




Business Requirements Specification

Hybrid Resources Phase 1: Co-Located Resources

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Revision History

Date	Version	Description
7/16/2020	1.0	Initial draft.
11/04/2020	1.1	<ul style="list-style-type: none"> -Updated Section 1.1: Purpose to reflect new scope item (providing forecasts to VER components of hybrid resources) -Updated Section 5.2: BPM to reflect BPM changes related to new scope item -Updated Section 6.3 (Managing Market Model in MasterFile): Added BRQ-201, BRQ-221, BRQ-202, BRQ-203 to 6.3.1 -Added Section 6.6: Manage Plant Information, added BRQ-210 and BRQ-212 to 6.6.1 -Updated Section 6.7: Manage VER Forecasts: Added BRQ-205 and BRQ-223 to 6.7.1 -Updated Section 6.8.2: Day-Ahead and Real-Time Market Enhancements: Updated text in BRQ-130(a) and BRQ-130(b). Removed BRQ-104(b), -Added Section 6.8.4: CMRI, added BRQ-214 -Added Section 6.10: Manage Market Billing & Settlements: Added BRQ-215, BRQ-216, BRQ-217, BRQ-218, BRQ-219, and BRQ-220 to 6.10.1 -Updated Section 6.11: Market/Business Simulation: Removed MSIM 001, MSIM 002, MSIM 003, and MSIM 004 from 6.11.1

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1 Introduction

1.1 Purpose

The purpose of this project is to initiate a market model that will represent multiple resources of different technologies that share a common point-of-interconnection (POI) that may have an aggregate capability constraint (ACC) limit below the combined grid injection/withdrawal capability of all “co-located” resources behind a common ACC. In this initial phase of the Hybrid Resources initiative (Phase 1), the co-located resources will be modeled as individual resources. In Phases 2 (Hybrid Resource Forecasting, introduction of the Hybrid Resource Model to the Markets) of the initiative, energy production units of different technologies will have the option to model as a single hybrid resource. In the meantime, Phase 1 was initiated earlier to meet the growing number of new resource implementations that are candidates for the co-located resource option. **In addition, Phase 1 will allow the renewable (variable energy resource) component of hybrid resources to receive CISO forecasts. Note that new requirements allowing for this capability are grouped into two release schedules: requirements in the “Group 1 Release” will be released in December 2020, while requirements in the “Group 2 Release” will be released in the spring of 2021.**

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 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).


2 Intellectual Property Ownership

Intellectual Property covers a broad array of information and materials, including written works, computer programs, software, business manuals, processes, symbols, logos and other work products. Determining ownership of Intellectual Property is very important in preserving the rights of the California ISO, and helps to avoid Intellectual Property infringement issues. In considering the business requirements or service requirements to be performed, the business owner of the project must determine Intellectual Property Ownership.

Specifically, CAISO retains intellectual property ownership of the following:


- Related Business Practice Manuals
- All formulations, algorithms, software, and display interfaces produced by ISO
- Unless noted otherwise, all rights reserved for works provided within this BRS document

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3 Acronym and Term Definition


Acronym/Term	Definition
A2A	Application-to-Application (internal API)
ACC	<p>Aggregate Capability Constraint.</p> <p>The Aggregate Capability Constraint (ACC) is a new energy production constraint that limits a set of co-located (see glossary) resources that share a common max (for grid injection) and min (for grid withdrawal, in the case where there are multiple resources charging from the grid) limits for access to a shared point-of-interconnection (POI). It is possible there could be multiple ACCs for a given POI location, wherein each ACC's limits applies to its own associated co-located resources, but this would not be a common circumstance.</p>
ALFS	Automated Load Forecast System.
API	Application Program Interface
AS	<p>Ancillary Services</p> <p>Ancillary services are energy products used to help maintain grid stability and reliability. There are four types of ancillary services products: regulation up, regulation down, spinning reserve and non-spinning reserve. Regulation energy is used to control system frequency, which must be maintained very narrowly around 60 hertz, and varies as generators change their energy output. Resources providing regulation are certified by the ISO and must respond to automatic control signals to increase or decrease their operating levels depending upon the need. Spinning reserve is standby capacity from generation units already connected or synchronized to the grid and that can deliver their energy in 10 minutes when dispatched. Non-spinning reserve is capacity that can be synchronized to the grid and ramped to a specified load within 10 minutes.</p>
B2B	Business-to-Business (API between ISO and EIM or ISO BAA participants)
BAA	Balancing Authority Area

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Acronym/Term	Definition
BAAOP	<p>Balancing Authority Area Operations Portal</p> <p>Interface provided for EIM entities for the following purposes:</p> <ul style="list-style-type: none"> * UI to the market operations * Management of dispatches <p>BAAOP sends the following information to the EIM Entity:</p> <ul style="list-style-type: none"> * Load forecast bias * Dispatch instruction approve/decline * Dynamic limits: interties * Intertie changes
BRS	Business Requirement Specification
BSAP	<p>Base Schedule Aggregation Portal</p> <p>BSAP is a modified SIBR application for Energy Imbalance Market (EIM) entities.</p> <p>BSAP will receive hourly Base Schedules from all resources within the EIM balancing authority area and interchange transactions five hours prior to the operating hour, in order to provide an input for all Real-Time processes including the longer-term Short-Term Unit Commitment (STUC) as well as Real-Time Unit Commitment (RTUC) and Real-Time Dispatch (RTD).</p> <p>These hourly Base Schedules will balance against the load forecast and serve as the baseline for settling imbalance energy in the EIM. The combination of load forecasts, Base Schedules, and the bid range from Participating Resources will become the hourly Resource Plan for the EIM balancing authority.</p> <p>The ISO has based the EIM on the Real-Time Market design, which was developed in part to comply with FERC Order No. 764, and consists of a 15-minute market and a 5- minute dispatch. Each of these market runs will produce schedules and locational marginal prices for resources.</p>
CAISO	California Independent System Operator
CISO	See CAISO
CMRI	CAISO Market Results Interface

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Acronym/Term	Definition
Co-Located Resource	<p>A new resource class wherein two or more resources are behind a shared point-of-interconnection and, therefore, share access rights to the transmission grid based on the scarcity of MW capability for energy injection and withdrawal at the POI location.</p> <p>Co-located resources are managed as single, independent resource IDs as with current ISO business practice (e.g. bidding/scheduling, outage, forecasting, metering and settlement). The significant difference with co-located resources are that they must share a limited capacity for interconnection rights to the grid (which may or may not accommodate the full aggregate production capacity of all co-located resources sharing a common POI or ACC limit).</p> <p>Separately, Hybrid Resources will model multiple technologies (e.g. storage, wind, thermal) as a single resource. The Hybrid resource class will be implemented in Phase 2 of this initiative.</p>
DAM	<p>Day Ahead Market</p> <p>The day-ahead market is made up of three market processes that run sequentially. First, the ISO runs a market power mitigation (MPM) test. Bids that fail the test are revised to predetermined limits. Then the integrated forward market (IFM) establishes the generation needed to meet forecast demand. And last, the residual unit commitment (RUC) process designates additional power plants that will be needed for the next day and must be ready to generate electricity. Market prices set are based on bids. A major component of the market is the full network model (FNM), which analyzes the active transmission and generation resources to find the least cost energy to serve demand. The model produces prices that show the cost of producing and delivering energy from individual nodes, or locations on the grid where transmission lines and generation interconnect</p>
DEC	Decrement. Indicates the active power output of a resource is being decreased.
DOT	Dispatch Operating Target. Identifies where the unit is expected to be at the end of the dispatch time interval.
ED	<p>Exceptional Dispatch (also referred to as Manual Dispatch)</p> <p>Exceptional dispatches are requests for energy from System Operators for reliability purposes, regardless of cost. Exceptional Dispatches allow the EIM and ISO operators to draw power from sources not cleared by market software in order to maintain grid reliability during emergencies, so they are likely not the most economic resources, but they are deemed necessary for the reliability of the system. EDs are entered manually by the ISO Operator into the Day-Ahead or Real Time Market optimization software so that they are accounted for and included in</p>
ED Tool	<p>Internal component of the Real-Time Market (managed by the ISO Operators).</p> <p>Manual Dispatch for resources in the EIM BAAs shall be managed by their respective EIM Operator.</p>

