Member Impacting Project Overview
PR20150019
Enhanced Combined Cycle,
Gas Electric
Harmonization Markets Release
1.19, 1.20, RR106, RR184, RR199

V4.03.4
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1.0. Executive Summary

This project will deliver two large areas of functionality related to Enhanced Combined Cycle (RR1-MPRR101, RR5-MPRR140, RR112, RR161, and RR199) and Gas Electric Harmonization (RR100) as well as some other enhancements.

1.1. RR106 RR184 – Outage Deviation

Settlements plans to release changes for RR106 RR184 Outage Deviation within this same ECC timeline. See “Additional Items” section of this MIPO.

Link to RR106 RR184: https://www.spp.org/spp-documents-filings/?document_name=RR184&docket=&start=&end=&filter_filetype=&search_type=filtered_search

1.2. Markets Release 1.19 – Non ECC Changes

The Markets release (1.19) that delivers functionality for ECC is also providing some enhancements and corrections that are not ECC related. Information about the content of that release and testing details for that release are also included in this MIPO.

1.3. Markets Release 1.20 – ECC corrections

SPP plans a release 1.20 which would include required corrections for ECC functionality and would be effective in production on Operating Day 3-1-17. Testing of any corrections in 1.20 would be included in the overall ECC testing timeline.

1.4. Enhanced Combined Cycle and Gas Electric Harmonization

Enhanced Combined Cycle and Gas Electric Harmonization functionality and associated protocol language is addressed by several RRs. ECC: RR1- MPRR101, RR5-MPRR140, RR112, RR161 and RR199. Gas Electric Harmonization: RR100.

Links to the written RRs:

RR1-MPRR101: http://www.spp.org/Documents/20275/MPRR101.zip
RR100: http://www.spp.org/Documents/28915/MRR100.zip
RR5-MPRR140: http://www.spp.org/Documents/20458/MRR5_MPRR140.zip
RR112: http://www.spp.org/Documents/29302/mrr112%202.zip
RR199 *: https://www.spp.org/Documents/45098/RR199.zip

*This MIPO assumes that RR199 progresses through the stakeholder process as written within the December 2016 – January 2017 timeframe. If the RR language changes, additional revisions to the MIPO might be necessary.

The Enhanced Combined Cycle (ECC) portion of the project originally started in early 2014 and was put on hold by the SPP Board of Directors (BOD) in July, 2014. The Board directed SPP to restart the project October 1, 2015 and be effective in production on March 1, 2017. Meanwhile, the revision request for Gas Electric Harmonization (GEH, RR100) was passed by the SPP stakeholders (with BOD approval on July 28, 2015). Because many of the same software performance improvements needed for ECC are also needed for GEH, SPP has combined the two efforts. The GEH timeline changes will be implemented in the Fall of 2016. SPP anticipates
making ECC performance and other changes throughout 2016 with quarterly releases. The last of the ECC changes will be implemented by 3-1-17. FERC approved the Gas Day order on December 17, 2015.

The functionality for ECC allows Market Participants to register multiple configurations for Combined Cycle Resources (CCs) and submit separate offers for each configuration. This new Resource type will be referred to as Multi-Configuration Combined Cycle Resource (MCR) throughout this document. The Markets System Market Clearing Engine will then select the optimal configuration for each hour and the transitions between configurations for the MCR.

This project reduces the production cost in the Integrated Marketplace by allowing a more economic commitment and dispatch of the MCRs. Market Participants will extract more value from the market since these Resources will be more efficiently dispatched.

With the configuration model, a MCR can be described and modeled by:

- A collection of configurations, each representing a possible mode of operation.
  - Each configuration:
    - Represents a unique logical mode of operation
    - Is offered in the market with the same parameters as a normal resource
    - Enables the logic to capture the physical component couplings through transition specific registration and offer parameters
  - Modeling abstraction layer:
    - Complexity transferred from Market Participants to market systems
    - Operational directive conversion: responsibility transferred to Market Participants with minimal translation effort.

ECC Configuration Example

The Gas Electric Harmonization changes will adjust the Market timelines

1. Move the Day-Ahead (DA) Market timeline to close at 0930 and post at 1400
(2) Shorten the reoffer period between DA Market and DA RUC to 45 minutes

(3) Move the DA RUC timeline to close at 1445 and complete by 1715.

Per this change, all DA Market offers will now need to be submitted by 0930 day-ahead and all RTBM offers for DA RUC consideration will need to be update by 1445 day-ahead.

These timeline changes are an incremental improvement over the existing timeline for improving coordination between the market results and the Timely and Evening nominations. While the proposed timeline does not provide DA Market results prior to the 1300 Timely Gas Nomination, it does allow for DA Market and DA RUC commitments to be provided prior to the Evening Gas Nomination. This also allows sufficient time in the morning for gas price formation prior to the DA Market close. These changes are intended to be an incremental step, with the long-term goal being to post DA Market results prior to the Timely Gas Nomination.

Illustrations of these time changes are provided below:
The following two pictures are supplied by SPP Training, and are available on LMS or in the project folder on spp.org (https://www.spp.org/spp-documents-filings/?id=28808)
As of 9/30/2016 for Operating Day 10/01/2016

Quick Reference Card: SPP Integrated Marketplace Timeline

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<tr>
<th>Time</th>
<th>Event</th>
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<td>00:00</td>
<td>Reserves Posted (0600)</td>
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<td>06:00</td>
<td>Reserve Depletion (0900)</td>
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<tr>
<td>11:30</td>
<td>Timely Gas Nom (1130)</td>
</tr>
<tr>
<td>13:00</td>
<td>DA Market (0930-1400)</td>
</tr>
<tr>
<td>14:45</td>
<td>DA RUC (1445-1715)</td>
</tr>
<tr>
<td>18:00</td>
<td>Evening Gas Nom (1800)</td>
</tr>
<tr>
<td>23:59</td>
<td>Re-Offer Closes (1445)</td>
</tr>
</tbody>
</table>

DA = Day-Ahead
RUC = Reliability Unit Commitment
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Quick Reference Card: SPP Integrated Marketplace Timeline

Why?
In 2014, FERC began the process of better aligning gas supply and electric supply schedules. The Final Rule, FERC Order 866:
- Moved the Gas Day’s 1130 Timely Nomination to 1300
- Changed the timing of the nomination cycles
- Added a 1900 Intraday nomination

Under the original SPP Day-Ahead (DA) Market timeline (see right), results posted after the Timely Gas Nomination deadline at 1330, and DA Reliability Unit Commitment (RUC) results posted after the Evening Gas Nomination deadline at 1800. With SPP moving the DA Market from 0930 to 1400. Market Participants (MPs) will still not have DA Market results before the Timely Gas Nomination at 1300. However, with DA RUC moving to 1445-1715, MPs will have 45 minutes to analyze and submit nominations for the Evening Gas Nomination at 1800.

Important Links:
- Gas Day Kickoff Meeting Registration
- Gas Day MP Testing Status Call Registration
- Other Gas Day Information (MPKO, Test Scripts, etc.)

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2.0. ECC Project Approach

2.1. MCE Prototype

SPP recognizes that other RTOs have had some difficulty in implementing configuration-based Combined Cycle functionality. Specifically, the performance of the Markets System Market Clearing Engine (MCE) is of concern for SPP.

There is significant new complexity required in the MCE for MCR commitment. SPP has concerns the additional functionality will push the MCE performance beyond the timeline requirements for the Day-Ahead Market and RUC processes. Because of these concerns, SPP and GE/Alstom are collaborating on MCE prototype testing.

With the stand-alone MCE prototype, SPP is able to assess performance and also determine if the logic is consistent with RR1-MPRR101, RR5-MPRR140, RR112, RR161 and RR199. Appropriate enhancements have been incorporated and stand-alone testing continues as needed.

2.2. Configurations

Based on prototype solve time results to date, it has been decided to limit the initial number of MCR configurations to three (3) in registration. Configurations may be updated via the registration process (up to six (6) times per year).

All registered configurations must be able to start and stop when committed.

Note: Though the initial implementation will be limited to 3 configurations, the system is being designed to support a configurable number of allowed MCR configurations. So in the future, as SPP and the vendor make progress to improve performance through the natural maturation of the Market Systems, SPP will seek guidance from the Market Working Group as to if the maximum number of configurations should be increased. If the allowable number of configurations changes, there will be no system changes required to support the increase.

A configuration based model provides the market with:

- Transparency - Market Participants no longer need to approximate their bidding strategies to reflect their capacity offerings. Such an inefficiency could result in:
  - Inaccurate market offer costs,
  - Possible gaps in forward market clearing, reliability and real-time capacity assessments

- Efficiency:
  - Offered plant configurations and transition matrixes provide additional efficiency opportunity for the centralized unit commitment processes.
  - Real-time transition constraints allow for better accuracy in dispatch needs and capacity assessment in order to meet load and Operating Reserve requirements
  - Improved accuracy of the Integrated Marketplace by allowing MPs to submit offers that more closely resemble the physical operating characteristics of the MCR.
3.0. Business Impact

3.1. **RR161 – “Commitment Level Cost Recovery and MCR Settlement Design Enhancements”**

This RR is expected to be approved through the stakeholder process May-July 2016. The functions this RR adds and the changes this RR makes are required for the Enhanced Combined Cycle software to work correctly in Markets and Settlements.

One of the significant outcomes of this RR creates involvement from ALL resource-owning MPs, not just those MPs that plan to register MCRs for March 1, 2017. Resource-owning MPs will have changes to their Shadow Settlements system, and EVERY resource-owning MP will now be required to test within the MP testing phase of this project. See Appendix C for details on testing phase

The Settlements changes for ECC detailed in RR161 will implement a netting approach to determine eligible start-up and transition costs for all resources as there was significant complexity related to adjacent and overlapping commitments. Additionally, current adjacency rules are not consistent with MCR flexibility to trade-off between Start-Up and Transition Offers in the evaluation of commitment schedule changes. This netting approach will:

- Take in to account cost avoidance which will cause some scenarios to settle differently than they do today
- Provide better transparency
- Provide cost allocations between DAMKT and RUC that are better aligned with commitment decisions
- Provide one set of Start-Up cost recovery rules applied to all Resources in Settlements and SCUC, maintaining consistency in assumptions about Start-Up and Transition cost recovery
- More accurately represents the incremental costs in RUC commitments
- Eliminate two different sets of rules for Make Whole Payments (MWP)
  - Reduces duplication of calculations and charge types
  - Reduces complication to make changes in the future

Presentations on RR161 details and examples which have been given to various working groups in 2016 can be found in the ECC/Gas Day project folder where this MIPO is saved.

Link:  [http://www.spp.org/spp-documents-filings/?id=28808](http://www.spp.org/spp-documents-filings/?id=28808)


More detailed information on resource commitment business rules for RR161 that need to be made to Shadow Settlements systems is included in this MIPO as Appendix D.

3.2. **Markets Release 1.19**

This release migrated to production on November 8, 2016.
There are member-impacting changes that are not associated with ECC-Gas Day being made to the Markets system with Markets Release 1.19. A list of these changes is provided below. The changes included in Markets Release 1.19 are enhancements or corrections which were previously reported via the Stakeholder Prioritization Quarterly Meeting (SPQM) as planned for an upcoming release. Some changes will affect Markets APIs for ALL MPs, some might be Markets User Interface changes, etc.

Markets API changes will have associated specifications (WSDLs, XSDs) issued in advance so MPs will be able to code their API changes. Those draft specifications will be issued on the schedule previously published in this MIPO (see Summary of Timeline section).

See Appendix B for detail regarding Market Participant testing of the issues listed below.

### Markets Release 1.19 MP Facing/Impacting Changes

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<tr>
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<th>Enhancement Description</th>
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<td>02 - 3035</td>
<td>Markets UI API</td>
<td>The overrides display in Markets UI does not show when an override was entered by an operator. It only shows the intervals that were overridden. If an operator makes an override at 1550 for the current hour and the next 2 hours, the Markets UI only displays that an override was entered for 1500-1800. This is misleading and the display should display a timestamp of when the override occurred.</td>
<td>SPP</td>
<td>N/A</td>
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<td>02 – 3356</td>
<td>Markets UI API</td>
<td>Summary: Allow users to use Virtual Bids/Offers post API operations to delete Virtual Bids or Offers. Today, participants must delete Virtual Bids or Offers using a separate API. Requires MP Code Changes: Yes. Participants using the Virtual Service would be required to make code changes.</td>
<td>XO Energy SW, LP (XOSW)</td>
<td>RMS 9459</td>
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<td>02 - 3975</td>
<td>Markets UI API</td>
<td>Summary: Improve data structure for Overrides in Markets API and Notification to help with parsing data. Currently, resource offer overrides are communicated to participants in a single text field in the API and XML notification. The text field includes multiple pieces of information (e.g. resource name, operating hour, overridden parameter) which cannot easily be parsed programmatically. Requires MP Code Changes: Yes. All participants using the EnergyService and/or EnergyNotifyService (XML Notifications) will be required to make code changes.</td>
<td>Southwestern Public Service Company (SPSM-MP)</td>
<td>RMS 15949, RMS 21898</td>
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<td>02 - 4513</td>
<td>Markets UI API</td>
<td>Summary: Overrides that span multiple days should be returned in the Market Energy Web Service API. The information is displayed correctly in the UI and XML Notifications. Requires MP Code Changes: No.</td>
<td>The Energy Authority (TEA)</td>
<td>RMS 18198</td>
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<td>02 - 4559</td>
<td>Markets UI API</td>
<td>Summary: The Markets UI Transaction Log page and associated API operation, should include the endpoint address. In the UI, this column should be added with filtering capabilities. Requires MP Code Changes: Yes. Participants using the TransactionService will be required to make code changes.</td>
<td>Rainbow Energy Marketing Corporation (REMC)</td>
<td>RMS 17505</td>
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<td>02 - 4560</td>
<td>Markets UI API</td>
<td>Summary: Add a unique ID to all Markets XML notifications to provide the ability to determine if duplicate messages are being sent to multiple endpoints. Requires MP Code Changes: Yes. Participants receiving XML notifications would need to modify their code to consume the new element.</td>
<td>Rainbow Energy Marketing Corporation (REMC)</td>
<td>RMS 17505</td>
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<td>02 - 1301</td>
<td>Markets UI API</td>
<td>Summary: The Markets UI should allow users to save preferences such as filtering options (e.g. the # of Operating Days) for each tab and not have to reset them every time they log into the Markets UI. Requires MP Code Changes: No.</td>
<td>(SPSM-MP)/American Electric Power (AEP-MP)</td>
<td>RMS 1844, RMS 1739</td>
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<td>02 - 1302</td>
<td>Markets UI API</td>
<td>Summary: Currently in the Market UI, the messages/filtering options are located at the bottom. Please move messages and filtering options to the top of the display. Requires MP Code Changes: No.</td>
<td>Southwestern Public Service Company (SPSM-MP)</td>
<td>RMS 1844</td>
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### Clarifying Information for 02-1818 for Markets UP/API

Enhancement 02-1818 was intended to identify Commitment information associated with SELF commitments. The primary business driver was to assist MP shadow settlements, and the final implementation in 1.19 included commitment status information in two places.

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<td>YES</td>
</tr>
<tr>
<td>Commitment</td>
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<td>NO</td>
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#### Background on Message Types

The Markets UI pages and Markets API actions related to Commitment information serve two purposes.

