



Renewables Portfolio Standard Database Project

Feasibility Study Report

**California Energy Commission
Renewable Energy Office
Renewables Portfolio Standard Unit
1516 Ninth Street
Sacramento, CA 95814**

January 15, 2014

Version 6.0

DOCUMENT CONTROL

| Date | Version | Description |
|------------|---------|--|
| 12/18/2012 | 1.0 | Draft forwarded to RPS and PMO staff for review. |
| 1/3/2012 | 1.1 | Pre-Final FSR forwarded to RPS staff for review. |
| 1/4/2013 | 2.0 | Final FSR forwarded to RPS and PMO staff. |
| 7/15/2013 | 3.0 | Revised FSR sent to California Technology Agency. |
| 9/5/2013 | 3.1 | Change in funding source for Procurement Analyst and Independent Project Oversight Consultant. |
| 10/15/2013 | 4.0 | New transmittal pages and corrections to EAWs. |
| 10/22/2013 | 4.1 | Correction to EAWs. |
| 12/3/2013 | 5.0 | Changes to Business Objectives and Procurement wording; correction in EAW. |
| 1/15/2014 | 6.0 | Changes to Business Case and Procurement Section as requested by Department of Technology. |

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1.Executive Project Approval Transmittal

California Energy Commission
Renewables Portfolio Standard Database Project

Feasibility Study Report

1.Executive Project Approval Transmittal

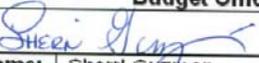
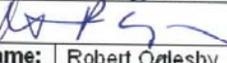
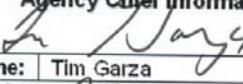
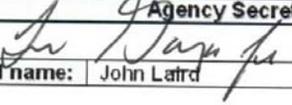
| | | |
|--|----------------------------|------------------------|
| Information Technology Project Request Feasibility Study Report Executive Approval Transmittal | | |
|  | | |
| Department Name | | |
| California Energy Commission | | |
| Project Title (maximum of 75 characters) | | |
| Renewables Portfolio Standard Database Project | | |
| Project Acronym | Department Priority | Agency Priority |
| RPS Database | | |

I am submitting the attached Feasibility Study Report (FSR) in support of our request for the California Technology Agency's approval to undertake this project.

I certify that the FSR was prepared in accordance with State Administrative Manual Sections 4920-4930.1 and that the proposed project is consistent with our Information technology strategy as expressed in our current Agency Information Management Strategy (AIMS).

I have reviewed and agree with the information in the attached Feasibility Study Report.

I also certify that the acquisition of the applicable Information technology (IT) product(s) or service(s) required by my department that are subject to Government Code 11135 applying Section 508 of the Rehabilitation Act of 1973 as amended meets the requirements or qualifies for one or more exceptions (see following page).

| APPROVAL SIGNATURES | |
|---|--------------------|
| Chief Information Officer | |
|  | Date Signed |
| Printed name: Steve Bonta | 9-23-13 |
| Budget Officer | |
|  | Date Signed |
| Printed name: Sherril Guzman | 10-2-13 |
| Department Director | |
|  | Date Signed |
| Printed name: Robert Oglesby | 10-9-13 |
| Agency Chief Information Officer | |
|  | Date Signed |
| Printed name: Tim Garza | 10/15/13 |
| Agency Secretary | |
|  | Date Signed |
| Printed name: John Laird | 10/15/13 |



EDMUND G. BROWN JR., Governor
JOHN LAIRD, Secretary for Natural Resources

To: Department of General Services
Resources Agency Departments, Boards, Commissions, Conservancies
California Technology Agency

From: California Natural Resources Agency

Subject: Authority to Approve Information Technology and Administrative Documents

By virtue of my authority as Cabinet Secretary of the California Natural Resources Agency, effective October 1, 2011, I am delegating authority to Tim Garza, Agency Chief Information Officer, to approve and sign documentation and correspondence related to all information technology matters. This includes the approval of procurement documents, special project reports, reports, and all Department of General Services and California Technology Agency documents.

This delegation will remain in effect until further notice.

APPROVED:

A handwritten signature in blue ink that reads 'John Laird'.

John Laird, Secretary
California Natural Resources Agency

cc: Patrick Kemp
Tim Garza
Resources Agency Legal Office

1416 Ninth Street, Suite 1311, Sacramento, CA 95814 Ph. 916.653.5656 Fax 916.653.8102 <http://resources.ca.gov>

Baldwin Hills Conservancy • California Coastal Commission • California Coastal Conservancy • California Conservation Corps • California Tahoe Conservancy
Coachella Valley Mountains Conservancy • Colorado River Board of California • Delta Protection Commission • Delta Stewardship Council • Department of Boating & Waterways • Department of Conservation
Department of Fish & Game • Department of Forestry & Fire Protection • Department of Parks & Recreation • Department of Resources Recycling and Recovery • Department of Water Resources
Energy Resources, Conservation & Development Commission • Native American Heritage Commission • Sacramento-San Joaquin Delta Conservancy • San Diego River Conservancy
San Francisco Bay Conservation & Development Commission • San Gabriel & Lower Los Angeles Rivers & Mountains Conservancy • San Joaquin River Conservancy
Santa Monica Mountains Conservancy • Sierra Nevada Conservancy • State Lands Commission • Wildlife Conservation Board



**Feasibility Study Report
Executive Approval Transmittal
Information Technology (IT) Accessibility Certification**

Yes or No

| | |
|------------|---|
| Yes | The Proposed Project Meets Government Code 11135 / Section 508 Requirements and no exceptions apply. |
|------------|---|

Exceptions Not Requiring Alternative Means of Access

| | Accessibility Exception Justification |
|--|---|
| | The IT project meets the definition of a national security system. |
| | The IT project will be located in spaces frequented only by service personnel for maintenance, repair, or occasional monitoring of equipment (i.e., "Back Office Exception.") |
| | The IT acquisition is acquired by a contractor incidental to a contract. |

Exceptions Requiring Alternative Means of Access for Persons with Disabilities

| | Accessibility Exception Justification |
|--|---|
| | <p>Meeting the accessibility requirements would constitute an "undue burden" (i.e., a significant difficulty or expense considering all agency resources).</p> <p>Explain:</p> <p>Describe the alternative means of access that will be provided that will allow individuals with disabilities to obtain the information or access the technology.</p> |
| | <p>No commercial solution is available to meet the requirements for the IT project that provides for accessibility.</p> <p>Explain:</p> <p>Describe the alternative means of access that will be provided that will allow individuals with disabilities to obtain the information or access the technology.</p> |

**Feasibility Study Report
Executive Approval Transmittal**

**IT Accessibility Certification
(continued)**

Exceptions Requiring Alternative Means of Access for Persons with Disabilities

| | Accessibility Exception Justification |
|--|---|
| | <p>No solution is available to meet the requirements for the IT project that does not require a fundamental alteration in the nature of the product or its components. Explain:</p> <p>Describe the alternative means of access that will be provided that will allow individuals with disabilities to obtain the information or access the technology.</p> |

2. Project Summary Package

Section A: Executive Summary

Section B: Project Contacts

Section C: Project Relevance to State and/or Department/Agency Plans

Section D: Budget Information

Section E: Vendor Project Budget

Section F: Risk Assessment Information

INFORMATION TECHNOLOGY PROJECT SUMMARY PACKAGE
SECTION A: EXECUTIVE SUMMARY

1. Submittal Date

| | | | | |
|---------------------|----------|-----|----------|--------|
| | FSR | SPR | PSP Only | Other: |
| 2. Type of Document | X | | | |
| Project Number | 3360-071 | | | |

| | | | |
|------------------|--|-------------------------|----------|
| 3. Project Title | Renewables Portfolio Standard Database Project | Estimated Project Dates | |
| | | Start | End |
| Project Acronym | RPS Database Project | 07/01/14 | 01/02/18 |

| | |
|--------------------------|------------------------------|
| 4. Submitting Department | California Energy Commission |
| 5. Reporting Agency | Natural Resources Agency |

6. Project Objectives

- Implement an enterprise level relational database that can be sized and expanded as needed to meet the legislative, regulatory, and operational requirements for RPS program expansion.
- Increase RPS staff efficiency for doing a “completeness check” of certification applications by reducing turnaround time from approximately 14 days to 3 days.
- Increase RPS staff efficiency for processing and approving pre-certification applications by reducing turnaround time from 2-3 months to 1 month; increase RPS staff efficiency for processing and approving certification applications by reducing turnaround time from 4-6 months to 2 months.
- Increase RPS staff efficiency for completing the verification and compliance processes by reducing turnaround time from 1-2 years to 3 months for annual claim checks and to 6 months for compliance period claim checks.
- Increase the frequency of status postings from monthly to weekly by providing staff with an automated certification application status report that can be uploaded to the RPS Web Page.
- Implement system security and privacy technologies in accordance with State of California policies and standards to give users the ability to log in and enter or modify their data, features currently not available.

| 8. Major Milestones | Est Complete Date |
|--|-------------------|
| RFP Released | 11/18/14 |
| RFP Vendor Contract Awarded | 05/29/15 |
| Conduct Project Initiation Activities | 06/22/15 |
| Gather Detailed Requirements | 10/29/15 |
| Design System | 05/12/16 |
| Develop System | 05/12/16 |
| Conduct Testing | 12/01/16 |
| Conduct User Training | 12/14/16 |
| Deploy System | 12/29/16 |
| PIER | 12/29/17 |
| Project Closeout | 01/02/18 |
| Key Deliverables | |
| RFP Released | 11/18/14 |
| RFP Vendor Contract Awarded | 05/29/15 |
| System Design/Development Documents Completed | 05/12/16 |
| Converted Data | 08/18/16 |
| Training Materials and Training Sessions Completed | 12/14/16 |
| System Deployed | 12/29/16 |
| PIER | 12/29/17 |
| Project Closeout | 01/02/18 |

7. Proposed Solution

The proposed solution requires a secure web-based system with a centralized and expandable database that supports renewable energy facility application data entry, application processing and review workflow, as well as Load Serving Entity (LSE) procurement claim data entry, procurement claim verification, and reporting.

INFORMATION TECHNOLOGY PROJECT SUMMARY PACKAGE
SECTION B: PROJECT CONTACTS

| | |
|------------------|----------|
| Project # | 3360-071 |
| Doc. Type | FSR |

| Executive Contacts | | | | | | | | |
|--|------------|-----------|-----------|----------|------|-----------|-------|--|
| | First Name | Last Name | Area Code | Phone # | Ext. | Area Code | Fax # | E-Mail |
| Agency Secretary | John | Laird | (916) | 653-5656 | | (916) | | secretary@resources.ca.gov |
| Dept. Director | Robert | Oglesby | (916) | 654-4996 | | (916) | | Robert.Oglesby@energy.ca.gov |
| Budget Officer | Sherri | Guzman | (916) | 654-4391 | | (916) | | Sherri.Guzman@energy.ca.gov |
| CIO | Steve | Bonta | (916) | 653-3873 | | (916) | | Steve.Bonta@energy.ca.gov |
| Office Manager II (Project Sponsor) | Kate | Zocchetti | (916) | 653-4710 | | (916) | | Kate.Zocchetti@energy.ca.gov |

| Direct Contacts | | | | | | | | |
|----------------------------|------------|-----------|-----------|----------|------|-----------|-------|--|
| | First Name | Last Name | Area Code | Phone # | Ext. | Area Code | Fax # | E-Mail |
| RPS Unit Supervisor | Jennifer | Campagna | (916) | 654-4710 | | (916) | | Jennifer.Williams@energy.ca.gov |
| Primary Contact | James | Haile | (916) | 651-9072 | | (916) | | James.Haile@energy.ca.gov |
| Project Manager | James | Haile | (916) | 651-9072 | | (916) | | James.Haile@energy.ca.gov |

**INFORMATION TECHNOLOGY PROJECT SUMMARY
SECTION C: PROJECT RELEVANCE TO STATE AND/OR DEPARTMENT PLANS**

| | | |
|--|--------|---------|
| 1. What is the date of your current Operational Recovery Plan (ORP)? | Date | 01/2010 |
| 2. What is the date of your current Agency Information Management Strategy (AIMS)? | Date | 01/2011 |
| 3. For the proposed project, provide the page reference in your current AIMS and/or Strategic Business Plan. | Doc. | |
| | Page # | |

| | |
|-----------|----------|
| Project # | 3360-071 |
| Doc. Type | FSR |

| | | Yes | No |
|---|--|-----|----|
| 4. Is the project reportable to control agencies? | | X | |
| If YES, CHECK all that apply: | | | |
| X | a) The project involves a budget action. | | |
| | b) A new system development or acquisition that is specifically required by legislative mandate or is subject to special legislative review as specified in budget control language or other legislation. | | |
| X | c) The estimated total development or acquisition cost exceeds the departmental cost threshold and the project does not meet the criteria of a desktop and mobile computing commodity expenditure (see SAM 4989 - 4989.3 | | |
| | d) The project meets a condition previously imposed by the Technology Agency. | | |

**INFORMATION TECHNOLOGY PROJECT SUMMARY PACKAGE
SECTION D: BUDGET INFORMATION**

| |
|----------|
| 3360-071 |
| FSR |

| | | | | | | | | | | |
|--------------------------------------|---|-----------|--|-----------|-------------|-----------|-----------|-----------|-------|-----|
| Budget Augmentation Required? | | | If YES, indicate fiscal year(s) and associated amount: | | | | | | | |
| No | | | | | | | | | | |
| Yes | X | FY | 14/15 | FY | 15/16 | FY | 16/17 | FY | 17/18 | |
| | | | \$60,480 | | \$1,270,000 | | \$995,000 | | | \$0 |

PROJECT COSTS

| 1. | Fiscal Year | 14/15 | 15/16 | 16/17 | 17/18 | TOTAL |
|----|-----------------------------|----------|-------------|-------------|----------|-------------|
| 2. | One-Time Cost | 81,345 | 1,453,261 | 921,382 | 0 | \$2,455,987 |
| 3. | Continuing Costs | 0 | 6,943 | 128,209 | 42,677 | \$177,830 |
| 4. | TOTAL PROJECT BUDGET | \$81,345 | \$1,460,204 | \$1,049,592 | \$42,677 | \$2,633,817 |

PROJECT FINANCIAL BENEFITS

| | | | | | | |
|----|-------------------------|-----|-----|-----|-----|-----|
| 5. | Cost/Savings Avoidances | \$0 | \$0 | \$0 | \$0 | \$0 |
| 6. | Revenue Increase | \$0 | \$0 | \$0 | \$0 | \$0 |

INFORMATION TECHNOLOGY PROJECT SUMMARY PACKAGE
SECTION E: VENDOR PROJECT BUDGET

| | |
|--|-------------------------------|
| Vendor Cost for FSR Development (if applicable) | 183,480 |
| Vendor Name | Business Advantage Consulting |

| | |
|------------------|----------|
| Project # | 3360-071 |
| Doc. Type | FSR |

VENDOR PROJECT BUDGET

| 1. | Fiscal Year | 14/15 | 15/16 | 16/17 | 17/18 | TOTAL |
|----|------------------------------|-----------------|--------------------|------------------|------------|--------------------|
| 2. | Primary Vendor Budget | 0 | 1,205,000 | 962,500 | 0 | \$2,167,500 |
| 3. | Independent Oversight Budget | 0 | 65,000 | 32,500 | 0 | \$97,500 |
| 4. | IV&V Budget | 0 | 0 | 0 | 0 | \$0 |
| 5. | Other Budget (STPD Analyst) | 60,480 | 0 | 0 | 0 | \$60,480 |
| 6. | TOTAL VENDOR BUDGET | \$60,480 | \$1,270,000 | \$995,000 | \$0 | \$2,325,480 |

(Applies to SPR only)

PRIMARY VENDOR HISTORY SPECIFIC TO THIS PROJECT

| | | | | |
|-----|-------------------------------|--|--|--|
| 7. | Primary Vendor | | | |
| 8. | Contract Start Date | | | |
| 9. | Contract End Date (projected) | | | |
| 10. | Amount | | | |

PRIMARY VENDOR CONTACTS

| | Vendor | First Name | Last Name | Ext. | Area Code | Fax # | E-Mail |
|-----|--------|------------|-----------|------|-----------|-------|--------|
| 11. | | | | | | | |
| 12. | | | | | | | |
| 13. | | | | | | | |

**INFORMATION TECHNOLOGY PROJECT SUMMARY PACKAGE
SECTION F: RISK ASSESSMENT INFORMATION**

| | |
|-----------|----------|
| Project # | 3380-071 |
| Doc. Type | FSR |

RISK ASSESSMENT

| | Yes | No |
|---|-----|----|
| Has a Risk Management Plan been developed for this project? | X | |

| General Comment(s) |
|--|
| A risk management plan can be found in Section 7 of this FSR document. |

3. Business Case

This section provides the business case for the California Energy Commission's (Energy Commission) Renewables Portfolio Standard (RPS) Database Project Feasibility Study Report (FSR). It describes the program to be supported, key business problems that the project will address, expected objectives to be achieved through the implementation of the proposed solution, and the users functional requirements for a new system.

The remainder of this section is organized as follows:

- 3.1 Business Area Identification and Mandates
- 3.2 Business Problems
- 3.3 Business Objectives
- 3.4 Business Functional Requirements

3.1. Business Area Identification and Mandates

3.1.1. Introduction

California with its abundant natural resources has had a long history of support for renewable energy. In 2011, 14.5 percent of all electricity came from renewable resources such as wind, solar, geothermal, biomass and small hydroelectric facilities. Large hydroelectric plants generated another 13.4 percent of electricity.¹

Following deregulation of the electric utilities in 1998, the Energy Commission was placed in charge of a new Renewable Energy Program. It was created to help increase total renewable electricity production statewide. This followed decades of bipartisan legislative and gubernatorial support for renewable energy helping to make California a recognized leader in the field.

In 2002, California established its RPS Program with the enactment of Senate Bill (SB) 1078 (Sher, Chapter 516, Statutes of 2002), which required California's electricity retail sellers² to procure 20 percent of their electricity sales with eligible sources of renewable energy by 2017. Senate Bill 1078 defined specific responsibilities for the Energy Commission, including review and approval/disapproval of electrical generation facilities applying for RPS certification status and verification that retail sellers are only using energy from certified RPS eligible facilities to meet their RPS obligations. When staff completes the verification check of retail sellers, they

¹ Statistics obtained from The California Energy Commission Energy Almanac:
http://energyalmanac.ca.gov/electricity/total_system_power.html.

² A retail seller is an entity engaged in the retail sale of electricity to end-use customers located within the state. Retail sellers include electrical corporations (also known as investor-owned utilities), community choice aggregators, and electric service providers.

publish their findings in a *Verification Report* and send it to the California Public Utilities Commission (CPUC). The CPUC determines if a retail seller is compliant and can penalize a retail seller for noncompliance.

To implement these requirements, the RPS Unit staff has been tracking and storing large volumes of information regarding the RPS precertification/certification status of facilities and RPS procurement claims from LSEs. The certification data includes current and historical contacts, addresses, renewable technology types, identification numbers, etc., for each facility. The verification data includes monthly RPS obligation procurement claims from each retail seller (reported annually, on two different claim tracking systems) for each generating facility (some facilities sell generation to more than one retail seller) as well as data from other regulatory agencies for comparison. In addition, relevant documentation is kept as attachments to each record.

In 2011, California enacted Senate Bill X1-2 (Simitian, Chapter 1, Statutes of 2011) with the overall goal of increasing the use of renewable energy in California; specifically, this bill expanded California's RPS program by establishing a higher RPS target (33 percent by 2020) and by mandating that publicly owned utilities (POUs) participate (previously, the program only required that retail sellers participate). The legislation established RPS targets to be met by POUs at the end of three compliance periods:

- 1) Compliance period 2011-2013 – 20 percent by December 31, 2013
- 2) Compliance period 2014-2016 – 25 percent by December 31, 2016
- 3) Compliance period 2017-2020 – 33 percent by December 31, 2020

After the completion of these compliance periods, the 33 percent RPS target of the final compliance period must be maintained each year. At this point compliance and verification shifts from a three year compliance period cycle to a more frequent annual cycle.

In addition, SB X1-2 expanded the Energy Commission's responsibilities with respect to the RPS. The Energy Commission would continue to implement pre-SB X1-2 duties, but would now be responsible for overseeing POU eligibility and compliance. The expanded responsibilities include:

- **RPS Verification and Compliance:** Whereas the RPS Unit only verified procurement data for retail sellers under previous law, staff must now verify procurement of the retail sellers and 45 POUs. In addition, the RPS Unit must monitor and determine POU compliance with California's RPS program, and then refer non-compliant POUs to the Air Resources Board (ARB) to impose possible penalties. As part of this new workload, Verification and Compliance staff will have to determine which procurement content category is being met with each POU claim. In addition, staff will have to collect hourly

generation data and transmission schedules from generating facilities that do not connect to California's electrical grid directly through a California Balancing Authority (as required by SB X1-2). The required hourly analysis may result in 78,876 or more records per compliance period per facility per claiming Load Serving Entity (LSE).³ Multiple LSEs may make claims from the same facility, which could add layers to the amount of data required for these facilities. Staff must analyze how much generation is below and above the hourly schedule.

- **RPS Certification:** The RPS Unit staff will continue to review and approve precertification/certification applications for generating facilities; however, the amount of applications will continue to grow since SB X1-2 allows distributed generation facilities to apply for RPS-eligibility. The number of additional facilities is expected to be in the range of 70,000.
- **RPS Regulations:** SB X1-2 required that the Energy Commission adopt regulations to enforce RPS procurement requirements for the POUs. RPS staff completed this project and California adopted the new RPS regulations in September 2013. The Energy Commission anticipates having to go through future rulemakings to update to the regulations to address problems with the regulations or when there are changes to existing law.

3.1.2. Business Process Identification

The RPS Unit manages two business processes, which are the subjects of this study.

- **Verification and Compliance:** Verify renewable energy procurement claims from LSEs and produce verification reports for the CPUC and compliance reports for the ARB.
- **Certification:** Review pre-certification and certification applications to determine if an electrical generation facility may be RPS-certified as a renewable energy resource and issue certificates.

3.1.3. Project Sponsor Identification

The RPS Database Project's sponsor is the Office Manager for the Renewable Energy Office. As illustrated in Figure 3-1, the RPS Unit (shaded area) is within the office.

3 POUs and retail sellers are referred to collectively as load serving entities (LSEs).

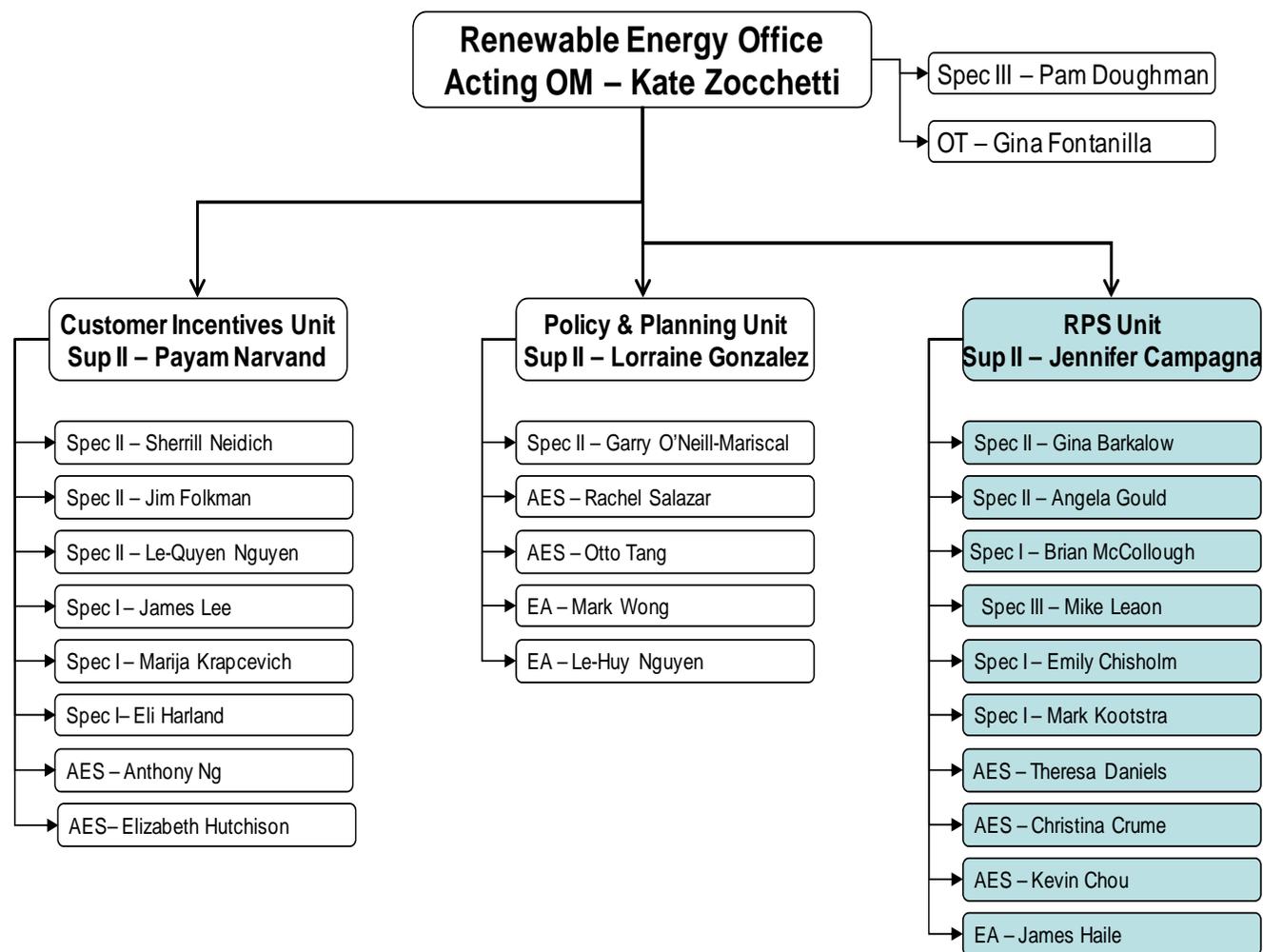


Figure 3-1 Renewable Energy Office Organization Chart

3.1.4. Current and Post-Implementation Costs

Table 3-1 lists the current annual and estimated post-implementation costs for Information Technology (IT) and the business found in the Economic Analysis Worksheets (EAWs).

Table 3-1 Annual IT and Business Costs

| Timeframe | Dollar Amount | Personnel Years (PYs) |
|---------------------|---------------|-----------------------|
| Current | \$930,564 | 10.0 |
| Post-Implementation | \$973,242 | 10.25 |

3.2. Business Problems

The RPS staff face the critical challenge of certifying facilities as “RPS eligible” and verifying that LSEs meet their RPS obligation using only energy from certified RPS eligible facilities.

In response to requirements prior to SB X1-2, the RPS staff created two separate Microsoft® (hereafter referred to as MS) Access databases, one for entering certification applications and another for storage of renewable energy procurement claims. The RPS Unit must retain all certification, verification, and compliance data. No records are, or can be, archived because of program requirements. Because MS Access databases have limited maximum storage capacity, the RPS certification and verification data sets are close to reaching capacity limits. A limitation resulting from this storage issue is that the system will sometimes freeze up during concurrent use, which severely impacts staff productivity and performance. The data and functional limitations of MS Access also mean that RPS staff have to rely heavily on manual processes. There is no “front end” interface to allow database end users (e.g. generation facility owners and LSEs) to manage and update their company data.

The main problem with the current RPS Certification business process is that it relies heavily on manual processes, which delays application review and approval. Electrical generating facilities use MS Excel spreadsheets to create renewable energy certification applications and submit them to the certification team via e-mail, as well as and physically signed official copies via U.S. mail. Certification staff must manually key this data into the database. The certification process requires several review and approval tasks to be performed by different RPS staff, which requires manual routing of paper applications and supporting documents between staff members. The absence of automated workflow makes it difficult to track the progress of applications to approval for certification.

The RPS staff are only able to post the renewable energy certification results to the RPS Web Page once per month due to the amount of manual effort involved with file preparation and uploading tasks. This labor intensive method of updating the Web Page prevents more frequently communication on the status and results of the certification of applications to the energy generating facilities.

The RPS Verification and Compliance business process also relies on manual processes. LSEs use MS Excel spreadsheets to create energy procurement claims and then submits them to the Verification and Compliance team via e-mail and U.S. mail. Staff must manually upload these spreadsheets to the Verification and Compliance database where few automated validation and data checks can be performed. This results in a great amount of manual effort for staff to validate the accuracy and completeness of the data and perform the Verification and Compliance tasks and produce Verification and Compliance reports.

The current MS Access systems provide limited security controls with no password protection for application access. This prevents staff’s ability to control access privileges and permissions

by user groups or roles. It also limits staff’s ability to audit users activities and track changes to data. The Verification Database is stored in a protected folder with limited access.

With the expansion of the Energy Commission's responsibilities under SB X1-2, the RPS Unit requires a database system that can accommodate the rapidly increasing amount of data that has to be collected, stored, and analyzed. In addition, the RPS Unit must streamline RPS business processes to increase staff efficiency and make the database more user-friendly for outside customers (for example, facilities applying for certification). The new system will allow staff to reduce manual processing and complete the certification, verification, and compliance processes in half the time.

3.3. Business Objectives

Table 3-2 provides a traceability matrix for the RPS processes and business problems, along with associated business objectives.

Table 3-2 Traceability Matrix

| Traceability Matrix | | |
|---|--|--|
| RPS Process | Business Problems | Business Objectives |
| Certification Verification Compliance | Problem 1. The RPS Certification, Verification, and Compliance staff need a database system with the data storage capacity and flexibility to meet operational requirements for program expansion under SB X1-2 and future policy mandates regarding the RPS. | <p>1.0 Objective. Implement an enterprise level relational database that can be sized and expanded as needed to meet the legislative, regulatory, and operational requirements for RPS program expansion. Achieving this objective will allow the RPS Unit to meet the following program requirements or goals under SB X1-2:</p> <ul style="list-style-type: none"> • Increase maximum storage capacity of the RPS Certification database to allow staff to process and store up to 70,000 new applications and supporting documents. • Increase maximum storage capacity of the RPS Verification database to allow staff to store the increased amount of verification and compliance data and supporting documents for 45 POUs. • Accommodate additional functional requirements for likely future policy mandates for renewable energy certification and verification. • Increase staff capability for system regression testing and improve system integrity during changes. • Provide technical architecture and system documentation to reduce risks when making changes or performing maintenance activities. • Reduce the potential need for staffing increases to support increases in manual certification, verification, or compliance workloads. |
| Certification | Problem 2. The RPS Certification staff need a database system that will | <p>2.0 Objective. Increase RPS staff efficiency for doing a “completeness check” of certification applications by reducing turnaround time from approximately 14 days to</p> |

| Traceability Matrix | | |
|-------------------------|---|---|
| RPS Process | Business Problems | Business Objectives |
| | greatly increase the efficiency of the RPS Certification business process in order to meet application processing deadlines as identified in the Energy Commission's <i>RPS Guidebook</i> . | <p>3 days. The new system will help meet this objective by providing the following tools and functionality:</p> <ul style="list-style-type: none"> • Electrical generating facilities will have the ability to fill out certification applications on-line. • Facilities will receive immediate electronic feedback from staff on the completeness and accuracy of the certification applications. • Staff will be able to quickly obtain missing or corrected certification information. • Facilities will have the ability to submit electronic copies of supporting documentation that can be easily searched for relevant project information and data. <p>2.1 Objective. Increase RPS staff efficiency for processing and approving pre-certification applications by reducing turnaround time from 2-3 months to 1 month; increase RPS staff efficiency for processing and approving certification applications by reducing turnaround time from 4-6 months to 2 months. The new system will help meet this objective by providing the following tools and functionality:</p> <ul style="list-style-type: none"> • Automated workflow for receiving, logging, and tracking the submittal, review, and amendment of renewable energy certification applications. • Capability of management to adjust staff workloads and workflows to meet changing certification demands and resolve bottlenecks in workflow process. • RPS Certification staff will have the ability to certify energy generating facilities in 60 days as specified in guidelines. |
| Verification Compliance | Problem 3. RPS Verification and Compliance staff need a database system that will greatly increase the efficiency of the RPS Verification and Compliance business processes in order to complete annual procurement checks and produce verification and compliance reports at the end of each compliance period. | <p>3.0 Objective. Increase RPS staff efficiency for completing the verification and compliance processes by reducing turnaround time from 1-2 years to 3 months for annual claim checks and to 6 months for compliance period claim checks. The new system will help meet this objective by providing the following tools and functionality:</p> <ul style="list-style-type: none"> • Automated validation and verification checks on submitted renewable energy procurement claims data. • LSEs will have the ability to submit electronic copies of supporting documentation that can be easily searched for claims information. • LSEs will receive immediate electronic feedback from staff on the completeness and accuracy of procurement claim information submitted. • RPS staff will have the ability to process and publicly |

| Traceability Matrix | | |
|---|--|--|
| RPS Process | Business Problems | Business Objectives |
| | | present data on an annual basis and produce verification reports at the end of each compliance period in a timely manner. |
| Certification | Problem 4. The RPS Unit needs a database system that will allow automated reporting in order to communicate application status and progress to electrical generating facilities on a more frequent basis to improve quality of service. | 4.0 Objective. Increase the frequency of status postings from monthly to weekly by providing staff with an automated certification application status report that can be uploaded to the RPS Web Page. |
| Certification Verification Compliance | Problem 5. The RPS Unit needs a database system that meets current California Office of Information Security Information security, privacy policies, standards, procedures to enhance security and protection of customer data. | 5.0 Objective. Implement system security and privacy technologies in accordance with State of California policies and standards to give users the ability to log in and enter or modify their data, features currently not available. The new system will help meet this objective by providing the following tools and functionality: <ul style="list-style-type: none"> • System access controls to include password protection for all users. • Technologies to provide secure, role-based remote and internal access to the system. • Track system access and record history on all data changes. • Compliance with data storage, retention, and Internet access standards. • Documentation of new system technical standards, functional hierarchy, data model and technical architecture to support future maintenance and operations. |

3.3.1. Project Performance Indicators Evaluation Plan

The following table provides information on how attainment of the business objectives will be measured.

