Energy Storage and Distributed Energy Resources (ESDER) Phase 3A

Training Session: Market Simulation Readiness

August 26, 2019

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Customer Readiness

Agenda

- Purpose of ESDER initiative
- Review Phase 3A changes
- Review changes to ISO applications
- Market simulation activities

Purpose of energy storage and distributed energy resources initiative

- The central focus of the Energy Storage and Distributed Energy Resources (ESDER) initiative is to lower barriers and enhance the ability of transmission grid-connected energy storage and distribution-connected resources to participate in the market.

- The number and diversity of these resources is growing and represents an increasingly important part of the resource mix.

- Integrating these resources will help lower carbon emissions and add operational flexibility.

ESDER 2 changes being implemented with ESDER Phase 3A to comply with Tariff

Issue:
ESDER 2 requirement for submittal of actual underlying load data to measurement type “Baseline Load Data (.CBL)” was determined not to fulfill the requirement to provide Customer Load Baseline as defined in tariff

- Submittal of Customer Load Baseline Data
  - Customer Load Baselines are required to be calculated in conjunction with the various Performance Evaluation Methodologies for PDRs and RDRRs
  - Per Tariff requirements, the calculated Customer Load Baselines are required to be submitted to the ISO along with the underlying load/consumption data associated with the Customer Load Baseline
  - This project provides the requirements and capabilities to submit Customer Load Baseline data in MRI-S

Changes being implemented with ESDER Phase 3A

- Demand Response Dispatchable Bidding Options:
  - Currently, Demand Response (DR) resources are limited to a 5-minute bid option
  - This project will introduce new dispatchable bid options of 60-minutes and 15-minutes

- Removal of Single LSE requirement for DR registrations and default load adjustment (DLA):
  - Currently, a DR registration requires that all service accounts/locations be with the same LSE
  - This project will remove the requirement for a single LSE
  - Removal of the single LSE requirement combined with new bid criteria will eliminate the need for the DLA
  - A new field will be added in Master File to identify PDR/RDRR resources

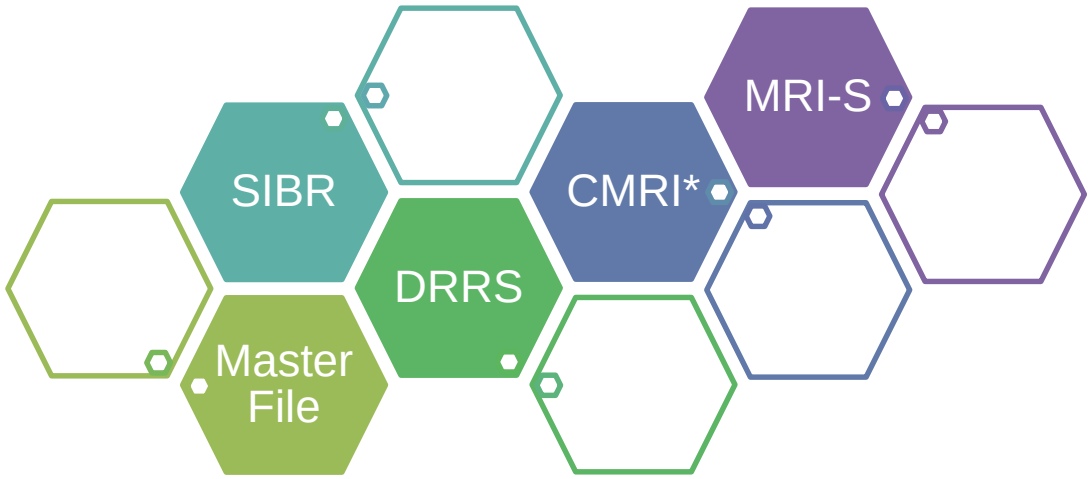
To be addressed in future phases

Proposed changes under ESDER Phase 3B

- New load shift product for behind-the-meter storage
- Measurement of load curtailment by behind-the-meter electric vehicle supply equipment

For more information, see the Reference Material section of this presentation

Review Changes to ISO Applications



* No functional changes to CMRI

Master File: New fields added

Master File

- **DR_TYPE** is a new field that will identify the type of resource as PDR or RDRR
  - The current mechanism to identify resource type needs to be updated
  - The ISO will populate this field for all existing resources as part of production activation
  - This field will update automatically based on the registration in DRRS
- This new identifier is anticipated to be leveraged in the ESDER 3B implementation of the PDR - Load Shift product

Generator RDT Definitions and Business Rules							
RDT Column Name (Gray-shaded fields are for reference only and are not modifiable through the RDT update process)	**Column Code**	**Unit**	**Field Length**	**Definition**	**Can be Null?**	**Business Rule**	**Tips for making a change** (All changes should be made through the UI or API unless specified here)
Demand Response Type	DR_TYPE	text	varchar2 (8)	Indicator of the type of Demand Response resource: PDR or RDRR	Y		Field is not modifiable

Master File: New fields added

Master File

- **Bid Dispatchable Option – DR**
  - Allows PDR resources to select new dispatchable bid options of 60-minutes and 15-minutes
  - This field will default to the 5-minute option if no action is taken

Generator RDT Definitions and Business Rules							
RDT Column Name (Gray-shaded fields are for reference only and are not modifiable through the RDT update process)	**Column Code**	**Unit**	**Field Length**	**Definition**	**Can be Null?**	**Business Rule**	**Tips for making a change** (All changes should be made through the UI or API unless specified here)
Bid Dispatchable Option - DR	BID_DISP_OPT	number		Bidding option enabling a PDR resource to be dispatched for time periods that are supported by its individual operating characteristics. Options are 5, 15, or 60 (minutes). RDRR resources are considered 5-minute and are not eligible to change this option.	Y	- Only PDR resources are eligible to modify this field. - For Dynamic and ASVER import resources, this field is set consistent with the hourly pre-dispatch flag. - All other resources are 5-minute	Modifiable for PDR resources only

DRRS: Process Change – aggregating locations

DRRS

- The ISO currently requires that DR resource aggregations consist of locations:
  - represented by one demand response provider (DRP)
  - within a single sub-LAP
  - ~~under a single LSE~~

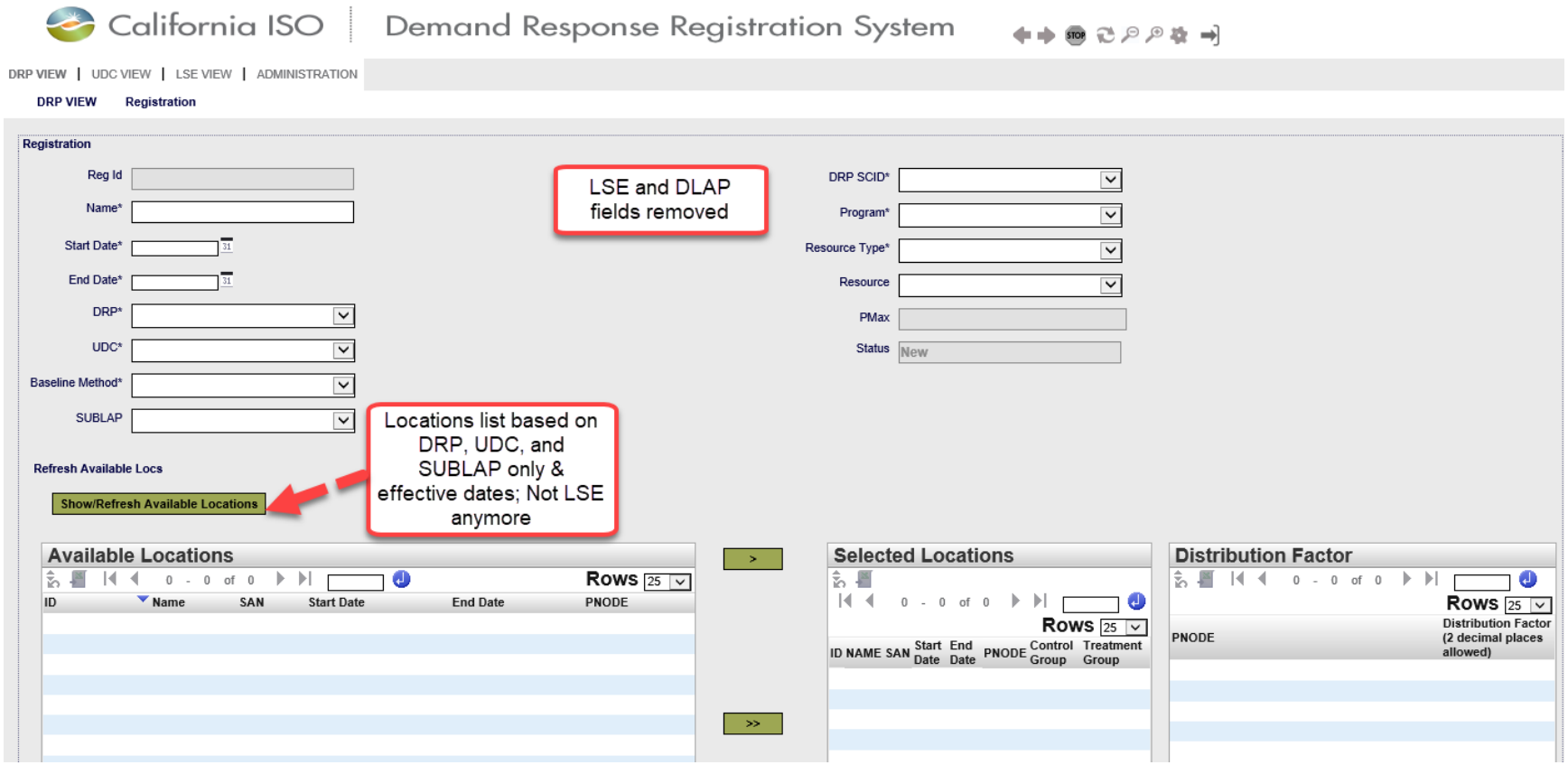
This is changing to allow registrations to include locations (service accounts) from multiple LSEs

