![California ISO logo]

Business Requirements Specification

Ancillary Services State of Charge Constraint

Document Version: 1.0

Current Version Date: 2/8/2023

California ISO	**Technology**	**Template Version:**	**6.8**
		Document Version:	**1**
Ancillary Services State of Charge Constraint **Business Requirements Specification - Planning**		**Date Created:**	**2/7/2023**

Table of Contents

Owner: Freed; Adam

Copyright 2023 California ISO

Program Office

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 determine the scope of projects and all Business Process Modeling and System Requirements Specifications (SRS) efforts.

Business requirements are what must be delivered to provide value for the Users and Business Stakeholders. Systems, software, and processes are the ways (how) to deliver, satisfy, or meet the business requirements (what).

Project Background

In spring of 2022, the Department of Market Monitoring (DMM) discovered undue market outcomes resulting from regulation down awards to or self-provisions by storage resources for long periods when paired with high energy bids from those resources. In these circumstances, storage resources receive unusually large and unwarranted receive Real-Time Market (RTM) Bid Cost Shortfall payments. DMM observed situations where discharge instructions resulting from this constraint were uneconomic because the prevailing LMPs were below the storage resource's energy bids. As a result, the storage resources were eligible to receive RTM Bid Cost Shortfall payments because of the difference between their bids and the prevailing prices during the interval when the resource was issued instructions to discharge. Because the storage resources' bids were at or near the bid cap, the bid cost recovery payments were abnormally high. Both DMM and the CAISO have concluded that these excess bid cost recovery payments under these conditions cannot be justified by the principles underlying bid cost recovery. The CAISO has already filed Tariff changes with FERC to address the issue with an effective date of 09/20/2022.

Project Scope

Make storage resources ineligible for RTM Bid Cost Shortfall payments for certain market intervals:

- When the market state of charge (SOC) constraint is binding due to AS Awards causing the market to dispatch resource energy uneconomically
- Re-settle relevant intervals (beginning with effective date of 09/20/2022)

2 Details of Business Need/Problem

2.1 Description

Business Opportunity/Problem Statement:	
What:	The Department of Market Monitoring (DMM) identified a potential issue whereby energy storage resources had the potential to game the market through the bid cost recovery (BCR) mechanism. This initiative addresses the issue by making storage resources ineligible for RTM Bid Cost Shortfall payments during certain market intervals. The Tariff language has already been filed to provide the CAISO with the necessary authority to implement this enhancement and re-settle the relevant intervals.
Why do we have this opportunity/problem:	DMM discovered this potential gaming issue and informed the CAISO of the gap. The CAISO seeks to address the gap with market design enhancements.

Owner: Freed; Adam

Program Office

Doc ID: GNFDMDEHU6BB-46-53

Page 5 of 11

3 Project Impact Assessment (IA)

3.1 Business Practice Manuals (BPM)

BPM	Description of Impact(s)
Market Instruments	Describe new resource-specific CMRI report on AS SOC binding constraint
Market Operations	Expand on AS SOC constraint, and explain requirement for storage resources in RTPD/RTD (applies to spin/non-spin, regulation up/regulation down).
Settlements and Billing	Update configuration guides to reflect use of new constraint, RTM Bid Cost Shortfall ineligibility.

3.2 Other

Impact	Description (optional)
Market Simulation	Yes: for Settlement configuration change
Market Participant Impact	Yes: ISO BA storage customers to receive new CMRI report
External Bid Publication	New resource-specific CMRI report only, no bidding impacts
Operational Procedures	No
Customer Readiness Impact	
• **External Communication Needed**	Yes
• **External Onboarding and Maintenance**	No
• **External Training**	Yes
• **External Computer Based Training**	No
Policy Initiative	Yes

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 RTM

4.1.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
ASSOC-BRQ001	System shall broadcast RTD/RTPD AS SOC Flag: Flag shall indicate that storage resource awarded MW was limited due to AS SOC binding constraint on either direction for the binding interval pricing run to downstream systems. When the constraint is binding, broadcast shall include: trade date, time interval, market (RTD vs. RTPD), resource ID Note: RTM shall only broadcast flag when the constraint is binding Note: Flag applies to storage resources using the non-generator resource (NGR) model	Core	RTM