Table 3-3 Performance Indicators Evaluation Plan

| Business Objective | Recipient of Value | Metric | Baseline | Target | By Date | Methodology |
|---|---|---|---|---|------------------------------|---|
| Objective #1.0 Implement an enterprise level relational database that can be sized and expanded as needed to meet the legislative, regulatory, and operational requirements for RPS program expansion. | RPS Unit Electrical Generating Facilities Load Serving Entities | Months to certify renewable energy applications Months to verify renewable energy procurement claims | Average pre-certification takes 2 to 3 months and certification takes 4 to 6 months Average claim verification takes 1-2 years | Cert: 1 st Quarter 2017 Verif: Annual 4th Quarter 2017 | 1 st Quarter 2017 | Use averages for dates when certification applications are received and dates when certified Use averages for dates when procurement claims are received and dates when verification reports are adopted by the Energy Commission. |
| Objective #2.0 Increase RPS staff efficiency for doing a “completeness check” of certification applications by reducing turnaround time from approximately 14 days to 3 days. | RPS Unit Electrical Generating Facilities | Days to submission of a complete and accurate certification application | Average certification application is complete and accurate in 14 days | Average certification application is complete and accurate in 3 days | 1 st Quarter 2017 | Use averages for dates when certification applications are received and dates when they are considered complete and accurate |
| Objective #2.1 Increase RPS staff efficiency for processing and approving pre-certification applications by reducing turnaround time from 2-3 months to 1 month; increase RPS staff efficiency for processing and approving certification applications by reducing turnaround time | RPS Unit Electrical Generating Facilities | Months to certify renewable energy applications | Average pre-certification takes 2 to 3 months and certification takes 4 to 6 months | Average pre-certification in 1 month and certification in 2 months | 1 st Quarter 2017 | Use averages for dates when certification applications are received and dates when certified |

| Business Objective | Recipient of Value | Metric | Baseline | Target | By Date | Methodology |
|---|---|---|---|--|--|---|
| from 4-6 months to 2 months. | | | | | | |
| Objective #3.0 Increase RPS staff efficiency for completing the verification and compliance processes by reducing turnaround time from 1-2 years to 3 months for annual claim checks and to 6 months for compliance period claim checks. | RPS Unit Load Serving Entities | Months to verify renewable energy procurement claims | Average claim verification takes 1-2 years | Average claim verification in 3 months for annual data and 6 months for compliance period | Annual 4th Quarter 2017 | Use averages for dates when procurement claims are received and dates when verification and compliance reports are adopted by the Energy Commission |
| Objective #4.0 Increase the frequency of status postings from monthly to weekly by providing staff with an automated certification application status report that can be uploaded to the RPS Web Page. | RPS Unit Electrical Generating Facilities | Frequency of posting statuses on the renewable energy certification applications | Status of renewable energy certification applications posted once per month | Status of renewable energy certification applications posted weekly | 1 st Quarter 2017 | Use dates the RPS Web Page is uploaded with statuses for certification applications |
| Objective #5.0 Implement system security and privacy technologies in accordance with State of California policies and standards to give users the ability to log in and enter or modify their data, features currently not available. | RPS Unit Electrical Generating Facilities Load Serving Entities | Tracking users logging in to enter, modify or view certification applications or procurement claims information | No user login required. Only RPS staff have access to the Verification system, which is stored in a confidential file on a shared drive. Minimal security or privacy mechanisms in | RPS staff, energy generating facility and load serving entity staff will have user accounts Security and privacy mechanisms in place User logons | Cert: 1 st Quarter 2017 Verif: Annual 4th Quarter 2017 | Users will be required to have an account on the system and be assigned roles with permissions to access the system data. User roles and permissions will provide a mechanism for the system to keep data secure and private. Tracking log will record user login, data creation, modification and viewing history. |

| Business Objective | Recipient of Value | Metric | Baseline | Target | By Date | Methodology |
|--------------------|--------------------|--------|---|--|---------|-------------|
| | | | place. No tracking of users activity for creation, modification or viewing of certification application, verification, or compliance data. | and activity for creation, modification or viewing of certification application, verification, or compliance data will be tracked. | | |

3.4. Business Functional Requirements

Representative Energy Commission RPS management and staff participated in the identification of functional requirements to ensure the proposed solution meets their specific business needs. Table 3-4 identifies the business functional requirements and maps each requirement to the respective category and corresponding identification number, and priority.

Requirement categories are logical groupings of requirements for user analysis and communication. The Requirement Categories are as follows:

System Access (SA) – Defines roles, policies, standards and technologies that provide a framework for user access and availability to electronic services.

Data Entry (DE) – Defines standards and technologies for initial data capture and later data amendment.

Energy Commission Staff Workflow Requirements (SW) – Defines system processes to assign and track work to Energy Commission staff and to report on work results.

System Interface (SI) – Defines requirements for data integration with applications external to the proposed system.

Reporting (RE) – Defines roles, standards and technologies for standard and ad hoc reporting.

Security (SE) – Defines roles, standards, policies, audits, and reviews, and backup and recovery operations to ensure security.

System Processes (SP) – Defines standards and rules for system characteristics and transformation of data.

Training (TR) – Defines training requirements for new system.

Data Migration (DM) – Defines required system functionality to support the successful completion of data migration activities.

Requirements are prioritized as Mandatory, Required, or Desired as follows:

M (Mandatory) – Absolutely essential feature; project shall be canceled if not included; regulation required functionality.

R (Required) – Features are not essential, but together they affect the viability of the project; additional functionality not specified by regulation; category of functionality that may be optional or a later system enhancement.

D (Desired) – One or more of these features could be omitted without affecting the project viability; nice-to-have function (e.g., bells and whistles); high-cost unique requirements.

Table 3-4 Functional Requirements

| ID | Functional Requirement | Priority |
|-----------------------------------|--|----------|
| System Access Requirements | | |
| SA-1 | The system shall provide a single, seamless user interface to access certification application, verification, compliance, and reporting pages. | M |
| SA-2 | All users will have web access to system features and functionality, within the limits of designated roles and permissions. | M |
| SA-3 | The system design shall provide user-friendly, uncluttered data entry screens. | M |
| SA-4 | The system shall provide the look and feel of systems that support comparable Energy Commission systems. | R |
| SA-5 | The system shall verify a unique user-identification (ID) and password sign-in to authenticate the user. | M |
| SA-6 | The system shall authorize single sign-on user access to systems that support comparable Energy Commission programs. | R |
| SA-7 | The system shall support web-browser access with a minimum of 128-bit encryption, with no additional special client configuration required. | M |
| SA-8 | The system shall support standard secured Internet web-browser access compatible with Windows Internet Explorer Version 8.0 or greater and Mozilla Firefox 3.0 or greater. | M |
| SA-9 | The system shall support standard secured Internet web-browser access compatible with Google Chrome release 20 or greater and Safari 4 or greater. | R |
| SA-10 | The system shall comply with the TCP/IP (Transmission Control Protocol/Internet Protocol) Domain Name System (DNS) used to identify all publicly available resources and registered with either the "ca.gov" or "state.ca.us" domain names. (This can be found on www.servicecatalog.dts.ca.gov/dns.asp , within the California Technology Agency website). | M |
| SA-11 | The system shall comply with accessibility standards defined by section 508 or the U.S. Rehabilitation Act (part of the Americans with Disability Act). | M |
| SA-12 | Provides Graphical User Interface (GUI) point and click and pull down menu access to various screens and files. | M |
| SA-13 | The system shall provide designated agency (CPUC, ARB), with appropriate security permissions and according to defined roles, with access to only their specific data for data entry, queries and reporting. | R |
| SA-14 | The system shall provide users with read-only access to all historical applicant and procurement claim data, based on user defined roles. | M |
| SA-15 | The system shall provide Help functionality on each displayed page, with topics sensitive to the page context. | M |
| SA-16 | The system shall provide help functionality to display field-level help for each data item on a page. | M |
| SA-17 | The system shall provide online help functionality for all web pages (e.g., general application help, such as "how-to" direction and navigation assistance for the user). | M |
| SA-18 | The system shall provide the Energy Commission System Administrator with the functionality to add new links to program information. | M |
| SA-19 | The system shall provide clear and consistent navigational aids. | M |

| ID | Functional Requirement | Priority |
|--------------------------------|--|----------|
| SA-20 | The system shall allow public read only access to view limited data (e.g., historical application information, procurement information, compliance information, etc.). | M |
| SA-21 | The system shall provide the ability for users, with the appropriate security permissions, to view individual applications or procurement claims. | M |
| SA-22 | The system shall allow a user to view all application or procurement claims data associated with their facility (linked to their user name and password). | M |
| SA-23 | The system shall provide a search function for users (Energy Commission, CPUC, ARB, or other designated users), based on defined roles, to search data element fields to find specific data, with search parameters based on defined business rules (e.g., search for a specific facility name, facility contact, facility location, select all records within a specific facility). | M |
| SA-24 | The system shall provide the capability to restrict fields for display to only designated users (e.g., official use only fields). | M |
| SA-25 | The system shall allow Energy Commission RPS staff to select a category (e.g., email or other correspondence, phone call, decision) of free form text that may be queried to display the associated text entry (i.e. notes capability). | M |
| SA-26 | The system shall follow the CEC Application Development Standard (i.e., ASP .NET 4.0 Web Forms, Entity Framework for persistent layer, Windows Server Standard 2008 R2 (IIS 7.5), Structured Query Language (SQL) Server 2008 R2 Standard, Visual Studio 2010 Professional, C#, Transact SQL, Microsoft SQL Reporting Services 2008 R2, etc.). | M |
| SA-27 | The system shall be hosted in the California Natural Resources Agency data center utilizing current server and network technology. | M |
| Data Entry Requirements | | |
| DE-1 | The system shall accommodate data capture (user entry or upload) for application data (e.g., facility contact information, application data, others as defined by legislation, regulation, policy). | M |
| DE-2 | The system shall accommodate data capture (user entry or upload) for procurement claim data (e.g., facility name, unit number, fuel type, monthly procurement data, etc.). | M |
| DE-3 | The system shall assign a unique identification or tracking number to each applicant or LSE (e.g., federal employer identification number). | M |
| DE-4 | The system shall provide the ability for Energy Commission RPS staff to assign a unique identifier for each facility. | M |
| DE-5 | The system shall accommodate data capture (user entry or upload) for one entity with multiple facilities. | M |
| DE-6 | The system shall provide the ability to automatically associate and link multiple facilities from the same entity. | M |
| DE-7 | The system shall assign a unique application number to each application | M |
| DE-8 | The system shall provide the Energy Commission System Administrator with the ability to manually combine duplicate information, companies and applicants into a single record (i.e., data cleanup). | M |
| DE-9 | The system shall provide the ability for applicants to submit data (e.g., supplemental or supporting) through a web form and include file attachments as applicable. | M |

| ID | Functional Requirement | Priority |
|-------|---|----------|
| DE-10 | The system shall save all data submitted by an entity or facility. | M |
| DE-11 | The system shall have the ability to automatically populate fields based upon defined business rules. | M |
| DE-12 | The system shall prevent completion of applications until all required documentation has been entered and uploaded based on the application type. | M |
| DE-13 | The system shall store and track internally all correspondence (e.g., letters, email, forms, certificates, etc.), linked to applications, sent to facilities, sent to LSE's. | M |
| DE-14 | The system shall provide the ability to capture and store multi-fuel data. | M |
| DE-15 | The system shall incorporate user-friendly navigation between screens. | M |
| DE-16 | The system shall provide the ability to efficiently add data – minimizing, to the greatest extent possible, the number of keystrokes required to enter all required information. | M |
| DE-17 | The system shall provide the ability to designate required fields for data entry, based on the context of the form and applicant type. | M |
| DE-18 | The system shall provide visual indicators for required fields. | M |
| DE-19 | The system shall provide the ability to mask specific fields (e.g., Date field, TAX ID (EIN)). | M |
| DE-20 | The system shall allow users to select data for entry using pull down menus, lists. | M |
| DE-21 | The system shall prevent the completion of an application or claim transaction in the event any required field data is missing or incomplete. | M |
| DE-22 | The system shall provide the user with notifications of corrections, omissions, and requirements needed to complete a transaction. | M |
| DE-23 | The system shall provide the ability for users to retrieve and amend data up to the point of data submission (e.g., application submission). | M |
| DE-24 | The system shall provide the user with the ability to stop in the middle of a transaction and restart, without loss of transaction data, at a later date and time. | M |
| DE-25 | The system shall provide the capability to save complete pages prior to submission. | M |
| DE-26 | The system shall provide the ability for the user to choose to save, or to clear changes to new or existing data entered within a unique page. | M |
| DE-27 | The system shall prompt the user of the next data entry requirement. | M |
| DE-28 | The system shall present specific stored record data for reuse or update in a new application or procurement claim submittal (e.g., pre-populate facility or generation information). | M |
| DE-29 | The system shall not allow duplicate entry or import of unique identifiers (e.g., facility (ID)). | M |
| DE-30 | The system shall validate entered or uploaded data to identify and flag duplicate entries. | M |
| DE-31 | The system shall display a warning to the user if any current displayed information will be lost or deleted upon navigation to another form or screen. | M |
| DE-32 | The system shall provide action-specific confirmation messages (e.g., "Are you sure you want to delete this record?"). | M |
| DE-33 | The system shall prompt system users when a user action will result in an irreversible change. | M |
| DE-34 | The system shall incorporate easily understood error, edit, and confirmation messages. | M |
| DE-35 | The system shall provide context-specific dynamic forms which display specific fields to the user based on the user defined security role. For example, when submitting information | M |

| ID | Functional Requirement | Priority |
|-------|---|----------|
| | only fields applicable to that applicant type should be visible to the user based on their defined role. | |
| DE-36 | The system shall display a checklist (e.g., process barometer, bread crumbs, check-off list) indicating the progress toward completing the application. | R |
| DE-37 | The system shall provide a confirmation message after edit of existing application or procurement claim data. | M |
| DE-38 | The system shall provide a print friendly version of the application and/or report information. The printed version will include, but not be limited to, the following information: Facility Profile, application summary, attestation signature page. | M |
| DE-39 | The system shall provide a print friendly version of the procurement claim and/or report information. The printed version will include, but not limited to, the following information: Facility Profile, procurement details, attestation signature page. | M |
| DE-40 | The system shall generate real-time user notifications (e.g., information submitted, incomplete information, processing status, etc.). | M |
| DE-41 | The system shall have the capability to send notifications to applicant and LSE email accounts. | M |
| DE-42 | The system shall have the capability to generate hard copy applicant and LSE notifications. | M |
| DE-43 | The system shall accept and process information submitted electronically by applicants and LSEs or transaction data manually entered by Energy Commission staff. | M |
| DE-44 | The system shall validate entered and uploaded data according to Energy Commission defined business rules. | M |
| DE-45 | The system shall validate user entry prior to submission (e.g., zip code, spacing, missing fields) & auto correct to standard (e.g., st/st. to street) formats. | M |
| DE-46 | The system shall validate data entered into fields where data types (e.g., text, binary, MIME-type), data structure or pattern (e.g., email address, telephone numbers), data length (e.g., character limit) or data size (e.g., file size) are constrained. | M |
| DE-47 | The system shall provide feedback to the user regarding data validation and will identify corrective actions as each field or screen is completed. | M |
| DE-48 | The system shall validate dependent fields. | M |
| DE-49 | The system shall have the ability to access field reference files (e.g., files or tables independent of the current page) to validate data. | M |
| DE-50 | The system shall enforce validation rules at the field, screen and form levels. | M |
| DE-51 | The system shall allow user entry and submittal of facility change of ownership data. | M |
| DE-52 | The system shall link owners of facilities as ownership changes. | M |
| DE-53 | The system shall retain change of ownership information (e.g., previous owner data). | M |
| DE-54 | The system shall provide the ability for Energy Commission staff, with the appropriate security permissions, to edit applicant or procurement claim data (e.g., contact information, profile information). Users not affiliated with the Energy Commission are limited to edit their own facility registration information. | M |
| DE-55 | The system shall allow users, with appropriate security permissions, to update specific application or procurement data. | M |
| DE-56 | The system shall provide the ability for the user to retrieve and amend their applicant account data (e.g., change of address, change of contact name). | M |
| DE-57 | The system shall provide the ability for Energy Commission staff, with appropriate security permissions, to change compliance and/or application information deadlines. | M |
| DE-58 | The system shall allow Energy Commission staff to configure field selection lists (e.g., | M |

| ID | Functional Requirement | Priority |
|--|--|----------|
| | ability to configure/select fields and functionality). | |
| DE-59 | The system shall allow Energy Commission staff, with specific security permissions, to define user notifications. | M |
| DE-60 | The system shall allow reporting LSEs to enter or upload RPS energy procurement claims reports. | M |
| DE-61 | The system shall perform claim report validation checks (e.g. beginning on date, Renewable Energy Credit Vintage Check, Total claim versus generation data, Procurement Content Categories (PCC), firmed and shaped energy, etc.). | M |
| DE-62 | The system shall accommodate the entry and/or upload of power source disclosure data. | M |
| Energy Commission Staff Workflow Requirements | | |
| SW-1 | The system shall provide check box functionality to allow Energy Commission staff, conducting a review or verification of record data, to indicate when specific steps within an application review are complete, to indicate an application review is complete, to indicate when specific procurement claim verification and compliance steps are complete, and to indicate when verification of a procurement claim is complete. | M |
| SW-2 | The system shall provide automatic flags for data indicating possible non-conformance. | M |
| SW-3 | The system shall provide the ability for Energy Commission staff, conducting a review of record data, to record text comments. | M |
| SW-5 | The system shall provide the ability for Energy Commission staff to document the results of an application review using checklists, menus and free form text. | M |
| SW-6 | The system shall validate Energy Commission staff have appropriate security permissions prior to entry of review information. | M |
| SW-7 | The system shall allow Energy Commission staff, with appropriate security permissions, the ability to update application review information once it has been entered and saved. | M |
| SW-9 | The system shall maintain a user-defined checklist of required activities for each review. These review checklists will be unique for each application type. | M |
| SW-10 | The system shall allow the user to indicate completed items in the review checklist where manual procedures have been done, such as checking supporting documentation. | M |
| SW-11 | The system design shall support workflow management to allow electronic routing of applications for review and approval among RPS staff. | M |
| SW-12 | The system must allow highlighting, comments and edits when routing documents for review and approval. | M |
| SW-13 | The system shall have the capacity to route records based on certain flags and triggers. | M |
| SW-14 | The system shall maintain a staff list to support routing for review and informational purposes, which is easy to administer. | M |
| System Interface Requirements | | |
| SI-1 | The system shall allow batch imports of properly formatted data from external and internal systems (e.g. WREGIS, Electricity Analysis Office (EAO), Energy Information Agency (EIA), Federal Energy Regulatory Commission (FERC), CPUC, etc.) using Energy Commission defined standards. | M |

| ID | Functional Requirement | Priority |
|-------------------------------|---|----------|
| SI-2 | The system shall allow for batch exports of data (e.g., XML, other defined formats, etc.) to other governmental agencies such as the CPUC and ARB or other designated entities. | M |
| Reporting Requirements | | |
| RE-1 | The selected vendor shall use the Energy Commissions standard reporting tool Microsoft SQL Reporting Services 2008 R2. | M |
| RE-2 | The reporting tool shall provide the ability to create and export displayed report information in various output formats, including but not limited to CSV, PDF, HTML, XLS, XLXS, XML, DOC, and TXT. | M |
| RE-3 | The reporting tool shall accommodate date driven reporting to let users query by identified date ranges. | M |
| RE-4 | The reporting tool shall provide Energy Commission staff with the ability to generate and save ad hoc queries and reports against all system accessible data. | M |
| RE-5 | The reporting tool shall provide the ability to facilitate the creation of reusable, sharable templates for ad hoc reporting. | M |
| RE-6 | The selected vendor shall develop, utilizing the standard reporting tool, up to 50 standard reports and queries. | M |
| RE-7 | The reporting tool shall provide the capability to include calculations within a report query. | M |
| RE-8 | The reporting tool shall interface with the RPS system. | M |
| RE-9 | The system will update eligibility application status reports on a scheduled basis for display on the Energy Commission RPS website. | M |
| Security | | |
| SE-1 | The system shall support use of an authentication check box to agree to terms of use (e.g., a user confirms entered data is complete and correct upon submittal). | M |
| SE-2 | The system shall have the ability to capture unique identifiers for each facility, corporation and person accessing the system (e.g., Corporate Number assigned by the California Secretary of State, staff identifiers). | M |
| SE-3 | The system shall protect information through user authentication and authorization. | M |
| SE-4 | The system shall authenticate against the user profile for each session. | M |
| SE-5 | The system shall require a unique login user ID when establishing a user profile. | M |
| SE-6 | The system shall provide a process for a user to define and maintain user profiles. | M |
| SE-7 | The system shall capture an email account for each user, according to the user assigned role (e.g., one user may have multiple email accounts for each facility). | M |
| SE-8 | The system shall require each corporation and facility to enter a primary email address. | M |
| SE-9 | The system shall require a configurable number of Energy Commission approved security questions to authenticate users when a user ID or password is forgotten. | M |
| SE-10 | The system shall utilize the email account stored in the user profile for all communication regarding account changes. | M |
| SE-11 | The system shall include a single logon attribute to communicate forgotten user id or password. | M |
| SE-12 | The system shall not display the number of login attempts remaining. | M |
| SE-13 | The system shall display notice when an unsuccessful sign-on attempt occurs. | M |

| ID | Functional Requirement | Priority |
|------------------------------------|--|----------|
| SE-14 | The system shall present a message to non Energy Commission users, when the maximum number of login attempts has been exceeded, informing them they are locked out for a specific time (e.g., 15 minutes, 30 minutes) or present them an alternative means of signing into the application which meets all State Office of Information Security policies and guidelines and complies with Section 508, Subpart B, Subsection 1194.22, Guidelines A-P of the Rehabilitation Act of 1973 as revised in 1998. | M |
| SE-15 | The system shall provide for secure sockets layer (SSL) access for and encryption of confidential information. | M |
| SE-16 | The system shall provide a secure process that allows a user to obtain a forgotten user ID. | M |
| SE-17 | The system shall provide a secure process that allows a user to reestablish a password. | M |
| SE-18 | The system shall logout a user when the user leaves the site or closes the browser. | M |
| SE-19 | The system shall logout non Energy Commission users when there has been no activity for a configurable amount of time. | M |
| SE-20 | The system shall provide the ability to configure access to data, report generation, and distribution (e.g., security model of user roles and privileges) by user, role, program, and facility. | M |
| SE-21 | The system shall have the ability to maintain secured role-based user authorization levels and restrict access at the report, file, table, screen, and field level based on user authorization. | M |
| SE-22 | The system shall apply roles-based security throughout the application. | M |
| SE-23 | The system shall allow Energy Commission staff, with appropriate security permissions, the ability to establish user authorizations (e.g., full admin, partial edit, read only access to designated functions). | M |
| SE-24 | The system shall allow users to have multiple roles. | M |
| SE-25 | The system shall support database level security in combination with the roles based security at the table, record, and field level. | M |
| SE-26 | The system shall provide an audit trail to track changes to data or tables, including who made the change, date/time of change, and what change was made. | M |
| SE-27 | The system shall allow Energy Commission System Administrator to update select system security configurations as appropriate. | M |
| SE-28 | The production system shall be automatically backed-up periodically as defined by the System Administrator. | M |
| SE-29 | The system shall perform a virus scan on any files from outside sources prior to uploading or processing them, and reject any files found with any type of virus, malware, Trojan horse, etc. | M |
| SE-30 | The system shall only accept files with the following (but not limited to) file extensions: DOC, DOCX, XLS, XLSX, PPT, PPTX, PPS, PPSX, VSD, MPP, PDF | M |
| System Process Requirements | | |
| SP-1 | The system shall provide Energy Commission users with appropriate security permissions the option to define the start month and end month of twelve consecutive months. | M |
| SP-2 | Each entry updates all relevant databases. | M |
| SP-3 | The system shall provide the ability to automatically generate confirmation of receipt of all | M |

| ID | Functional Requirement | Priority |
|------------------------------------|---|----------|
| | reports. | |
| SP-4 | The system shall generate report notices within a predetermined time period prior to due dates. | M |
| SP-5 | The system shall update the database at the time the user submits the data. | M |
| SP-6 | Energy Commission shall own all system source code developed for this project. | M |
| SP-7 | The system shall be a scalable system to accommodate future enhancements. | M |
| SP-8 | The system shall provide the ability to send mass emails based on but not limited to facility type, application type, application status, documentation requests, etc. | M |
| Training Requirements | | |
| TR-1 | The selected vendor shall prepare a training plan for Energy Commission staff | M |
| TR-2 | The selected vendor shall prepare training materials and train approximately 20 Energy Commission staff on the use, functions, and administration of the new system. | M |
| TR-3 | Energy Commission shall prepare end user (e.g., Generation Facility, Load Serving Entity, CPUC, etc.) training materials and train approximately 100 end users on the use and functions of the new system. | M |
| Data Migration Requirements | | |
| DM-1 | Approximately 100 gigabytes (GB) of historical RPS certification, verification, and compliance data (within the current database or stored separately in another file system) and all attachments shall be cleansed, transformed, translated, and migrated to the new system. | M |

4. Baseline Analysis

This section reviews current methods of operations and existing technologies that support the California Energy Commission's Renewable Energy Program related to California's RPS. The RPS is administered within the Efficiency and Renewable Energy Division's Renewable Energy Office. The discussion of the Baseline Analysis focuses on the current processes for the RPS certification and verification systems and activities.

Additional details of the Baseline Analysis is presented in the following sub-sections.

4.1 Current Methods

4.2 Technical Environment

4.1. Current Methods

4.1.1. Certification Process

Application Submittal

The Energy Commission approves RPS certification for electrical generation facilities (power plants and distributed generation systems) that have commenced commercial operations and are using eligible renewable energy resources to generate electricity. RPS precertification is also available for an applicant whose facility has not commenced commercial operations or is not yet using an eligible renewable resource. Both certification types follow the same process. Precertification is not required for certification approval. Also, precertification does not guarantee that a facility will be eligible for RPS certification in the future, but if the facility becomes RPS certified, generation will be eligible starting back to the date that the pre-certification application was submitted.

The Energy Commission provides seven different certification types depending on the facility operations, contractual obligations, and applicant preference. They are as follows:

- Individual facilities
- Aggregated unit for facilities for wind and solar photovoltaic⁴
- Facilities serving multijurisdictional utilities
- Facilities serving POUs
- Utility-certified facilities
- Limited certifications
- Special certification for POU-related facilities

⁴ A technology that uses a semiconductor (a material that is neither a good conductor of electricity such as copper nor a good insulator such as rubber) to convert sunlight directly into electricity.

The electrical generation facilities and LSEs initiate the RPS pre-certification and certification application processes by accessing an MS Excel spreadsheet via the Energy Commission website. The generators and LSEs use either the CEC-RPS-1 (for individual facilities) or CEC-RPS-3 (for aggregated units – a number of very small facilities being treated as a single facility) spreadsheet depending on the number of projects they want certified. They must also complete supplemental forms for the following facility types:⁵

- Biopower
 - Biodiesel - A renewable fuel derived in whole or in part from a biomass feedstock such as agricultural crops or agricultural wastes and residues, including but not limited to animal wastes, remains and tallow; food wastes, recycled cooking oils, and pure vegetable oils; or from an eligible solid waste conversion process using municipal solid waste.
 - Biogas - Includes digester gas, landfill gas, and any gas derived from an eligible biomass feedstock.
 - Biomethane – Biogas that has been upgraded or otherwise conditioned such that it meets the gas quality standards applicable to the natural gas transportation pipeline system into which the biogas is first accepted for transportation.
 - Biomass - Any organic material not derived from fossil fuels, including, but not limited to, agricultural crops, agricultural wastes and residues, waste pallets, crates, manufacturing, construction wood wastes, landscape and right-of-way tree trimmings, mill residues that result from milling lumber, rangeland maintenance residues, bio-solids, sludge derived from organic matter, wood and wood waste from timbering operations, and any materials eligible for “biomass conversion” as defined in Public Resources Code Section 40106.
- Hydroelectric – A technology that produces electricity by using the kinetic energy of flowing or falling non-marine water to turn a turbine generator.
- Repowered – Replacement of a significant portion of the generating equipment at an existing facility.
- First Point of Contact to a Non-CBA outside of California (includes outside U.S.A.).

The applicant emails the application and supplemental forms to the RPS Energy Track email address and sends a hard copy of all documents with an original signature to the certification team. There may be additional information required in addition to the forms.

An RPS analyst checks the RPS Track email regularly for new applications as well as for other types of inquiries and submittals. The application emails are generally held in an electronic

⁵ Definitions from the *Renewable Energy Programs: Overall Program Guidebook, Fifth Edition*. California Energy Commission. CEC-300-2012-005-ED5-CMF, pages 16-27.

folder until the hard copy documents arrive; however, the analyst may do a quick review to see if there are any technical problems while waiting for the hard copy to arrive. Once a hard copy application is received, the analyst date stamps it (which becomes the “beginning on” date for RPS eligibility and claim verification purposes), assigns an RPS Identification Number, and manually enters the data on the application into the MS Access Certification Database. Complete applications are processed in the order they are received.

Initial Application Review

The hard copy application is placed in a folder to start the review process. The electronic copy is moved from the email folder to the Certification Database. The analyst also uses Google Earth to add the new facility’s Global Positioning System coordinates to a map of all RPS certified facilities.

During the initial review of the application, the analyst performs the following checks:

- Reviews the application to see if all information has been provided and highlights missing information, as necessary.
 - Checks facility resource type.
 - Checks to see if signatures are photocopied or originals (original “wet signatures” are required).
 - Checks supplemental forms for completeness.
- If the application is complete, finalizes the approval letter and appropriate certificates using MS Word and includes these documents in the both the hard copy file and Certification Database record.

At the end of this initial review the next step the application takes in the review process is determined by the application type.

- Biopower, hydroelectric, repowered, incremental generation, Municipal Solid Waste (MSW) conversion, unspecified issues, alternate fuel management methodologies, and first point of contact to a non-CBA outside of California facilities generally require supplemental review.
- Pre-certifications that do not require a supplemental review go directly to the Office Manager for final approval and a signature on the facility’s certificate.
- Certifications without supplemental review go to the RPS Program Technical Lead for a review of the analysis.

Supplemental Review

Supplemental review is conducted by another analyst and consists of the following manual steps:

1. Review file to become familiar with the application.

2. Use Google Earth to view facility location.
3. Review file and verify that it meets certain requirements based on project type:
 - o Hydroelectric – Determine if project violates any federal licenses or has other problems.
 - o Hydroelectric Units Smaller than 40 Megawatts and part of a water supply or conveyance systems – Consult with Energy Commission hydroelectric experts and Legal Counsel to see if the allocation fits or not.
 - o Biomass – Check to see if it falls within Energy Commission definition of biomass.
 - o Repowered – Evaluate supplemental information.
 - o Incremental – Evaluate supplemental information and determine the baseline.
 - o Alternative fuel measurement – Determine validity.
 - o MSW conversion – Compliance with law.
 - o Unspecified issues.

If the facility is not interconnected to a CBA or is outside the U.S.A., the file moves to the Laws, Ordinances, Regulations and Standards (LORS) review. If not, it goes to the RPS Lead Analyst.

LORS Review

Under a LORS review, applicants must prove they will not cause or contribute to a violation of California law, ordinances, regulation or standard in California. Facilities outside the U.S. A. receive more review than a facility within the U.S.A. Facilities outside the U.S.A. must show they are as protective of the environment as if they were located in the California per California statute, regardless of their interconnection to the Western Electricity Coordinating Council (WECC).⁶

A LORS review consists of the following manual steps:

1. Locate the LORS checklist in the certification package. It cites where in the package certain information is located.
2. Review the information referenced in the checklist and ask for clarification information as needed from the applicant via email. There is a 60-day time limit for an applicant to respond.
3. Add reviewer comments as appropriate.

⁶ The Western Electricity Coordinating Council (WECC) is the Regional Entity responsible for coordinating and promoting Bulk Electric System reliability in the Western Interconnection which includes California.

The analyst initials the file when the review is complete and forwards it to the RPS Technical Lead for review.

Program Technical Lead Review

The RPS Program Technical Lead reviews all pre-certifications and certifications with the exception of pre-certifications without supplemental review. If there are any questions, the file is returned to the previous reviewer asking for clarification. In some cases the Technical Lead will contact the applicant directly with questions.

At any time an analyst may do the following:

- Contact internal Legal Counsel and others for assistance or to answer questions.
- Request additional information from the applicant via email or by phone. If the applicant does not respond within 60 days, the application may be denied and if so, a letter to that effect is generated and mailed.
- Deny the application and return it to the applicant after consulting with RPS Technical Lead. At that point, the applicant must start the process over if still interested in program participation.

When the Technical Lead review is complete, the file is initialed and given to the Office Manager.

Office Manager Review and Approval

The Office Manager reviews the file, approves, signs the letter appended to the RPS certificate, and returns the file to the first analyst. The analyst then updates the Certification Database and generates an approval letter and mails it along with the certificate to the applicant.

Amending Precertification or Certification

Certified and pre-certified facility representatives must notify the Energy Commission of any changes in information previously submitted in an application within 90 days. A facility risks losing its current status if it fails to do so. Changes must be reported on an amended CEC-RPS-1 or an CEC-RPS-3 spreadsheet for any of the following:

- Change in fuel, technology, or energy resource type
- Increase in nameplate capacity
- Change in Federal Energy Regulatory Commission (FERC) Qualifying Facility (QF) status
- Change in fuel suppliers (except for biomass facilities)
- Repowering of the facility
- Increase in nonrenewable fuel amount used annually beyond the allowable amount, or a change that exceeds 10 percent of the total annual energy input.

