Release User Group Agenda

December 18th, 2018   *10:00 a.m.–11:00 a.m.* (Pacific Time)

Web Conference Information	Conference Call Information
Web Address: https://caiso.webex.com/meet/RUG Meeting Number: 960 941 245 Audio connection instructions will be available after connecting to the web conference. When prompted, select "Call me" and enter the phone number you will use during the call. You will be called by the conference shortly.	Dial-in Number: 866-528-2256 International Dial-in: 216-706-7052 Access Code: 291 426 5
Calls and webinars are recorded for stakeholder convenience, allowing those who are unable to attend to listen to the recordings after the meetings. The recordings will be publicly available on the ISO web page for a limited time following the meetings. The recordings, and any related transcriptions, should not be reprinted without the ISO's permission.	

Release User Group Agenda

December 18th, 2018   *10:00 a.m. – 11:00 a.m. (Pacific Time)*

Time	Topic	Facilitator
10:00 – 10:05	Agenda & ISO Roll call	Adrian Chiosea
10:05 – 10:45	Release Plan	Joanne Alai Heidi Carder Eureka Cullado Marcelo Da Costa Trang Deluca Ayman Fattah Jami Herguth Cynthia Hinman Mohan Koya Deann MacDougall Christopher McIntosh LeAnne McLaughlin Janet Morris Indu Nambiar Prince Phillip Raymond Riley Daniel Shaw LuAnn Rivera Craig Williams John Williams Justin Wong

The ISO offers innovative training programs

Date	Training
---------	No courses scheduled at this time

New Modules (recorded webinar and slides)
Generator Contingency and Remedial Action Scheme Modeling (GCARM)
Congestion Revenue Rights (CRR) Auction Efficiency – Track 1A and Track 1B
Commitment Cost Enhancements Phase 3 (CCE3)
EIM Enhancements 2018
Energy Storage / Distributed Energy Resources Phase 2
Eligible Intermittent Resource Dispatch Operating Target (EIR DOT)
Greenhouse Gas (GHG) Enhancements for EIM
Welcome to the ISO (find under Markets and Operations learning track)

CustomerTraining@caiso.com

New computer-based training (CBT) courses		
ISO Orientation	Master File Process	Metering Overview
Day-Ahead Overview	Emergency Response & Abnormal Operations	Interchange & eTag
Real-Time Overview	Outages Overview	*More to come!!*

Visit our **Learning Center** web page to access our training calendar, register for courses and find other useful resources, including computer based training courses, recorded webinars and new release training materials at:

http://www.caiso.com/participate/Pages/LearningCenter/default.aspx

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Release Plan Summary: 2018 – Independent 2019

Independent 2018
- Congestion Revenue Right Auction Efficiency 1B

Spring 2019
- Commitment Cost Enhancement (CCE) Phase 3
- Energy Imbalance Market (EIM) 2019 Balancing Authority of Northern California (BANC) / Sacramento Municipal Utility District (SMUD)
- EIM Enhancements (Flexible Ramping Sufficiency and Capacity Test, 1% Tolerance Band)
- LMC Transparency Enhancement

Independent 2019
- Imbalance Conformance Enhancements (ICE)
- Generator Contingency and Remedial Action Scheme (RAS) Modeling
- Automated Dispatch System (ADS) User Interface (UI) Replacement
- FERC Order 844 Uplift Cost Allocation & Transparency
- Interconnection Process Enhancements (Nov 2018 BOG)

Fall 2019 – tentative, subject to impact assessment
- Commitment Costs and Default Energy Bid Enhancements
- Dispatch Operating Target Tariff Clarifications
- Energy Storage and Distributed Energy Resources Phase 3
- RMR and CPM Enhancements (March 2019 BOG)
- Intertie Deviation Settlement (Feb 2019 BOG)
- Local Power Mitigation Enhancements (Mar 2019 BOG)
- EIM 2019 Enhancements

Release Plan Summary: Fall 2019 – Spring 2020

Spring 2020
- Energy Imbalance Market (EIM) 2020 Salt River Project
- Energy Imbalance Market (EIM) 2020 Seattle City Light
- Energy Imbalance Market (EIM) 2020 Los Angeles Dept. of Water and Power

Fall 2020
- Contingency Modeling Enhancements - Transmissions
- DAME 15 Minute Granularity – Phase 1 (Mar 2019 BOG)
- Storage as a Transmission Facility (Feb 2019 BOG)
- RA Enhancements Track 2 (Nov 2019 BOG)
- Excess Behind the Meter Production (May 2019 BOG)

Spring 2021
- Energy Imbalance Market (EIM) 2021 Public Service Company of New Mexico
- Energy Imbalance Market (EIM) 2021 NorthWestern Energy

TBD – tentative, subject to impact assessment
- DAME - Flexible Ramping Product (May 2019 BOG)

RC Participant Onboarding Timeline – please attend RC Onboarding webinars for more information.