4.2 Business Process: Manage Settlements

4.2.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
ASSOC-020	System shall receive RTD/RTPD AS SOC Flag. Data shall include: trade date, time interval, market (RTD vs. RTPD), resource ID	Core	Settlements (RTM)
ASSOC-023	System shall map received payloads to bill determinants that were created for AS SOC Constraint	Core	Settlements
ASSOC-024	RTM Bid Cost Shortfall interval adjustment due to binding AS SOC Constraint: • System shall flag any interval where the RTD or RTPD constraint is non-zero	Core	Settlements

ASSOC-025	For any AS SOC Constraint identified interval the system shall evaluate RTM Bid Cost Shortfall/surplus and apply logic as follows:
	
	• If RTM Bid Cost is > RTM Market Revenue (shortfall):
	    ○ This interval shall be set to 0 in the daily BCR settlements;
	
	• If RTM Bid Cost is ≤ RTM Market Revenue (surplus):
	    ○ There shall be no change in this interval
	
	These surpluses shall be included in the daily BCR settlements and used to cover shortfalls that may have been generated in other periods in the day.
		Core	Settlements

4.3 Business Process: Manage CMRI

4.3.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
ASSOC-030	System shall receive RTD/RTPD AS SOC Flag. Data shall include: trade date, time interval, market (RTD vs. RTPD), resource ID	Core	CMRI
ASSOC-031	System shall develop new external report to inform customers on AS SOC binding constraint data Data shall include: trade date, time interval, market (RTD vs. RTPD), resource ID -Report shall be private and resource-specific	Core	CMRI

4.4 Business Process: Market/Business Simulation

This section shall provide a basis for the development of the Market/Business Simulation Scenarios. These requirements will provide guidance on the market participant impacts, inputs into the Scenarios, endpoints to the Scenarios and reasons for potential Scenarios. The guidance on market participant impacts shall be gathered from the requirements that impact rules, interfaces, applications/reports, new system processes, new/modified data models, and new user roles. The source and sink systems shall be determined through the development of the system context diagram and the web service requirements. The *Reason for the Potential Scenario* column will be to offer guidance regarding what potential scenarios, and their context, may be needed for this project. This section applies to all policy development projects, market enhancements, technology enhancements, operation enhancements, Energy Imbalance Market (EIM) implementations, and Reliability Coordination (RC) service implementations. If the project team has deemed that no structured testing is needed, an end-to-end test case must be specified.

In the Reason for Potential Scenario column, select one or more of the following reasons:

1. **Rule Impacts**: Generalized changes in market rules, bidding rules, settlements rules, market design changes, or other business rules.

2. **Interface changes**: Changes that impact templates (e.g., the Resource Adequacy (RA) supply plan), user interface (UI), and application programming interface (API) (e.g., retrievals of new shadow settlement data).

3. **New application/report**: Changes that cause addition/modification of market software or reports, especially when market data input is required by the market participant.

4. **New system process**: Modification of data flow in systems, especially if the new process requires the market participant to demonstrate proficiency prior to production.

5. **New/Modified model data**: Addition or substantial modification of model data as a market solution or export provided by the ISO.

6. **New user role**: The addition or modification of access permissions for a user role applied to specific business units within an WEIM entity or market participant organization (e.g., Load Serving Entity (LSE) as a Local Regulatory Authority (LRA) role). Scenarios are beneficial for market participants taking on a new function or process within their organization.

4.4.1 Business Requirements

ID#	Guidance on Market Participant Impacts	Source System	Sink System	Reason for Potential Scenario
ASSOC-MSIM001	Storage resource SCs shall submit energy bids and competitive regulation bids (to receive regulation awards) to trigger AS SOC constraint to be binding in RTPD, RTD Potential scenarios include: Energy bids to bid cap Both regulation up and regulation down bids	SIBR	RTM Settlements CMRI	Confirm AS SOC constraint binds