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Acronym/Term	Definition
EFC	<p>Effective Flexible Capacity</p> <p>A resource's Effective Flexible Capacity is the number of megawatts eligible to be counted towards meeting a load serving entity's Flexible Resource Adequacy requirements (i.e., how much MW a resource can move within a specified period of time). The ISO calculates an EFC value for all resources that have a Net Qualifying Capacity (NQC). The EFC value is what can be used for Flex Resource Adequacy Showings to meet the Annual Flexible RA requirement.</p>
EIM	<p>Energy Imbalance Market</p> <p>An Energy Imbalance Market (EIM) manages real-time imbalances on the grid economically, reliably, and automatically. Deviations in supply and demand occur in real time resulting in a mismatch, or imbalance, between available electricity versus what is needed by consumers. Balancing Authorities (BAs) have traditionally tried to manage these imbalances by relying on manual dispatches and extra power reserves. An EIM solves these imbalances in real-time with more precision through an automated five-minute energy dispatch service. EIM's automation and economic dispatch lower costs for participants and become even more valuable as additional renewable resources connect to the grid.</p>
EMS	<p>Energy Management System</p> <p>The ISO's telemetry-based system for managing reliable operations of the ISO-controlled grid. The EMS system receives information every four seconds regarding the system load and generator operating levels. EMS also provides Automatic Generation Control (AGC) sending operating set points for units on regulation.</p> <p>An energy management system (EMS) is a system of computer-aided tools used by operators of electric utility grids to monitor, control, and optimize the performance of the generation and/or transmission system. The monitor and control functions are known as SCADA</p>
ETSR	Energy Transfer System Resource
GCARM	<p>Generator Contingency and RAS Modeling</p> <p>GCARM updates the congestion component of the locational marginal price so that it accounts for the cost of generator contingencies and remedial action scheme operations.</p>

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Acronym/Term	Definition
GIA	<p>Generator Interconnection Agreement</p> <p>The form of Interconnection Agreement applicable to an Interconnection Request pertaining to a Generating Facility processed under the interconnection procedures set forth in Appendix Y. For a Large Generating Facility, a pro forma version of the Interconnection Agreement is set forth in Appendix CC. For a Small Generating Facility, a pro forma version of the Interconnection Agreement is set forth in Appendix T.</p>
GRDT	Generator Resource Data Template
Hybrid Resource	Hybrid Resources will model multiple technologies (e.g. storage, wind, thermal) as a single resource. The Hybrid resource class will be implemented in Phase 2 of this initiative.
IFM	Integrated Forward Market (see Day-Ahead Market)
INC	Increment. Indicates the active power output of a resource is being increased.
ISO	Independent System Operator
LESR	Limited Energy Storage Resource
MF	<p>MasterFile</p> <p>The Generator Resource Data Template is one of several Excel spreadsheets, designed to capture data specific to a particular unit type, such as Wind, Biomass, Hydro, Solar, etc. The spreadsheet includes fields for dozens of data elements that describe the resource, including SCIDs, resource type, ramp rate, heat rate, startup requirements, forbidden operating regions, etc. - much of the data that is required for the ISO's Master File database. As part of the new resource implementation (NRI) process, the new generator operator must submit an initial Generator Resource Data Template for preliminary modeling to the ISO. The Generator Resource Data Template and the Intertie Resource Data Template are used to submit requests to add or change specific operating parameters that reside within Master File.</p>
MSG	<p>Multi-Stage Generation</p> <p>Multistage Generators: between their minimum and maximum operating levels, there are output levels at which the units cannot be dispatched. Multi-Stage Generation Resources have between 1 and 10 operating configurations (or operating regions) that have distinct operating parameters. It requires time and money to move from one configuration operating range to another configuration operating range, and they can be operated only in one configuration within any given dispatch interval. During transition from one configuration to another, if the configurations do not overlap, then there is a gap between them where they cannot be dispatched. For these forbidden regions, the transition profile for external Dispatch Operating Targets (DOTs) remains in the `From Configuration` until the end of transition, while internal imbalance calculations assume ramping.</p>
MSS	Metered Sub-System
MW	Mega-Watt

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Acronym/Term	Definition
NGR	Non-Generating Resource (e.g. battery, flywheel, pumped hydro, etc.)
NQC	<p>Net Qualifying Capacity</p> <p>Net Qualifying Capacity (NQC) is a Resource Adequacy (RA) - defined value that represents the maximum MW capacity that a resource can sell to a Load Serving Entity (LSE) as part of the RA Program for a calendar year. The ISO is required to use conventions created by a resource's Local Regulatory Agency (LCA) in establishing the value of NQC. The ISO also insures that the NQC value is fully dispatchable in the ISO Market. NQC is also a component of RAAM, RR, and RUC ICPM.</p>
OASIS	Open Access Same Time Information System
PCA	Price Correction Application (internal ISO system for implementing price correction)
PCT	Price Correction Tool (internal ISO system for implementing price correction)
PDR	Proxy Demand Response
PGA	<p>Participating Generator Agreement</p> <p>An agreement entered into between the CAISO and a Participating Generator. A Generator or other seller of Energy or Ancillary Services through a Scheduling Coordinator over the CAISO Controlled Grid (1) form a Generating Unit with a rated capacity of 1 MW or greater, (2) from a Generating Unit with a rated capacity of from 500 kW up to 1 MW for which the Generator elects to be a Participating Generator, or (3) from a Generating Unit providing Ancillary Services or submitting Energy Bids through an aggregation arrangement approved by the CAISO, which has undertaken to be bound by the terms of the CAISO Tariff, in the case of a Generator through a Participating Generator Agreement, Net Scheduled PGA (NSPGA), or Pseudo-Tie PGA (PPGA).</p>
PLA	<p>Participating Load Agreement</p> <p>An agreement entered into between the CAISO and a Participating Load or a Non-Generator Resource. An entity, including an entity with Pumping Load or Aggregated Participating Load (e.g., pumps, pump-generating, energy storage), providing Curtailable Demand, which has undertaken in writing by execution of a Participating Load Agreement to comply with all applicable provisions of the CAISO Tariff.</p>
POD	<p>Point of Delivery or Withdrawal (POD or Point(s) of Withdrawal)</p> <p>Point(s) within the ISO Balancing Authority Area where Energy and Ancillary Services are made available to a receiving party under this Tariff.</p> <p>(2) Point(s) of interconnection on the Transmission Provider's Transmission System where capacity and/or energy transmitted by the Transmission Provider will be made available to the Receiving Party. The Point(s) of Delivery shall be specified in the Service Agreement.</p>

