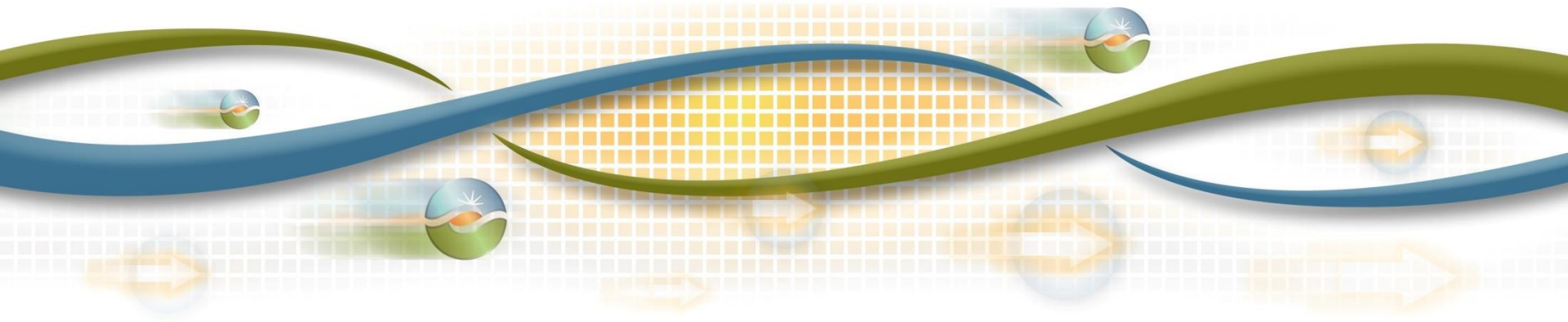




Market Simulation – Spring and Independent 2017 Releases

Christopher McIntosh
Lead Market Simulation Coordinator

Spring and Independent 2017 Releases Market Simulation
May 1, 2017



Agenda

- Spring and Independent 2017 MAP Stage Availability
- Spring and Independent 2017 Market Simulation Initiatives and Timelines
- Initiatives
 - LMPM Enhancements
 - PIRP System Decommissioning
 - MRI-S ACL Groups and CPG Enhancements
- Known Issues
- Next Steps
- Reference Slides

Spring and Independent 2017 Releases MAP Stage Availability

MAP Stage Scheduled Maintenance –

Upcoming maintenance –

MRI-S GUI only offline, available May 1, 2017

MAP Stage Daily Maintenance Window - Tuesday, Wednesday, Thursday and Friday 16:00 – 20:00

MAP Stage Weekly Maintenance Window - Monday 08:00 – Tuesday 09:00

Please refer to the MAP Stage portal at <https://portalmap.caiso.com> for specific application availability information.

Spring and Independent 2017 Releases Market Simulation Initiatives and Timelines

| <u>Spring and Independent 2017 Releases Initiatives</u> | <u>Start Date</u> | <u>Start Date (Trade Date)</u> | <u>End Date</u> | <u>Structured Simulation Start (Trade Date)</u> | <u>Expected Participation</u> |
|---|-------------------|--------------------------------|-----------------|---|-------------------------------|
| <u>Spring 2017 Release Market Simulation</u> | | | | | |
| RTD LMPM | 2/6/17 | 2/7/17 | 2/24/17 | N/A | EIM Entities and ISO MPs |
| PIRP System Decommissioning | 4/4/17 | N/A | 4/18/17 | N/A | ISO MPs |
| <u>Independent 2017 Release Market Simulation</u> | | | | | |
| MRI-S ACL Groups and CPG Enhancements | 3/13/17 | N/A | 5/26/17 | N/A | EIM Entities and ISO MPs |

Market Simulation Plan -

http://www.aiso.com/Documents/MarketSimulationPlan_Spring_Independent2017Releases.pdf

Local Market Power Mitigation (LMPM) Enhancements Simulation

LMPM Enhancements Market Simulation timeline - Complete

CMRI Tech Spec –

http://www.caiso.com/Documents/CMRI-InterfaceSpecification_v3_5_4Clean_Fall2016Release.pdf

