




California ISO
Shaping a Renewed Future

Business Requirements Specification

Pay for Performance Enhancement

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1. Introduction

1.1 Purpose

The purpose of this document is to capture and record a description of what the Users and Business Stakeholders of the project wish to obtain by providing high-level business requirements. This document establishes the basis for the agreement between the initiators and implementers of the project. The information in this document serves as input to determining the scope of Information Systems projects and to all Business Process Modeling and System Requirements Specifications efforts.

These requirements will serve as the initial set of business unit requirements for the appropriate software application/systems development effort. It is understood that additional requirements and systems analysis may produce “To Be” Business Process Models, System Requirements Specifications, and Use Cases to serve as the set of requirements documents used by the development teams to buy, modify, or build the necessary software and hardware systems. The Business Unit(s) involved in the project will have an opportunity to review and approve all requirements documentation produced.

1.2 References

All references represent external requirements documents or stakeholder requests developed and submitted by the Business Units.


1. The Draft Final Proposal – Pay for Performance Year One Design Change is http://www.caiso.com/Documents/DraftTariffLanguage_PayForPerformanceYearOneDesignChanges.doc

2. Details of Business Need/Problem

2.1 Description

In October 2011, the Commission issued Order 755, which adopted a final rule for compensation of frequency regulation in organized wholesale power markets. The Commission’s final rule required organized markets to compensate regulation resources based on the actual service provided, including a capacity payment that reflects the marginal unit’s opportunity costs and a performance payment that reflects the quantity of regulation service actually provided by a resource when the resource accurately follows a dispatch signal.

In response to the final rule, the ISO developed an Order 755-compliant market design, which the Commission accepted effective June 1, 2013. The design uses a two-part structure to establish capacity and mileage clearing prices for bid-in and self-provided regulation. As part of this structure, the ISO estimates the expected mileage from the capacity a resource bids-in or self-provides based on that resource’s specific mileage multiplier. This expected mileage allows the ISO to optimize capacity offered to satisfy regulation requirements and to establish a market clearing price for

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performance payments as adjusted for accuracy. Under the ISO’s market design, a resource responding to the ISO’s control signal receives a performance payment based on the resource’s actual movement in response to the control signal. In other words, the ISO adjusts a resource’s performance payment based on how accurately it responds to the ISO’s control signal.

As part of its design, the ISO also implemented a minimum performance threshold for resources providing regulation up or regulation down. Many resources certified to provide regulation in the ISO’s market have not met this minimum performance threshold and, on January 10, 2014, the ISO requested a limited waiver and the Commission approved of these tariff provisions until December 31, 2014. The ISO requested the waiver to avoid the market disruption that might occur if it required all resources that did not meet the minimum performance threshold to recertify to provide regulation service.

During the stakeholder process to develop the ISO’s pay for performance regulation market design, it was anticipated that potential changes may be needed based upon operational experience under the new regulation paradigm. The ISO believes that significant redesign of the pay for performance regulation market design is unwarranted at this time. However, the ISO does believe that two changes are warranted: (1) modification of the monthly accuracy calculation from a simple average to a weighted average and (2) reduction of the minimum performance threshold to 25%.

3. Business Process Impacts

3.1 High Level Business Process

3.1.1 Description


The two changes introduced by this project are

- The monthly regulation performance calculation will be changed from the current simple average to the weighted average with 15-minute instructed regulation mileage as the weighting factor
- The minimum regulation performance threshold will be reduced from the current 50% to 25%.

All the changes will be implemented in MQS involving calculation logics and configurable parameter changes. There is no business process impact.

3.2 Justification

The project is mandated by Pay for Performance Regulation Year 1 Design Changes.

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4. Business Requirements

The sections below describe the Business Processes and the associated Business Requirements involved in the project. These may represent high level functional, non-functional, reporting and/or infrastructure requirements. These business requirements directly relate to the high level scope items determined for the project.


4.1 Business Process: <Manage Market Quality System (MQS)>

4.1.1 Business Requirements

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ID#	Business Feature	Requirement Type	Potential Application(s) Impacted		
PFPE-BRQ001	<p>The monthly regulation up performance accuracy calculation shall be changed from the current simple average to the weighted average with the 15-minute interval instructed regulation up mileage as the weighting factor:</p> $ACU_r = \frac{\sum_{i \in MU_r} IUM_{r,i} * CU_{r,i}}{\sum_{i \in MU_r} IUM_{r,i}}$ <p>Notation:</p> <p>ACU_r Monthly average performance accuracy for regulation up for resource r for all market intervals</p> <p>MU_r the set of 15-minute intervals for which the resource is scheduled for regulation up in each calendar month</p> <p>$IUM_{r,i}$ the resource Instructed regulation up mileage of each 15-minute intervals</p> <p>$CU_{r,i}$ the resource regulation up performance accuracy of each 15-minute intervals</p> <p>The current rules MU_r and ACU_r remain unchanged:</p> <p>The set MU_r shall not include the 15-minute intervals with missing data (e.g., missing telemetry data) in calculating the resource's historical accuracy. ACU_r shall be set to zero when the resource has not been scheduled for regulation up during the calendar month at all.</p> <p>Note that the current rolling 30-day regulation up performance accuracy calculation shall remain unchanged.</p>	Core	MQS		

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
PFPE-BRQ002	<p>The monthly regulation down performance accuracy calculation shall be changed from the current simple average to the weighted average with the 15-minute interval instructed regulation down mileage as the weighting factor:</p> $ACD_r = \frac{\sum_{i \in MD_r} IDM_{r,i} * CD_{r,i}}{\sum_{i \in MD_r} IDM_{r,i}}$ <p>Notation:</p> <p>ACD_r Monthly average performance accuracy for regulation down for resource r for all market intervals</p> <p>MD_r the set of 15-minute intervals for which the resource is scheduled for regulation down in each calendar month</p> <p>$IDM_{r,i}$ the resource Instructed regulation down mileage of each 15-minute intervals</p> <p>$CD_{r,i}$ the resource regulation down performance accuracy of each 15-minute intervals</p> <p>The current rules MD_r and ACD_r remain unchanged:</p> <p>The set MD_r shall not include the 15-minute intervals with missing data (e.g., missing telemetry data) in calculating the resource's historical accuracy. ACD_r shall be set to zero when the resource has not been scheduled for regulation down during the calendar month at all.</p> <p>Note that the current rolling 30-day regulation down performance accuracy calculation shall remain unchanged.</p>	Core	MQS

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4.2 Business Process: <Manage Resource Regulation Service Certification>

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
PFPE-BRQ003	To certify the resource eligibility of providing regulation service, the minimum performance threshold measured each calendar month that issues for both the regulation up and the regulation down services shall be reduced from the current 50% to 25%.	Core	MF

4.3 Business Process: Metrics and Performance Criteria

4.3.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
PFPE-BRQ004	MQS shall still be able to meet all the existing metrics and performance criteria after these changes described in Section 5.1.	Core	MQS