1. **Commitments UI / EnergyCommitmentSet API** – displays actionable changes going forward in time.
   a. The net starts/stops required to actually operate a Resource
   b. Each action may include multiple commitment decisions

2. **Commitment History UI / EnergyCommitmentHistorySet API** – displays incremental COP changes for a Resource.
   a. Each commitment change is listed individually, not “stitched” together and not always obvious how the Resource should physically be operated.
   b. Intended to provide information needed for analysis and shadow settlements.

To address confusion generated by the 1.19 implementation of this enhancement, in an upcoming Markets release, the commitment status will be removed from the Resource Offer/Commitment page as well as associated APIs. This update will be communicated again, in conjunction with other updates on that upcoming Markets release.
Markets Release 1.20

SPP plans a release 1.20 which would include required corrections for ECC functionality and would be effective in production on Operating Day 3-1-17. Testing of any corrections in 1.20 would be included in the overall ECC testing timeline. Content details will be provided at a later date.

RR106 RR184 – Outage Deviation

Settlements and Shadow Settlements changes associated with RR106 RR184 will be released at the same time as the ECC-related Settlements changes. RR106 RR184 Outage Deviation prevents Resources with a Day-Ahead commitment and who are operating in Real-Time with a control status of “Regulating” or “Following Dispatch” from receiving an Outage Deviation when SPP dispatches them to zero MWh output. The outage deviation calculation of the RUC MWP Distribution is changing to exempt Resource from deviation under the conditions described above.

This applies to all Resources with a minimum operating limit of zero, but will mainly impact VERs. Anyone with a Resource that has a minimum operating limit of zero could fall under this scenario, and would need to update their Shadow Settlements system.

Users Impacted

- ALL Resource-Owning MPs are affected by RR161. The MPs with MCRs will clearly have more in-depth changes and testing, but with the additions from RR161, all resource-owning MPs will be affected by changes to specific make-whole payment scenarios in Settlements. All resource-owning MPs will have Shadow Settlements changes and testing responsibilities to ensure the changes in Settlements are correctly implemented. More detailed information in the resource commitment business rules, which will feed the shadow settlements changes, has been added as Appendix D to this MIPO.

- ALL MPs who own a resource with a minimum operating limit of zero are affected by RR106 RR184 – Outage Deviation. Shadow Settlements systems will need to change to account for this RR. The previously approved formula in RR106 would exempt all Resources that clear in the DAMKT that were following SPP’s Dispatch to zero from receiving the RtOutageDevHrlyQty in the RUC MWP distribution. However, the formula would also charge every Resource RtOutageDevHrlyQty that cleared in the DAMKT and submitted meter in Real-Time.
• The changes below reflect the intent of RR106/RR184. If a Resource clears in the DAMKT and is off line in RT (meters zero) then the amount of MWs cleared in the DAMKT will be included in the RUC MWP distribution via the RtOutageDevHrlyQty charge type. If a Resource clears in the DAMKT and meters zero in RT and that Resource was either decommitted by SPP or was following SPP’s Dispatch to zero, then the Resource will be exempted from RtOutageDevHrlyQty. The changes also add a check for the RtOom5minFlg to verify that the Resource was following SPP dispatch via OOME.

• There are 14 MPs with candidate Combined Cycle Resources who have expressed interest in registering MCRs and participating in data submission for SPP’s prototype / performance testing.

• A base project assumption is that the Markets UI/API changes will be limited to impact only the MPs with MCRs.

• Financial-only MPs should not be affected by the ECC portion of the project. However, Financial-Only MPs are affected by the Gas Day changes.

3.6. Business Functions Impacted

- Market System (Ex: Offers (Markets API and UI))
- Ops Engineering
- Ops Modeling and Model Coordination
- Settlements
- Training
- MMU
- Registration
- Reliability
- Shadow Settlements

4.0. Technical Impact

4.1. SPP Systems/Processes Impacted

- Centralized Modeling Tool (CMT) / Model Change Submission Tool (MCST) modeling system and appropriate documentation will be modified to include various configuration options with associated data for MCRs. The MCST User Guide will be updated accordingly. However, the new MCR modeling will be accomplished via separate documentation from MCST modeling. The SPP staff modelers will input the MCR modeling changes to CMT / MCST.

- Re-registration of combined cycle units as MCRs: ECC registration packets were posted on April 6, 2016. The deadline to return ECC registration packets in order to participate in the March 1, 2017 Go-Live is August 1, 2016.

- MPs will be able to make changes to their registration during MP testing from November 28 to January 6. To submit changes to your ECC resource registration during the MP testing period, please submit a project on MCST as you usually would (with attachments that inform SPP the exact modeling changes you wish to make.)

- The model schedule during this period follows.

<table>
<thead>
<tr>
<th>Date Model information is due</th>
<th>Date Model will be effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, Dec 05, noon *</td>
<td>Friday, Dec 09</td>
</tr>
<tr>
<td>Monday, Dec 12, noon *</td>
<td>Friday, Dec 16</td>
</tr>
<tr>
<td>Monday, Dec 19, noon *</td>
<td>Friday, Dec 23</td>
</tr>
<tr>
<td>Friday, Jan 06, 5:00 CPT</td>
<td>Friday, Jan 13</td>
</tr>
</tbody>
</table>
No Network modeling changes for these weeks

- Beginning January 6, 2017, the commercial model will be frozen for combined cycle resources through the Go Live date of March 1, 2017. Per the regular modeling schedule, changes to be effective on April 1, 2017, must be submitted by February 15, 2017.
- The Markets system and appropriate documentation will be modified to appropriately commit MCR configurations.
- Downstream systems such as the SPP Data Warehouse and Markets Settlements will be modified to accept additional data and process appropriately for Make-Whole Payments.
- Settlements and Shadow Settlements systems are affected by the make-whole payment changes being made in RR161. More detailed information about the changes to Shadow Settlements systems has been added as Appendix D to this MIPO.
- SPP Settlements and Shadow Settlements systems are affected by the changes for RR106 RR184 – Outage Deviation.

4.2. Anticipated Member Systems/Processes Impacted

- MCRs are not permitted to register as a JOU.
- MCRs will have one settlement location. In some cases, MPs who have multiple settlement locations in the current market will need to consolidate those settlement locations to one to utilize the ECC functionality.
- MCST will change to incorporate the new data to be collected for MCRs. The MCST User Guide will be updated accordingly.
- ICCP will change to include new data points that need to be communicated for MCRs. The ICCP User Guide will be updated accordingly.
- Markets Settlements and Shadow Settlements:
  - Settlements systems will be changed accordingly for ECC functionality.
  - Market Participants’ shadow settlements systems will need to be modified accordingly for ECC as well as RR106 RR184.
  - RR161 detailed information on the resource commitment business rules for MP shadow settlements systems has been added to this MIPO as appendix D.
- Markets UI / API / XML
  - Specifications for offer data via API and the Markets UI will be modified to accept the additional MCR data required. Appropriate documents have been updated to reflect the changes. Final specifications have been posted here: Future Marketplace Tech Specs folder
  - API / XML and Markets UI Offer data will be modified. MPs will submit separate offers for each configuration, and those offers will require additional detailed MCR information.
  - The Marketplace Market User Interface Guide has been revised with Markets Release 1.18 and is located here: Current UI Guides folder on spp.org

5.0. Member Requirements

Member Requirements listed below provide a high level impact to the Markets UI/API for ECC. This section will be updated as the project progresses and additional information is known.

5.1. Markets UI and API

The Markets UI and API will be modified to include the following additional functionality.

- View/Edit Resource Offer Data for each Configuration registered
• View/Edit Group and Transition Offer Data including:
  • Group Minimum Run Time for DAMKT and RTBM
  • Plant Minimum Run Time for DAMKT and RTBM
  • Transition State Offer for DAMKT, RTBM and Mitigation
  • Transition State Time for DAMKT and RTBM
  • Transition State Maximum Quick-Start Response Limit for DAMKT and RTBM

• Override notification for new MCR parameters including:
  • Group Minimum Run Time for DAMKT and RTBM
  • Plant Minimum Run Time for DAMKT and RTBM
  • Transition State Time for DAMKT and RTBM
  • Transition State Maximum Quick-Start Response Limit for DAMKT and RTBM

• View Configuration non-price parameters Transition state time when mitigation is applied:
  • Transition State Time
  • Plant/Group Minimum Run Time
  • Transition State Maximum Quick-State Response Limit

• Resource Characteristics page updates for Configurations when mitigation is applied:
  • Transition State Time
  • Plant/Group Minimum Run Time
  • Transition State Maximum Quick-Start Response Limit

• View Configuration Transition cost when the Resource is mitigated. Similar to startup cost

• Add Transition Cost to Offer type for Mitigation

• Roll forward logic for Plant/Group and Transitions for MCR Resources

• Configuration Commitment History to include Transitions

• Display/Return Configurations as separate Resources

• View/Edit ability to disable Transitions

• Market Results displays to reflect individual committed Configurations for MCRs

• View individual Configurations on Emergency Limits, Overrides, Real-time Regulation Status and Reserve Cap

• New Data validations for submission of Configuration, Group and Transition offers

5.2. Settlements:

The following Settlement charge types are impacted:

• Day-Ahead Make-Whole-Payment Amount
• RUC Make-Whole-Payment Amount
• Real-Time Out-of-Merit Amount
• RUC Make-Whole-Payment Distribution Amount
• Unused Regulation-Up Mileage Make-Whole-Payment Amount
• Unused Regulation-Down Mileage Make-Whole-Payment Amount

The following Settlement Determinant reports are impacted:

• 5-minute Determinant
• Hourly/Daily Determinant
SPP staff has added Settlements-related information that outlines the resource commitment business rules to Appendix D of this MIPO. This document provides details to assist in determining the changes for Shadow Settlements systems.

6.0. Testing
SPP will conduct its standard internal Test Stages for Gas Day changes and the new ECC functionality. There is no Market Participant involvement in these phases.

SPP will conduct MP testing during the specified testing phases of the project. The MP-Facing Member Test Environment (MTE) will be used. MPs need to ensure access to that environment before scheduled testing begins.

Testing will be divided in phases and is based on when these changes move to production.

<table>
<thead>
<tr>
<th>Release</th>
<th>Production Date</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas Day</td>
<td>September 30, 2016</td>
<td>Complete</td>
</tr>
<tr>
<td>Non-ECC Markets Release 1.19</td>
<td>November 08, 2016</td>
<td>Complete</td>
</tr>
<tr>
<td>ECC (Markets and Settlements)</td>
<td>March 01, 2017</td>
<td></td>
</tr>
<tr>
<td>RR106 RR184 Settlements</td>
<td>March 01, 2017</td>
<td></td>
</tr>
</tbody>
</table>

6.1. Gas Day MP testing

- August 1, 2016 -> August 29, 2016 - COMPLETE
This testing is mandatory for all MPs (resource owning and non-resource owning) who submit bids and offers in the Day-Ahead Market.

- A Gas Day Testing kick-off meeting will be held on Thursday, July 28 (9:00 – 10:00am CPT). All MPs are encouraged to attend and can register here.

- After two weeks of testing, SPP will host a status/update call on Monday, August 15 (3:00 – 4:00pm CPT). MPs are encouraged to attend and can register here. The purpose of the status call is to ask questions, listen to other MP questions, hear updates from SPP, etc.

- As always, SPP will communicate project and testing updates via the ECC-Gas Day liaison email distribution list, CWG Expoder and CWG meetings – MPs are encouraged attend these meetings if possible.

Details concerning test cases, environment, scorecards are all in Appendix A of this document.
- The Gas Day testing is NOT bid-to-bill.

6.2 Markets Release 1.19
NON-ECC Member impacting testing – September 1, 2016 -> October 15, 2016 COMPLETE

- A Markets Release 1.19 Non-ECC Testing kick-off meeting will be held on Thursday, August 25 (9:00 – 10:00 a.m.). All MPs are encouraged to attend and can register here.
• After three weeks of testing, SPP will host a status/update call on Thursday, September 22 (9:00 – 10:00 a.m.). MPs are encouraged to attend and can register here. The purpose of the status call is to ask questions, listen to other MP questions, hear updates from SPP, etc.

• As always, SPP will communicate project and testing updates via the ECC-Gas Day liaison email distribution list, CWG Exploder and CWG meetings – MPs are encouraged to attend these meetings if possible.

• See Appendix B additional for detail regarding Market Participant testing Markets Release 1.19.

6.3 **ECC, Markets Release 1.20 and RR106 RR184 MP testing –**

November 15, 2016 -> November 25, 2016: API testing COMPLETE
November 28, 2016 -> January 31, 2017: Bid to Bill testing

• SPP has added additional testing time to this test phase.
  ▪ From November 15 through November 25 MPs are encouraged to begin Markets API testing. During this period, MPs can test to verify they are able to both query and submit data using the Markets APIs. The data being returned are not supported during this period, but the testing to ensure connectivity and appropriate communication is supported. There are no test cases for this phase.
  ▪ Beginning November 28, SPP will begin the full bid-to-bill testing for ECC and other associated changes.

• Comprehensive, bid-to-bill (includes Markets and Settlements) for certain supported days during the MP testing phase. Supported days will be specifically defined in the testing materials which will be distributed to the MPs.

• The Settlements testing portion (RR161 and RR106 RR184) is **required** for all resource owning MPs who submit bids and offers

• The ECC testing portion is required for only those MPs who have a registered Multiple Combined Resource (MCR) unit effective 3-1-17

• The ECC regression testing portion is optional for MPs who do not have a registered MCR effective on 3-1-17

• Structured test cases will be issued by SPP

• Scorecards will be required

• Time for unstructured testing will also be available

• For more details, see Appendix C

• MCST will be available for ad hoc unscripted testing by the MPs, but there will be no formal MP testing period for the MCST changes.

• **Details for testing are still being developed. A revision to this MIPO will be issued before the testing phase with the details and expectations.**

6.4 **Liaisons**

Each MCR-owning MP has already been contacted to identify Test Liaisons for this project. We will retain these liaisons for ECC-related portions of the project.
However, since the project now includes testing not related to Enhanced Combined Cycle (Gas Day, Markets Release 1.19, Markets Release 1.20, Settlements RR161 change, RR106 RR184), we will need liaisons from each MP to serve as the point of contact for all testing for their company.

Please submit an RMS ticket, using Project quickpick, ECC as SubType 1 with the name, phone number, and email of the person who will be the liaison(s) for SPP for the project. We will add these names to our ECC liaison list we already have to ensure all affected are on the distribution.

### 6.5 Testing Assumptions:

- All MPs should have already conducted connectivity testing to the MP-Facing Member Test Environment (MTE). This project timeline will not include connectivity testing.
- MPs staff who are participating in the testing are trained on the systems they are testing.

### 7.0 Training

Requirements for training are currently being drafted and are dependent on system design phase outputs. Additional information will be added to this MIPO as soon as it is available.

A training session was held on May 20 for those interested in additional in-depth information on the new RR161. Materials are posted in the same project folder where this MIPO is posted.

Customer Training will provide training for overall Markets ECC changes, and then specifically for the ECC changes being made to individual market functions such as Offers. Generally, the training schedule will include job aides for those MP representatives testing in December/January.

The SPP Training department will offer a series of classes in January and February for the full training on Enhanced Combined Cycle. The schedule is as follows. More information will be added to LMS.

