are operational in nature, and require flexibility to balance hourly, daily, and weekly, and balance-of-month load variations. Net Position Limits guidelines do not apply to within-the-month transactions, but they are included in transaction reporting and total deliveries reported to the ROC.
2. Resource Adequacy capacity, GHG Compliance Instruments, transmission, transportation, ancillary services, basis, and storage requirements are set by reliability based technical standards, regulatory requirements, or maximum potential usage in order to reliably meet real-time and peak demand. Net Position guidelines do not apply to these Approved Products, but staff shall inform the ROC of the criteria used for estimating SJCE's needs.
3. Transactions of surplus or excess Approved Products made available through existing contracts (e.g. due to weather conditions) shall not constitute Speculation, but shall be reported to the ROC.

The net changes in physical position due to buy-sell transactions executed to offset positions with a counterparty, effect transportation or transmission transactions, or other approved purpose shall be included in the Net Position guidelines.

¹ A transaction priced based on an index rate that is directly offset with a matching transaction priced at the same index rate (e.g., a sales transaction that is directly offset with a like purchase transaction) shall be excluded from the calculation of net position.

10. Risk Control Structure

10.1. Control Principles

SJCE will strive to conduct its energy risk management activities in accordance with best practices of the wholesale electric industry, but implementing such practices must be justified and balanced as to their costs and benefits. Processes and control systems must be in place that allow SJCE to identify, measure, monitor, control and track its risk exposures. These processes and control systems shall be consistent with the following risk management control principles:

- a. Appropriate segregation of duties and internal controls;
- b. Appropriate systems to ensure accurate and effective management reporting;
- c. Necessary resources in place to achieve management objectives;
- d. Attract and retain skilled and trained personnel;
- e. Cross-train and provide cross-coverage;
- f. Employees conducting Energy transactions who are free of conflicts of interest;
- g. Authority and approval delegation that is commensurate with accountability and capability;
- h. Performance measurement and reporting incorporate risk and return measures; and
- i. Ongoing monitoring of control effectiveness.

10.2. Functional Responsibilities

SJCE has integrated but segregated responsibilities to control risks in a manner consistent with the above control principles by means of clearly defined roles and responsibilities for the Front Office, Middle Office, and Back Office. Oversight functions are performed at an operational level by these offices, and managed at an executive level by the City Council, City Manager, Director of Community Energy, and ROC. These functional responsibilities are described in detail in Section 4 of these Regulations. SJCE may utilize the services of its Wholesale Energy Services Provider and consultants for performing such functions.

10.3. Transaction Capture Process

All transactions² of Approved Products must be formally and officially documented by SJCE. Transaction capture procedures shall address all of the following elements:

- a. Authorization/Approval (e.g., participant authorization form as used in the market purchase program agreement);
- b. Competitive bidding;
- c. Commitment to the transaction;
- d. Recording the transaction;

² Transaction for a term of balance-of-month or shorter are not subject to certain elements of the transaction capture process, as further described in the respective transaction procedures.

- e. Confirming the validity of the transaction with the counterparty;
- f. Inputting the transaction into the deal capture system;
- g. Actual product delivery; and
- h. Billing and settlement.

10.3.1. Authorization/Approval

The appropriate authorizations and approvals must be obtained by Front Office staff prior to transacting Approved Products. Such authorizations may be in the form of predefined contractual authorizations, or as defined in the ERMP or these Regulations. SJCE shall develop protocols to address when the volume and/or VAR limits are not in compliance. If the limits are violated by a certain to-be-determined amount SJCE shall assemble the ROC for an emergency meeting. The ROC can choose to be flexible on the limits (within certain parameters) or require action. If it exceeds a certain amount it goes higher in the organization and to SJCE's City Council. Front Office staff shall obtain approval from duly authorized personnel (supervisor or higher) with specified *dollar and volume* limits as specified in Appendices 3, 4 and 5 before consummating any transactions for Approved Products.

10.3.2. Competitive Bidding

For Approved Product transactions scheduled for delivery further than one (1) week in advance, quotes for forward commitments, with the exception of exchange traded transactions, must be obtained competitively from available and approved counterparties, consistent with the size and type of transaction and counterparty. Alternatives are to be evaluated on an equivalent basis (similar quality, volume, duration and options), adjusted for such factors as transmission, losses, etc. Front Office staff must obtain quotes from at least three (3) qualified suppliers, if three (3) approved counterparties are available. Alternatives are to be evaluated on an equivalent basis (similar quality, volume, duration and options), adjusted for such factors as transmission, losses, etc.

Transactions occurring for delivery of product within one week or less, or exchange traded (e.g. NYMEX, ISO, ICE, etc.) transactions, do not require formal written documentation that three (3) quotes were obtained beyond what is entered in the deal capture system.

10.3.3. Commitment to the Transaction

A commitment is a legally binding contract between SJCE and a counterparty. The Front Office must be the point of commitment for all Approved Product transactions. Final price commitments may only be made by authorized SJCE transacting personnel. Commitments shall be made verbally or electronically in the case of an electronic exchange. Transacting personnel shall only transact with counterparties who are listed on the Approved Counterparties List.

10.3.4. Recording the Transaction

All transactions must be recorded.³ Verbal commitments must be executed on a recorded telephone line, and shall be stored and maintained in accordance with SJCE's records retention policy. Electronic commitments must have an electronic audit trail. All transactions must be evidenced by a deal control system entry prepared in a timely manner. All transaction information shall be time and date stamped at the time of commitment.

10.3.5. Confirmation

A confirmation is a written document evidencing a verbal or electronic commitment made by SJCE transaction personnel. All confirmations must agree with the transacting person's commitments, as evidenced by phone records, deal capture system entries or other supporting documentation. All confirmations must be reviewed and confirmed by Back Office personnel for accuracy. The Front Office shall generate a written confirmation, when required, in any case where the counterparty does not provide or require a written confirmation. Any transaction that is not confirmed by the counterparty and approved by authorized personnel within five (5) business days after the transaction has been executed will be subjected to review and identification by the Middle Office. Using the confirmation, the Back Office staff shall review and confirm the consistency and accuracy of the deal capture system entry made by the Front Office staff. All written transaction confirmation shall be stored by SJCE consistent with SJCE's records retention policies. Written confirmations are not required for any transaction with a duration of less than seven (7) calendar days.

10.3.6. System Input

All transactions must be entered into the deal capture system, and the transaction information shall be maintained in accordance with SJCE's record retention policy. All transactions shall be entered into the deal capture system by Front Office personnel. Deal capture system input shall be performed no later than the first business day after the deal was confirmed. Once a transaction is entered into the deal capture system, Back Office staff shall review the deal entry to confirm that the information entered into the deal capture system is consistent with the transaction confirmation, if required. If the data entry is found to be correct by Back Office staff, the deal shall be approved for accuracy. If the data entry is found to be inconsistent with the deal confirmation, Back Office staff shall notify Front Office staff to make the necessary corrections to the data entry stored in the deal capture system.

10.3.7. Billing and Settlement

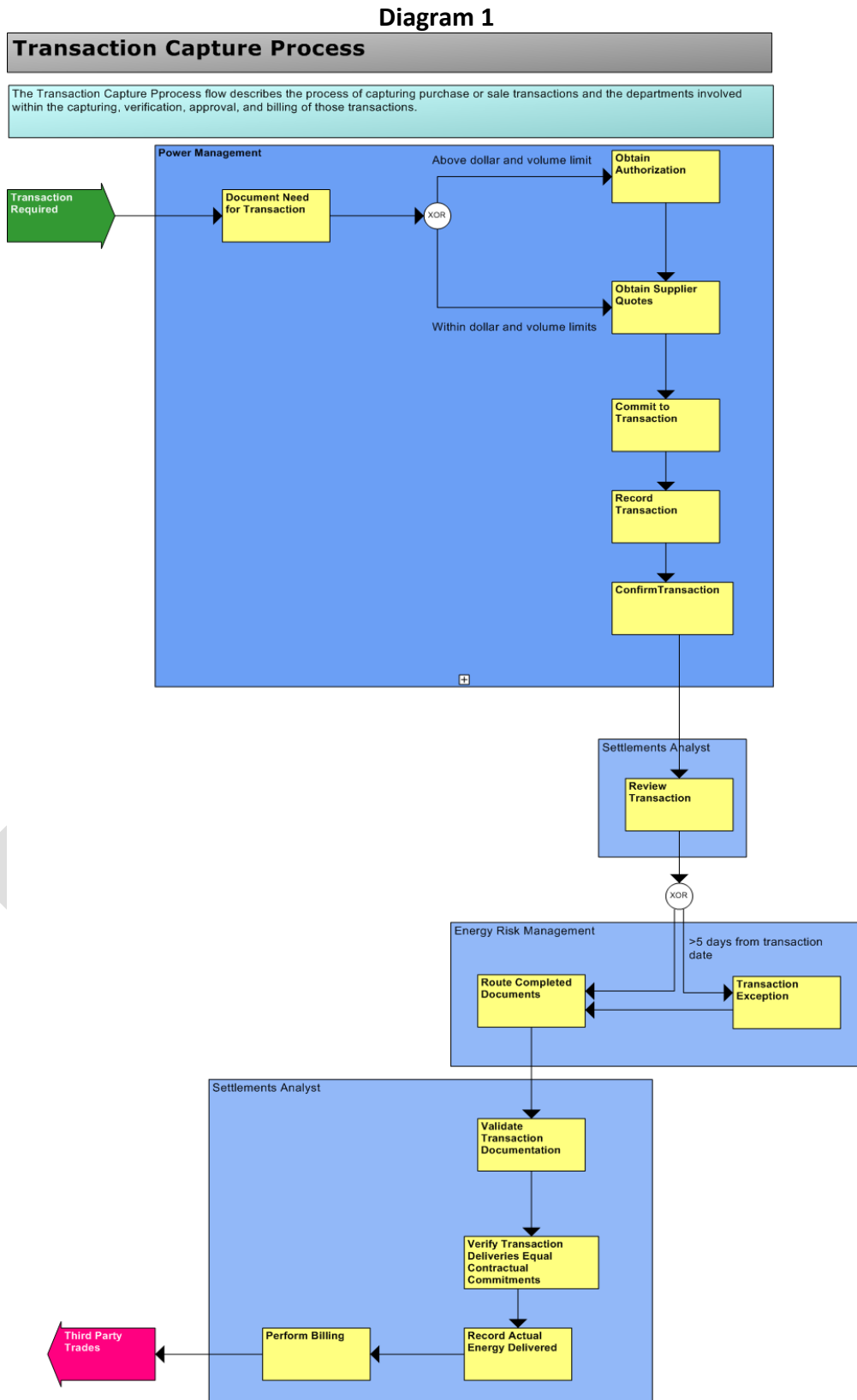
Back Office staff ensures that bills are issued to counterparties with outstanding accounts

³ Real-time verbal and electronic commitment dates and times are recorded in the dispatch log. GHG Compliance Instruments are recorded in the CITTs system maintained by the California Air Resources Board.

receivable, and reviews bills for transactions to verify that the bills match the terms of the contract and the amount of product actually delivered (this process is generally referred to as the “checkout process”).

