

Market Simulation Plan Fall 2020 Release

Initiatives -

Automated Dispatch System (ADS) replacement,
Commitment costs and default energy bid enhancements,
Dispatch operating target tariff clarification,
Energy imbalance market enhancements 2020,
Energy storage and distributed energy resources phase 3,
FERC Order No. 841 requested adjustments,
Flexible ramping product refinements,
Commitment cost enhancements tariff clarifications,
Market settlement timeline transformation, and
Excess behind the meter production

Version: 1.1 July 22, 2020

California ISO	Market Simulation Plan	Template Version:	1.1
California io	Program Office	Template Date:	03/30/2011
ISO External Market Simulation Plan		Document	1.1
		Effective Date	07/22/2020

Location of Document - (link)

Revision History

Date	Version	Description	Author
6/04/2020	1.0	Initial draft	Anshuman Vaidya
07/22/2020	1.1	Updated projects and dates	Anshuman Vaidya

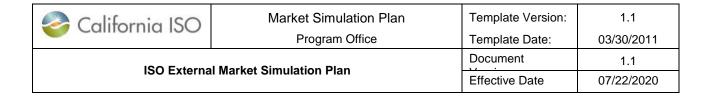


Template Version:	1.1
Template Date:	03/30/2011
Document	1.1
Effective Date	07/22/2020

ISO External Market Simulation Plan

Table of Contents

1.	INTRODUCTION	4
1.1 1.2		
1.3		
2.	MARKET SIMULATION APPROACH	6
2.1	111011 22 (22 0) 21() 22 ()	
2.2	110 01101110111111111111111111111111111	
2.3		
3.	GENERAL INFORMATION	8
3.1	TIMETON IN CORPORATION IN CORPORATION CONTROL OF CORPORATION CORPO	
3.2	TELLE ISE (TEL SIN TOL SIN TOLS)	
3.3		
3.4		
3.5 3.6		
4.	MARKET SIMULATION SUPPORT	19
4.1	ROUTINE FUNCTIONS	19
4.2	MARKET SIMULATION-SPECIFIC SUPPORT	19
4.3		
4.4		
5.	MARKET SIMULATION TRAININGS	21
6.	MARKET SIMULATION EXECUTION AND EXCEPTIONS	22
7.	DOCUMENTATION LINKS	23
8.	ISO MARKET SIMULATION CONTACT	23



1. Introduction

The objective of this document is to provide the information needed by market participants in order to engage in the Fall 2020 Release initiatives, thereby enabling them to smoothly transition and utilize the new features and functionality that will be available when they go into production.

1.1 Scope of Initiatives

ISO release planning sites for the Fall 2020 Release initiatives - (link)

- 1. Automated Dispatch System (ADS) replacement (link)
- 2. Commitment costs and default energy bid enhancements- (link)
- 3. Dispatch operating target tariff clarification— (link)
- 4. Energy imbalance market enhancements 2020 (link)
- 5. Energy storage and distributed energy resources phase 3– (link)
- 6. FERC Order No. 841 requested adjustments (link)
- 7. Flexible ramping product refinements– (link)
- 8. Commitment cost enhancements tariff clarifications (link)
- 9. Market settlement timeline transformation (link)
- 10. Excess behind the meter production— (link)

1.2 Market Simulation

The ISO conducts market simulations on a regular basis as part of its process of bringing new capabilities to its markets. This provides participants an opportunity to test their systems and procedures in advance of the market implementation. The market simulation process serves a number of purposes for both the ISO and market participants. It also facilitates an effective market operations dress rehearsal and helps expedite a smooth production launch. The benefits of market simulation may include but are not limited to:

- Allowing for system or procedural problem identification and mitigation before the market is operationally or financially binding.
- Enabling market participants to observe the behavior of ISO systems and markets in a simulated production environment, particularly in regards to new functions and features introduced through the addition of the modifications included in the Fall 2020 Release initiatives.
- Establishing confidence in the operational processes and systems associated with the new market functionality implementation.