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Acronym/Term	Definition
POI	<p>Point of Interconnection</p> <p>The physical or geographical point where Interconnection Facilities connect with Distribution Provider's Distribution or Transmission System.</p>
PSH	Pumped Storage Hydro
PT	Pseudo-Tie
RIMS	<p>Resource Interconnection Management System</p> <p>Web application accessed by external entities to post changes to transmission equipment and/or generators that may affect the ISO. This application is monitored by the ISO. (Also RIMS5: version 5 of RIMS)</p>
RTBS	<p>Real-Time Balance Schedule.</p> <p>Application and process internal to ISO that performs resource sufficiency tests for the EIM.</p>
RTCA	Real Time Contingency Analysis (internal ISO application)
RTD	<p>Real-Time Dispatch</p> <p>The Security Constrained Economic Dispatch (SCED) and Security Constrained Unit Commitment (SCUC) software used by the CAISO to determine which Ancillary Service and Imbalance Energy resources to Dispatch and to calculate LMPs.</p> <p>The Real-Time Dispatch Process (RTD) is the general term for one of three specific dispatches:</p> <ul style="list-style-type: none"> • Real-Time Economic Dispatch (RTED) that is executed every 5 minutes, • Real-Time Contingency Dispatch (RTCD) that is executed for a 10-minute interval on demand, • Real-Time Manual Dispatch (RTMD) that is executed on demand in manual mode.
RTM	<p>Real-Time Market</p> <p>The real-time market is a spot market in which utilities can buy power to meet the last few increments of demand not covered in their day ahead schedules. It is also the market that secures energy reserves, held ready and available for ISO use if needed, and the energy needed to regulate transmission line stability.</p> <p>The market opens at 1:00 p.m. prior to the trading day (during the Day-Ahead) and closes 75 minutes before the start of the trading hour (in the Real-Time). The results are published about 45 minutes prior to the start of the trading hour.</p>
RTMO	Real-Time Market Operator (ISO BAA Operator)

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Acronym/Term	Definition
RTPD	Real-Time Pre-Dispatch An application of the Real Time Market that runs every 15 minutes and commits Fast and Medium-Start Units using the Security Constrained Unit Commitment (SCUC) to adjust Day-Ahead Schedules and Hour-Ahead Scheduling Process (HASP) Intertie Schedules.
RTSI	EIM Real Time Schedule Interchange. Schedule representation of tags sent to market for dispatch.
SC	Scheduling Coordinator
SCADA	Supervisory Control and Data Acquisition
SE	State Estimator A computer software program that provides the ISO with a near Real-Time assessment of system conditions (i.e., the `state` of current conditions) within the ISO Balancing Authority Area, including portions of the ISO Balancing Authority Area where Real-Time information is unavailable.
SIBR	Scheduling Infrastructure and Business Rules
SOC	State-of-Charge The Instantaneous State of Charge is the amount of energy (MWh) that a battery, in real time, has available for ISO participation. For resources that have defined minimum and maximum energy limits in the MasterFile, the SOC will be maintained within these energy limit constraints. Data should be updated every 4 seconds and vary from zero to maximum energy limit.
SQMD	Settlement Quality Meter Data Meter Data gathered, edited, validated, and stored in a settlement-ready format, for Settlement and auditing purposes.
STUC	State of Charge
SUPP	Supplemental Energy The difference between the bid-in capacity in the Day Ahead market and the forecasted demand (made up of Residual Unit Commitment and Resource Adequacy). When the Day Ahead demand forecasted volume is greater than the volume that clears the market, the ISO procures additional capacity from resources which are then required to submit an energy bid into the Real Time Market to ensure that there is enough supply available for the Real Time Market to dispatch. The energy between the cleared forecasted capacity bids and the forecasted demand is called Supplemental Energy. Supplemental Energy is made up of Residual Unit Commitment (RUC) procurement and Resource Adequacy (RA) capacity.
UI	User-Interface

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Acronym/Term	Definition
VER	<p>Variable Energy Resource</p> <p>A Variable Energy Resource is a device for the production of electricity that is characterized by an energy source that:</p> <ul style="list-style-type: none"> * Is renewable; * Cannot be stored by the facility owner or operator; * Has variability that is beyond the control of the facility owner or operator. <i>For example: wind; solar thermal and photovoltaic; and hydrokinetic generating facilities.</i>
WebOMS	Web Outage Management System
XSD	XML Schema Definition

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4 Details of Business Need/Problem

4.1 Description

Business Opportunity/Problem Statement:	
What:	<p>The new market model will allow individual resources, with potentially different SCs and technologies, to share a common point-of-interconnection (POI) to the transmission grid. This shared access will be managed by the market as a congestion management constraint for all associated resources (i.e. “co-located”) while energy dispatch is optimized (AS co-optimization will be delivered with Phase 2 of the initiative in later part of 2021).</p> <p>Key Notes:</p> <ul style="list-style-type: none"> Tariff and BPM revisions will be required for implementation
When:	<p>Phase 1 of the Hybrid Resources initiative (“Co-Located Resources”) is intended to implement at the end of 2020.</p> <p>Phase 2, which is not part of this project scope, will be implemented in the later part of 2021.</p>
Why do we have this opportunity/problem:	<p>EIM and ISO BAA participants with new resource implementations that involve energy production from different technologies at the same POI may have arrangements where their combined capabilities exceed the maximum approved capability at their shared POI (both in the positive and negative directions). Instead of managing their own access to the transmission grid, this project will allow the market to model the individual co-located resources and an aggregate capability constraint (ACC) equal to the capability approved at the POI, while optimizing their dispatch (energy only in Phase 1) and enforcing the ACC limits.</p>
Who does this opportunity/problem impact:	<p>Market Participants: EIM and ISO BAAs</p>

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5 Business Impacts

5.1 Visual Aids

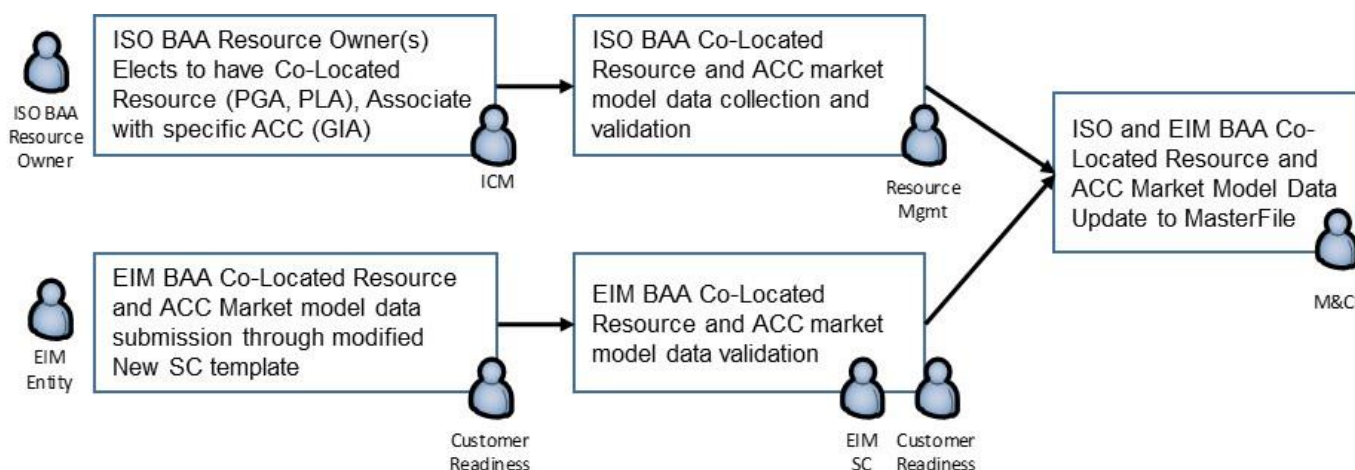


Figure 4.2.1 Co-Located Resource and Aggregate Capability Constraint (ACC) Market Model Election and Submission Processes

Note: ICM, Resource Management, Customer Readiness, and M&CI are all business units internal to the ISO.