California ISO
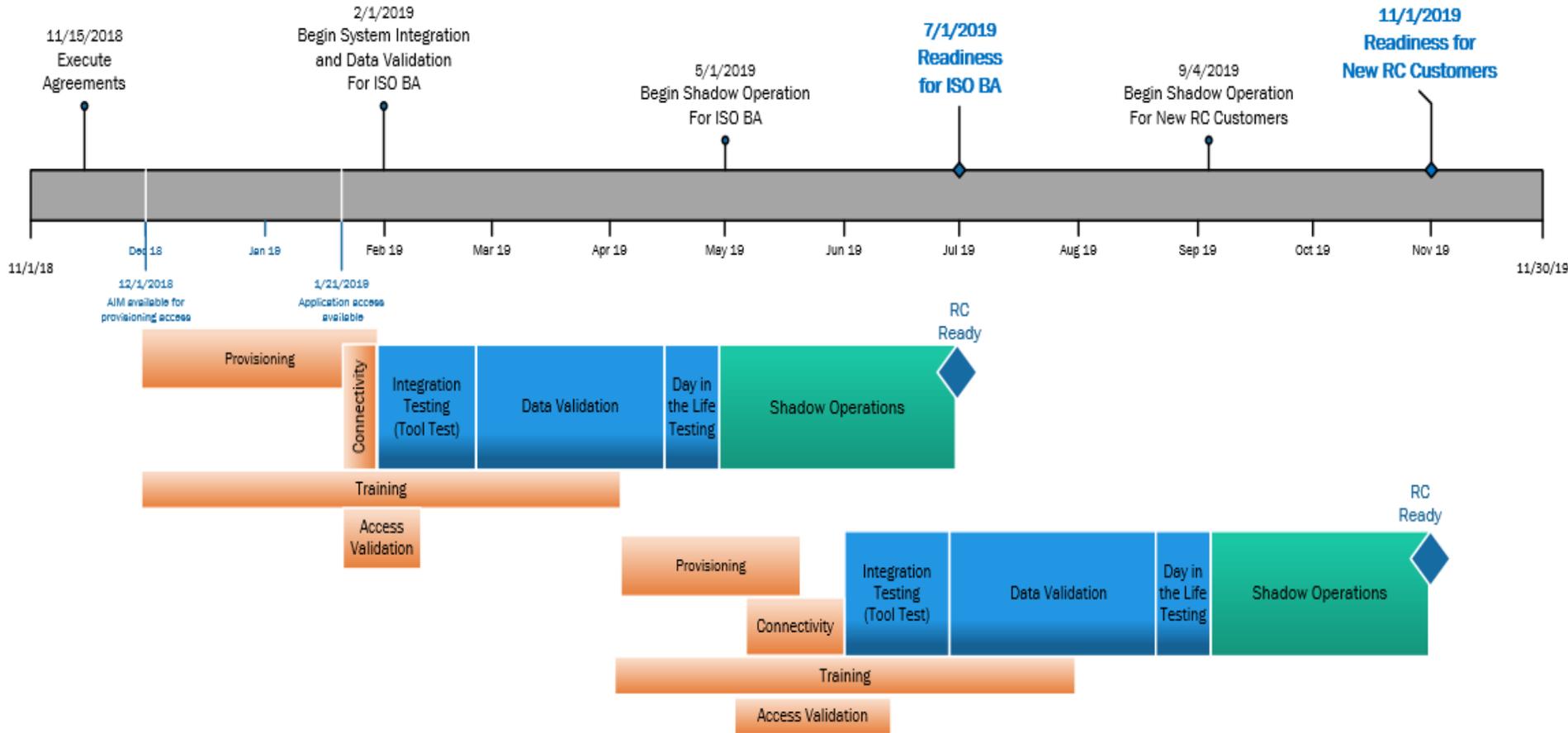
RC Onboarding Guidance Documents available

- 01 - RC Overall Onboarding Plan
- 02 - CAISO Reliability Coordinator Area Full Network Model
- 03 - Outage Coordination Overview for RC Services
- 04 - Architecture Overview for Reliability Coordination Services
- 05 - RC System Integration and Data Validation Overview
- 06 - Day in the Life Reliability Coordination Services
- 07 - Hosted Advance Network Applications (HANA) Overview
- 08 - Schedule Submission Overview for RC Services
- 09 – Reliability Coordination Communication Plan
- 10 – RC Progress Tracking - Example
- 11 – RC Onboarding Training Plan
- 12 – RC Readiness Criteria checklist
- 13A – Grid Messaging System User Guide
- 13B – Grid Messaging System Administrator Guide
- RCSA information Request Sheet
- Supplemental Generator Information Template (SGIT)

Note: Technical specifications are available; please be aware of web service version updates.

Release Schedule 2018 – 2019

California ISO

Legend
- Market Simulation
- CA ISO Holiday
- Deployment Week

Date columns (weeks):
12/10/18-12/16/18, 12/17/18-12/23/18, 12/24/18-12/30/18, 12/31/18-1/6/19, 1/7/19-1/13/19, 1/14/19-1/20/19, 1/21/19-1/27/19, 1/28/19-2/3/19, 2/11/19-2/17/19, 2/25/19-3/3/19, 3/25/19-3/31/19, 4/1/19-4/7/19, 4/8/19-4/14/19, 7/1/19-7/7/19, 7/8/19-7/14/19, 7/15/19-7/21/19, 7/22/19-7/28/19, 7/29/19-8/4/19, 8/5/19-8/11/19, 8/12/19-8/18/19, 8/19/19-8/25/19, 8/26/19-9/1/19, 9/2/19-9/8/19, 9/9/19-9/15/19, 9/16/19-9/22/19, 9/30/19-10/6/19, 10/28/19-11/3/19, 11/4/19-11/10/19, 11/11/19-11/17/19, 11/18/19-11/24/19, 11/25/19-12/1/19, 12/9/19-12/13/19

MAP Stage Environment Window

Item	Schedule
EIM - BANC-SMUD	EIM - BANC-SMUD (08/15-01/31)
Generator Contingency and RAS Modeling	Generator Contingency and RAS Modeling (09/10-02/01)
EIM - BANC-SMUD - Market Sim	EIM - BANC-SMUD - Market Sim (12/03-01/31)
CRR Auction Efficiency 1B	CRR Auction Efficiency 1B (11/05-12/26)
CRR Auction Efficiency 1B - Market Sim	CRR Auction Efficiency 1B - Market Sim (11/05-12/18)
FERC 844 External Testing	FERC 844 External Testing (01/24-01/31)
LMPM - Enhancements	LMPM - Enhancements (07/01-09/16)
RMR and CPM Enhancements	RMR and CPM Enhancements (07/10-09/05)
LMPM - Enhancements - Market Sim	LMPM - Enhancements - Market Sim (07/15-08/30)
CCDEBE	CCDEBE (07/15-08/30)
CCDEBE - Market Sim	CCDEBE - Market Sim (07/15-08/30)
Intertie Deviation Settlement	Intertie Deviation Settlement (07/15-08/30)
Intertie Deviation Settlement - Market Sim	Intertie Deviation Settlement - Market Sim (07/15-08/30)
RMR and CPM Enhancements - Market Sim	RMR and CPM Enhancements - Market Sim (07/15-08/30)

Production Environment Window

Item	Schedule
CRR 1B: Settlement Provisions	CRR 1B: Settlement Provisions (12/28-12/28)
Generator Contingency and RAS Modeling	Generator Contingency and RAS Modeling (02/01-02/01)
FERC 844	FERC 844 (02/15-02/15)
Imbalance Conformance Enhancements	Imbalance Conformance Enhancements (02/28-02/28)
LMC Transparency Enhancement	LMC Transparency Enhancement (04/01-04/01)
Commitment Cost Activation	Commitment Cost Activation (04/01-04/01)
EIM Capacity and Sufficiency Test Enhancements	EIM Capacity and Sufficiency Test Enhancements (04/01-04/01)
EIM - BANC-SMUD	EIM - BANC-SMUD (04/03-04/03)
Intertie Deviation Settlement	Intertie Deviation Settlement (10/01-10/01)
LMPM - Enhancements	LMPM - Enhancements (10/01-10/01)
RMR and CPM Enhancements	RMR and CPM Enhancements (10/01-10/01)
EIM Enhancements 2019	EIM Enhancements 2019 (10/01-10/01)
ESDER Phase 3	ESDER Phase 3 (10/01-10/01)
CCDEBE	CCDEBE (10/01-10/01)
Dispatch Operating Target Tariff Clarification	Dispatch Operating Target Tariff Clarification (10/01-10/01)