Path to file: ISO Public Created By: Anshuman Vaidya External MarketSim.doc Page 4 of 23

California ISO	Market Simulation Plan	Template Version:	1.1
California iso	Program Office	Template Date:	03/30/2011
ISO External Market Simulation Plan		Document	1.1
		Effective Date	07/22/2020

- Providing a hands-on environment to allow participants to interact with new and unique features and functionality.
- Providing an environment where market participants can scrutinize and tailor their own tools, applications, and business practices to participate in new market functionality.
- Providing a means of capturing additional market participant input and feedback regarding the implementation of the new market features and functionality, beyond what might have been received in the stakeholder process.
- Providing market participants the tools to help determine:
 - Proper exchange of market related data and validation of new timelines.
 - o Common understanding of data submittal requirements and timelines.
 - o Familiarity with market rules and timelines.
- An opportunity to verify the ISO Bid-to-bill process in a pre-production environment that
 includes simulated market and operational data inputs. Allowing the market participants to
 verify systems, process and procedures which may need modifying due to the functional
 changes tied to the release.

1.3 Schedule Summary

Fall Release 2020 Market Simulation High Level Time line is the following.

Phase 1 Market Simulation Type	Start	End
Connectivity Testing	07/27/2020	08/07/2020
Structured Simulation Phase 1	08/10/2020	08/21/2020
Unstructured Simulation Phase 1	08/24/2020	09/04/2020
Structured Simulation Phase 2	08/24/2020	09/04/2020
Unstructured Simulation Phase 2	09/07/2020	09/18/2020
Supported Regression Testing Phase 1	09/07/2020	09/30/2020
Supported Regression Testing Phase 2	09/21/2020	12/31/2020

ISO will continue to have MAP Stage available for market participants to support regression testing if necessary beyond go live.

Path to file: ISO Public External MarketSim.doc

California ISO	Market Simulation Plan	Template Version:	1.1
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ISO External Market Simulation Plan		Document	1.1
		Effective Date	07/22/2020

2. Market Simulation Approach

2.1 High Level Overview

The timeline for the Fall 2020 Release initiatives market simulations is identified below. Critical presimulation activities are identified in section 2.2 of this document.

Fall 2020 Release Initiatives	Start Date	Start Date (Trade Date)	End Date	Structured Simulation Start (Trade Date)
Fall 2020 Release Market Simulation Phase 1	07/27/20	07/28/20	09/04/20	08/11/20
Automated Dispatch System (ADS) replacement				08/11/20
Commitment costs and default energy bid enhancements				NA
Dispatch operating target tariff clarification				08/12/20
Energy imbalance market enhancements 2020				08/19/20
Energy storage and distributed energy resources phase 3				08/18/20
FERC Order No. 841 requested adjustments				08/12/20
Flexible ramping product refinements				08/19/20
Commitment cost enhancements tariff clarifications				NA
Fall 2020 Release Market Simulation Phase 2	07/27/20	08/25/20	09/18/20	08/25/20
Market settlement timeline transformation				08/25/20
Excess behind the meter production				08/25/20

California ISO	Market Simulation Plan	Template Version:	1.1
California io	Program Office	Template Date:	03/30/2011
ISO External Market Simulation Plan		Document	1.1
		Effective Date	07/22/2020

2.2 Pre-Simulation Activities

The Fall 2020 Release initiatives market simulations will be conducted in the MAP Stage environment. Participants will need to obtain access to this environment if they do not already have access. The ISO envisions participants may wish to access Master File (MF), Market Participant Portal (MPP), Outage Management System (WebOMS), Demand Response Registration System (DRRS), Customer Interface for Resource Adequacy (CIRA), Scheduling Infrastructure and Business Rules (SIBR), Base Schedule Aggregation Portal (BSAP), Balancing Authority Area Operations Portal (BAAOP), CAISO Market Results Interface (CMRI), Automated Dispatch System (ADS), and Market Results Interface Settlements (MRIS). For those who do not already have access to the MAP Stage systems, access can be requested by completing an Application Access Request Form (AARF) or modifying existing certificates through the Access Identity Management (AIM) application. Information regarding the completion of AIM and AARF forms can be found on the ISO portal under application access request forms and application installation instructions heading.

Information pertaining to accessing the externally facing ISO environments is available on the ISO Developer site (<u>link</u>).