#### Markets
- **January 19th**: 9:00 – 11:00 a.m. CPT (a.m.)
- **February 9th**: 2:00 – 4:00 p.m. CPT (p.m.)

#### Non-MCRs
- **January 26th**: 9:00 – 11:00 a.m. CPT (a.m.)
- **February 8th**: 2:00 – 4:00 p.m. CPT (p.m.)

#### MCRs
- **January 31st**: 9:00 – 11:00 a.m. CPT (a.m.)
- **February 14th**: 2:00 – 4:00 p.m. CPT (p.m.)

Training Assumptions:
- All member companies will identify personnel to receive project-related training and/or documentation.
- All member companies will use the LMS to register for any project-related training sessions, if applicable.
- SPP Training will provide learning opportunities that aid understanding, but each entity will be expected to certify performance readiness.
8.0 Implementation/Back-out Plan
TBD

9.0 Summary of Timeline

9.1 GAS DAY DATES
COMPLETE

<table>
<thead>
<tr>
<th>Date</th>
<th>Responsible Party</th>
<th>Action</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>August 1, 2016 –</td>
<td>MP</td>
<td>MP Testing for Gas Day</td>
<td></td>
</tr>
<tr>
<td>August 29, 2016</td>
<td></td>
<td></td>
<td>COMPLETE</td>
</tr>
<tr>
<td>September 30, 2016</td>
<td>ALL</td>
<td>Gas Day Production Implementation</td>
<td></td>
</tr>
</tbody>
</table>

9.2 Non-ECC Markets 1.19 DATES
COMPLETE

<table>
<thead>
<tr>
<th>Date</th>
<th>Responsible Party</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>June, 2016 –</td>
<td>MP</td>
<td>Software Build for Markets Release 1.19 non-ECC changes</td>
</tr>
<tr>
<td>September 1, 2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>August 25, 2016</td>
<td>MP</td>
<td>Markets Release 1.19 Non-ECC Testing kick-off meeting</td>
</tr>
<tr>
<td>September 1, 2016 –</td>
<td>MP</td>
<td>MP Testing for non-ECC Markets Release 1.19</td>
</tr>
<tr>
<td>October 15, 2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>September 22, 2016</td>
<td></td>
<td>Markets Release 1.19 Non-ECC Testing status/update call</td>
</tr>
<tr>
<td>November 8, 2016</td>
<td>SPP</td>
<td>Markets Release 1.19 Production Implementation</td>
</tr>
</tbody>
</table>

9.3 ECC, Markets Release 1.20, and RR106 RR184 DATES

<table>
<thead>
<tr>
<th>Date</th>
<th>Responsible Party</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 6, 2016 –</td>
<td>MP</td>
<td>MCR Registration for 3-1-2017 Commercial Model</td>
</tr>
<tr>
<td>August 1, 2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>June, 2016 –</td>
<td>MP</td>
<td>Software Build for ECC Release Software build for Shadow</td>
</tr>
<tr>
<td>December, 2016</td>
<td></td>
<td>Settlements and RR106 RR184 changes</td>
</tr>
</tbody>
</table>

9/9/161/16/17
<table>
<thead>
<tr>
<th>Date</th>
<th>Responsible Party</th>
<th>Action</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid October, 2016</td>
<td>SPP</td>
<td>Update MIPO to include ECC testing and training details</td>
<td>COMPLETE</td>
</tr>
<tr>
<td>January, 19, 26, 31 2017 – February 8, 9, 14 2017</td>
<td>MP</td>
<td>SPP provide ECC Training</td>
<td></td>
</tr>
<tr>
<td>November 17, 2016</td>
<td>MP</td>
<td>MP Testing Kick off Meeting</td>
<td>COMPLETE</td>
</tr>
<tr>
<td>November 15, 2016 - November 25, 2016</td>
<td>MP</td>
<td>MP API Testing for ECC</td>
<td>COMPLETE</td>
</tr>
<tr>
<td>November 28, 2016 - February 1, 2017</td>
<td>MP</td>
<td>MP Testing for ECC</td>
<td></td>
</tr>
<tr>
<td>December 6, 2016</td>
<td>MP</td>
<td>MP Testing Status Meeting</td>
<td></td>
</tr>
<tr>
<td>December 16, 2016</td>
<td>MP</td>
<td>MP Testing Status Meeting</td>
<td></td>
</tr>
<tr>
<td>January 6, 2017</td>
<td>MP</td>
<td>MP Testing Status Meeting</td>
<td></td>
</tr>
<tr>
<td>January 16, 2017</td>
<td>MP</td>
<td>MP Testing Status Meeting</td>
<td></td>
</tr>
<tr>
<td>January 30, 2017</td>
<td>MP</td>
<td>MP Testing Status Meeting</td>
<td></td>
</tr>
<tr>
<td>February 21, 23, 2017</td>
<td>ALL</td>
<td>1.20 Production Implementation Commercial model effective March 1, 2017 available in production</td>
<td></td>
</tr>
<tr>
<td>March 1, 2017</td>
<td>ALL</td>
<td>ECC model effective, ECC production implementation RR184 effective</td>
<td></td>
</tr>
</tbody>
</table>
10.0 Project Assumptions
- Vendor development is completed on dates estimated by SPP.
- The Markets UI/API can be changed in such a way that MPs without MCRs will not be affected.
- Performance challenges can be resolved without re-architecture of the Market Clearing Engine or Markets System.
- SPP and vendor can progress through functionality testing while performance is still being improved.
- The Vendor and SPP will adhere to a 'last possible date' for changes to XML specifications. The specific date for ECC specification publication is still to be determined and is expected to be at least two months before MP testing is to begin.

11.0 Risks
- Development delays by vendors may delay testing of core components.
- The Market Clearing Engine (MCE) may already be at its outer limits of performance. There is a risk that there will be performance degradation when the ECC functionality is added. The project team and the vendor will spend significant time performance testing to ensure performance time requirements are still within limits for production processes. This could be a long process risking the production implementation date.
- If there is MCE major re-architecture due to performance, the date would be at risk.

12.0 Additional Documentation
Presentations on RR161 details and examples which have been given to various working groups in 2016 can be found in the ECC/Gas Day project folder where this MIPO is saved.

   Link:  http://www.spp.org/spp-documents-filings/?id=28808

13.0 Communication Plan
Monthly updates will be provided via written status report or presentation to CWG.
All project communication and information will be posted to the ECC and Gas Day project folder, located within the SPP Change Working Group Project Documentation folder.

This MIPO will be updated upon change or with any new information, according to the Member Project Touch Points and Deliverables. With any update, a redline version is posted to the project documentation folder, and the ECC liaisons and CWG is notified.

### 14.0 Next Steps

<table>
<thead>
<tr>
<th>Action</th>
<th>Assignee</th>
<th>Status &amp; Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPs code 1.19 changes in API</td>
<td>MPs</td>
<td>June 15, 2016 – September 01, 2016</td>
</tr>
<tr>
<td>MPs code ECC changes in API</td>
<td>MPs</td>
<td>June 15, 2016 - November 30, 2016</td>
</tr>
<tr>
<td>MPs Test Gas Day</td>
<td>MPs</td>
<td>August 01, 2016 – August 29, 2016</td>
</tr>
<tr>
<td>MPs Test 1.19</td>
<td>MPs</td>
<td>September 1, 2016 – September 25, 2016</td>
</tr>
<tr>
<td>MPs Test ECC</td>
<td>MPs</td>
<td>November 28, 2016 – February 1, 2017</td>
</tr>
</tbody>
</table>