- This change affects the UI and API
- DRRS user guide has been updated with these changes

DRRS: Create Registration Screen

DRRS

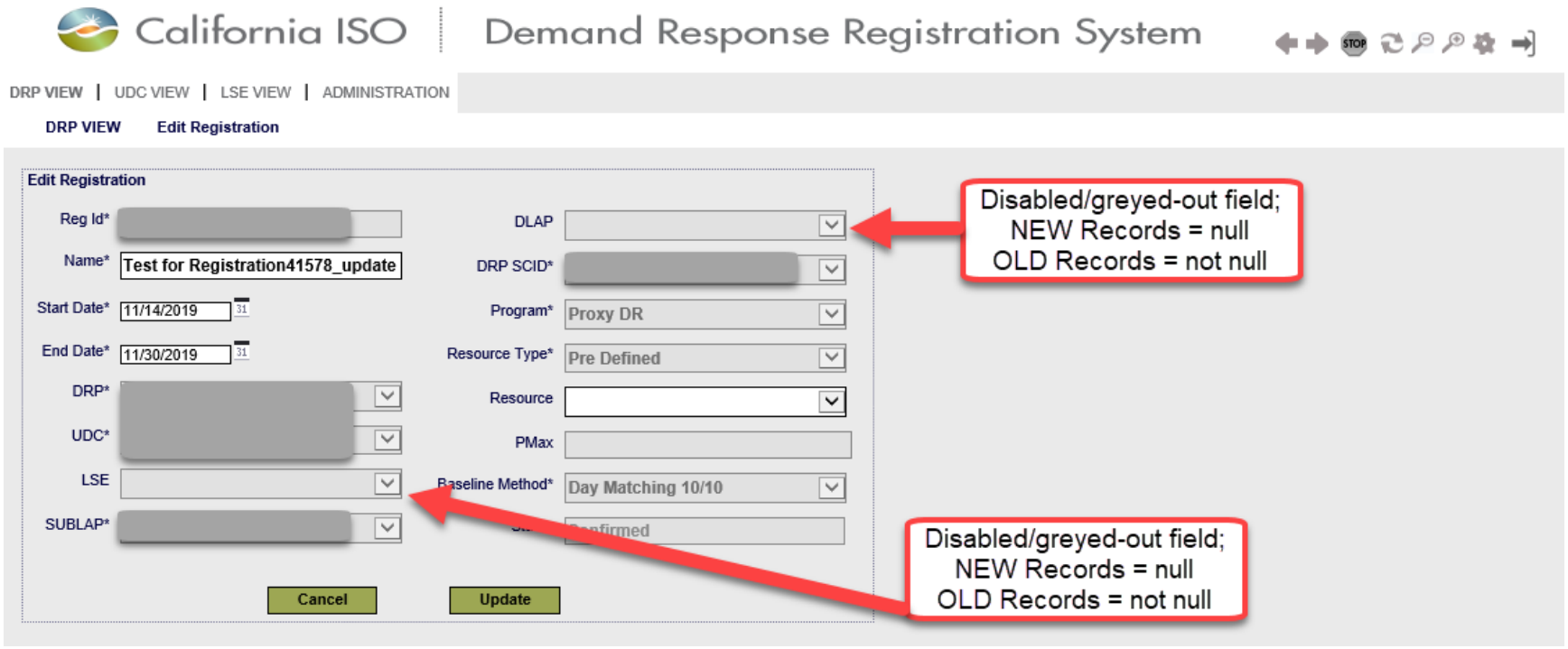
- DRPs can create registrations that include locations from multiple LSEs



DRRS: Edit Registration Screen

DRRS

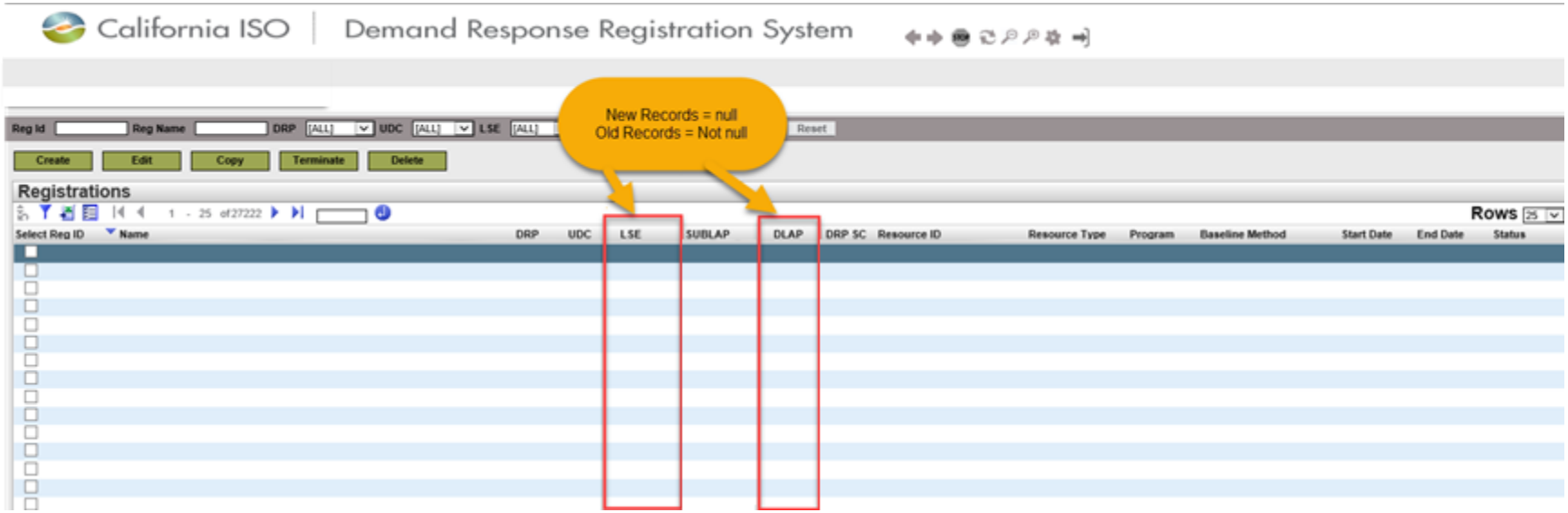
The LSE and DLAP fields will contain data for pre-existing records, but will be blank for all registrations created on/after activation of ESDER 3A