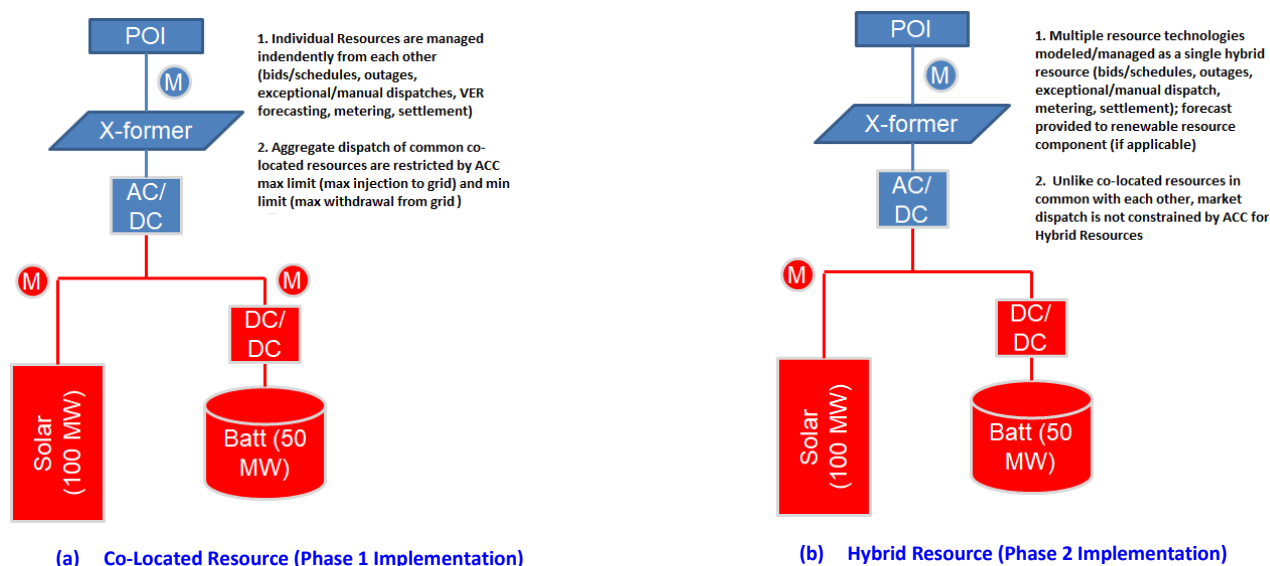




Figure 4.2.2 (a) Co-Located and (b) Hybrid Resource Modeling, Operational Differences (“M” represents meter location)¹

¹ Co-Located vs. Hybrid Resource diagrams from Policy Straw Proposal

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5.2 Business Practice Manual (BPM)

BPM	Description of Impact(s)
Definitions & Acronyms	Define Aggregate Capability Constraint, Co-Located Resource
Energy Imbalance Market (EIM)	EIM Co-Located Resource election process, ACC notification via SC Selection Letter; EIM Operator override of ACC limits within BAA; Energy Only capability (no AS or FRU) for EIM co-located resources during Phase 1 (will support in Phase 2)
Generator Management	ISO Co-Located Resource election process, ACC notification through PGA / PLA
Market Instruments	VER co-located resources will not have training data sent to FSP forecast models for time periods when DOT_FOLLOW flag set = Y;
Market Operations	-Market model of directional ACC max and min limits, co-located resources; curtailment of economic bids/self-schedules of co-located resources behind a binding ACC constraint; CISO Operator override of ACC limits within BAA; Prioritization of ACC limits over Outage Pmin/Pmax de-rates, Exceptional Dispatches (Listed Penalty Prices) -Hybrid NGR Resource SCs notify M&CI if opting in to receive forecasts for VER component(s) (manual process)
Metering	Under current metering configuration guidelines, co-located resources shall have a settlement quality meter installed for each individual resource (as currently performed)
Reliability Requirement	Deliverability impacts for co-located resources with aggregate qualified capacity exceeding associated ACC max limit
BPM Change Management	NONE
Candidate CRR Holder	NONE
Compliance Monitoring	NONE
Congestion Revenue Rights	NONE
Credit Management	NONE
Direct Telemetry	NONE
Distributed Generation for Deliverability	NONE
Generator Interconnection and Deliverability Allocation Procedures	NONE
Generator Interconnection Procedure (GIP)	NONE
Managing Full Network Model	NONE
Outage Management	NONE
Rules of Conduct Administration	NONE
Scheduling Coordinator Certification & Termination	NONE
Settlements & Billing	Settlements shall use CC701 to apply forecast fee to Hybrid NGR Resources
Transmission Planning Process	NONE

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5.3 Other

Impact:	Description: (optional)
Market Simulation	<i>Yes</i> <i>(Unstructured test verification of market results that POI constraint enforced for associated co-located resource schedules/bids; no AS awards/self-provisions are awarded or settled, nodal constraints will be placed under binding conditions)</i>
Market Participant Impact	<i>Yes; both EIM and ISO participants</i> <i>(Process-only; will communicate to ICM resource whether it elects to be co-located under a specified POI limit during the NRI process)</i>
External Training	<i>Yes</i> <i>(EIM and ISO Participants trained on how co-located resource POI limits will be handled in market; process of electing to be co-located, limitations of market functions for co-located resources – e.g. No AS provisions, exclusions of specific resource type)</i>
Policy Initiative	<i>Yes (Phase 1 of the Hybrid Resources initiative)</i>

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6 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.


6.1 Business Process: Manage Transmission & Resource Implementation (CISO BAA only)

6.1.1 Business Requirements


ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-001	<p>Resources sharing a common point-of-interconnection (POI) to the transmission grid may elect, if qualified, to be modeled as "co-located resources", wherein each of these resources shall have their energy dispatch optimized by their economic bids while their aggregate energy dispatch will be bound by the minimum and maximum aggregate capability constraint (ACC) limits applied to those associated resources. The ACC limit will equal the max and min limits defined in the GIA at the POI.</p> <p>For an interim time period, referred to as Phase 1, co-located resources may only provide their energy product to the market.</p> <p>Ancillary services (AS) and flex ramp uncertainty (FRU) awards will not be available until the market applications are upgraded to accommodate co-optimization behind the ACC (in Phase 2 of the Hybrid Resources initiative). Once Phase 2 initiates, co-located resources may provide AS.</p> <p>Co-located resources are not considered hybrid resources as they have different classification, metering and telemetry requirements, and market rules.</p>	Info	- N/A

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ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-002	<p>In Phase 1 co-located resources will interact with the market as individual resources perform today:</p> <ul style="list-style-type: none"> - VER co-located resources may still receive VER forecasts from the ISO - Co-located resources will have individual outage tickets submitted through WebOMS - Co-located resources will have individual bids/schedules submitted through SIBR/BSAP - Co-located resources will receive separate dispatch instructions through ADS/BAAOP - Co-located resource results will publish separately in CMRI reports - Co-located resources will have separate metering, telemetry, and resource IDs 	Info	- N/A
HRPh1-BRQ-003	For ISO BAA participants, election of co-location status, subject to the ACC, will be handled through the Participating Generator Agreement (PGA) and Participating Load Agreement (PLA).	Process	- N/A
HRPh1-BRQ-010	<p>Upon execution of a Generating Interconnection Agreement (GIA), the Queue Management (QM) process shall initiate, wherein:</p> <ul style="list-style-type: none"> - QM will add to the milestone status reports that the Interconnection Customer (IC) notify QM when they have decided to be co-located or hybrid. - QM will notify ICM and New Resource Implementation (NRI) six (6) months prior to project synchronization via an email with all detailed information. 	Process	- N/A
HRPh1-BRQ-012	<p>Upon NRI process initiation, the IC shall submit Bucket #1 information to the ISO, wherein:</p> <ul style="list-style-type: none"> - Regulatory Contracts will revise the PGA and PLA Schedule 1s to add a column for co-located / hybrid resource status - Participating Generator Agreement (PGA), and if appropriate Participating Load Agreement (PLA), initiated and built as part of bucket #2. - For co-located resources: PGA fills in the additional column in Schedule 1 that identifies resource IDs that will be co-located (flags co-located resource requirement). 	Process	- N/A