### 15.0 FAQs

Frequently asked questions will be added to the document as identified or necessary.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will existing combined cycle resources be required to register as a MCR or will MPs be allowed to maintain the current registration for a resource?</td>
<td>MPs will not be required to register as an MCR resource; you will be able to maintain current registration.</td>
</tr>
<tr>
<td>Once a resource has registered as a MCR, is it possible for that resource to de-register as a MCR and revert to its original registration?</td>
<td>Yes, for go live, January 6, 2017 is the last day to deregister as an MCR. Changes or reversions after go-live will follow the same modeling timeline as any other commercial model change.</td>
</tr>
<tr>
<td>If a MP identifies a significant issue during the testing phase, is it possible to revert that resource back to its original registration prior to ECC go-live?</td>
<td>Yes, as long as the reversion is submitted by January 6, 2017.</td>
</tr>
<tr>
<td>Once the August 1 registration packet has been returned to SPP, are MPs able to make revisions to their registration prior to 3/1/2017? For example, during</td>
<td>MPs will be able to make changes to their registration during MP testing from November 28 to January 6. See section 4.1 for modeling schedule.</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>the MP testing phase?</td>
<td></td>
</tr>
<tr>
<td>What are the expectations in terms of the transition registration. Do all configurations have to have an associated transition?</td>
<td>There is a requirement that each configuration be listed at least once as either a From or To transition.</td>
</tr>
<tr>
<td>Are configurations resource specific?</td>
<td>Yes</td>
</tr>
<tr>
<td>if the MCR in the example registration packet is committed in 1x1, will SPP provide additional commitment detail such as which units are expected to be online specifically, or will the MP be left to choose the units to fulfill that commitment. For example, would SPP issue a 1x1 commitment specifically for CT#1 + the steamer (or CT#2 + the steamer) or would will the MP just see a commitment for 1x1?</td>
<td>SPP would commit 1x1. We wouldn't tell you specifically which set of physical equipment to use.</td>
</tr>
<tr>
<td>Is it possible to get a list of all the DA and RT offer parameters for a MCR? (If there are any that are not include in the MIPO)</td>
<td>All offer parameters are listed in the MIPO.</td>
</tr>
<tr>
<td>Will MCRs be able to provide a max number of transitions allowed per day? Per week?</td>
<td>There is no limitation specific to transitions. Transitions and Starts both count to the configuration-specific max daily and max weekly starts constraints. There are no group-level offer parameters other than Group Minimum Runtime as part of the ECC project scope. Additional Group-level offer parameters could be added after March 1, 2017 as an enhancement though the Revision Request process.</td>
</tr>
<tr>
<td>Is there additional registration information needed beyond what is listed in the registration packet?</td>
<td>No additional registration information is needed once the packet is submitted to SPP via MCST Project.</td>
</tr>
<tr>
<td>Will existing regulation qualified resources be required to re-qualify if they choose to re-register as a MCR?</td>
<td>No. We will not require requalification because of this registration change.</td>
</tr>
<tr>
<td>Is it possible to register a MCR resource past August 1, 2016? Is the January 6, 2017 commercial model freeze only for configuration changes?</td>
<td>Yes, Registration packets returned after August 1, 2016 but by the February 15, 2017 regular model submission deadline will be effective April 1, 2017 (not March 1, 2017 when MCR functionality goes live)</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>If an outage occurs in RT that impacts one of the registered configurations, is there a way for MPs to update the offers to reflect what is currently available without re-registering?</td>
<td>When the MP registers the MCR, they will also give us component sets. The component set approach was decided to address situations like this, where an outage could cause the whole plant to go out of service, especially when we are limiting them to three (3) configurations. This will be used by the clearing engine to process derates and outages. In this example, when the steam goes out, MCE will see the outage in the equipment. It will then go to the component set table and determine which configuration is affected. Both configurations can still be considered by the MCE because the MP told us both configurations can still run without the steam unit. In both configurations, the outage will really act as a derate but will be available. It is important to note that the Configuration offers should reflect the reduced capabilities.</td>
</tr>
<tr>
<td>For example, assume a MP has a MCR registered with the following three configurations: 1x1, 2x1, 2x1 + ducts. Say the steam unit trips in RT and is not anticipated to return immediately and the two remaining CTs are available to run in simple cycle. Is it possible to make offer updates in RT that would all the MP to accurately reflect those two CTs are still available to the market?</td>
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<td>Is the January 6, 2017 commercial model freeze only for configuration changes?</td>
<td>The deadline to return ECC Registration Packets to be able to participate in the March 1, 2017 Go-Live is August 1, 2016. After testing starts on November 28, 2016, the MPs have until January 6, 2017 to deregister as an MCR and/or make any changes to configurations or registrations prior to March 1, 2017 for Go Live.</td>
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<tr>
<td>If a MP would like to register 1x1 as one of the configurations for their MCR and that configuration can be met through a combination of two different CTs plus a steamer (CT#1 + steamer OR CT#2 + steamer), does each combination count as a single configuration? So, if a MP wants to offer in both of those combinations would CT#1 + steamer count as one configuration and CT#2 + steamer count as a second configuration, leaving one</td>
<td>The 1x1 in your example could be registered as two individual configurations, or a single configuration. For the single configuration option, you would simply list both combinations (CT1 &amp; ST, CT2 &amp; ST) in the 'MCR to Unit' tab of the MCR Registration packet. Each combination would refer to a different component set which is a separate column in the table. In this example the two combinations of units forming the 1x1 only count as 1 of your 3 available configurations. Review the options presented in the example packet. (<a href="http://www.spp.org/spp-documents-filings/?id=28808">http://www.spp.org/spp-documents-filings/?id=28808</a>)</td>
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<td>Can an MCR be Registered to Provide Regulation up and down in one configuration but not certified in a second configuration? We would like to provide regulation in simple cycle and not provide regulation in combined cycle. Also, if this is possible, will you be performing regulation certification testing as part of the registration process?</td>
<td>Yes, ancillary service flags are set per configuration so you could have one configuration qualified for Reg and another configuration of the same MCR not qualified for Reg. If the MCR relates to a currently registered market resource which is already certified for regulation, then no testing will be required. If this is a newly registered resource, or if the MCR’s currently registered counterpart is not qualified for Reg, then certification testing will be required. Since the resource in question is currently modeled in our Production environment, we could schedule a time to perform regulation qualification testing before MCR testing begins. We would coordinate this to make sure that you were operating in simple cycle at the time of the test. Once passed we could go ahead and set the reg flags for your current market resource (you could manage whether you wanted to regulate based on control mode/offer), or we could hold off and only set the reg flags for the simple cycle configuration when the MCR modeling is put in place.</td>
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<td>This resource is not currently qualified for regulation so will we be scheduled to perform our regulation qualification as part of the MCR registration or will we need to submit a different registration packet for the regulation qualification?</td>
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<td>Will the 1.19 release contain new settlement determinants?</td>
<td>Per version 2.1 of the MIPO Enhanced Combine Cycle, Gas Electric Harmonization, Markets Release 1.19, and RR106 RR184, published on 05/24/2016, Markets Release 1.19 has no Settlement Impacts. It consists of a number of Markets UI and API modifications. The next member facing or member impacting Settlement release will be the Enhanced (Multi-Configuration) Combined Cycle release. There will be changes to the Markets notification services. A draft of the XML specification changes are scheduled to be published on 06/15/2016, which will include changes to the XML notification.</td>
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<td>And will there be an impact to the listeners from a payload perspective/ revision changes to the notification processes?</td>
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<td>In the example configurations below, it could be possible for each component to have a different mitigated offer. If an outage occurs in RT that would necessitate a MP to make a change to their mitigated offer, will that be allowed? How will changes the RT offers be evaluated in this case? Is the expectation that all the</td>
<td>Offers are made at the Configuration level, not the component level. You will need to update all offers affected by an outage such as the Steam outage in your example. Rules for submitting offers for configurations are consistent with how you submit offers for resources today.</td>
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| components for a configuration have the same mitigated offer?           | The SPP OATT (Attachment AE section 3.2E) currently allows changing the mitigated offer under specific circumstances unrelated to an outage, however, the MMU expects that each resource configuration will have its own offer and associated mitigation offer.  
Currently, heat rates are reflected at the commercial model unit level in the MMDD and aggregated to a resource level, which even today presents challenges for combined cycles. For the few resource configurations with special considerations regarding transition fuel use and configuration heat rate that can't be easily derived from the unit level data, we have the option to gather this information manually. |
| How will the MMDD be updated to accommodate MCRs? Depending on how the resource is registered, it may be possible for one or more configurations to have different mitigated offers depending on unit availability. Take the example from question #2 for instance. The 1x1 configuration has four components associated with it. The first two components that include the steamer unit will have a different mitigated offer than the third and the fourth simple cycle components. Will MPs be able to reflect that in the MMDD? | Yes, ancillary service flags are set per configuration so you could have one configuration qualified for Reg and another configuration of the same MCR not qualified for Reg. If the MCR relates to a currently registered market resource which is already certified for regulation, then no testing will be required. If this is a newly registered resource, or if the MCR's currently registered counterpart is not qualified for Reg, then certification testing will be required.  
Since the resource in question is currently modeled in our Production environment, we could schedule a time to perform regulation qualification testing before MCR testing begins. We would coordinate this to make sure that you were operating in simple cycle at the time of the test. Once passed we could go ahead and set the reg flags for your current market resource (you could manage whether you wanted to regulate based on control mode/offer), or we could hold off and only set the reg flags for the simple cycle configuration when the MCR modeling is put in place. |
| I have a question regarding MCR Registration. Can an MCR be Registered to Provide Regulation up and down in one configuration but not certified in a second configuration? We would like to provide regulation in simple cycle and not provide regulation in combined cycle. Also, if this is possible, will you be performing regulation certification testing as part of the registration process? | Yes, ancillary service flags are set per configuration so you could have one configuration qualified for Reg and another configuration of the same MCR not qualified for Reg. If the MCR relates to a currently registered market resource which is already certified for regulation, then no testing will be required. If this is a newly registered resource, or if the MCR's currently registered counterpart is not qualified for Reg, then certification testing will be required.  
Since the resource in question is currently modeled in our Production environment, we could schedule a time to perform regulation qualification testing before MCR testing begins. We would coordinate this to make sure that you were operating in simple cycle at the time of the test. Once passed we could go ahead and set the reg flags for your current market resource (you could manage whether you wanted to regulate based on control mode/offer), or we could hold off and only set the reg flags for the simple cycle configuration when the MCR modeling is put in place. |
| Will there be a mitigated transition offer similar to other price related offer components? We assume that transition costs could be mitigated. Is that accurate? | There will be a transition cost and it could be mitigated.  
From MMU: Yes. RR112 implements this language in the Tariff, AF 3.4: A Mitigated Transition State Offer shall be submitted daily by the Market Participant in accordance with the Mitigated Offer Development Guidelines for each potential transition state change. Mitigated Transition State Offer($/Transition)=(Transition Fuel Consumed(mmBtu/Transition)*TFRC($/mmBtu)*Performance Factor)+Transition VOM Cost($/Transition)+Incremental |
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<td>The MIPO references the roll forward logic Plant/Group and Transitions for MCR resources (page 13). Does SPP anticipate implementing the roll forward logic that was approved in RR153 by ECC go live, or does SPP anticipate applying the current roll forward logic for ECC?</td>
<td>SPP anticipates RR153 implementation will be after ECC goes live.</td>
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<td>The MIPO also states that &quot;View/Edit ability to disable Transitions&quot; will be an added functionality in the Markets UI and API (page 13). Can SPP explain further what this functionality is? Will MPs be able to enable and disable certain transitions? If so, how does the MMU anticipate evaluating physical withholding in the context of MCRs?</td>
<td>The MPs will register all valid transitions at Registration. Since Registration changes occur bimonthly, we needed to provide a way for the MP to disable a normally valid transition due to a temporary outage like condition. From MMU: If MPs disable transitions for technical reasons that are not true and verifiable, or for any other reason when it would have been in their economic interest to offer the transition without market power, that appears to meet the current Tariff definition of physical withholding in Attachment AG section 4.6.4(A).</td>
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<td>The registration packet asks for the reasonable EMS Max/Min MW limits by unit (Unit Details tab). How does SPP intend to use these MW limits? We assume that these limits will be used for registration validation for offers in the Markets UI. Will they be used for other processes or market functions?</td>
<td>These limits are also used in our Energy Management System (EMS) to check the quality of SCADA received for the individual equipment output as well as to validate the submitted min/max limits for the configurations.</td>
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<td>Will MP receive setpoint instructions via ICCP and energy dispatch XML for each registered configuration? or is it &quot;1&quot; setpoint instruction and &quot;1&quot; XML energy dispatch instruction for &quot;active&quot; configuration.</td>
<td>The MP will receive only one setpoint value via ICCP (not one for each configuration). The same is true for the XML energy dispatch signal.</td>
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<td>Are there any additional data points for CC to be sent by MP to SPP via ICCP? If so, what is timeline to release updated ICCP handbook</td>
<td>The MP will be providing two additional data points to SPP via ICCP for each CC resource. The first will be an integer value which will indicate the current resource configuration. The second new point will be a True/False flag indicating whether or not the resource is currently in transition from one configuration to another. The revised ICCP Handbook has been posted:</td>
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<td>Will commitment history and commitment status queries contain results for each configuration?</td>
<td>The commitment history and commitment status queries will include results for each registered configuration.</td>
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<td>During CC transition, what is the expected resource status for CC? I was wondering how RTBM dispatches CC in transition? or does it handle it same as &quot;Resource Control Status&quot; of Manual (Status Code 3)</td>
<td>While in Transition, the Resource will not clear Operating Reserve Products. The submitted control mode (status code in your words) will be used to determine energy dispatchability.</td>
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<td>As a wind farm, what must I test as a part of this project?</td>
<td>Even as wind only, there are several testing areas where we will need your participation.</td>
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<td>• Gas Day timeline changes (testing in August)</td>
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<td>• Markets Release 1.19 changes that are not ECC related if you use any of the APIs or notifications that are being changed (testing in September)</td>
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<td>• Changes in Settlements connected with ECC project but affect all applicable resources, specifically, the RR161 changes. This MIPO offers additional detail about those changes and Appendix D offers additional detail on the shadow settlements changes that you might need to make. (testing in December, January)</td>
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<td>• Changes in Settlements for RR106 RR184 – Outage Deviation (testing in December, January)</td>
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<td>Does the Max and Min of a simple cycle need to reflect both CTs (one CT max 150 two 300)? We are having some problems finding how to reflect the ability to run 2 CTs without the steam turbine.</td>
<td>Due to system performance we have limited the number of available configurations for any ECC to 3. You will need to decide which 3 configurations to register that best fit your needs. If you decide on a 1X0 configuration over the 2X0 configuration, then I would expect the registered max to be that of one CT. If you decide on the 2X0 over the 1X0, I would expect the registered max to be the combination of both CTs.</td>
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<td>Do we need to reflect our ability to go from 2x1 to a simple cycle? Or just show a 2x1 to 1x1 then 1x0?</td>
<td>There is no expectation that every configuration be transferable to every other configuration. If you are not able to transition from 2X1 to 1X0 then don't include that transition on the 'MCR Transition' tab.</td>
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<td>If the Resource is able to transition from 2x1 to 1x0, then that transition should be reflected even if there is a transitory period where the MCR is technically operating in 1x1. The offered Transition Time and Transition Cost should for that Transition should reflect the total cost and time to Transition from 2x1 to 1x0.</td>
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| Clarification on the tab "MCR Groups" once again have the same setup as the example so used it very heavily on this tab. What significance does the label "Plant" have/mean? | For each set of MCRs, there must be one group defined that represents all MCRs. This group is considered the 'Plant' group. You will then be able to submit minimum run times as part of your offer at a group level for each group you have defined. In other words you will need one group that identifies all configurations which will be designated as the plant group. You may define other groups of configurations as you see fit.  
You will then be able to submit min run times as part of your offer at a group level for each group you have defined. |
| The description for Item 02-3513 in the MIPO states that Participants using the ReserveService and/or ReserveNotifyService (XML Notifications) would be required to make code changes. I am not seeing a change in the ReserveService_specifications_V7 document or the ReserveNotifyService_specifications_V7 other than the change to "V7". Is this correct? No other changes are being made to the XSD other than the version number? | The easiest way to see the changes in the ReserveService and ReserveNotifyService changes is to view the diff reports: reserve_WSDL_diff.htm  
reserve_XSD_diff.htm  
reservenotify_WSDL_diff.htm  
These diff reports are located in the published specs here: https://www.spp.org/Documents/40342/Marketplace%20Markets%20Web%20Service_1007e1283%2028.zip  
I do not see the MarketService_specifications document in the marketplace markets_web_service_1007e1283 28.zip file that I downloaded from www.spp.org. Is the current version to use for the Markets Release 1.19 the file in marketplace markets_web_service_1007e1283 27.zip named MarketService_specifications_v6.1.docx? | You are correct. The diff reports and the MarketService_specifications_v6.1.docx are the most current that we have.  
There were no updates made to the Market Web Service so the version of the specification document will be the same as the one that is included in the Marketplace Markets Web Service 1007E1283 27 (Release 1.18) version.  
The updated version of the Marketplace Markets Web Service zip file is now available in the following location on spp.org:  
https://www.spp.org/spp-documents-filings/?id=21071  
Can you explain the concept of making a unit the plant unit in the registration packet. I don't understand why I want one unit to set certain parameters for all the unit. I want to be able set them according to our operating conditions. | The plant group will allow you to set a minimum run time (MRT) for your plant. You will still be able to set an MRT for the individual configurations. While individual configurations might have short MRTs, it might not make sense for a plant to start up unless it was guaranteed to run for at least a certain number of hours.  
Example 1 MRTs:  
1X0: 1 hour  
1X1: 4 hours |
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<td>2X1: 4 hours</td>
<td>Plant Group: 10 hours</td>
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<td>In this example SPP would respect the MRT of the individual configurations making sure that if we dispatched you in a specific config, you would operate in that config for the given number of hours. SPP would also abide by the total plant MRT of 10 hours. For instance, if we dispatched the plant at 1X1 for 4 hours and then moved it to 2X1 for 4 hours, we would have to keep the plant on for at least another 2 hours, perhaps in 1X0. If the Plant MRT was 0 hours, SPP would simply use the config MRTs.</td>
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| Example 2 MRTs:                                                         | 1X0: 1 hour  
1X1: 1 hours  
2X1: 1 hours  
Plant Group: 10 hours  
Steam Group: 4 hours  
In this example we see a steam group which would include configurations 1X1 and 2X1. The example shows that the CT’s in general have a MRT of 1 hour, but the Steam unit has a min run time of 4 hours. This would allow SPP to transition the unit between 1X1 and 2X1 every hour for 4 hours (provided it was economical to do so), leaving the steam to run for the full four hours. |
| We are a financial only entity and wanted to know which aspects of the market participant training apply to us for the above project. I read and MIPO and gathered the following apply: Gas Day timeline changes Markets Release 1.19 changes that are not ECC and if APIs are used | Correct. If you use API or Markets UI, those changes apply to you.  
Leading up to the testing for ECC (MCR), we had a question regarding the deployment of regulation. When one configuration of an MCR is committed in the Day Ahead market to provide Regulation, will that resource remain in the same configuration in the Real Time that was committed Day Ahead, or can the market decommit to a smaller |
| The resource may be transitioned up to a larger configuration in real-time based on economics. If the larger configuration is Regulation qualified, it would be eligible to be selected for Regulation.  
If the larger configuration were not eligible for regulation, then you would not be selected and would have to buy back at the real-time price.  
A transition to a lower configuration is considered a decommit, and if initiated by SPP, would be eligible for Make Whole Payments. |
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<td>configuration offer at any time? We are trying to understand if we could be short Regulation at any time due to one configuration offering regulation and another configuration later committed that can not offer Regulation.</td>
<td>So that you may be able to test in the SPP Marketplace MTE testing environment, please have one of your company's LSAs, obtain an OATI digital certificate for you and setup your user access in the Marketplace MTE testing environment. Also, your LSAs should be able to determine whether past testing has taken place previously. Your LSAs has access to the testing environment, therefore they should be able to complete your setup.</td>
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<td>I am unable to find the Member Testing Environment and no one in my company seems to know if there has been some testing done before.</td>
<td>So that you may be able to test in the SPP Marketplace MTE testing environment, please have one of your company's LSAs, obtain an OATI digital certificate for you and setup your user access in the Marketplace MTE testing environment. Also, your LSAs should be able to determine whether past testing has taken place previously. Your LSAs has access to the testing environment, therefore they should be able to complete your setup.</td>
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<td>It seems we are unable to login to the test OATI environment for the gas day MP testing using the certificates we use to access the production environment. Would you happen to know who we should contact in order to get access to the environment (whether it is SPP or OATI)?</td>
<td>Please contact OATI for user setup in the correct environment. You can call the OATI help desk 763-201-2020.</td>
</tr>
<tr>
<td>How do offers requests (to the market API) target a specific configuration upon submit? (Is the resource name different for each configuration or is there a new configuration name attribute? If different resource names are used for each configuration, do the names reflect the group to which they belong? If not, how are configuration names linked to each other in groups from a data standpoint?</td>
<td>Each configuration will be treated as its own resource that will need the same set of submission data as a GEN-type resource. The configurations are linked together through the group/plant definition. Additional to the general resource submission, you would provide the Market a group/plant min runtime along with the valid transition paths to include the transition costs and times. For internal testing we've used different configuration names. These configurations are mapped together via a MCR Group. Our MCR data configurations are named based on the Settlement Location name with the identifying suffix (&quot;_1X0&quot;, &quot;_1X1&quot;, &quot;_2X1&quot;). Groups are based on the SL name and have the suffix '_PLT' on the end. I don't believe these rules are set in stone yet, but would probably be the recommended convention.</td>
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<td>What constitutes a &quot;group&quot; when submitting a PostEnergyMCRGroupOfferSet request? (Is this a logical name given to comprise the different configurations? If so, who defines this name and can the relationships be discovered via</td>
<td>The group is determined by the Market Participant at the point of registration. In the attached registration example, under the MCR Groups tab, you will notice certain configurations arranged to leverage common settings and parameters; i.e. min-run time.</td>
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<td>In real time, when a plant transitions from one configuration to the next, are any programmatic notifications sent (via the listener) alerting the plant to begin the transition from one configuration to the next? Are any other notification events send before/during/after transition?</td>
<td>A transition will look like a stop notification for the &quot;from&quot; configuration and a start notification for the &quot;to&quot; configuration. They will be issued in the same manner as the current notifications, i.e., you should receive them in plenty of time to honor your notification and startup times before you are to be synced to the system for dispatch\deployments. (Joe)</td>
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<td>For MCRs, when dispatches are sent to to listener, is just one dispatch sent out for the group (settlement location with suffix '_PLT'), or does each resource (settlement location with suffix ('_1X0', '_1X1', '_2X1) receive its own dispatch message?</td>
<td>Via ICCP, one setpoint is sent at the PLT level.                                                                                              The dispatch notification will provide information at the configuration level when sent to your listener (if registered to receive).</td>
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<td>bids/offers for 1 week so they have some time to upgrade their PROD systems</td>
<td>You can find this document in the following location on spp.org: <a href="https://www.spp.org/spp-documents-filings/?id=20196">https://www.spp.org/spp-documents-filings/?id=20196</a></td>
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<td>2. When can MP's start to use new services to submit bids for? Is it 11/01 for operating day 11/08 DA bids &amp; Offers?</td>
<td>Once the code is installed on 11/08, you will be able to use the new versions of the web services to submit RT information for OD 11/08 and forward or DA information for OD 11/10 and forward.</td>
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<tr>
<td>Q: So, looks like MP's can wait till 11/15 10 am and submit DA bids for OD 11/22 using the old web services before they are retired sometime later on 11/15.</td>
<td>Is that correct? If yes, then the upgrade window is between (11/08/16 10:00 AM - 11/15/16 10:00 AM).</td>
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<td>A: So that we have a clean cutover to the new version of the web services, the old versions will no longer be available for use as of midnight on 11/15.</td>
<td>We encourage MP's to make the cutover once they have verified that the new web services are functioning correctly.</td>
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<td>Q: Based on your response on 08/15/2016 1:32PM, it looks like if MP's start to use the new services on 11/08 after SPP goes live with 1.19, MP's won't be able to submit DA bids for OD 11/09. And, MP's will need to use the old services to submit DA bids for OD 11/09. Correct?</td>
<td>If that correct, we will request MP's to wait till 11/09 10 am to upgrade their systems.</td>
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<td>A: That is correct. The Markets Release is currently scheduled to be installed during the planned maintenance window on 11/08 at 8:00 pm that evening. The DAMKT submission for 11/09 will have been closed at the point the install takes place therefore the first operating day that a DA submission can be made using the new version of the web services would be for operating day 11/10.</td>
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<td>When will the ICCP handbook be published. It is referenced in the MIPO under section 15.</td>
<td>The revised ICCP handbook has been posted <a href="https://www.spp.org/spp-documents-filings/?id=20196">https://www.spp.org/spp-documents-filings/?id=20196</a></td>
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<td>The latest tech specs for MR 1.19 (<a href="https://www.spp.org/spp-documents-filings/?id=21071">https://www.spp.org/spp-documents-filings/?id=21071</a>) do</td>
<td>The Market Web Service did not have any updates as a result of Market Release 1.19, therefore the specification document include will be the same as the one that is currently in</td>
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<td>not have the MarketService_specifications_v7.docx file. They do include the MarketNotifyService_specifications_v7.docx</td>
<td>production. The Market Notify Service was updated as part of Market Release 1.19. The updates made to the Market Notify service are reflected in the V7 of the Market Notify Service specifications.</td>
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<td>Can you please add the MarketService_specifications_v7.doc document?</td>
<td>Any updates reflected in the Web Service WSDL or XSD's that are associated with Enhanced Combined Cycle will not be reflected in the documentation. An updated version of the Web Service specifications will be published when Enhanced Combined Cycle becomes available. The &quot;TRANIN&quot; and &quot;TRANOUT&quot; transition types you are seeing are associated with Enhanced Combine Cycle resources.</td>
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<tr>
<td>Also, the EnergyService_specifications_v8.docx, doesn't include the new Action's for the GetEnergyCommitmentHistorySetByDay operation. The Energy XSD includes two new values for CommitmentHistoryActionType (TRAININ and TRAINOUT) and this should translate to two new Actions for the GetEnergyCommitmentHistory service. Same thing for the GetEnergyCommitmentSet service, the TransitionType element will have the same two new values.</td>
<td>Q: so the documentation will be updated at a later point to reflect the ECC changes but the actual tech spec's (XML and XSD's) won't change. Is that correct?</td>
</tr>
<tr>
<td>This is more of an FYI, not sure if prefer to update the EnergyService_specifications_v8.docx so that it includes the changes in the new XSD's.</td>
<td>That is correct. There should be no additional updates to the WSDL or XSD's for Markets Release 1.19. An updated version of the documentation will be posted at a later date to reflect ECC changes.</td>
</tr>
<tr>
<td>The latest MIPO indicates that MR 1.19 includes a Markets UI API impact to the VirtualService:</td>
<td>This enhancement request is not fully functioning as intended. We are currently working with the vendor to resolve the issue. At this time the implementation of this enhancement will not require Market Participants to make any code changes, but will rather be reflected in the values submitted for MW and price using the existing Virtual bid and offer post operations. The intent is to treat the existing bid and offer post operations as a delete when the data being submitted has a MW and price of 0.</td>
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"Summary: Allow users to use Virtual Bids/Offers post API operations to delete Virtual Bids or Offers. Today, participants must delete Virtual Bids or Offers using a separate API. Requires MP Code Changes: Yes. Participants using the Virtual Service would be required to make code changes."