An analyst generates a monthly Excel file for certification updates and emails it to the Energy Commission Web Team to post on the RPS Web Page. The Western Renewable Energy Generation Information System (WREGIS) is also updated monthly via an Excel file upload.

Figure 4-1 presents a high level graphical representation of the RPS certification process.

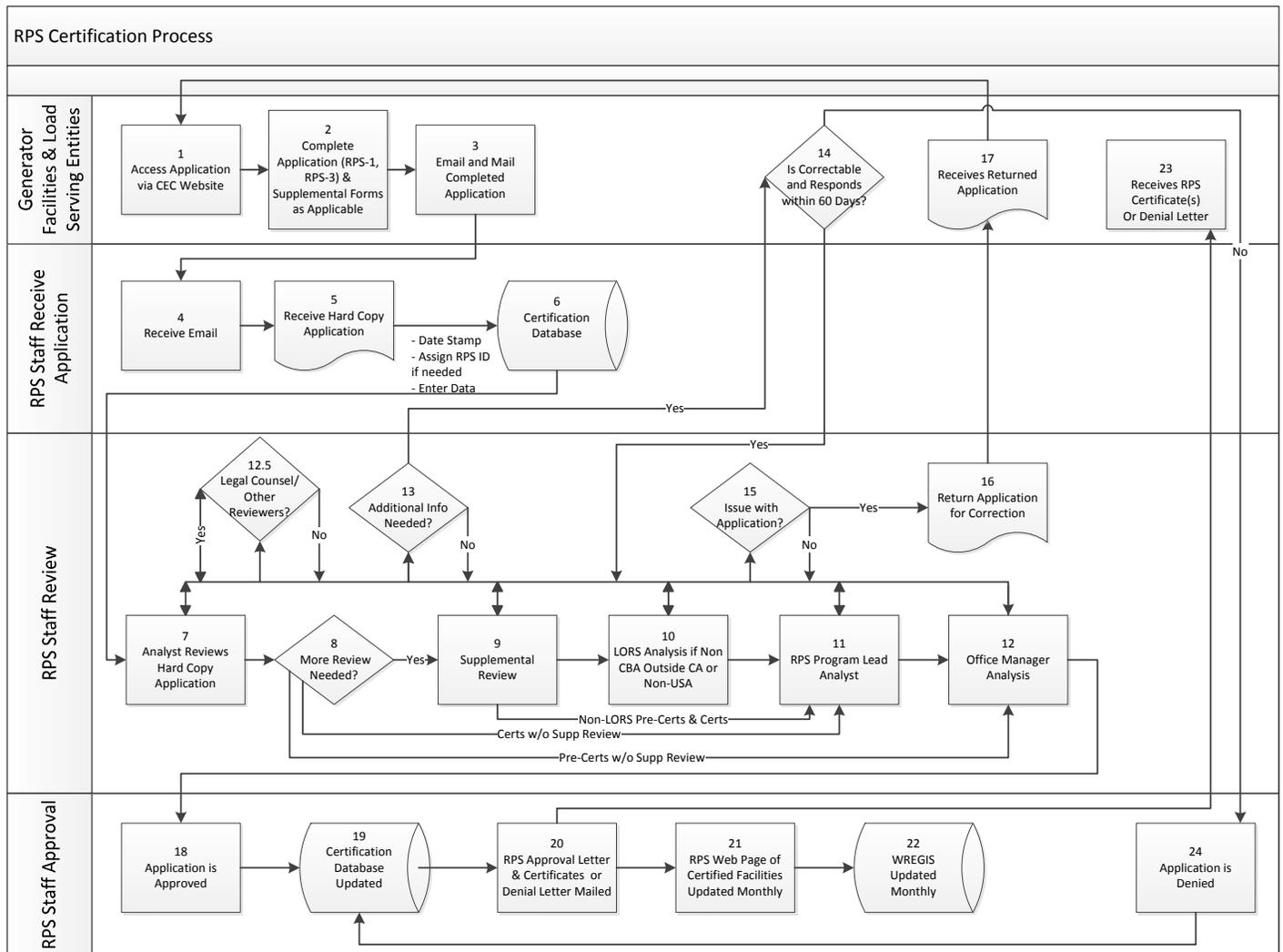


Figure 4-1 RPS Certification Process

4.1.2. Verification Process Reporting Procurement Claims

Retail sellers must report annually to the Energy Commission on the amount of RPS eligible electricity they procure per month per facility. To be RPS-compliant, all RECs must be retired within 36 months of generation of the associated RPS eligible electricity which includes

generation both tracked in WREGIS⁷ and reported using the Interim Tracking System (ITS).⁸ In addition, a REC may only be counted once for compliance with the RPS and may not be used to count toward the regulatory requirements of any other state or to satisfy any other retail product claims.

All retail sellers initiate the verification process by using the ITS forms and MS Excel spreadsheets, which include an attestation form to report RPS procurement via email and hard copy to Verification staff unless it is tracked in WREGIS. Annual retirement data stored in WREGIS is emailed and mailed to the Verification staff on behalf of the retail sellers. Retail sellers who report to WREGIS also email and mail attestation forms for their claims.

Verification staff uploads procurement claims and generation data from the Retail Sellers and WREGIS into the Verification database. Staff pulls generation information from the Energy Information Administration (EIA) and Electricity Analysis Office (EAO) websites. The Power Source Disclosure Program (PSDP) supplies additional electronic renewable claims reports which staff also uploads into the database. All three sources are in an Excel spreadsheet format.

Verification Checks

Eligibility Check

An eligibility check is performed to see if the certification was approved during the time claimed using a query in the Verification database to look for claims made from pre-certified or disapproved facilities. A manual check is done to ensure the claims were not before the “beginning on” date, which would render that portion of the claim as ineligible. A check is also done to ensure there was no status change to “disapproved” and, if so, to determine when the facility was disapproved and what amount may or may not be RPS eligible as a result.

⁷ WREGIS is an independent, renewable energy tracking system for the region covered by the Western Electricity Coordinating Council (WECC). WREGIS tracks renewable energy generation from units that register in the system by using verifiable data and creating renewable energy certificates (RECs) for each megawatt-hour (MWh) generated. WREGIS users have private accounts similar to bank accounts where certificates are deposited upon creation. Once a certificate is created it can be transferred or exported to a compatible tracking system (The export function only allows transfer to one other system – once a REC is retired to an export account it cannot be transferred again within WREGIS) according to the needs of the certificate owner until a final owner makes a claim, at which time the REC is considered “retired” in the system.

⁸ The Interim Tracking System (ITS) was developed by the Energy Commission prior to WREGIS availability and is currently undergoing a “phasing out” process. All eligible facilities and retail sellers who enter into REC transactions for RPS compliance purposes must now participate in WREGIS.

REC-Vintage Check

A REC-vintage check is conducted using a query in the database to compile WREGIS data since it has vintage month and year attached to it. That information is put into Excel for comparison of the vintage year to the retirement month and year. Claims cannot exceed month and year of generation by more than 36 months. An additional REC/vintage check is done in cases where the REC-vintage is different than the retirement year, staff has to do additional analyses to ensure there are no over claims when the procurement is considered in with the REC-vintage year procurement and generation amounts from which it occurred.

A form is opened in the Verification database for each RPS ID, which shows all claims for the year and procurement amounts for each LSE to get a total procurement claim amount. The same form lists the generation data amounts for the RPS facility and then takes the greatest generation amount and calculates the percentage difference between that generation amount and the total procurement amount. There is a flag if the procurement amount is greater than the generation amount by 5 percent or more. In those flagged instances, staff requests additional documentation from the LSEs such as invoices and metered data. The Center for Resource Solutions - Green-e Energy⁹ and other states are also contacted via email to supply information to help ensure there is no double-counting of the same renewable energy claims elsewhere.

Multi-Fuel Check

Staff uses a multi-fuel query in the Verification Database to pull in the facility fuel use table located in the Certification Database. The list is put into Excel for manual analysis for nonrenewable fuel usage. Information from the EIA, EAO, and RPS generators is used to compare the claims data for each of those facilities. For those generators with no multi-fuel data available, staff prepares and forwards a spreadsheet requesting the information. Fuel source data is used to determine what percentage of the fuel came from renewable and non-renewable resources. Staff verifies that the amount of non-renewable fuel used does not exceed the facility's de minimis¹⁰ allowance. The Energy Commission sets the de minimis quantity of nonrenewable fuels for each renewable energy technology at no more than 2 percent of the total quantity of fuel used by the facility to generate electricity. The Energy Commission may adjust the de minimis quantity for an individual facility, up to a maximum of 5 percent, if it finds that certain conditions are met. Any amount that is over the de minimis allowance is disallowed.

9 Green-e Energy is a voluntary certification program for renewable energy.

10 De minimis is a Latin phrase meaning "concerning minimal things". It usually refers to the failure to reach some threshold level required to be actionable.

Delivery Analysis

Staff conducts a manual delivery analysis only for out-of-state claims to verify that the amount of the delivery data is equal to or greater than the annual procurement claim using the following:

- Verification Database query to pull location information from the Certification Database to identify out-of-state claims
- WREGIS North American Electric Reliability Corporation (NERC) e-Tag¹¹ Summary Reports
- CEC-RPS-DELIVERY spreadsheets (if information unavailable in WREGIS)
- Random audits of NERC e-Tags to verify the required information is on the e-Tag (Samples are requested from the retail sellers.)

If there are any issues during the process, staff emails the retail sellers to try to resolve them to the extent possible. This process can go back and forth multiple times and can take months.

Public Workshop and Final Verification Report

The Verification staff creates a summary table document which is divided into four categories – Eligible, Pending, Withdrawn, and Ineligible and is emailed to the retail sellers. This document notifies the retail sellers of the Energy Commission’s findings in advance of a public workshop.

Verification staff prepares a Workshop Notice, which is posted to the website 10 days prior to an Energy Commission hearing on the subject. Staff holds a public workshop to announce their findings. Retail sellers and members of the public are allowed to ask questions and provide comments.

Using available information and taking public comments into consideration, staff develops a *Draft Verification Report*, which is posted on the web and sent to list serves. Staff then prepares a proposed *Final Verification Report*, which is posted to the web a minimum of 10 days prior to the Energy Commission Business Meeting. Staff presents the proposed *Final Verification Report* to the Commissioners in a public Business Meeting. The Energy Commission then votes to adopt the report. The *Final Verification Report* is transmitted to the California Public Utilities Commission for its use in determining RPS compliance.

Figure 4-2 presents a high level graphical representation of the level RPS verification process.

¹¹ NERC is the entity responsible for the implementation of the first energy tagging process. A NERC e-Tag is an electronic record that contains the details of a transaction to transfer electricity from a seller to a buyer where the electricity is scheduled for transmission across one or more balancing authority area boundaries.

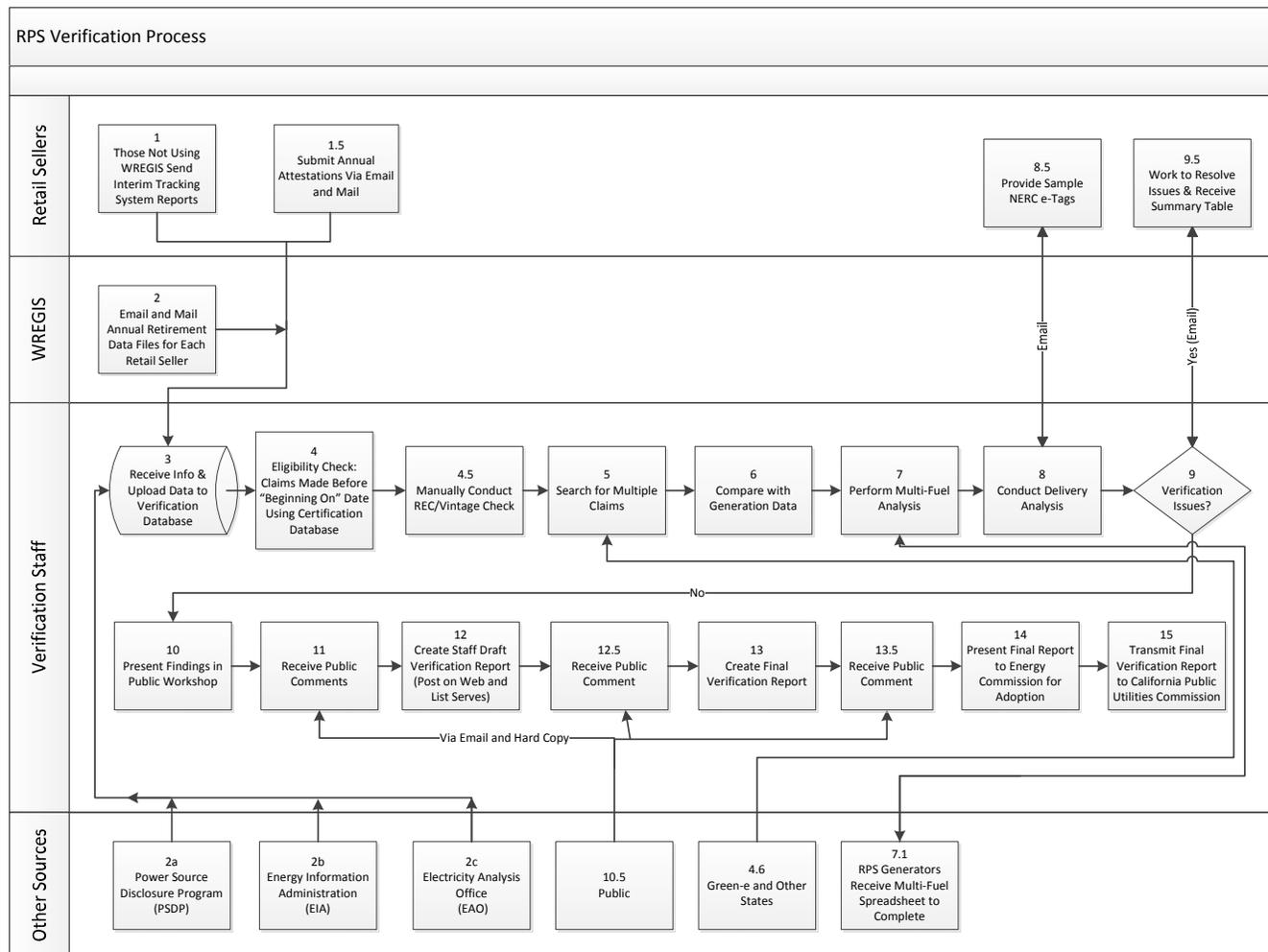


Figure 4-2 RPS Verification Process

4.1.3. Existing System Characteristics

Objectives of the Current System

The objectives of the current RPS system are twofold:

- Collect, approve, or deny applications from facilities seeking RPS certification.
- Verify all RPS energy procurement claims were from RPS certified facilities, the generation complied with all relevant delivery and fuel requirements, and that no RECs were double-counted.

Ability to Meet Current/Projected Workload

The current system is a largely manual process with very limited automatic data validation resulting in extensive paper and manual processes. In addition, the system design is currently inadequate with the capacity nearing its maximum. Due to limited data storage, some key

documents and information must be stored elsewhere. It will not support the additional data collection requirements as a result of recent legislation (SB X1-2 as discussed in Section 3) and implementing regulations under development as of the date of this document.

User Satisfaction

The RPS staff is not satisfied with the existing system. Issues that contribute to this dissatisfaction include:

- Two different databases exist to manage the system using limited software.
- A significant amount of manual data entry is required for the Certification Database contributing to process inefficiencies which adversely impact application response times.
- Both databases are poorly structured and nearing capacity. Two people in the database at the same time can cause the Certification Database to freeze greatly reducing user productivity.
- There are insufficient fields in the Certification Database to record all of the necessary information from the application forms.
- Significant amounts of time and labor are required to generate ad hoc reports from either database.
- The response time in the Verification Database is slow since it references the Certification Database. Some of the functionality no longer works.

Data Input / Output Characteristics

Certification Inputs

- RPS staff receive each Excel spreadsheet application with any applicable supplemental information via email and hard copy. Information from the hard copy is manually added to the Certification database. The soft copy is uploaded as an attachment.

Certification Outputs

- Application approval letters and certificates are mailed to the applicant.
- Application denial letters are mailed to the applicant.
- An Excel spreadsheet of certified facilities is emailed monthly to the Web Team for posting to the RPS website.
- WREGIS is updated monthly via an Excel spreadsheet

Verification Inputs

- Retail sellers and generators submit Excel spreadsheets
- WREGIS staff email reports to the Energy Commission
- Retail sellers and generators submit attestations forms via mail and email.
- Generation information (Excel spreadsheets) obtained from internal Energy Commission programs and other energy information sources:
 - EIA website
 - EAO website

- PSDP supplies additional electronic renewable claims reports

Verification Outputs

- Summary table document emailed to the retail sellers
- Draft and final Verification reports (manual) are posted to the website

Data Characteristics

The Certification Database is populated with alphanumeric data exclusively from RPS staff data entry. The Verification Database is populated via Excel spreadsheet uploads. Neither database automatically imports any files for data validation or other use within the system. Any supporting documents must be manually uploaded into the Certification Database.

Provisions for Security, Privacy and Confidentiality

Access to both databases are limited to the RPS Unit staff on a file share. The Verification Database is in a confidential folder which is only viewable by authorized staff. There is no public access. Physical access to the server on which the database resides in a secured area within the California Natural Resources Agency Data Center (CNRADC).

Equipment Requirements of Current System

An RPS staff member maintains both databases. The Energy Commission's Web Team maintains and operates the web server for the RPS Web Page. RPS staff access the databases on their network drive using their desktops and print documents using a network printer.

Software Characteristics

Microsoft Access 2007 is the database management system (DBMS). There are two databases storing a different data set and share some tables. The databases include:

- Certification – Tracks information related to facilities seeking RPS certification
- Verification – Tracks information related to verification of RPS generation and procurement claims

Internal/External Interfaces

The system does not exchange data electronically with any internal or external organizations.

Personnel Requirements

The following work groups perform the tasks that directly support the RPS processes.

Table 4-1 Current Personnel Requirements

| Activity | PYs |
|--|--------------|
| Certification and Verification Activities | 9.60 |
| Program staff support for Access databases | 0.40 |
| Total | 10.00 |

System Documentation

Program staff created the Certification and Verification Databases to fulfill immediate business needs so no documentation exists for the system.

System Limitations and Inadequacies

The following table illustrates the failures of the current system to meet the Energy Commission’s business needs as detailed within Section 3, Table 1: Business Problems and Objectives.

Table 4-2 System Failures and Inadequacies

| Failure/Inadequacy | Implications |
|---|--|
| The system has insufficient data capacity | <ul style="list-style-type: none"> • Difficult to incorporate major programs changes required by legislation or regulations. • Two people using the database at the same time can cause it to freeze. • Unnecessarily consumes excessive processing time. • Requires a significant amount of manual data entry which can contribute to problems with data integrity. |
| Microsoft Access has limitations inhibiting system growth | <ul style="list-style-type: none"> • System cannot be scaled to meet additional needs of the certification and verification processes or other new programs • Unsuitable to support Web-based self-service functionality. • Does not allow registrants to conduct any transactions online, forcing RPS staff to manually input data and slow certification processing. • Requires significant amount of time to generate routine ad hoc reports. |
| Limited data editing and validation capabilities | <ul style="list-style-type: none"> • Allows data to be entered without complete data validation. • Not capable of providing a set of sophisticated security controls to protect against unauthorized access. |

4.2. Technical Environment

This section details the technical environment of the current RPS Database system.

The current technical environment for RPS support is built around two MS Access databases that are only accessible by RPS staff. The system uses Access 2007 as the DBMS residing on a file server located at the CNRADC in the CoLoA White Space. The Certification Database contains all information related to RPS facility applications. The Verification Database contains procurement claim information. RPS program staff maintains both databases and Information Technology Services Branch (ITSB) staff backs them up to disk and then to tape to store off-site.

The current system, originally developed in 2008, has been modified over the years to meet the changing needs of the Energy Commission. The databases are poorly structured and have no documentation. Some of the functionality has ceased to work. Due to the limitations of MS Access 2007 and ever changing legislation and regulation, the organizational and managerial environment has a long-term need for a more robust and flexible system.

Expected Operational Life of Proposed Solution

It is difficult to estimate the expected operational life of a proposed solution. However, it is not unusual for well supported systems to remain functional for up to ten years. The current system has been operational for four years, but will quickly exceed its maximum capacity of 2 GB per database and is incapable of handling new legislatively mandated data collection. It has exceeded its useful lifespan for meeting the Energy Commission's business needs.

Interaction of Proposed Solution with Other Systems and Organizations

The proposed system will have no direct electronic interaction with any other systems. The CPUC will have a specific interest in viewing the results of the Energy Commission's RPS verification findings in their role of determining RPS compliance for retail sellers. In addition, the CPUC will be providing the Energy Commission with CPUC-approved procurement contracts. Therefore, the CPUC will have access to some of the data via a log-in using role based security.

State Level Policies / Strategic Alignment

The fulfillment of the business requirements directly supports the Energy Commission's compliance with governing statutes. The requirements will enable the Energy Commission to directly align with the following mission, vision and strategic goals:

Table 4-3 State Level Policies / Strategic Alignment

| Document | Goal/Mission/Vision | How Met |
|--|---|--|
| 2012 California Information Technology Strategic | Mission: The mission of the California Technology Agency and the state's information technology community is to support state programs and departments in the delivery of state services and | The new RPS Database system will provide an online web form for the direct online certification and verification process thus reducing |

| Document | Goal/Mission/Vision | How Met |
|--|---|--|
| Plan | <p>information to constituents and businesses through agile, cost-effective, innovative, reliable and secure technology.</p> | <p>program staff processing time and accelerating the approval processes increasing customer satisfaction.</p> |
| | <p>Vision: California’s government of the 21st century leverages technology to better serve Californians and deliver better services and program outcomes. Technology is a tool that enables state government to be accessible to constituents at their convenience and in their location, and efficient and effective in delivering services and information. The Technology Agency, in collaboration with the Agency Information Officers, lead these efforts.</p> | |
| | <p>Objective 1: Accessible and Mobile Government California’s government is providing more services and information to citizens by expanding online services, increasing access from mobile devices, and bridging the digital divide by increasing digital literacy and access to broadband. The result is a state government that is better able to meet Californians’ service expectations and which provides Californians with access at their convenience, on their schedule, and wherever they are.</p> | |
| | <p>Objective 4: Information is an Asset To engender trust from consumers of government services and information, the state must secure and safeguard sensitive and confidential data through strong privacy and data security practices and ensure that state departments are prepared to operate during and recover from times of disruption (natural disasters, unplanned outages and other events). Additionally, government will leverage data resources and analytical capacities so we can convert data into information and knowledge that departments can use to make more informed policy decisions, administer programs, reduce costs, improve outcomes and better serve constituents. Further, by creating secure transactions, we will ensure that Californians can leverage technology with confidence to get the services and information they need.</p> | <p>The new RPS Database system will conform with all state requirements for information security and privacy as outlined in Section 5. It will leverage data resources and analytical capacities by having functionality to create multiple ad hoc reports quickly and efficiently for the Legislature and other requesting entities.</p> |
| <p>2012 Statewide Information Technology Capital Plan (ITCP)</p> | <ul style="list-style-type: none"> • Ensure IT investments drive program efficiency and effectiveness and improve the quality of government services for Californians. • Facilitate improvements in internal business processes and financial management through IT investments. • Link IT investments to state and Agency priorities and business direction. • Promote the alignment of IT investments with the | <p>The new RPS Database system will do the following:</p> <ul style="list-style-type: none"> • Reduce internal manual business processes allowing the RPS certification and verification to proceed more quickly and efficiently. • Be web enabled to meet the 2012 California Information Technology Strategic Plan |

| Document | Goal/Mission/Vision | How Met |
|---|--|---|
| | <p>Agency's enterprise architecture (Technology, Standards, and Infrastructure), and the state's IT Strategic Plan.</p> <ul style="list-style-type: none"> Facilitate consideration and conceptual approval to pursue selected IT investments. | <p>Objective 1: Accessible and Mobile Government (above).</p> <ul style="list-style-type: none"> Leverage data resources and analytical capacities by providing reports to requesting entities more quickly and efficiently to meet the 2012 California Information Technology Strategic Plan Objective 4: Information as an Asset (above). Align with the Energy Commission's and Natural Resource's Agency's enterprise architecture as outlined in Sections 4 and 5 of this document. <p>The RPS Database Project FSR will facilitate the California Department of Technology's consideration and approval of the project.</p> |
| <p>Natural Resources Agency Mission Statement</p> | <p>To restore, protect and manage the state's natural, historical and cultural resources for current and future generations using creative approaches and solutions based on science, collaboration and respect for all the communities and interests involved.</p> | <p>The new RPS Database system will provide an online web form for the direct online certification and verification processes thus reducing program staff processing time and accelerating the approval process increasing customer satisfaction.</p> |
| <p>California Energy Commission 1997 Strategic Plan</p> | <p>Mission Statement It is the California Energy Commission's mission to assess, advocate and act through public/private partnerships to improve energy systems that promote a strong economy and a healthy environment.</p> <p>Vision Statement It is the vision of the California Energy Commission for Californians to have energy choices that are affordable, reliable, diverse, safe and environmentally acceptable.</p> <p>Values Statement The California Energy Commission's highest responsibility is to the people of California. We will strive to conduct business in a manner that results in maximum public benefit while ensuring fiscal integrity and accountability for the expenditure of public funds.</p> <p>Customers and Stakeholders All interactions with the public and others with whom we do business are of utmost importance in carrying out the Energy Commission's responsibilities. Our time, skills, abilities, intelligence, creativity, products and services are focused on these important</p> | |

| Document | Goal/Mission/Vision | How Met |
|--|---|---------|
| | <p>relationships, with an emphasis on customer service.</p> <p style="text-align: center;">Products and Services</p> <p>We are committed to providing quality products and services that are timely, accurate, reliable, responsive and useful. All staff will strive to continuously improve technologies, processes, structure and the way we provide products and services to the public and other stakeholders.</p> <hr/> <p>Roles, Goals and Strategies</p> <p style="text-align: center;">Role III — Market Programs</p> <p>Provide services and programs to consumers and other market participants to improve the functioning of energy markets and to encourage the economic, efficient, effective, and environmentally responsible use of all forms of energy.</p> <p style="text-align: center;">Goal</p> <p>The Energy Commission's services and programs enhance the energy industry infrastructure and improve the functioning of competitive markets, resulting in more affordable energy supplies, improved reliability, and enhanced economic well-being and environmental quality</p> <p style="text-align: center;">Strategy III (5)</p> <p>Use market based mechanisms to implement the Renewables Program created by AB 1890 and other legislative directives to foster renewable technologies which provide public benefits and facilitate their transition to a competitive market.</p> | |
| Energy Commission Renewable Energy Program Mission Statement | The mission of the Renewable Energy Program is to maintain the benefits and diversity that renewable energy offers Californians by developing a sustainable renewable energy industry in the state. | |

Financial Constraints

The development of a solution meeting the business objectives is dependent on approval of a Budget Change Proposal (BCP) requesting funding for this project. The Natural Resources Agency has approved the BCP concept for this project.

Policy Constraints

A solution to fulfilling the business objectives must provide the capability for applicants to enter information directly through the Internet via a web form. As required by statute, the RPS Unit must collect, track, and verify the data that resides in the RPS Database system. Some policy constraints that guide system design, development and implementation efforts include:

- Applicable State and federal government regulations related to privacy, confidentiality and security
- Energy Commission ITSB software and hardware standards
- IT Accessibility as outlined in Government Code 11135 / Section 508

System implementation will be conducted with full participation of the Energy Commission's Information Security Officer (ISO) to ensure all security considerations are met.

Anticipated Changes in Equipment, Software, or the Operating Environment

The current system is split into two MS Access 2007 databases which reside on a file server managed by the Energy Commission ITSB and does not meet the needs of the program. The proposed solution will utilize the BladeSystem housed at the CNRADC. It will be developed in C# using MS ASP.NET as the platform, MS Internet Information Services as the web/application server, and MS SQL Server as the database management system. The solution will also use virtual servers managed by VMWare and use MS Windows Server Datacenter 2008 as the operating system.

The proposed system will be scalable to process additional certification and verification data as a result of SB X1-2 as discussed in Section 3.

Personnel Availability

The Energy Commission has limited RPS resources available for development and operation of the current and proposed solution. RPS staff are available to provide subject matter expertise for the design, development, and testing of the proposed solution. The Energy Commission's ITSB does not have staff available to design and develop the system. Therefore, the proposed solution will require contractor support to further analyze, design, and develop the system.

4.2.1. Existing Infrastructure and Technical Architecture

Hardware and Software Standards

The Energy Commission will continue with its current investment in desktop configuration, printers, and network and communications hardware. The Energy Commission currently has a sufficient number of printers and will utilize them as part of the proposed solution.

The Energy Commission uses Transmission Control Protocol/Internet Protocol, Secure Sockets Layer, Hypertext Transfer Protocol over Secure Sockets Layer, and Secure File Transfer Protocol as standard network protocols.

The Energy Commission's ITSB recommends using the following technology standard for the RPS Database system:

Development Environment

| | |
|-------------------------|---|
| Development Framework | ASP .NET 4.0 Web Forms Entity Framework for persistent layer |
| Source Control Software | Team Foundation Server Visual Source Safe 2005 |
| Development Tool | Visual Studio 2010 Professional |
| Programming Language | C# |
| Scripting Language | JavaScript Allowed JavaScript Library – JQuery AJAX Control Toolkit for Visual Studio |
| Markup Language | XHTML transitional |
| Report Tools | Microsoft SQL Reporting Services 2008 R2 Preferred Output formats Microsoft Word Microsoft Excel Adobe PDF XML |
| 3rd Party Software | Component One |

Database

| | |
|-------------------------------------|--|
| Enterprise Database | SQL Server 2008 R2 Standard |
| Database Language | Transact SQL |
| Data Exchange With Outside Entities | XML is the preferred format. Others such as Word Doc, Access DB and Excel are allowed based on the requirement. |
| Desktop Productivity Tool | MS Access |

Server

| | |
|--------------------------|---|
| Server OS | Windows Server Standard 2008 R2 |
| Internet Server Platform | Microsoft Internet Information Services (IIS) 7.5 |

Client Environment

| | |
|------------|--------------------------|
| Desktop OS | Windows XP Pro/Windows 7 |
| Browser | IE 8 |

Historically, individual programs within the Energy Commission have acquired or developed automated systems to support their specific business processes. These system platforms are not necessarily based on current Energy Commission standards. The ITSB may provide support for these systems based on the availability of resources and expertise. Otherwise, support is routinely provided by program staff.

Network Infrastructure

The system is supported by the Energy Commission and California Natural Resources Agency Internet and Intranet infrastructure. Figure 4-3 RPS Network Infrastructure illustrates the current RPS network topology.

The Energy Commission Internet is an area of the network accessible by anyone. The identity of individuals is usually not required but may be confirmed if necessary. The Internet is generally used by the public connected over the public Internet.

The Energy Commission Intranet is an area of the network used by all Energy Commission staff, including those in the RPS Unit. The Energy Commission Intranet is only accessible by authorized staff. The Intranet is connected through the internal, private network.

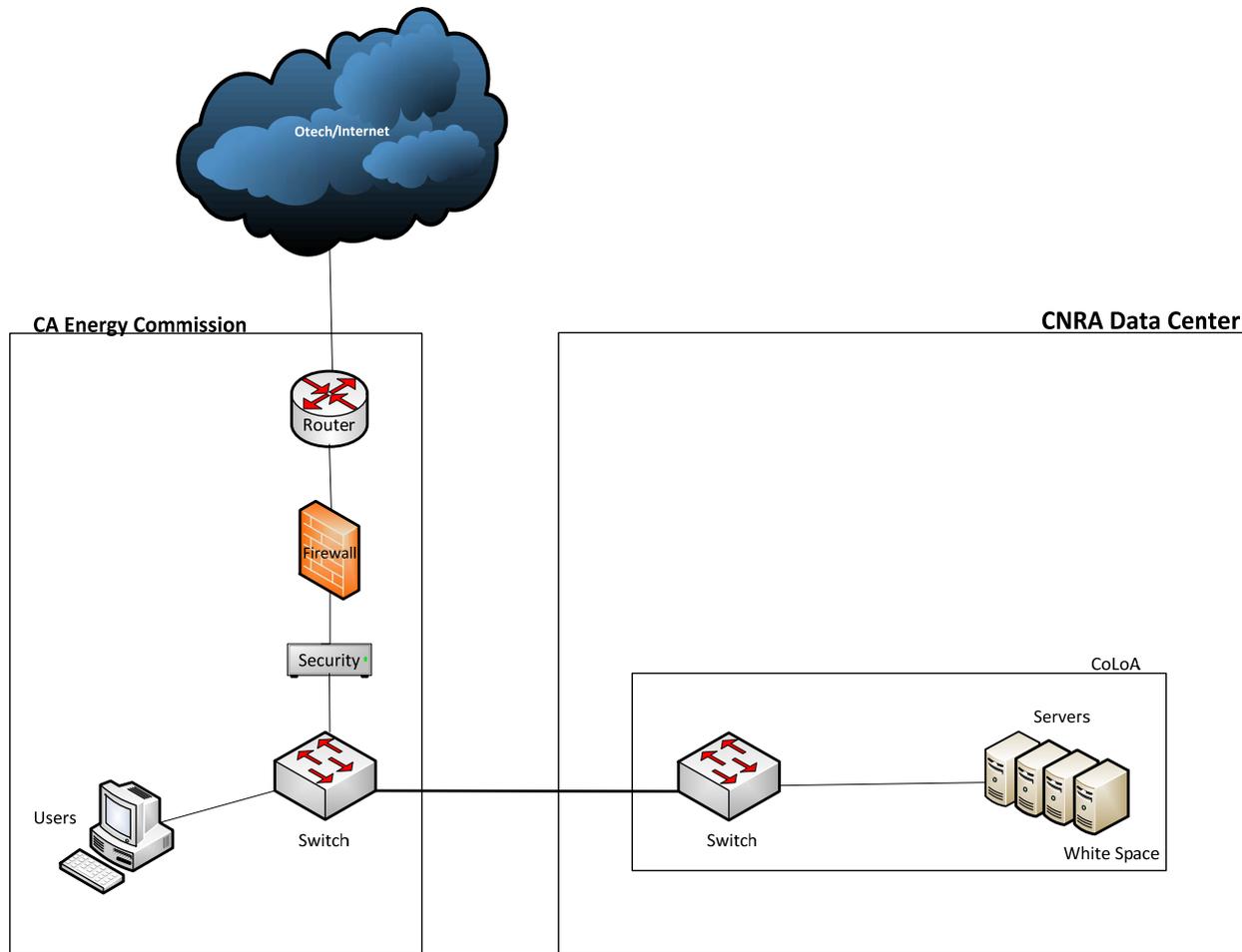


Figure 4-3 Network Infrastructure

Project Management Methodology

The Energy Commission utilizes the Project Management Institute's (PMI) best practices and the Project Management Body of Knowledge (PMBOK) as the basis for IT project management incorporating the concepts of project lifecycle and unique management based on the requirements for each project phase. Moreover, the Energy Commission employs the Statewide Information Management Manual Section 17 (SIMM-17) California Project Management Methodology (CA-PMM) guidelines.