OASIS Tech Spec –

http://www.caiso.com/Documents/OASIS-InterfaceSpecification_v4_3_5Clean_Spring2017Release.pdf

OASIS LMPM Enhancements reports deployed to MAP Stage March 15, 2017 –

1. PRC_MPM_RTM_NOMOGRAM_CMP RTD - now has data for TD 3/23 Intervals 8-12. This report will only have data when the nomogram is binding, thus will be intermittent.
2. PRC_MPM_CNSTR_CMP - RTD - this report has data TD 3/22 starting HE12
3. PRC_MPM_RTM_REF_BUS - RTD - this report has data TD 3/22 starting HE12

PIRP System Decommissioning Simulation

PIRP System Decommissioning Market Simulation timeline –

- PIRP System Decommissioning Simulation - April 4, 2017 – April 18, 2017

CMRI Tech Spec –

- http://www.aiso.com/Documents/CMRI-InterfaceSpecification_v3_5_4Clean_Fall2016Release.pdf

MRI-S ACL Groups and CPG Enhancements Simulation

MRI-S ACL Groups and CPG Enhancements Market Simulation timeline –

- MRI-S ACL Groups and CPG Enhancements Simulation - March 13, 2017 – May 26, 2017
Unstructured

MRI-S Tech Spec –

- http://www.caiso.com/Documents/OMAROnlineReplacementTechnicalSpecificationCleanV1_10.pdf

AIM ACL Training –

- http://www.caiso.com/Documents/Access_IdentityManagementAccessControlListTraining-Jan_2017.pdf

AIM User Guide –

- <http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=EBFDD87D-9926-4BFE-8DBD-09AA3D1E5CC5>

Known Issues

| # | System | Summary | Status | Estimated Fix Date |
|---|--------|---|--------|--------------------|
| 1 | MRI-S | Implementation of the requirement stated in MRIS-BRQ085 for allowing users within the same organization to view the batch submission status is being delayed in market simulation pending further security validations. | Open | 5/1/2017 |
| 2 | MRI-S | The error description for error code 1028 incorrectly has X and Y instead of the actual meter value and PMAX, respectively. | Open | 5/1/2017 |
| 3 | MRI-S | Intermittent issues with Export function in the UI not returning expected results. | Open | 5/1/2017 |
| 4 | MRI-S | UpdateSinceDateTime does not allow time input | Open | 5/1/2017 |
| 5 | MRI-S | IntervalEndTime for 3/12/2017 (DST Date) is not displaying correctly | Open | 5/1/2017 |
| 6 | MRI-S | Error generated when data is submitted for a resource that is valid till the end of the day in GMT | Open | 5/1/2017 |

Next Steps

- The next teleconference will take place @ 14:00 PPT on Thursday, May 4, 2017

Reference Slides

Transmission B2B Service Changes

- Production activation, April 5, 2017
- Transmission B2B Service Changes
 - V1 supported, V2 to be added
 - NoW Enumerations: RIMS_OUTAGE, RIMS_TESTING,
 - New Equipment Type – SYNCHRONOUS_MACHINE and Multiple instances of Adjusted Operational Limit per Equipment

| Nature of Work | Switch Modeling | Equipment Derate | Overlaps Allowed | Exclusive Nature of Work |
|-----------------------------------|-----------------|------------------|------------------|--------------------------|
| RIMS Outage | A | A | Yes | Yes |
| RIMS Testing | A | A | Yes | Yes |
| Out of service | R | A | Yes | Yes |
| Energized Work | | | Yes | Yes |
| Relay work | | A | Yes | Yes |
| Special Setup | A | A | Yes | Yes |
| Test Program | A | A | Yes | Yes |
| Equipment Derate | | R | Yes | Yes |
| Equipment Abnormal | A | A | Yes | Yes |
| Path Limitation | A | A | Yes | Yes |
| Communications | | | Yes | Yes |
| Out of Service with Special Setup | A | A | Yes | Yes |