However, I don't see the VirtualService specs changing and nor do I see a diff report for the
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<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>VirtualService in the latest specs.</td>
<td>Are there any changes to the VirtualService due to the above change?</td>
</tr>
<tr>
<td>The PostEnergyOverrideSet service in the EnergyNotifyService_specifications_v8.docx is missing the MarketType parameter. The input request seems to include the MarketType field in the XML.</td>
<td>It appears that the MarketType was not included in the PostEnergyOverrideSet notification Parameters table. The valid values for the MarketType parameter are 'RTBM' and 'DAMKT'. This update will be noted and will be published as part of the next version of the Web Service Specifications.</td>
</tr>
<tr>
<td>Can you help me understand what the change is for enhancement 02 - 4765?</td>
<td>I am not seeing anything like what SPP is indicating as being a 'change&quot; per the current version of the IM Markets Data Exchange Guide (version 28 updated early August). So can you provide clarity on what is being done on this item. Is it some additional text that will be included in a notification message? Is it some warning that SPP will provide during submission?</td>
</tr>
<tr>
<td>We are a financial-only market participant. I have two questions regarding the required testing.</td>
<td>You should test whichever method you use to access the market, meaning that if via API, then run the API test cases, if via UI, then run the UI test cases. It is strongly encouraged that if you access via the API, that you also test the UI cases as a backup.</td>
</tr>
<tr>
<td>1. My understanding is that we must complete Tests 7-9 for Market Virtual Participants in the testing environment (MTE) as described in the &quot;gas day mp test cases.xlsx&quot; file. Is this correct or are their additional testing requirements?</td>
<td></td>
</tr>
<tr>
<td>2. Can we meet the testing requirements by only completing the UI test cases or are we also required to complete the API test cases?</td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Can we submit one report card on behalf of all of our customers or do we need to submit a report card for each customer?</td>
<td>It’s fine for you to submit one test case packet for all of the MPs you represent. Please include a list of them so that we can record their testing as complete.</td>
</tr>
<tr>
<td>How are MCR Configuration Names and MCR Group Names setup in the Marketplace MUI, what are the steps to perform the same (in the MTE env)?</td>
<td>ECC/MCR MP testing starts in November. You won't see the MCR related names or configurations in MTE until the model is loaded to that environment in November.</td>
</tr>
<tr>
<td>Is MCR Group Name configuration part of Network Model configuration? Is that done separately away the Marketplace Market User Interface?</td>
<td></td>
</tr>
<tr>
<td>Could you help me navigate in the Marketplace MUI to the appropriate windows to view &quot;EnergyMCRGroupOffer&quot;, &quot;EnergyMCRTransitionMitigatedOffer&quot; or &quot;EnergyMCRTransitionOffer&quot;?</td>
<td></td>
</tr>
<tr>
<td>I reviewed the &quot;integrated marketplace market user interface guide_v10.0.pdf&quot; published as of 8/8/2016, but could not find details for MCR Group Name or MCR Configuration Name or MCR Group Offer or MCR Transition Offer, could you point me to the appropriate guide for the same?</td>
<td></td>
</tr>
<tr>
<td>On Markets UI Test Cases, row 17, Market or Self not shown in Commitment Status column and Transition Type is set to OFF.</td>
<td>The Commitment Status column will only be populated with Market or Self when the Transition Type is ON. In your example it is OFF, so you will not see anything in the Commitment Status column.</td>
</tr>
<tr>
<td>I’m working through the Markets Release 1.19 test cases, and I’m wondering if a new version of the XSD/WSDL service generation document was released, and if we had to regenerate our SppTransactionServiceClient class?</td>
<td>A new version of the Transaction Service was published. Please reference the Marketplace Markets Web Service version 28 zip file located on spp.org in the following location for information regarding updates made as a results of 1.19: <a href="https://www.spp.org/spp-documents-filings/?id=21071">https://www.spp.org/spp-documents-filings/?id=21071</a></td>
</tr>
<tr>
<td>I haven’t seen this explicitly</td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>stated anywhere, and want to make sure that I am testing correctly.</td>
<td>I am trying to conduct API Test #1, and when I get a response from the MTE, there is no &quot;Endpoint&quot; field being passed back. I'm thinking that this is because there is no &quot;Endpoint&quot; property specified in my TransactionType class.</td>
</tr>
<tr>
<td></td>
<td>So, in short, was a new version of the API Client released that I missed?</td>
</tr>
<tr>
<td>What is the date of when Markets Release 1.19 changes being deployed to</td>
<td>The Markets release 1.19 changes will be available in MTE beginning on 9-1-16.</td>
</tr>
<tr>
<td>the MTE for the UI/API and notified services?</td>
<td>PRODUCTION:</td>
</tr>
<tr>
<td></td>
<td>The new versions of the web services and notify services will be made available for participants to use once the Market Release 1.19 is installed in the Production environment on 11/08.</td>
</tr>
<tr>
<td></td>
<td>Both versions of the web services will be available for one week after the Markets Release 1.19 is installed in the Production environment to allow participants time to transition their systems over to the new versions.</td>
</tr>
<tr>
<td></td>
<td>The previous versions of the web services are currently set to retire in Production on 11/15.</td>
</tr>
<tr>
<td>Does SPP know when the prior version will be retired from Production?</td>
<td>An updated version of the Marketplace Technical Specifications Inventory was published on 8-15-16 and contains the effective and termination times associated with the web services for both MTE and Production environments.</td>
</tr>
<tr>
<td></td>
<td>You can find this document in the following location on spp.org:</td>
</tr>
<tr>
<td></td>
<td><a href="https://www.spp.org/spp-documents-filings/?id=20196">https://www.spp.org/spp-documents-filings/?id=20196</a></td>
</tr>
<tr>
<td>Per SPP's XSD, the CommitmentStatus attribute can have any of the</td>
<td>When the TransitionType is OFF the commitmentstatus will return a null value.</td>
</tr>
<tr>
<td>following values: MARKET, SELF, RELIABILITY, OUTAGE,</td>
<td></td>
</tr>
<tr>
<td>NOTPARTICIPATING. Still, the GetEnergyCommitmentSetByDayResponse XML</td>
<td></td>
</tr>
<tr>
<td>shows some</td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
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<td>--------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>units where the CommitmentStatus is not reported, which is also allowed.</td>
<td></td>
</tr>
<tr>
<td>In which cases does this happen?</td>
<td></td>
</tr>
<tr>
<td>What causes the units to be reported without one of the possible CommitmentStatus values?</td>
<td></td>
</tr>
<tr>
<td>I have attached to different screen shots from tabs in the MTE. I have</td>
<td>That is correct. There is a note in the test case for both the Administrative and Notifications stating Filtering functionality does not apply to this tab.</td>
</tr>
<tr>
<td>noticed that the other filtering options give the user ability to refine</td>
<td></td>
</tr>
<tr>
<td>filtering. The Notifications tab currently has nothing. This may be</td>
<td></td>
</tr>
<tr>
<td>intended, however, we wanted to point it out if not.</td>
<td></td>
</tr>
<tr>
<td>Is the current version of the ICCP handbook (v1.13) the final version</td>
<td>The current version should contain everything needed for ECC so there are no updates expected. However, if anything does change prior to ECC go-live, we will be sure to communicate that information.</td>
</tr>
<tr>
<td>that will be use for ECC? Or are there any additional data requirements</td>
<td></td>
</tr>
<tr>
<td>for ECC that have not yet been released?</td>
<td></td>
</tr>
<tr>
<td>Considering the multiple transitions example in RR161 (pg 79 in 2016_mcr</td>
<td>The Startup state (Hot/Inter/Cold) is based on when how long that configuration has been offline and not based on the plant.</td>
</tr>
<tr>
<td>design_enhancement_notes.pdf), how is the startup cost identified?</td>
<td></td>
</tr>
<tr>
<td>For DA commitment#1, i’m assuming the startup costs for config#2 are used.</td>
<td></td>
</tr>
<tr>
<td>whether its a hot/warm/cold startup, is that based on when that</td>
<td>The Startup state (Hot/Inter/Cold) is based on when how long that configuration has been offline and not based on the plant. For DA commitment 1, the startup state would be based on the last time config 2 was online. The same would apply to the DA commitment 2, which would look for the last time config 1 was online.</td>
</tr>
<tr>
<td>configuration last started/ran or when the plant last ran?</td>
<td></td>
</tr>
<tr>
<td>2. Similarly, for DA commitment #2, i suppose we use the startup costs</td>
<td></td>
</tr>
<tr>
<td>of Config#1. what kind of startup would it be?</td>
<td></td>
</tr>
<tr>
<td>Which of the RuntimeSet parameters differ per configuration and which</td>
<td>The Config min runtime is the runtime for a specific configuration, and the common min runtimes are the group (made up of the configurations defined in registration) and the plant (all the configurations in the plant) min runtimes. All applicable min runtimes must be honored in the Unit Commitment studies. If, for example, a single configuration should be committed and that configuration is a part of a</td>
</tr>
<tr>
<td>ones are common ?</td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
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</tbody>
</table>
| Can you please let me know what changed in the version 28.2 vs 28.1? We compared the Energy xsd and wsdl and found no difference between these two. Needed to know why was the version number updated so we do not miss out on anything. | The only thing that changed with the new version was strictly documentation updates. There were no changes to the wsdl or xsd. A summary of changes associated with the new version can be found in the revision history table of the IM Markets Data Exchange Guide contained in the Marketplace Markets Web Service zip file on spp.org. Below is a summary of updates that were made to the Energy Specification document:  

- Updated the following operations to reflect the correct Action:  
  - GetEnergyOverrideSetByDay  
  - GetEnergyMCRGroupOfferSetByDay  
  - PostEnergyMCRGroupOfferSet  
  - GetEnergyMCRGroupMitigatedParameterSetByDay  
  - GetEnergyMCRTransitionOfferSetByDay  
  - PostEnergyMCRTransitionOfferSet  
  - GetEnergyMCRTransitionMitigatedOfferSetByDay  
  - PostEnergyMCRTransitionMitigatedOfferSet  
  - GetEnergyMCRTransitionMitigatedParameterSetByDay |

We have a few general questions about the ECC MP testing process:

1. During the structured testing scenarios, will SPP be over riding resource offers so that MPs will see all of the scenarios each week. For example, there are four scenarios listed for the test this week. Should we expect to see all four scenarios occur during the three day window of structured testing? If so, should we expect to possibly see more than one commitment per day during structured testing?

2. Is there a Settlements calendar posted for ECC testing? Or will Settlement statements follow the normal production schedule?

3. As the structured testing scenarios are largely to verify Settlements results, is it SPP’s expectation that testing results won’t be reported |

1. There may be times when SPP will need to overwrite data in order to see a commitment for the scenarios. For example, there are four scenarios listed for the test this week. It is the goal to be able to complete the scenarios during the week. There may be times that a commitment doesn’t occur for the scenario. We are tracking this so that they can be repeated on a different day. Yes, more than one commitment per day could occur.