5. Proposed Solution

The Energy Commission proposes to conduct a procurement to select a vendor to develop an IT solution to address the business objectives and functional requirements identified in Section 3 Business Case. The RPS Database development vendor is to develop the application by designing, developing, and implementing a new web-based software system to provide the following:

- A secure, user friendly web-based application for renewable energy resource eligibility certification and renewable energy procurement claim verification, POU compliance, and RPS reporting.
- Customer self-service ability to enter applications, forms, and supplemental documentation to determine RPS eligibility, annual procurement claims and RPS compliance.
- Work flow capability for review of applications to deny or approve RPS eligibility and process RPS compliance documentation.
- The ability to perform automatic procurement claim verification where feasible.
- The ability to update records as necessary.
- A web-based interface to perform queries and generate reports.
- Enhanced data validation.
- Secure access to system and data.

In addition to meeting Energy Commission requirements, the solution is consistent with Energy Commission's current regulatory and policy structure, scalable to accommodate future expansion, and complies with State and Energy Commission IT policies, procedures, and standards.

The remainder of this section is organized as follows:

- 5.1 Solution Description
- 5.2 Rationale for Selection
- 5.3 Other Alternative Solutions Considered

5.1. Solution Description

The proposed solution requires a web-based system with a centralized database that supports renewable energy facility application data entry, application processing and review workflow, as well as LSE procurement claim data entry, procurement claim verification, determining compliance, and reporting.

The proposed solution automates existing manual data verification processes, eligibility application review processes, and business rule evaluations. The electronic submission of applications and automated rule processing is to significantly reduce the time and effort to

approve or deny RPS eligibility applications. Electricity produced by a renewable energy facility cannot be used to verify utility procurement claims until the facility is certified as RPS eligible. If a facility is not certified as RPS-eligible then LSEs may avoid purchasing electricity from those facilities. The sooner a facility is certified as RPS-eligible, purchasers of the renewable energy will be able to claim procurement to meet their RPS obligations.

RPS Unit staff, responsible for procurement claim verification, will use the system to verify procurement reported to the Energy Commission is from a RPS-eligible source and complies with all legislation and rules. The RPS unit will also use the system to gauge the overall effectiveness of the program.

Figures 5-1 and 5-2 present a conceptual view of improved RPS business processes.

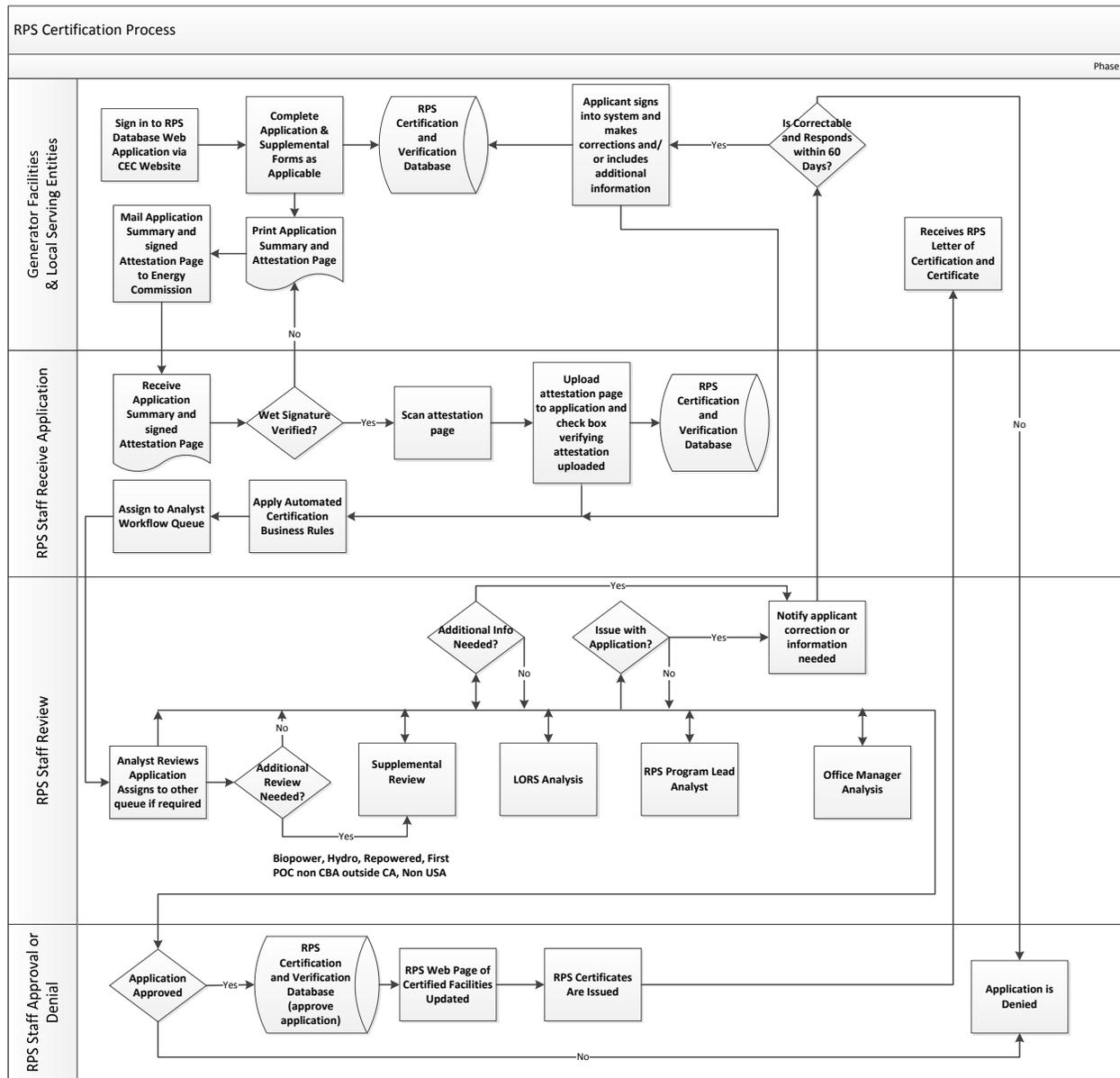


Figure 5-1 Conceptual View of Improved Certification Process

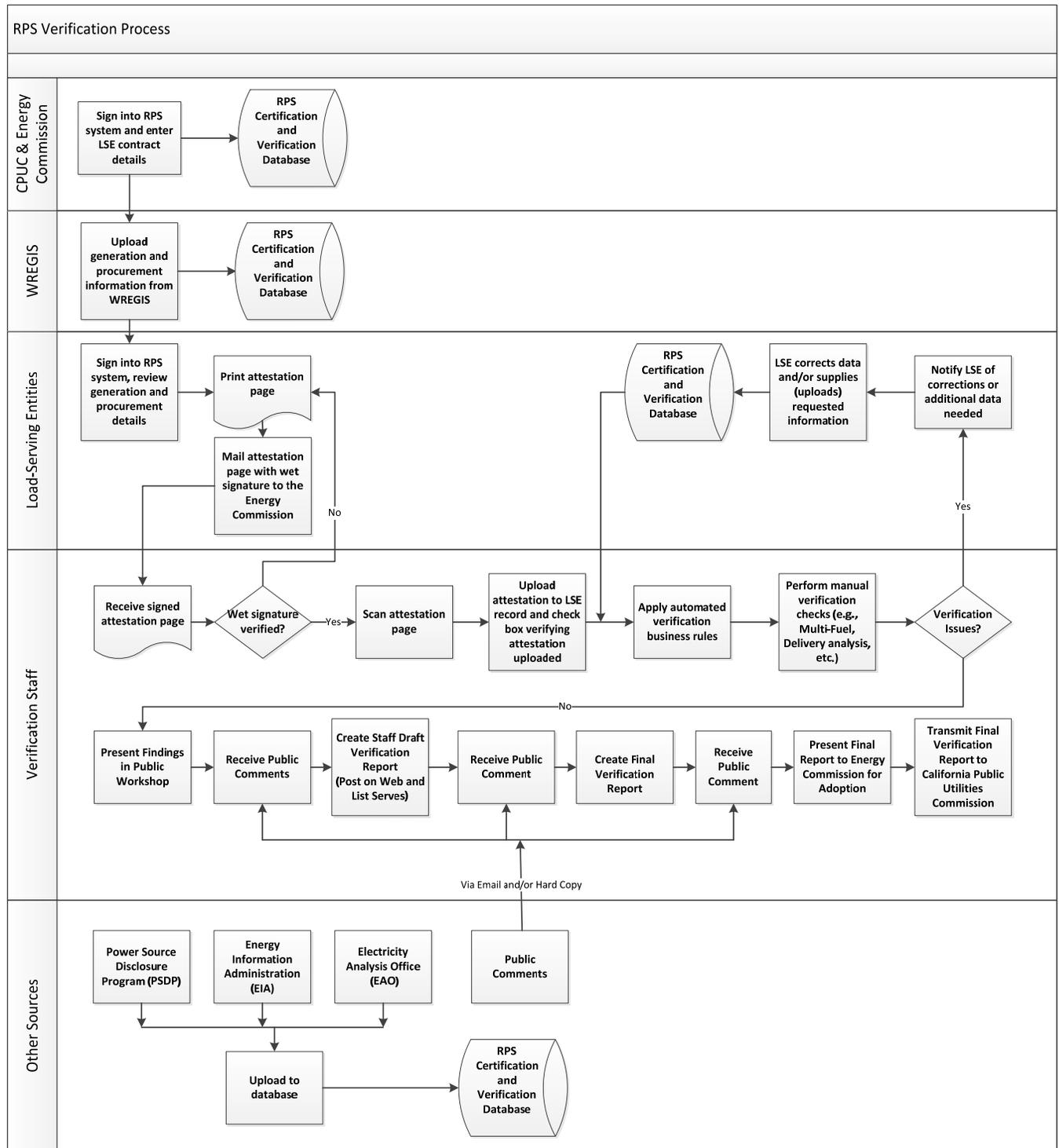


Figure 5-2 Conceptual View of Improved Verification Process

The solution provides a flexible environment for Energy Commission staff to configure the system to add or change business rules, data relationships, forms and reports to meet changes in regulation or business practices.

The proposed solution migrates from the MS Access 2007 databases to a more robust DBMS, MS SQL Server. The solution provides maximum secure access and data handling flexibility to eliminate data duplication issues, improve accuracy, and increase flexibility of user configurability. Although not a requirement, system downtime beyond routine and predictable maintenance activities is minimized, allowing for the system to approach 24X7 availability.

The Energy Commission's stated direction in technology development includes MS ASP.NET platform, MS IIS, MS SQL Server, C# programming language, along with additional Microsoft and third party components.

Overall, the proposed solution directly addresses many of the operational challenges of the current system. Specific problems addressed by the solution include:

- **Problem 1:** The RPS Certification, Verification, and Compliance staff need a database system with the data storage capacity and flexibility to meet operational requirements for program expansion under SB X1-2 and future policy mandates regarding the RPS.
- **Problem 2:** The RPS Certification staff need a database system that will greatly increase the efficiency of the RPS Certification business process in order to meet application processing deadlines as identified in the Energy Commission's *RPS Guidebook*.
- **Problem 3:** RPS Verification and Compliance staff need a database system that will greatly increase the efficiency of the RPS Verification and Compliance business processes in order to complete annual procurement checks and produce verification and compliance reports at the end of each compliance period.
- **Problem 4:** The RPS Unit needs a database system that will allow automated reporting in order to communicate application status and progress to electrical generating facilities on a more frequent basis to improve quality of service.
- **Problem 5:** The RPS Unit needs a database system that meets current California Office of Information Security Information security, privacy policies, standards, procedures to enhance security and protection of customer data.

The proposed solution deploys a new system to support the following business objectives:

- **Objective 1.0:** Implement an enterprise level relational database that can be sized and expanded as needed to meet the legislative, regulatory, and operational requirements for RPS program expansion.
- **Objective 2.0:** Increase RPS staff efficiency for doing a "completeness check" of certification applications by reducing turnaround time from approximately 14 days to 3 days.
- **Objective 2.1:** Increase RPS staff efficiency for processing and approving **pre-certification** applications by reducing turnaround time from 2-3 months to 1 month;

increase RPS staff efficiency for processing and approving **certification** applications by reducing turnaround time from 4-6 months to 2 months.

- **Objective 3.0:** Increase RPS staff efficiency for completing the verification and compliance processes by reducing turnaround time from 1-2 years to 3 months for annual claim checks and to 6 months for compliance period claim checks.
- **Objective 4.0:** Increase the frequency of status postings from monthly to weekly by providing staff with an automated certification application status report that can be uploaded to the RPS Web Page.
- **Objective 5.0:** Implement system security and privacy technologies in accordance with State of California policies and standards to give users the ability to log in and enter or modify their data, features currently not available.

System capabilities in support of these objectives include:

- Automated data entry validation for renewable energy generation certification applications and procurement claims.
- Automated upload capability for required documentation and supplemental information.
- Automated screening of applications and procurement claims for completeness.
- Automated application review workflow assignments to analysts.
- Automated business rules to check applications for compliance of legislation, regulations, and rules.
- Automated business rules to verify procurement claims for compliance of legislation, regulations, and rules.
- Monitoring of application status and workflow management.
- Automated upload of renewable energy generation information from the following programs or agencies:
 - WREGIS (includes REC information for procurement)
 - EIA
 - EAO
 - PSDP
- Automated generation of verification report charts and tables.
- Automated printing of certification documents (e.g., certificates, letters of certification).
- Generation of standard and ad hoc reports.

Figure 5-3 provides a conceptual view of the proposed solution. Note that this is a conceptual view and the actual solution and server environment conform to applicable California Department of Technology (CalTech)¹² standards and architecture.

¹² Formerly known as California Technology Agency or CTA.

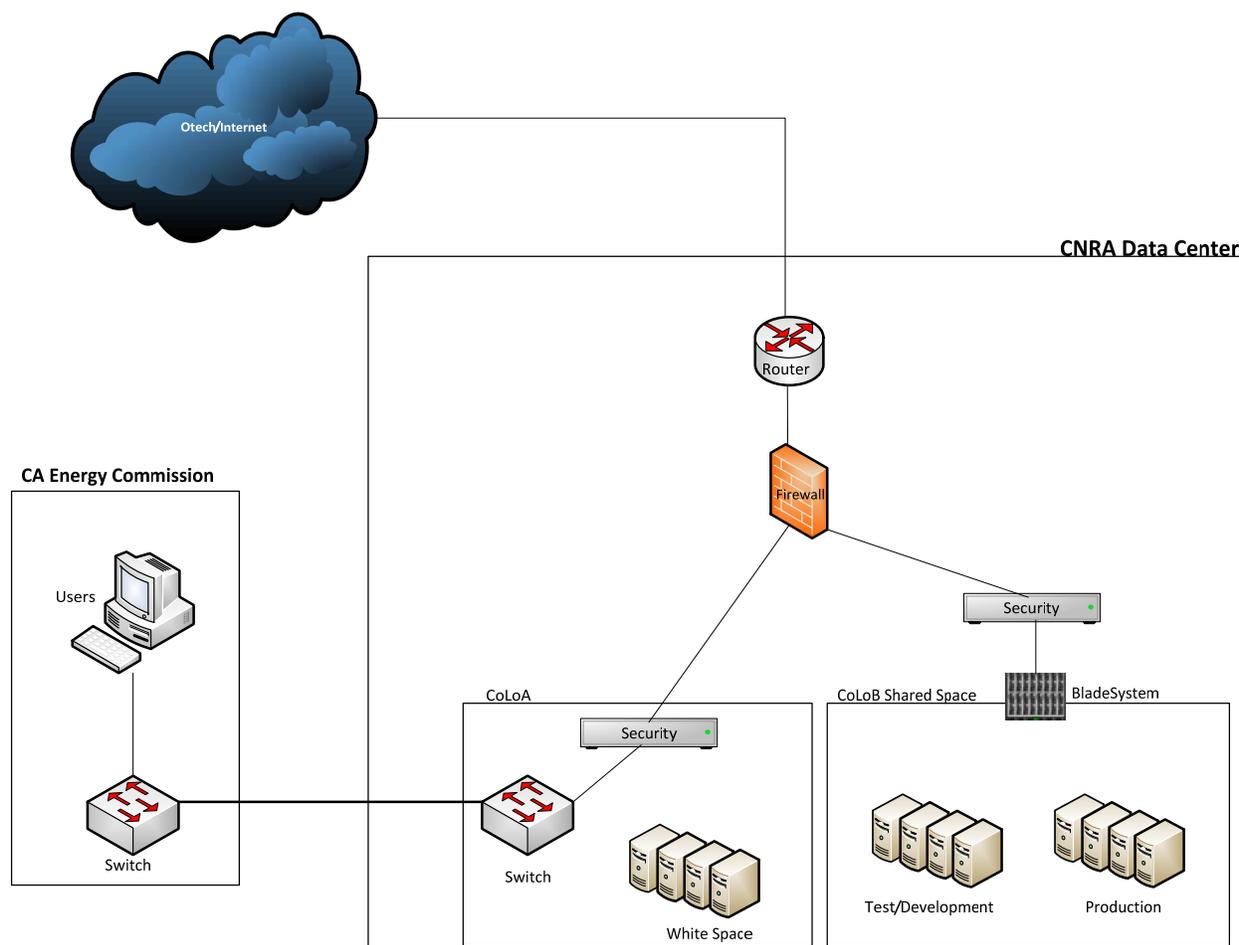


Figure 5-3 Conceptual View of Solution

5.1.1. Proposed Hardware

The California Natural Resources Agency Data Center (CNRADC) hosts the servers and storage devices that support the RPS Database solution. The proposed solution will utilize the BladeSystem housed in the CoLoB Shared space at the CNRADC. The proposed solution will be developed in C# using MS ASP.NET as the platform, MS Internet Information Services as the web/application server, and MS SQL Server as the database management system. The solution will use virtual servers managed by VMWare and use MS Windows Server Datacenter 2008 as the operating system. The CNRADC maintains an inventory of shared physical blade servers in sufficient quantity to support the needs of the RPS Database solution, therefore, no additional hardware purchases are required. The proposed solution will be hosted at the CNRADC, which has a Business Continuity and Disaster Recovery Plan.

The proposed solution utilizes the CNRADC BladeSystem to provide virtual servers for web/application, and DBMS production servers. The environment also uses virtual servers to create isolated environments for test and development. One virtual server with two Central

Processing Units (CPUs), 8 GB of memory and one terabyte of storage is required for the database production server and one identical server is required for test/development. Two virtual servers with two CPU's, 4 GB of memory and 40 GB of storage are required for webserver production and two identical servers are required for test/development.

The proposed solution utilizes the Energy Commission's current investment in desktop configuration, printers, network and communications hardware. The Energy Commission currently has a sufficient number of printers and utilizes them as part of the proposed solution.

Energy Commission IT staff and the development vendor are to maintain access to the servers and environments, with flexibility to make ongoing configuration changes.

The solution further partitions the development environments to create a multi-tiered architecture. The partitioned test and development servers, residing at CNRADC, provide a staging environment for production.

Table 5-1 describes the minimum configuration of hardware for the solution. These represent a guideline for development vendors; exceptions where necessary can be authorized by the Energy Commission Chief Information Officer (CIO).

Table 5-1 Proposed Minimum Hardware Configuration

| Category | Description |
|------------------|--|
| Server Type | <ul style="list-style-type: none"> Virtual servers residing on the BladeSystem |
| Operating System | <ul style="list-style-type: none"> Microsoft Windows Server 2008 R2 |
| Processor | <ul style="list-style-type: none"> One Database Production – Virtual server (2 CPU) One Database Dev/Test – Virtual server (2 CPU) Two Webserver Production – Virtual server (2 CPU) Two Webserver Dev/Test – Virtual server (2 CPU) |
| RAM Memory | <ul style="list-style-type: none"> Database Production – 8GB each Database Dev/Text – 8GB each Webserver Production – 4GB each Webserver Dev/Test – 4GB each |
| Storage | <ul style="list-style-type: none"> One terabyte for the production database server and one terabyte for the dev/test database server 40 GB for the webserver in both the production and dev/test environments |

5.1.2. Proposed Software

The proposed solution results in new software to provide comprehensive electronic processing and certification of RPS eligibility applications from renewable energy generators, assist in the verification of renewable energy procurement claims, and produce verification charts, tables and

reports. This solution will meet the Energy Commission business needs identified in Section 3: Business Case.

5.1.3. Proposed Technical Platform

The Energy Commission expects development vendors to propose a multi-tiered, Web-enabled solution that uses a Web server, application server (Web and application may be combined on one server), and database server, in accordance with Energy Commission standards. The test, development, and production environment is to be located at the data center at the California Natural Resources Agency. The servers adhere to the State’s standards for security, firewall, password authentication, hardware, software, and Web access.

The Energy Commission users access the proposed solution through their existing Energy Commission WAN and LAN network infrastructure. The Energy Commission customers of the proposed solution are able to access the system through the public Internet, but via a secure portal that requires a login authentication.

Table 5-2 identifies the network protocols to be used in the Energy Commission environment.

Table 5-2 Energy Commission Network Protocols

| Type | Description |
|--|--|
| Transmission Control Protocol/Internet Protocol (TCP/IP) | <ul style="list-style-type: none"> Connects the Energy Commission host environment to the Internet. |
| SSL | <ul style="list-style-type: none"> Manages the security of file and message transmissions from the Internet to the RPS Database environment. |
| Hypertext Transfer Protocol over Secure Socket Layer (HTTPS) | <ul style="list-style-type: none"> Transmits individual data messages securely over the Internet through encryption/decryption. Transmits user’s RPS Database User ID and password to gain access to the RPS Database environment. |
| SSH File Transfer Protocol | <ul style="list-style-type: none"> Exchanges files between the Energy Commission and other servers/systems in a secure manner (if needed). |

5.1.4. Development Approach

The Energy Commission has defined and will continue to develop specific business requirements for the RPS Database processes. The selected development vendor is to, in addition to providing a solution that meets the Energy Commission business requirements, comply with the Energy Commission ISO and the State of California Information Security Strategic Plan.

The Energy Commission requires, through its vendor procurement activities, a development approach that builds a new 100 percent custom system and incorporates standard system lifecycle activities, including:

- Analyze
- Design
- Develop
- Test
- Modify as needed
- User Acceptance
- Training and knowledge transfer
- Implementation

The development vendor will be asked to analyze, design, develop and/or modify, test, and implement new software to support:

- End user online access to enter applications to become RPS-eligible renewable energy generators.
- A work flow rules-based environment to process the applications for certification or denial.
- End user online access to enter required annual procurement claim reports.
- A rules-based environment to verify the validity of the renewable energy procurement claims.
- Produce charts, tables and reports for inclusion into required verification reports for outside agencies and LSEs.

The RPS Database development vendor is to be responsible for all software and database configurations required to implement the solution. Potential RPS Database development vendors must submit a detailed proposed development approach and methodology during the procurement phase. The proposed approach and methodology must adhere to standards defined by the PMI's PMBOK and the SIMM-17 CA-PMM guidelines, as well as applicable standards defined by the Institute of Electrical and Electronics Engineers.

5.1.5. Data Migration/Integration Issues

Historical RPS data is to be converted and migrated into the new system. The migration process will convert data from the MS Access databases to the proposed solution's data format. Data and documents maintained in a variety of miscellaneous stand-alone spreadsheets and HyperText Markup Language (HTML) maintained documents may also be migrated. During the design activities of the project, the development vendor will create and maintain a detailed data migration plan.

The major tasks associated with data migration are data cleansing, reconciliation of inconsistent data, repair of incomplete data, the actual migration of the data, and data integration. Each major task is briefly described below:

Data Cleansing

The existing system databases, and spreadsheets contain data that may be redundant, incomplete, formatted inconsistently, or out-of-date. The development vendor uses data cleansing activities to detect and correct any inconsistent data before the data are migrated to the proposed solution. Data cleansing may be automated if business rules for the processes can be accurately defined, if automation is not feasible, data cleanup will be manual and involve Energy Commission staff.

Reconciliation of Inconsistent Data

As the Energy Commission identifies inconsistencies among data across impacted systems, staff is to identify which data are the most accurate and ensure that inaccurate data are not migrated to the proposed solution. The Energy Commission is to establish a process to handle any data exceptions through automation or manual reconciliation.

Repair of Incomplete Data

Energy Commission staff are responsible to review current data to ensure that complete application, certification, generation, and procurement claim data are correctly saved into the databases. It is anticipated that, whenever possible, Energy Commission staff is to correct incomplete data prior to migration to the new system. Energy Commission staff will define procedures to resolve this issue. The development vendor migrates the corrected data to the proposed solution.

Data Migration

The data migration process converts data from various formats (including MS Excel, Access, etc.) to the proposed solution's data format and structures. To enable successful data migration from one DBMS to another, Energy Commission staff assists in developing the requirements of the data migration effort, including identification of which historical data to migrate and the definition of data relationships and data mapping rules. Energy Commission staff will also likely be needed to assist in establishing a process to handle any data exceptions through automation or manual reconciliation.

The development vendor is responsible for managing and conducting the data migration and integration effort. During project design activities, the vendor develops a Data Cleansing and Conversion Plan. At a minimum, the plan must:

- Create an overall data cleanup and conversion schedule.

- Provide sufficient data migration to fulfill business requirements for customer self-service, including applications, eligibility rules, power generation information, and procurement claim data.
- Identify opportunities for automated data conversion (e.g., scripting).
- Identify necessary manual data conversion and responsible parties.
- Define data clean-up tasks and responsible parties.
- Define a validation approach to confirm data accuracy prior to migration.

Data Integration

The development vendor ensures that the proposed solution successfully integrates with specified external systems. Section 5.1.7 describes the systems with which the RPS Database system is to interoperate.

5.1.6. Procurement Approach

This is a new IT project supported by this FSR. There is no previous contracting and/or procurement history for the described work.

The Energy Commission will use a procurement approach to acquire products and services for the RPS Database Project that has been approved by CalTech and is in common use for State of California procurements. The procurement approach for services greater than \$1,500,000 is a Request for Proposal (RFP). The Energy Commission prefers to use a Master Services Agreement (MSA) for software development of the RPS system. MSA contracts are normally limited to a maximum of \$1,500,000, but a waiver of this limit can be requested. The Energy Commission plans to apply for this waiver at the appropriate time.

Table 5-3 presents information on the products and services and the procurement approach.

Table 5-3 Products and Services to Procure

| CONTRACT TABLE | | | | | | | | | | |
|-----------------|-------------------------|-------------------------------------|--|------------------------|----------------------|-------------------------|---|-------------------------------|------------------------------|---|
| Contract Number | Type of Contract | Has the contract been awarded (Y/N) | If so, what is the date of the award? If not, what is the planned award? | Start date of Contract | End date of Contract | Total Value of Contract | Is this an Interagency Acquisition? (Y/N) | Is it performance based (Y/N) | Competitively awarded? (Y/N) | What, if any, alternative financing option(s) are being used? |
| N/A | Primary Solution Vendor | N | 6/1/2015 | 6/19/2015 | 1/2/2017 | \$2,167,500 | N | N | Y | N/A |
| N/A | IPOC | N | N/A | 7/1/2014 | 1/2/2017 | \$97,500 | Y | N | N | N/A |
| N/A | STPD Procurement | N | N/A | 7/1/2014 | 6/19/2015 | \$60,480 | Y | N | N | N/A |

To procure the RPS Database Solution vendor, the Energy Commission will enter into an Interagency Agreement and work closely with a Procurement Analyst from the Statewide Technology Procurement Division (STPD)¹³ to develop an RFP or MSA and related documents that satisfy Energy Commission business needs and the State’s procurement process requirements. The Energy Commission, STPD, and CalTech will review and approve the RFP or MSA. The STPD will publish the RFP or MSA in the State Contracts Register and any other appropriate forums.

If using the RFP approach, the Energy Commission will conduct the RFP using the two-envelope procedure, the first for the administrative and technical requirements and the second for cost.¹⁴ The RFP will incorporate value-effective evaluation factors such as technical expertise, past experience, project management expertise, and proposed approach to the project – including a timeline and customer references. Table 5-4 shows the value of the evaluation factors for scoring purposes.

Table 5-4 Evaluation Factors for RFP

| Evaluation Factor | Value Assigned (% or points) |
|------------------------|------------------------------|
| Technical Requirements | 50 |
| Cost | 50 |

The Energy Commission’s evaluation team will score the proposal by evaluating the technical requirements for responsiveness and publishing the scores at the cost envelope opening. All solicitation processes will encourage small businesses and DVBE-owned businesses. The DGS model contract stipulates mandatory provisions that will be used for the development vendor. As such, the Energy Commission and STPD will ensure that the RFP contains the State’s position with respect to Certified Small Business and DVBE goals.

Contract Terms

The terms of the contract will be fixed price for 18 months of system development and for six months of maintenance and operations (M&O). The development vendor is required to provide knowledge transfer to Energy Commission IT staff during the development and M&O periods. At the end of the six month M&O contract Energy Commission staff will take over the M&O of the solution.

13 Formerly known as Department of General Services Procurement Division.

14 Department of General Services, *State Contracting Manual, Volume 3*, July 2010, <http://www.dgs.ca.gov/pd/Resources/publications/SCM3.aspx>.

RPS Database Solution Development

The RPS Database Solution Development procurement selects a single development vendor responsible for developing, testing, training, and deploying the software needed to meet RPS program needs. The development vendor is to provide all software and assist the Energy Commission procurement of appropriate ongoing licenses required by the solution, if any. The development vendor is also to support and maintain the solution for one year after which ITSB will provide all maintenance services.

Contract Manager

| | |
|---------------------|-------------------------------|
| Name | James Haile |
| Title | Contract Manager |
| Unit | Renewables Portfolio Standard |
| Phone Number | (916) 651-9072 |

Contract Management Approach

The Energy Commission monitors the performance of all contracts to ensure compliance with STPD on all contract provisions. James Haile, a certified Contract Manager within the Renewable Energy Division of the Energy Commission, will oversee this task for the Energy Commission's RPS Database Modernization Project. James Haile will serve as the RPS Business Project Manager in consultation with the RPS Unit Supervisor.

James Haile will be the point of contact between the IT Project Manager and the Independent Project Oversight Consultant (IPOC) for issue resolutions, contract changes and amendments, as well as contract closeout. The Energy Commission's IT Procurement Officer will serve as the advisor to James Haile and the Project Team on all contract terms and conditions and to the IPOC for issue resolution. The IT Procurement Officer will contact the Procurement Analyst from STPD for guidance on issue resolution. Issues that cannot be resolved will be turned over to STPD.

Contract Protection

The procurements will comply with all IT contract provisions and all management memorandums applicable to the procurement of IT goods and services. Additional terms and conditions will be incorporated in the RFP or MSA in the best interest of the State of California, California Energy Commission.

The Energy Commission will base payments on the criteria of acceptance of deliverables. The RPS Business Project Manager, IT Project Manager, RPS Supervisor, and RPS Project Executive Sponsor must review and accept the completed deliverables from each phase of the project's system development. In this way, the Energy Commission's risk is reduced, as each phase of the project is not reliant on the next, thereby sustaining on its own merit in case the IT Contractor defaults on the contract. All phases must be approved by the above parties prior to

the IT Contractor receiving payment for those deliverables minus a holdback amount of 20 percent.¹⁵ Using a certification and sign-off process, plus implementing the holdback feature throughout the life of the project, will assure that project deliverables are in-line with functional requirements and provide a better opportunity to manage risks.

IPOC Services

The Department of Technology will provide a half-time Data Processing Manager (DPM) II staff person for IPOC services. The DPM II is responsible for overseeing the RPS Database project to make sure the project is managed according to industry and the State's best practices.

Monthly Reporting

The IPOC will track, control, and provide status regarding problems, outstanding issues, resolutions, and any potential and/or actual contractual conditions to control agencies. The monthly report will:

- Provide cost and schedule status for each milestone.
- Isolate significant variances and identify the reasons they occurred.
- Identify major accomplishments for the reporting period and project accomplishments for the next reporting period.
- Describe resource, schedule, and scope impacts on other project elements.
- Indicate impact on project baselines (what revisions are needed, when, why).
- Describe specific corrective actions taken and planned.
- Assign responsibility for corrective actions and give expected dates for improvement.
- Reference outcomes of corrective action plans identified in previous reports.