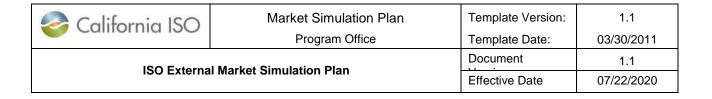
2.3 Pre-Simulation and Simulation Activities Calendar

Activity	Description	Timeframe
MAP Stage Maintenance	MAP Stage maintenance for market simulation preparation for the Fall 2020 Release	06/18/20 – 07/27/20
Structured Simulation Resource Registration	As identified in the structured simulation documents for each initiative; registration for the resources to be validated during the structured simulation phase of the market simulation	07/03/20
Fall 2020 Releases Market Simulation Kick-Off Teleconference	ISO to conduct a teleconference to provide MPs with a Fall 2020 Releases market simulation briefing	07/23/20
Fall 2020 Release Simulation Begins	Fall 2020 Release market simulation in the MAP Stage environment	07/27/20
Fall 2020 Connectivity Testing	MAP Stage open for interface access validation	07/27/20 – 08/07/20

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Created By: Anshuman Vaidya Page 7 of 23



Activity	Description	Timeframe
Fall 2020 Structured Scenarios Phase 1	Phase 1 Fall 2020 Structured Scenarios to be executed.	08/10/20 - 08/21/20
Fall 2020 Unstructured Validation Phase 1	Phase 1 Fall 2020 Unstructured Validation Period.	08/24/20 — 09/04/20
Fall 2020 Structured Scenarios Phase 2	Phase 2 Fall 2020 Structured Scenarios to be executed.	08/24/20 – 09/04/20
Fall 2020 Unstructured Validation Phase 2	Phase 2 Fall 2020 Unstructured Validation Period.	09/07/20 – 09/18/20

3. General Information

3.1 Participant Observation and Inputs

During the Fall 2020 Release initiatives market simulations, participants will be able to observe market results in the same applications that are available in Production: OASIS, CMRI, ADS, etc.

ISO will seed bids and base schedules on your behalf in MAP Stage, participants are encouraged to input data into the ISO Bid-to-bill using all systems available in Production: MRI-S, SIBR/BSAP, ADS and OMS etc., for a more realistic simulation.

<u>Day Ahead Market (DAM)</u> bids are submitted for T+4 >> (**NOTE**: CB bids are submitted for T+2, if participant submits for T+4 they will be over-written)

• Example: on 9/10 bids are submitted for 9/14

Participants wishing to check and or submit DA bids for T+1-T+4) can do so after 7am on T.

- Example T=9/10 DA bids can be submitted for 9/11, 9/12, 9/13 and if after 8am for 9/14
- In the example no seeded bids will over-write submitted bids for T+1, T+2, T+3. For T+4 if the submitted bids come in after 7am they will not be over-written by seeded bids.

Real Time Market (RTM) bids are submitted for T+1 at 11:00am

- Example: on 9/10 static bids are submitted at 11:00am for 9/11
- Participants wishing to check and or submit RT bids for T+1 can do so after 12:00pm (noon), no seeded data will over-write submitted bids.

Path to file: ISO Public Created By: Anshuman Vaidya External MarketSim.doc Page 8 of 23



Template Version:	1.1
Template Date:	03/30/2011
Document	1.1
Effective Date	07/22/2020

ISO External Market Simulation Plan

<u>Day Ahead Base Schedules BSAP (DAM)</u> base schedules are submitted for T+4 <u>Real Time Base Schedules BSAP (RTM)</u> base schedules are submitted for T+ 4

• Example: on 9/10 base Schedules (DAM/RTM) are submitted for 9/14

Participants wishing to check and or submit base schedules for T+1-T+4) can do so after 8am on T.

- Example T=9/10 DA/RT base schedules can be submitted for 9/11, 9/12, 9/13 and if after 7am for 9/14
- In the example no seeded base schedules will over-write submitted base schedules for T+1, T+2, T+3. For T+4 if the submitted base schedules come in after 8am they will not be over-written by seeded base schedules.

SIBR RTM functionality for validating submitted bids or generating submitted bid based on DA market results will still apply, typically MAP Stage market results are not published until after 12pm.

All RTM bids are revalidated between 22:10 and 23:00 for the next day based on latest commitment cost data received.

All DAM bids are revalidated beginning at 03:10 and again at 09:10 for future dates based on latest Master File and commitment cost data received.