2. Yes a calendar has been posted: [https://marketplace-mte.itespp.org/calendars1](https://marketplace-mte.itespp.org/calendars1). The accelerated calendar will be used during testing. Initials are posted no later than OD+7 and Finals no later than OD+14. Meter data should be submitted no later than noon OD+2. If not submitted State Estimator data will be used.

3. An update to the test cases and scenarios is being made to allow MPs to report completion of each scenario and to add any comments that you want us to be aware of.
### Question vs. Answer

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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<tbody>
<tr>
<td>by the MPs until the following week? (Assuming there is no accelerated Settlements schedule for ECC testing).</td>
<td>4. The scenarios on the blue tabs should occur naturally by submitting resource offers, as well as self-committing offers. Self-commitments will be helpful, otherwise we will need to overwrite your commit status to Self</td>
</tr>
<tr>
<td>4. For the testing scenarios on the blue tabs in the test cases spreadsheet, are MPs expected to manipulate their offers in MTE to replicate the scenarios exactly? The MIPO states that these scenarios will likely to occur on any given day during testing by submitting normal offer information. However, several of these scenarios indicate a MP self-commitment is expected.</td>
<td>5. Results from testing in MTE are based on test data that is input in MTE, not true production results. The logic used is the logic that will be in place on March 1, 2017</td>
</tr>
<tr>
<td>5. According to the MIPO, during the Nov 28 - Dec 16 timeframe, Tuesday - Thursday are structured testing days with the remaining days of the week available for unstructured testing. Will the test environment clear MCRs economically during the unstructured periods (ie, as they would be cleared in production)? Can MPs assume the results observed during these times are true market clearing results?</td>
<td>6. In the next update to the test cases and scenarios two new columns will be added for each scenario to indicate if the MP has completed the scenario as well as a comment box. The results from the scenarios will be tracked on the settlements scorecard.</td>
</tr>
<tr>
<td>6. There doesn’t seem to be space to provide comments on for all of the scenarios in the test cases spreadsheet. Is SPP expecting feedback/testing results for these scenarios as well or just the ones where a space has been provided?</td>
<td>7. All MP resources will be included on the Settlement statements for ECC testing.</td>
</tr>
<tr>
<td>7. Will the Settlement statements for ECC testing include ALL MP resources, or just the registered ECC resource?</td>
<td>8. No, you shouldn’t disregard the RT results. These are part of the structured scenarios that we are trying to produce. All scenarios may not apply to each MCR units, but wanted to provide some examples of commitment possibilities and how settlements would handle each scenario. Yes, you will be able to observe true RT dispatching during the days which are not setting up the scheduled scenarios. As this is a test environment, the results are only indicative of the quality of test data that exists in the environment. Although production quality logic is in place, there will more than likely not be offer data reflecting current system conditions in production.</td>
</tr>
<tr>
<td>8. During the structured testing phase, should we disregard the RT results? If so, will there be an opportunity for us to observe true RT dispatching as we would expect in the production environment?</td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
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<tr>
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</tr>
<tr>
<td>Page 10 one bullet point states state estimator will be used if meter data is not submitted. - Do we need to submit meter data for testing?</td>
<td>Meter data is not required for testing, but it can be submitted. If you choose to submit meter data it is due no later than noon OD+2.</td>
</tr>
<tr>
<td>No production is based of of MTE clearings therefor no generation?</td>
<td>The results from MTE are based on the data input in MTE. Production data is not used in the testing environment.</td>
</tr>
<tr>
<td>Page 11 states: MPs with MCRs are expected to test all tabs in the test case document. For tab &quot;Markets UI&quot; there is a pass/fail/na section - ok. But for some tabs &quot;overlaps in single day&quot; and any blue tab, there is no pass/fail/na. How do we verify blue tabs?</td>
<td>Documentation is being updated for scenarios on all tabs, 2 new columns are added to indicate scenario is complete and a comments column to add any information. If you do not have a MCR you do not need to return the spreadsheet. The settlements scorecard will be used to track the charge types and determinants processed for each Asset owner for all scenarios.</td>
</tr>
<tr>
<td>The other tabs &quot;blue&quot; and overlaps/cancel/config/outage do these are verified through settlements? Are we verifying billing determinants? MWP accuracy etc? No pass/fail in these tabs?</td>
<td>The other tabs &quot;blue&quot; and overlaps/cancel/config/outage do these are verified through settlements? Yes they will be verified in settlements. Are we verifying billing determinants? Yes MWP accuracy etc? Yes No pass/fail in these tabs? New column to indicate complete Yes or No can be used.</td>
</tr>
<tr>
<td>Looking through the various testing scenarios for the various changes (ECC changes, RR161, and RR106) it seems that the testing scenarios are all geared towards market participants with gas generation. Are the testing scenarios really relevant for a participant which only has one wind resource</td>
<td>If your resources fall into one of the following categories, You should complete the associated test cases.</td>
</tr>
<tr>
<td></td>
<td>Only Resource Owning Market Participants are required to test. (MCR registered MPs will have more to test.)</td>
</tr>
<tr>
<td></td>
<td>Financial Only Market Participants are not expected to participate in ECC MP testing.</td>
</tr>
<tr>
<td></td>
<td>Load Only Market Participants are not expected to participate in ECC MP Testing.</td>
</tr>
<tr>
<td></td>
<td>The following information was presented during the ECC MP testing kick off meeting:</td>
</tr>
<tr>
<td></td>
<td>ECC changes impact Asset Owners who register MCRs:</td>
</tr>
<tr>
<td></td>
<td>o Scheduled Scenarios 1-10, 12 (including all unscheduled scenarios 13-67)</td>
</tr>
<tr>
<td></td>
<td>RR161 All Resource owning Market Participants should test the following scenarios:</td>
</tr>
<tr>
<td></td>
<td>o Scheduled Scenarios 11, 12 (including all unscheduled scenarios 13-67)</td>
</tr>
<tr>
<td></td>
<td>RR106 All MPs who own a Resource with a minimum operating limit of zero should test the following scenario:</td>
</tr>
<tr>
<td></td>
<td>o Unit in Outage Deviation RR106 § (Scenario 12)</td>
</tr>
<tr>
<td></td>
<td>The remaining scenarios in the test case workbook with tabs highlighted in Blue are expected to occur naturally during testing. For those scenarios that do not occur naturally during testing, SPP will force the scenarios during the week of December 12th and post results to the Settlements scorecard.</td>
</tr>
</tbody>
</table>
### Table: Questions and Answers

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Will the Settlement Statements and Determinant Reports be published in MTE environment during the ECC Testing?</td>
<td>Yes, we are publishing initials and finals for operating dates 11/28 through 2/1 on the MTE Portal - <a href="https://marketplace-mte.itespp.org/">https://marketplace-mte.itespp.org/</a>. Initials post on OD+7 and Finals post on OD+14. There is a settlement calendar for the ECC project on the MTE Portal as well that you may want to reference (<a href="https://marketplace-mte.itespp.org/calendars1">https://marketplace-mte.itespp.org/calendars1</a>).</td>
</tr>
<tr>
<td>2. Will these reports be published for both Non-ECC and ECC changes?</td>
<td>The LSAs are responsible for granting access to their users in each environment, so if you have users that haven't accessed the MTE environment prior to the ECC project, the LSA may need to grant that access within the MTE Portal. Settlement Statements began posting this Monday, December 5th per the calendar.</td>
</tr>
<tr>
<td>3. When will these reports be published in MTE?</td>
<td>The settlement statements cover the scenarios identified by the project and include both non-ECC and ECC scenarios. All resource owning market participants are encouraged to test in MTE as there are changes that impact all resources - not just those that have an MCR (Multi-Configuration Resource).</td>
</tr>
<tr>
<td>4. What trade-dates will those reports be published for?</td>
<td>There is quite a bit of information (including a scorecard) located on spp.org in the project folder - <a href="https://www.spp.org/spp-documents-filings/?id=28808">https://www.spp.org/spp-documents-filings/?id=28808</a>.</td>
</tr>
<tr>
<td>5. What does the Market Participants and/or Asset Owners have to do in MTE environment to get these reports published for them?</td>
<td></td>
</tr>
</tbody>
</table>

**As a wind only asset owner, which tests do I need to complete?**

<table>
<thead>
<tr>
<th>Test Scenarios</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduled Scenarios 1-10, 12 (including all unscheduled scenarios 13-67)</td>
<td>If you have registered an MCR, you should complete:</td>
</tr>
<tr>
<td>Scheduled Scenarios 11,12 (including all unscheduled scenarios 13-67)</td>
<td>If you are a resource owning Market Participant you should complete:</td>
</tr>
</tbody>
</table>

**Can a resource be registered with one configuration min limit that is lower than the max limit of the configuration below it?**

| Yes, you can register an MCR where the dispatchable ranges (ECOMIN to ECOMAX) partially overlap. |

### 16.0 More Information

At any time, Members can ask questions or get more information by completing an RMS ticket using the “Project Inquiries” Quick Pick and “Enhanced Combined Cycle” Subtype option.

RMS link: [https://spprms.issuetrak.com/login.asp](https://spprms.issuetrak.com/login.asp). If a new user ID is needed for RMS, click on that link and follow the directions for “Register Now”.
* Request Type: Project Inquiries

* Subtype 1: Enhanced Combined Cycle - G
APPENDIX A – Gas Day MP Testing
August 1, 2016 -> August 29, 2016 COMPLETE

- A Gas Day Testing kick-off meeting will be held on Thursday, July 7 (9:00 – 10:00am CPT). All MPs are encouraged to attend and can register here.

- After two weeks of testing, SPP will host a status/update call on Monday, August 15 (3:00 – 4:00pm CPT). MPs are encouraged to attend and can register here. The purpose of the status call is to ask questions, listen to other MP questions, hear updates from SPP, etc.

- As always, SPP will communicate project and testing updates via the ECC-Gas Day liaison email distribution list, CWG Exploder and CWG meetings – MPs are encouraged attend these meetings if possible.

Details concerning test cases, environment, scorecards are all in Appendix A of this document.
- The Gas Day testing is NOT bid-to-bill

System and Environment
All Gas Day testing will occur in the Member Testing Environment (MTE). Any MPs using this environment for testing during July will notice the Day-Ahead timeline changes.

The Gas Day changes affect the Market and OATI Systems only and should pose no impact to other systems (including Settlements, TCR, CMS, etc.) MPs will not be required to make any coding changes to allow for the Gas Day timeline changes, although MPs using APIs may need to update configurations within their APIs to account for new Day-Ahead Market timeline.

Test Cases
Test cases for structured testing will be supplied by SPP and can be found on the SPP website in the CWG ECC-Gas Day folder located here (Excel spreadsheet ‘Gas Day Market Participant Test Cases’). The primary purpose of testing is to ensure that Market Participants are able to submit bids and offers prior to the revised DA Market close time, are unable to submit for the next Operating Day after the Market has closed, and can view the results after they are posted at the revised time.

MPs can/should test via the UI, using APIs, or both. It is strongly suggested that if using an API, the UI be tested as well as a back-up means of data submission.

For those MPs that use submit schedules via tags, additional testing is required to ensure that the tags can be submitted, approved, and results viewable within the new timeline. These test cases can be found on the ‘OATI Test Case’ tab on the test case spreadsheet. While SPP will approve tags in MTE, it will be the responsibility of MPs to work with their tagging agent (if they use a 3rd party) to submit tags. If assistance is needed for getting a tag approved by another entity (MISO, TVA, etc.), contact the OATI Help Desk.
Participants are welcome and encouraged to conduct unstructured testing in MTE after completion of the structured test cases. However it should be taken into account that day-to-day support of the environment will be limited after Gas Day testing concludes (August 31) and that testing of the Markets 1.19 Release will be occurring in the same environment starting on Thursday, September 1.

Results and Reporting

Market Participants are required to return the test case spreadsheet (complete with results) via the Request Management System (RMS) once finished testing, but no later than **EOD Wednesday, August 31.**

If certain test cases do not apply to an MP, please record N/A on the scorecard.

SPP will track MP test completion via a consolidated scorecard that will updated and republished each Monday to the ECC project folder on spp.org

Any questions, comments, or concerns regarding Gas Day testing should be submitted through RMS using the “Project Inquiries” quick pick and the ‘Enhanced Combined Cycle-Gas Day’ Subtype.

The Gas Day changes will take effect in Production beginning Friday, September 30 for the October 1 Operating Day.
APPENDIX B – Non-ECC Markets Release 1.19 MP Testing
September 1, 2016 -> October 15, 2016 COMPLETE:

Markets Release 1.19 contains several Member Impacting/Facing items not related to the ECC Project that will need to be tested by all Market Participants. Changes include: layout updates to the UI screens and data structure improvements for the APIs. As these changes impact the Markets System only, no bid-to-bill testing is required. Test cases for Structured Testing will be provided by SPP and give steps to follow to test the 1.19 items.

Refer to the sections below for information pertaining to important dates, system and environment information, Testing, and Results/Reporting.

Dates

- August 25: Markets 1.19 Kick-Off Meeting, 9:00 - 10:00 am CST, Register Here, All MPs encouraged to attend. In this meeting SPP staff will review testing goals, timelines, and cases as well as answer any MP questions regarding the release.

- September 1: Structured Testing Begins

- September 22: Markets 1.19 Testing Status Meeting, 9:00 – 10:00 am CST, Register Here, All MPs are encouraged to attend. During this meeting SPP staff will provide updates on the testing effort and answer MP questions pertaining to the project

- September 30: Structured Testing Ends; Final / completed testing spreadsheets due to SPP by EOD

- October 3: Unstructured Testing Begins

- October 14: Unstructured Testing Ends

- November 8: Markets 1.19 migrates to Production (no ECC functionality will be enabled at this time)

System and Environment

- All testing will occur in the Member Testing Environment (MTE)

- During Structured Testing, MTE will be supported by SPP during business hours only - Monday thru Friday 8:00 am to 5:00 pm CPT; MPs are welcome to test outside of these times and any issues identified should be logged via RMS.

- Please refer to the CWG Calendar (located here) for updates and times for scheduled environmental outages, maintenance, downtimes, etc.
• MTE uses the new Gas Day timeline – the Day-Ahead Market closes at 9:30 am CPT; Results post at 2:00 pm CPT

Testing

• The primary purpose of Markets 1.19 testing is to ensure Market Participants are aware of and can see the changes to the Markets User Interface (MUI) and that their systems are updated to and function with the new API specifications (refer here to for 1.19 Technical Design Specs).

• Test cases for Structured Testing are located on the SPP website in the CWG Markets Release 1.19 folder located here (Excel spreadsheet entitled 'Markets 1.19 MP Test Cases').

• Test cases are divided into three sections – Markets UI, Markets API, and Market Notifications. MPs are required to execute the cases that apply to their entity. However, it is strongly suggested that participants who use an API also exercise the UI test cases as a back-up means of data submission.