http://www.caiso.com/Documents/ReleaseSchedule.pdf

2018 Independent Projects

California ISO

2018 - CRR Auction Efficiency – 1B

Project Info	Details/Date
Application Software Changes	Targeted reduction of congestion revenue rights payouts on a constraint by constraint basis **CRRS:** Calculate offset MW for netted CRRs per portfolio per constraint/contingency case per hour: • Calculate netted CRR portfolio proportion of netted flow on constraint (alpha) • Calculate IFM constraint flow difference (CFD) • Calculate netted CRR portfolio Offset MW = alpha x CFD • Calculate netted CRR portfolio Notional, Offset, Clawback and Circular Scheduling Revenue values **Settlement:** Daily Settlement: • Daily CRR Settlement value based on results of constraint-based calculations • Daily CRR Surplus Distribution Payment from available constraint-specific funds (In CC6700) • Daily surplus and deficits per constraint managed during the month Monthly Settlement - at end of each month • Monthly CRR Surplus Distribution Payment from available constraint-specific funds (New CC6701) • Residual funds allocated to Balancing Account and measured demand. (New CC6706) **CMRI**: Report individual CRR's Notional, Offset, Clawback and Circular Scheduling Revenue values **OASIS:** Report constraint-based data affecting CRR settlements **Market Clearing/Credit Tracking:** Process new charge codes
BPM Changes	• Congestion Revenue Rights • Definitions & Acronyms • Market Instruments • Market Operations • Settlements & Billing
Business Process Changes	• Manage Operations Support & Settlements (MOS) / Manage Market Billing & Settlements

2018 – CRR Auction Efficiency – 1B (cont.)

Milestone Type	Milestone Name	Dates	Status
Board Approval	BOG Presentation and Approval - Track 1B	Jun 21, 2018	✓
External BRS	Post External Draft BRS	Aug 06, 2018	✓
Config Guides	Post Draft Configuration Guides	Sep 10, 2018	✓
Tech Spec	Create ISO Interface Spec (Tech spec)	Sep 10, 2018	✓
Tariff	File Tariff	Jul 17, 2018	✓
	Update Tariff and Refile with FERC	Oct 01, 2018	✓
BPMs	Post BPM (Draft)	Nov 05, 2018	✓
External Training	Deliver external training	Oct 31, 2018	✓
Market Sim	CRR Auction Efficiency 1B	Nov 05, 2018 - Dec 18, 2018	
Production Activation	CRR Auction Efficiency 1B	Dec 28, 2018	
	65% Transmission Capacity for CRR Allocation & Auction	Sep 24, 2018	✓
	Settlement Provisions	Dec 28, 2018	

CRR 1B Enhancement – to be implemented in 2019

CAISO will provide the following CRR-specific information in a new CMRI report, per binding constraint and time interval
- CRR ID
- Hedge Type (option or obligation)
- CRR Type (LSE, AUC, etc.)
- Hourly Notional Revenue
- Hourly CRR Clawback Revenue
- Hourly Circular Scheduling Revenue
- De-rate factor (applies to merchant TOR CRRs)
- CRR award MW

This information will be provided for each CRR at a unique source and sink location. If an SC has multiple CRRs at the same source and sink, result will be based on the net award value