DRRS: Registrations Screen

DRRS

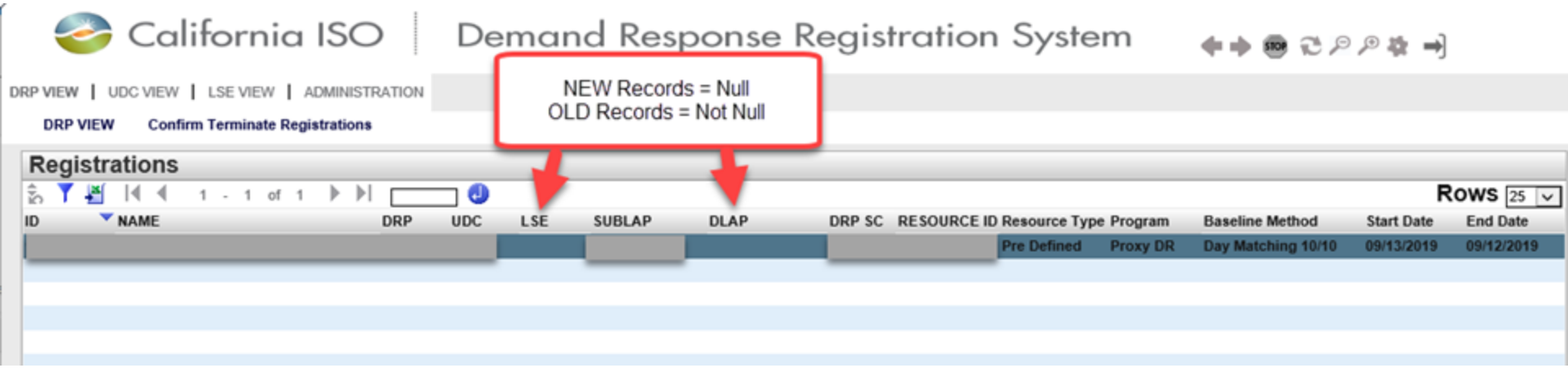
LSEs will continue to see registrations that include their Service Accounts, however, they will be restricted from seeing other LSE's SA's in the registration

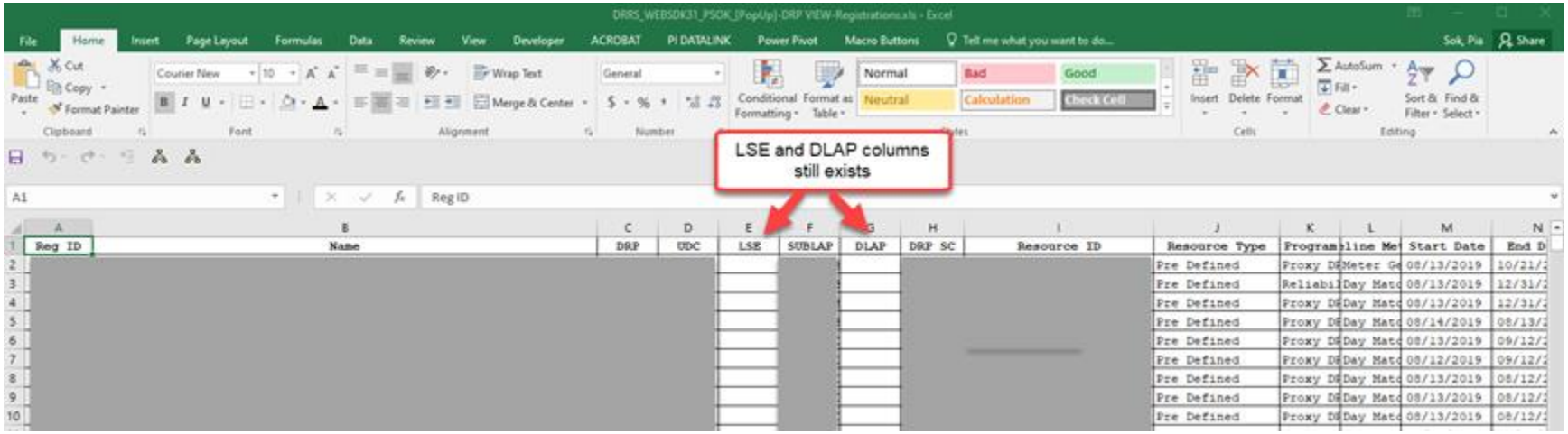


DRRS: Terminate Registration/Export Registration

DRRS

Other screens follow the same format for the LSE and DLAP fields





Scheduling Infrastructure & Business Rules (SIBR) validates bids against the Net Benefits Test

SIBR

- SIBR will only accept bids from PDR and RDRR resources that meet or exceed the Net Benefits Test (NBT) price threshold

- Applies to Day-Ahead and Real-Time energy bids
  - Example:
    - If NBT = $30 (for month of April)
    - Bid price must be >= $30 to be accepted by SIBR
    - Bid price < $30 will not be accepted by SIBR

Scheduling Infrastructure & Business Rules (SIBR) validates bids against the Net Benefits Test (continued)

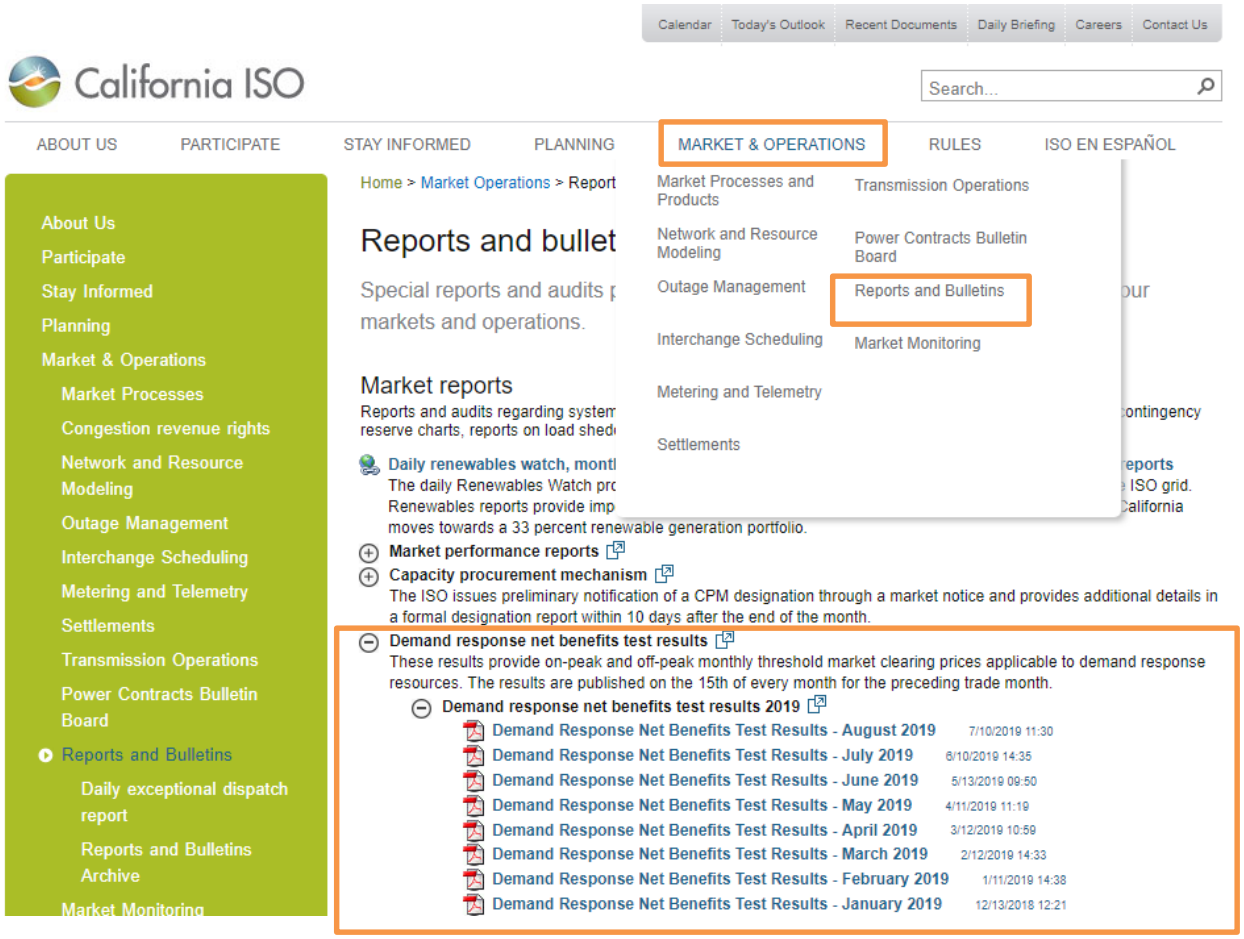
SIBR

Bids from PDR and RDRR resources that do not meet or exceed the NBT price threshold will receive the error message(s) shown below, as applicable:

Business Rule ID	Description
31327	Bid is Invalid - The Bid Price can not be less then the product of the Relative RDRR Bid Floor and the Energy Bid Soft Cap.
31328	Bid is Invalid - The Energy Bid price for this resource must not be below the NET Benefit Floor (RDR and PDR On-Peak).
31329	Bid is Invalid - The Energy Bid price for this resource must not be below the NET Benefit Floor (RDR and PDR Off-Peak).
31333	Bid is Invalid - All Energy Bid prices must not be less than the Net Benefit On-Peak Floor.
31334	Bid is Invalid - All Energy Bid prices must not be less than the Net Benefit Off-Peak Floor.

Demand Response Net Benefits Test Results

Net Benefits Test Results are published by the 15th of every month, for the following trade month



How the Real-Time Market processes PDR Hourly and Fifteen Minute Bidding Options

New bidding options for demand response (DR) resources provide longer notification times and extended real-time dispatch intervals for PDRs

- Hourly Bid: energy is dispatched for the full hour in the hour ahead scheduling process (HASP) but will be settled at 15-minute market (FMM) prices over the operating hour
  - Communicated approximately 52.5 minutes before the flow of energy
  - Is a price taker for the full hour
  - The hourly block bid option is not eligible for bid cost recovery

- 15-minute Bid: energy is dispatched in 15 minute blocks and settled at the FMM price
  - Communicated approximately 22.5 minutes before the flow of energy
  - The 15 minute dispatchable option is eligible for bid cost recovery

Treatment of resource start-up time in Day-Ahead vs. Real-Time

Day-Ahead Market

- PDR bids start-up time registered in the Master File will be recognized in the Day Ahead Market

Real-Time Market

- Master File start-up time will be ignored for PDR bids submitted into Real Time so that HASP and FMM can dispatch according to the bidding option market notification timelines outlined on the previous slide

Customer Market Results Interface (CMRI) reports communicate Real-Time Dispatches for Hourly and Fifteen-Minute Bidding Options

CMRI*

- For Hourly and 15 Minute Bid/Dispatch Options
- PDR energy schedules/awards and instructions provided by CMRI
- Note that ADS dispatches will not be included in this phase of implementation

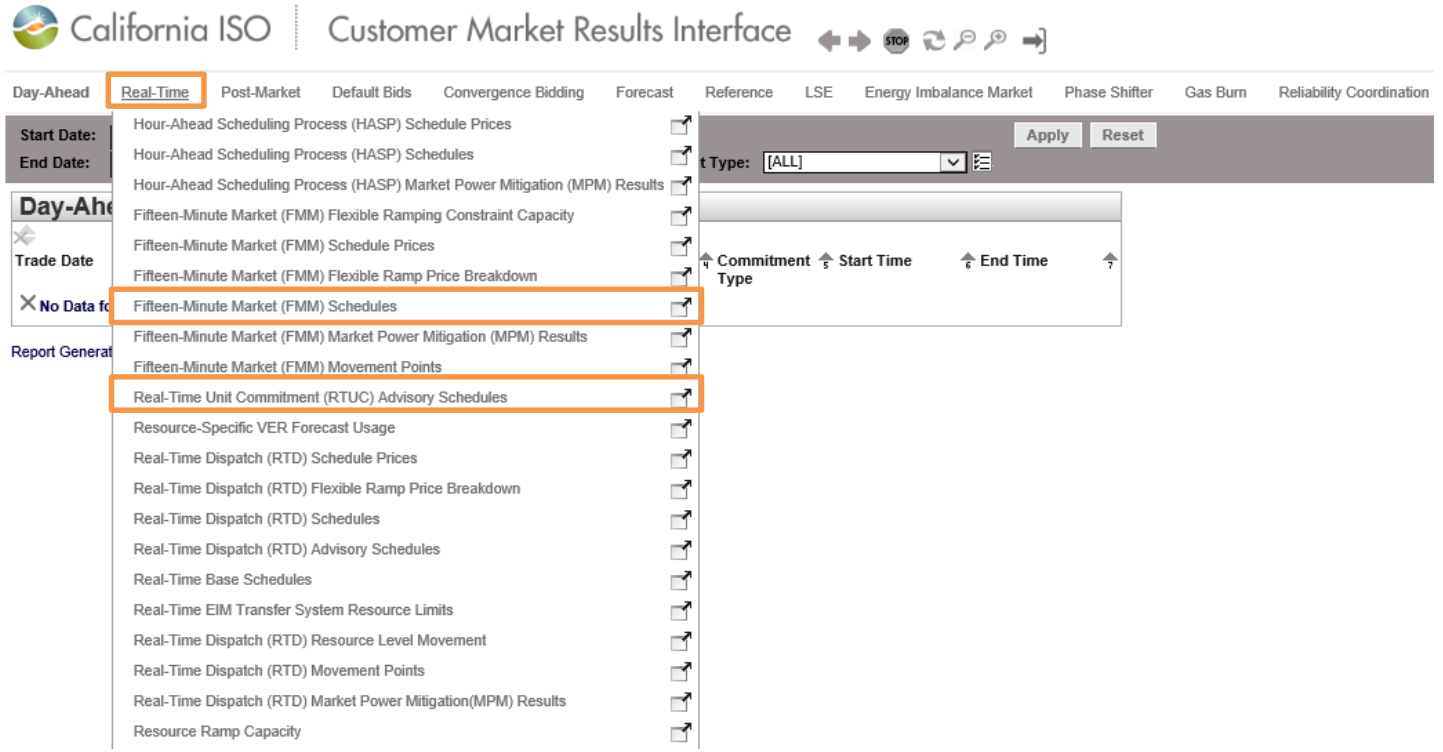
* No functional changes for CMRI

View Energy Schedules and Awards – CMRI

CMRI*

ESDER 3A - Hourly and 15 Minute Bid/Dispatch Options

- Utilize CMRI to obtain binding schedules and awards (not through ADS)
  - Fifteen-Minute Market (FMM) Schedules (15 Minute)
  - Real-Time Unit Commitment (RTUC) Advisory Schedules (Hourly)