DRAFT

Diagram 1 below is a representation of the transaction capture process:



Energy Risk Management Regulations

10.4. Management Reporting Framework

The key to energy risk management is monitoring of risks. Accurate and timely information must be provided to all parties involved in any aspect of energy risk management, to allow them to perform their functions appropriately. Reports can be categorized into three main areas:

- a. Risk Monitoring – illustrate risks that are faced ahead;
- b. Oversight – show compliance with policies, authorities or risk limits; and
- c. Performance – compares actual past and present performance of the portfolios to appropriate budget and market benchmarks.

A complete list of management reports for each level of oversight is provided in Appendix 7 of these Regulations. These reports shall be prepared on a frequency as indicated in Appendix 7. New reports, or changes to existing report formats, may be recommended and approved by the ROC.

10.5. Internal Controls

Internal controls shall be based on proven principles that meet the stringent requirements of generally accepted auditing standards (GAAS), financial institutions and credit rating agencies. The required controls shall include all customary and usual business practices designed to prevent errors and improprieties, ensure accurate and timely reporting of results of operations, provide information pertinent to management and facilitate attainment of business objectives.

The required controls shall include the following:

- a. Segregation of duties between initiation, confirmation, monitoring and settlement transactions;
- b. Delegation of authority that is commensurate with responsibility and capability;
- c. Complete and precise capture of transaction and other data, with standardization of electronic and hard copy documentation;
- d. Meaningful summarization and accurate reporting of transactions and other activity at regular intervals;
- e. Regular independent compliance review to ensure that the ERMP and these Regulations are adhered to; and
- f. Active participation of senior management in the risk management process.

11. Conflict of Interest

In accordance with the California Political Reform Act, consultants shall cause each person performing services for the SJCE to complete annual conflict of interest filings and disclose investments as required by the FPPC and this Section.

All SJCE employees who are engaged in Approved Product transactions, counterparty credit evaluation, or oversight of the foregoing and are employed in any job classification listed in the SJCE Conflict of

Interest Code are required to complete annual conflict of interest filings on FPPC Form 700, and disclose investments as required by that Code. They are required by that Code to abstain from participating in or attempting to influence any decisions that foreseeably would have a material financial effect on any such investment.

In addition to the foregoing disclosure requirement, SJCE employees engaged in Approved Product transactions, counterparty credit evaluation, or oversight of the foregoing are barred from direct investment in any company with whom SJCE has consummated any Approved Product transaction within the last two (2) years. Further, such employees must divest existing direct investments in Approved Product counterparties prior to engaging in any negotiating, evaluating, transacting or oversight functions. The ban on investment and requirement for divestment applies regardless of whether or not the investment would be of sufficient size (\$2,000) to require disclosure on FPPC Form 700. As used in this section, a “direct” investment means an investment which, if of sufficient size, is of a nature that would constitute an “investment” pursuant to the California Political Reform Act.

SJCE employees supervising staff who are subject to this policy are responsible for routinely reviewing the most recent Form 700 of each such staff member for the purpose of identifying potential financial conflicts of interest. Updated copies of Form 700 shall be given to the supervisor/manager by the SJCE Conflict of Interest Filing Officer designated in the SJCE Conflict of Interest Code. The SJCE legal counsel will assist in reviewing these forms and providing legal advice in connection with such reviews on request.⁴ In accordance with the California Political Reform Act, consultants shall cause each person performing services for the SJCE to complete annual conflict of interest filings and disclose investments as required by the FPPC and this Section/Paragraph

12. Policy Review

Prudence is required in implementing any and all policies and procedures. Market and industry conditions, technology and risk tolerances tend to change over time. Therefore, the ERMP and these Regulations should be reviewed annually, or as necessary, in order to make adjustments in response to changes in business objectives and/or industry conditions. All recommended amendments to the ERMP are to be reviewed by the ROC and presented to the City Council for final review and approval. Changes to these Regulations shall be reviewed and approved by the ROC.

⁴ Non-staff ROC members, if any, shall not be subject to the requirements of Section 11 since their oversight functions are generally not transactional and company specific. Non-staff ROC members may be subject to conflict of interest compliance requirements at each of their own organizations.

Part II: Counterparty Risk Management

13. Organizational Philosophy Toward Counterparty Risk

13.1. Objective and General Risk Policy

SJCE's wholesale energy market activities are directed toward the goal of providing Energy, capacity, transmission and related services to its customers at the lowest possible cost consistent with an acceptable level of risk. SJCE fulfills its supply obligations by contracting with counterparties for the purchase or sale of such assets on a long-term or short-term basis. Effective wholesale counterparty management and credit analysis is essential to mitigate the counterparty risks associated with Approved Product transactions in the Energy wholesale markets. The objective of the wholesale counterparty risk policy is to preserve SJCE's capital, liquidity and supply reliability by limiting counterparty credit risk and counterparty concentration to acceptable levels.

13.2. Expectations of the City Council

Analytical procedures for granting open lines of credit and managing counterparty exposures are required. However, SJCE recognizes that the models used in managing credit risk are not predictive; they are explanatory. Credit risk management models cannot predict individual credit events or collective credit events. The Finance and Administrative Services Division is expected to manage counterparty risks to acceptable levels established by the ROC and approved by the City Council. The City Council recognizes that SJCE is generally a net buyer of Energy. Exposure to wholesale counterparty credit risk will normally be greater in periods of rising market prices due to higher replacement costs in a rising market. On the other hand, in high hydrological conditions, where excess generation may be available for sale on the wholesale market, SJCE is exposed to greater counterparty credit risk if counterparties fail to take delivery, or if they fail to pay for power delivered.

14. Counterparty Risk Definitions

14.1. Counterparty Risk

Counterparty risk is defined as the exposure to economic loss resulting from default by another party to a contract. Such risk exists in all financial and commodity markets and can be distinguished from other financial risks such as market risk, operational risk and regulatory risk.

Counterparty risk affects both contracts requiring physical settlement and those specifying monetary settlement. Contractual payments can result from purchases or sales. Under a sale, the counterparty owes cash and a receivable is created. The holder of the receivable is at risk of financial loss if the receivable is ultimately uncollectible. Under a purchase, the counterparty is

obligated to deliver a product. However, the counterparty may also be required to reimburse the purchasing party for financial loss in the event of delivery failure. Therefore, the purchasing party is at risk of financial loss if the counterparty is unwilling or unable to reimburse for financial losses.

The ERMP states that for all fixed price Approved Product transactions, the counterparty must possess a public credit rating of at least a BBB+ (or equivalent investment grade rating) by a nationally recognized statistical rating organization (NRSRO). SJCE staff may consider counterparties with a rating below investment grade or counterparties with no NRSRO rating on a case-by-case basis with the approval of the ROC. If ratings differ between NRSRO's, the lowest available rating will be used for underwriting purposes.

14.2. Credit Risk

For the purchaser of an Energy related product, credit risk is defined as the difference between the contracted price and current market price of a contracted product. If the current market price is greater than the contracted price, a positive MTM exists, thus exposing the purchaser to credit risk in the event of supplier default.

If the current market price is less than the contracted price, a negative MTM exists. The purchaser has credit exposure with a negative MTM if the deal is subject to termination or MTM damages. There is no credit exposure with negative MTM if the deal is subject to one-way liquidating damages and the purchaser is not the defaulting party.

If the seller has a positive MTM position in a transaction, the seller is exposed to profit risk in the event the counterparty defaults, where the seller would lose its opportunity to above market revenue. In contrast, if the seller has a negative MTM position in a transaction, the seller is exposed to liquidity risk and may be subject to margin calls if the MTM exceeds established credit limits.

15. Underwriting Standards

All transacting counterparties shall be reviewed for creditworthiness. This review shall include:

- a. A search of public debt and implied unsecured credit ratings as published by a NRSRO such as Standard & Poor's, Moody's Investor Services and Fitch;
- b. Review of at least the two (2) most recent years audited financial statements receiving an unqualified opinion from a certified public accounting firm; and
- c. Other information, as available, from news services, trade publications, financial websites, etc.

For transacting counterparties without NRSRO ratings, SJCE credit staff shall determine an implied rating according to SJCE's internally-developed methodology and rating scale. Transacting for all counterparties shall require an implied "investment grade" rating of BBB+ or its equivalent, at a minimum. SJCE credit staff may consider counterparties with a rating below BBB+ or its equivalent on a case-by-case basis. All sub-investment grade rated counterparties require ROC approval before

transacting and may require credit assurances or other consideration.

16. Credit Risk Measurement

Credit risk exposure should be measured as: (1) current exposure, and (2) potential exposure. Current credit risk exposure to a single counterparty is defined as the sum of: (1) the dollar value of all amounts invoiced and unpaid, and (2) the dollar amount of all uninvoiced deliveries. Potential credit exposure is the MTM value of all forward contracts from today forward, as reported by the business unit.

Total credit risk exposure is the sum of the variables shown in the formula below, less all offsetting amounts that are supported by legally binding netting agreements or available collateral. SJCE's credit exposure measurement is defined by the following formula:

$$\text{Credit Exposure} = \text{Current and Prior Month Sales (Net Sales}^5) + \text{MTM} - \text{Credit Enhancements}$$

In addition, potential credit risk exposure is captured by the CVaR statistic. The CVaR statistic represents the maximum dollar loss at a 95% confidence level within a certain time, due to volatility in market prices if the counterparty defaults. CVaR is a dollar estimate of the risk that potential changes in market price would result in increased credit exposure for all forward contracts. CVaR shall be presented as supplementary information for credit benchmarking. SJCE's CVaR calculation methodologies are documented in Appendix 8 of these Regulations.