California ISO

2019 Spring Release

ISO PUBLIC

Spring 2019 - Commitment Cost Enhancements Phase 3

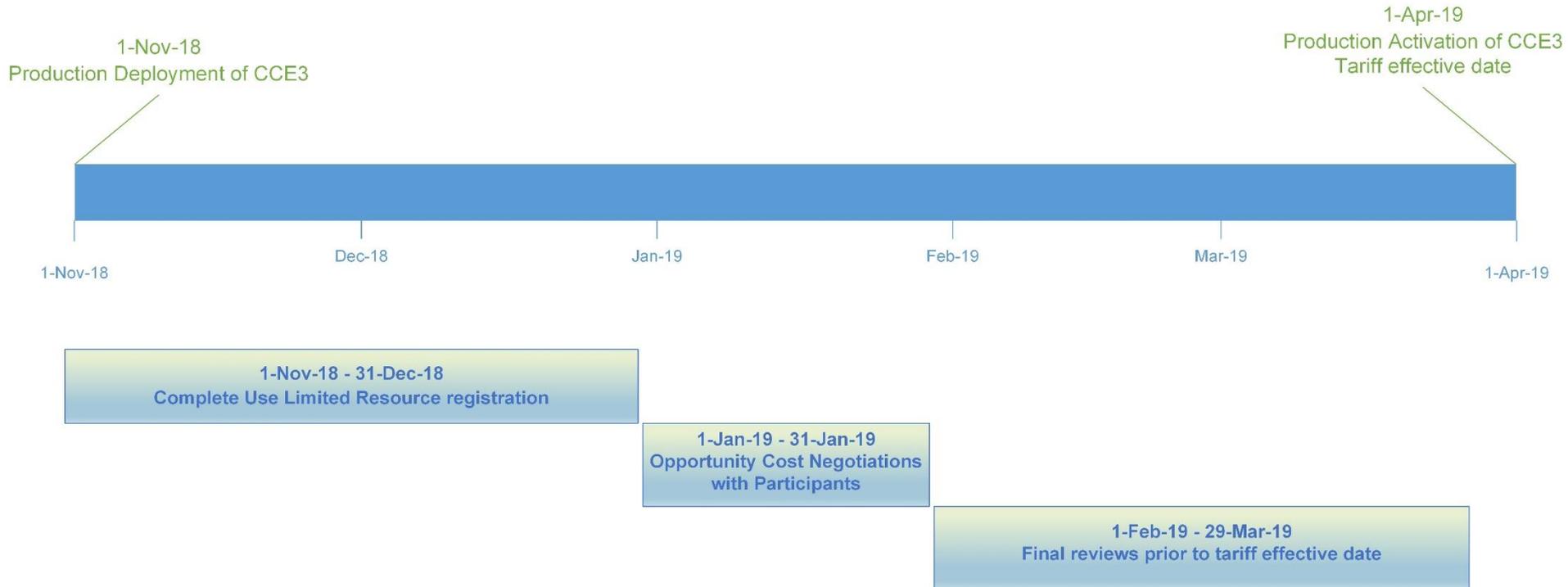| Project Info	Details/Date

Application Software Changes	**Scope:**
	1. Clarify use-limited registration process and documentation to determine opportunity costs
	2. Determine if the ISO can calculate opportunity costs
	   • ISO calculated; Modeled limitation Start/run hour/energy output
	   • Market Participant calculated; Negotiated limitation
	3. Clarify definition of "use-limited"; add MSG Configuration ID to ULPDT
	4. Change Nature of Work attributes (Outage cards)
	   • Modify use-limited reached for RAAIM Treatment
	   • Allow PDR to submit use-limit outage card for fatigue break.
	5. Market Characteristics (added to GRDT in Spring 2018) shall be Read-Only and set to Null
	   • Maximum Daily Starts
	   • Maximum MSG transitions
	   • Ramp rates
	Impacted Systems:
	1. Master File: Set use-limited resource types and limits
	2. ECIC: Process use limited resource input values for and Receive opportunity cost adders from opportunity cost tool
	3. CIRA: RAAIM exempt rule for "use-limited reached"
	4. CMRI: Publish opportunity cost
	5. SIBR: Add Opportunity cost adders on bid caps
	6. OMS: "Use-Limited Reached" nature of work attribute for Generation Outage Card
	7. Settlements: Publish the actual start up, run hour and energy output for the use-limited resources
	8. Opportunity cost calculator (OCC): Calculate and publish opportunity costs for start-up, MLC and DEB

BPM Changes	Market Instruments, Outage Management, Reliability Requirement, Market Operations
Business Process Changes	• Manage Market & Reliability Data & Modeling • Manage Markets & Grid

Spring 2019 - Commitment Cost Enhancements Phase 3 (cont.)

Project Info	Details/Date
FERC ruling: CCE3 changes	**Updates:** 1. As a result of FERC's ruling against CAISO's proposal to allow scheduling coordinators to register market values for resource characteristics in the Master File, changes have been made to prevent the collection of this data. 2. This resulted in Technical Specification, RDT, and validation rule changes, which have been posted to the CAISO website.

Milestone Type	Milestone Name	Dates	Status
Board Approval	Board of Governors (BOG) Approval	Mar 25, 2016	✔
External BRS	Post Updated External BRS	Aug 21, 2017	✔
Config Guides	Config Guide	May 17, 2018	✔
Tech Spec	Publish Updated Master File Technical Specification, GRDT/IRDT Definitions	Jul 13, 2018	✔
	Publish updated CMRI Tech Spec, updated API for Use Limit Type Enumeration update	Aug 02, 2018	✔
Tariff	Draft Tariff	Jul 31, 2017	✔
	File Tariff	Mar 23, 2018	✔
BPMs	Publish Draft BPM: Market Instruments	Oct 19, 2018	✔
	Publish Draft BPM: Market Operations	Oct 19, 2018	✔
	Publish updated Draft BPMs	Dec 07, 2018	✔
External Training	Deliver external training	Sep 10, 2018	✔
Market Simulation	Full Market Simulation Testing	Sep 05, 2018 - Oct 12, 2018	✔
Production Activation	Commitment Costs Phase 3	Apr 01, 2019	

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Spring 2019 - Commitment Cost Enhancements Phase 3 (cont.)

Registration and Opportunity Cost Evaluation timeline

Spring 2019 – EIM BANC/SMUD

Project Info	Details/Date
Application Software Changes	Implementation of SMUD as an EIM Entity
BPM Changes	EIM BPM will be updated if needed to reflect new modeling scenarios identified during implementation and feedback from SMUD.
Market Simulation	December 3, 2018 – January 31, 2019
Parallel Operations	February 1, 2019 – March 31, 2019
Notes:	Started Market Sim on 12/03/2018

Milestone Type	Milestone Name	Dates	Status
Tariff	File Readiness Certification	Mar 01, 2019	
Market Sim	Market Sim Window	Dec 03, 2018 - Jan 31, 2019	
Parallel Operations	Parallel Operations	Feb 1, 2019 - Mar 31, 2019	
Production Activation	EIM - BANC-SMUD	Apr 03, 2019	

Spring 2019 – EIM Capacity and Sufficiency Test Enhancements

Project Info	Details/Date

Application Software Changes	**EIM:** Perform Capacity Test and Sufficiency Test Enhancements
	• Apply Tolerance Threshold Sufficiency Test of 1% or 1MW threshold, whichever greater
	• Independent pass/fail result for each 15min interval of next hour
	• Capacity Test rule where failure of one trade hour 15min interval, results in Sufficiency Test failure for entire trade hour (all intervals)
	RTM (RTPD, RTD): Apply EIM transfer limits based on 15-minute Sufficiency Test results:
	• EIM Transfer for 15min interval failing FRU/FRD limited from below/above (import/export) to least restrictive of:
	    o EIM Transfer in previous 15min interval from last FMM, or
	    o base EIM Transfer in current 15min interval from current FMM

BPM Changes	Energy Imbalance Market (EIM) Market Instruments Market Operations
Business Process Changes	TBD

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	N/A	
External BRS	Milestone: Post External BRS	Dec 21, 2018	
Config Guides	Post Draft Configuration Guides	TBD	
Tech Spec	Create ISO Interface Spec (Tech spec)	TBD	
Tariff	File Tariff	N/A	
BPMs	Post Draft Business Practice Manual changes	TBD	
External Training	Deliver External Training	TBD	
Market Sim	Market Sim Window	TBD	
Production Activation	EIM Capacity and Sufficiency Test Enhancements	Apr 01, 2019	

Spring 2019 – LMC Transparency Enhancement

Project Info	Details/Date
Application Software Changes	Logical Meter Calculation (LMC) enhancements will provide additional transparency for ISO market participant dynamic system resources (non ISO-polled) by providing LMC Allocation Factors used to determine the 5-minute settlement interval meter value as a bill determinant. Allocation Factor bill determinants become available for settlement dates on or after April 1, 2019.