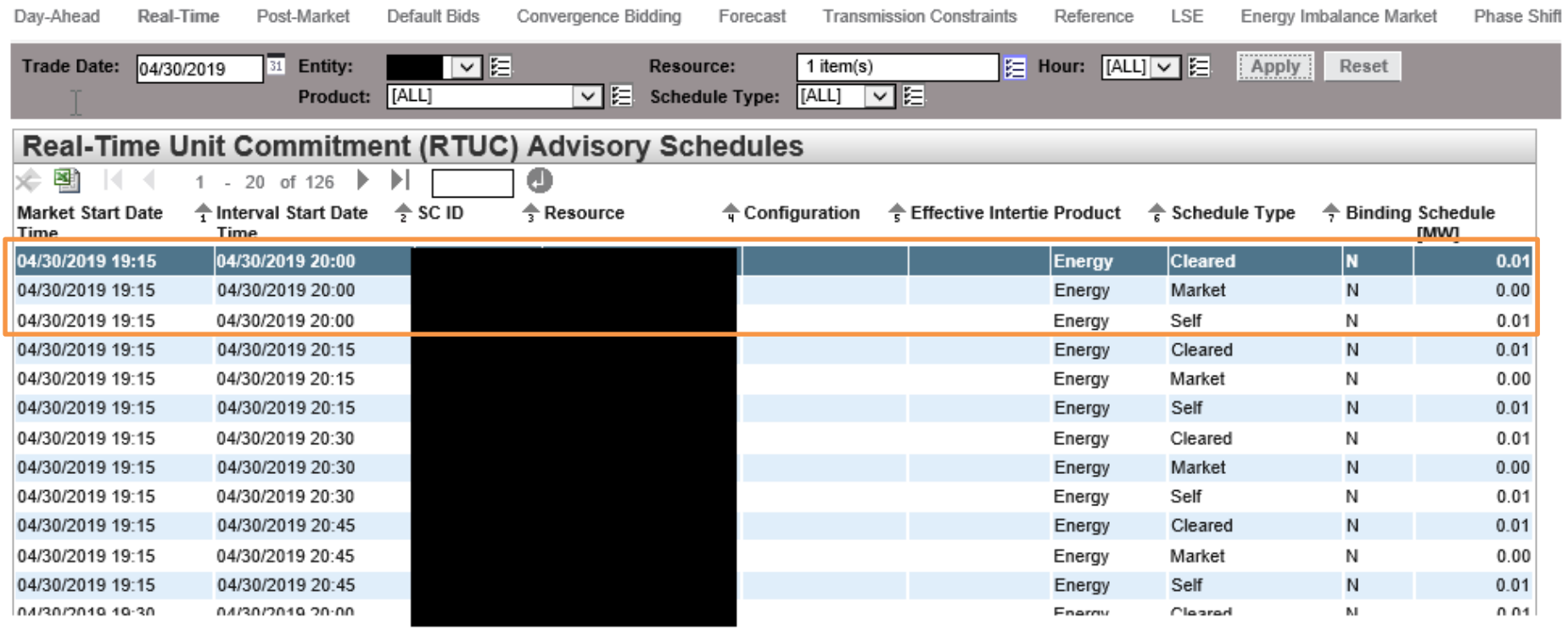


Energy Schedules and Awards – CMRI (continued)

CMRI*

RTUC Schedules

- Published as an Advisory, but operationally binding for PDR selecting hourly bid option
- RTUC runs and the report is published in CMRI 52.5 minutes before the hour



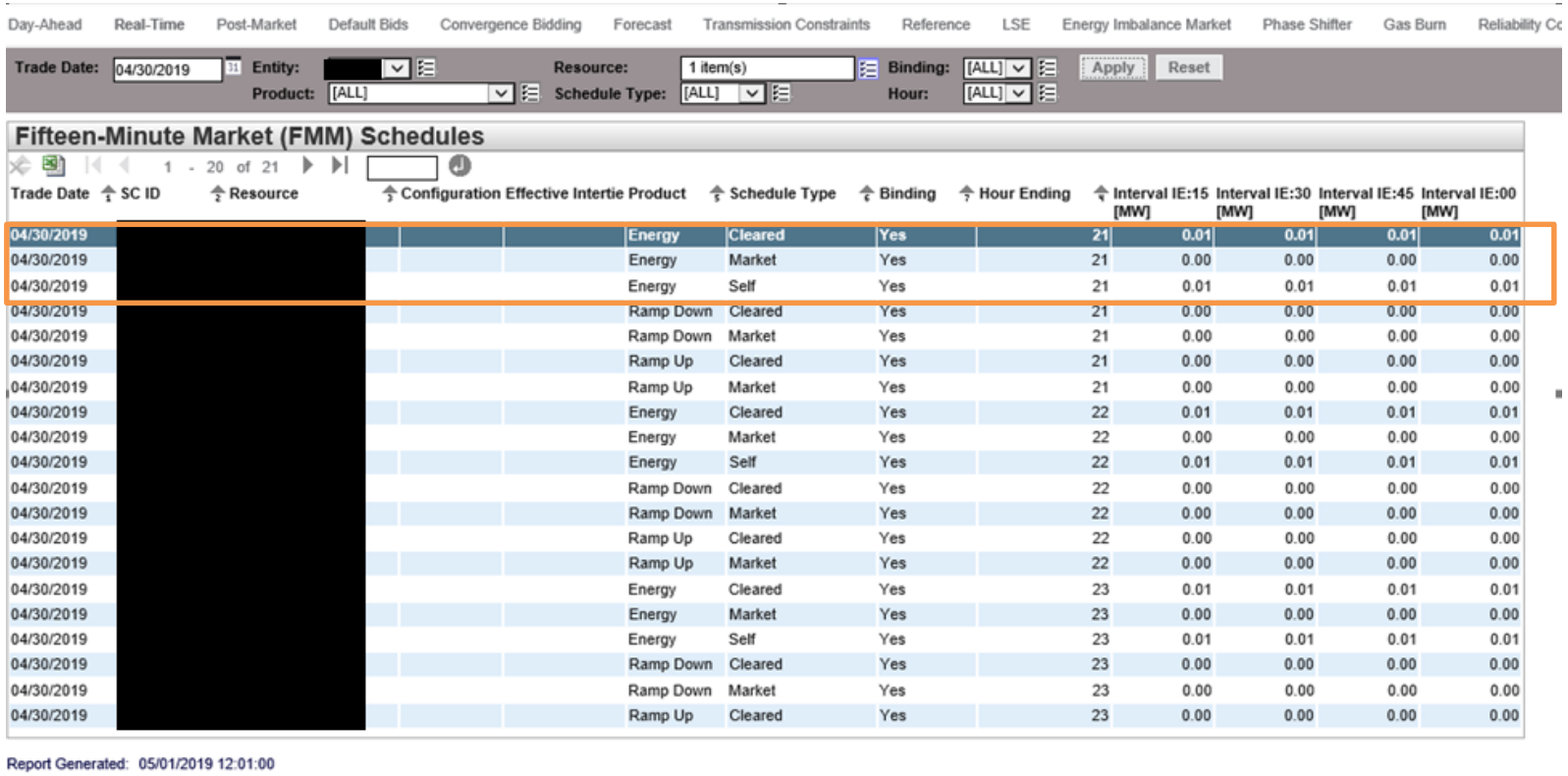
Market Start Date Time	Interval Start Date Time	SC ID	Resource	Configuration	Effective Intertie Product	Schedule Type	Binding	Schedule [MW]
04/30/2019 19:15	04/30/2019 20:00	[redacted]			Energy	Cleared	N	0.01
04/30/2019 19:15	04/30/2019 20:00				Energy	Market	N	0.00
04/30/2019 19:15	04/30/2019 20:00				Energy	Self	N	0.01
04/30/2019 19:15	04/30/2019 20:15				Energy	Cleared	N	0.01
04/30/2019 19:15	04/30/2019 20:15				Energy	Market	N	0.00
04/30/2019 19:15	04/30/2019 20:15				Energy	Self	N	0.01
04/30/2019 19:15	04/30/2019 20:30				Energy	Cleared	N	0.01
04/30/2019 19:15	04/30/2019 20:30				Energy	Market	N	0.00
04/30/2019 19:15	04/30/2019 20:30				Energy	Self	N	0.01
04/30/2019 19:15	04/30/2019 20:45				Energy	Cleared	N	0.01
04/30/2019 19:15	04/30/2019 20:45				Energy	Market	N	0.00
04/30/2019 19:15	04/30/2019 20:45				Energy	Self	N	0.01

Energy Schedules and Awards – CMRI (continued)

CMRI*

15-Minute Market (FMM) Schedules

- Published as binding for PDR selecting 15-minute bid option
  - Hourly bid option will also see FMM awards consistent with the hourly schedule.
- FMM runs 37.50 minutes before the start of the binding interval.
- Report is published 22.50 minutes before the start of the binding interval.