Market Research

The business needs of the Energy Commission RPS program are very specific and it is difficult to find existing solutions to meet those needs. Research was accomplished by reviewing licensing/permitting solutions in use by the State of California, Commercial/Modifiable Off the Shelf (COTS/MOTS) solutions, and RPS solutions in use by other states with RPS programs. Another potential solution is WREGIS, an independent renewable energy tracking system for the Western Interconnection region covered by the WECC which includes California. WREGIS

¹⁵ The California Public Contract Code 12112 states: Any contract for information technology goods or services, to be manufactured or performed by the contractor especially for the state and not suitable for sale to others in the ordinary course of the contractor's business may provide, on the terms and conditions that the department deems necessary to protect the state's interests, for progress payments for work performed and costs incurred at the contractor's shop or plant, provided that not less than 10 percent of the contract price is required to be withheld until final delivery and acceptance of the goods or services, and provided further, that the contractor is required to submit a faithful performance bond, acceptable to the department, in a sum not less than one-half of the total amount payable under the contract securing the faithful performance of the contract by the contractor.

is used to track renewable energy generation and create RECs for units registered in the system.

There are California state agencies and departments that manage permit and license application efforts and provide licenses and certificates for various professions and facilities within California. Some of these agencies and departments (e.g., Air Resources Board, Board of Equalization, Department of Public Health) use software to capture applications while many use paper based application forms. Of those that use software for permitting and licensing none had similar business needs required by the Energy Commission. No systems were found that support application business rule work flow processing as well as procurement claim entry and verification processing.

Research identified the following COTS/MOTS software products:

- **Vendor 1** uses a COTS product which provides a web-based solution to manage regulatory code enforcement, land management and permitting, licensing, billing and mobile field automation. The solution is much more comprehensive than the Energy Commission requires, and while the system is configurable for specific government entities, it is not modifiable to meet the business needs and functional requirements detailed in Section 3: Business Case.
- **Vendor 2** uses a configurable web-enabled COTS product which provides the ability to custom tailor the environment for look-and-feel, workflow, rules, fees, and instructions. A Vendor 2 user can also custom tailor their own Vendor 2 experience. However, the product is not modifiable to the extent required by the Energy Commission so it cannot meet the business needs and functional requirements detailed in Section 3: Business Case.
- **Vendor 3** uses a “Work Management Framework” with pre-configured best practice modules. The solution is modifiable and configurable without changing source code. The best practice modules are land management application and permits, business license applications, and enforcement workflows. The solution is very workflow driven which the Energy Commission needs to process eligibility applications and procurement claims. The solution is modifiable and is practical for the business needs of the Energy Commission.

There are a number of states that have RPS programs in place. All RPS programs publish MS Office Excel or Word application forms on their web sites used by renewable energy generators to apply for eligibility and additional forms for LSEs to submit procurement claims to their respective RPS programs. Some states upload this data into some type of data store once it is received by the applicants through email. No solutions were found that provide the ability for facilities to enter their applications, process application through certification or denial, LSEs to enter procurement claim information, and process claims for verification. Connecticut provides a

web-enabled system limited to the entry of renewable energy applications. Once entered into the system the applications are processed manually.

WREGIS was the final system reviewed in the market research. WREGIS issues one WREGIS Certificate (also known as a REC) for each MWh of renewable energy generated by registered generation facilities. WREGIS users have private accounts similar to bank accounts where certificates are deposited upon creation. Once a certificate is created it can be transferred, retired, or exported to a compatible tracking system according to the needs of the certificate owner.

The Energy Commission is requesting to contract for vendor services to develop a new RPS database certification and verification solution.

Government Code (GC) Section 19130 Justification for Personal Services

This request complies with GC Section 19130(b)(10) in that the development services (specifically, the in-depth knowledge and experience with the specific software) are needed only during the project duration and are urgent and temporary in nature. The delay incumbent in the implementation of these positions under civil service would frustrate their very purpose on the project. The request also complies with GC Section 19130(b)(3) in that the services contracted are of such a highly specialized or technical nature that the necessary expert knowledge, experience, and ability are not readily available through the civil service system.

5.1.7. Technical Interfaces

The Energy Commission requires the solution to accept data from:

- Energy Information Administration
 - Data includes: EIAID, Report Year, Facility Name, Operator Name, State, Net Generation in MWh
 - Format: Excel
 - Interface: upload to RPS database
- Electricity Analysis Office
 - Data Includes: EAO ID, Report Year, Facility Name, Net Generation MWh
 - Format: Excel
 - Interface: upload to RPS database
- Power Source Disclosure Program – (Specific Purchases by retail seller)
 - Data includes: Facility Name, Fuel Type, CEC RPS Certification Number, EIA ID Number, CEC Plant ID Number, QF ID Number, Gross kilowatt hour (kWh), kWh Resold or Self-Consumed, Net kWh Procured
 - Format: Excel
 - Interface: upload to RPS database

- WREGIS
 - Data includes: Renewable Energy generation & procurement data and NERC e-Tags
 - Format: Excel
 - Interface: upload to RPS database
- Green-e Voluntary REC program and other states' RPS program data
 - Data includes: Facility Name, Fuel Type, CEC RPS Certification Number, EIA ID Number, QF ID Number, Generation Claimed As Supply in Green-e Energy Certified States (MWh) / Other State Procurement Claim amount (kWh)
 - Format: Excel
 - Interface: upload to RPS database
- Ability to accommodate additional data inputs, as determined necessary and available
 - Data includes: To be determined
 - Format: Excel
 - Interface: upload to RPS database
- Interface to external reporting tools (e.g., Microsoft SQL Server Reporting Services)

5.1.8. **Accessibility**

The proposed solution is to meet the accessibility requirements documented in Government Code 11135 and Section 508. This is a mandatory requirement as listed in Section 3.4 Business Functional Requirements. The selected development vendor will include the appropriate technology in the solution to meet this requirement.

5.1.9. **Testing Plan**

Consistent with best practices, the development vendor, in coordination with the Energy Commission, must develop and manage a comprehensive Testing Plan. The Testing Plan includes a traceability matrix to the functional requirements. At a minimum, the Testing Plan is to address the following areas of testing:

Unit / Integration Testing – Unit testing is verification of the accuracy and completeness of the system's individual software modules, objects, functions, and procedures. Unit testing is performed by the development vendor. Integration testing is the phase in software testing in which individual software modules are combined and tested as a group. It occurs after unit testing. Integration testing takes as its input modules that have been unit tested, groups them in larger aggregates, applies tests defined in an integration test plan to those aggregates, and delivers as its output the integrated system ready for system testing.

Performance / System Testing – Performance testing is verification that the software and hardware operate together in a manner that meets the expected average and peak performance requirements. Performance testing is dependent on scripting as test scripts mimic the expected

production environment. Performance is performed by the development vendor. System testing is verification that the system components work together as designed as well as the new system integrates seamlessly with existing systems and data stores. System testing is performed by the development vendor.

User Acceptance Testing – User acceptance testing is verification that the completed system operates in accordance with the system requirements based on structured testing process. User acceptance testing is coordinated by the development vendor and performed by designed users.

5.1.10. Resource Requirements

The project design, development, testing, implementation, and training phases requires the Energy Commission staff, a vendor, and other state resources. In addition to the development vendor, resources include a half-time DPM II from the California Department of Technology to provide IPOC services and a Procurement Analyst from STPD to assist with the development and review of the RFP. These personnel will participate in the capacities listed below.

Table 5-5 Proposed Solution Resource Requirements

| Energy Commission Resources | Vendor Resources | Other State Resources |
|--|--|--|
| <ul style="list-style-type: none"> • Project Sponsor • Business Project Managers • IT Project Manager • Executive Steering Committee • Technical and Subject Matter Experts • Project Management Office Representative | <ul style="list-style-type: none"> • RPS Database System Development Vendor | <ul style="list-style-type: none"> • Department of Technology DPM II (1/2 time) as IPOC • STPD Procurement Analyst |

Under direction of the Business Project Managers and IT Project Manager, the development vendor performs the majority of the required development and implementation tasks, with oversight from the IPOC. Successful implementation of this project requires Energy Commission staff participation during all phases. Assumptions relating to resource requirements are presented in Section 8 of this FSR.

5.1.11. Training Plan

The implementation of the new system directly impacts the business processes and tools used by Energy Commission staff. The development vendor is responsible for the development and execution of all initial training documentation and efforts. The development vendor’s proposed training approach and methodology is included in the proposals submitted during the procurement phase. At a minimum, the training approach must include user and systems training, classroom training to all Energy Commission users, and train-the-trainer offerings, with

the selected development vendor training key Energy Commission individuals and subsequent training provided by the trained Energy Commission staff. In addition, the development vendor must develop a plan to transfer development and maintenance information to Energy Commission IT staff.

The selected development vendor, in coordination with the Energy Commission, must develop a detailed Training Plan during the design phase of the project. At a minimum, the Training Plan must include the following information:

- Types of training (e.g., technical - including solution development and system maintenance, and business)
- Topics to be covered
- Training channel/media (e.g., classroom, Web-based)
- Frequency and duration of training
- Target participants/audiences
- Location of training
- Development of training materials
- Responsible parties for each training activity

The Training Plan must also address any training necessary for other external parties – for example, how to submit an eligibility application and/or procurement claim. This training could be fulfilled by online help and/or tutorials, as appropriate to the task.

5.1.12. Ongoing Maintenance and Operation

Hardware Maintenance

The CNRADC is to host and support the hardware and VMWare environment for all the test, development, and production virtual servers and WAN and LAN network infrastructure, including any required maintenance and infrastructure upgrades. The Energy Commission IT staff support all applications software installed on the virtual servers and supports the configuration of the operating system, IIS, SQL Server, and tools required by the application software. Certain hardware and software components of the solution may include maintenance contracts with the appropriate vendor(s). An agreement between the Energy Commission and CNRADC clearly defines expectations and responsibilities.

Software Maintenance

Under a software maintenance and support contract, the development vendor provides software maintenance for six months following the implementation date of the final solution. Upon conclusion of the maintenance and support agreement, the Energy Commission may decide to extend the agreement or to assume responsibility for any maintenance tasks. During the vendor maintenance period, Energy Commission Program staff are responsible for:

- Quality assurance
- Participation in knowledge transfer sessions and code reviews
- Testing assistance
- Deployments
- Maintenance of user security
- Development and maintenance of standard and ad hoc reports
- Level one help desk support

Before the end of the contracted maintenance period, and prior to the Energy Commission deciding to assume responsibility for the application maintenance and support, the vendor must provide all system documentation and provide training for a smooth transition to Energy Commission IT staff. An agreement between the development vendor and the Energy Commission clearly defines expectations and responsibilities.

5.1.13. Information Security

The current system has limited security management capabilities.

The proposed solution's information security environment conforms with the CNRADC, Energy Commission, and State of California security policies and standards, including, but not limited to SAM Section 5100 and Chapter 5300. The solution implements security components at a system-wide and user-level.

The Energy Commission is to define requirements for secured access to proposed solution stored data and for the protection of confidential data. Energy Commission staff requires defined security access roles to align with their data access needs. Energy Commission staff and the development vendor are to review State and Energy Commission privacy and confidentiality guidelines to determine security role permissions to create, update, and view this data.

System-wide security elements include:

- Compliance with www.ca.gov portal standards for State of California-branded websites.
- SSL encryption of data transactions.
- Limited role-based key card access by authorized staff to server and network equipment at CNRADC and the Energy Commission.
- Logical access to Energy Commission information controlled by system and application-level security utilizing group policy objects for security administration.
- Data ownership group policy objects to control authorized user access to specific data elements on a need-to-know basis only and prevent unauthorized users from creating, reading, updating, or deleting sensitive Energy Commission data.
- Hyper Text Transfer Protocol (Secure) (HTTPS) to control access to a secure Web server.

- Implement an “n-tier” architecture to provide secure zones for each tier of the application including the database, application, and presentation layers.
- Secure protocols to control communication between each of the layers.

Where applicable, security limits access based on an authorized User ID and password, as well as security roles. At a minimum, the proposed solution implements the following security control access features:

- Forced log-off of inactive users.
- Termination of a user’s session after unsuccessful logon attempts.
- Locking for a specified amount of time of a user’s master record after repeated failed logon attempts.
- Audit log of changes to records once they have been submitted and accepted by the system.
- Minimum password lengths.
- Prohibited use of certain passwords, such as using the same character string for user log on and password.
- Unique Energy Commission issued user name and strong password for secure user authentication in a role-based security model.

The California Technology Agency Questionnaire for Information Security and Privacy Components in Feasibility Study Reports and Project-Related Documents is located in Appendix D.

5.1.14. Confidentiality

For all confidential data obtained and retained in the new RPS Database, system security based on roles ensures that only authorized Energy Commission staff have access to this information. For all other Energy Commission staff, this information is either not available (i.e., access to the screen containing the data will not be made accessible) or the data is masked (i.e., “grayed out”). The solution is to meet industry standards and State security and privacy regulations.

For data requiring safeguards, the Energy Commission uses SSL 128-bit encryption and server validation via registered server certificates retained by the Energy Commission (e.g., VeriSign certificates). Sensitive confidential data will be encrypted.

5.1.15. Impact on End Users

End users for the proposed solution include staff from the Energy Commission, CPUC, and ARB, as well as customers and the general public. The proposed solution will have a significant and positive impact on end users.

The current Energy Commission RPS eligibility and verification system is problematic. Among the many challenges:

- Systems are built on outdated technology and are not designed to meet the current and future business requirements.
- Systems are not flexible or scalable enough to support Energy Commission abilities to adequately address some regulatory requirements in a timely manner.
- Systems do not provide staff with the tools to efficiently process application and verification workload.
- The RPS system is at risk of catastrophic failure due to its technical platform and architecture.

The proposed solution technologies alleviate these operational challenges and obstacles within the Energy Commission. The solution significantly enhances the manner in which staff perform work functions through the automation of many current manual processes and the elimination of multiple stand-alone worksheets and databases. The proposed solution provides a central data repository and workflow system to improve the Energy Commission's eligibility application, annual procurement claim reporting, and claim verification processes. In addition, the new system enables Energy Commission staff expanded use of the Internet to facilitate business with customers and external stakeholders.

The Energy Commission envisions that the new system is to change current internal processes to:

- Eliminate or reduce manual, paper-based processes.
- Reduce process delays and the need to refer to paper files by providing a central data repository.
- Reduce the volume of paper received, distributed, and processed by allowing customers to submit applications and procurement claims electronically via a secure Web site.
- Allow customers to submit application changes electronically via a secure Web site, reducing the need for manual changes.
- Provide customers on-line customer access to their application and procurement claim information via a secure Web site.
- Allow more effective management of work flow and work processes required to be performed and staff assignments.
- Enable the development and publication of standard and ad hoc reports.
- Eliminate duplicate data entry and redundant data by eliminating stand-alone spreadsheets and databases.
- Provide the general public with access to non-confidential application and procurement data via the Energy Commission Web site.
- Allow the submission of annual reporting information via a secure Web site.

5.1.16. Impact on Existing System

As stated above, the proposed solution is to ultimately eliminate use of the current system after historical data has been converted and loaded into the new system. The Energy Commission is to plan the decommissioning of the current system. The current system is to continue operations until Energy Commission management is confident with and ready to exclusively access the proposed system. Energy Commission Program and IT staff continue to support the current system until decommissioning.

5.1.17. Consistency with Overall Strategies

Refer to Section 4: Baseline, Table 4.3 State Level Policies / Strategic Alignment.

5.1.18. Impact on Current Infrastructure

The proposed solution has no impact on the current infrastructure. Once the proposed solution is implemented the current solution will be decommissioned. The data stored in the current solution MS Access databases will have been converted and migrated to the proposed system allowing the legacy MS Access databases to be stored off-line and storage space freed up on the current infrastructure.

5.1.19. Impact on Data Centers

In accordance with current State of California strategy, the test, development, and production environments of the proposed solution are to reside at the CNRADC.

The proposed solution is to comply with the hardware, software, network, and security standards defined by the Energy Commission ITSB. The CNRADC has the necessary infrastructure and support required to provide comprehensive 24x7 services with no additional technology procurements or personnel. In addition, by housing the new system test, development, and production environments at CNRADC and by providing a defined maintenance period for development vendor support, their core competencies help to ensure the Energy Commission's successful implementation and ongoing support of the system.

CNRADC services to the Energy Commission include:

- Providing space for servers, routers and other telecommunications equipment
- Performance monitoring and alerting
- Secure network connectivity
- Environmentally controlled and secure facility
- Reliable power supply with full uninterruptible power supply (UPS) and generator backup
- System backup, recovery, and off-site storage
- Security systems, including virus protection

An agreement between the Energy Commission and CNRADC will be used for clearly defining expectations and responsibilities.

5.1.20. **System Hosting/Data Center Consolidation**

The proposed solution environments, including test, development, and production, will reside at the CNRADC and comply with existing standards and defined services offered by the data center.

5.1.21. **Backup and Disaster Recovery**

The new system is to adhere to the backup and operational recovery requirements defined by the Energy Commission's Disaster Recovery Plan.

5.1.22. **Public Access**

The proposed solution is designed to improve public access to information. With the proposed solution, the public is able to review non-confidential eligibility and procurement data through various reporting functions on the Energy Commission website. Data is to include the facility name, facility city and state, location, commercial operation date, nameplate capacity, technology, CEC RPS ID, type of certificate, eligibility date, applicant name, applicant company name, phone number and, eligibility status. No confidential information is available for public access.

Authenticated and authorized Energy Commission customers are able to review their application and procurement claim information through a secure portal via the Internet. In addition, authenticated and authorized customers are able to submit applications and procurement claims through a secure Web portal.

5.2. **Rationale for Selection**

Five potential solutions were evaluated for the Energy Commission RPS database project. These were:

- Develop a custom software solution.
- Select and implement a COTS or MOTS software product.
- Acquire and modify a database system used by another state's RPS.
- Use WREGIS as a base system.
- Modify existing system using in-house resources.

The proposed solution – to develop a custom software solution – satisfies all of the objectives and functional requirements set forth in this FSR. The solution offers the greatest value to the Energy Commission with the least risk. The proposed solution was selected for the following reasons:

- Aligns with the State's and the Energy Commission's strategic directions.
- Greater level of service provided by the Energy Commission to its customers.
- Provides customers secure online access to enter required eligibility applications and procurement claim data.
- Decreases the amount of time to certify applicant eligibility and the time to produce verification reports.
- Improved internal efficiencies of Energy Commission operations.
- Ability for the Energy Commission to better meet regulatory and other requirements.
- Enables future scalability.
- Improves data quality; eliminates duplicate data entry and reduces the amount of paper documents (receipt, processing, storage, retrieval).
- Reduces system processing time.
- Offers customers online access to their data via the Internet and public access to non-confidential eligibility and procurement data via the Internet.
- Reduces risk due to use of outdated technologies.

5.3. Other Alternative Solutions Considered

The next section provides information on the other alternatives considered, but not selected.

5.3.1. **Alternative Solution #1: Select and Implement a COTS/MOTS Software Product**

This alternative would implement a Web-based, commercially available software product with a centralized database that provides a workflow engine for eligibility application and energy procurement claim processing.

This alternative solution supports some of the objectives and business functional requirements for workflow as documented in Section 3: Business Case.

Advantages

- Provides a workflow engine to address the workflow functional requirements identified in FSR Section 3: Business Case.
- Enables future scalability around the core workflow engine.
- Employs best practices already incorporated in the software through other customers with similar missions.
- Aligns with State and Energy Commission strategic directions to provide more on-line services.
- Organization acquires an existing workflow system with proven capabilities; reduces project risk because the work flow engine has previously been successfully implemented.

- Allows the Energy Commission to build upon existing off-the-shelf packaged interfaces to third-party adjunct software (e.g. report writer).
- Vendor can provide implementation services.
- Vendor support of system with on-going upgrades and enhancements.
- Organization acquires an existing work flow system with proven capabilities.

Disadvantages

- Commercially available software package does not meet requirements (other than workflow) for the organization, requiring substantial customization.
- Commercial software is not always as flexible as custom software.
- Reliance on outside vendor for service and support.
- Vendor does not provide code to the Energy Commission.
- Vendor does not use Energy Commission ITSB supported platforms.
- Increased risk of:
 - Lengthy change cycle – vendor may wait for each new release prior to allowing changes to the product.

Conclusion

This alternative, implementing a COTS/MOTS software solution, is viable only if products are available in the marketplace that provide the functionality required by the Energy Commission. Market research identified a possible product that did meet the workflow requirements off-the-shelf (see market research reference in Sub-section 5.1.6 Procurement Approach). This COTS/MOTS package would therefore require modification or use of add-on software products to meet the Energy Commission business needs. This alternative is not viable because it does not provide the source code to the Energy Commission and is not built with the Energy Commission ITSB supported platform.

5.3.2. **Alternative Solution #2: Acquire and Modify Another State's RPS Database System**

This alternative would acquire and modify a web-based, software product with a centralized database from another state with a similar RPS program. If available this software should satisfy identified business needs and functional requirements to provide electronic transaction processing (i.e., eligibility application, procurement claim verification) to the Energy Commission customers and to support the implementation of improved business processes.

Connecticut is the only state with a system that provides the ability for on-line entry of generator RPS eligibility applications. However, after the applications are entered by the generators into the database, the applications are processed manually by staff from the Connecticut Public Utilities Regulatory Authority. There is no capability in the system to manage workflow or to

enter and process procurement information. In addition, the Connecticut system is built on a platform that is not supported by the Energy Commission ITSB.

This alternative does not meet the business needs and functional requirements of the Energy Commission as documented in Section 3: Business Case.

Advantages

There are no advantages as no system exists.

Disadvantages

There are no disadvantages as no system exists.

Conclusion

This alternative is not viable. No other state has developed a system that meets the business needs and functional requirements of the Energy Commission.

5.3.3. Alternative Solution #3: Use WREGIS as a Base System

This alternative would acquire and use WREGIS as a base system. All renewable energy generators in the WECC (which includes California, 13 other western states, two Canadian provinces, and portions of Baja Mexico) are required to join and register with WREGIS and enter the amount of renewable energy generated. WREGIS issues certificates based on verifiable data. It provides participants with various reports on renewable generation totals. The Energy Commission uses data from WREGIS, among other sources, to verify procurement claims submitted by LSEs. WREGIS does not certify renewable energy generators nor does it verify LSE procurement claims. The WREGIS data model would need to be heavily modified, a work flow system built into the solution, and the system would have to be extensively modified to satisfy the Energy Commission business needs and functional requirements.

Advantages

- Utilize a proven base system.
- WREGIS collects much of the same generator information required by the Energy Commission.

Disadvantages

- WREGIS is owned and administered by the WECC.
- WREGIS is an independent system and not available to the Energy Commission.

Conclusion

The WREGIS system is not available for Energy Commission use, which makes this alternative not viable.

5.3.4. **Alternative Solution #4: Modify Existing System Using In-House Resources**

This alternative would use existing Energy Commission staff from ITSB to design, develop, and deploy a custom solution. Most likely, the Energy Commission would have to hire contractors to supplement existing ITSB staff during implementation. ITSB staff would serve as project managers, QA resources, and would perform training and organizational change management services to assist with transitioning program staff to the new system. Energy Commission ITSB staff would maintain the database on an on-going basis.

Advantages

- The existing ITSB staff has knowledge of the Energy Commission's business processes and programs.
- This alternative is the least expensive, although the actual cost could fluctuate as ITSB would likely have to hire contractors to assist with parts of the project.

Disadvantages

- There is not sufficient ITSB staff to implement this large-scale project, nor are there sufficient programmers on staff .
- This alternative would likely have the longest duration.
- There is a higher risk of project delay in the event that ITSB staff become unavailable and the time it takes to fill staff vacancies.

Conclusion

This alternative is not recommended given the already limited ITSB programming staff available for in-house projects. The Energy Commission has indicated it is not able to acquire additional permanent or limited-term full-time staff ITSB staff to be dedicated solely to this project. Any ITSB resources would be shared with competing projects within the Energy Commission. Given this, the RPS database implementation would run into time constraints and delays. In addition, if the project runs into challenges or increases in complexity, the cost of the system may significantly increase or the project may fail.

6. Project Management Plan

The RPS Unit of the Renewable Energy Office recognizes that a structured approach to managing the project is critical to ensuring its success. To this end, the RPS Unit utilizes the Project Management Plan outlined in this FSR section to manage IT development projects. This plan complies with CalTech’s CA-PMM.

The CA-PMM, as outlined in the SIMM 17, provides the framework for the RPS project management methodology. The RPS methodology is a blend of business and IT project management methodologies and best practices. It is consistent with PMI’s PMBOK best practices. The project methodology incorporates the concepts of project lifecycle and project management processes. Each RPS project manager uses MS Project to develop a detailed project plan and schedule, and provides written status reports on a regular basis.

The remainder of this section is organized as follows:

- 6.1 Project Organization
- 6.2 Project Plan
- 6.3 Authorization Required

6.1. Project Organization

The following table contains the locations for the required organization charts.

Table 6-1 Organization Chart Location

| Organization Chart | FSR Location |
|--|---|
| Renewable Energy Office – Renewables Portfolio Standard Unit | Section 3.1 Business Area Identification (Figure 3-1) |
| Information Technology Services Branch | Appendix B |
| California Energy Commission | Appendix C |
| Project Team | Section 6.1 |

Figure 6-1 provides the organization of the project team.

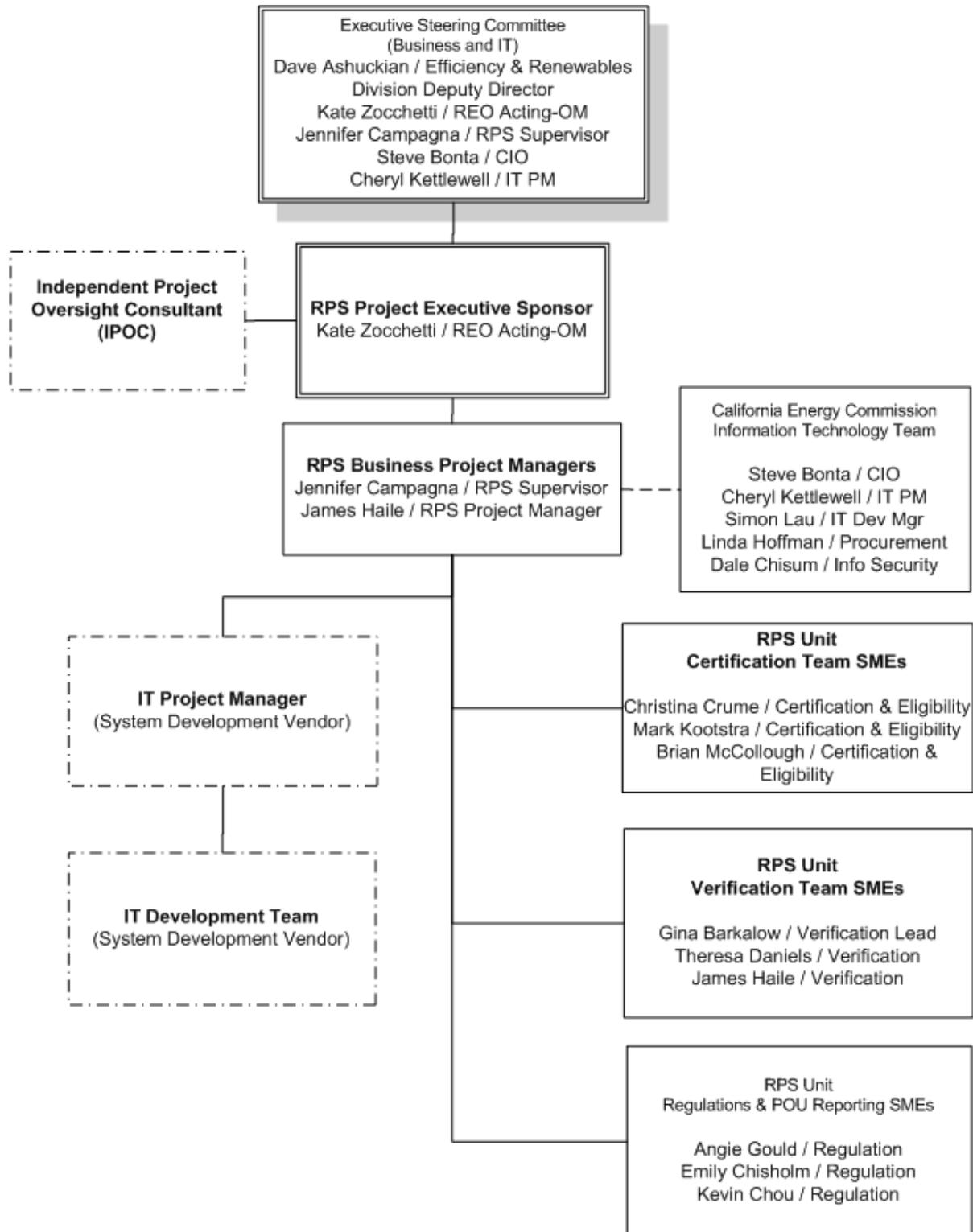


Figure 6-1 Project Team Organization

6.2. Project Plan

Project planning defines:

- Project goals and objectives
- The activities required to accomplish them
- How to perform these activities
- When these activities must be complete
- The resources required to accomplish them

The project plan defines each major task, estimates the time and resources required to accomplish it, and provides a framework for management review and control. Project planning activities include defining the project scope, assumptions, staging/phasing, team roles and responsibilities, and schedule. The following sections briefly define and discuss each of these components.

6.2.1. Project Phases

In order to reduce project risk and stay within resource constraints, the RPS Unit plans to implement the project in a phased approach, as follows.

Phase 1.0 Procurement Development and Vendor Selection

In this phase, the project team gathers and documents detailed requirements and prepares a systems development vendor RFP in coordination with the Procurement Analyst from STPD. The RFP is made available to potential system vendors.

Based on the SIMM Section 45 Information Technology Project Oversight Framework, the CA-PMM Reference Manual (SIMM Section 17A) and SIMM Section 17D.1, Complexity Assessment is used to determine the level of project oversight needed on the project, as well as providing guidelines to the qualifications for the Project Manager.

The Complexity Assessment for the RPS Database project places it into Complexity Zone 2 or Medium Complexity (Technical) as shown in Table 6-2. This indicates the project requires departmental and agency level oversight based on the framework for graduated project oversight because the risk, sensitivity and/or criticality of the project is categorized as medium.

CalTech will provide direction to the department as to how project oversight will be conducted based upon its review of the Complexity Assessment, and the decision will be communicated to the department prior to project approval and included in the project approval letter.

Table 6-2 Complexity Assessment

| Factor | Rating |
|-------------------------|------------------------|
| 1) Business Complexity | 1.7 |
| 2) Technical Complexity | 1.8 |
| Complexity Zone | 2 (Medium (Technical)) |

The “IT Project Manager Skill Set Guidelines”, as shown in Table 6-3, indicate a level 2 IT Project Manager will need to be included as part of the system development. This will require a minimum 3 – 5 years working as a key team member on a medium or large IT project or as a Project Manager on other small or medium IT projects; technical experience commensurate with the proposed technology, professional knowledge, and a strong working knowledge of the CA-PMM, departments methodology, Software Development Life Cycle. The IT Project Manager should also be familiar with California budgeting, procurement and contracting processes.

Table 6-3 Project Manager Skill Set Guidelines

| Factor | Rating |
|---------------|------------------------|
| 1) Complexity | 2 (Medium (Technical)) |
| 2) Duration | > 1 Year, < 3 years |
| 3) Budget | > 1M, < 5M |
| 4) Resources | 11 – 20 |
| Level | 2 |

The RPS Unit answers vendor questions, provides clarifications, holds a bidder’s conference and may have confidential discussions with bidders. The RPS Unit evaluates vendor responses to the RFP working closely with the STPD during all phases of the procurement effort to get a development contract awarded to a vendor.

Phase 2.0 System Development

Following a standard software development life cycle methodology, this phase includes project initiation and planning, requirements gathering and design, development, conversion, testing, and training.

Initiation and Planning

Project initiation activities formally authorize the project. Activities include preparing a project charter, developing an updated project management plan, and coordinating project team and subject matter experts’ participation. The project leadership conducts a kick-off meeting with the project team to mark the official start of the project.

Requirements Analysis

The project team reviews the business requirements and defines what the solution must do to meet the functional requirements. Some of the major activities are to analyze the current system and functions; analyze business processes; identify the gaps in processing and functionality; conduct a logical data analysis; develop a data model and, define and document the findings into detailed business requirements. Problems, opportunities, and functional requirements are broken down into detailed business requirements.

Design and Development

Working closely with the project team, the contractor develops the software architecture for the system and the business and technical design. The software architecture provides the foundation, framework and the constraints for the system design based on the infrastructure within which the system must be built and the architecturally significant functional requirements. In business and technical design, the project team uses project functional and technical requirements to develop specifications that guide the building of the finished product during the development and unit testing phase.

During development the contractor creates the development environment, builds the solution, and performs unit testing of components in their respective systems to verify they have performed work according to specifications.

Data Conversion

The existing Certification system and Verification system data will be cleansed and migrated to the new system.

Testing

The contractor is primarily responsible for developing a testing plan and conducting system testing to verify that all components of the solution work according to the business and technical design. Any problems the contractor identifies are prioritized and corrected, and then re-tested. This process repeats until all problems are resolved. The contractor also conducts testing during this phase to ensure that changes made during problem resolution do not negatively affect other areas of the system.

Concurrent with system testing, the contractor conducts performance tests to ensure that there is sufficient bandwidth to meet the system's demand. Performance testing verifies that the expected number of concurrent users or simultaneous inquiries do not cause system failure or delayed response. This testing includes functions being performed by external users via web access as well as internal users.

After testing, but prior to deployment, the project team's subject matter experts and a select group of others conduct acceptance testing to verify the solution works according to the business requirements, including appropriate response times. This testing includes functions

being performed by external users via web access as well as internal users. When acceptance testing is successfully complete, the project team signs-off on the new solution as ready for production.

Phase 3.0 Deployment Activities

Deployment activities include training and rollout of the developed system to production.

Training

The contractor is responsible for developing a training plan and training content to train both internal Energy Commission users and external energy generating facility and load serving entity users. Before implementation, all users are trained in how to use any new equipment and software. The project team works with the contractor to develop a detailed plan including a schedule for delivering training to designated users as they prepare to implement the new system. The contractor prepares user training documents and materials. The project team conducts communications and outreach to other stakeholders both external to and within the Energy Commission, and prepares policies and procedures for the new system, as needed.