Milestone Type	Milestone Name	Dates	Status
External BRS	Post External BRS	Nov 19, 2018	✔
Config Guides	Post Config Guides	Oct 19, 2018	✔
BPMs	Post Draft BPM changes – PRR 1102	Oct 19, 2018	✔
Market Simulation	Market Sim Window	N/A	
Production Activation	LMC Transparency Enhancements	April 1, 2019	

2019 Independent

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2019 – Imbalance Conformance Enhancements

Project Info	Details/Date
Application Software Changes	Improve RTPD, RTD limiter algorithm to better adjust for factors before and after conformance (Inc. VER deviations; other patterns observed from conformance studies; and after conformance value entered - ramping across multiple intervals rather than today's one interval). In scope for delivery in early 2019.
BPM Changes	Definitions & Acronyms BPM. The ISO is replacing the term 'load biasing' with 'imbalance conformance'

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	May 16, 2018	✔
External BRS	Post External BRS	Jul 10, 2018	✔
Config Guides	Post Config Guides	N/A	
Tech Spec	Publish Technical Specifications	N/A	
Tariff	File Tariff	Dec 12, 2018	✔
BPMs	Post Draft BPM changes	Dec 19, 2018	
External Training	External Training Complete	N/A	
Market Simulation	Market Sim Window	N/A	
Production Activation	Imbalance Conformance Enhancements	Feb 28, 2019	

2019 – Generator Contingency and Remedial Action Scheme Modeling

Project Info	Details/Date

Application Software Changes	• Enhance the Security Constrained Economic Dispatch
	    • Model generation/load loss in the dispatch
	    • Model transmission loss along and generation/load loss due to RAS operation dispatch
	    • Model transmission reconfiguration due to RAS operation in the dispatch
	• Update the congestion component of LMP so that it considers the cost of positioning the system to account for generator contingencies and RAS operations
	• Enhance DAM, RTM and EIM to support generator contingencies
	Impacted systems:
	• CRR, IFM/RTM, Integration.

BPM Changes	Managing Full Network Model CRR Market Operations EIM
Business Process Changes	• Manage Congestion Revenue Rights (MMR LII) • Manage Operations Planning • Manage Real Time Operations - Transmission & Electric System (MMG LII)

2019 – Generator Contingency and Remedial Action Scheme Modeling (cont.)

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	Sep 19, 2017	✓
External BRS	Complete and Post External BRS	Mar 16, 2018	✓
Config Guides	Post Draft Config Guides	N/A	
Tech Spec	Create ISO Interface Spec (Tech spec)	N/A	
Tariff	File Tariff	Nov 16, 2018	✓
BPMs	Post Draft BPM changes	Nov 27, 2018	✓
External Training	Deliver external training	Sep 12, 2018	✓
Market Sim	Market Sim Window	Sep 17, 2018 - Oct 12, 2018	✓
Production Activation	Generator Contingency and RAS Modeling	Feb 01, 2019	
Effective Date	GCARM Effective Date	Mar 01, 2019	

2019 – ADS Replacement

Project Info	Details/Date
Application Software Changes	• Transition to web-based user interface to eliminate the need to install thick client • Transition ADS provisioning to the Access and Identity Management (AIM) application including Resource Level Access Controls (RACL) access • The query tool will provide 30 days of historical data • Move near-term transactions for FERC-764 15-minute awards to ADS; This will include user interface; historical transactions will stay in CMRI. • Various user interface enhancements adding content per Operation's request • ADS B2B services will not otherwise change.
BPM Changes	• Market Instruments • Market Operations
Business Process Changes	To Be Determined

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	N/A	
External BRS	Post External BRS	Aug 06, 2018	✔
ADS Update	ADS Update Meeting	Aug 15, 2018	✔
Config Guides	Design review - BPM and Tariff SMEs	N/A	
Tech Spec	Publish Technical Specifications	TBD	
Tariff	File Tariff	N/A	
BPMs	Draft BPM changes	TBD	
	Post Draft BPM changes	TBD	
External Training	Conduct External Training	TBD	
Market Sim	Market Sim Window	TBD	
Production Activation	ADS Replacement	TBD	

2019 – FERC 844 Uplift Cost Allocation & Transparency

Project Info	Details/Date

Application Software Changes	• Order No. 844 directs CAISO to post three monthly OASIS reports:
	   (1) A zonal uplift report of all uplift payments categorized by transmission zone, day, and uplift category that must be posted within 20 calendar days of the end of each month;
	   (2) A resource-specific report of the total amount of uplift paid to each resource, aggregated across the month, that must be posted within 90 calendar days of the end of each month; and
	   (3) An operator-initiated commitment report listing the commitment size, transmission zone, commitment reason, and commitment start time of each operator-initiated commitment that must be posted within 30 calendar days of the end of each month.
	• CAISO must include in its tariff the transmission constraint penalty factors used in its market software, as well as any circumstances under which those penalty factors can set locational marginal prices, and any process by which CAISO can temporarily change the penalty factors.

BPM Changes	Market Instruments
Business Process Changes	• Manage Operations Support & Settlements (MOS)

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	Nov 14, 2018	✓
External BRS	Republish External Business Requirements with FERC deficiency letter changes	Dec 19, 2018	
Config Guides	Post Configuration Guide Updates	N/A	
Tech Spec	Publish Technical Specifications	Dec 21, 2018	
Tariff	File Tariff	Sep 07, 2018	✓
	Tariff clarification; response to deficiency letter	Dec 07, 2018	✓
BPMs	Post Draft BPM changes for Market Instruments	Jan 04, 2019	
External Training	Deliver external training	Jan 22, 2019	
External Testing	External Testing Window	Jan 24, 2019 – Jan 31, 2019	
Production Activation	FERC 844 - Uplift Cost Allocation and Transparency	Feb 15, 2019	

California ISO

2019 Fall Release

Fall 2019 Release – Overview

	Board Approval	External BRS	Config Guide	Tech Spec	Draft Tariff**	BPMs	External Training	Market Sim	Production Activation
Fall 2019 Release - Overview	**04/01/19**	**05/17/19**	**05/17/19**	**05/17/19**	**06/14/19**	**07/12/19**	**07/12/19**	**07/15/19 - 08/30/19**	**10/01/19**
CCDEBE	03/22/18	01/10/19	05/17/19	05/17/19	06/14/19	07/12/19	07/12/19	07/15/19 - 08/30/19	10/01/19
Dispatch Operating Target Tariff Clarification	07/26/18	12/26/18	TBD	TBD	TBD	TBD	TBD	TBD	10/01/19
ESDER Phase 3	09/05/18	01/10/19	TBD	TBD	TBD	TBD	TBD	TBD	10/01/19
RMR and CPM Enhancements	03/2019	TBD	TBD	TBD	TBD	TBD	TBD	TBD	10/01/19
Intertie Deviation Settlement	02/2019	TBD	TBD	TBD	TBD	TBD	TBD	TBD	10/01/19
LMPM - Enhancements	03/2019	TBD	TBD	TBD	TBD	TBD	TBD	TBD	10/01/19
EIM Enhancements 2019	N/A	1/31/19	TBD	TBD	N/A	TBD	TBD	TBD	10/01/19

Notes:
Items in **BLUE** are complete
Items in **RED** indicate a new date which is later than the target date listed on the overview line.