17. Credit Enhancements

Customers or counterparties that do not meet the minimum requirements for an extension of an open line of credit, as set forth in Section 15 of these Regulations, must post at least one (1) of the following types of security prior to the execution of transactions:

17.1. Guarantees and Surety Bonds

Counterparties may provide a guarantee from a third party, or parties, which meets the creditworthiness requirements set forth in Section 15 of these Regulations. If a counterparty provides a guarantee, the amount of any open line of credit will be determined through an analysis of the financial strength of the guarantor. The guarantor will be considered secondarily liable for the obligations of the counterparty. In the event a surety bond is provided, SJCE will consider the surety bond as primarily liable for the obligations of the counterparty. All guarantees must be approved as to content and form by SJCE's legal counsel.

Preferred terms for guarantees include, but are not limited to:

- a. A statement that the guarantee is one of payment and not of collection;
- b. A statement that the guarantor agrees to pay the guaranteed obligations on the date due;

⁵ Provided there is a netting agreement with the counterparty. Otherwise, it will be the receivable portion only.

- c. A statement that the guarantor's obligations under the guarantee rank pari passu with its senior unsecured debt obligations;
- d. A statement restricting the guarantor's right to terminate the guarantee, and any termination must still guarantee existing exposures as they may exist;
- e. A statement that the guaranteed obligations are unconditional, irrespective of value, genuineness, validity, waiver, release, alteration, amendment, and enforceability of the guaranteed obligations, and a statement that the guarantor waives the right of set-off, counterclaim, etc.;
- f. A statement that the guarantee reinstates if any guaranteed payment made by the primary obligor is recaptured as a result of the primary obligor's bankruptcy or insolvency;
- g. A statement that the guarantor waives its right to subrogation until the guaranteed obligations are paid in full;
- h. A statement that the guarantee is binding on successors of the guarantor and a statement that SJCE is a beneficiary of the guarantee;
- i. A statement that the guarantee will be interpreted under either New York or California law; and
- j. A statement that the guarantor has subjected itself to jurisdiction and service of process in the jurisdiction in which the guarantee is to be performed (i.e., State of California).

Exceptions to the above concepts and/or acceptance of guarantees from entities domiciled outside the U.S. or Canada require ROC approval.

17.2. Letter of Credit

Counterparties may provide an irrevocable Letter of Credit in an amount sufficient to cover the amount in excess of the credit limit approved by SJCE at the date the transactions are entered into (e.g., MTM in excess of credit limit). Letters of Credit must have a term of at least 45 days past the term of the transactions. Letters of Credit must be issued by a domestic bank (or domestic branch of a foreign bank) that has a senior debt rating of at least "A" or its equivalent from a NRSRO. Approved Banks should be monitored for any potential Letter of Credit concentration between SJCE and various counterparties.

Exposure to any single institution will be limited to 20% of SJCE's total credit exposure, unless exposure is derived from a few transactions whereby demanding Letter of Credits from several institutions would be unreasonable for the counterparty. If credit risk exposure is derived over the entire portfolio of transactions, the 20% rule will apply. Any exposures greater than 20% must be approved by the ROC. All Letters of Credit must be approved as to content and form by SJCE's legal counsel.

17.3. Prepayments

Counterparties may provide a prepayment or cash margin deposit in an amount that is sufficient to cover the related transactions. Discounts for prepayment, consistent with industry standards, may be applied to the sum owed as authorized by the Director of Finance.

18. Quality Assessment

18.1. Counterparty and Credit Analysis

Middle Office staff are responsible for ensuring a standardized credit screening process for all counterparties. All counterparties must be reviewed for financial creditworthiness according to these guidelines.

Middle Office staff will submit a credit review report to the appropriate approval authority, depending on the level of credit requested, for consideration and action. For agency-rated counterparties, Middle Office staff may elect a rating similar to one derived by a NRSRO, and waive initial review requirements, if the counterparty is recognized and established in the industry. As a result, a more stringent review process should be followed for those entities that do not possess a NRSRO rating and/or have marginal financial capacity.

All counterparty credit lines and credit reviews will be submitted to the appropriate authority level as authorized in Section 19 of these Regulations. ROC actions can result in the approval or rejection of a proposed counterparty, or in an amendment to credit limits approved under delegated approval authorities. Approved counterparties will be grouped into three tiers. A counterparty's tier status will be based on the credit evaluation matrix found in Table 1. More frequent monitoring may be required if a counterparty is subject to the possibility of a credit event (e.g., if their credit rating falls one full letter grade or greater, or if their credit rating falls below investment grade), or if industry factors dictate.

Table 1
Credit Evaluation Matrix

	Tier 1	Tier 2	Tier 3
Criteria	Bilateral master agreement or transactions of one (1) month or longer within past two (2) years	No greater than prompt month transactions within past two (2) years	No transactions in past two (2) years
Type of Trading	All	Prompt month or less	Day-ahead (Prescheduling time frame)/Real-time
Credit Evaluation Requirement	At least annually	At least biennially, or as needed	None

External credit and EDF ratings checked	For RFPs and at least annually	Annually	Annually
Credit Limit	See Section 19	\$500,000	\$100,000
Event Monitoring	On-going	On-going	On-going

18.2. Credit Limits

Once a counterparty has been determined to be creditworthy, a credit limit will be proposed. An open line of credit may be extended up to the lesser of 5% of the counterparty’s adjusted tangible net worth⁶ or SJCE’s maximum counterparty credit limits. In the case of municipal or public organizations, an open line of credit may be extended up to 10% of average free cash flow⁷ for the prior two (2) years not to exceed SJCE’s maximum counterparty credit limits.

NRSRO/SJCE Internal Rating

Maximum Counterparty Credit Limits

AA- and above

\$ 35 million

A+ to A-

\$ 25 million

BBB+

\$ 15 million

For example, if a municipal counterparty qualifies for a credit limit of \$20,000,000 based on the cash flow test (e.g., 10% of avg. free cash flow for past two (2) years), but only qualifies for an SJCE rating of BBB+, then the maximum policy limit allowed would be \$15,000,000.

Although a counterparty may qualify for a certain maximum credit limit, anticipated transaction volumes and other business factors may prompt the selection of a lower limit that is considered more appropriate. As a result, the credit limit methodology provides limit ceilings while allowing flexibility in response to normal business activities.

18.3. Concentration Limits

In addition to maintaining credit limits, SJCE staff shall strive to diversify transactions among counterparties. SJCE staff shall document the business reasons (e.g. differences in bid price, lack of other qualified suppliers, etc.) for awarding contracts to counterparties with high concentrations of credit exposure.

⁶ Tangible Net Worth (TNW) = shareholder equity – goodwill – intangible assets – receivables from officers – investments in other trading companies – off-balance sheet liabilities, etc.

⁷ Free Cash Flow = net income + non-cash charges such as depreciation + or - changes in accounts receivable, inventory, prepaid expenses, accounts payable, and accrued liabilities – cash dividends (general fund transfer) + net borrowing – capital expenditure.

19. Approval Authorities

19.1. Credit Authorization

Approval authorities are based on the level of business experienced by SJCE on a historical and current basis within limits allowed under the Regulations. Authority to establish credit limits is segregated as follows:

Director of Community Energy or designee: (designee cannot be staff in the Power Resources group)	Up to \$ 15Million
Director of Finance or designee:	Up to \$ 20 Million
ROC:	Up to \$ 50 Million
City Council:	\$ 50 Million +

The maximum amount of any open line of credit to be extended to any customer or counterparty shall not exceed \$50 million unless authorized by the ROC. If credit lines exceeding \$50 million are anticipated, approval by the City Council is required.

19.2. Increases to Wholesale Counterparty Limits

Any increase to an existing open line of credit must have the written approval of SJCE's Division Manager of Administration and Finance Group, the Director of Finance, or the ROC, within the authorized limits stated in Section 19.1. A sign off sheet shall be used to ensure written approval according to the limits authorized by this Regulations.

19.3. Credit Review Exceptions

Wholesale counterparties not subject to the above credit review criteria include those associated with day-ahead and current day purchases where risk associated with market movements is minimal. Sales transactions within the day-ahead and current day can be consummated with a counterparty that has not been assigned a pre-approved credit limit if the counterparty maintains at least a BBB+ rating from an NRSRO. Such transactions may not exceed \$250,000 per counterparty.

If a counterparty or guarantor does not maintain any NRSRO rating, and if a counterparty credit review has not been performed in the past 24 months, a policy limit of \$100,000 in aggregate net receivables per counterparty may be authorized, with the approval of the Director of Finance or a designated alternate until a formal review can be completed. These individual non-rated counterparty limits are subject to a total net receivable portfolio limit not to exceed \$1,000,000, in aggregate.

20. Wholesale Credit / Counterparty Management

20.1. Monitoring and Reporting Exposures

Middle Office staff are responsible for monitoring and reporting on the risk management program. A list of reports, which document trade positions, risk exposure, authorization and policy compliance, may be found in Appendix 7 of these Regulations. The credit exposure for each customer or counterparty described in these Regulations may be monitored according to concentration in the following areas: credit rating, counterparty, region, contract type, contract term and MTM exposure.

Middle Office staff are also responsible for communicating this information to management under the timelines outlined in Appendix 7 of these Regulations, and for establishing a violation reporting process to document exceptions to the ERMP or these Regulations. Exception Reports will document the nature of exception, and the actions taken to correct exceptions.

The credit risk reporting system should be integrated with the transaction processing system. This is generally an extension of the concept that credit risk assessment and reporting should be supported by the normal transaction processing system. The credit system, should be integrated with the deal capture system and should not be a stand-alone system, or an add-on with manual interface.

20.2. Master Enabling Agreements

The use of master enabling agreements to document trading relationships with counterparties is considered to be the preferred practice and should be followed whenever reasonably possible. The general form of such master enabling agreements shall be approved by the City Council upon recommendation of the ROC before any such master enabling agreement is used for any individual counterparty transaction. Transactions entered into under such contracts and agreements are subject to the requirements of these Regulations, and limited to Approved Products. SJCE staff are responsible for ensuring that master enabling agreements are developed in conjunction with legal counsel review, approved by the City Council and used for the following transactions:

- a. The Western Systems Power Pool (“WSPP”) Agreement may be used as the master agreement for transacting Approved Products with WSPP members. The WSPP Agreement applies to all transactions between WSPP members unless the parties to a transaction expressly opt out of the WSPP Agreement.
- b. The Edison Electric Institute (“EEI”) Agreement, or its equivalent, as modified by a set of City Council approved special provisions, may be used as the master agreement for transacting Approved Products. The EEI Agreement provides for an array of reciprocal credit and collateral requirements for each party, and includes negotiated provisions as specified on a “Cover Sheet”. The EEI Agreement can also be supplemented with specific annexes (e.g., Credit Annex, Collateral Annex, REC Annex).