Settlements Calendar for Settlements Production Release (sample statement)

| Calendar Day | CMRI T+1B | Publish Initial Statement T+4B |
|--------------|--------------|-----------------------------------|
| 04-Mar-17 | | |
| 05-Mar-17 | | |
| 06-Mar-17 | | |
| 07-Mar-17 | | |
| 08-Mar-17 | | |
| 09-Mar-17 | 8-Mar | |
| 10-Mar-17 | | |
| 11-Mar-17 | | |
| 12-Mar-17 | | |
| 13-Mar-17 | | |
| 14-Mar-17 | | 8-Mar |
| 15-Mar-17 | | |
| 16-Mar-17 | | |
| 17-Mar-17 | | |

Draft Configuration Output File has been posted under “***Settlements technical documentation***” at:

<http://www.caiso.com/market/Pages/Settlements/Default.aspx>

Settlements Calendar for Spring Release 2017

| Calendar Day | CMRI T+1B | Publish Initial Statement T+4B |
|--------------|--------------|--------------------------------------|
| 13-Feb-17 | | |
| 14-Feb-17 | | |
| 15-Feb-17 | | |
| 16-Feb-17 | 15-Feb | |
| 17-Feb-17 | | |
| 18-Feb-17 | | |
| 19-Feb-17 | | |
| 20-Feb-17 | ISO Holiday | |
| 21-Feb-17 | | |
| 22-Feb-17 | | 15-Feb |
| 23-Feb-17 | | |
| 24-Feb-17 | | |
| 25-Feb-17 | | |
| 26-Feb-17 | | |

February 15, 2017 TD statement was published on time.

FMM and RTD Market Execution Reports

Link -

<http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=DB357A9C-87C9-4BDF-8020-29C5E40A7A82>

Mitigation Status

<http://oasismap.caiso.com/mrioasis/logon.do>

Market Power Mitigation Status

File Edit View Favorites Tools Help

CQ HP QC IOOC MAPStage MAPStageBAAOP MAPTest BAAOP MapTest Stage BAAOP (EIM)

California ISO OASIS

OASISUI MAPStag

ATLAS REFERENCE REPORT DEFINITION PRICES TRANSMISSION SYSTEM DEMAND ENERGY ANCILLARY SERVICES CONGESTION REVENUE RIGHTS

Date From: 02/15/2017 To: 02/15/2017 Market/Process: RTM Execution Type: RTD BAA ID: [ALL]

Download XML Download CSV

Market Power Mitigation Status

| Balancing Authority Area ID | Market | Opr Date | Execution Type | Opr Interval | HE01 | HE02 | HE03 | HE04 | HE05 | HE06 | HE07 | HE08 | HE09 | HE10 | HE11 | HE12 | HE13 | HE14 | HE15 | HE16 | HE17 | HE18 | HE19 | HE20 | HE21 | HE22 | HE23 |
|-----------------------------|--------|------------|----------------|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| CISO | RTM | 02/15/2017 | RTD | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | | | Y | Y | | | | | | |
| CISO | RTM | 02/15/2017 | RTD | 2 | N | Y | Y | Y | Y | Y | | Y | Y | Y | Y | Y | Y | Y | | Y | Y | | | | | | |
| CISO | RTM | 02/15/2017 | RTD | 3 | Y | Y | Y | Y | Y | Y | N | Y | Y | Y | N | | Y | Y | Y | | Y | N | | | | | |
| CISO | RTM | 02/15/2017 | RTD | 4 | N | Y | Y | Y | N | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | | | | | |
| CISO | RTM | 02/15/2017 | RTD | 5 | N | N | N | N | N | N | Y | | Y | Y | Y | Y | Y | | | | N | N | | | | | |
| CISO | RTM | 02/15/2017 | RTD | 6 | N | N | N | N | N | N | Y | | | Y | Y | | Y | | | | | | | | | | |
| CISO | RTM | 02/15/2017 | RTD | 7 | N | Y | Y | Y | N | Y | Y | | Y | Y | | | Y | | | | Y | Y | | | | | |
| CISO | RTM | 02/15/2017 | RTD | 8 | N | N | N | N | N | Y | Y | | Y | | | Y | | | N | N | | | | | | | |
| CISO | RTM | 02/15/2017 | RTD | 9 | N | N | N | N | N | Y | Y | | Y | | | Y | | | | | Y | | | | | | |
| CISO | RTM | 02/15/2017 | RTD | 10 | N | Y | Y | Y | N | Y | Y | Y | | | | | Y | | | | N | Y | | | | | |
| CISO | RTM | 02/15/2017 | RTD | 11 | N | N | N | N | N | N | Y | | Y | | | Y | | | | | N | | | | | | |
| CISO | RTM | 02/15/2017 | RTD | 12 | N | N | N | N | N | N | Y | | Y | | Y | | | N | Y | N | | | | | | | |