*TBD items may be inapplicable, or they may have undetermined dates
**Draft Tariff dates have been updated to show only the draft tariff posting. FERC Filing dates can be seen on individual project slides.

California ISO

Fall 2019 – Commitment Cost and Default Energy Bid Enhancements

Project Info	Details/Date
Application Software Changes	**Scope:** Enhances the ability to submit market-based commitment cost bids in order to reflect unique costs and volatility: • Support integration of renewable resources through incentivizing flexible resources participation during tight fuel supply • Account for costs of flexible resources (gas and non-gas) to reduce risk of insufficient cost recovery • Encourage participation of non-RA and voluntary EIM resources; compliance with FERC Order 831 • Raises energy bid cap from \$1,000/MWh to \$2,000/MWh: • Requires supporting verified costs of energy bids above \$1,000/MWh • Introduces market power mitigation (MPM) measures for commitment costs. **Impacted Systems:** • SIBR: Incorporate negotiated default commitment bids, allow the submittal of Ex Ante cost adjustments. Increase commitment cost caps, increase energy bid caps, incorporate soft energy bid cap. Allow for hourly submittal of minimum load bids into day-ahead market. • IFM/RTM: Add MPM tests for commitment costs. Mitigate commitment costs where tests indicate market power. Incorporate MPM (both energy and commitment) in short term unit commitment process. Recalibrate the penalty price parameters in response to raising energy bid cap to \$2,000/MWh. • CMRI: Provide resource-specific reporting on mitigation results for commitment costs. Provide additional source information for default bids. • MQS/PCA: Incorporate mitigation of commitment costs for specific exceptional dispatch (ED) types. Incorporate bid locking of commitment costs for ED instructions and for certain cases where resources are uneconomic to operating. • Master File: Allow submittal of resource-specific minimum load costs for costs that are independent of the Pmin level. Add the ability to indicate preference for new negotiated cost basis type. Provide a view of resource-specific scalars used for validating Ex-Ante cost adjustments. • CIDI: Incorporate templates for submitting request for manual consultation and ex-post default bid adjustments.

Fall 2019 – Commitment Cost and Default Energy Bid Enhancements (cont.)

Project Info	Details/Date
BPM Changes	• Market Instruments • Market Operations
Business Process Changes	• Maintain Major Maintenance Adders (MMG LIII) • Maintain Negotiated Default Energy Bids (MMG LIII) • Maintain Negotiated O_Ms (MMG LIII) • Manage Day Ahead Market (MMG LII) • Manage Market Billing Settlements (MOS LII) • Manage Real Time Hourly Market (RTPD) (MMG LII) • Manage Real Time Operations – Maintain Balance Area (MMG LII)

Milestone Type	Milestone Name	Dates	Status
Draft Policy	Publish Draft Business Rules externally	Jan 31, 2018	✔
Board Approval	Obtain Board of Governors Approval	Mar 22, 2018	✔
External BRS	Publish revised external BRS	Jan 10, 2019	
Config Guides	Config Guide	*May 17, 2019*	
Tech Spec	Publish Technical Specifications	*May 17, 2019*	
Tariff	File Tariff	*Jun 14, 2019*	
BPMs	Post Draft BPM changes	*Jul 12, 2019*	
External Training	Deliver external training	*Jul 12, 2019*	
Market Sim	Market Sim Window	Jul 15, 2019 - Aug 30, 2019	
Production Activation	CCDEBE	Oct 01, 2019	

Fall 2019 – Dispatch Operating Target Tariff Clarification

Project Info	Details/Date
Application Software Changes	**Scope:** Allow Energy Intermittent Resources (EIRs) to automate their response to operational instructions that require the resource not to exceed their DOT **Impacted Systems:** **RTM:** Operator can select EIR resources, system to send Operating instruction Flag to ADS **ADS:** Receive Operating instruction flag for EIRs. Broadcast message to EIRs operator. **ALFS**: Performance evaluation of Forecast Service Providers (FSPs).
BPM Changes	Market Instruments Market Operations
Tariff Change	Changes tariff language from "Operating Order" to "Operating Instruction" in multiple sections.

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	Jul 26, 2018	✓
External BRS	Milestone: Post External BRS	Dec 26, 2018	
Config Guides	Design review - BPM and Tariff SMEs	TBD	
Tech Spec	Create ISO Interface Spec (Tech spec)	TBD	
Tariff	Post Draft Tariff	TBD	
	File Tariff	TBD	
BPMs	Post Draft BPM changes	TBD	
External Training	Deliver external training	TBD	
Market Sim	Market Sim Window	TBD	
Production Activation	Dispatch Operating Target Tariff Clarification	Oct 01, 2019	

Fall 2019 – ESDER 3

Project Info	Details/Date
Application Software Changes	**Scope:** The ESDER 3 initiative will include four (4) demand response enhancements: • New bidding options for demand response resources • Removal of single LSE requirement for PDR registrations & removal of default load adjustment (DLA) • Addition of a Load Shift Product wherein demand response resources with behind the meter (BTM) storage devices can participate in both load consumption and load curtailment. • Enable sub-metered electric vehicles supply equipment (EVSE) to participate in load curtailment **Impacted Systems (Overview):** **Master File:** • RDTs for PDR registrations in MF will require selection of an effective Bid Option to be used for market optimization and dispatch • Registration of new PDR Resource Types and business rules for PDRs with BTM storage devices and wanting to participate in both Load Curtailment and Consumption • Two (2) Resource IDs will be assigned to the same Resource to allow Consumption versus Curtailment participation (PDR-LSR) **DRRS:** • PDR registrations will not require all service accounts to have the same LSE • New PDR Resource types will be added for the Load Shift Product (PDR-LSR) **SIBR:** • Will apply new price criteria for PDR bids and reject those not meeting the applicable criteria • Will not allow Bid Options to be changed in SIBR **HASP/RTM:** • Will use effective Bid Option registered in MF (e.g., 5-min, 15-min or Hourly) for market optimization and dispatch instructions • Will broadcast new PDR energy schedules/awards and instructions to CMRI and/or ADS

Fall 2019 – ESDER 3 (cont.)