Day-Ahead | Real-Time | Post-Market | Default Bids | Convergence Bidding | Forecast | Transmission Constraints | Reference | LSE | Energy Imbalance Market | Phase Shifter | Gas Burn | Reliability Co

Trade Date: 04/30/2019 Entity: [redacted] Resource: 1 item(s) Binding: [ALL] Apply Reset
Product: [ALL] Schedule Type: [ALL] Hour: [ALL]

Fifteen-Minute Market (FMM) Schedules

1 - 20 of 21

Trade Date	SC ID	Resource	Configuration Effective Intertie	Product	Schedule Type	Binding	Hour Ending	Interval IE:15 [MW]	Interval IE:30 [MW]	Interval IE:45 [MW]	Interval IE:00 [MW]
04/30/2019	[redacted]			Energy	Cleared	Yes	21	0.01	0.01	0.01	0.01
04/30/2019				Energy	Market	Yes	21	0.00	0.00	0.00	0.00
04/30/2019				Energy	Self	Yes	21	0.01	0.01	0.01	0.01
04/30/2019				Ramp Down	Cleared	Yes	21	0.00	0.00	0.00	0.00
04/30/2019				Ramp Down	Market	Yes	21	0.00	0.00	0.00	0.00
04/30/2019				Ramp Up	Cleared	Yes	21	0.00	0.00	0.00	0.00
04/30/2019				Ramp Up	Market	Yes	21	0.00	0.00	0.00	0.00
04/30/2019				Energy	Cleared	Yes	22	0.01	0.01	0.01	0.01
04/30/2019				Energy	Market	Yes	22	0.00	0.00	0.00	0.00
04/30/2019				Energy	Self	Yes	22	0.01	0.01	0.01	0.01
04/30/2019				Ramp Down	Cleared	Yes	22	0.00	0.00	0.00	0.00
04/30/2019				Ramp Down	Market	Yes	22	0.00	0.00	0.00	0.00
04/30/2019				Ramp Up	Cleared	Yes	22	0.00	0.00	0.00	0.00
04/30/2019				Ramp Up	Market	Yes	22	0.00	0.00	0.00	0.00
04/30/2019				Energy	Cleared	Yes	23	0.01	0.01	0.01	0.01
04/30/2019				Energy	Market	Yes	23	0.00	0.00	0.00	0.00
04/30/2019				Energy	Self	Yes	23	0.01	0.01	0.01	0.01
04/30/2019				Ramp Down	Cleared	Yes	23	0.00	0.00	0.00	0.00
04/30/2019				Ramp Down	Market	Yes	23	0.00	0.00	0.00	0.00
04/30/2019				Ramp Up	Cleared	Yes	23	0.00	0.00	0.00	0.00

Report Generated: 05/01/2019 12:01:00

Market Results Interface – Settlements (MRI-S)

MRI-S

- New data submittal requirements require an additional BASE measurement type
- Additional data requirements for baseline methods and measurement type mapping
- This application also has API changes

Baseline Methods and Measurement Type mapping

MRI-S

Baseline Methods and Measurement Type mapping (under ESDER 3A highlighted in blue):

Measurement Type	Data Granularity	Baseline Method	Comments
LOAD	5 minute	• Control Group • Day Matching 5/10 (Residential Only) • Day Matching 10/10 • Day Matching Combined • Weather Matching • Meter Generation Output with 10 in 10[1]	AS Resource only This is the actual load for intervals the resource receives an Ancillary Service award. Both LOAD and MBMA data sets are required for no pay calculations, even though the LOAD data includes the same values submitted in the MBMA data set.
GEN	5 minute	• Control Group • Day Matching 5/10 (Residential Only) • Day Matching 10/10 • Day Matching Combined • Weather Matching • Meter Generation Output[2] • Meter Generation Output with 10 in 10	Demand Response Energy Measurement (DREM) or performance data of the resource in response to an award or dispatch. Data required for intervals where TEE>0.
MBMA	5 minute	• Control Group • Day Matching 5/10 (Residential Only) • Day Matching 10/10 • Day Matching Combined • Weather Matching • Meter Generation Output with 10 in 10	AS Resource Only This is the actual load data for the interval preceding, during, and following the trading intervals for which they were awarded ancillary services.

[1] "MGO with 10 in 10" under this performance methodology option, the demand response performance is a result of combining the demand response energy measurement (DREM) from pure load reduction calculated utilizing a customer load baseline (10 in 10, 5 in 10, weather matching) combined with the DREM from load reduction attributed to generation offset (MGO). Referred to as "load and generation"

[2] "MGO" is a performance evaluation methodology that can be used by a generation device located behind the revenue meter, to represent the load reduction attributed only to the output of that generation device excluding its typical use. Referred to as "generation offset only".

Baseline Methods and Measurement Type mapping (Continued)

MRI-S

CBL	Hourly	• Control Group • Day Matching 5/10 (Residential Only) • Day Matching 10/10 • Day Matching Combined • Weather Matching • Meter Generation Output with 10 in 10	For monitoring only. Underlying load data used in the customer load baseline calculation for all baseline methods. 90 days of historic data prior to the day of the event is required. This is applicable for the "MGO with 10 in 10"[3] only. It represents the net load data used to develop the customer load baseline of the facility only. 90 days of historic data prior to the day of the event is required.
TMNT	Hourly	• Control Group • Meter Generation Output • Meter Generation Output with 10 in 10	For monitoring Only For the Control Group baseline method, data represents the actual load data for those locations in the treatment group. For the MGO baseline method, TMNT data represents the generation device metered values.
BASE	Hourly	• Control Group • Day Matching 5/10 (Residential Only) • Day Matching 10/10 • Day Matching Combined • Weather Matching • Meter Generation Output with 10 in 10	For monitoring Only Calculated customer load baseline values used to derive DREM. For the "MGO with 10 in 10": **BASE** data represents the customer load baseline used to calculate the DREM attributed to the pure load reduction only. BASE data is submitted for trade dates when the resource/registration is being actively **bid into the market** for the hours in which it is bid.

[3] "MGO with 10 in 10" provides for the use of 10 in 10, 5 in 10 (residential customers only) and weather matching performance evaluation methods in the calculation of the DREM portion attributed to customer load response only.

New Data submittal of Customer Load Baseline

MRI-S

- DRPs will submit a BASE measurement for each hour a DR resource is bid into the day-ahead or real-time market
  - Hourly granularity
  - Applies to all baseline methodology types
  - Per Tariff section 11.6.1

Example: When to apply and not apply baseline adjustment

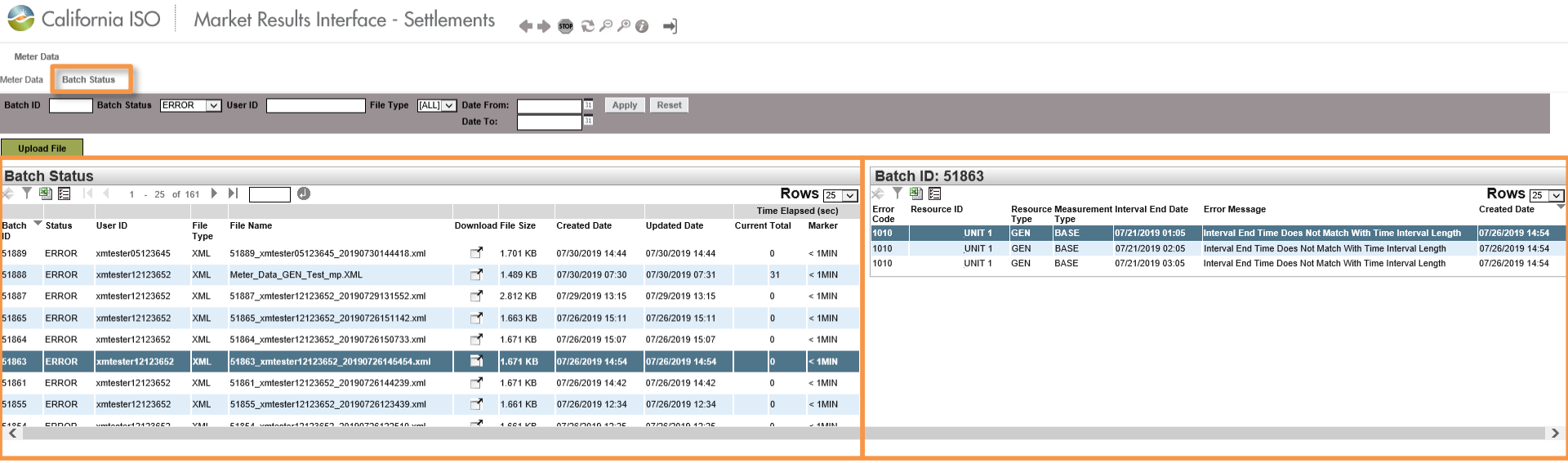
Resource A, Market day 4/30/2019:																							
Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Bid in day-ahead														Y	Y	Y	Y	Y	Y	Y	Y			
Bid in real-time																	Y	Y	Y	Y	Y	Y		
TEE > 0																		Y	Y					
BASE submission required														Y	Y	Y	Y	Y	Y	Y	Y	Y		
Adjusted (A) or Unadjusted (U)														U	U	U	U	A	A	U	U	U		