For RT Interval 17:45 - LMP for | SMEC=

CONNECTED QUICK LINKS

OASIS Home System Operating Messages LMP Price Contour Maps Trading Hub Real-Time Prices Historical ACE SYSTEM HELP WWW.CAISO.COM Support System Technical Information 02/15/2017 17:45 PST

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110%

MPM Not Competitive constraints on Oasis

The screenshot displays the OASIS web interface for Market Power Mitigation (MPM) status. The main content area is divided into two columns: a list of MPM entries on the left and a detailed constraint matrix on the right.

Market Power Mitigation Status Table:

| Balancing Authority Area ID | Market | Opr Date | Execution Type | Opr Inter |
|-----------------------------|--------|------------|----------------|-----------|
| CISO | RTM | 02/15/2017 | RTD | 1 |
| CISO | RTM | 02/15/2017 | RTD | 2 |
| CISO | RTM | 02/15/2017 | RTD | 3 |
| CISO | RTM | 02/15/2017 | RTD | 4 |
| CISO | RTM | 02/15/2017 | RTD | 5 |
| CISO | RTM | 02/15/2017 | RTD | 6 |
| CISO | RTM | 02/15/2017 | RTD | 7 |
| CISO | RTM | 02/15/2017 | RTD | 8 |
| CISO | RTM | 02/15/2017 | RTD | 9 |
| CISO | RTM | 02/15/2017 | RTD | 10 |
| CISO | RTM | 02/15/2017 | RTD | 11 |
| CISO | RTM | 02/15/2017 | RTD | 12 |

Report Generated: 02/16/2017 01:44:00

Constraint Matrix Table:

| Constraint Name | HE14 | HE15 | HE16 | HE17 | HE18 | HE19 | HE20 | HE21 | HE22 | HE23 | HE |
|---|------|------|------|------|------|------|------|------|------|------|----|
| Interval AS Clearing Prices | | | | | | | | | | | |
| Interval Intertie Constraint Shadow Prices | | | Y | Y | | | | | | | |
| HASP Locational Marginal Prices | Y | | Y | Y | | | | | | | |
| FMM Locational Marginal Prices | Y | | Y | Y | N | | | | | | |
| FMM Scheduling Point/Tie Combination Locational Marginal Prices | Y | Y | Y | Y | | | | | | | |
| Fuel Prices | | | | N | N | | | | | | |
| Interval Intertie Constraint Shadow Prices | | | Y | Y | | | | | | | |
| Interval Nomogram/Branch Shadow Prices | N | N | | | | | | | | | |
| Reference Prices | | | | | Y | | | | | | |
| Nodal Group Constraints | | | | N | Y | | | | | | |
| Flexible Ramping Constraint Results | | | | N | | | | | | | |
| Contingency Dispatch Locational Marginal Prices | N | Y | N | | | | | | | | |