Project Info	Details/Date
Application Software Changes (continued)	**Settlements**: • Will remove the default load adjustment (DLA) application • Will provide Bid Cost Recovery for PDRs with 15-Minute Bids but not Hourly Bids **ADS**: • Will include new dispatch instructions and displays for PDRs **CMRI:** • Will include energy schedules and awards for PDRs with new Bid Options
BPM Changes	Market Operations, Market Instruments, Outage Management, Settlements and Billing
Tariff Change	4.13 and 11.6

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	Sep 05, 2018	✓
External BRS	Post External BRS	Jan 10, 2019	
Config Guides	Design review - BPM and Tariff SMEs	TBD	
Tech Spec	Create ISO Interface Spec (Tech spec)	TBD	
Tariff	File Tariff	TBD	
BPMs	Post Draft BPM changes	TBD	
External Training	External Training	TBD	
Market Sim	Market Sim Window	TBD	
Production Activation	ESDER Phase 3	Oct 01, 2019	

Fall 2019 – RMR and CPM Enhancements

Project Info	Details/Date

Application Software Changes	**Scope:** **POLICY STAKEHOLDER REVIEW STILL IN PROGRESS**
	
	RMR and CPM Enhancements will address the following policy and tariff amendment scope:
	• Risk-of-Retirement will transition from CPM to RMR Tariff section
	• RMR units with new contracts shall:
	    Have reliability capacity allocated by TAC Area (for PTOs, not LSEs), Flex RA credit shall be applied
	    Receive Must-Offer Obligation (MOO)
	    Subject to RAAIM
	    Streamline RMR invoicing, settlement process through inclusion in ISO Settlement process
	CPM units shall have pricing formulation for resources offering CPM above soft-offer cap (formulation TBD)
	
	Impacted Systems (Overview):
	Master File:
	• New resource RMR contract type flag to distinguish RMR units with contracts signed prior to ("pre-existing") vs. after ("new") the Interim RMR Agreement Tariff Amendment was enacted.
	CIRA:
	• New features to both qualify (e.g. confirm EFC is defined) and allocate System/Local/Flex reliability capacity by TAC Area (for PTOs) for RMR units with new contract type:
	    • Apply Flex RA credit by TAC Area (for PTOs)
	    • Perform RMR Substitution
	    • Support RMR Risk-of-Retirement
	• Like RA resources, new contract type RMR units will receive RAAIM status determination
	SIBR
	• Like RA resources, automatically generates cost-based energy bids for new contract type RMR units for un-submitted bid range below RMR contract capacity
	    • Bids will reflect applicable GHG Compliance costs, SC charges, Major Maintenance Adder (MMA), or Opportunity Costs (OC); Note: MMA and OC will only be applied for Unit Commitment/Economic Dispatch decisions in market (will not be recovered in settlement)
	• Removes self-schedule requirement for new contract type RMR units scheduled/dispatched in Day-Ahead Market

Fall 2019 – RMR and CPM Enhancements (cont.)

Project Info	Details/Date

Application Software Changes	**Impacted Systems (Continued):**
	IFM/RTM:
	• Unit Commitment, Economic Dispatch decisions will include applicable MMA and OC
	• Like RA resources, new contract type RMR units will have automatic RA Obligation ($0/MWh bids in RUC)
	Settlements:
	• RMR units under new contract type will receive:
	    • Replacement of existing RMR invoice and settlement with standard ISO settlement process
	    • Monthly RMR capacity payment (by resource) and cost allocation (by PTO)
	    • RAAIM settlement/allocation
	    • Bid Cost Recovery (does not include MMA or OC)
	    • True-ups for RMR Condition 2 overpayment (does not include MMA or OC)
	• CPM units with offers above soft-offer cap may receive true-up based on CPM pricing formulation (formulation TBD)

BPM Changes	Reliability Requirements, Market Operations, Market Instruments, Settlements and Billing
Tariff Change	11.13, 31.2.2, 34.1, 40.9, 41, 43, 43A, Appendix G

Milestone Type	Milestone Name	Dates	Status
Board Approval	Board of Govenors Approval	Mar 2019	
External BRS	Post External BRS	TBD	
Config Guides	Publish Config Guide	TBD	
Tech Spec	Publish Technical Specifications	TBD	
Tariff	File Tariff	TBD	
BPMs	Post Draft BPM changes	TBD	
External Training	Deliver External Training	TBD	
Market Sim	Market Sim Window	TBD	
Production Activation	RMR and CPM Enhancements	Oct 01, 2019	

Fall 2019 – Intertie Deviation Settlement

Project Info	Details/Date
Application Software Changes	**Scope:** Implement a new Under/Over Delivery Charge for intertie deviations from Market Schedule and After-The-Fact (ATF) E-Tag, to replace Decline charge **Impacted Systems:** **Settlements** • Calculate FMM binding intertie award, exclude Curtailment, calculate under/over delivery quantity as deviation of schedule and ATF E-Tag, Charge under/over delivery Charge at 50% of RTD LMP. • Remove the decline charge calculation and Decline Threshold • Allocate Over/Under delivery charge to measured demand
BPM Changes	Settlements and Billing
Tariff Change	Section 11.31

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	Feb 2019	
External BRS	Post External BRS	TBD	
Config Guides	Post Draft Config Guides	TBD	
Tech Spec	Publish Technical Specifications	TBD	
Tariff	File Tariff	TBD	
BPMs	Post Draft BPM changes	TBD	
External Training	Deliver external training	TBD	
Market Sim	Market Sim Window	TBD	
Production Activation	Intertie Deviation Settlement	Oct 01, 2019	

Fall 2019 – Local Market Power Mitigation Enhancements

Project Info	Details/Date

Application Software Changes	**Scope:** Prevent Flow reversal, Limits transfer, DEB for Hydro, Reference level adjustment process, Gas price Indices
	Impacted Systems:
	RTM: prevent flow reversal
	     Eliminate rule mitigate in FMM carry to RTD
	     Eliminate rule mitigate for balance of hour for FMM, balance 15 minute for RTD
	     Use current market competitive LMP for mitigation
	     Add a nominal parameter to mitigated bids
	     Mitigated bid = MAX (DEB, Competitive LMP + $0.xx parameter)
	RTM: Limit transfers to limit Economic Displace
	     Optional rule for EIM BAA
	     Limit transfers to the greater of exports in MPM and flexible ramping requirements
	     Export Limit = MAX [ExportsBase, ExportsMPM, $\Sigma FRUMPMAward$]
	     The exporting BAA will receive congestion rents created by this proposed rule
	OASIS: publish Export limit
	ECIC: Default Energy Bid for Hydro resource with storage short-term and long-term
	     Use DA index, BOM index, Monthly future Index, Gas Heat Rate, GPI with customizable inputs on maximum
	     storage horizon and long term bilateral hubs, apply short-term or long-term scalar
	Update the reasonableness thresholds
	Reference level adjustments gas resource GAS price Indices in DAM: for Mondays by including ICE's Monday-only index
	Gas Price Indices to allow as few as one index

BPM Changes	Market Operations, Market Instruments
Tariff Change	Section 29.39, 31.2.1, 39.7

Fall 2019 – Local Market Power Mitigation Enhancements (cont.)