• Test cases noted as “Optional” will require SPP assistance to complete. To accommodate testing in the most efficient manner, a schedule is being set for weekly optional testing on Thursdays for the duration of Market Participant testing. RMS tickets should be submitted by the Tuesday prior to the desired Thursday testing date. Schedule as follows:

<table>
<thead>
<tr>
<th>Register By:</th>
<th>Test On:</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 13, 2016</td>
<td>September 15, 2016</td>
</tr>
<tr>
<td>September 20, 2016</td>
<td>September 22, 2016</td>
</tr>
<tr>
<td>September 27, 2016</td>
<td>September 29, 2016</td>
</tr>
</tbody>
</table>

• During Unstructured Testing, MPs are encouraged to openly test whatever testing might be applicable to your company. During the time allotted for Unstructured Testing, issues identified in MTE may take longer to resolve than during Structured Testing. While SPP will monitor the environment to ensure it is up/solving, day-to-day support of the environment will be limited during Unstructured Testing.

Results and Reporting

• MP questions pertaining to Markets Release 1.19 testing should be submitted through the Request Management System (RMS) using the ‘Project Inquiries’ Quick Pick and the ‘Markets Release 1.19’ Sub-Type.

• SPP will track MP test completion via a consolidated scorecard that will updated and published each Monday (for the duration of Structured Testing) to the ECC and Gas Day project folder on spp.org

• Market Participants will return updated testing spreadsheets (with results) each Friday (EOD) for duration of Structured Testing via RMS
- Final and complete Market Participant testing spreadsheets are due no later than **EOD Friday, September 30**

- SPP will communicate project and testing updates via the CWG Exploder, the project liaison distribution list, and CWG monthly meetings. MPs are encouraged attend these meetings/sign up for the distribution list if they have not done so already.
APPENDIX C – ECC, Markets Release 1.20 and RR106 RR184

MP Testing --

November 15, 2016 -> November 25, 2016: API testing
November 28, 2016 ->February 1, 2017:  Bid to Bill testing

SPP has added additional testing time to this test phase.

• The ECC testing portion is required for only those MPs who have a registered Multiple Combined Resource (MCR) unit going live on 3-1-17
• The ECC regression testing portion is optional for only those asset-owning MPs who do not have a registered MCR

Structured ECC testing will start in MTE on November 28. All Resource owning Market Participants are strongly encouraged to test and validate system changes associated with ECC for Multi Configuration Resource (MCR), RR161 and RR106 RR184. Test cases for Structured Testing will be provided for MCR testing using the Markets UI/API, scenarios for MCRs, non-MCR RR161 and RR106 RR184.

ECC, RR161 and RR106 RR184 testing will be bid-to-bill in MTE. Settlements will settle every Operating day during the testing timeline. An accelerated calendar will be used, initials will post OD+7 and finals will post OD+14. Invoices will be weekly as usual. If meter data is not submitted, then state estimator will be used in its place. Please note that any data (Offer, meter, ICCP) submitted on scenario days may be overridden to achieve the expected results of the scenario. Scorecards will be posted weekly to the ECC/Gas Day CWG project folder located on spp.org.

Refer to the sections below for information pertaining to important dates, system and environment information, Testing, and Results/Reporting.

**Dates**

• COMPLETE November 15:  ECCs are effective in MTE, MPs may begin to query and submit data using the Market API and UI. Data being returned is not supported during this period, but testing to ensure connectivity and appropriate communication is supported. There are no test cases for this phase.

• COMPLETE November 17:  ECC Kick-Off Meeting, 3:00 - 4:00 am CST, Register Here, All MPs are encouraged to attend. In this meeting SPP staff will review testing goals, timelines, and scenarios as well as answer any MP questions regarding ECC testing, UI/APIs and settlement processing. ECC’s will be available in MTE beginning November 15. There will be time during this meeting to ask questions regarding UI and API changes.

• November 28:  Structured Testing Begins

• December 5:  MCR Modeling changes begin

<table>
<thead>
<tr>
<th>Date Model information is due</th>
<th>Date Model will be effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, Dec 05, noon *</td>
<td>Friday, Dec 09</td>
</tr>
<tr>
<td>Monday, Dec 12, noon *</td>
<td>Friday, Dec 16</td>
</tr>
<tr>
<td>Monday, Dec 19, noon *</td>
<td>Friday, Dec 23</td>
</tr>
</tbody>
</table>
December 6: ECC Testing Status Meeting, 2:30 – 3:30 pm CST, Register Here, All MPs are encouraged to attend. During this meeting SPP staff will provide updates on the testing effort and answer MP questions pertaining to the project.

December 9 – MCR notification testing for Transition State Time and Transition disabling will be tested by SPP. Each MCR Asset Owner should receive a notification of the override when the test is performed.

December 16: ECC Testing Status Meeting, 2:00 – 3:00 pm CST, Register Here, All MPs are encouraged to attend. During this meeting SPP staff will provide updates on the testing effort and answer MP questions pertaining to the project. Structured Testing Ends.


January 6: ECC Testing Status Meeting, 2:00 – 3:00 pm CST, Register Here, All MPs are encouraged to attend. During this meeting SPP staff will provide updates on the testing effort and answer MP questions pertaining to the project.

January 6 – MCR notification testing for Transition State Time and Transition disabling will be tested by SPP. Each MCR Asset Owner should receive a notification of the override when the test is performed.

January 16: ECC Testing Status Meeting, 2:00 – 3:00 pm CST, Register Here, All MPs are encouraged to attend. During this meeting SPP staff will provide updates on the testing effort and answer MP questions pertaining to the project.

January 30: ECC Testing Status Meeting, 2:00 – 3:00 pm CST, Register Here, All MPs are encouraged to attend. During this meeting SPP staff will provide updates on the testing effort and answer MP questions pertaining to the project.

February 1: Unstructured Testing Ends.

February 23: MCRs become effective for March 1 in Markets UI/API.

March 1: MCR processing in Production, RR184 effective.

**System and Environment**

- All testing will occur in the Member Testing Environment (MTE).
- During Structured Testing, MTE will be supported by SPP during business hours only - Monday thru Friday 8:00 am to 5:00 pm CPT; MPs are welcome to test outside of these times and any issues identified should be logged via RMS.
- Scenarios will be scheduled on Tuesday, Wednesday and Thursday each week until 12/15. Scenarios will be repeated in January if needed in order for all new and updated Settlement...
charge types and billing determinants are processed for all Resource owning Market Participants.

- Please refer to the CWG Calendar (located here) for updates and times for scheduled environmental outages, maintenance, downtimes, etc.

- MTE uses the new Gas Day timeline – the Day-Ahead Market closes at 9:30 am CPT; Results post at 2:00 pm CPT.

**Testing**

- The primary purpose of this Market Participant testing is to verify ECC/MCR data submissions via the Markets User Interface (MUI)/API, review and validate MCR and non-MCR commitments from Day-Ahead and Real Time studies, and validate settlement change types and bill determinates associated with ECC, RR161, and RR196 RR184.

- Test cases for Structured Testing are located on the SPP website in the CWG Markets Release 1.19 folder located here (Excel spreadsheet entitled ‘MP_ECC_Test Cases_Scenarios’).

- ECC/MCR test cases for Markets UI, Markets API, and Market Notifications will be available. Test cases for MCR Configuration offer data submission are not provided. Submitting Configuration offer data is the same as submitting a normal Resource offer. If you need assistance with this please refer to the Markets UI Guide for additional information. Scenarios that are scheduled for specific dates are available on separate tabs. Not every scenario is assigned a specific date to test. Scenarios with a blue tab are most likely to occur on any given day during testing by submitting normal offer information.

- MPs are required to execute the test cases that apply to their entity. However, it is strongly suggested that participants who use an API also exercise the UI test cases as a back-up means of data submission.

- Two notifications related to MCR transition state time and transition disabled overrides are scheduled for 12/09 and 01/06 to test notifications for MCR Asset Owners.

- Unstructured testing can occur on non-scenario days (Friday – Monday) and in January after all Scenarios have been processed through settlements.

**Results and Reporting**

- MP questions pertaining to ECC testing should be submitted through the Request Management System (RMS) using the ‘Project Inquiries’ Quick Pick and the ‘Enhanced Combined Cycle’ Sub-Type.

- SPP will track MP Markets UI/API/Notifications test completion via a consolidated scorecard that will updated and published each Monday (for the duration of Structured Testing) to the ECC and Gas Day project folder on spp.org. A settlements scorecard will be used to track each Resource owning Asset Owner charge types and billing determinants for all scenarios.
SPP will complete the Settlements scorecard for the MPs based on the charge types and determinants encountered. MPs do not need to complete and return the Settlements scorecard.

Market Participants with registered MCRs will return updated testing spreadsheets (with Market UI/API/Notification results) each Friday (EOD) for duration of Structured Testing via RMS. A Settlement scorecard will be used for tracking charge type and billing determinants for scenarios for all Resource Owning/Asset Owning Market Participants.

Market Participant testing ends on February 1. Final and completed Market Participant testing spreadsheets are due no later than EOD Wednesday, February 1, via RMS.

SPP will communicate project and testing updates via the CWG Exploder, the project liaison distribution list, and CWG monthly meetings. MPs are encouraged to attend these meetings/sign up for the distribution list if they have not done so already.
APPENDIX D – RESOURCE COMMITMENT BUSINESS RULES

This appendix section of the document is intended to provide MPs the details they need to make the shadow settlements system changes necessary to address the ECC changes (specifically, the protocols in RR161).

1.0 MCR Input Data

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>New MCR data for the following:</td>
</tr>
<tr>
<td>• Day-Ahead Commitments</td>
</tr>
<tr>
<td>• Dispatch Instructions</td>
</tr>
<tr>
<td>• RUC Commitments</td>
</tr>
<tr>
<td>• Transition Cancellation</td>
</tr>
<tr>
<td>• Transition Decommitments</td>
</tr>
<tr>
<td>• RTBM As-Offered</td>
</tr>
</tbody>
</table>

1.1 Day-Ahead Market Commitment Data

**Scope:** New MCR data for Day-Ahead Market Commitments.

**Frequency:** Daily

The following data is needed:

<table>
<thead>
<tr>
<th>Data Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCR Configuration</td>
<td>MCR resource configuration at the commitment time</td>
</tr>
<tr>
<td>MCR Minimum Run Time</td>
<td>MCR Resource Offer minimum run time in Minutes</td>
</tr>
<tr>
<td>MCR Transition Time</td>
<td>Additional time needed to prepare for an MCR transition, in the direction of 'From' configuration towards 'To' configuration. During Transition Time, the MCR Resource will not be eligible for clearing Operating Reserve. Time prior to this period expected to be in transition, except for transition back to Day-Ahead in which case Effective Day = Termination Day records will be sent to indicate transition time is following the period.</td>
</tr>
<tr>
<td>MCR Transition Cost</td>
<td>Additional operational cost associated with an MCR transition, in the</td>
</tr>
</tbody>
</table>
direction of 'From' configuration towards 'To' configuration for an MCR Resource

MCR Start-Up Cost MCR Resource Offer Start-Up Cost to start an MCR Resource and reach the Minimum Economic Capacity Operating Limit, from the state (i.e. cold, warm or hot) as indicated by operational data.

MCR Configuration Time Time at which the configuration was committed in the Day-Ahead Market

1.2 Dispatch Instruction Data

**Description**

**Scope:** New MCR data for Dispatch Instructions.

**Frequency:** Daily

The following data is needed:

<table>
<thead>
<tr>
<th>Data Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCR Configuration</td>
<td>MCR Combined Cycle Configuration MCR resource configuration at the time of dispatch</td>
</tr>
<tr>
<td>MCR Transition Flag</td>
<td>Flag indicating MCR was in transition during the time of the 5-minute dispatch interval</td>
</tr>
</tbody>
</table>

1.3 RUC Commitment Data

**Description**

**Scope:** New MCR data for RUC Commitments.

**Frequency:** Daily

The following data is needed:

<table>
<thead>
<tr>
<th>Data Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCR Configuration</td>
<td>MCR resource configuration at the commitment time</td>
</tr>
<tr>
<td>MCR Minimum Run Time</td>
<td>MCR Resource Offer minimum run time in Minutes</td>
</tr>
<tr>
<td>MCR Transition Time</td>
<td>Additional time needed to prepare for an MCR transition, in the direction of 'From' configuration towards 'To' configuration. During Transition Time, the MCR Resource will not be eligible for clearing Operating Reserve. Time prior to this period expected to be in</td>
</tr>
<tr>
<td>MCR Transition Time</td>
<td>Additional time needed to prepare for an MCR transition, in the direction of 'From' configuration towards 'To' configuration. During Transition Time, the MCR Resource will not be eligible for clearing Operating Reserve. Time prior to this period expected to be in</td>
</tr>
</tbody>
</table>
transition, except for transition back to DA in which case Effective Day = Termination Day records will be sent to indicate transition time is following the period.

MCR Transition Cost
Additional operational cost associated with an MCR transition, in the direction of 'From' configuration towards 'To' configuration for an MCR Resource

MCR Start-Up Cost
MCR Resource Offer Start-Up Cost to start an MCR Resource and reach the Minimum Economic Capacity Operating Limit, from the state (i.e. cold, warm or hot) as indicated by operational data.

MCR Configuration Time
Time at which the configuration was committed by RUC

1.4 Transition Cancellation Data

Description Scope: New Transition Cancellation data. Frequency: Daily

The following data is needed:

<table>
<thead>
<tr>
<th>Data Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction ID</td>
<td>Unique identifier of the commitment the transition was a part of</td>
</tr>
<tr>
<td>Settlement Location</td>
<td>MCR resource configuration at the commitment time</td>
</tr>
<tr>
<td>MCR Configuration</td>
<td>Time (minutes) the transition was scheduled to have started</td>
</tr>
<tr>
<td>MCR Start Time</td>
<td>Total expected duration (minutes) of the MCR transition (Real-Time off snapped), in the direction of 'From' configuration towards 'To' configuration. During transition time, the MCR will not be eligible for clearing Operating Reserve.</td>
</tr>
<tr>
<td>MCR Transition Time</td>
<td>Time elapsed (minutes) into the transition when MCR was notified of cancellation</td>
</tr>
<tr>
<td>MCR Transition Amount</td>
<td>Operational Cost (Real-Time offer snapped) associated with an MCR transition, in the direction of 'From' configuration towards 'To' configuration</td>
</tr>
</tbody>
</table>
1.5 Transition Decommitment Data

**Scope:** New MCR data for Decommitments.

**Frequency:** Daily

The following data is needed:

<table>
<thead>
<tr>
<th>Data Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction ID</td>
<td>Unique identifier of the commitment the transition was a part of</td>
</tr>
<tr>
<td>Settlement Location</td>
<td>Interval Ending: Record for every interval through the end of the:</td>
</tr>
<tr>
<td></td>
<td>- Commitment (Non-MCRs)</td>
</tr>
<tr>
<td></td>
<td>- Configuration Period (MCRs)</td>
</tr>
<tr>
<td>Decommit Indicator</td>
<td>0 - not decommitted</td>
</tr>
<tr>
<td></td>
<td>1 - decommitted</td>
</tr>
</tbody>
</table>

1.6 RTBM As-Offered Data

**Scope:** New MCR data for RTBM As-Offered commitments.

**Frequency:** Daily

The following data is needed:

<table>
<thead>
<tr>
<th>Data Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCR Configuration</td>
<td>MCR resource configuration at the commitment time</td>
</tr>
<tr>
<td>MCR Minimum Run Time</td>
<td>MCR Resource Offer minimum run time in Minutes</td>
</tr>
<tr>
<td>MCR Transition Time</td>
<td>Additional time needed to prepare for an MCR transition, in the direction of 'From' configuration towards 'To' configuration. During Transition Time, the MCR Resource will not be eligible for clearing Operating Reserve. Time prior to this period expected to be in transition, except for transition back to DA in which case Effective Day = Termination Day records will be sent to indicate transition time is following the period.</td>
</tr>
<tr>
<td>MCR Transition Cost</td>
<td>Additional operational cost associated with an MCR transition, in the direction of 'From' configuration towards 'To' configuration for an MCR Resource</td>
</tr>
</tbody>
</table>
2.0 Business Drivers

Description

Rules are needed to define the Balance Sheet Approach, its components, and the associated bill determinants used in the Day-Ahead and RUC MWP calculations. The approach, with the exception of Transition Cost, applies to ALL resources, not just MCRs.