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ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-014	<p>ISO Transmission Planning shall perform interconnection studies for both Max and Min aggregate point-of-interconnection (POI) injection (+)/withdrawal (-) limits based on POI capacity for the project, as requested by the project owners (not based on physical limits).</p> <p>Once determined, both Max and Min POI limits will be identified for the Generator Interconnection Agreement (GIA), as follows: - POI Max Limit shared for each resource behind the POI - POI Min Limit shared for each charging resource (may apply to one or many resource IDs that have “co-located” status determined closer to synchronization of the project).</p> <p>If the sum of the multiple resources Pmax or Pmin exceeds the POI Pmax or Pmin then the project is required to have a runback / limiter scheme in place prior to synchronization to prevent power on the grid greater than the approved net MW at the POI.</p>	Process	- N/A
HRPh1-BRQ-015	All contract implementations of co-located resources where Pmax and Pmin exceeds the POI Pmax or Pmin for the project shall require installation of a runback/limiter scheme that will physically limit the aggregate energy production of all common (i.e. sharing the same ACC) co-located resources within or equal to the ACC max (injection into grid) and min (withdrawal from grid) limits.	Existing Process	- N/A

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ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-016	<p>Performing as part of Bucket #3 (SC Association), Queue Management (QM) and then New Resource Implementation (NRI) will provide the MasterFile team with:</p> <ul style="list-style-type: none"> - same Gen Module resource information as today (inclusive of co-located resources) - (if resource is co-located) co-located resource IDs, where Pmax or Pmin exceeds the POI Max or Min limits for the project, shall require the following associated Aggregate Capability Constraint (ACC) Information: <ul style="list-style-type: none"> > ACC Identifier (must be unique) > ACC Location (Substation, Voltage Level) > Constraint Max Limit > Constraint Min Limit > Effective start date of ACC (synchronization date) <p>The following validation must be performed by QM and NRI processes prior to submission of ACC/Co-Located Resource Info to the MasterFile team:</p> <ul style="list-style-type: none"> - PGA / PLA associated with co-located resources has location of associated ACC (e.g. POI level constraint) - Co-located resources are not any of the following gen types²: Multi-Stage Generator, Pseudo-Tie, Proxy Demand Response, Pumped Storage Hydro, Metered Sub-System, and Use-Limited Resource with associated Commitment Cost Enhancements Phase 3 opportunity costs. 	Process	- N/A
HRPh1-BRQ-018	<p>Upon retirement of a co-located resource, a modification assessment is performed to determine if the remaining co-located resources can remain. If the assessment approves the configuration, the GIA will be amended.</p> <p>Infrastructure Contracts & Management will notify Queue Management and MasterFile team business teams of the following:</p> <ul style="list-style-type: none"> - Retiring co-located resource effective end date - Impacted ACC effective end date - Replacement ACC information (including associated co-located resources), as defined in HRPh-BRQ-016 (if applicable) 	Process	- RIMS

² The following resource types aren't supported due to technical complexity and the target schedule of implementation.


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6.2 Business Process: Managing Aggregate Capability Constraint (ACC) and Co-Located Resource Market Model Information (EIM BAA only)


6.2.1 Business Requirements

ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-025	For EIM BAA participants, resource election for “co-located” status will be handled through the SC Selection Letter submission. Co-located resources may be either participating or non-participating resources.	Process	- N/A
HRPh1-BRQ-030(a)	For EIM BAA participants, provision of the following Aggregate Capability Constraint (ACC) information, including its mapping to the EIM SC’s co-located resources, shall be provided to the ISO by the EIM BAA Entity through the SC Selection Letter: <ul style="list-style-type: none"> - ACC Identifier (possible to have multiple ACCs at same POD pnode) - ACC POD Location (Substation, Voltage Level) - ACC Max, Min Limit (+ for injection, - for withdrawal) - Mapping of ACC’s associated co-located resource IDs (participating, non-participating) by SC - Effective start date of ACC activation 	Process	- N/A
HRPh1-BRQ-030(b)	The following validations must be performed by ISO (Customer Readiness) prior to submission of EIM ACC/Co-Located Resource ID Info to MasterFile team ³ : <ul style="list-style-type: none"> - Each ACC Identifier has two or more resources associated with it which may have different fuel types - Each ACC Identifier has both a Max and Min Limit defined (where grid injection is positive value, withdrawal is negative value) - None of the co-located resources are among the following gen types: Multi-Stage Generator, Pseudo-Tie, Proxy Demand Response, Pumped Storage Hydro, Metered Sub-System, and Use-Limited Resource with associated Commitment Cost Enhancements Phase 3 opportunity costs. 	Process	- N/A

³ It is possible that more than one ACC exists at a single point-of-interconnection location. Therefore, a given set of co-located resources will need to associate with a unique ACC identifier rather than location.

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ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-032	<p>Once the EIM Entity submission is verified by the relevant EIM SC and ISO Customer Readiness, the Aggregate Capability Constraint (ACC) and Co-Located information defined in HRPh1-BRQ-030 shall be provided to MasterFile team by Customer Readiness by change request with an effective date when the ACC should be activated.</p> <p>As it is possible for a given ACC to associate with co-located resources from more than one SC, the SC Selection Letter validation may be needed from multiple EIM SCs for the same ACC.</p>	Process	- N/A
HRPh1-BRQ-033	Each EIM Entity shall include all participating and non-participating co-located resources within its Settlement Quality Meter Plan submission to the ISO.	Existing Process	- N/A
HRPh1-BRQ-034	<p>Upon retirement of a EIM co-located resource, as notice received in a relinquishing letter by the EIM Entity, Customer Readiness will provide MasterFile team with the following information regarding the impacted resource and ACC:</p> <ul style="list-style-type: none"> - Retiring co-located resource's effective end date - Impacted ACC ID's effective end date - Replacement ACC information (included associated co-located resources), as defined in HRPh-BRQ-030 with effective start date (if applicable) 	Process	- N/A

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6.3 Business Process: Managing Market Model in MasterFile (EIM and CISO BAAs)

6.3.1 Business Requirements


ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-040	<p>System shall define the following market modeling information for generator resources identified as "co-located", or sharing the same aggregate capability constraint (ACC):</p> <ul style="list-style-type: none"> - Common Resource Information (Resource IDs, Pmax, Pmin, Gen Types, etc). - Point of Delivery (POD) pnode - BAA ID (CISO and EIM) <p>Where the following data validations must be met for co-located resources:</p> <ul style="list-style-type: none"> - Resource POD identifies the pnode of the ACC location (CISO and EIM) - Resource Pnode must be inactive for Convergence Bidding (CISO only, ACC Pnode may be active) - Resource must have AS_CERT = N (CISO and EIM; only required during the Phase 1 interim period) - Resource must not have any of the following gen types: Metered Sub-System (MSS), Multi-Stage Generation (MSG), Proxy Demand Response (PDR), Pseudo-Tie (PT), Pumped Storage Hydro (PSH), or Use-Limited with Commitment Cost Enhancement Phase 3 (CCE3) opportunity costs (CISO and EIM, if applicable) 	Core	MasterFile