Deployment

The solution is rolled out to production including the use of new or modified business processes, policies and procedures. This includes data cleansing and migration into the new system. The system will provide for entry of certification applications and supporting documents by energy generating facility users, entry of procurement claims and supporting documents by load serving entity users and public access with the appropriate security and role based permissions.

Phase 4.0 Closeout and Post Implementation Evaluation Review

The Closeout and Post Implementation Evaluation and Review signals the end of the project. There is a final sign-off of the new system and formal closure of the prior contract. Six months after formal sign-off, the project team evaluates project performance in comparison to original project objectives and plans and documents findings within a Post Implementation Evaluation Report (PIER). The PIER includes any lessons learned that may benefit future projects.

For additional information on each of these phases, please see Table 6-3 RPS Database Project Schedule.

Project Deliverables

Table 6-4 identifies and lists the deliverables by project phase that result from the accomplishment of the tasks listed in the Project Schedule.

Table 6-4 RPS Project Deliverables / Milestones

| Phase in the Project Schedule | Deliverable/Milestone |
|--|--|
| Phase 1.0 Procurement Development and Vendor Selection | <ul style="list-style-type: none"> • Development Vendor RFP completed and approved • Development Vendor RFP released • Development Vendor selected |
| Phase 2.0 System Development | <ul style="list-style-type: none"> • Project Kick-Off meeting held and documented • Project, Issue, and Risk Management Plans • Communications Management Plan • Business Process Models • Functional Requirements Specification • Software Architecture Document • Detailed Design Document • Development, Test & Phase environments installed • Application developed • Data Cleansing & Conversion Plan / Data converted • Test Plans, Test Cases and Scripts • System Test results • Performance Test results • User Acceptance Test results |
| Phase 3.0 Deployment Activities | <ul style="list-style-type: none"> • Training Plan, curriculum and materials • Training Materials • Training completed • RPS Database system deployed |
| Phase 4.0 Transition and Post Implementation Review | <ul style="list-style-type: none"> • MS Access Certification and Verification systems retired • PIER completed • Final system sign-off |

6.2.2. Project Schedule

The proposed project schedule is outlined below. The draft schedule includes procurement planning and development of this FSR and development of an RFP and procurement of a development vendor. It also includes the analysis, design and development of the new RPS Database system, training of users, and deployment of the system.

Table 6-5 RPS Database Project Schedule

| FSR PMP Section Project Schedule_Final | | | | | |
|--|---|---|-----------------|--------------------|---------------------|
| ID |  | Task Name | Duration | Start | Finish |
| 1 | | RPS Database Project | 916 days | Tue 7/1/14 | Tue 1/2/18 |
| 2 | | Phase 1.0 Procurement Development and Vendor Selection | 254 days | Tue 7/1/14 | Fri 6/19/15 |
| 3 | | Develop RFP and Contract Award | 254 days | Tue 7/1/14 | Fri 6/19/15 |
| 4 |  | Plan and Develop Systems Development Vendor RFP | 80 days | Tue 7/1/14 | Mon 10/20/14 |
| 5 | | Dept. of Technology RFP Review and Approval | 20 days | Tue 10/21/14 | Mon 11/17/14 |
| 6 | | Release RFP | 1 day | Tue 11/18/14 | Tue 11/18/14 |
| 7 | | Last Day to Submit Intent to Bid | 10 days | Wed 11/19/14 | Tue 12/2/14 |
| 8 | | Last Day to Submit Written Questions for Clarification of RFP | 5 days | Wed 12/3/14 | Tue 12/9/14 |
| 9 | | State's Response to Submitted Bidder Questions | 10 days | Wed 12/10/14 | Tue 12/23/14 |
| 10 | | Last Day to Request Changes in Requirements | 10 days | Wed 12/24/14 | Tue 1/6/15 |
| 11 | | State's Response to Requests for Change in the Requirements | 7 days | Wed 1/7/15 | Thu 1/15/15 |
| 12 | | Last Day to Protest the RFP Requirements | 5 days | Fri 1/16/15 | Thu 1/22/15 |
| 13 | | Last Day to Submit Final Proposals | 5 days | Fri 1/23/15 | Thu 1/29/15 |
| 14 | | State Review of Final Proposals | 40 days | Fri 1/30/15 | Thu 3/26/15 |
| 15 | | Public Cost Opening | 1 day | Fri 3/27/15 | Fri 3/27/15 |
| 16 |  | Notification of Intent to Award | 2 days | Mon 3/30/15 | Tue 3/31/15 |
| 17 | | Last Day to Protest Selection | 2 days | Wed 4/1/15 | Thu 4/2/15 |
| 18 | | Materials to IT Procurement and Prep for Business Meeting | 40 days | Fri 4/3/15 | Thu 5/28/15 |
| 19 |  | California Energy Commission Business Meeting | 1 day | Fri 5/29/15 | Fri 5/29/15 |
| 20 |  | Contract Award and Execution | 15 days | Mon 6/1/15 | Fri 6/19/15 |
| 21 | | Phase 2.0 System Development | 379 days | Mon 6/22/15 | Thu 12/1/16 |
| 22 |  | Conduct Project Initiation and Planning Activities | 14 days | Mon 6/22/15 | Thu 7/9/15 |
| 23 | | Develop Detailed Requirements Specifications | 80 days | Fri 7/10/15 | Thu 10/29/15 |
| 24 | | Design and Develop the System | 140 days | Fri 10/30/15 | Thu 5/12/16 |
| 25 | | Convert the Data | 70 days | Fri 5/13/16 | Thu 8/18/16 |
| 26 | | Develop the Test Plan | 14 days | Fri 5/13/16 | Wed 6/1/16 |
| 27 | | Conduct Unit and Integration Testing | 40 days | Fri 8/19/16 | Thu 10/13/16 |
| 28 | | Conduct Performance and System Testing | 20 days | Fri 10/14/16 | Thu 11/10/16 |
| 29 | | Conduct User Acceptance Testing | 15 days | Fri 11/11/16 | Thu 12/1/16 |
| 30 | | Phase 3.0 Deployment Activities | 165 days | Fri 5/13/16 | Thu 12/29/16 |

| FSR PMP Section Project Schedule_Final | | | | | |
|--|---|--|-----------------|---------------------|-------------------|
| ID |  | Task Name | Duration | Start | Finish |
| 31 |  | Develop Training Plan | 8 days | Fri 5/13/16 | Tue 5/24/16 |
| 32 | | Develop Training Materials | 20 days | Wed 5/25/16 | Tue 6/21/16 |
| 33 |  | Conduct User Training Sessions | 9 days | Fri 12/2/16 | Wed 12/14/16 |
| 34 |  | Deploy New RPS Database System | 11 days | Thu 12/15/16 | Thu 12/29/16 |
| 35 | | Phase 4.0 Transition and Post Implementation Evaluation | 263 days | Fri 12/30/16 | Tue 1/2/18 |
| 36 |  | Transition to Maintenance and Operations | 132 days | Fri 12/30/16 | Mon 7/3/17 |
| 37 |  | Retire Old Certification and Verification Systems | 132 days | Fri 12/30/16 | Mon 7/3/17 |
| 38 |  | Conduct Post Implementation Review | 131 days | Tue 7/4/17 | Tue 1/2/18 |
| 39 | | Conduct Project Closeout | 2 days | Fri 12/30/16 | Mon 1/2/17 |

6.3. Authorization Required

The RPS Database Project requires FSR approval by the Energy Commission CIO, Budget Officer, and Executive Director. In addition, the FSR must be approved by the Natural Resources Agency's Secretary and Agency Information Officer. The project also requires approval of the technical approach and expenditures from California Department of Technology and approval of the procurement approach from the STPD.

7. Risk Register

Project risks are factors that jeopardize the successful accomplishment of project goals. Risk management is the systematic process of identifying, analyzing, and responding to project risks. This Risk Management Plan helps minimize the risks associated with the project.

The Energy Commission's approach to risk management on the project includes:

- Identification of potential project issues and risks by the project team, executive management, and vendors
- Development of preventative risk mitigation strategies and contingency measures to avoid or minimize the impact of these potential issues and risks if they occur
- Continuous monitoring of identified issues and risks through ongoing communications and reporting mechanisms

The Energy Commission's risk management processes comply with the California Technology Agency's Information Technology Project Management Methodology. The approach is based on early detection, swift response, close monitoring, impact minimization, and thorough recovery.

The sections that follow represent the Risk Management Plan:

- 7.1 Risk Management Approach
- 7.2 Risk Tracking and Control
- 7.3 Risk Register Worksheet

7.1. Risk Management Approach

The Business Project Managers and IT Project Manager share the overall responsibility for risk management on the project, and are supported in this responsibility by the project management team. The Project Managers and project management team members have experience with the applicable RPS programs, and receive assistance and advice from the Energy Commission ITSB Project Management Office (PMO). The project management team includes the following key individuals:

- **Project Sponsor** – Has overall responsibility for the project. The project sponsor helps identify project risks, review and approve the risk management plan, regularly review the project issues log, and meet regularly with the Project Manager(s).
- **Business and IT Project Managers** – Develop and maintain the Risk Management Plan and the issues log. They share responsibility for monitoring project risks, developing risk mitigation strategies and contingency plans, and ensuring that these are implemented appropriately.
- **IPOC** – Responsible for providing project oversight. The IPOC meets with the Project Sponsor, PMO representative, and Project Managers on a regular basis to discuss the status of the project, including project risks. The IPOC may assist the Project Sponsor,

PMO representative, and Project Managers in identifying project risks and developing risk mitigation strategies and contingency plans.

7.1.1. Risk Assessment

The Project Managers, with support from the project management team and subject matter experts, are responsible for risk assessment. This consists of identifying, analyzing, quantifying, and prioritizing project and security risks. The Project Managers determine the probability that specific risks will occur, and evaluate their potential impact. This is an ongoing process throughout the life of the project. The three steps in Risk Assessment are:

- Risk Identification
- Risk Analysis and Quantification, and
- Risk Prioritization.

Each of these is briefly discussed below.

Risk Identification

Risk identification is the first step in risk assessment. It is the responsibility of all project team members and consists of foreseeing potential risks as early as possible in the project. Initially, this is based on an understanding and analysis of project requirements and challenges in light of previous experience with similar projects. As the project progresses, and more specific experience is gained with the people, organizations, technologies, and the business environment associated with the project, additional risks are identified, and the probability estimates of others may be adjusted.

Crucial to risk identification is the input of the project team and other stakeholders who are encouraged to recognize and report risks as soon as possible. This occurs through formal means, such as status reports and meetings, as well as by less formal communications such as telephone calls and email messages. The Project Managers document and evaluate risks identified by team members and stakeholders.

Risk Analysis and Quantification

Once a risk is identified, the Project Managers, in consultation with the project team, evaluate the likelihood of the risk event occurring, and the probable outcomes associated with the risk event, in order to determine its probable impact on the success of the project.

Risk Prioritization

Risk prioritization is the final step in risk assessment. Based on the analysis of risk event likelihood and impact, the Project Managers prioritize the risks so that attention and resources are applied to reducing the likelihood and/or minimizing the impact of the highest priority risks. Risks that are less likely to occur and/or have relatively low impact if they do occur, are

assigned a lower priority. They are monitored, but fewer resources are applied to addressing them unless circumstances change their likelihood of occurrence or probable impact.

Some risks may cease to require attention because one or more of the following occur:

- Their likelihood of occurrence drops to zero percent;
- Their impact is determined to be negligible; or,
- They have already occurred, successful contingency measures have been implemented, and there is little risk of recurrence.

These are the lowest priority risks. They are removed from the list of open risks and are no longer actively managed by the Project Managers or project team. Nevertheless, a record of these items is maintained, their impact (if any), and how they were addressed.

7.1.2. Risk Response

This refers to the actions taken to manage risks. They include risk avoidance, acceptance, mitigation, and sharing. Each of these is discussed briefly below. In general, risk mitigation actions are undertaken for all high impact/high probability risks that cannot reasonably be avoided. When risk events do occur, the Energy Commission must put contingency plans in place to address them and minimize their negative impact on the project.

Risk Avoidance

This refers to eliminating the cause of the risk by modifying or selecting an alternate approach, technology, vendor, timeframe, or method that does not include the risk. Risk avoidance is often a key factor in initially selecting the proposed solution, but once a solution is selected, the risks inherent in it cannot usually be avoided without sacrificing important benefits. When planning the implementation, the project manager and team weigh the risks associated with all key project decisions (vendor, technology, schedule, etc.) in order to avoid or minimize risks whenever possible.

Risk Mitigation

In the context of this Risk Management Plan, *risk mitigation* refers to actions taken to minimize the probability of a risk event occurring (in contrast to *contingency plans*, which attempt to minimize the negative impact of risk events that do occur). For example, in addressing the risk that a vendor may not deliver needed equipment on time, a risk mitigation action may be to order the equipment ahead of schedule. A contingency plan may be to have an alternate source of the equipment if the primary vendor still fails to deliver on time. The Risk Register Worksheet lists both risk mitigation actions and contingency plans.

Risk Transference

This may involve risk sharing to shift some of the risk to other stakeholders such as vendors. It may also include shifting the cost of managing risk to others, for example to insurance or to penalties for non-compliance by vendors.

Risk Acceptance

Risk acceptance involves an organizational decision to accept a certain degree of risk, usually for technical or cost reasons. The Project Managers and project team evaluate the costs and benefits associated with all key project decisions in order to determine which risks should reasonably be accepted. For example, in addressing a particular risk they may have to weigh the probable impact of a particular risk event occurring against the cost of shifting some portion of the risk to a vendor, in order to determine how much of the risk should be accepted.

Contingency Plan

Contingency planning involves identification and specification of work a rounds to minimize the impact on the business when a risk does occur.

7.2. Risk Tracking and Control

This involves maintaining up-to-date risk status information. It is continuous throughout the project. The Project Managers track and control project risk using the Risk Register, which may be expanded to include:

- Date the risk was identified
- Person/organization that identified the risk
- Priority rating or color coding
- Timeframe to begin taking risk action
- Risk trigger event
- Risk Owner
- Response plan effectiveness
- Residual risks
- Secondary risks
- Risk status
- Closure date

7.2.1. Risk Tracking

Risk tracking involves monitoring risks and the progress toward risk event resolution. It includes providing accurate and timely information to the project management team, and keeping the Risk Management Worksheet updated as new risk-related information becomes available and risks are addressed. Risks are discussed in project staff meetings in order to identify new risks, plan mitigation strategies and contingency plans, and monitor the impact of risk events that have occurred. The Project Managers and PMO track this information. Risk tracking and control information are included in project status reports.

7.2.2. Risk Control

Risk control is necessary to ensure that the risk management plan is executed and risk events are addressed in a timely manner. The focus is on risk response actions. As risk events occur, the project team implements the appropriate contingency plans as outlined in the Risk Register, which is, in turn, updated with the results of these actions and other relevant information. While the Project Managers take the lead in this, the IPOC has an important roles in providing timely support and oversight of the risk control function.

7.3. Risk Register Worksheet

The Risk Register Worksheet that follows is a key tool in tracking, managing, and reporting on project risks. It lists the major risks associated with the project in two tables due to the size in width of the tables and groups them into the risk categories. The Risk Register – Risk Prioritization Table 7-1 includes an estimate of the likely impact on project success of each risk event, the estimated probability of occurrence, and a risk level which can be used for priority rating (see the Definition of Probability and Impact Scales section of the Risk Register Worksheet below). The Risk Register – Risk Response Table 7-2 includes specific strategies to reduce the likelihood or impact of each risk event identified. Within each category, risks are sorted according to their priority based on risk level. The content of this table is updated regularly throughout the life of the project.

Risk Register Worksheet

Processes that will be used to identify risks:

The following processes will be used to identify risks:

- Iterative Process – Risk identification is conducted throughout the life of the project. Risks will be continually assessed during Change Control, Status Meetings, Team Meetings and analysis and workgroup sessions.
- Project Charter Development - High level risks will be identified during initiation of the project as the Project Charter is developed.
- Project Planning – Risks will be identified during project planning as scope baseline and work breakdown structure is created.
- Requirements Analysis – Risks will be identified as the functional and technical requirements are analyzed and specified.
- Interviewing Stakeholders – All stakeholders will be interviewed during the planning and requirements analysis phases of the project to identify potential risks.
- Contracts Development – Risks associated with contractual dependencies will be identified during project planning.
- Legislation Reviews – Current legislation that may affect the business direction, technology and/or system functionality to be provided will be reviewed prior to and periodically during the project to determine associated risks to the project.
- Documentation Reviews – Risks will be identified during reviews of deliverable documents, for example the Charter, Contracts, Project Management Plan, Requirements Specifications, Technical Specifications etc.
- Lessons Learned – Risks will be identified during lessons learned sessions conducted after each milestone is achieved.

The following techniques may be used to identify risks:

- Involve everyone, stakeholders and non-stakeholders.
- Use a checklist of Risk Categories to consider and ensure risks of all types identified.
- Schedule Brainstorming Sessions with team members and stakeholders to openly consider risks of all types.
- Use Delphi Techniques by submitting anonymous requests for risk identification to team members.
- Interview team members, project managers, stakeholders on any element of work to identify risks.
- Perform Root Cause Analysis to reorganize the risks by their root cause to identify more risks.
- Perform Strengths, Weaknesses, Opportunities and Threats Analysis to look at these factors to identify risks.
- Perform Assumptions Analysis to look for risks associated to all assumptions being made.

Processes to be used to escalate risks, the resolutions of which are beyond the project manager’s level of authority:

The process used to escalate risks beyond the Project Manager’s level of authority is:

Risks will be reviewed during regularly scheduled project management meetings to assess probability and impact. Risks will be prioritized and re-prioritized as needed. Those risks that result in a “High Risk” rating will be monitored closely to determine if the Risk Responses specified in the Risk Register are adequate to prevent the risk from becoming an “Issue”. For “High” level risks, if it is determined the Project Manager does not have authority to implement and execute an effective mitigation strategy, these risks will be escalated to the Project Sponsor during regularly scheduled Project Sponsor Meetings to determine an acceptable risk response.

Definition of Probability and Impact Scales:

| Probability Scale | |
|-------------------|----------|
| 1 | <20% |
| 2 | 21 - 40% |
| 3 | 41 - 60% |
| 4 | 61 - 80% |
| 5 | >80% |

| Impact Scale | |
|--------------|--|
| 1 | Less than a 5% change to schedule, scope, budget, or quality |
| 2 | 5 - 10% change to schedule, scope, budget, or quality |
| 3 | 11 - 15% change to schedule, scope, budget, or quality |
| 4 | 16 - 24% change to schedule, scope, budget, or quality |
| 5 | 25% or greater change to schedule, scope, budget, or quality |

Risk Categories are identified by the rows that are shaded, have no # assigned and contain a category name in the Risk column.
* 1-9 = Low Risk Level, 10-15 = Medium Risk Level, 16-25 = High Risk Level

Table 7-1 Risk Register - Risk Prioritization

| # | Risks | Probability (1-5) | Potential Impact (1-5) | Risk Level* (1-25) | Cause | Consequences | Avoidance Plan |
|---|---|-------------------|------------------------|--------------------|---|---------------------|--|
| | Audit and Control Needs | | | | | | |
| | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | Budget | | | | | | |
| 1 | Funds have not been approved for this project at the time of this entry. | 1 | 5 | 5 | BCP is under development and will be submitted for Energy Commission review in August 2013. | Schedule | Submit project FSR to budget review and approval committees with Sponsor support. |
| | Client/Server Architecture | | | | | | |
| 2 | The database will be hosted outside of the organization at the Natural Resources Agency data center which may cause delay in implementation. | 1 | 3 | 3 | Lack of communication with the data center staff. | Operations Schedule | Include the data center in project architecture and development environments planning efforts. |
| | Customer Sophistication | | | | | | |
| 3 | Many internal and external business users may not have extensive experience using web based applications which may cause delays during user acceptance testing and/or deployment to production. | 1 | 1 | 1 | Not providing training to internal and external end user. | Operations Schedule | Include a training plan in the project schedule to train business users. |
| | Design and Implementation | | | | | | |
| 4 | Unfamiliar or complex areas of the | 2 | 3 | 6 | Poor or missing | Operations | Create software |

| # | Risks | Probability (1-5) | Potential Impact (1-5) | Risk Level* (1-25) | Cause | Consequences | Avoidance Plan |
|----|---|-------------------|------------------------|--------------------|---|---|--|
| | product take more time than expected to design and implement. | | | | software architecture and technical design specifications. | Schedule Resources | architecture and detailed design specifications. |
| 5 | Design fails to address major issues. | 1 | 4 | 4 | Requirements specifications are incomplete. | Cost Schedule Functionality Contract | Create detailed functional and technical requirements specifications. |
| 6 | Components developed separately cannot be integrated easily. | 2 | 2 | 4 | Poor or missing software architecture specifications and technical design and integration planning. | Schedule | Create software architecture specifications, detailed design specifications and integration plans. |
| 7 | Vendor development team members may not have experience with energy business systems which may result in communication problems or misinterpretation of requirements. | 1 | 3 | 3 | Business overview and familiarization not provided to the vendor team members. | Schedule Functionality | Provide overviews and presentations on business operations, practices and policies to familiarize the vendor team with the business. |
| 9 | Data conversion activities are underestimated or are ignored. | 1 | 3 | 3 | Data conversion requirements not documented. | Cost Schedule Contract Resources | Include detailed data conversion requirements in the technical requirements specification. |
| 9 | Unacceptably low quality requires more testing, design, and implementation work to correct than expected. | 1 | 2 | 2 | Poor or missing software architecture and technical design specifications. | Cost Schedule Resources | Create software architecture and detailed design specifications. |
| 10 | Development of extra software | 1 | 2 | 2 | Lack of requirements | Schedule | Establish |

| # | Risks | Probability (1-5) | Potential Impact (1-5) | Risk Level* (1-25) | Cause | Consequences | Avoidance Plan |
|----|---|-------------------|------------------------|--------------------|--|----------------------------------|--|
| | functions that are not required extends the schedule. | | | | management. | Functionality Resources | requirements management with requirements tracing activities performed at regular intervals. |
| 11 | Requirements for interfacing with other systems result in unforeseen design, implementation, and testing. | 1 | 2 | 2 | Poor or missing software architecture and external interface design specifications. | Schedule Functionality Resources | Create software architecture and external interface design specifications. |
| | Development Environment | | | | | | |
| 12 | All system environments development, testing, staging and production will be hosted outside of the organization at the Natural Resources Agency data center which may cause delays in implementation. | 1 | 3 | 3 | Lack of communication with the data center staff. | Operations Schedule | Include the data center in project database environments planning efforts. |
| 13 | Development tools are not in place by the desired time. | 1 | 2 | 2 | Setup and configuration of development environment not included in the project plan. | Operations Schedule | Include setup and configuration of development environment in the project plan. |
| 14 | Development tools do not work as expected; developers need time to create workarounds or to switch to new tools. | 1 | 2 | 2 | Poor or missing development environment and toolset documentation. | Operations Schedule Resources | Create detailed development environment and toolset documentation. Ensure development staff are trained and proficient in use. |
| 15 | Development environment structure, policies, procedures are not clearly | 1 | 2 | 2 | Poor or missing Development Plan. | Operations Schedule | Create a detailed Development Plan |

| # | Risks | Probability (1-5) | Potential Impact (1-5) | Risk Level* (1-25) | Cause | Consequences | Avoidance Plan |
|---------------------------------------|--|-------------------|------------------------|--------------------|--|---|---|
| | defined. | | | | | | that includes policies and procdures. |
| 16 | Necessary functionality cannot be implemented using the selected methods and tools. | 1 | 1 | 1 | Poor or missing development environment and toolset documentation. | Cost Operations Schedule Functionality Contract | Create detailed development environment and toolset documentation. |
| 17 | Developers are unfamiliar with the development tools. | 1 | 1 | 1 | Poor or missing development environment and toolset documentation. | Operations Schedule | Create detailed development environment and toolset documentation. Ensure development staff are trained and proficient in use. |
| External Environment | | | | | | | |
| | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Facilities | | | | | | | |
| 18 | Facilities for the vendor development team members are not available on time. | 5 | 4 | 20 | No advanced planning for workspace performed. | Cost Operations Schedule | Plan for and prepare for additional working space in advance of the vendor arriving. |
| 19 | There is limited physical space available for vendor development team members which could require them to be located away from the RPS business users. | 5 | 4 | 20 | No advanced planning for workspace performed. | Cost Operations Schedule | Plan for and prepare for additional working space in advance of the vendor arriving. |
| Human Resources: Skills, Availability | | | | | | | |
| 20 | Freeing time for IT and subject matter | 2 | 4 | 8 | Backup resources to | Cost | Plan in advance for the |

| # | Risks | Probability (1-5) | Potential Impact (1-5) | Risk Level* (1-25) | Cause | Consequences | Avoidance Plan |
|----|--|-------------------|------------------------|--------------------|--|--|--|
| | expert (SME) project participation may be difficult. | | | | cover/assist SMEs with daily work not planned for. | Operations Schedule | identification and training of resources to take on and/or assist and SMEs with daily workload. |
| 21 | Vendor turnover on the development team may cause delays until replacements are procured and brought up to speed on the project. | 2 | 4 | 8 | Poor project staffing by the vendor. | Operations Schedule Resources | Ensure the vendor has backup resources identified to back fill project staffing as needed. |
| 22 | IT resources supporting other projects in other divisions may limit the time they can dedicate to the project. | 2 | 3 | 6 | Project staffing plan not completed in advance. | Cost Operations Schedule Functionality Resources Contract | Perform planning for project staffing in advance to identify when specific resources are needed and ensure alternate resources are identified and cross trained. |
| 23 | Departure, retirement or reassignment of state project staff, management, technical, and/or subject matter experts could delay project implementation. | 1 | 3 | 3 | Project staffing plan not completed in advance. | Schedule Cost Resources | Perform planning for project staffing in advance to identify dedicated resources and to cross train where needed. |
| | Infrastructure | | | | | | |
| | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | Legislation | | | | | | |
| 24 | Product depends on law, policy or regulations that change frequently | 1 | 5 | 5 | Lack of monitoring upcoming policy and regulation. | Cost Schedule Functionality | Establish a process to monitor upcoming policy and regulation that may affect the |

| # | Risks | Probability (1-5) | Potential Impact (1-5) | Risk Level* (1-25) | Cause | Consequences | Avoidance Plan |
|----|--|-------------------|------------------------|--------------------|---|--|---|
| | | | | | | | project. |
| | Litigation | | | | | | |
| | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | Management Processes | | | | | | |
| 25 | Project issues and risks are not adequately identified and managed. | 1 | 5 | 5 | Poor risk identification and risk management processes. | Cost Operations Schedule Functionality Resources Contract | Perform risk identification and risk management functions prior to project start up and at regular frequent intervals during the project execution. |
| 26 | Quality-assurance activities are limited or cut short. | 3 | 1 | 3 | Inadequate QA built into the Project Plan. | Cost Operations Schedule Functionality | Ensure that QA processes, tasks, guidelines and standards are included in the project plan. |
| 27 | Management review/decision cycle is slower than expected. | 3 | 1 | 3 | Lack of review and approval processes. | Operations Schedule | Create, publish and communicate the review and approval processes to be used on the project. |
| 28 | Inaccurate status and/or progress reporting. | 2 | 1 | 2 | Lack of status reporting processes and templates. | Operations Schedule | Create, publish and communicate status reporting processes and templates to be used for the project. |
| 29 | Poor relationships between project team and users or other stakeholders slow decision making and follow through. | 1 | 2 | 2 | Lack of leadership and team building practices. | Operations Schedule Functionality Resources | Include tasks and time dedicated to team building in the project plan to help team members |

| # | Risks | Probability (1-5) | Potential Impact (1-5) | Risk Level* (1-25) | Cause | Consequences | Avoidance Plan |
|----|---|-------------------|------------------------|--------------------|---|---|--|
| | | | | | | | understand each others roles and responsibilities and the dependencies on each other. |
| 30 | Inefficient team structure reduces productivity. | 1 | 1 | 1 | Project Team planning not performed. | Operations Schedule Resources | Develop the project team organization chart early in project planning. |
| 31 | Conflicts between team members and/or problem team members are encountered. | 1 | 1 | 1 | Lack of personnel management practices. | Operations Schedule Resources | Include tasks and time personnel management in the project plan to communicate with and understand staff personalities and issue resolutions needed. |
| 32 | User will not buy into the project or participate in review cycles for plans, prototypes, and specifications. | 1 | 1 | 1 | Lack of leadership and team building practices. | Operations Schedule Functionality | Include tasks and time dedicated to team building which include communicating the importance of participation in reviews and providing feedback to improve the quality of the product being built. |
| | Other Projects | | | | | | |
| | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | Paradigm Shift | | | | | | |

| # | Risks | Probability (1-5) | Potential Impact (1-5) | Risk Level* (1-25) | Cause | Consequences | Avoidance Plan |
|----|--|-------------------|------------------------|--------------------|---|-----------------------------------|---|
| | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | Regulations | | | | | | |
| | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | Requirements Management | | | | | | |
| 33 | Less than thorough and complete documentation of requirements may result in a system lacking required functionality. | 2 | 5 | 10 | Poorly written requirements specifications. | Functionality Schedule Cost | Create a Requirements Management Plan that specifies the requirements processes, guidelines and standards to be used. |
| 34 | User introduces new requirements after agreed upon requirements specification is complete. | 3 | 2 | 6 | Lack of communication on the Requirements Management baseline and change control processes. | Schedule Functionality | Communicate to all users the Requirements Management Plan and established requirements baseline and change control processes. |
| 35 | Contractor does not meet quality, security or production requirements. | 1 | 5 | 5 | Poorly specified quality, security or production requirements or inadequate QA processes. | Functionality Schedule | Poorly specified quality, security or production requirements or inadequate QA processes. |
| 36 | The project may be unable to adequately support future programs or new program requirements. | 1 | 5 | 5 | Software Architecture Specifications missing requirements for flexibility to support for future | Functionality Operations | Ensure Software Architecture Specifications include requirements for supporting flexibility |

| # | Risks | Probability (1-5) | Potential Impact (1-5) | Risk Level* (1-25) | Cause | Consequences | Avoidance Plan |
|----|---|-------------------|------------------------|--------------------|--|-----------------------------|--|
| | | | | | growth and expansion. | | for future growth and expansion. |
| 37 | Changing requirements (includes new legislation or regulations) may expand scope and delay project implementation. | 1 | 3 | 3 | Lack of Requirements Management controlling scope. | Schedule Cost | Develop a Requirements Management Plan and establish requirements management processes to manage scope. |
| 38 | User input is not successfully solicited for input to requirements. | 1 | 3 | 3 | Requirements analysis process did not include participation from users. | Schedule Functionality | Establish a requirements analysis process that includes user participation. |
| 39 | Different expectations among various stakeholders may cause frustration with the capabilities of the system as implemented. | 1 | 3 | 3 | Lack of participation by stakeholders in the requirements analysis effort. | Functionality Operations | Ensure the stakeholders have opportunity to participate in the requirements analysis effort and to review and provide feedback on requirements specifications. |
| | Schedule | | | | | | |
| 40 | User review/decision cycles for plans, prototypes, and specifications are slower than expected. | 3 | 3 | 9 | Inaccurate project task estimation. | Operations Schedule | Ensure project schedule review tasks are estimated realistically. |
| 41 | User communication time (e.g., time to answer requirements-clarification questions) is slower than expected. | 3 | 3 | 9 | Inaccurate project task estimation. | Operations Schedule | Ensure project schedule allows time for communication |

| # | Risks | Probability (1-5) | Potential Impact (1-5) | Risk Level* (1-25) | Cause | Consequences | Avoidance Plan |
|----|---|-------------------|------------------------|--------------------|--|--|---|
| | | | | | | | feedback. |
| 42 | The project is not approved on time. | 2 | 4 | 8 | FSR review and approval process is delayed. | Schedule | Ensure the FSR is written, reviewed and approved internally in a timely manner so transmittal to CalTech is on time. |
| 43 | Contract not awarded on schedule. | 2 | 3 | 6 | RFP vendor procurement process is delayed. | Schedule Contract Resources | Involve STPD and internal contracts and procurement staff in the RFP development and the RFP vendor selection process. |
| 44 | Contractor does not deliver components when promised according to schedule. | 1 | 5 | 5 | Project schedule not reviewed during status meetings. | Schedule Contract Cost | Ensure the status meetings review the project schedule to identify milestones that may be missed to corrective action can be taken. |
| 45 | Installation of hardware may be delayed. | 1 | 5 | 5 | Poor planning for development and production environments. | Schedule Cost | Ensure the project plan accounts for installation schedules for all hardware environments. |
| 46 | Project Plan omits necessary tasks. | 2 | 2 | 4 | Poor project scheduling. | Operations Schedule Functionality Resources | Make sure all project team members are involved in the project work breakdown structure effort to ensure all tasks are identified. |
| 47 | Schedule was based on the use of | 2 | 2 | 4 | Poor planning for | Operations | Ensure project |

| # | Risks | Probability (1-5) | Potential Impact (1-5) | Risk Level* (1-25) | Cause | Consequences | Avoidance Plan |
|----|---|-------------------|------------------------|--------------------|---|---|--|
| | specific team members, but those team members were not available. | | | | project staffing. | Schedule Functionality Resources | planning identifies staff and confirms their availability to the project. |
| 48 | Re-estimation in response to schedule slips does not occur, or is overly optimistic or ignores project history. | 2 | 2 | 4 | Project schedule not reviewed during status meetings. | Cost Operations Schedule | Ensure the status meetings review the project schedule to identify milestones that may slip so corrective action can be taken. |
| 49 | A delay in one task causes cascading delays in dependent tasks. | 3 | 1 | 3 | Project schedule has too many end to end dependent tasks. | Cost Operations Schedule | Create the project schedule to avoid long series of end to end dependent tasks. |
| 50 | The contract award is protested. | 1 | 3 | 3 | Poorly written RFP or RFP process not followed. | Schedule Contract | Ensure the RFP is written accurately and the RFP vendor selection process is correctly followed. |
| | Sponsorship Commitment | | | | | | |
| | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | Structure of Installed Systems | | | | | | |
| | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | Supplier/Vendor Capability/Capacity | | | | | | |
| 51 | A vendor and/or product (hardware/software) may be selected that fails to meet requirements in one or more key areas. | 2 | 4 | 8 | Inadequate evaluation of vendor product vendor selection process. | Cost Operations Schedule Resources | During procurement, ensure complete evaluation of vendor products are performed. |
| 52 | Vendor technical personnel may lack the skills required to implement the | 1 | 5 | 5 | Inadequate evaluation of vendor | Operations | During procurement, ensure the vendor |

| # | Risks | Probability (1-5) | Potential Impact (1-5) | Risk Level* (1-25) | Cause | Consequences | Avoidance Plan |
|----|--|-------------------|------------------------|--------------------|--|---|--|
| | new system. | | | | resources during the procurement effort. | Cost | has staff identified and dedicated to the project with the skills required for assigned tasks. |
| 53 | The vendor might go out of business, or otherwise be unable to provide ongoing support. | 1 | 4 | 4 | Inadequate evaluation of vendor during vendor selection process. | Cost Operations Schedule Resources | During procurement, ensure the vendor has a stable business and financial background with references. |
| 54 | Personnel with critical skills needed for the project cannot be found or are available only part time. | 1 | 3 | 3 | Inadequate evaluation of vendor resources during the procurement effort. | Operations Schedule Resources | During procurement, ensure the vendor has staff identified and dedicated to the project with the skills required for assigned tasks. |
| 55 | Personnel need extra time to learn unfamiliar software tools or environment. | 1 | 3 | 3 | Inadequate evaluation of vendor resources during the procurement effort. | Cost Operations Schedule | During procurement, ensure the vendor has staff identified and dedicated to the project with the skills required for the software tools. |
| 56 | New development personnel are added late in the project, and additional training and communications overhead reduces existing team members' effectiveness. | 1 | 3 | 3 | Inadequate evaluation of vendor resources during the procurement effort. | Operations Schedule Resources | During procurement, ensure the vendor has the correct number of staff identified and dedicated to the project for the assigned tasks. |

| # | Risks | Probability (1-5) | Potential Impact (1-5) | Risk Level* (1-25) | Cause | Consequences | Avoidance Plan |
|---|---------------------|-------------------|------------------------|--------------------|-------|--------------|----------------|
| | System Architecture | | | | | | |
| | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | Technology | | | | | | |
| | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | Turnover | | | | | | |
| | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

Risk Categories are identified by the rows that are shaded, have no # assigned and contain a category name in the Risk column.