- c. Transmission transactions shall be consummated under an Open Access Transmission Tariff or City Council approved bilateral agreement.

A master enabling agreement executed by SJCE and a counterparty provides the general terms and conditions for all transactions entered into with that counterparty. All master enabling agreements are to be executed and entered into in accordance with the ERMP and these Regulations, and with applicable SJCE policy and procedures.

20.3. Premium Surcharge on Counterparties Without Master Enabling Agreement

Master enabling agreements require credit and performance assurances from a counterparty that provide protection against counterparty credit risk. In the event SJCE desires to transact with a counterparty without such assurances, a premium surcharge shall be imposed on the counterparty's bid to compensate for its increased credit risk and allow for comparison of the relative prices, taking into account the varying credit risks which might be incurred. The following formula shall be used in calculating the surcharge:

$$\text{Premium Surcharge} = Edf * Fwd * 1.645 * \sigma$$

Where: (i) *Edf* is the expected default frequency of the counterparty, (ii) *Fwd* is the current forward price, (iii) σ is the market implied volatility (or standard deviation) of the commodity price, and (iv) 1.645 represents the number standard deviations where the price falls at a 95% confidence level.

Example of Premium Surcharge Calculation

A counterparty with a master enabling agreement where SJCE has accepted changes to its preferred terms, is bidding on SJCE's RFP for a NP-15 peak Energy product for the 3rd quarter. The current market forward price for the product is \$50/MWh, market implied volatility is 40%, and the expected default frequency for this counterparty is 0.55%. Therefore, a premium of \$0.18/MWh ($0.0055 * 50 * 1.645 * 0.4$) should be added to the counterparty's bid price for comparison with other bids.

20.4. Margin Calls

If a counterparty has exceeded a credit limit, the Middle Office is responsible for initiating a margin call if such action is authorized under the applicable master enabling agreement. Calling margin may include a request for cash collateral or other credit enhancement (i.e., letter of credit, etc.). A margin call is necessary when counterparty credit exposure exceeds an established credit limit. The appropriate timing of a margin call is not dictated by these Regulations. However, factors such as counterparty financial capacity, volume of business, overall portfolio concentration and market conditions should be considered. A margin call should be considered necessary if credit exposure exceeds the counterparty's limit by more than one ratings notch⁸. The same would apply if the

⁸ Notch as referenced by Nationally Recognized Statistical Rating Organization (e.g., from BBB to BBB+ represents one notch).

counterparty suffers a ratings downgrade.

SJCE as a buyer or seller may be exposed to margin calls from counterparties. Middle Office staff must be aware of collateral thresholds assigned to SJCE by counterparties, and monitor these limits no less than monthly, and shall keep the Director informed in the event of market volatility. SJCE may be exposed to margin calls if a significant level of purchases or sales is reached.

20.5. Transaction Authority

No new transactions are to be entered into with counterparties that have exceeded their credit limits unless: (1) the new transactions are used to mitigate (offset) existing exposure, and (2) if those transactions have prior approval of the Director, or ROC within authorized limits as established in this Regulations.

21. Segregation of Duties

Controls over counterparty inputs and systems operations are of particular importance in ensuring the integrity of data used in counterparty risk control and management. In all cases the Middle Office will be responsible for managing the counterparty review and ratings process and all counterparty reporting. Front Office staff is responsible for recommending new counterparties to the Middle Office for review and approval.

APPENDIX 1

DEFINITIONS

1. Definitions

Whenever used in these Regulations, the following terms shall have the following respective meanings, provided, capitalized terms used in these Regulations that are not defined in this Appendix 1 shall have the meaning indicated in Appendix A Master Definition Supplement of the CAISO Tariff:

- 1.1. “Approved Counterparty List” is a list of the active trading counterparties that have been authorized for trading, and that have been assigned an approved credit limit by the Middle Office or ROC.
- 1.2. “Approved Product” means transactions types or products that are authorized pursuant to these Regulations, as specifically identified in Appendix 6.
- 1.3. “Balance-of-Month Transaction” means a purchase or sale of electric Energy, capacity and/or other related attributes for a term not greater than one month to be performed or delivered within the current or next succeeding calendar month.
- 1.4. “CAISO Tariff” means the CAISO FERC Electric Tariff.
- 1.5. “California Independent System Operator Corporation” or “CAISO” means the non-profit public benefit corporation responsible for the provision of fair and open transmission access, and maintaining reliable and efficient operation of that portion of the electric grid contained within its defined balancing authority area, pursuant to the California Public Utilities Code, or its successor entity.
- 1.6. “Call Option” means an option that gives the buyer (holder) the right, but not the obligation, to buy a futures contract (enter into a long futures position) for a specified price within a specified period of time in exchange for a one-time premium payment. It obligates the seller (writer) of an option to sell the underlying futures contract (enter into a short futures position) at the designated price, should the option be exercised at that price.
- 1.7. “Cap and Trade Program” means CARB’s Regulation for the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms as set forth in title 17, California Code of Regulations, chapter 1, subchapter 10, article 5 (commencing with section 95800), as such may be amended from time to time, or
(ii) other GHG compliance obligations, including but not limited to, federal, regional, state, or local jurisdictions.
- 1.8. “CARB” means the California Air Resources Board, or its regulatory successor.

- 1.9. "CARB Offset Credit" means a tradable compliance instrument issued by CARB that represents a GHG reduction of GHG removal enhancement of one metric ton of carbon dioxide equivalent.
- 1.10. "City Council" means the City of San Jose City Counsel.
- 1.11. "Commercial Compliance Policy" means the Commercial Compliance Policy adopted by the City Council, as such may be amended from time to time.
- 1.12. "Congestion Revenue Right" or "CRR" means a financial instruments made available through the CAISO's CRR Allocations and Auctions. CRRs are acquired primarily for the purpose of offsetting integrated forward market transmission congestion costs that are incurred in the day-ahead market on CAISO managed transmission paths.
- 1.13. "Cost of Value at Risk" or "Cost VaR" means a calculation that summarizes the expected maximum "cost" exposure over a target horizon within a given confidence level.
- 1.14. "Counterparty" means a party on either side of a transaction (i.e., purchasing counterparty as opposed to a selling counterparty).
- 1.15. "CPUC Decisions" means, to the extent still applicable, CPUC Decisions 04-01-050, 04-10-035, 05-10-042, 06-06-064, 06-07-031, 07-06-029, 08-06-031, 09-06-028, 10-06-036, 11-06-022, 12-06-025, 13-06-024, 14-06-050 and subsequent decisions related to resource adequacy, as may be amended from time to time by the CPUC.
- 1.16. "CRR Allocation" means the process of allocating CRR source-to-sink combinations, both annually and monthly, based on nominations by registered Candidate CRR Holders.
- 1.17. "CRR Auction" means the awarding of bids for CRR source-to-sink combinations, by the CAISO, made by Candidate CRR Holders based on criteria established by the CAISO.
- 1.18. "CVaR" means credit value at risk.
- 1.19. "Deputy Director of Power Supply" means the Department of Community Energy's Deputy Director.
- 1.20. "Director" means the Director of Community Energy.
- 1.21. "Director of Finance" means the City of San Jose's Finance Director.
- 1.22. "Division Manager of Finance and Administration" means the Department of Community Energy's Division Manager.

- 1.23. "Emission Allowance" means a limited tradable authorization to emit up to one metric ton of carbon dioxide equivalent.
- 1.24. "Energy" means an electric charge that lets work be accomplished.
- 1.25. "ERMP" means the Energy Risk Management Policy.
- 1.26. "FERC" means the Federal Energy Regulatory Commission, or its regulatory successor.
- 1.27. "Forward Power Transaction" means an Energy transaction that starts beyond the Balance-of-Month.
- 1.28. "GHG Compliance Instrument" means any instrument, including but not limited to, Emission Allowance, CARB Offset Credit, or Sector-Based Offset Credit that can be used to fulfill a GHG emissions compliance obligation.
- 1.29. "Greenhouse Gas" or "GHG" includes, but is not limited to, carbon dioxide ("CO₂"), methane ("CH₄"), nitrous oxide ("N₂O"), sulfur hexafluoride ("SF₆"), hydro fluorocarbons ("HFCs"), perfluorocarbons ("PFCs"), and other fluorinated gasses.
- 1.30. "Letter of Credit" means a document, typically from a bank, assuring that a seller will receive payment up to the amount of the letter of credit, as long as certain documentary delivery conditions have been met.
- 1.31. "Long Term Transaction" means a purchase or sale of, electric power, capacity, transmission and/or other related attributes to be performed or delivered for a duration longer than a Balance of Month Transaction.
- 1.32. "MTM" means Mark-to-Market. MTM is a measure of the fair value of accounts that can change over time, such as assets and liabilities. MTM aims to provide a realistic appraisal of an institution's or company's current financial situation. The accounting act of recording the price or value of a security, portfolio or account to reflect its current market value rather than its book value.
- 1.33. "Natural Gas" means a flammable gas, consisting largely of methane and other hydrocarbons, occurring naturally underground (often in association with petroleum) and used as fuel.
- 1.34. "NRSRO" means nationally recognized statistical rating organization.
- 1.35. "Prompt month" means the next full calendar month beyond the current month.
- 1.36. "Regulations" means these Energy and Counterparty Risk Management Regulations.