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ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-041	<p>System shall define the following market modeling information for Aggregate Capability Constraints (ACCs) for both CISO and EIM BAAs:</p> <ul style="list-style-type: none"> - ACC Identifier - POI or POD Pnode (financial location of ACC) - Max MW Limit - Min MW Limit - BAA ID (ISO or EIM) - POD (location of ACC; there may be multiple ACC IDs associated with a single POD) - Mapping to associated co-located resource IDs (one constraint to many resources) <p>Where the following data validations must be met:</p> <ul style="list-style-type: none"> - Each ACC must have both Max, Min MW limit (follows positive sign convention for grid injection, negative for withdrawal) - Each ACC must associate with at least two co-located resources - No two ACCs may associate with the same resource ID - Each ACCs may only associate with co-located resources from a single BAA ID 	Core	MasterFile
HRPh1-BRQ-042	<p>The system shall model entity relationships as follows:</p> <ul style="list-style-type: none"> - One or Many ACCs may exist at a given point-of-interconnection (POI), or point-of-delivery (POD) - Each ACC must associate with two or more Resource IDs (which may or may not have different fuel types) - Each co-located resource must associate with only one ACC 	Core	MasterFile
HRPh1-BRQ-044	MasterFile shall identify co-located status of EIM and ISO BAA resources at the individual resource ID level by means of a flag.	Core	- MasterFile
HRPh1-BRQ-201	<p>System shall model VER component of hybrid NGR resources to identify one or more renewable resource component(s) associated with the NGR resource using a new flag, "VER_NGR_FF= 'Y'"</p> <p>Note: Allow only NGR resources (NGR_FF=Y) to be able to have VER_NGR_FF flag set to Y</p>	Core	-MasterFile Group 1 Release
HRPh1-BRQ-221	<p>System shall allow three values for VER_NGR_FF: Q, Y, or NULL</p> <p>Note: VER_NGR_FF=NULL indicates a regular NGR ISO resource without any VER components</p>	Core	-MasterFile Group 1 Release

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ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-202	<p>System shall model VER component of hybrid NGR resources using VER_NGR_FF flag and FORECAST_SELECTION_FF to designate ISO-provided forecasts for one or more renewable components for NGR resources</p> <p>Note: VER_NGR_FF=Q indicates for FSP to test forecast (stage 2), and requires the FORECAST_SELECTION_FF to be set to ISO</p> <p>Note: VER_NGR_FF=Y can have FORECAST_SELECTION_FF set to ISO (stage 3) or SC, indicating the preference for ISO forecast or SC submitted forecast</p>	Core	-MasterFile Group 1 Release
HRPh1-BRQ-203	Resource Pmax must allow for both Pmin at charging limit, and Pmax for aggregate production capability for battery and renewable component(s) for an NGR resource	Business Rule	-MasterFile Group 1 Release

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6.4 Business Process: Manage Market & Reliability Data & Modeling


6.4.1 Business Requirements

ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-050	Each co-located resource ID shall require its own settlement quality meter data submission for energy produced from each resource.	Existing Process	N/A


6.5 Business Process: Manage Reliability Requirements

6.5.1 Business Requirements

ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-060	Upon calculation of Net Qualifying Capacity (NQC) and Effective Flexible Capacity (EFC) for each individual co-located resource, ISO shall determine during its assessment of deliverability whether an Aggregate Capability Constraint (ACC) will require reduction of the NQC/EFC value. If the aggregate NQC/EFC values of in-common co-located resources exceed their ACC's max limit, the ISO will need to reduce all common co-located resources' NQC/EFC values to ensure deliverability.	Process	- N/A

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ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-062	<p>Deliverable NQC/EFC amount determination is performed once annually and the same deliverable amount in percent bases will apply for all remaining months of the Resource Adequacy (RA) assessment year.</p> <p>In accordance with the tariff section 40.4.6, deliverability calculations for NQC and EFC values of co-located resources if one resource is already on-line the resource may transfer deliverability either in the year ahead process or may request deliverability transfer during the year for example when the new resource comes on-line.</p> <p>If the co-located resource is not on-line during the year-ahead NQC process, then the resource owner or its Scheduling Coordinator, if applicable, may request to be put on the Other NQC tab for the estimated date when the resource will come on-line; or once operational the resource may request to be on the Main NQC tab (through CIRA) from the beginning of a month through December of that year.</p> <p>If the estimated on-line date of the new collocated resource is delayed, the SC may request through CIRA to increase the NQC on the on-line unit, for the applicable months of delay.</p>	Process	- CIRA

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6.6 Business Process: Manage Plant Information


6.6.1 Business Requirements

ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-210	System shall receive VER component of hybrid NGR resources with single resource ID and VER_NGR_FF flag set to Y in the MF.	Core	PI Group 1 Release
HRPh1-BRQ-212	System shall broadcast dispatch data for VER component of hybrid NGR resources components (mimic existing process for dispatch DOT instruction) to FSP or SC	Existing	-ADS -ADSAPI Group 1 Release


6.7 Business Process: Manage VER Forecasts

6.7.1 Business Requirements

ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-070	Co-located VER resources shall receive forecasts as is currently provided by the ISO today. Co-located resources must follow what is declared in Appendix Q of the California ISO FERC tariff where the \$0.10/MWh forecast charge will be applied for ISO-provided forecasts. VER co-located resource Scheduling Coordinators may, in addition, elect to provide SC-selected forecasts for use in received DOT instructions, but the ISO markets will always operate on the basis of ISO-provided VER forecasts.	Existing Function	ALFS
HRPh1-BRQ-072	System shall broadcast DOT_FOLLOWED = "Y" flag for VER resources to VER Forecast Service Providers receiving either: 1) operator instruction (wherein a VER may not produce energy "as capable") or 2) a negative supplemental DOT (where the VER's Forecast exceeds its initial DOT).	Will be delivered in DOT Enhancements project.	RTM

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ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-074	VER Forecast Service Providers (FSPs) shall exclude co-located resources receiving DOT_FOLLOWED = "Y" (e.g. negative supplemental DOT) from its forecasting data model for the entire time period these dispatch flags are received.	Will be delivered in DOT Enhancements project.	N/A
HRPh1-BRQ-205	System shall receive and store day ahead and real time forecasts from FSP or SC for VER component of hybrid NGR resources attributes	Core	- ALFS -ALFSSOA Group 1 Release
HRPh1-BRQ-223	For Phase 1 the ISO will NOT be offering the persistence forecasting service to the VER component of Hybrid NGR resources.	Process	-ALFS Group 1 Release

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6.8 Business Process: Manage Markets & Grid

6.8.1 Business Requirements: SIBR/BSAP Enhancements


ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-080	<p>Co-located resources from CISO and EIM BAAs shall submit their individual energy bids/self-schedules by resource ID (not in aggregate). No AS bids will be accepted for co-located resources.</p> <p>EIM BAAs may submit schedules for both participating and non-participating co-located resources.</p>	Existing Function	- SIBR/BSAP

6.8.2 Business Requirements: Day-Ahead and Real-Time Market Enhancements


ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-100	On a daily basis, all Day-Ahead and Real-Time market systems shall receive model data for all active Aggregate Capability Constraints (ACCs) and their associated co-located resources.	Core	<ul style="list-style-type: none"> - IFM - RTM