Adjusted baseline data for hours when TEE >0

MRI-S: Batch Status Screen

MRI-S

The Batch Status screen contains two sections



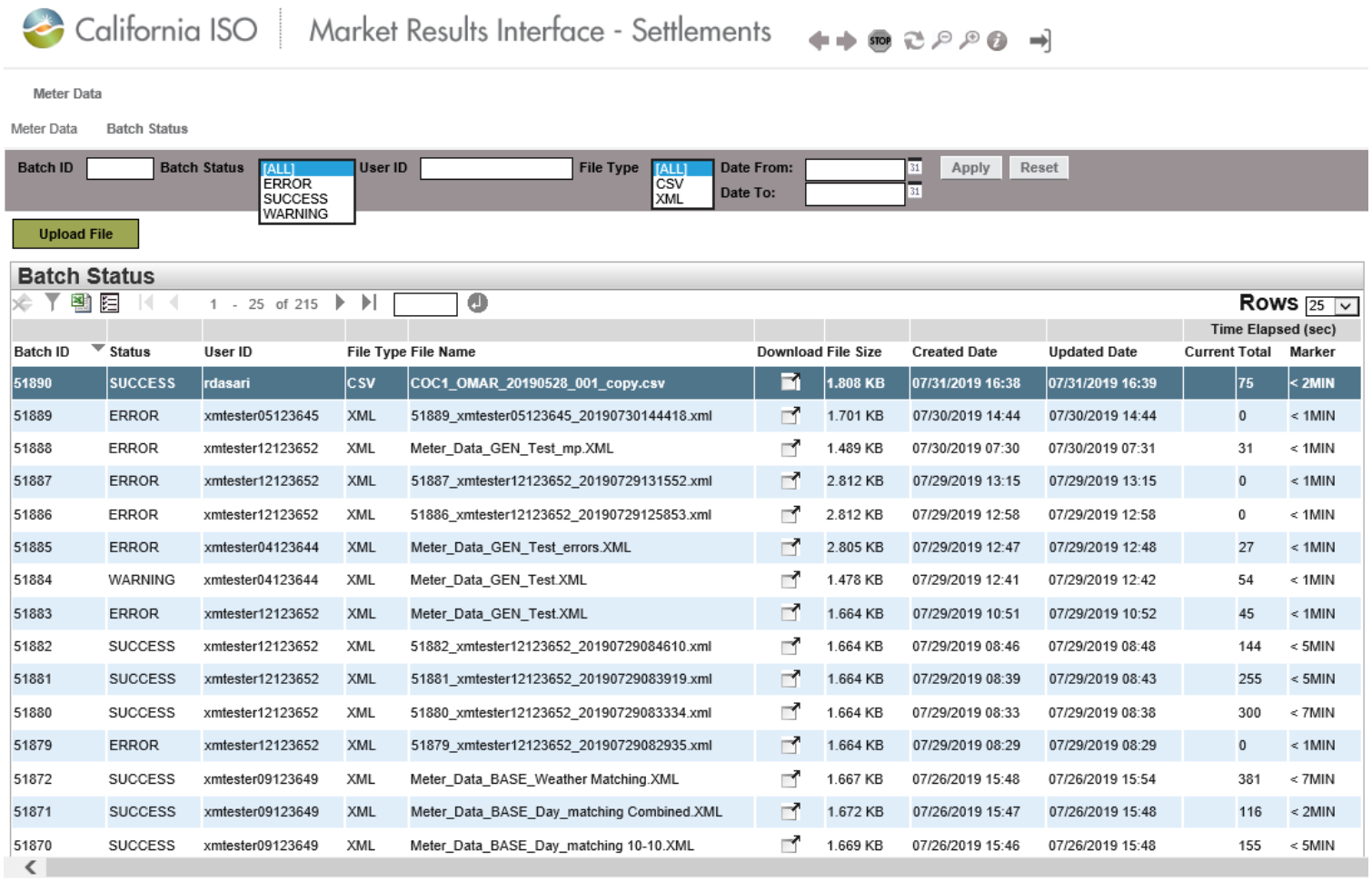
Batch Status

Batch ID

MRI-S: Batch Status Screen

MRI-S

The left side shows the list of files that have been uploaded



Batch ID	Status	User ID	File Type	File Name	Download	File Size	Created Date	Updated Date	Current	Total	Marker
51890	SUCCESS	rdasari	CSV	COC1_OMAR_20190528_001_copy.csv		1.808 KB	07/31/2019 16:38	07/31/2019 16:39		75	< 2MIN
51889	ERROR	xmtester05123645	XML	51889_xmtester05123645_20190730144418.xml		1.701 KB	07/30/2019 14:44	07/30/2019 14:44		0	< 1MIN
51888	ERROR	xmtester12123652	XML	Meter_Data_GEN_Test_mp.XML		1.489 KB	07/30/2019 07:30	07/30/2019 07:31		31	< 1MIN
51887	ERROR	xmtester12123652	XML	51887_xmtester12123652_20190729131552.xml		2.812 KB	07/29/2019 13:15	07/29/2019 13:15		0	< 1MIN
51886	ERROR	xmtester12123652	XML	51886_xmtester12123652_20190729125853.xml		2.812 KB	07/29/2019 12:58	07/29/2019 12:58		0	< 1MIN
51885	ERROR	xmtester04123644	XML	Meter_Data_GEN_Test_errors.XML		2.805 KB	07/29/2019 12:47	07/29/2019 12:48		27	< 1MIN
51884	WARNING	xmtester04123644	XML	Meter_Data_GEN_Test.XML		1.478 KB	07/29/2019 12:41	07/29/2019 12:42		54	< 1MIN
51883	ERROR	xmtester12123652	XML	Meter_Data_GEN_Test.XML		1.664 KB	07/29/2019 10:51	07/29/2019 10:52		45	< 1MIN
51882	SUCCESS	xmtester12123652	XML	51882_xmtester12123652_20190729084610.xml		1.664 KB	07/29/2019 08:46	07/29/2019 08:48		144	< 5MIN
51881	SUCCESS	xmtester12123652	XML	51881_xmtester12123652_20190729083919.xml		1.664 KB	07/29/2019 08:39	07/29/2019 08:43		255	< 5MIN
51880	SUCCESS	xmtester12123652	XML	51880_xmtester12123652_20190729083334.xml		1.664 KB	07/29/2019 08:33	07/29/2019 08:38		300	< 7MIN
51879	ERROR	xmtester12123652	XML	51879_xmtester12123652_20190729082935.xml		1.664 KB	07/29/2019 08:29	07/29/2019 08:29		0	< 1MIN
51872	SUCCESS	xmtester09123649	XML	Meter_Data_BASE_Weather Matching.XML		1.667 KB	07/26/2019 15:48	07/26/2019 15:54		381	< 7MIN
51871	SUCCESS	xmtester09123649	XML	Meter_Data_BASE_Day_matching Combined.XML		1.672 KB	07/26/2019 15:47	07/26/2019 15:48		116	< 2MIN
51870	SUCCESS	xmtester09123649	XML	Meter_Data_BASE_Day_matching 10-10.XML		1.669 KB	07/26/2019 15:46	07/26/2019 15:48		155	< 5MIN

MRI-S: Batch Status Screen – Batch ID

MRI-S

Batch ID: 51863

Rows 25

Error Code	Resource ID	Resource Type	Measurement Type	Interval End Date	Error Message	Created Date
1010	_UNIT 1	GEN	BASE	07/21/2019 01:05	Interval End Time Does Not Match With Time Interval Length	07/26/2019 14:54
1010	_UNIT 1	GEN	BASE	07/21/2019 02:05	Interval End Time Does Not Match With Time Interval Length	07/26/2019 14:54
1010	_UNIT 1	GEN	BASE	07/21/2019 03:05	Interval End Time Does Not Match With Time Interval Length	07/26/2019 14:54

- The right side provides additional information on files that contain errors and warnings. Click on a batch from the list on the left to see the errors/warnings for that batch.
- Note: Although MRI-S is used to collect baseline data, it is not considered “meter data”, which means that data with the BASE measurement type cannot be displayed or retrieved from the Meter Data tab