- 1.37. “Renewable Energy Credit” or “REC” is the (i) right to the environmental benefits from generating electricity from renewable Energy sources that can be sold and traded and the owner of the REC can legally claim to have purchased renewable Energy, or (ii) as set forth in California Public Utilities Code §399.12, as such can be amended from time to time.
- 1.38. “Renewable Energy Products” means any combination of Energy, capacity, RECs, or other environmental attributes produced by a generation facility or resource that is eligible to satisfy applicable renewable Energy mandates as defined by federal, state, or local jurisdictions.
- 1.39. “Resource Adequacy” means the resource adequacy requirements established for load serving entities by their respective governing body having jurisdiction.
- 1.40. “ROC” means the Risk Oversight Committee.
- 1.41. “Sector-Based Offset Credit” means a credit issued from a sector-based crediting program once the crediting baseline for a sector has been reached.
- 1.42. “SJCE” means San Jose Clean Energy.
- 1.43. “Short-term transaction” means a purchase or sale of electric power, capacity, transmission and/or other related attributes to be performed or delivered for a duration less than a Balance of Month Transaction.
- 1.44. “Speculation” means the practice of engaging in risky financial transactions in an attempt to profit from fluctuations in the market value of a tradable good such as a financial instrument. Speculation can in principle involve any tradable good or financial instrument.
- 1.45. “Transmission” means the bulk transfer of electrical Energy, from generating power plants to electrical substations located near demand centers. This is distinct from the local wiring between high-voltage substations and customers, which is typically referred to as electric power distribution.
- 1.46. “Wholesale Energy Services Provider” means the service provider for scheduling coordinator, portfolio management, and optimization services.

APPENDIX 2

RISK OVERSIGHT COMMITTEE

1. Roles and Responsibilities

1.1. ROC Members

All members of the ROC have the following responsibilities:

- a. Oversee implementation of risk strategy of SJCE as such pertains to transaction activities;
- b. Advise on educational needs on risk management at all levels within SJCE;
- c. Review proposed changes to the ERMP and these Regulations by other ROC members;
- d. Attend all ROC meetings or ensure that fully-briefed alternates attend, including meetings requested by a member requiring ROC approval in a timely fashion; and
- e. Monitor key activities of the Front Office, Middle Office and Back Office as such pertain to transaction activities.

1.2. ROC Advisors

SJCE's legal counsel has the following responsibilities:

- a. Reviewing and approving all forms of contracts used by SJCE to consummate transactions of Approved Products;
- b. Determining what legal documentation is required, and proposing monitoring and review procedures to ensure legal and regulatory compliance with the ERMP and these Regulations; and
- c. Reviewing processes and procedures associated with transaction activities to ensure legal compliance with all local, state and federal laws and regulations.

ROC members' and all advisors' roles and responsibilities are detailed in the Table 2 below:

**Table 2
Roles and Responsibilities**

Responsibility	City Manager	Director of Community Energy	Director of Finance (Middle Office support)	Budget Director (Middle Office Support)	Risk Manager	SJCE Deputy Director Power Resources (Front Office)	SJCE Manager Finance and Admin. Services (Middle and Back Office)	City Attorney
Serve as Chairperson for ROC.	e							
Review proposed changes to ERMP by other ROC members.	e							
Attend all ROC meetings or ensure that a fully briefed delegated representative is present.	t							
Oversee implementation of SJCE's risk strategy.	v							
Provide accurate reports on the risk management program to the City Council.	r			?				
Ensure to the ROC that operational performance of the Front, Middle and Back Offices are in conformance with policies approved by the City Council.	n							
Present ROC-approved recommendations for changes to ERMP for consideration by the City Council.	r		?					
Serve as official spokesperson for the ROC reports	e							

to the City Council.								
Advise ROC on proposed portfolio and trader limits.		?	?	?	?			
Advise ROC on education needs on risk management at all levels within SJCE.		?	?	?	?	?	?	?

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Responsibility	City Manager	Director of Community Energy	Director of Finance (Middle Office support)	Budget Director (Middle Office Support)	Risk Manager	SJCE Deputy Director Power Resources (Front Office)	SJCE Manager Finance and Admin. Services (Middle and Back Office)	City Attorney
Propose change to Front and Back Office Regulations.		?	?	?	?	?	?	?
Ensure that the ROC is provided with reporting that is consistent with the ERMP and these Regulations.		?	?	?	?	?	?	
Advise ROC on analysis of potential enabling agreements with regard to Front and Back Office operations.		?				?	?	?
Provide ROC with "market view" of financial market conditions and implications on an as needed basis.			?		?		?	
Ensure Front and Middle Offices, and Legal Counsel participate on new product or transaction type development team.						?	?	?
Verify that operational performance of the Front, Middle and Back Offices are in conformance with the ERMP and these Regulations.						?	?	
Monitor key activities of Front, Middle and Back Offices.						?	?	
Brief the ROC on transaction operations with special regard to transacting authority and speculation issues.					?	?	?	
Ensure to the ROC that the Middle Office reporting is accurate and in compliance with Middle Office policies.			?		?		?	

Responsibility	City Manager	Director of Community Energy	Director of Finance (Middle Office support)	Budget Director (Middle Office Support)	Risk Manager	SJCE Deputy Director Power Resources (Front Office)	SJCE Manager Finance and Admin. Services (Middle and Back Office)	City Attorney
Ensure that the ROC is provided with an accurate report on all Middle Office operations, especially with regard to market and credit exposure.			?		?		?	
Advise ROC on proposed changes to Middle Office procedures.			?		?		?	
Provide accurate reports to the ROC on any discrepancies between the Back Office settlement and reconciliation with the deal capture system.							?	
Verify that the ROC is provided with an accurate report on Front Office operations.						?		
Advise ROC on consideration of pending enabling agreements and large contracts with regard to market and credit risk.			?				?	?
Provide accurate reports on trading operations and all transactions carried out since last ROC meeting and summary of current and future transaction strategies.						?		
Provide ROC with "market view" of future market conditions and results of market models.						?		

Responsibility	City Manager	Director of Community Energy	Director of Finance (Middle Office support)	Budget Director (Middle Office Support)	Risk Manager	SJCE Deputy Director Power Resources (Front Office)	SJCE Manager Finance and Admin. Services (Middle and Back Office)	City Attorney
Verify to ROC that rules related to transacting authority and speculations are complied with by Front Office.							?	
Verify that Front Office and Back Office staff are in compliance with all policies and regulations.							?	
Verify that the ROC is provided the most accurate forecast possible of market trends and a summary of stress testing and sensitivity analysis.							?	
Verify that the ROC is provided an accurate reporting of all transactions.							?	
Ensure that the ROC is provided accurate reporting of risk measures and performance monitoring (including MTM, Cost VaR, CVaR) and compliance (limits, transaction authority, transaction type, instrument type).							?	
Ensure that the ROC is provided with accurate reports on any transactions which exceeded limits, and proposed actions on strengthening compliance procedures and recommendations for corrective action.							?	

Responsibility	City Manager	Director of Community Energy	Director of Finance (Middle Office support)	Budget Director (Middle Office Support)	Risk Manager	SJCE Deputy Director Power Resources (Front Office)	SJCE Manager Finance and Admin. Services (Middle and Back Office)	City Attorney
Provide accurate reports on operational performance of Front and Back Offices with strategic objectives and provide solutions for violations.						?	?	
Verify to the ROC that all adopted Regulations are consistent with applicable law.								?
Verify to the ROC that all approved contracts and enabling agreements have followed a process that is consistent with applicable law.								?
Provide timely support and legal advice to the Front, Middle and Back Office operations and to the ROC.								?
Determine documentation and legal review requirements to all processes are consistent with applicable law.								?

APPENDIX 3

AUTHORIZED CRR TRANSACTING GUIDELINES

1. Congestion Revenue Rights Transacting Guidelines

Congestion Revenue Rights are used by CAISO market participants to hedge against the cost of congestion associated with delivering resources to serve load obligations within a locational marginal price (LMP) market.

1.1. CRR Allocation Process

SJCE staff will participate in the CRR Allocation and Auction markets as follows:

SJCE staff nominates its CRRs during the allocation process in general conformance with the following methodology:

- a. CRR nominations are limited by the seasonal/monthly eligible quantities.
- b. CRR valuation of source/sink combinations are based upon the historical congestion component of the LMP. If access to an Integrated Forward Market (IFM) pricing model becomes available, simulated prices may be used in the CRR valuation process.

CRRs that have SJCE generation or scheduling points as sources, and the DLAP_PGAE-APND pricing node as the sink, are nominated first when the expected average congestion is statistically greater than zero, and no one historical period exhibited large negative congestion. Nominated amounts are equal to or less than expected generation in order to create a perfect or partial hedge. When expected congestion is low, nominated amounts are low and increase as expected congestion increases.

- a. After exhausting possible SJCE source/sink pairs, then nominations may be made from non-SJCE source/sink combinations that statistically have positive average congestion across historical periods with, no substantial negative congestion, as follows:
 - 1) Rank the CRRs by congestion value.
 - 2) Nominate the highest valued CRRs first, working down the possible Source-Sink combinations until the seasonal/month eligible quantities are exhausted.
 - 3) Avoid large positions at any one non-SJCE sourced CRR.
 - 4) Avoid clustered CRRs (e.g., source CRRs in the same geographic area that would expect to have the same or similar congestion component price).
- b. Avoid nominating both SJCE and non-SJCE sourced CRRs when data and experience shows that the CRR will not clear the allocation feasibility test.
- c. Once the above selection criteria results in a nomination portfolio, and prior to final submission, SJCE stress tests the portfolio on historical data for any large negative single period positions and if found removes that position prior to submission.

1.2. CRR Auction Process

SJCE staff bids into the CRR Auction in general conformance with the following methodology:

- a. Bids are made only to unwind CRRs obtained in the allocation process that are non-hedged, or are expected to have a negative value due to operational changes.
- b. Prices on the bid curves start at zero and go negative.
- c. Bids that clear in the auction result in revenue to SJCE and reduce overall risk by unwinding existing un-hedged allocation portfolio positions.
- d. Auction revenue is left in the SJCE CRR collateral account until the monthly/seasonal period is over.

APPENDIX 4

AUTHORIZED APPROVED PRODUCT TRANSACTION LIMITS

1. Approved Product Transaction Limits

1.1. City Council

- a. Approving all long-term supply strategies and Integrated Resource Plans.
- b. Approving all long-term Approved Product Transactions

1.2. Director

The Director is assigned the following primary responsibilities and transactions limits:

- a. Developing long-term supply strategies.
- b. Approval of financial authority limits associated with Approved Product transactions as recommended by the ROC.
- c. Authority for individual transactions as authorized under City Council approved agreements or resolutions.
- d. Approval authority for Approved Product transactions up to, but not greater than, 115% of a SJCE's annual load forecast, including executed fuel transactions that have been made to support generation operations up to 115% of load. These transactions are limited to short-term transactions that do not to exceed \$500,000 per day and have a duration longer than 1 year. The Director should seek Council approval for all transactions over 6 months and \$1,000,000 unless there is a time constraint. The approval will be a delegated Authority to enter into an approved enabling agreement with a not to exceed value.
- e. All optimization strategies, statistical/procedural risk management methods (including risk tolerances), and resulting exposures.