All base schedules are revalidated beginning at 08:25 for the next day only based on latest Master File data received.

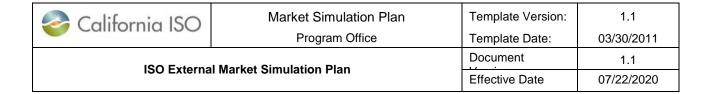
Bids and Base Schedules must be submitted or verified by participants wanting to validate functionality in SIBR and BSAP or downstream applications with regard to project expectations.

3.2 Release Web Service Changes

ISO has provided all the necessary technical specifications for the Web Service changes in scope for Fall 2020 Release on the ISO Developer site at https://developer.caiso.com:

ADS – (link)
DRRS – (link)
MRI-S – (link)
Master File – (link)
CMRI – (link)
OASIS – (link)

Resource Data Template (RDT) submission and or modifications for the Fall 2020 Release initiatives will take 10 business days to process. Prior to the start of simulation all modified RDT's for the Fall 2020 Release should be emailed to RDT@caiso.com please also Cc



MarketSim@caiso.com. Once simulation begins RDT's should be submitted to the MAP Stage Master File with an expected turnaround time of 10 business day, similar to Production.

ISO will be settling unstructured scenario trade dates for the Fall 2020 Release simulations.

ISO will be offering Settlements statements during the Fall 2020 Release market simulation. Similar to Production the ISO will be using estimated Meter data with our initial statements and MP submitted meter data where applicable, for the Re-calc statements.

3.3 Known Issue List

ISO will create and publish a known issues list and post in on the release planning site – (link)

3.4 Structured Scenarios

MP's will need to register their request with the ISO to participate in this simulation via the MarketSim@caiso.com mailbox.

Please submit the information requested below by 07/03/20.

For initiatives not listed, there will be no structured scenarios executed -

- 1. Automated Dispatch System (ADS) replacement (link)
- 2. Dispatch operating target tariff clarification implementation (link)
- 3. Energy imbalance market enhancements 2020 (link)
- 4. Energy storage and distributed energy resources phase 3 implementation (link)
- 5. FERC Order No. 841 requested adjustments (link)
- 6. Flexible ramping product refinements implementation (link)
- 7. Market settlement timeline transformation (link)
- 8. Excess behind the meter production implementation (link)

3.5 ISO's Approach

Unstructured Simulation -

If a MP would like to see specific market conditions for their resource please contact ISO at MarketSim@caiso.com preferably TD-1 prior to the unstructured TD's DAM or RT market run.

Regression Simulation -

If a MP would like to see specific market conditions for their resource please contact ISO at MarketSim@caiso.com preferably TD-1 prior to the regression TD's DAM or RT market run.

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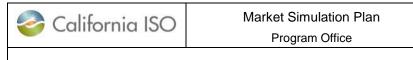
California ISO	Market Simulation Plan	Template Version:	1.1
California iso	Program Office	Template Date:	03/30/2011
ISO Evitorina	al Market Simulation Plan	Document	1.1
150 Externa	Effective Date	07/22/2020	

3.6 Configuration Guides and Payment Calendars

ISO Settlements Calendar and Configuration guides Fall 2020 Release -

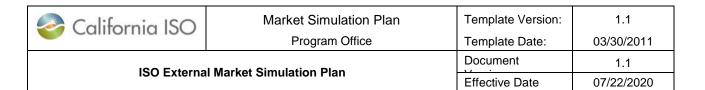
Draft Settlements Configuration Guides – (<u>link</u>)
 Settlements Calendars –

Calendar Day	Day	CMRI T+1B	Publish Initial Statement T+4B	Meter Data Due T+4B Statement	Publish Recalc Statement T+8B	Publish Market Invoice
			T+3B Initial. Estimated by DReAMS. No Meter Data submission	Submit Meter Data by T+4B 18:00 for Recalc		
			INITIAL (Current MSTT)	Current MSTT	RECALC1 (Current MSTT)	
27-Jul-20	Monday					
28-Jul-20	Tuesday					
29-Jul-20	Wednesday	28-Jul				
30-Jul-20	Thursday	29-Jul				
31-Jul-20	Friday					
01-Aug-20	Saturday					
02-Aug-20	Sunday					
03-Aug-20	Monday		28-Jul	28-Jul		
04-Aug-20	Tuesday		29-Jul	29-Jul		
05-Aug-20	Wednesday		Monthly Initial 28-			Daily Initial
			Jul - 29-Jul			28-Jul, 29-
						Jul
						Monthly
						Initial 28-
		4-Aug				Jul - 29-Jul
06-Aug-20	Thursday	5-Aug				35 20 041
07-Aug-20	Friday	37148			28-Jul	
08-Aug-20	Saturday				20 00.	
09-Aug-20	Sunday					
10-Aug-20	Monday		4-Aug	4-Aug	29-Jul	