California ISO

Market Simulation Activities

Application access

California ISO | Market Applications

Market Participant Portal
CAISO.com
MAP-STAGE

Application Access

AIM — Access and Identity Management

Inquiries & Disputes

CIDI — Customer Inquiry Dispute and Information

Market & Operations

CMRI — Customer Market Results Interface

CRR — Congestion Revenue Rights

SIBR — Scheduling Infrastructure & Business Rules

SIBR Reports — Scheduling Infrastructure & Business Rules Reports

Metering

OMAR — Operational Meter Analysis & Reporting

OASIS

OASIS — Open Access Same-Time Information System

Outage Coordination

WebOMS — Outage Management System

Reliability Requirements

CIRA — Customer Interface for Resource Adequacy

RAAM — Resource Adequacy Availability Management

Renewables & Demand Response

DRS — Demand Response System

DRRS — Demand Response Registration System

PIRP — Participating Intermittent Resource Program

Settlements

MRI-S — Market Results Interface - Settlements

Systems & Resource Modeling

TR — Transmission Registry

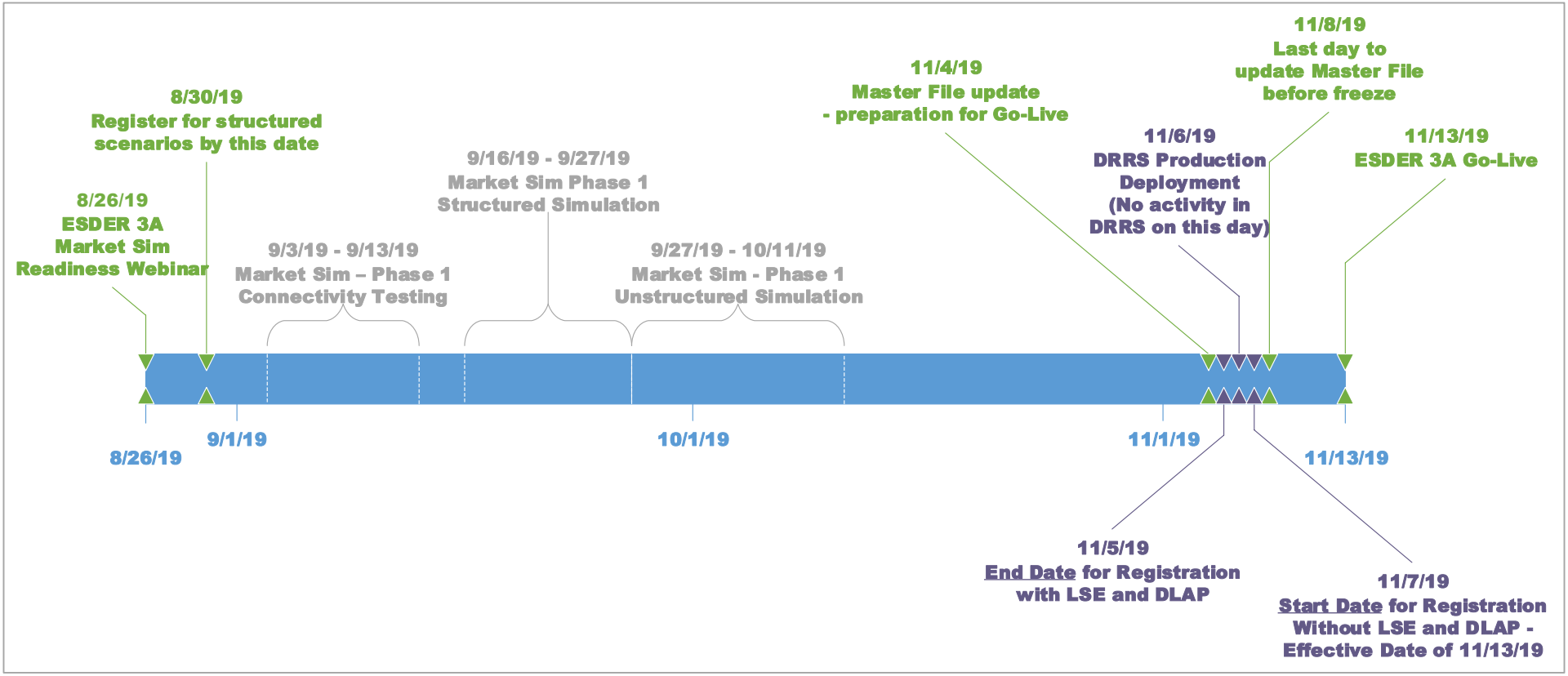
Master File

RIMS — Resource Interconnection Management System

RIMSG — Resource Interconnection Management System - Generation

Implementation Timeline

* Attend the RUG and Market Sim calls for any updates to the dates below *



Market Simulation Activities

- The purpose of market simulation is to provide customers with the ability to preview and test the following items:
  - New dispatch options for PDR resources
    - Bidding
    - Dispatch
    - Settlement
  - Submit customer load baselines along with underlying load/consumption data (unstructured scenario)

Market Simulation Activities

Complete additional setup for structured scenarios by August 30th

- Market participants will need to register their request with the ISO to participate in this simulation via the MarketSim@caiso.com mailbox

  – Register specific resources with the ISO identifying which resources they would like set up as 60 minute dispatchable PDR and 15 minute dispatchable PDR
    - ISO will allow one of each PDR resource type for scenario executions

Market Simulation Activities

- There is a link to the market sim structured scenarios document in the reference section
- Users must be provisioned for access in order to participate in market simulation
- Attend the Market Simulation calls to stay informed on the timing of activities for this and other Fall 2019 release initiatives
  - Kickoff call is Thursday, August 29 at 2:00 pm PPT

California ISO

Questions?

REFERENCE MATERIAL

Reference Material

- Business Practice Manual changes:
  - BPM Change Management
    - Market Instruments – changes identified in PRR 1165
    - Demand Response – changes identified in PRR 1174
    - Market Operations – changes identified in PRR 1176

- Business Requirements Specification:
  - http://www.caiso.com/Documents/BusinessRequirementsSpecificationClean-EnergyStorageandDistributedEnergyResourcesPhase3.pdf

- DRRS User Guide:
  - http://www.caiso.com/Documents/DemandResponseUserGuidev46.pdf

Reference Material

- ESDER Initiative webpage:
  - http://www.caiso.com/informed/Pages/StakeholderProcesses/EnergyStorage_DistributedEnergyResources.aspx
- FERC Order - Demand Response Compensation in Organized Wholesale Energy Markets:
  - https://www.ferc.gov/EventCalendar/Files/20110315105757-RM10-17-000.pdf
- Market Simulation Structured Scenarios:
  - http://www.caiso.com/Documents/ESDER3MarketSimulationScenariosFall2019.pdf
- Master File Changes – new Generator Resource Data Template:
  - http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=8A5DEE79-74F7-45AF-AC21-3A019CD99E1A

Reference Material

- Technical Specifications – located on the ISO's Developer Site which provides detailed descriptions of the API changes for:
  - DRRS
  - MRI-S

- Settlements – affected charge codes:
  - http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=F0C9026C-A552-4076-8675-32AEEA77312B
    - 6011 – Day Ahead Energy, Congestion, Loss Settlement
    - 6460 – FMM Instructed Imbalance Energy Settlement
    - 6470 – Real Time Instructed Imbalance Energy Settlement
    - 6475 – Real Time Uninstructed Imbalance Energy Settlement
    - 6620 – RUC and RTM Bid Cost Recovery Settlement

Terms and acronyms

Application Programming Interface (API)

Demand Response Provider (DRP)

Load Serving Entity (LSE)

Utility Distribution Company (UDC)

Locations

- Physical location of the demand response entity
- Includes customer data such as service account number, physical service address, etc.
- Uniquely identified by service account number and UDC
- Submitted for review by LSE and UDC

Terms and acronyms

PDR/RDR Resource ID

- Select from available list of IDs during registration
- One ID per registration
- Unique ID used for participation in the ISO wholesale markets (scheduling/bidding and settlement)
- Resource specific information for the ID resides in the ISO Master File

Registration

- May be comprised of a single location or many locations

Service Account Number (SAN)

- Unique number assigned to a location by the UDC