Table 7-2 Risk Register - Risk Response

| # | Risks | Mitigation Plan | Transference | Acceptance | Contingency Plan |
|---|---|---|--------------------------------------|------------|--|
| | Audit and Control Needs | | | | |
| | N/A | N/A | N/A | N/A | N/A |
| | Budget | | | | |
| 1 | Funds have not been secured for this project at the time of this entry. | BCP requesting funds is under development; Natural Resources Agency has already approved the BCP concept for this project. Staff will work closely with executive management and finance office on BCP. | None | Accept | None |
| | Client/Server Architecture | | | | |
| 2 | The database will be hosted outside of the organization at the Natural Resources Agency data center which may cause delay in implementation. | Work closely with Natural Resources Agency data center staff during project planning and obtain buy-in on the schedule. | Natural Resources Agency data center | Accept | None |
| | Customer Sophistication | | | | |
| 3 | Many internal and external business users may not have extensive experience using web based applications which may cause delays during user acceptance testing and/or deployment to production. | Ensure the project plan includes time and resources to provide training on the new system for all business users prior to the user acceptance testing and deployment.. | External Business Users | Accept | Provide ongoing training workshops. |
| | Design and Implementation | | | | |
| 4 | Unfamiliar or complex areas of the product take more time than expected to design and implement. | Require detailed software architecture documentation and detailed design documentation reviews prior to development that focus on architecturally significant functional and technical requirements. | Vendor | No | Re-evaluate the staff assignments to tasks and balance the workload on the team as needed. |

| # | Risks | Mitigation Plan | Transference | Acceptance | Contingency Plan |
|----|---|---|--------------|------------|--|
| 5 | Design fails to address major issues. | Require detailed software architecture documentation and detailed design documentation reviews prior to development. | Vendor | No | Review design specifications to identify where improvements can be made. |
| 6 | Components developed separately cannot be integrated easily. | Require detailed software architecture documentation and reviews. Ensure frequent collaboration between team members. | Vendor | No | Review architecture documents to identify where improvements can be made. |
| 7 | Vendor development team members may not have experience with energy business systems which may result in communication problems or misinterpretation of requirements. | Ensure the project plan includes time and resources to provide an overview of the energy business, demos of existing systems and walkthroughs of business processes for development team members. | None | Accept | Provide one on one assistance as needed. |
| 8 | Data conversion activities are underestimated or are ignored. | Require data modeling and data conversion specifications reviews. Perform level of effort estimates to verify the project tasks and schedule timelines. | Vendor | No | Review data modeling and data conversion documents to accurately identify tasks and timelines. |
| 9 | Unacceptably low quality requires more testing, design, and implementation work to correct than expected. | Require design and code reviews by peers to maximize the quality of development work. | Vendor | No | Hold design and code reviews to identify areas for potential improvement. |
| 10 | Development of extra software functions that are not required extends the schedule. | Ensure modules and components included in the design documents are the only ones developed. Additional functions must be presented to management for review and approval to be added to the design before implementation. | Vendor | No | Evaluate the extra functions to ensure there is no adverse impact if deployed. Acceptable function must be added to the requirements and design documents. |
| 11 | Requirements for interfacing with other systems result in unforeseen | Include in the project team personnel responsible for systems with which the | Vendor | No | Review the requirements and |

| # | Risks | Mitigation Plan | Transference | Acceptance | Contingency Plan |
|--------------------------------|---|---|--------------------------------------|------------|--|
| | design, implementation, and testing. | project must interface. Clearly document the interface requirements. Ensure the project plan includes detailed interface development activities and timeline. | | | design documents to make corrections as needed. |
| Development Environment | | | | | |
| 12 | All system environments development, testing, staging and production will be hosted outside of the organization at the Natural Resources Agency data center which may cause delays in implementation. | Work closely with Natural Resources Agency data center staff during project planning and obtain buy-in on the schedule. | Natural Resources Agency data center | Accept | None |
| 13 | Development tools are not in place by the desired time. | Include the setup and configuration of the development environment and tools in the project plan and schedule. | Vendor | No | Evaluate alternative tools available that will allow development to proceed. |
| 14 | Development tools do not work as expected; developers need time to create workarounds or to switch to new tools. | Ensure thorough evaluation and testing of the development environment toolsets during the specification of the development environment. | Vendor | No | Evaluate alternative tools available that will allow development to proceed. |
| 15 | Development environment structure, policies, procedures are not clearly defined. | Provide detailed documentation and a presentation/walkthrough on the development environment, policies and procedures to the development team. | None | No | Identify internal staff to serve as sources of information as needed. |
| 16 | Necessary functionality cannot be implemented using the selected methods and tools. | Ensure thorough analysis against the functional requirements when determining the development environment toolsets. | None | No | Re-evaluate functionality and design to look for alternative solutions. |
| 17 | Developers are unfamiliar with the development tools. | Ensure the vendor provides development staff that are experienced with the development environment toolsets. | Vendor | No | Provide documents and training on the development tools as |

| # | Risks | Mitigation Plan | Transference | Acceptance | Contingency Plan |
|----|--|--|--------------|------------|--|
| | | | | | needed. |
| | External Environment | | | | |
| | N/A | N/A | N/A | N/A | N/A |
| | Facilities | | | | |
| 18 | Facilities for the vendor development team members are not available on time. | Work closely with the facilities management to identify and/or setup working areas for the vendor staff in advance of the team reporting to work on the project. | None | No | Plan for the vendor team to work off-site as needed until facilities are available. |
| 19 | There is limited physical space available for vendor development team members which could require them to be located away from the RPS business users. | Work closely with the facilities management to identify and/or setup working areas for the vendor staff as close to the RPS unit as possible. | None | No | Plan for a part of the vendor team to work off-site, use hotel cubes, or be located in another area of the building. |
| | Human Resources: Skills, Availability | | | | |
| 20 | Freeing time for IT and subject matter expert (SME) project participation may be difficult. | <p>Obtain support from senior management in order to ensure appropriate allocation of resources.</p> <p>Develop a resource management plan, obtain executive approval of the plan, and communicate the plan early, making sure to address staff concerns about their careers.</p> <p>The implementation may change the nature of their work, but does not result in job loss.</p> <p>Identify team members early and plan for resources to temporarily backfill their work while they work on the project.</p> <p>Minimize fluctuations in existing workload during the project.</p> | None | Accept | |

| # | Risks | Mitigation Plan | Transference | Acceptance | Contingency Plan |
|----|--|---|--------------|------------|---|
| 21 | Vendor turnover on the development team may cause delays until replacements are procured and brought up to speed on the project. | Ensure the vendor has identified staff in the project staffing plan that are dedicated for the duration of the project. | Vendor | No | Provide project overview and education to new team members to bring them up to speed as quickly as possible. |
| 22 | IT resources supporting other projects in other divisions may limit the time they can dedicate to the project. | Work closely with IT and include them in the project planning and scheduling to ensure the IT resource needs can be provided when needed. | None | Accept | Review the project schedule with IT management to look for alternative resources and/or times when staff will be available. |
| 23 | Departure, retirement or reassignment of project staff, management, technical, and/or subject matter experts could delay project implementation. | Define roles and responsibilities for team members and identify backups for them. Ensure knowledge transfer between team members, subject matter experts, and their backups. Document key project and system information. | None | Accept | |
| | Infrastructure | | | | |
| | N/A | N/A | N/A | N/A | N/A |
| | Legislation | | | | |
| 24 | Product depends on law, policy or regulations that change frequently | Ensure project management track current legislation and try to obtain advance notice of upcoming changes to law, policy or regulations. | None | Accept | Re-evaluate the project requirements when law, policy or regulations change. |
| | Litigation | | | | |
| | N/A | N/A | N/A | N/A | N/A |
| | Management Processes | | | | |
| 25 | Project issues and risks are not | Require the vendor IT Project Manager | Vendor | No | Re-visit the risk register |

| # | Risks | Mitigation Plan | Transference | Acceptance | Contingency Plan |
|----|--|---|--------------|------------|---|
| | adequately identified and managed. | implement rigorous risk and issue management practices according to industry standards. Require the IPOC assess and provide guidance, as necessary, to ensure the project risk and issues management processes meets industry standards. Conduct regular meetings which include IV&V and IPOC vendors to discuss identified issues and risks and to identify and implement mitigation strategies. | | | and risk management plan to make improvements on the planning and processes. |
| 26 | Quality-assurance activities are limited or cut short. | Ensure the project plan contains details on the QA tasks, artifacts and processes. Hold periodic QA meetings to review findings. | None | Accept | Re-visit the QA planning to make improvements to the process. |
| 27 | Management review/decision cycle is slower than expected. | Document and communicate the review and approval cycle processes and tasks to all reviewers early in the project and provide scheduled timeframes for reviews in advance. | None | Accept | Identify alternate reviewers for instances where a reviewer is unable to complete reviews when needed. |
| 28 | Inaccurate status and/or progress reporting. | Ensure the project plan contains details on the project status report template and processes. Hold periodic status meetings to review status reports. | None | No | Increase the frequency of status report meetings and review the status report content and process. |
| 29 | Poor relationships between project team and users or other stakeholders slow decision making and follow through. | Hold project promotion and team building meetings to ensure all parties understand each others involvement, responsibilities, importance and contribution to the success of the project. | Vendor | No | Meet with suspected parties and discuss working relationships and importance of contributions to the project. |
| 30 | Inefficient team structure reduces productivity. | Ensure the project staffing plan provides a team structure to maximize productivity | None | No | Shift tasks among resources based on |

| # | Risks | Mitigation Plan | Transference | Acceptance | Contingency Plan |
|----|--|--|--------------|------------|--|
| | | based on tasks to be accomplished and skill sets needed based on the project schedule. | | | skill sets to improve productivity. |
| 31 | Conflicts between team members and/or problem team members are encountered. | Hold project promotion and team building meetings to ensure all team members understand each others involvement, responsibilities, importance and contribution to the success of the project. | Vendor | No | Meet with suspected team members to discuss working relationships and importance of teamwork to the project. |
| 32 | User will not buy into the project or participate in review cycles for plans, prototypes, and specifications. | Hold project promotion and team building meetings to ensure all team members understand the importance of participation in reviews to ensure the quality and success of the project. | None | No | Meet with suspected users to discuss the importance of their participation and input to the review process. |
| | Other Projects | | | | |
| | N/A | N/A | N/A | N/A | N/A |
| | Paradigm Shift | | | | |
| | N/A | N/A | N/A | N/A | |
| | Regulations | | | | |
| | N/A | N/A | N/A | N/A | N/A |
| | Requirements Management | | | | |
| 33 | Less than thorough and complete documentation of requirements may result in a system lacking required functionality. | Thoroughly document functional requirements in the RFP; include the provision of documents as project deliverables. Involve subject matter experts throughout the process. Provide opportunities for them to review the system design, in detail, early on, in order to verify that required functionality | Vendor | No | Re-visit requirements areas where there are deficiencies and hold analysis sessions to identify improvements to be made. |

| # | Risks | Mitigation Plan | Transference | Acceptance | Contingency Plan |
|----|--|--|--------------|------------|---|
| | | is included. | | | |
| 34 | User introduces new requirements after agreed upon requirements specification is complete. | Educate the users on the requirements baseline process and the change control processes to emphasize the importance of providing requirements input during the analysis process. | None | No | Document the new requirements as change requests. |
| 35 | Contractor does not meet quality, security or production requirements. | Check vendor references thoroughly. Include RFP and contract provisions that are clear as to these standards. Include penalty provisions in the contract. Clearly define acceptance criteria for all project deliverables. Require the vendor IT Project Manager implement rigorous quality assurance/ quality control practices. | Vendor | No | Hold meetings with the vendor to review requirements and identify how to resolve areas of deficiency. |
| 36 | The project may be unable to adequately support future programs or new program requirements. | Include functional requirements which allow the solution to be flexible and expandable. | None | Accept | Analyze new and/or future requirements that will challenge the product design and identify solutions for future enhancements. |
| 37 | Changing requirements (includes new legislation or regulations) may expand scope and delay project implementation. | At project initiation, clearly identify, document, and communicate the functionality the system will (and will not) provide. Alert the appropriate Office of Legislative Affairs of this project so as to learn of any potential new applicable laws as early as possible. Monitor regulatory process to learn of coming regulations as early as possible. Require the IT Project Manager to obtain | None | Accept | Document the new and changing requirements as change requests. |

| # | Risks | Mitigation Plan | Transference | Acceptance | Contingency Plan |
|----|---|---|--------------|------------|--|
| | | approval on and incorporate a structured change management process. | | | |
| 38 | User input is not successfully solicited for input to requirements. | Ensure all users who are designated as SMEs are included in the project team organization chart and participate in the requirements analysis process. | Vendor | No | Include users who are SMEs in the review of requirements artifacts and obtain feedback. |
| 39 | Different expectations among various stakeholders may cause frustration with the capabilities of the system as implemented. | Clearly identify, document, and communicate the functionality the system will (and will not) provide. Include feedback from stakeholders early on in the project to manage expectations and create the foundation for effective organizational change management. | Vendor | No | Hold workshops to provide information on functionality and clarifications where needed. |
| | Schedule | | | | |
| 40 | User review/decision cycles for plans, prototypes, and specifications are slower than expected. | Document and communicate the review cycle and the importance of participation and timely feedback on the quality and success of the project. | Vendor | Accept | Meet with users to conduct reviews and obtain feedback. |
| 41 | User communication time (e.g., time to answer requirements-clarification questions) is slower than expected. | Document and communicate the importance of participation and timely requirements clarification feedback on the quality and success of the project. | Vendor | Accept | Meet with users to discuss and obtain requirements clarifications needed. |
| 42 | The project is not approved on time. | Establish early communication to obtain guidance and expertise from CalTech, STPD, and Fiscal Systems Consulting Unit (FSCU) assigned project representatives. Set up regular meetings with the Project Sponsor and Executive Steering Committee to address urgent approval needs. | None | No | Meeting with the Project Sponsor and Executive Steering Committee discuss altering the project schedule. |
| 43 | Contract not awarded on schedule. | Allow sufficient time for the procurement | None | No | Meeting with the |

| # | Risks | Mitigation Plan | Transference | Acceptance | Contingency Plan |
|----|---|---|--------------|------------|---|
| | | <p>process.</p> <p>Establish an experienced evaluation team to review schedule options.</p> <p>Collaborate with the STPD to prepare and award the contract.</p> | | | Project Sponsor and Executive Steering Committee discuss altering the project schedule. |
| 44 | Contractor does not deliver components when promised according to schedule. | <p>Allow sufficient time for project design, development and implementation.</p> <p>Check vendor references thoroughly.</p> <p>Obtain contractual agreement to the project schedule.</p> <p>Require the vendor IT Project Manager implement rigorous schedule management practices.</p> <p>Require the vendor IT Project Manager report regularly on project schedule accomplishments and any risks to project schedule.</p> <p>Require the vendor IT Project Manager identify and manage the implementation of measures to mitigate schedule issues or risks.</p> <p>Ensure the vendor has timely and appropriate access to all required systems, personnel, and information.</p> <p>Include substantial penalties in the contract for late performance.</p> | Vendor | No | Meeting with the Project Sponsor and Executive Steering Committee discuss altering the project scope and/or schedule. |
| 45 | Installation of hardware may be delayed. | <p>Require the vendor IT Project Manager develop a project plan delineating a detailed installation timeline.</p> <p>Require the vendor IT Project Manager communicate project deadlines regularly.</p> | None | No | Analyze the possibilities of using existing hardware as an interim solution. |
| 46 | Project Plan omits necessary tasks. | Ensure the project schedule includes all | Vendor | No | Make updates to the |

| # | Risks | Mitigation Plan | Transference | Acceptance | Contingency Plan |
|----|---|---|--------------|------------|--|
| | | tasks necessary to implement the technical and functional requirements. | | | project schedule to add tasks as needed. |
| 47 | Schedule was based on the use of specific team members, but those team members were not available. | Ensure the project staffing plan includes resources that can be dedicated to accomplish the assigned tasks on the project schedule. | Vendor | No | Identify resource replacements and make updates to the project schedule to resource assignments. |
| 48 | Re-estimation in response to schedule slips does not occur, or is overly optimistic or ignores project history. | Review the project schedule at regular status meetings to identify slippage in advance and to verify scheduled resources and timeframes. | Vendor | No | Re-estimate the schedule slips and modify the schedule accordingly. |
| 49 | A delay in one task causes cascading delays in dependent tasks. | Review the project schedule at regular status meetings to identify potential delays in dependent tasks and take corrective action. | Vendor | Accept | Evaluate the dependent tasks and identify portions of work that can be accomplished prior to the dependency being completed. |
| 50 | The contract award is protested. | Ensure all procurement rules are followed. Specify clear, non-proprietary requirements. Conduct bidder conferences. Send RFP and contract to DGS Legal counsel for review and approval. Utilize alternative protest procedures. | None | No | Meeting with the Project Sponsor and Executive Steering Committee discuss altering the project schedule. |
| | Sponsorship Commitment | | | | |
| | N/A | N/A | N/A | N/A | N/A |
| | Structure of Installed Systems | | | | |
| | N/A | N/A | N/A | N/A | N/A |
| | Supplier/Vendor Capability/Capacity | | | | |

| # | Risks | Mitigation Plan | Transference | Acceptance | Contingency Plan |
|----|---|---|--------------|------------|--|
| 51 | A vendor and/or product (hardware/software) may be selected that fails to meet requirements in one or more key areas. | <p>Provide the vendor with very clear, complete, and specific functional requirements.</p> <p>Incorporate financial penalties into the contract for failure of the vendor to perform as agreed.</p> <p>Gather as much information as possible from other entities regarding their experiences with the vendors under consideration.</p> <p>Obtain demonstrations and hands-on experience, if possible, with the systems under consideration.</p> <p>Ensure that key technical and business personnel have the opportunity to meet with and question vendors. Obtain and carefully consider their concerns and impressions.</p> <p>Ensure that vendor compensation is clearly tied to delivering a functioning and usable system that meets documented requirements.</p> | Vendor | No | Assess the key area of deficiency and alternatives to satisfying the requirements. |
| 52 | Vendor technical personnel may lack the skills required to implement the new system. | <p>Clearly define vendor selection criteria that assures selection of appropriately skilled vendor personnel.</p> <p>Require minimum skill sets of technical staff in the RFP. Vendor must submit resumes of all key personnel, which demonstrate required skills.</p> <p>Require that the vendor promptly replace personnel on demand, allowing vendor personnel to be quickly moved off the project if necessary.</p> <p>Require vendor to submit resumes of</p> | Vendor | No | Require the vendor replace staff with technically proficient resources. |

| # | Risks | Mitigation Plan | Transference | Acceptance | Contingency Plan |
|----|--|---|--------------|------------|--|
| | | any replacement staff for review and approval. | | | |
| 53 | The vendor might go out of business, or otherwise be unable to provide ongoing support. | Select a base product that may be supported by other vendors with comparable expertise. Contractually provide the means to obtain the source code and full system documentation in the event the vendor is unable to perform. Require vendor to submit financial statements, stakeholder reports, and bond. Ensure DGS and the Legal team review and approve the Qualifications Checklist that is required in the RFP. | Vendor | No | Research opportunities to replace the vendor with another vendor and/or obtain sub-contractor services to complete and/or support the project. |
| 54 | Personnel with critical skills needed for the project cannot be found or are available only part time. | Require the vendor to ensure that identified resources are dedicated and made available to the project to perform assigned tasks in the project schedule. | Vendor | No | Analyze the possibilities for re-arranging the project schedule to allow critical skilled resources the ability to perform assigned tasks. |
| 55 | Personnel need extra time to learn unfamiliar software tools or environment. | Require the vendor to ensure that identified resources are experienced with the software tools to be used on the project. | Vendor | No | Provide documentation and training on the software tools as needed. |
| 56 | New development personnel are added late in the project, and additional training and communications overhead reduces existing team members' effectiveness. | Require the vendor to ensure that identified resources are dedicated and made available to the project to perform assigned tasks in the project schedule to avoid adding staff later. | Vendor | No | Provide an overview or the business and a walk through of the business processes to the new staff joining the project. |
| | System Architecture | | | | |

| # | Risks | Mitigation Plan | Transference | Acceptance | Contingency Plan |
|---|------------|-----------------|--------------|------------|------------------|
| | N/A | N/A | N/A | N/A | N/A |
| | Technology | | | | |
| | N/A | N/A | N/A | N/A | N/A |
| | Turnover | | | | |
| | N/A | N/A | N/A | N/A | N/A |

8. Economic Analysis Worksheets

Five options were considered as possible solutions for the business challenges presented in this FSR:

- Proposed Solution: Develop a custom software solution.
- Alternative #1: Select and implement a COTS or MOTS software product.
- Alternative #2: Acquire and modify a database system used by another state's RPS.
- Alternative #3: Use WREGIS as a base system.
- Alternative #4: Modify existing system using in-house resources.

Alternatives 1 – 3 are not considered viable because:

- Alternative 1: Does not provide the source code to the Energy Commission and is not built with the Energy Commission ITSB supported platform
- Alternative 2: No other state has developed a system that meets the business needs and functional requirements of the Energy Commission.
- Alternative 3: The WREGIS system is not available.

While Alternative 4 is viable, the Energy Commission's ITSB has limited staff resources available to meet the project's technical requirements and critical timing needs. As required, the Economic Analysis Worksheets (EAWs) provide a breakdown of costs for two alternative scenarios (Alternatives 1 and 4 above).

The EAWs provide cost worksheets for the viable solution - develop a custom software solution. The EAWs present estimated PYs and costs for Fiscal Years (FYs) 2014/15 through 2017/18 and represent the one-time and ongoing costs of the RPS Database Project.

This section presents the assumptions made to prepare the cost sheets pursuant to the EAW Package Guidelines. The EAW Worksheets are presented as follows:

1. Existing System/Baseline Cost Worksheet
2. Proposed Solution: Custom Developed Software Solution
3. Alternative Solution: COTS or MOTS Software Solution
4. Alternative Solution: Existing System Modification Solution
5. Economic Analysis Summary
6. Project Funding Plan

8.1. Existing System Cost Worksheet

All existing costs are based on staffing allocations and dollars budgeted in support of the existing system.

8.1.1. Existing Information Technology Costs

There are no existing IT costs to support the current database system.

8.1.2. Existing Program Costs

The RPS program is currently supported by 10 full time employees. Classifications and PY counts for the program staff are shown below in Table 8-1 Existing Program Staff.

Table 8-1 Existing Program Staff

| RPS Staff (Class Title) | PYs |
|--|--------------|
| Office Manager II, Energy | 0.20 |
| Energy Commission Supervisor II, Technology Evaluation and Development (TED) ¹⁶ | 0.60 |
| Energy Commission Specialist III (TED) | 0.75 |
| Energy Commission Specialist II (TED) | 2.00 |
| Energy Commission Specialist I (TED) | 3.25 |
| Associate Energy Specialist (TED) | 1.00 |
| Energy Analyst | 2.20 |
| Total Existing Program Staff | 10.00 |

8.2. Proposed Alternative Cost Worksheet

The total cost (one-time and continuing) of this proposed solution is estimated at \$2,633,817 based on the assumptions outlined in the following subsections.

8.2.1. One-Time IT Project Costs

One-time project costs are based on estimated expenses for the categories of:

- Staff Salaries and Benefits
- Contract Services
- Data Center Services

16 The Energy Commission classifies positions based on areas of specialty. The positions listed in Table 8-1 specialize in the area of technology evaluation and development (TED).

No expenses are anticipated in the cost categories of Telecommunications, Agency Facilities or Other, and are therefore not addressed in the subsections that follow.

Staff Salaries and Benefits

The Energy Commission will provide project staff to support the development of the RFP and the solution by realigning the responsibilities of existing program staff. The \$238,507 cost of project staff assumes personnel will be needed for:

- The 12 month duration of the RFP development, release, and contract award (twelve months in FY 2014/15).
- The 18 month duration of the RPS Database project (twelve months in FY 2015/16 and six months in FY 2016/17).

The personnel required are shown in the table that follows.

Table 8-2 Project Staff

| Project Staff (Class Title) | Number of Staff | Percent on Project |
|--|------------------------|---------------------------|
| Office Manager II, Energy | 1 | 5% |
| Energy Commission Supervisor II (TED) | 1 | 10% |
| Energy Commission Specialist III (TED) | 1 | 15% |
| Energy Commission Specialist II (TED) | 1 | 30% |
| Energy Commission Specialist I (TED) | 2 | 45% |
| Associate Energy Specialist (TED) | 1 | 25% |
| Energy Analyst | 2 | 60% |

Solution Costs

There are three types of costs associated with the proposed solution:

- RFP Development and Contract Award
- System Development
- IPOC

The following table identifies the primary assumptions for the costs of a Procurement Analyst to assist with the RFP development and contract award, a system development vendor, and a half-time DPM II:

Table 8-3 Cost Assumptions

| Type of Solution Costs | Assumptions |
|------------------------|---|
| RFP Development | <ul style="list-style-type: none"> • The RFP development and contract award has an expected duration of 12 months from 7/01/14 to 6/19/15 (resulting in 12 months in FY 2014/15) • The STPD Procurement Analyst works an average of 40 • hours per month for 12 months • Total STPD cost at \$126 per hour) is \$60,480 for FY 2014/15 • <i>Note: If MSA approach is used, this duration would likely be significantly shorter.</i> |
| System Development | <ul style="list-style-type: none"> • The project has an expected duration of 18 months from 6/22/15 to 12/29/16 (resulting in 12 months in FY 2015/16 and six months in FY 2016/17) • The total proposed solution is estimated to contain the following components of development <ul style="list-style-type: none"> ○ 100% custom development • Vendor responsibilities will include: <ul style="list-style-type: none"> ○ Requirements ○ Design /Develop ○ Data Conversion ○ Unit/Integration testing ○ Performance/System testing ○ User Acceptance Testing ○ Training Plan ○ Training Materials ○ Training ○ Deployment of Solution ○ Maintenance & Operations • Vendor resources will include Developers at a rate of \$150 per hour and Business Analysts at a rate of \$125 per hour • 160 working hours per month • Total vendor development project cost is \$2,167,500: \$1,205,000 for FY 2015/16 and \$854,500 for FY 2016/17; \$108,000 in FY 2016/17 for M&O, which is identified below under “Contract Services” |
| IPOC | <ul style="list-style-type: none"> • The project has an expected duration of 18 months from 6/22/15 to 12/29/16 (resulting in 12 months in FY 2015/16 and six months in FY 2016/17) • IPOC works an average of 40 hours per month for the duration of the project • Total IPOC cost (DPM II at 50 percent time) is \$97,500: \$65,000 for FY 2015/16 and \$32,500 for FY 2016/17 |

Data Center Costs

On-going data center costs, shown in Table 8-4, are based on the following assumptions:

- Servers for the solution will reside at the CNRADC.
- Cost for CNRADC BladeSystem environment is based on a menu choice of virtual server resources.
- There are 12 months of development in 2015/16 and six months in FY 2016/17.
- The development/test environment will continue to be used for M&O from December 2016 forward.
- Costs for the production environment will begin November 2016.

Table 8-4 Ongoing Data Center Costs

| Cost Description | Cost Per Item | Number of Items | FY 15/16 | FY 16/17 | FY 17/18 | Ongoing Cost Per Year |
|--|---------------|-----------------|----------|----------|----------|-----------------------|
| Virtual database production server with two CPU's, eight GB of memory, and one terabyte of storage | \$3,045/yr | 1 | | \$2,030 | \$3,045 | \$3,045 |
| Virtual database development/test server with two CPU's, eight GB of memory, and one terabyte of storage | \$3,045/yr | 1 | \$3,045 | \$3,045 | \$3,045 | \$3,045 |
| Virtual Web/App production server with two CPU's, four GB of memory, and 40 GB of storage | \$1,949/yr | 2 | | \$2,599 | \$3,898 | \$3,898 |
| Virtual Web/App development/test server with two CPU's, four GB of memory, and 40 GB of storage | \$1,949/yr | 2 | \$3,898 | \$3,898 | \$3,898 | \$3,898 |
| Total | | | \$6,943 | \$11,572 | \$13,866 | \$13,886 |

8.2.2. Continuing IT Project Costs

Total continuing IT project costs for the solution are estimated at approximately \$177,830 following the assumptions outlined below.

Staff

An existing Senior Programmer Analyst (0.2 PY) will be assigned by ITSB beginning in December FY 2016/17 to work with the vendor on contracted M&O until June FY 2016/17. From July 2017/18 forward, this Senior Programmer Analyst will take over M&O from the vendor and become 0.25 PY. The cost shown in the EAWs includes salary and benefits. Responsibilities for this role include, but are not limited to:

- Maintaining and updating user, system and database configurations and interfaces.
- Research of data that requires technical assistance (e.g., ad hoc reports requiring complex queries).

Software Maintenance and Licenses

- Software maintenance and license costs are included in the Data Center Costs.

Contract Services

The ongoing contract services costs assume that the primary solution vendor will also provide ongoing support and maintenance of the application. The \$108,000 cost of the ongoing maintenance and support are based on the following assumptions:

- Vendor will support the ongoing maintenance and operation of the system for six months at 120 hours per month and a rate of \$150 per hour.
- There are six months of maintenance and operations in FY 2016/17 after implementation in December 2016.

Data Center Services

Ongoing data center costs are based on the costing of the CNRADC discussed in the section on Data Center Costs. After the implementation of the solution, data center costs will continue at the rates described in that section.

8.2.3. Continuing Existing Costs

Existing program costs as found in Section 8.1.2 Existing Program Costs will continue with the implementation of the RPS Database solution. When the current RPS Database MS Access based system is retired in July 2017, an existing part time Senior Programmer Analyst will be assigned by ITSB to support the new solution beginning in December FY 2016/17.

8.3. Economic Analysis Summary

This worksheet summarizes existing system/baseline and costs for:

- Proposed Solution – Custom Developed Software Solution

8.4. Project Funding Plan Worksheet

This worksheet summarizes the costs, realignments, and funding plan for the project. Ongoing maintenance and operations of the solution will be funded through Energy Commission Internal funding. The need for new funding sources to support the long-term maintenance and support of the solution is not anticipated.