1.3. Deputy Director of Power Resources

The Deputy Director of Power Resources is assigned the following primary responsibilities and transaction limits:

- a. Authority to enter individual transactions with a term not to exceed 6 cumulative months, and not to exceed \$1 Million dollars. When possible the Deputy Director should seek written approval from the Director of Community Energy for all transactions over \$500,000.

1.4. Scheduler and Planner (SJCE's Wholesale Energy Services Provider)

- a. Planning functions to determine the appropriate transactions necessary to maintain load/resource balance from day-ahead to Balance-of-Month in duration, and prompt month beginning 10 days prior to the conclusion of the current month.

- b. Approval authority for Approved Product transactions up to, but not greater than, the hourly peak load forecast,
- c. Authority to enter individual transactions with a term not to exceed balance-of-month, and prompt month beginning 10 days prior to the conclusion of the current month. Transacting is limited to variability between supply requirements and available resources. **In all cases transactions should not exceed \$500,000 per day or 1 year in duration.**

Approved Product Transaction Limits Summary

	Director of Community Energy	Deputy Director of Power Resources	Scheduler / Planner SJCE Wholesale Energy Services Provider
Transaction Term Limits:	As authorized under City Council approved resolutions, programs or project agreements.	Transactions for a term up to 6 months and \$1 Million dollars	Day-ahead to balance-of-month. Prompt month beginning 10 days prior to conclusion of current month.
Transaction Volume Limits:	Approved Product volume limits up to 115% of annual load forecast. Not to exceed \$500,000/day or 1 year Where possible Director should seek Council approval for all Contracts over 6 months and \$1 Million dollars	Approved Product volume limits up to 115% of annual load forecast. Not to exceed 6 months or \$1 Million dollars	1. Approved Product volume limits up to Hourly peak load forecast. 2. Transacting limited to variability between load requirements and available resources. Not to exceed \$500/day or 1 month

APPENDIX 5

NEW PRODUCT DEVELOPMENT PROCEDURES

1. New Product Development

When the Front Office staff request to transact a new product type, instrument or strategy, several control processes must take place to ensure SJCE can identify, manage, control and report on the risks from the new transaction.

The process for submitting a request for a new Approved Product type is as follows:

1. The Front Office staff notifies Middle Office staff of his/her desire to enter into a new type of transaction. The Front Office staff are responsible for reviewing the transaction details, including all the key risk, pricing and operational elements of the transactions with Middle Office staff. Middle Office staff assume responsibility for undertaking all the risk and processing implications of the proposed transaction.
2. The Front Office staff is responsible for preparing a new product report for review and consideration by Middle Office staff. This report requires the Front Office staff to document all of the risk attributes of the transaction, and how they will be controlled (primarily focusing on market and credit risk).
3. Middle Office staff will review the new product report and begin the process of determining SJCE's ability to record, process and manage the transaction.
4. Middle Office staff first ascertains if the Front Office staff has the ability to accurately price the transaction. Secondly, Middle Office staff determines whether the risk of the transaction can be accurately measured. In either case, if the Front Office staff does not have the capability to price or measure the risk of the transaction, the Front Office staff is notified, and the Front Office staff must discuss the model development or purchase options with the Middle Office staff before the transaction can be authorized.
5. If the Front Office staff can price and model the risk of the new product, then the Middle Office staff will evaluate the Front Office's operational readiness to execute the transaction. The Middle Office staff will also evaluate the Middle Office's and Back Office's readiness to transact the new product. If any outstanding issues or concerns are identified by the Middle Office staff as part of the review, the issues or concerns identified must be resolved prior to transacting the new product.
6. The Middle Office staff then gathers all of the new product report summaries, and prepares a written recommendation to the ROC for consideration and approval. This written recommendation will consider whether or not the risks and potential control considerations, if any, warrant entering into the new product type.

New Product Approval Checklist

Risk/Task to be Completed During the Analysis	Primary Accountability
Business Strategy	
Sponsor new strategy	Front Office
Understand and document the economics of the new strategy	Front Office
Define the resource requirements for the new product	Front Office
Regulatory and Legal Risks	
Identify applicable California and local regulatory restrictions for product or business	Legal Counsel
Verify counterparty power and authority to enter into activity	Legal Counsel
Determine what legal documentation is required	Legal Counsel
Propose monitoring and review procedures to ensure legal/regulatory compliance	Legal Counsel
Designate the supervisor responsible to ensure that the product is sold only to counterparties for which it is suitable	Front Office
Determine if sufficient resources are available to support regulatory and legal requirements	Front Office
Market Risks	
Identify and analyze market risk	Front Office/Middle Office
Specify management's intention (Hold positions, actively trade or hedge)	Front Office
Propose fair market value and risk measurement methodology	Middle Office
Determine hedging approach	Front Office
Establish product trading limits	Middle Office
Determine impact on total position limits	Middle Office
Establish special interim limits on control the new product expansion in a measured, granular manner	Middle Office
Define and recommend management reporting requirements	Middle Office
Present report format for communication of positions on a timely basis	Front Office
Check if the new product involves commitments, guarantees, contingencies or any other off-balance sheet items	Middle Office
Credit Risks	
Identify and analyze credit risk of product	Middle Office
Develop methodology for capturing facilities and counterparties in the credit reporting system and measuring credit risk and concentration exposures	Middle Office
Define procedure for monitoring credit exposure	Middle Office
Identify target counterparties, determine suitability and request credit facilities	Middle Office
Determine proper procedure for perfecting collateral, netting agreements	Middle Office
Recommend maximum credit exposure limits for counterparties	Middle Office
Develop capability to report daily/weekly credit limit compliance	Middle Office
Check if the new product involves commitments, guarantees, contingencies or any other off-balance sheet items	Middle Office
Operational Risks	
Verify consistency with ERMP	Front Office/Middle Office
Define transaction tracking plan and procedures	Middle Office
Develop required deal sheet modifications	Front Office
Settlement procedures – how will transaction payment/billing be handled?	Back Office
Authorizations/approvals – what approval levels or delegation of authority is required?	Front Office/Middle Office
Develop procedure for transacting from start to finish	Front Office/Middle Office/Back Office

Note: Advice services in areas such as valuation, market/credit risk management, legal review, accounting/tax may also be sought and presented as part of this process.

APPENDIX 6 APPROVED PRODUCTS

1. Approved Products

The Energy and Energy related products that SJCE is authorized to transact are as follows:

Approved Products	Pre-Approved Examples	Authorization
1. Long Term Transactions for Energy	<ul style="list-style-type: none"> • Purchases of Energy to cover the forecasted supply shortage of the SJCE • Sales of Energy amounts that are forecasted to be surplus to SJCE’s need • Liquidating “in the money” and “out of the money” transactions for optimization in accordance to a dual volume-VAR framework. 	<ul style="list-style-type: none"> • Authorized in accordance with the limits as set forth in these Regulations.
2. Balance-of-Month Transaction for Energy	<ul style="list-style-type: none"> • Energy purchases/sales within defined term and volume limits • Forecasting errors 	<ul style="list-style-type: none"> • Authorized in accordance with the limits as set forth in these Regulations.
3. Day-Ahead and Real-Time Power Transactions Through a BAA (e.g., CAISO)	<ul style="list-style-type: none"> • Purchasing Energy from the CAISO day-ahead and/or real-time market to serve load • Selling Energy into the CAISO day-ahead and/or real-time market from generation resources 	<ul style="list-style-type: none"> • Authorized in accordance with the limits as set forth in these Regulations.
4. Purchase/Sale of Capacity	<ul style="list-style-type: none"> • Short-term or forward purchases of capacity products (e.g., Ancillary Services and Resource Adequacy products) • Short-term or forward sales of capacity products (e.g., Ancillary Services and Resource Adequacy products) 	<ul style="list-style-type: none"> • Authorized in accordance with the limits as set forth in these Regulations.
5. Transmission	<ul style="list-style-type: none"> • Purchases/sales of firm and non-firm transmission capacity required for the delivery Energy 	<ul style="list-style-type: none"> • Authorized in accordance with the limits as set forth in these Regulations.

Approved Products	Pre-Approved Examples	Authorization
6. GHG Compliance Instruments	<ul style="list-style-type: none"> Purchases of Emission Allowances from bilateral trades, and from the CARB administered Cap and Trade Program auctions and reserve auctions to satisfy actual and/or forecasted GHG emissions compliance obligations attributed to SJCE generation and scheduling activities (e.g. imports) 	<ul style="list-style-type: none"> Authorized in accordance with the limits as set forth in these Regulations.
7. Renewable Energy Products	<ul style="list-style-type: none"> Purchases of Renewable Energy Products to satisfy any requirement for such products under applicable law; Bilateral purchases are to be consummated under approved contract forms, follow approved credit risk limit procedures, and all other applicable risk management practices defined in this regulation Sales of Renewable Energy Products for the sole purpose of eliminating a surplus 	<ul style="list-style-type: none"> Authorized in accordance with the limits as set forth in these Regulations.
8. Congestion Revenue Rights	<ul style="list-style-type: none"> Participation in the CRR Allocation and CRR Auction processes through the submission of nominations and/or bids in the Annual and/or Monthly Congestion Revenue Right Allocation and Auction processes administered by the CAISO 	<ul style="list-style-type: none"> Authorized in accordance with the limits as set forth in these Regulations. See Appendix 3 to these Regulations

APPENDIX 7 MANAGEMENT REPORTS

1. Management Reports

The following energy risk management reports shall be developed and presented as further described in the following table:

	Primary Responsibility			Report Frequency				Approval
	Front	Middle	Back	Weekly	Monthly	Quarterly	Annual	
Management Report								
Load and Resource Balance	X					X		CED Deputy Director of Power Resources
Portfolio Performance		X				X		CED Division Manager
Portfolio Risk Exposure (Open Position Cost VaR)		X				X		CED Division Manager
Exceptions Report		X				X		CED Division Manager
Master Agreements	X						X	CED Deputy Director of Power Resources
Policies Update		X					X	CED Division Manager
Transaction Position Detail		X			X			CED Division Manager
MTM		X		X				CED Division Manager
Credit Limit Status by Counterparty		X		X				Finance
Trading Strategy	X				X			CED Deputy Director of Power Resources
Scenario Planning	X						X	CED Deputy Director of Power Resources

	Primary Responsibility			Report Frequency				Approval
	Front	Middle	Back	Weekly	Monthly	Quarterly	Annual	
Management Report								
Pending Agreements	X					X		CED Deputy Director of Power Resources
Energy Transaction Summary	X				X			CED Deputy Director of Power Resources
Non-Energy Transaction Summary	X				X			CED Deputy Director of Power Resources
Market Forecast	X				X			CED Deputy Director of Power Resources
Performance to Budget			X			X		CED Division Manager / Budget?
Procedure Exceptions			X		X			CED Division Manager

1.1. Description of Management Reports

- a. Load and Resource Balance: Front Office report detailing total resources by source as compared to total load. Report shows supply surpluses and shortages. The Load Resource Balance report is developed weekly and presented to the ROC quarterly.
- b. Portfolio Performance: Middle Office report comparing the cost of the portfolio of contracts, to the market value of the portfolio (tracking what we paid for it to what it's worth now). This is the counterparty to the risk exposure report. The Portfolio Performance report is developed weekly and presented to the ROC quarterly.
- c. Portfolio Risk Exposure (Open Position Cost VaR): Middle Office report showing portfolio exposures by month due to price volatility. The Portfolio Risk Exposure report is developed weekly and presented to the ROC.
- d. Exception Report: Middle Office report summarizing current exception and violation reports. The Exception Report is developed quarterly presented to the ROC.