Milestone Type	Milestone Name	Dates	Status
Board Approval	Board Approval	Mar 2019	
External BRS	Milestone: Post External BRS	TBD	
Config Guides	Post Draft Configuration Guides	TBD	
Tech Spec	Publish Technical Specifications	TBD	
Tariff	File Tariff	TBD	
BPMs	Post Draft BPM changes	TBD	
External Training	Deliver External Training	TBD	
Market Sim	Market Sim Window	TBD	
Production Activation	LMPM - Enhancements	Oct 01, 2019	

California ISO

Fall 2019 – Energy Imbalance Market Enhancements 2019

Project Info	Details/Date
Application Software Changes	**Scope:** Implement 21 EIM enhancements requested by EIM entities through Customer Inquiry, Dispute and Information system (CIDI) **Impacted Systems:** **BAAOP:** Add displays for BAA overview, Unit deviations, Load Bias, transfer limits, contingency flag, timestamps, and other identified items. Enhance sorting and layouts ability. Enhance alarm ability for market thresholds. **BSAP**: Enhance capability for Base schedule modification, Add aggregated BS deviation in API. **OASIS**: Display ROC limits **RTM/ADS**: prevent ETSR swing using explicit triggers. Publish current DOP in the MSG transition period. **Settlement**: Publish data for UFE shadow calculation
BPM Changes	Market Instruments Energy Imbalance Market

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	N/A	
External BRS	Milestone: Post External BRS	Jan 31, 2019	
Config Guides	Post Draft Configuration Guides	TBD	
Tech Spec	Create ISO Interface Spec (Tech spec)	TBD	
Tariff	File Tariff	N/A	
BPMs	Post Draft BPM changes	TBD	
External Training	External Training	TBD	
Market Sim	Market Sim Window	TBD	
Production Activation	EIM Enhancements 2019	Oct 01, 2019	

2020 Spring Release

California ISO

Spring 2020 – EIM integrations for SCL, LADWP, and SRP

Project Info	Details/Date
Application Software Changes	Implementation of SCL, LADWP, and SRP as EIM Entities
BPM Changes	EIM BPM will be updated if needed to reflect new modeling scenarios identified during implementation and feedback from SCL, LADWP, and SRP.
Market Simulation	December 2019 – January 2020
Parallel Operations	February 2020 – March 2020

Milestone Type	Milestone Name	Dates	Status
Tariff	File Readiness Certification	March 2020	
Market Sim	Market Sim Window	December 2019 – January 2020	
Parallel Operations	Parallel Operations	February 2020 – March 2020	
Production Activation	EIM – SCL, LADWP, SRP	April 2020	

2020 Fall Release

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Fall 2020 – Day-Ahead Market Enhancements Phase 1

Project Info	Details/Date
Application Software Changes	**Scope:** **Phase 1: 15-minute Granularity DAM** • 15 minute bids in DAM and RTM • 15 minute scheduling and settlement in DAM • 15 minute Base schedule in RTM **Impacted Systems:** **AFLS**: 15 minute Load and VER forecasts **SIBR**: SC submit bids for energy, AS in 15 min interval in DAM and RTM, InterSC Trade is in 15 minute **MPM:** Market Power Mitigation in 15 minute in DAM **ETCC:** *Transmission Contract limits in 15 minute interval for DAM* **IFM/RUC**: • Calculate AS (RegU, RegD, Spin, NSP) requirements in 15 minute interval • Co-optimize Energy, AS, TD: 15 minute interval • TD+X: hourly intervals, need normalize the cost for mixed intervals • Hourly Block energy scheduling constraint for eligible resources elect the block option, intertie, RDRR and PDR. • AS on interties can only be procured from 15-minute dispatch-able resources **BSAP:** *Submit Base Schedules in 15 minute interval, energy and AS* **BASI:** *Balance test, capacity test, and sufficiency test are in 15 minutes in RTM* **RTM:** Receive DAM 15 minute award Energy, AS; Receive EIM BAA submit 15 minute base Schedule. **CMRI**: report 15 minute IFM awards, include Energy and AS. Base schedule test results by 15 minute interval **OASIS:** Display IFM Energy and AS requirements and results in 15 minute intervals; 15-Minute RTM LAP Price report **Settlement**: • All energy, include physical energy supply, virtual supply/demand, load from all resources are settled at the LMP: λ + MCC + MLC in 15 minute interval • AS is settled in 15 minute interval • CRR Settled at DAM congestion cost component in 15-minute interval • GMC $1 divided by 4 for IST • GMC market service portion will apply to AS bids • Administrative price use relevant DAM 15 minute price. • Make whole payment for price correction made to load and block export. • 15 minute bidding exports get BCR **EMS:** receive DAM schedule in 15 minute interval
BPM Changes	Market Instruments, Market Operations, Energy Imbalance Market (EIM), Settlements & Billing
Tariff Change	Yes

2021 Spring Release

California ISO

Spring 2021 – EIM integrations for PSC-NM and NWE

Project Info	Details/Date
Application Software Changes	Implementation of PSC-NM and NWE as EIM Entities
BPM Changes	EIM BPM will be updated if needed to reflect new modeling scenarios identified during implementation and feedback from PSC-NM and NWE.
Market Simulation	December 2020 – January 2021
Parallel Operations	February 2021 – March 2021

Milestone Type	Milestone Name	Dates	Status
Tariff	File Readiness Certification	March 2021	
Market Sim	Market Sim Window	December 2020 – January 2021	
Parallel Operations	Parallel Operations	February 2021 – March 2021	
Production Activation	EIM – PNM and NWE	April, 2021	

California ISO

Stay Informed

Ways to participate in releases

- Visit the Release Planning page
    - http://www.caiso.com/informed/Pages/ReleasePlanning/Default.aspx

- Attend meetings
    - Release Users Group (RUG) bi-weekly meetings
        - Initiative status updates
        - System change updates on independent releases
    - Market Simulation calls
        - Visit the ISO calendar at www.caiso.com for meeting dates and times and add events to your calendar
        - Typically held on Mondays and Thursdays
        - Market sim calls for major releases will be market noticed
    - Market Performance and Planning Forum
        - Bi-monthly review of market performance issues
        - High level discussion of release planning, implementation and new market enhancements

What to look for on the calendar…