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ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-104(a)	<p>For each Day-Ahead and Real-Time Market run, system shall optimize unit commitment and economic dispatch for co-located resources while enforcing the security constraint of their associated ACC.</p> <p>The ACC will be enforced in the market formulation prohibiting the combined dispatch instructions of associated co-located resources from exceeding both the ACC maximum and minimum interconnection limits (in the positive injection and negative withdrawal directions, respectively), but no shadow price will be applied to the locational marginal price (LMP) of the co-located resource or its point-of-interconnection (POI) node.</p> <p>Constraint relaxation shall be prioritized (highest priority to lowest) with the following order of protection:</p> <ul style="list-style-type: none"> - ACC constraint, Min or Max Limit (ACC-level) - Outage Pmin/Pmax De-rate Constraints (resource level) - Exceptional Dispatch (resource level) - Self-Schedule (resource level) - Economic Bids (resource level) 	Core	<ul style="list-style-type: none"> - IFM - RTM
HRPh1-BRQ-104(b)	<p>During time periods when the ACC is binding (either by its Max or Min limit), relaxation of co-located resource self-schedules shall be reduced pro-rata on the basis of schedule MW amount only for those schedules in the direction of the binding constraint (e.g. LESR resources with charging self-schedules will not be curtailed if the ACC is binding in the direction of the POI injection into the grid).</p>	Core	<ul style="list-style-type: none"> —IFM —RTM

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ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-104(c)	<p>During time periods when a co-located resources are producing energy (i.e. positive energy supply) while one or more associated co-located resource(s) are charging (i.e. negative energy supply), market systems shall net the energy production and load from behind the ACC constraint when enforcing the ACC limits.</p> <p><i>For example, Wind Resource #1 is producing 30 MW, Solar Resource #2 is producing 25 MW, and Battery Resource #3 is charging 10 MW at the same time under the same ACC ("ACC #1") with a Max Limit of 50 MW. Rather than curtail the resources to 50 MW, market systems will evaluate all resources with a net injection to grid of 45 MW and not consider the ACC binding as long as the battery has the ability to charge in the market run's binding and advisory intervals.</i></p>	Core	<ul style="list-style-type: none"> - IFM - RTM
HRPh1-BRQ-108	<p>When the ACC has a binding max limit (aggregate injection to grid is constrained), co-located resources may be inframarginal, where the self-schedule or economic bid is below the marginal price, but not dispatched up though capable of producing at higher levels.</p> <p>Similarly, if the ACC has a binding min limit (aggregate withdrawal from grid due to charging co-located resource(s) is constrained), co-located resources may also be inframarginal but not dispatched down though capable of producing at lower levels. Capability could be based on bids or self-schedules.</p>	Information	<ul style="list-style-type: none"> - IFM - RTD
HRPh1-BRQ-110	<p>Contingencies modeled in the Generator Contingency and RAS Modeling (GCARM) must apply co-located resources on an "all or none" basis with regards to resources associated with a given ACC.</p> <p>If split treatment is required for contingencies involving co-located resources within a common ACC, contingency management must be supported in RTCA (Real-Time Contingency Analysis, but the constraint shall not be enforced in the market.</p>	Core	<ul style="list-style-type: none"> - IFM - RTD

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ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-115	<p>VER co-located resources shall be required to follow operating instructions and any negative supplemental dispatches. Any resource exceeding its dispatch instruction (<i>i.e.</i> producing “as capable”) while subject to an operating instruction or negative supplemental dispatch could negatively impact the schedules/settlement of its peer co-located resources, particularly when the ACC is binding.</p> <p>In such circumstances, the ISO expected resolution will be performed through the resource owners' bilateral contracts and not through the ISO dispute process.</p> <p>When not subject to an operating instruction or negative supplemental dispatch, VER co-located resources may produce as capable subject to their Interconnection Service Rights at the Point of Interconnection.</p> <p>Additionally, each POI shall have a runback scheme enforced at a substation level to physically limit the aggregate dispatch of common co-located resources to be within the ACC max and min limits. This will ensure resources operating “as capable” do not cause overload of ACC limits when operating in excess of market dispatch instructions.</p>	Existing Function	- RTM
HRPh1-BRQ-116	<p>Co-located resources that do not follow dispatch instructions may lose eligibility to use the aggregate capability constraint. Such co-located resources will revert back to the current methodology where $\Sigma P_{Max} \leq ACC \text{ max limit}$ and $\Sigma P_{Min} \geq ACC \text{ min limit}$.</p>	Process	- N/A
HRPh1-BRQ-120	<p>System shall alert the ISO BAA and EIM BAA operator if the resource selected for exceptional dispatch was an active co-located resource prior to submission of the exceptional dispatch instruction. System shall provide the operator with the ACC identifier in its alert message. Individual co-located resources may be receive verbal or electronic exceptional dispatch instructions, as performed today.</p> <p>At this time, exceptional dispatch validation logic will not include ACC limits (maximum or minimum). ISO and EIM BAA operators may instead choose to reduce the ACC maximum limit to a non-negative value below its default MasterFile max limit as a tool to manage congestion for their own BAA.</p>	Core	- RTM

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ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-121	<p>EIM BAA operators may only interact with ACC limits and co-located resource exceptional dispatches from their own associated BAA.</p> <p>ISO BAA operators may interact with ACC and resource information associated from all EIM BAAs, but ACC max limit reduction is only expected to be performed by the relevant EIM BAA's operator.</p> <p>CISO BAA user role would be only allowed capability to modify ACC limits and co-located resource exceptional dispatches associated with the CISO BAA.</p> <p>RTMO user role would be allowed capability to modify ACC limits and co-located resource exceptional dispatches associated with all BAAs.</p>	Core	- RTM/BAAOP
HRPh1-BRQ-125	<p>Market systems shall not allow virtual bidding to be implemented at the pnodes of the co-located resources. Virtual bidding may be accepted at the pnode location of the ACC. No congestion pricing shall result from a binding aggregate capability constraint as the congestion will have resulted beyond the transmission system.</p>	Core	- IFM
HRPh1-BRQ-130(a)	<p>Day-Ahead and Real-Time Market displays shall provide the ISO operator with the following user-interface:</p> <ul style="list-style-type: none"> - List of all active ACC identifiers with their following information: <ul style="list-style-type: none"> - ACC identifier (filterable, sortable) - ACC operating limits (Pmax, Pmin) (filterable, sortable) - BAA identifier (filterable, sortable) - POD pnode (filterable, sortable) - will allow user to see if multiple ACC exist at the same POI/POD - List of all active co-located resources mapped to their ACC with the following information: <ul style="list-style-type: none"> - Resource IDs (filterable, sortable) - SC(s) identifier (filterable, sortable) - Resource Types - Generator Types - Resource Operating Limits (Pmax, Pmin, Ramp Rate Up/Dn) - Resource Temporal Limits (Min Up Time, Min Down Time, Max Starts Daily) 	Core	<ul style="list-style-type: none"> - IFM - RTM - BAAOP