Not competitive constraints for 02/15/2017 HE13

| HE | Interval | Not competitive Interface | Type of constraint |
|----|----------|---|--------------------|
| 13 | | 17755 SOL5_NG | Nomogram |
| | | PATH26_BG | |
| 13 | | 1TCOR | |
| 13 | | 1PACW | EIM XFER |
| 13 | | 1PSEI | EIM XFER |
| 13 | | 225406_J.HINDS _230_24806_MIRAGE _230_BR_1 _1 | LINE |
| 13 | | 2NEVP | EIM XFER |
| 13 | | 2AZPS | EIM XFER |
| 13 | | 2PSEI | EIM XFER |
| 13 | | 2PACE | EIM XFER |
| 13 | | 2PACW | EIM XFER |
| 13 | | 325406_J.HINDS _230_24806_MIRAGE _230_BR_1 _1 | LINE |
| | | PATH26_BG | |
| 13 | | 3TCOR | |
| 13 | | 3SUMMIT_BG | TCOR |
| 13 | | 3NEVP | EIM XFER |
| 13 | | 3PSEI | EIM XFER |
| 13 | | 3PACE | EIM XFER |
| 13 | | 3PACW | EIM XFER |
| 13 | | 425406_J.HINDS _230_24806_MIRAGE _230_BR_1 _1 | LINE |
| 13 | | 4SUMMIT_BG | TCOR |
| 13 | | 4NEVP | EIM XFER |
| 13 | | 4AZPS | EIM XFER |
| 13 | | 4PSEI | EIM XFER |
| 13 | | 4PACE | EIM XFER |
| 13 | | 4PACW | EIM XFER |
| 13 | | 47755 SOL5_NG | Nomogram |

Not competitive constraints for 02/15/2017 HE13

| | | |
|----|---|----------|
| 13 | 5 25406_J.HINDS_230_24806_MIRAGE_230_BR_1_1 | LINE |
| 13 | 5 NEVP | EIM XFER |
| 13 | 5 AZPS | EIM XFER |
| 13 | 5 PSEI | EIM XFER |
| 13 | 5 PACE | EIM XFER |
| 13 | 5 PACW | EIM XFER |
| 13 | 6 25406_J.HINDS_230_24806_MIRAGE_230_BR_1_1 | LINE |
| 13 | 6 NEVP | EIM XFER |
| 13 | 6 AZPS | EIM XFER |
| 13 | 6 PSEI | EIM XFER |
| 13 | 6 PACE | EIM XFER |
| 13 | 6 PACW | EIM XFER |
| 13 | 7 25406_J.HINDS_230_24806_MIRAGE_230_BR_1_1 | LINE |
| 13 | 7 NEVP | EIM XFER |
| 13 | 7 AZPS | EIM XFER |
| 13 | 7 PSEI | EIM XFER |
| 13 | 7 PACE | EIM XFER |
| 13 | 7 PACW | EIM XFER |
| 13 | 12 NEVP | EIM XFER |
| 13 | 12 AZPS | EIM XFER |
| 13 | 12 PSEI | EIM XFER |
| 13 | 12 PACE | EIM XFER |
| 13 | 12 PACW | EIM XFER |

Key points

- Input bid from corresponding RTPD is used in RTD LMPM. It can be market bid, or mitigated in RTPD bid.
- RTPD mitigated bid can be mitigated farther in RTD.
- RTD LMPM evaluates second interval. If bids are mitigated, they will be used for binding interval of next RTD.
- Mitigated bids will be used within quarter of the hour (15 min interval corresponding to RTPD interval).
Corresponding RTPD input bids used at the beginning of every quarter.
- EIM bids will be mitigated if EIM MCP is higher than CAISO MCP.

ISO System Access Documentation

- http://www.caiso.com/Documents/SystemAccessInformation_MarketParticipants.pdf

ISO Market Simulation Support

- **Hours** - 09:00 - 18:00, PPT (Monday through Friday)
- **ISO's 24X7 Help Desk** - (916) 351-2309 (Connectivity - GUI or API)
- **Email** - MarketSim@caiso.com

Market Simulation Issue Management

- Submit all issues to the ISO CIDI case management system
 - CIDI tickets will need to have
 - ‘Functional Environment’ = “Market Simulation Spring 2017”
 - Or ‘Functional Environment’ = “Independent Market Simulation 2017”
- to be reviewed by ISO SME’s