Table 8-5 Existing Baseline Costs

CONTINUING EXISTING COSTS

Project # 3360-071

RPS Database Project

| | FY 2014/15 | | FY 2015/16 | | FY 2016/17 | | FY 2017/18 | | TOTAL | |
|--|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|------------------|
| | PYs | Amts |
| Continuing Existing Costs | | | | | | | | | | |
| Information Technology Staff* | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 |
| Other IT Costs | | 0 | | 0 | | 0 | | 0 | | 0 |
| Total Continuing Existing IT Costs | 0.0 | 0 |
| Program Staff* | 10.0 | 930,564 | 10.0 | 930,564 | 10.0 | 930,564 | 10.0 | 930,564 | 30.0 | 2,791,693 |
| Other Program Costs** | | 0 | | 0 | | 0 | | 0 | | 0 |
| Total Continuing Existing Program Costs | 10.0 | 930,564 | 10.0 | 930,564 | 10.0 | 930,564 | 10.0 | 930,564 | 30.0 | 2,791,693 |
| Total Continuing Existing Costs | 10.0 | 930,564 | 10.0 | 930,564 | 10.0 | 930,564 | 10.0 | 930,564 | 30.0 | 2,791,693 |

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Table 8-6 Proposed Solution Economic Analysis Worksheet

PROPOSED ALTERNATIVE: Develop a Custom Software Solution

RPS Database Project

Project #: 3360-071

| | FY 2014/15 | | FY 2015/16 | | FY 2016/17 | | FY 2017/18 | | TOTAL | |
|--|-------------|----------------|-------------|------------------|-------------|------------------|--------------|----------------|-------------|------------------|
| | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts |
| One-Time IT Project Costs | | | | | | | | | | |
| Staff (Salaries & Benefits) | 2.0 | 20,865 | 2.0 | 183,261 | 2.0 | 34,382 | 0.0 | 0 | 4.0 | 238,507 |
| Hardware Purchase | | | | 0 | | 0 | | 0 | | 0 |
| Software Purchase/License | | | | 0 | | 0 | | 0 | | 0 |
| Telecommunications | | | | 0 | | 0 | | 0 | | 0 |
| Contract Services | | | | | | | | | | 0 |
| Software Customization | | | | 1,205,000 | | 854,500 | | 0 | | 2,059,500 |
| Project Management | | | | 0 | | 0 | | 0 | | 0 |
| Project Oversight (CalTech DPM II) | | | | 65,000 | | 32,500 | | 0 | | 97,500 |
| IV&V Services | | | | 0 | | 0 | | 0 | | 0 |
| Other Contract Services (STPD) | | 60,480 | | 0 | | 0 | | 0 | | 60,480 |
| TOTAL Contract Services | | 60,480 | | 1,270,000 | | 887,000 | | 0 | | 2,217,480 |
| Data Center Services | | | | 0 | | 0 | | 0 | | 0 |
| Agency Facilities | | | | 0 | | 0 | | 0 | | 0 |
| Other | | | | 0 | | 0 | | 0 | | 0 |
| Total One-time IT Costs | 2.0 | 81,345 | 2.0 | 1,453,261 | 2.0 | 921,382 | 0.0 | 0 | 4.0 | 2,455,987 |
| Continuing IT Project Costs | | | | | | | | | | |
| Staff (Salaries & Benefits) | 0.0 | 0 | 0.0 | 0 | 0.2 | 8,637 | 0.25 | 28,791 | 0.5 | 37,429 |
| Hardware Lease/Maintenance | | 0 | | 0 | | 0 | | 0 | | 0 |
| Software Maintenance/Licenses | | 0 | | 0 | | 0 | | 0 | | 0 |
| Telecommunications | | 0 | | 0 | | 0 | | 0 | | 0 |
| Contract Services | | 0 | | 0 | | 108,000 | | 0 | | 108,000 |
| Data Center Services | | 0 | | 6,943 | | 11,572 | | 13,886 | | 32,401 |
| Agency Facilities | | 0 | | 0 | | 0 | | 0 | | 0 |
| Other | | 0 | | 0 | | 0 | | 0 | | 0 |
| Total Continuing IT Costs | 0.0 | 0 | 0.0 | 6,943 | 0.2 | 128,209 | 0.25 | 42,677 | 0.5 | 177,830 |
| Total Project Costs | 2.0 | 81,345 | 2.0 | 1,460,204 | 2.2 | 1,049,592 | 0.25 | 42,677 | 4.5 | 2,633,817 |
| Continuing Existing Costs | | | | | | | | | | |
| Information Technology Staff | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 |
| Other IT Costs | | 0 | | 0 | | 0 | | 0 | | 0 |
| Total Continuing Existing IT Costs | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 |
| Program Staff | 8.0 | 759,693 | 8.0 | 759,693 | 8.0 | 759,693 | 10.0 | 930,564 | 26.0 | 3,209,644 |
| Other Program Costs | | 0 | | 0 | | 0 | | 0 | | 0 |
| Total Continuing Existing Program Costs | 8.0 | 759,693 | 8.0 | 759,693 | 8.0 | 759,693 | 10.0 | 930,564 | 26.0 | 3,209,644 |
| Total Continuing Existing Costs | 8.0 | 759,693 | 8.0 | 759,693 | 8.0 | 759,693 | 10.0 | 930,564 | 26.0 | 3,209,644 |
| TOTAL ALTERNATIVE COSTS | 10.0 | 841,038 | 10.0 | 2,219,897 | 10.2 | 1,809,285 | 10.25 | 973,242 | 30.5 | 5,843,462 |
| INCREASED REVENUES | | 0 | | 0 | | 0 | | 0 | | 0 |

Table 8-7 Alternative Solution Economic Analysis Worksheet

ALTERNATIVE #1:

Select and Implement a COTS/MOTS Software Product

RPS Database Project

Project #: 3360-071

| | FY 2014/15 | | FY 2015/16 | | FY 2016/17 | | FY 2017/18 | | TOTAL | |
|--|-------------|----------------|-------------|------------------|-------------|------------------|--------------|------------------|-------------|------------------|
| | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts |
| One-Time IT Project Costs | | | | | | | | | | |
| Staff (Salaries & Benefits) | 2.0 | 20,865 | 2.0 | 183,261 | 2.0 | 34,382 | 0.0 | 0 | 4.0 | 217,643 |
| Hardware Purchase | | | | 0 | | 0 | | 0 | | 0 |
| Software Purchase/License | | | | 1,573,600 | | 0 | | 0 | | 1,573,600 |
| Telecommunications | | | | 0 | | 0 | | 0 | | 0 |
| Contract Services | | | | | | | | | | 0 |
| Software Customization | | | | 200,000 | | 0 | | 0 | | 200,000 |
| Project Management | | | | 2,000,000 | | 700,000 | | 0 | | 2,700,000 |
| Project Oversight (CaITech DPM II) | | | | 65,000 | | 32,500 | | 0 | | 97,500 |
| IV&V Services | | | | 0 | | 0 | | 0 | | 0 |
| Other Contract Services (STPD) | | 60,480 | | 0 | | 0 | | 0 | | 0 |
| TOTAL Contract Services | | 60,480 | | 2,265,000 | | 732,500 | | 0 | | 2,997,500 |
| Data Center Services | | | | 0 | | 0 | | 0 | | 0 |
| Agency Facilities | | | | 0 | | 0 | | 0 | | 0 |
| Other | | | | 0 | | 0 | | 0 | | 0 |
| Total One-time IT Costs | 2.0 | 81,345 | 2.0 | 4,021,861 | 2.0 | 766,882 | 0.0 | 0 | 4.0 | 4,788,743 |
| Continuing IT Project Costs | | | | | | | | | | |
| Staff (Salaries & Benefits) | 0.0 | 0 | 0.0 | 0 | 0.2 | 8,637 | 0.25 | 28,791 | 0.5 | 37,429 |
| Hardware Lease/Maintenance | | 0 | | 0 | | 0 | | 0 | | 0 |
| Software Maintenance/Licenses | | 0 | | 0 | | 282,744 | | 282,744 | | 565,488 |
| Telecommunications | | 0 | | 0 | | 0 | | 0 | | 0 |
| Contract Services | | 0 | | 0 | | 0 | | 0 | | 0 |
| Data Center Services | | 0 | | 6,943 | | 11,572 | | 13,886 | | 32,401 |
| Agency Facilities | | 0 | | 0 | | 0 | | 0 | | 0 |
| Other | | 0 | | 0 | | 0 | | 0 | | 0 |
| Total Continuing IT Costs | 0.0 | 0 | 0.0 | 6,943 | 0.2 | 302,953 | 0.25 | 325,421 | 0.5 | 635,318 |
| Total Project Costs | 2.0 | 81,345 | 2.0 | 4,028,804 | 2.2 | 1,069,836 | 0.25 | 325,421 | 4.5 | 5,424,061 |
| Continuing Existing Costs | | | | | | | | | | |
| Information Technology Staff | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 |
| Other IT Costs | | 0 | | 0 | | 0 | | 0 | | 0 |
| Total Continuing Existing IT Costs | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 |
| Program Staff | 8.0 | 759,693 | 8.0 | 759,693 | 8.0 | 759,693 | 10.0 | 930,564 | 26.0 | 2,449,951 |
| Other Program Costs | | 0 | | 0 | | 0 | | 0 | | 0 |
| Total Continuing Existing Program Costs | 8.0 | 759,693 | 8.0 | 759,693 | 8.0 | 759,693 | 10.0 | 930,564 | 26.0 | 2,449,951 |
| Total Continuing Existing Costs | 8.0 | 759,693 | 8.0 | 759,693 | 8.0 | 759,693 | 10.0 | 930,564 | 26.0 | 2,449,951 |
| TOTAL ALTERNATIVE COSTS | 10.0 | 841,038 | 10.0 | 4,788,497 | 10.2 | 1,829,529 | 10.25 | 1,255,986 | 30.5 | 7,874,012 |
| INCREASED REVENUES | | | | 0 | | 0 | | 0 | | 0 |

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Table 8-8 Alternative Solution Economic Analysis Worksheet

ALTERNATIVE #2:

Modify Existing System - In-House Resources

RPS Database Project

Project #: 3360-071

| | FY 2014/15 | | FY 2015/16 | | FY 2016/17 | | FY 2017/18 | | TOTAL | |
|--|-------------|----------------|-------------|------------------|-------------|----------------|-------------|------------------|-------------|------------------|
| | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts |
| One-Time IT Project Costs | | | | | | | | | | |
| Staff (Salaries & Benefits) | 2.0 | 20,865 | 2.0 | 183,261 | 2.0 | 34,382 | | 0 | 4.0 | 217,643 |
| Hardware Purchase | | | | 0 | | 0 | | 0 | | 0 |
| Software Purchase/License | | | | | | 0 | | 0 | | 0 |
| Telecommunications | | | | 0 | | 0 | | 0 | | 0 |
| Contract Services | | | | | | | | | | 0 |
| Software Customization | | | | | | 0 | | 0 | | 0 |
| Project Management | | | | | | | | 0 | | 0 |
| Project Oversight (CalTech DPM II) | | 65,000 | | 65,000 | | 65,000 | | 0 | | 130,000 |
| IV&V Services | | | | 0 | | 0 | | 0 | | 0 |
| Other Contract Services | | | | 0 | | 0 | | 0 | | 0 |
| TOTAL Contract Services | | 65,000 | | 65,000 | | 65,000 | | 0 | | 130,000 |
| Data Center Services | | | | 0 | | 0 | | 0 | | 0 |
| Agency Facilities | | | | 0 | | 0 | | 0 | | 0 |
| Other | | | | 0 | | 0 | | 0 | | 0 |
| Total One-time IT Costs | 2.0 | 85,865 | 2.0 | 248,261 | 2.0 | 99,382 | 0.0 | 0 | 4.0 | 347,643 |
| Continuing IT Project Costs | | | | | | | | | | |
| Staff (Salaries & Benefits) | 0.0 | 0 | 0.0 | 0 | | | | | 0.0 | 0 |
| Hardware Lease/Maintenance | | 0 | | 0 | | 0 | | 0 | | 0 |
| Software Maintenance/Licenses | | 0 | | 0 | | | | | | 0 |
| Telecommunications | | 0 | | 0 | | 0 | | 0 | | 0 |
| Contract Services | | 0 | | 0 | | 0 | | 0 | | 0 |
| Data Center Services | | 0 | | 6,943 | | 11,572 | | 13,886 | | 32,401 |
| Agency Facilities | | 0 | | 0 | | 0 | | 0 | | 0 |
| Other | | 0 | | 0 | | 0 | | 0 | | 0 |
| Total Continuing IT Costs | 0.0 | 0 | 0.0 | 6,943 | 0.0 | 11,572 | 0.0 | 13,886 | 0.0 | 32,401 |
| Total Project Costs | 2.0 | 85,865 | 2.0 | 255,204 | 2.0 | 110,954 | 0.0 | 13,886 | 4.0 | 380,044 |
| Continuing Existing Costs | | | | | | | | | | |
| Information Technology Staff | 0.5 | 60,000 | 0.5 | 60,000 | 0.5 | 60,000 | 0.5 | 60,000 | 1.5 | 180,000 |
| Other IT Costs | | 5,000 | | 5,000 | | 5,000 | | 5,000 | | 15,000 |
| Total Continuing Existing IT Costs | 0.5 | 65,000 | 0.5 | 65,000 | 0.5 | 65,000 | 0.5 | 65,000 | 1.5 | 195,000 |
| Program Staff | 8.0 | 759,693 | 8.0 | 759,693 | 8.0 | 759,693 | 10.0 | 930,564 | 26.0 | 2,449,951 |
| Other Program Costs | | 0 | | 0 | | 0 | | 0 | | 0 |
| Total Continuing Existing Program Costs | 8.0 | 759,693 | 8.0 | 759,693 | 8.0 | 759,693 | 10.0 | 930,564 | 26.0 | 2,449,951 |
| Total Continuing Existing Costs | 8.5 | 824,693 | 8.5 | 824,693 | 8.5 | 824,693 | 10.5 | 995,564 | 27.5 | 2,644,951 |
| TOTAL ALTERNATIVE COSTS | 10.5 | 910,558 | 10.5 | 1,079,897 | 10.5 | 935,648 | 10.5 | 1,009,450 | 31.5 | 3,024,995 |
| INCREASED REVENUES | | | | 0 | | 0 | | 0 | | 0 |

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Table 8-9 Economic Analysis Summary

ECONOMIC ANALYSIS SUMMARY

RPS Database Project

Project #: 3360-071

| | FY 2014/15 | | FY 2015/16 | | FY 2016/17 | | FY 2017/18 | | TOTAL | |
|-----------------------------|---|----------|------------|-------------|------------|-------------|------------|-------------|-------|-------------|
| | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts |
| EXISTING SYSTEM | | | | | | | | | | |
| Total IT Costs | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 |
| Total Program Costs | 10.0 | 759,693 | 10.0 | 759,693 | 10.0 | 759,693 | 10.0 | 930,564 | 30.0 | 2,449,951 |
| Total Existing System Costs | 10.0 | 759,693 | 10.0 | 759,693 | 10.0 | 759,693 | 10.0 | 930,564 | 30.0 | 2,449,951 |
| PROPOSED ALTERNATIVE | Develop a Custom Software Solution | | | | | | | | | |
| Total Project Costs | 2.0 | 81,345 | 2.0 | 1,460,204 | 2.2 | 1,049,592 | 0.25 | 42,677 | 4.5 | 2,633,817 |
| Total Cont. Exist. Costs | 8.0 | 759,693 | 8.0 | 759,693 | 8.0 | 759,693 | 10.0 | 930,564 | 26.0 | 3,209,644 |
| Total Alternative Costs | 10.0 | 841,038 | 10.0 | 2,219,897 | 10.2 | 1,809,285 | 10.25 | 973,242 | 30.5 | 5,843,462 |
| COST SAVINGS/AVOIDANCES | 0.0 | (81,345) | 0.0 | (1,460,204) | (0.2) | (1,049,592) | (0.25) | (42,677) | (0.4) | (3,393,511) |
| Increased Revenues | | 0 | | 0 | | 0 | | 0 | | 0 |
| Net (Cost) or Benefit | 0.0 | (81,345) | 0.0 | (1,460,204) | (0.2) | (1,049,592) | (0.25) | (42,677) | (0.4) | (3,393,511) |
| Cum. Net (Cost) or Benefit | 0.0 | (81,345) | 0.0 | (1,460,204) | (0.2) | (2,509,795) | (0.4) | (2,552,473) | | |

Version: 5.0

Table 8-10 Project Funding Plan

Renewables Portfolio Standard Database Project

Project #: 3360-071

| | FY 2014/15 | | FY 2015/16 | | FY 2016/17 | | FY 2017/18 | | TOTALS | |
|---|-------------|---------------|-------------|------------------|-------------|------------------|-------------|---------------|-------------|------------------|
| | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts |
| TOTAL PROJECT COSTS | 2.0 | 81,345 | 2.0 | 1,460,204 | 2.2 | 1,049,592 | 0.25 | 42,677 | 4.5 | 2,633,817 |
| RESOURCES TO BE REDIRECTED | | | | | | | | | | |
| Staff | 2.0 | 20,865 | 2.0 | 183,261 | 2.2 | 43,019 | 0.0 | 0 | 4.2 | 247,144 |
| Funds: | | | | | | | | | | |
| Existing System | | 0 | | 6,943 | | 11,572 | | | | 18,515 |
| Other Fund Sources | | 0 | | 0 | | 0 | | 0 | | 0 |
| TOTAL REDIRECTED RESOURCES | 2.0 | 20,865 | 2.0 | 190,204 | 2.2 | 54,591 | 0.0 | 0 | 4.2 | 265,659 |
| ADDITIONAL PROJECT FUNDING NEEDED | | | | | | | | | | |
| One-Time Project Costs | 0.0 | 60,480 | 0.0 | 1,270,000 | 0.0 | 887,000 | 0.0 | 0 | 0.0 | 2,217,480 |
| Continuing Project Costs | 0.0 | 0 | 0.0 | 0 | 0.0 | 108,000 | 0.25 | 42,677 | 0.25 | 150,677 |
| TOTAL ADDITIONAL PROJECT FUNDS NEEDED BY FISCAL YEAR | 0.0 | 60,480 | 0.0 | 1,270,000 | 0.0 | 995,000 | 0.25 | 42,677 | 0.25 | 2,368,157 |
| TOTAL PROJECT FUNDING | 2.0 | 81,345 | 2.0 | 1,460,204 | 2.2 | 1,049,591 | 0.25 | 42,677 | 4.5 | 2,633,819 |
| Difference: Funding - Costs | 0.0 | 0 | 0.0 | 0 | 0.0 | (0) | 0.0 | 0 | 0.0 | (0) |
| Total Estimated Cost Savings | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 |
| FUNDING SOURCE* | | | | | | | | | | |
| General Fund | | - | 0% | - | 0% | - | 0% | - | 0% | - |
| Federal Fund (PVEA) | | | 100% | 1,205,000 | 100% | 962,500 | 0% | - | 82% | 2,167,500 |
| Special Fund (ERPA) | 100% | 81,345 | 100% | 255,204 | 100% | 87,091 | 100% | 42,677 | 18% | 466,317 |
| Reimbursement | | - | 0% | - | 0% | - | 0% | - | 0% | - |
| TOTAL FUNDING | 100% | 81,345 | 100% | 1,460,204 | 100% | 1,049,591 | 100% | 42,677 | 100% | 2,633,817 |

Funding source: Federal - Petroleum Violations Escrow Account (PVEA) in the amount of \$2,167,500 (Note: this amount includes \$108,000 in M&O costs to be performed by vendor; M&O included under "Continuing Project Costs" in 2016/17); Special - Energy Resources Program Account in the amount of \$466,317 to fund \$157,980 in one-time IPOC and Procurement Analyst costs and \$308,337 in continuing staff costs.

ADJUSTMENTS, SAVINGS AND REVENUES WORKSHEET

Project #: 3360-071

Renewables Portfolio Standard Database Project

| Annual Project Adjustments | FY 2014/15 | | FY 2015/16 | | FY 2016/17 | | FY 2017/18 | | Net Adjustments | |
|--|------------|---------------|------------|------------------|------------|------------------|-------------|------------------|-----------------|------------------|
| | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts | PYs | Amts |
| One-time Costs | | | | | | | | | | |
| Previous Year's Baseline | 0.0 | 0 | 0.0 | 0 | 0.0 | 1,270,000 | 0.0 | 887,000 | | |
| (A) Annual Augmentation /(Reduction) | 0.0 | 60,480 | 0.0 | 1,270,000 | 0.0 | (383,000) | 0.0 | (887,000) | | |
| (B) Total One-Time Budget Actions | 0.0 | 60,480 | 0.0 | 1,270,000 | 0.0 | 887,000 | 0.0 | 0 | 0.0 | 2,217,480 |
| Continuing Costs | | | | | | | | | | |
| Previous Year's Baseline | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 108,000 | | |
| (C) Annual Augmentation /(Reduction) | 0.0 | 0 | 0.0 | 0 | 0.0 | 108,000 | 0.25 | (65,323) | | |
| (D) Total Continuing Budget Actions | 0.0 | 0 | 0.0 | 0 | 0.0 | 108,000 | 0.25 | 42,677 | 0.25 | 150,677 |
| Total Annual Project Budget Augmentation /(Reduction) [A + C] | 0.0 | 60,480 | 0.0 | 1,270,000 | 0.0 | (275,000) | 0.25 | (952,323) | | |

[A, C] Excludes Redirected Resources

Total Additional Project Funds Needed [B + D]

| | |
|-------------|------------------|
| 0.25 | 2,368,157 |
|-------------|------------------|

Annual Savings/Revenue Adjustments

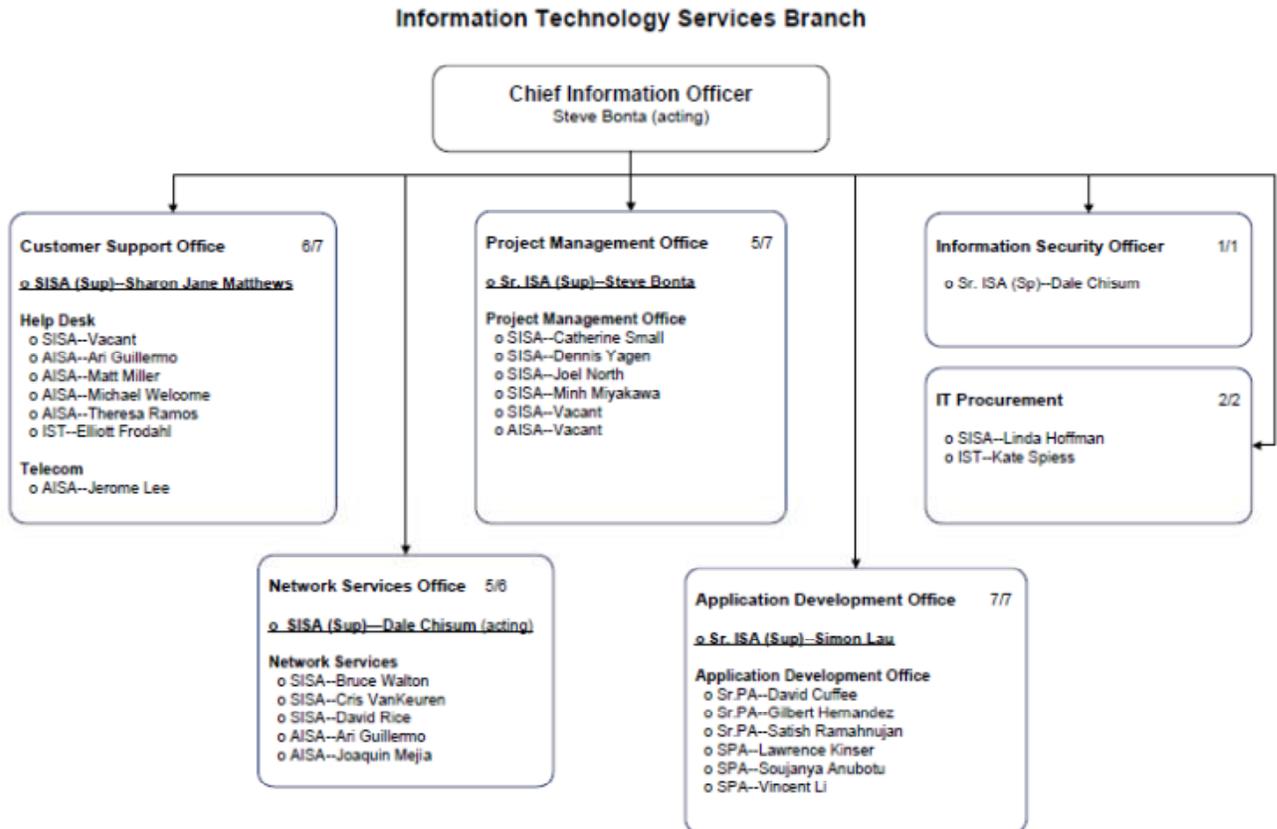
| Cost Savings | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | | |
|----------------------------|-----|---|-----|---|-----|---|-----|---|--|--|
| Increased Program Revenues | | 0 | | 0 | | 0 | | 0 | | |

Appendix A. Acronyms

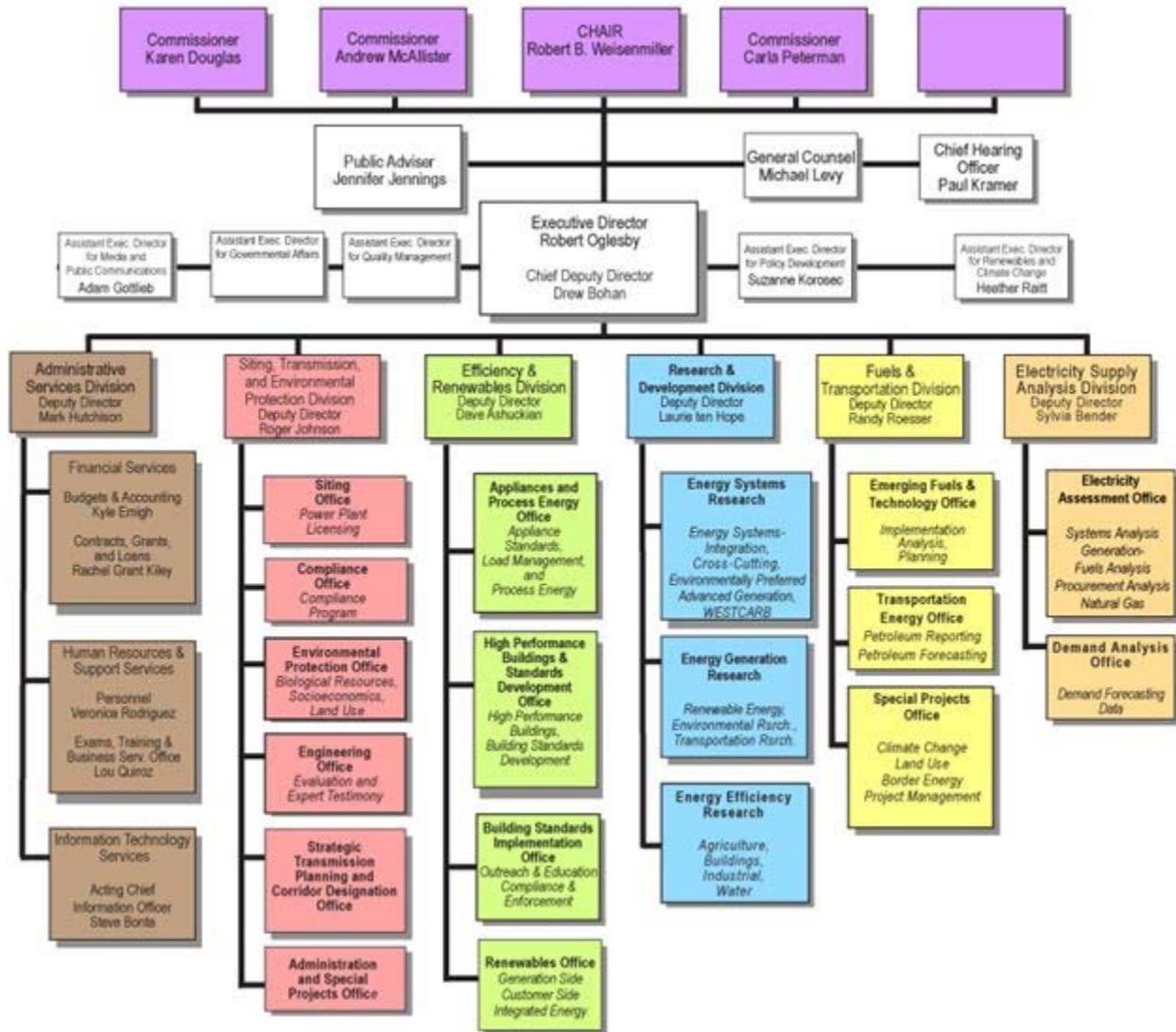
| Term | Definition |
|-------------------|---|
| ARB | Air Resources Board |
| CA-PMM | California Project Management Methodology |
| CBA | California Balancing Authority |
| CIO | Chief Information Officer |
| CMAS | California Multiple Awards Schedule |
| CNRADC | California Natural Resources Agency Data Center |
| COTS | Commercial Off-the-Shelf |
| CPU | Central Processing Unit |
| CPUC | California Public Utilities Commission |
| CalTech | California Department of Technology |
| DBMS | Database Management System |
| DGS | Department of General Services |
| DNS | Domain Name System |
| EAO | Electricity Analysis Office |
| EAW | Economic Analysis Worksheet |
| EIA | Energy Information Administration |
| Energy Commission | California Energy Commission |
| FERC | Federal Energy Regulatory Commission |
| FSR | Feasibility Study Report |
| FY | Fiscal Year |
| GB | Gigabytes |
| GC | Government Code |
| GPS | Global Positioning System |
| GUI | Graphical User Interface |
| HTML | Hyper Text Markup Language |
| HTTPS | Hypertext Transfer Protocol |
| ID | Identification |
| IOU | Investor-Owned Utility |
| IPOC | Independent Project Oversight Consultant |
| ISO | Information Security Officer |
| IT | Information Technology |
| ITS | Interim Tracking System |
| ITSB | Information Technology Services Branch |

| Term | Definition |
|-------------|--|
| kWh | Kilowatt Hour |
| LORS | Laws, Ordinances, Regulations and Standards |
| LSE | Load Serving Entity |
| M&O | Maintenance and Operations |
| MOTS | Modifiable Off-the-Shelf |
| MS | Microsoft |
| MSW | Municipal Solid Waste |
| MW | Megawatt |
| MWh | Megawatt-hour |
| NERC | North American Electric Reliability Corporation |
| PIER | Post Implementation Evaluation Report |
| PMBOK | Project Management Body of Knowledge |
| PMI | Project Management Institute |
| PMO | Project Management Office |
| POU | Publicly Owned Utility |
| PSDP | Power Source Disclosure Program |
| PY | Personnel Year |
| QF | Qualifying Facility |
| REC | Renewable Energy Certificate |
| RFO | Request for Offer |
| RFP | Request for Proposal |
| RPS | Renewables Portfolio Standard |
| SB | Senate Bill |
| SIMM | State Information Management Manual |
| SQL | Structured Query Language |
| SSL | Secure Socket Layer |
| STPD | Statewide Technology Procurement Division |
| TED | Technology Evaluation and Development |
| TCP/IP | Transmission Control Protocol/Internet Protocol |
| WECC | Western Electricity Coordinating Council |
| WREGIS | Western Renewable Energy Generation Information System |

Appendix B. ITSB Organization Chart



Appendix C. CA Energy Commission Organization Chart



Appendix D. CalTech Questionnaire for Information Security

State of California

California Technology Agency

**Questionnaire for Information Security
and Privacy Components
in Feasibility Study Reports
and Project-Related Documents**

SIMM 20D

July 15, 2013

1.0 Introduction

The following Questionnaire assists state agencies with describing the information security and privacy components associated with an IT project in its Feasibility Study Reports and other project-related documents. The Office of Information Security reviews these documents to ensure information security and privacy components are addressed by the state agency and provide its recommendations to CalTech.

If any of the answers could be considered sensitive in nature, the agency should address them in a separate addendum marked "Confidential" and include as an attachment to the document

2.0 Information Security Officer (ISO) Role and Responsibilities

- 1. What is the role and responsibilities of the Agency ISO in relationship to this project?**

The ISO will be involved in reviewing security requirements in all phases of the project.

- 2. Will the ISO be involved in developing and reviewing the security requirements?**

Yes

- 3. Will the ISO be involved in developing and reviewing the security testing efforts?**

Yes

- 4. Has the ISO participated in the response to these questions and signed off on the project-related document(s)?**

Yes

3.0 Proposed System

- 1. Who will be the designated owner of the proposed system (system)?**

The Renewable Energy Office Manager will be the designated owner of the proposed system.

- 2. Who will be the custodians and users of the system?**

The custodians of the system will be Energy Commission's ITSB. The users will be the RPS Unit staff and the public.

- 3. Has the data for the system been classified by the owner? Explain.**

Yes, the data has been classified by the Renewable Energy Office Manager as Low Sensitivity at the current time since it does not contain any confidential information.

4. Does the project require development of new application code or modification of existing code? Explain.

The new system requires the development of new code to accommodate new RPS functionality. The Energy Commission explored the use of COTS, MOTS, acquisition and modification of another state's RPS, and the use of WREGIS as a base system as potential solutions. As stated in Section 5 of this document, none of the alternatives proved to be viable.

5. Will your agency share the data for the system with other entities? If so, who?

- a. Load Serving Entities (LSEs)
- b. Generator Facilities
- c. CPUC
- d. ARB
- e. Public and other interested parties

6. If data for the system is to be shared with other entities, will your agency implement data exchange agreements with the entities? Explain.

The Energy Commission will implement data exchange agreements as applicable with other state agencies that will have direct system access using role-based security such as the CPUC. LSEs, generator facilities and other interested parties will not need agreements.

7. Are there checkpoints throughout the software development life cycle (SDLC) verifying and certifying that the security requirements are being met?

Yes. As part of the requirements analysis phase, detailed security requirements will be identified and factored into the overall project scope of work for the project. Each deliverable in the design and development phase will be reviewed to ensure the project is developed in accordance with the necessary security requirements. During the integration and test phase, the system will be evaluated to ensure it adheres to the scope of the security requirements.

8. At what points will risk assessments be performed throughout the SDLC?

Risk management will occur throughout the entire project life cycle. A comprehensive project risk management plan will be developed and implemented. Although the project manager will be responsible for leading the risk management process, an analyst will be assigned for the managing the project risk plan. These tasks include risk identification, risk assignment, risk monitoring and risk reporting.

9. At what point will vulnerability assessments be performed once the system is put into production (e.g., ongoing risk management after implementation)?

Ongoing maintenance will be performed to maintain system security. Vulnerability assessments may be performed on an ad hoc basis.

10. Will this system collect federal data? If so, have you yet determined the National Institute for Standards and Technology 800-53 rating (i.e., high / medium / low)?

No

11. Does your state agency's Five Year IT Capital Plan address information security and privacy as related to this system?

The system is designed in accordance with the Energy Commission's Five Year IT Capital Plan. The plan addresses security and privacy in regards to all systems for which ITSB is the custodian. The system will not need any unusual or unique security or privacy measures.