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HRPh1-BRQ-130(b)	<p>System UI shall allow operator the ability to perform the following process:</p> <ol style="list-style-type: none"> 1 - Filter and identify a specific ACC by its ACC ID, BAA ID, POI/POD location, or Resource ID of an associated co-located resource 2 - View filtered ACC(s) with their displayed Operating Limits, BAA ID, POD location 3 - Select an ACC and view all its active co-located resources with their displayed SCID, resource ID, resource type, Telemetry operating max and min limits, Current DOT, Prior DOT, VER Forecast (if applicable) 4 - View the aggregate dispatch of all co-located resources associated with the ACC (as an algebraic sum netting positive and negative dispatches) 5 - Overwrite ACC max or min limit value (value may only be a value below the max limit or above the min limit, as defined in MasterFile); value must revert to the MasterFile max and min limit values when max limit reduction is released. 	Core	<ul style="list-style-type: none"> - IFM - RTM - BAAOP
HRPh1-BRQ-131	<p>EIM and ISO Operator displays for ACC constraint information must:</p> <ul style="list-style-type: none"> - automatically refresh display values - allow the operator to override the MW amount of reduction adjustment for the ACC max limit, incremental adjustment for the ACC min limit - allow the operator to set the ACC override start and end time (aligning with market intervals); wherein the system shall revert to the MasterFile ACC limits once the market horizon passes beyond the override's end time <p>CISO BAA and EIM BAA user role would be only allowed capability to modify ACC limits and co-located resource exceptional dispatches associated with their own BAA.</p> <p>RTMO user role would be allowed capability to modify ACC limits and co-located resource exceptional dispatches associated with all BAAs.</p>	Core	<ul style="list-style-type: none"> - IFM - RTM - BAAOP

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ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-132	<p>System displays will allow EIM operator the ability to perform the following processes:</p> <ul style="list-style-type: none"> - Review ACC operating limits, locations, associated co-located resources - Set the ACC override start and end times (aligning with market intervals); wherein the system shall revert to the MasterFile ACC limits once the market horizon passes beyond the override's end time - Reduce ACC max and min limit for a temporary time period (in response to operating conditions) where the reduction value may only be a non-negative value below the max and min limit defined in MasterFile; max limit shall revert to its MasterFile default once reduction is released. <p>EIM operator shall only be able to view, update operating information for ACCs and co-located resources for their own BAA.</p>	Core	<ul style="list-style-type: none"> - IFM - RTM/BAAOP

6.8.3 Business Requirements: Outage Submissions


ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-170(a)	<p>System shall submit user-defined outages for co-located resources at an individual resource basis, but not support outage submission for Aggregate Capability Constraint (ACC) Max or Min limits.</p> <p>Given co-located resources under the same ACC may have different scheduling coordinators (SCs), it is possible that co-located resources may collectively have Pmins exceed the ACC max limit. The market optimization engine shall prioritize the ACC constraint above the outage constraint in these cases and, therefore, adjust dispatch for the co-located resources to a feasible value.</p>	Existing Function	- WebOMS

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ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-170(b)	<p><i>For example, ACC #1 has a max limit of 40 MW serving three co-located resources. During real-time operations, Resource #1 has its Pmin derated from 0 to 20 MW. Simultaneously, Resource #2 has an existing Pmin outage from 0 MW to 15 MW, and the default Pmin of Resource #3 is 7 MW.</i></p> <p><i>Since Resources #1 and #2 have a different SC than Resource #3, neither SC is aware they've collectively set the Pmin for all co-located resources to 42 MW while the ACC max limit is 40 MW.</i></p> <p><i>In response to this condition, the markets will relax the outage constraint prior to the ACC limit constraint. Additionally, runback schemes preventing overrun of the point-of-interconnection injection limit should engage.</i></p>	Informational	- WebOMS

6.8.1 Business Requirements: CMRI

ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-214	<p>System shall receive VER component of hybrid NGR resources forecasts and publish the data externally in the existing VER Forecast Report.</p> <p>Note: NGR resources with a VER component are identified in MF using the VER_NGR_FF flag=Y and the FORECAST_SELECTION=ISO</p> <p>Note: The resources shall appear in all three drop downs for the VER forecast report</p> <p>Note: Security rules for the existing report shall apply to the new dataset</p>	Core	<p>-CMRI</p> <p>Group 1 Release</p>

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6.9 Business Process: Managing Price Corrections


6.9.1 Business Requirements

ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-180	System shall calculate flex ramp movement for co-located resource settlement.	Existing	- PCA (Internal to ISO)
HRPh1-BRQ-182	For market gap fills and price sync, system shall assign prices for co-located resources at the financial location of their associated point-of-interconnection only. Gap intervals shall apply the same logic as today.	Existing	- PCA (Internal to ISO)
HRPh1-BRQ-183	Price correction shall not apply ACC shadow price to the locational marginal price (LMP) of the co-located resource or its point-of-interconnection (POI) pnode.	Core	- PCT (Internal to ISO)

6.10 Business Process: Manage Market Billing & Settlements

6.10.1 Business Requirements

ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-215	Settlements shall receive hybrid NGR resource with VER component identification (new MF flag). Note: New MF flag denoted as "VER_NGR_FF=Y"	Core	-Settlements -DReAMS -Masterfile Group 2 Release
HRPh1-BRQ-216	Settlements shall use the existing FORECAST_SELECTION flag in combination with the new VER_NGR_FF flag to identify an NGR resource with a VER component that is using ISO forecast for calculating the forecast fee.	Core	-Settlements -DReAMS -Masterfile Group 2 Release
HRPh1-BRQ-217	Settlements shall net the load from the generation	Existing Process	-DReAMS Group 2 Release

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ID#	Business Feature	Req Type	Potential Application(s) Impacted
HRPh1-BRQ-218	Settlements shall update CC701 to allow hybrid resources to be charged.	Core	-Settlements -DReAMS Group 2 Release
HRPh1-BRQ-219	Settlements shall charge a monthly forecasting fee based on the total net meter values for the month.	Core	-Settlements -DReAMS Group 2 Release
HRPh1-BRQ-220	The SC will not be paid if the total net meter values for the month is negative	Core	-Settlements -DReAMS Group 2 Release

6.11 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 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.

In the Reason for Potential Scenario column, the one or more of the following reasons shall be selected:

- 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.


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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 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 EIM 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.

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6.11.1 Business Requirements

ID#	Guidance on Market Participant Impacts	Source System	Sink System	Reason for Potential Scenario
HRPh1-MSIM-001	IFM and RTM optimized scheduling and dispatch <ul style="list-style-type: none"> Create Simulation Model Data for Co-located Resources, ACC limits Bid Submission (Energy Only) Execution of Day-Ahead, Real-Time Markets Dispatch Instruction Settlement (BD Files) 	RTM	ADS MRI-S	1. Rule Impacts 4. New system process 5. New Modified Model Data
HRPh1-MSIM-002	Virtual Bidding at the POI node <ul style="list-style-type: none"> Create Simulation Model Data for Co-located Resources, ACC limits Virtual Bid Submission Execution of Day-Ahead, Real-Time Markets Settlement (BD Files) 	SIBR	MRI-S CMRI	1. Rule Impacts 5. New Modified Model Data
HRPh1-MSIM-003	Enforcement of an ACC-Level Max Limit Reduction <ul style="list-style-type: none"> Create Simulation Model Data for Co-located Resources, ACC limits Submission of Market Bids, Forecasts Execution of Day-Ahead, Real-Time Markets EIM BAA Operator identifies ACC and reduces ACC max limit Releases ACC max limit reduction 	RTM BAAOP	RTM BAAOP	1. Rule Impacts 5. New Modified Model Data

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ID#	Guidance on Market Participant Impacts	Source System	Sink System	Reason for Potential Scenario
HRPh1-MSIM-004	Negative Supplemental DOT for VER Resources — Create Simulation Model Data for VER Co-located Resources, ACC limits — VER Forecasts submitted — VER Self-Schedules/Bids — Execution of Day-Ahead, Real-Time Markets — Operator Instruction submitted	RTM BAAOP	ADS	1. Rule Impacts 4. New system process 5. New Modified Model Data

6.12 Business Process: Market Monitoring and Reporting

6.12.1 Business Requirements

ID#	Business Feature	Req Type	Business Unit(s) Affected	Manual Or Auto	Application(s) Impacted
N/A					