- e. Master Agreements: Front Office report summarizing the current set of approved master agreements by approved counterparty. The Master Agreements report is developed quarterly presented to the ROC.
- f. Policies Update: Middle Office report providing annual review of risk management policies and procedures and recommendations for updates. The Policies Update report is presented to the ROC.
- g. Transaction Position Detail: Middle Office report showing detail of Portfolio Performance report. Individual deal details showing MWh under contract and total dollars sorted by counterparty in support of the Portfolio Performance report are included in this report. The Transaction Position Detail report is presented to the ROC.
- h. MTM: Middle Office report showing MTM for life of deals by counterparty. The MTM report is developed weekly presented to Front Office and Back Office staff quarterly.
- i. Credit Limit Status by Counterparty: Middle Office report showing counterparty credit limits, credit used and credit remaining. Special flagging of counterparties nearing their credit limits should also be shown. The Credit Limit Status by Counterparty report is presented to Front Office and Back Office staff weekly.
- j. Trading Strategy: Front Office report detailing trading strategies for various periods (e.g., daily, monthly, quarterly, future years). The Trading Strategy report is presented to the ROC quarterly.
- k. Scenario Planning: Front Office report detailing potential scenarios, expected result and probabilities. The Scenario Planning report is presented to the ROC quarterly.
- l. Pending Agreements: Front Office report detailing status of negotiations with potential counterparties on enabling agreements. The Pending Agreements report is developed weekly and presented to the ROC quarterly.
- m. Energy Transaction Summary: Front Office report summarizing, by counterparty, Energy related transactions, both completed and contracted, involving Energy delivery. The Energy Transaction Summary report is developed weekly and presented to the ROC quarterly.
- n. Non-Energy Transaction Summary: Front Office report summarizing, by counterparty, non-CAISO market Energy related transactions (puts, calls, options, RECs, GHG Compliance Instruments and etc.) which do not involve (or are not specifically reliant on) Energy delivery. The Non-Energy Transaction Summary report is developed monthly presented to the ROC quarterly.
- o. Market Forecast: Front Office report detailing forecast of market for periods (e.g. monthly, quarterly, future years). The Market Forecast report is presented to the ROC.

- p. Performance to Budget: Back Office report comparing incurred Energy costs to budgeted costs and existing contracts and uncovered exposure at market prices to remainder of budget. The Performance to Budget report is developed for SJCE staff weekly and presented to the ROC quarterly.
- q. Procedures Exceptions: Back Office report noting any procedure exceptions. The Procedures Exceptions report is presented to the ROC quarterly.

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APPENDIX 8

RISK ASSESSMENT METHODOLOGIES

1. Risk Assessment Methodologies

1.1. CRR Valuation and Risk Assessment

CRR valuation is based upon historical data. SJCE values its CRR holdings individually and as a portfolio. Along with the average valuation, SJCE calculates the fifth (5th) percentile and 95th percentile position of each CRR Source/Sink combination.

SJCE performs a stress test on its CRR nominations. The stress test identifies the minimum, maximum and expected revenue for each available seasonal/monthly historical period.

The highest risk to SJCE's CRR allocation and auction portfolios is a collateral call. The CAISO does not net the portfolios, so the risk is a result of the separate collateral requirements for each portfolio. The expected value of SJCE's allocated CRR portfolio is positive. SJCE's auction portfolio consists only of unwound allocated CRR; as such, the expected value is negative. A collateral call could occur if an event increased the expected negative value of the auction portfolio even though the actual day-ahead market position would be offset by an increase in the expected value of the allocation portfolio.

SJCE mitigates this risk by leaving all its auction revenue in the CRR collateral account at the CAISO. SJCE's initial deposits of \$500,000 for the annual auction, and \$100,000 for the monthly also remain in the collateral account.

SJCE will only request a return of its auction revenue after the end of each monthly/ seasonal period, thereby maintaining usable secured available credit well in excess of its required collateral.

1.2. Mark-to-Market Methodology

The MTM calculation is a method to value future or forward open trading or hedge positions on an on-going basis to track market price changes. Once a position is taken in the market for some future delivery period, the value of that position must be monitored and managed on a routine basis. The volatility and volume of activity for a particular traded product will dictate how often it is necessary to update the MTM valuation of such product. SJCE will "mark" all open positions on no less than a MONTHLY basis, or as necessary, given market dynamics.

Long Term Transactions for future delivery or receipt of Energy. Several trading hubs host the majority of physically traded contracts such as Palo Verde (PV), California Oregon Border (COB), Mid-Columbia (Mid-C), California South (SP15), and California North (NP15). There are also several

emerging hubs in the desert southwest and rocky-mountain areas. Publications such as *Megawatt Daily* and *Energy Market Report* list the daily prices traded at more heavily traded hubs. Information sources such as McGraw Hill publishing report broker trades for forward contracts at the most active trading points. For illiquid products or trading points, the MTM may be applied less frequently than daily. In these circumstances a weekly or monthly mark may be appropriate. However, periodic market inquiries, as appropriate, should be made to capture any market movement.

The following information sources, or their equivalents as approved by the Middle Office and Front Office, are to be used to mark open positions for the traded products and hubs listed below:

- a. **WSPP Contracts for Liquid Products and Trading Hubs:** The standard forward traded electricity products as reported in the *Energy Market Report, published by Insight Research, Inc.*, or other relevant broker/trade reporting system. This source may be replaced at such time that SJCE has available an information service such as the Intercontinental Exchange (“ICE”), *Reuters North America Power* or other reliable source.
- b. **WSPP Illiquid Products and Trading Points:** these products are likely to change value less often than the more standard products. Periodic (weekly or bimonthly) probing of the market may be necessary to obtain current valuation. It may be possible to identify basis relationships between the liquid and illiquid trading points resulting in an approximate valuation.

1.3. Cost Value at Risk Calculation Methodology

In its most literal sense, Value at Risk (VaR) refers to a particular *amount of money*, the maximum amount likely to be spent or lost over some period, at some specific confidence level. SJCE has defined its supply management activity as a cost hedging activity. Therefore, for purposes of power resources management, Cost VaR is defined as a single, summary statistical measure of possible costs that are in excess of, expected costs.⁹

Traditional VaR methodology (as practiced in the financial sector) has two important characteristics. The first is that it provides a common consistent measure of risk across different positions and risk factors. The other characteristic of VaR is that it takes account of the correlations between different risk factors. If two risks offset each other, the VaR allows for this offset and tells us that the overall risk is fairly low. If the same two risks don’t offset each other, the VaR takes this into account as well and gives us a higher risk estimate.

Since Cost VaR tells us about SJCE’s maximum cost exposure, management can use it to determine

⁹ Specifically, standard, or traditional, VaR is a measure of cash flow exposure due to “normal” market movements; traditional VaR would be used when monitoring hedge positions initiated with financial derivatives. Costs or losses greater than VaR estimates are suffered only with a specified small probability (e.g., 5% of the time, etc.). However, VaR is not a stress test – it will not indicate what a maximum loss may be 5% of the time.

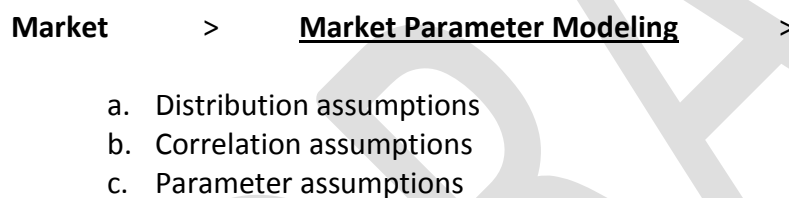
internal capital allocation. Cost VaR can be used to determine capital requirements at the senior management level of the organization, and also down the line to the level of the individual transaction decision. The higher the risk associated with the transaction, the higher the VaR and the greater the capital requirement. Cost VaR can also be used to assess the risks associated with different transaction opportunities and the implications of various risk tolerance thresholds. Cost VaR can also be used to evaluate the performance of divisions.

1.4. Methodology

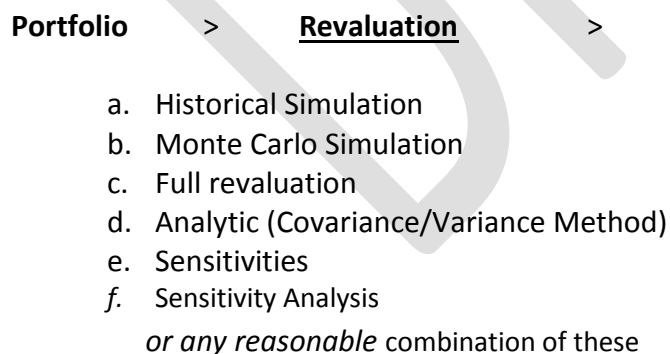
The two (2) principal components of the traditional VaR calculation are the:

- a. Market
- b. Portfolio

The “Market” involves understanding and estimating how the particular market parameters behave over a specified holding period. This is captured by performing market parameter modeling. The “Portfolio” involves understanding and quantifying how the portfolio’s value varies according to estimated changes in market parameters. This is captured by revaluation. The standards applied to market parameter modeling and revaluations are described below. These two components are illustrated as follows:



VaR Calculation



1.5. Market Parameter Modeling

During market parameter modeling, various assumptions are made in relation to the distributions and correlations between assets, or products in the case of electricity, within the same risk category, or hub jurisdiction (i.e., SP15 vs. COB, etc.). In addition, various estimations are made with respect to the level of commodity prices and their implied volatilities.