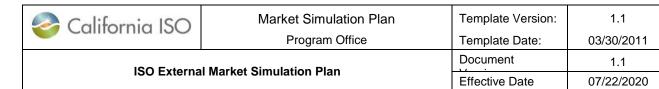


Template Version:	1.1
Template Date:	03/30/2011
Document	1.1
Effective Date	07/22/2020

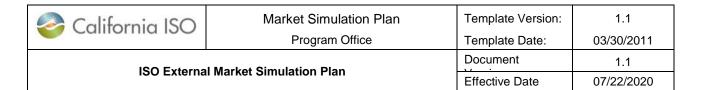
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18-Aug-20	Tuesday				Monthly	
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		18-Aug			`	



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22-Aug-20	Saturday				117108	
23-Aug-20	Sunday					
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25-Aug-20	Tuesday		0		Monthly	
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			19-Aug	19-Aug	Aug - 12-Aug	
26-Aug-20	Wednesday		Monthly Initial 18-			Daily
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05-Sep-20 Saturday	
06-Sep-20 Sunday	
07-Sep-20 Monday ISO Holiday	
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11-Sep-20 Friday	
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13-Sep-20 Sunday	



14-Sep-20	Monday			
15-Sep-20	Tuesday			
16-Sep-20	Wednesday			Daily Initial
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				02-Sep
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				Sep
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17-Sep-20	Thursday			
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19-Sep-20	Saturday			
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Template Version:	1.1
Template Date:	03/30/2011
Document	1.1
Effective Date	07/22/2020

ISO External Market Simulation Plan

					Matau		
					Meter data due		
				Publish	for	Publish	
	Day			Initial	T+70B	Recalc	Publish
Calenda		CMRI		statement	statemen	Statement	Market
r Day		T+1B		T+6B	t	T+9B	Invoice
			Submit Meter		Submit		
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			by T+3B	Initial.	Data		
			18:00 for	Includes	by T+6B	T+70B	
			T+9B Initial	Estimatio	18:00 for Recalc	Recalculatio	
			mittai	n INITIAL	New	n RECALC	
				(New	MSTT	(New MSTT)	
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27-Aug-	Thursday	26-					
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28-Aug- 20	Friday		25-Aug				
29-Aug- 20	Saturday						



Template Version:	1.1
Template Date:	03/30/2011
Document	1.1
Effective Date	07/22/2020

ISO External Market Simulation Plan

30-Aug- 20	Sunday						
31-Aug- 20	Monday		26-Aug				
01-Sep- 20	Tuesday						
02-Sep- 20	Wednesda y	1-Sep		25-Aug	25-Aug		
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04-Sep- 20	Friday			Monthly			
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06-Sep- 20	Sunday						
07-Sep- 20	Monday			IS	O Holiday		
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Template Version:	1.1
Template Date:	03/30/2011
Document	1.1
Effective Date	07/22/2020

ISO External Market Simulation Plan

10-Sep- 20 11-Sep- 20 12-Sep-	Thursday Friday Saturday		1-Sep 2-Sep	2-Sep	Monthly Recalc 25-Aug - 26- Aug	
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14-Sep- 20	Monday		Monthly Initial 01- Sep - 02- Sep			
15-Sep- 20	Tuesday					
16-Sep- 20	Wednesda y					Daily Initial 01- Sep , 02- Sep Monthly Initial 01- Sep - 02- Sep
					1-Sep	Daily Recalc 25-Aug, 26-Aug Monthly Recalc 25-Aug - 26-Aug
17-Sep- 20	Thursday				2-Sep	