Market parameters should be modeled on the basis of the following:

- a. Distribution assumptions for the market parameters are normal (this is a primary assumption for Cost VaR);
- b. Parameters are usually estimated on the following:
 - 1) a one (1) month holding period, which is consistent with the frequency of revaluation of all financial trading positions.
 - 2) the historic time period of one (1) calendar year or 252 days, unweighted, should be used to calculate historic volatilities and correlations.

Although distribution assumptions are assumed normal, management recognizes that actual power price distributions have displayed a skewed distribution. Traditional VaR methodology is not currently appropriate for the electric power industry. However, it may be appropriate for measuring positions in natural gas, whether physical or financial. Cost VaR, in the context of electricity portfolios, is not concerned with duration or term parameters (such as holding periods, etc.) since electricity products currently have predefined terms (e.g., hourly product, month product, quarterly product, etc.)

For modeling purposes, the Cost VaR is taken from the 95.0% quartile of the distribution of changes in the hourly chronological simulation of loads and resources (1.645 standard deviations).

1.6. Portfolio Revaluation

Revaluation is the calculation of the changes in portfolio costs resulting from a change in specific model assumptions (i.e., price, risk tolerance, volatility, etc.).

Two revaluation techniques are permitted:

- a. Full revaluation: Full revaluation occurs where the transactions in the portfolio, or positions, are all individually marked to market value for each market rate scenario generated. This is also true for Cost VaR applications.
- b. Delta approximation: Delta refers to the change in one variable given a change in another variable. A sensitivity analysis is an *approximation* of the change in net present value for various sensitivities of the portfolio. Sensitivity analysis may be used only for linear approximation. For linear approximation the sensitivity of the rate of change of the price of the transaction to a small change in the market rate is calculated. This is more applicable to traditional VaR where linear relationships and correlations may exist between financial

instruments. On a more simplified level, Cost VaR considers delta approximation when adjustments are made to parameters such as risk tolerance, price, and volatility.

For purposes of traditional VaR, the range should cover at least 1.645 standard deviations in either full revaluation or delta approximation. Any reasonable combination of the above is also permitted. For example, a combination of the above might be used for large portfolios which contain both complex and simple instruments and for which different revaluation techniques are appropriate.

The risk measurement methodology must take the current mark-to-market value supplied and apply revaluation techniques to calculate the potential loss or VaR, which may arise from the future changes in market.

Note: Sensitivity analysis is appropriate for individually measuring risks which may not otherwise be measured on a full portfolio basis such as location or spread risks. Sensitivity analysis is not appropriate for products with non-linear price behavior. In particular, option portfolios contain a high degree of non-linearity. This means that the change in the portfolio value has a non-linear relationship with changes in the underlying asset price. In this case, a sensitivity analysis is no longer valid.

1.7. VaR Calculation

Monte Carlo simulation is the preferred approach to VaR calculation for all portfolios. This is also true for Cost VaR when simulating loads and resources. However, the Analytic Method (Variance/Covariance) will be used if SJCE does not have the computing power necessary to generate a Monte Carlo simulation. SJCE recognizes that the Analytic Method is inappropriate for portfolios with non-linear characteristics (i.e., optionality) and will make the necessary adjustments when portfolio non-linearity becomes significant.

Monte Carlo Simulation Method:

Monte Carlo simulation estimates Cost VaR from a simulated distribution that is derived by assuming particular theoretical market processes and simulating large numbers of random paths that prices, or other parameters, could follow. The method proposes that if we take a sufficiently large number of simulations, they will produce a simulated distribution that will converge to the unknown true distribution of portfolio values. VaR and Cost VaR can be inferred from the simulated distribution. The steps required in a Monte Carlo simulation are as follows:

- a. Perform market parameter modeling by estimating the parameters of the distribution (e.g., volatilities and correlations) using a historical time series of market parameters;
- b. Generate an appropriate distribution of random variables;
- c. Perform the simulation by applying the covariance to the random numbers to generate a set of correlated market parameter scenarios; and
- d. Apply market parameter scenarios to the portfolio and, using revaluation method set, generate a distribution of portfolio values.

Analytic Method (Variance/Covariance):

The Analytic Method is based on the same distribution assumptions for market parameter modeling as the Monte Carlo method but restricts the portfolio to linear risk components only. This allows the analyst to assume that the portfolio changes are normally distributed.

The steps required in the analytic VaR calculation are:

- a. Perform market parameter modeling by estimating the parameters of the distribution (e.g., volatilities and correlations) using a historical time series of market parameters;
- b. Calculate the vector of sensitivities with respect to the underlying spot rates;
- c. A first order approximation is used to calculate changes in portfolio value. Given the normality assumption, the distribution parameters can then be calculated analytically using the sensitivities determined in step 2 above.

The VaR is defined as 1.645 the standard deviation of the change in portfolio value which equals – under the assumption of zero mean – a confidence level of 95%.

1.8. Cost VaR Stress Testing Methodologies and Procedures

In broad terms, there are two (2) main approaches to Cost VaR stress testing. The first of these focuses on the impact of particular specified scenarios – typically a fairly limited number of such scenarios – that are fed into an analytical process. This approach to stress testing is usually known as scenario analysis. The term “stress testing” is used here to apply to any procedures that attempt to evaluate the impact of hypothetical future events on SJCE’s hedging and/or transacting portfolios.

The term “scenario analysis” is used to apply to that type of stress testing that focuses on particular specified *scenarios*, as distinct from the second type of stress testing that specifies classes of mathematical or *statistical possibilities* and then works through these possibilities in a mechanical way. Note that scenario analysis only indicates what SJCE stands to “spend” in a particular circumstance, and does not indicate (and is not designed to indicate) how likely any particular circumstance is to occur. Scenario analysis is therefore a natural complement to Cost VaR approaches that indicate something about the probability of a clearly defined event, but do not as such identify what SJCE would spend if the event actually occurred.

The Cost VaR stress testing methods approved for use by the ROC include 1) worst-case scenario analysis, and 2) extreme value analysis.

Worst-Case Scenario Analysis (WCSA):

WCSA allows an examination of the worst case that is *expected to occur* (Boudoukh, Richardson and Whitelaw, 1995). This approach is useful when there is concern about maximum possible costs over

a particular horizon period (e.g., one month, one year, etc.) and an expectation of some savings or cost over each sub-period (e.g., each day or month). The worst-case scenario is the cost associated with the most adverse daily outcome. If each outcome is a random variable Z_i , and there are n sub-periods in our horizon, then the worst-case scenario is:

a. $\text{Min}[Z_1, Z_2, \dots, Z_n]$

The actual worst-case scenario can now be estimated by running simulations of the random Z variables.

Extreme Value Analysis (EVA):

This approach starts from the premise that the extreme values of the cost distribution are what we are mostly concerned about, and then uses the statistical theory of extreme values to determine maximum extreme costs with a determined degree of confidence.

In practice the distribution of extreme values is not known, but the key insight of EVA theory is that this distribution converges in large samples to a limiting distribution of a particular known form. An analytic solution for the Cost VaR can then be found from this distribution once a desired confidence level is specified. The important parameter is the tail index, which gives the thickness of the tails (e.g., for a t -distribution, this is the number of degrees of freedom).

The Extreme Value Analysis approach has various attractions: (1) It deals directly with the extreme values typical of the electric Energy market. (2) It provides a firm methodological basis for the estimation of Cost VaR. (3) It does not impose any particular form on the underlying price distribution, but instead allows this distribution to take any well-behaved form, including an asymmetric (i.e., skewed) one. (4) It produces a simple analytical formula for Cost VaR. (5) The approach is robust, flexible and easy to use.

Note: Standard VaR methodology will be used to evaluate exposures resulting from activity in financial instruments. Currently, the electric power industry has not developed a highly liquid market in financial instruments. However, the natural gas market is relatively mature and offers opportunities in the use of financial instruments for the purpose of cost hedging. Standard VaR methods can be utilized more appropriately with natural gas as market performance generally follows a normal distribution.

Backtesting:

The purpose of a backtest is to compare the expected cost (at the then forward price) with actual cost (at the spot price), and implied volatility with actual volatilities, to determine if SJCE's cost VaR is adequate (conservative enough) to capture the potential market exposure.

To serve such purpose, staff may use the same open position number forecast 12 months ago and apply the DA spot market price in the past 12 months. This number would be the "actual cost" of

the open position had it stayed unchanged and filled in the DA market. Comparing the difference between the two numbers will provide guidance as to whether the variance falls within the 95% cost VaR boundary and identify whether SJCE would have been better off leaving the position open or covering it 12 months ago.

SJCE has performed backtesting of the Cost VaR measures during the in-house model development and validation phase. The backtesting results revealed adequacies in the Cost VaR measures (given the statistical confidence intervals used or various parameters).

APPENDIX 9 RECOMMENDED COVERAGE

The following Time-Price Coverage Matrix will be used as a guide for SJCE’s short term and long term procurement strategies. The objective of the Time-Price Coverage Matrix is to develop a procurement strategy focused on hedging against the risk of open load positions, as measured over time, and to mitigate SJCE’s exposure to market price volatility and other pricing risk. SJCE will strive to further develop this matrix based on (1) SJCE’s wholesale price risk and (2) appropriate limits for these risks. The actual covered positions taken by SJCE, reflected as a percentage of forecasted load, may deviate from the following Time-Price Coverage Matrix based upon SJCE’s staff evaluation of current market conditions and other applicable requirements (e.g., regulatory requirements).

Months to Delivery		Price Matrix Percentile						
		>60%	60%	50%	40%	25%	10%	<10%
		Covered Position as a % of Forecasted Load						
0+	3	80%	80%	85%	85%	90%	90%	100%
3+	6	70%	70%	75%	80%	80%	90%	100%
6+	9	70%	70%	75%	80%	80%	80%	90%
9+	12	60%	60%	70%	80%	80%	80%	90%
12+		60%	60%	70%	80%	80%	80%	90%