California ISO	Market Simulation Plan	Template Version:	1.1
California iso	Program Office	Template Date:	03/30/2011
ISO Externa	Document	1.1	
130 Externa	Effective Date	07/22/2020	

18-Sep-	Friday			Monthly Recalc	Daily
20				01-Sep - 02-	Recalc
				Sep	01-Sep ,
					02-Sep
					Monthly
					Recalc
					01-Sep -
					02-Sep
19-Sep- 20	Saturday				
20-Sep- 20	Sunday				

4. Market Simulation Support

4.1 Routine Functions

All normal support processes should be followed for support functions that are not specific to the market simulation. These include system connectivity issues, system availability issues, user account and permissions issues, etc. The ISO Help Desk can be reached 24x7, 365 days a year @ (916) 351-2309.

4.2 Market Simulation-Specific Support

The ISO will operate a Market Simulation Support Center throughout the market simulation. This support center is focused on providing support for market simulation specific issues. Hours of operation of the Market Simulation Support Center are 09:00 – 18:00 PPT, Monday through Friday.

Issues will be tracked through the ISO's Case Management System, CIDI. Simple questions that can be answered in a single call can be asked without opening a CIDI case, but if the issue cannot be resolved on the call, then participants will need to open a CIDI case. Using the "Functional Environment" field please identify the CIDI case as a "Market Simulation Fall 2020" simulation related question and not a "Production" question.

California ISO	Market Simulation Plan	Template Version:	1.1
Camornia io C	Program Office	Template Date:	03/30/2011
ISO Externa	Document	1.1	
150 Externa	Effective Date	07/22/2020	

4.3 Market Simulation Communication

Dial in numbers and call schedules to be posted on the ISO Calendar – (link)

4.4 Market Simulation Environment Maintenance

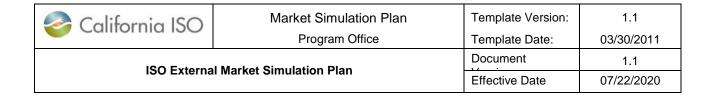
Fall 2020 Release market simulation maintenance will take place Friday morning through Monday morning as the weekly maintenance window.

California ISO	Market Simulation Plan	Template Version:	1.1
California io	Program Office	Template Date:	03/30/2011
ISO Externa	Document	1.1	
130 Externa	Effective Date	07/22/2020	

5. Market Simulation Trainings

Please find information regarding Fall 2020 Release market simulation training offerings at the following locations -

- Training calendar (<u>link</u>)
- ISO training contact <u>CustomerTraining@caiso.com</u>



6. Market Simulation Execution and Exceptions

MAP Stage has been setup with specific application characteristics and data flows to foster successful simulation, please note these changes are made to facilitate a simulation and will not be implemented in Production –

The ISO will upload a previous day's production based bid set for the Day Ahead Markets (DAM) run by 10:00 PPT daily.

Market participants can overwrite these bids between 10:00 PPT and 11:00 PPT when the DAM closes.

DAM will close @ 11:00 PPT and the results will be published by 14:00 PPT daily unless it is a Structured Scenario day, it may take ISO longer to publish DAM due to Scenario setup and verification.

Real Time (RT) template bids will be built from DAM awards as the standard process, ISO will seed RT bids and base schedules for EIM entities.

RT bid markets for a specific Trade Date (TD) open automatically @ 11:00 PPT TD-1.

Market participants are encouraged to bid and base schedule in the Real Time Markets (RTM) to foster a more realistic simulation, the only exceptions are during structured scenario executions were identified.

Market participants will need to register for a tagging test bed user identification if they would like to simulate E-Tagging, if no E-Tag is submitted ISO will "auto tag" on your behalf, limit one registration per SCID.

ISO has activated auto approval for all OMS submissions and changes in MAP Stage.

Please note the timeframes for each Settlements statement publication period are different. Settlements timelines are covered in section 3.5 above.

California ISO	Market Simulation Plan	Template Version:	1.1
California io	Program Office	Template Date:	03/30/2011
ISO Externa	Document	1.1	
130 Externa	Effective Date	07/22/2020	

7. Documentation Links

Fall 2020 Release Initiatives Release Planning Site – (link)

8. ISO Market Simulation Contact

Please contact MarketSim@caiso.com if you have any questions or concerns regarding this plan and its content.