- Preexisting and Actual Start-Up and Transition Costs
- Start-Up Cost movement
- Start-Up Cost replacement
- Start-Up Cost allocation
- Eligibility for:
  - Start-Up Cost recovery
  - Transition Cost recovery
  - Operating Reserve buy-back
- Performance adjustment to net commitment costs

2.1 Balance Sheet Approach

Description

The Balance Sheet Approach is used to incrementally sum the combined start-up and transition costs to determine which costs are included in the MWP for MCRs. This method defines all start-up and transition costs as eligible for recovery and then nets the two costs for the MWP.

Commitment cost evaluations in the DAMKT begin with the Day-Ahead Market SELF only commitment schedule (which includes any Multi-Day Reliability commitments), and is summed with the Day-Ahead Market net commitment schedule.

Commitment cost evaluations in the RUC process begin with all Day-Ahead Market net commitment schedules and RUC SELF commitments, and is summed with the RUC net commitment schedule.

In determining start-up and transition costs, the schedules consider commitments outside but adjacent to the...
commitment analysis window that were seen as input to the Day-Ahead Market clearing. The prior operating day schedule is considered when committing for the first interval of the current operating day to determine the commitment cost.

The cost at the beginning of that commitment period will either be
- zero (no change in configuration) or
- a transition cost (change in configuration) or
- a start-up cost (no configuration at the end of the prior operating day)

2.2 Day-Ahead MWP Preexisting and Actual Costs

<table>
<thead>
<tr>
<th>Description</th>
<th>Day-Ahead MWP Preexisting and Actual Costs for MCRs are defined as follows:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Pre-existing Costs <em>(DaMwpComPrxAmt)</em></td>
</tr>
<tr>
<td></td>
<td>o Start-Up <em>(DaPrxStartUpAmt)</em> - Associated MCR as-committed start-up costs at the beginning of the 1st hour in a series of contiguous Day-Ahead SELF committed hours</td>
</tr>
<tr>
<td></td>
<td>o Transition <em>(DaPrxTransAmt)</em> - Associated MCR as-committed transition costs at the beginning of the 2nd hour of a set of contiguous Day-Ahead SELF committed hours</td>
</tr>
<tr>
<td></td>
<td>• Actual Costs</td>
</tr>
<tr>
<td></td>
<td>o Start-Up <em>(DaComStartUpAmt)</em> - All MCR as-committed start-up costs at the beginning of the 1st hour in a series of contiguous Day-Ahead MARKET or SELF committed hours</td>
</tr>
<tr>
<td></td>
<td>o Transition <em>(DaTransAmt)</em> - All Associated MCR as-committed transition costs at the beginning of the 2nd hour through the end of a set of contiguous all Day-Ahead SELF hours</td>
</tr>
</tbody>
</table>

2.3 RUC MWP Preexisting and Actual Costs

<table>
<thead>
<tr>
<th>Description</th>
<th>RUC MWP Preexisting and Actual Costs for MCRs are defined as follows:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Preexisting Costs <em>(RtMwpComPrxAmt)</em></td>
</tr>
<tr>
<td></td>
<td>o Start-Up <em>(RtPrxStartUpAmt)</em> - Associated MCR as-committed start-up costs at the beginning of the 1st interval in a series of contiguous intervals within all Day-Ahead Market intervals and RUC SELF committed intervals</td>
</tr>
<tr>
<td></td>
<td>▪ Unless commitment time belongs to a Day-Ahead Market interval AND coincides with a RUC SELF committed interval</td>
</tr>
</tbody>
</table>
2.4 Start-Up Cost Movement

The following rules define when actual start-up costs from the Day-Ahead commitment are moved to the RUC commitment:

- **Day-Ahead Candidate Adjacency Rules (DatoRucCandStartUpAmt)**
  - Day-Ahead Market commitment is adjacent to and following a RUC commitment and
  - RUC commitment created after the Day-Ahead Market commitment and
  - Start-up Offer at the farthest left point of adjacency
  - Moved cost must stay within the same OD - if the RUC commitment begins in a previous OD, the cost is then associated with the second Make Whole Eligibility Period falling on the same OD as the DAMKT start.

- **When Day-Ahead candidate is adjacent (rules above), the net Day-Ahead Market commitment start-up costs are moved (subtracted from) the Day-Ahead MWP and into (added to) the leading RUC commitment**
  - If the RUC commitment cannot accommodate the entire allocation period (REQ10254), a portion of the start-up costs are allocated back to the Day-Ahead Market
commitment (DatoRucStartUpRatio, DatoRucStartUpAmt)

- Exceptions:
  - If the Day-Ahead Market commitment begins in an hour with a SELF status, no costs are shared with the RUC commitment; the preexisting and actual costs net to $0 (DatoRucCandStartUpAmt)
  - If the leading RUC commitment contains any intervals offered in SELF status, the portion of start-up costs shared with the RUC commitment is not eligible for recovery, but rather deducted from the Day-Ahead Market incremental sum (DatoRucStartUpEligFlg)
  - If the Day-Ahead Market actual start-up cost is greater than the net sum of all Day-Ahead Market commitment start-up and transition costs, the Day-Ahead to RUC moved cost (DatoRucStartUpAmt) is the lesser of
    - the actual start-up cost OR
    - net sum
  - Any unmoved portion of candidate start-up cost remains with the Day-Ahead Market commitment (DatoRucStartUpRatio)

See Protocols 4.5.8.12 (4), (a), (i), (ii), (iii) for further detail

2.5 Start-Up Cost Replacement

The following rules define when actual RUC start-up costs are replaced by Day-Ahead start-up costs:

- Day-Ahead Candidate Adjacency Rules
  - Day-Ahead Market commitment is adjacent to and following a RUC commitment and
  - RUC commitment created after the Day-Ahead Market commitment and
  - RUC commitment is not adjacent to and following another commitment

- When Day-Ahead candidate is adjacent (rules above) and the RUC commitment is, for all intervals, in the same configuration as the Day-Ahead Market commitment, the Day-Ahead commitment start-up cost replaces the actual RUC commitment start-up cost and its corresponding preexisting cost if the RUC start is offered in SELF status (RtComStartUpAmt)
2.6 Start-Up Cost Recovery Eligibility

The following eligibility rules are used for determining Day-Ahead Market and RUC start-up cost recovery:

- **Day-Ahead (DaStartUpEligFlg)**
  - Breaker is closed one hour prior to RUC commit time less its Sync-To-Min time
  - N/A for start-up costs moved from Day-Ahead to RUC
  - N/A for start-up costs at the adjacency

- **RUC (RtStartUpEligFlg)**
  - Breaker is closed one hour prior to RUC commit time less its Sync-To-Min time OR
  - Breaker is not closed (in dispatch configuration) in at least one interval of the RUC commitment

- If the Day-Ahead Market commitment or RUC commitment is ineligible (came on too early) for start-up cost recovery and contains a SELF interval, reduce preexisting costs by an amount equal to the lesser of:
  - the ineligible start-up costs OR
  - the sum of all RUC commitment preexisting costs
  - DaMwpNonPerfAmt, RtMwpNonPerfAmt

2.7 Transition Cost Recovery Eligibility

The following eligibility rules are used for determining Day-Ahead Market and RUC transition cost recovery:

- **Day-Ahead**
  - N/A; transition costs are always eligible

- **RUC**
  - Transition Cost Recovery (RtTransEligFlg)
    - RUC commitment transitions are flagged as eligible for transition cost recovery in RUC MWP when:
      - Breaker is successfully closed in the dispatched configuration prior to the transition during the RUC commitment AND
      - Breaker is successfully closed in the dispatched configuration following the transition in at least one interval during the RUC commitment
### Transition Cancellation
- RUC committed transitions cancelled by SPP during transition are eligible to recover a portion of their transition costs pro rata by the elapsed time over total configuration transition time
- \( \text{CnxTransRatio}, \text{RtCnxTransAmt}, \text{TransElapsedTime}, \text{TransTime} \)

### Transition Decommitment (\( \text{ConfigDecommit5minFlg} \))
- RUC committed transitions cancelled by SPP after achieving the 'To' configuration are flagged for Real-Time Out-of-Merit calculations

### 2.8 Day-Ahead Only Cost Allocation

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day-Ahead only start-up and transition costs from within an OD are allocated to that OD and the next only. A Day-Ahead Market commitment is defined as the contiguous Day-Ahead Market commitment time period within the Minimum Run Time/24 hour time window applied to the Day-Ahead only commitments. Start-up and transition costs are allocated from the start of the Day-Ahead Market commitment (including all configurations of the MCR) within the contiguous hours of the Day-Ahead Market Commitment.</td>
</tr>
<tr>
<td>- When the remaining Minimum Run Time of the MCR extends from the start of the commitment into the next Operating Day, allocate start-up and transition costs between the Make-Whole Eligibility Periods pro rata by the number of hours in each Operating Day up to the lesser of:</td>
</tr>
<tr>
<td>- Remaining Minimum Run Time from the start of the Day-Ahead Market commitment OR</td>
</tr>
<tr>
<td>- 24 hours</td>
</tr>
<tr>
<td>- ( \text{DaComStartUpAmt}, \text{DaPrxStartUpAmt}, \text{DaTransAmt}, \text{DaPrxTransAmt} )</td>
</tr>
</tbody>
</table>

### 2.9 RUC Only Cost Allocation

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RUC only start-up and transition costs from within an OD are allocated to that OD and the next only, from the start of the first RUC commitment (including all configurations of the MCR) within RUC committed intervals of the contiguous hours of the Day-Ahead Market and RUC commitments containing the RUC commitment. RUC commitment intervals do not need to be contiguous with one another; i.e. there can be gaps in the participating intervals connected by a Day-Ahead commitment.</td>
</tr>
<tr>
<td>- When the remaining Minimum Run Time extends from the start of the commitment into the</td>
</tr>
</tbody>
</table>
next Operating Day, allocate start-up and transition costs between the Make-Whole Eligibility Periods pro rata by the number of hours in each Operating Day up to the lesser of:
- Remaining Minimum Run Time of the first RUC commitment OR
- 24 hours
- RtComStartUpAmt, RtPrxStartUpAmt, RtPrxTransAmt, RtTransAmt

### 2.10 Day-Ahead to RUC Cost Allocation

**Description**

When the RUC commitment is adjacent to and followed by a Day-Ahead Market commitment created *after* the Day-Ahead Market commitment, allocate the start-up costs moved from Day-Ahead to RUC pro rata by the number of RUC committed interval/Day-Ahead committed hours up to the lesser of:
- Allocation may not begin any earlier than the OD of the DAMKT start
- Remaining Minimum Run Time of the first RUC commitment OR
- 24 hours
- DatoRucStartUpAmt, DatoRucStartUpRatio

### 2.11 RUC to Day-Ahead Cost Allocation

**Description**

When the RUC commitment is adjacent to and followed by a Day-Ahead Market commitment created *before* the Day-Ahead Market commitment, allocate start-up costs extended from RUC to Day-Ahead pro rata by the number of RUC committed interval/Day-Ahead committed hours up to the lesser of:
- Subject to eligibility:
  - If the Resource’s breaker is closed at RUC.start minus synch-to-min time minus 1 hour it is not entitled to recovery of Start-Up cost in either the leading RUC MWEP or the following DAMKT MWEP
  - If the Resource’s breaker is not closed for at least 1 interval between the start of the leading RUC MWEP and the stop of the following DAMKT MWEP it is not entitled to recovery of Start-Up cost in either the leading RUC MWEP or the following DAMKT MWEP
  - Remaining Minimum Run Time of the first RUC commitment OR
  - 24 hours
  - DaRucRmndrAmt

### 2.12 Operating Reserve Buy-Back Eligibility

**Description**

The following rules determine if an MCR resource is eligible for Operating Reserve buy-back compensation
treatment in the Day-Ahead Market or Real-Time.

• Day-Ahead MWP:
  o Adjacency/Order of Operations (DaTransStateEligFlg)
    ▪ The transition is not forced by a SELF configuration
  o Performance (DaTransState5minFlg)
    ▪ MCR is in transition
    ▪ Based on the scheduled time for a Day-Ahead Market transition and not for a RUC transition

• RUC MWP:
  o Adjacency/Order of Operations (RtTransStateEligFlg)
    ▪ The transition is not forced by a SELF configuration
  o Performance (RtTransState5minFlg)
    ▪ MCR is in transition
    ▪ Based on the scheduled time of transition for a RUC transition
    ▪ MCR is in transition and cancelled by SPP during the transition time

The term “forced” transition means any scenario in an MCR's final schedule in which a SELF status commitment is adjacent to either (1) a commitment of the same or different configuration with a smaller (i.e., earlier) entry timestamp or (2) a SELF commit in a different configuration.

2.13 RtMinLimitDev5minQty

| Description | Modifications to RtMinLimitDev5minQty are required to exclude MCRs committed into a different configuration than the Day-Ahead commitment in RUC with a MARKET or RELIABILITY status from Min Limit deviations. See Protocols 4.5.9.10 (1) (a.2) for further detail. |

2.14 RtMaxLimitDev5minQty

| Description | Modifications to RtMaxLimitDev5minQty are required to exclude MCRs committed into a different configuration than the Day-Ahead commitment in RUC with a MARKET or RELIABILITY status from Max Limit deviations. See Protocols 4.5.9.10 (1) (a.3) for further detail. |
2.15 RtRucScDevXmpt5minFlg

| Description | Modifications to RtRucScDevXmpt5minFlg are required to exclude all MCRs with an overlapping Day-Ahead commitment and an overlapping RUC SELF commitment from SELF commit deviation calculations. See Protocols 4.5.9.10 (1) (a.6) for further detail. |

2.16 RtRucScDev5minQty

| Description | Modifications to RtRucScDev5minQty are required to exclude MCRs for the MW hours cleared in the Day-Ahead Market from SELF commit deviation calculations. See Protocols 4.5.9.10 (1) (a.6) for further detail. |

3.0 Calculations

<table>
<thead>
<tr>
<th>Description</th>
<th>Modifications to the following charge type calculations are needed:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Day-Ahead Make-Whole-Payment Amount</td>
</tr>
<tr>
<td></td>
<td>• RUC Make-Whole-Payment Amount</td>
</tr>
<tr>
<td></td>
<td>• Real-Time Out-of-Merit Amount</td>
</tr>
<tr>
<td></td>
<td>• RUC Make-Whole-Payment Distribution Amount</td>
</tr>
<tr>
<td></td>
<td>• Unused Regulation-Up Mileage Make-Whole Payment Amount</td>
</tr>
<tr>
<td></td>
<td>• Unused Regulation-Down Mileage Make-Whole Payment Amount</td>
</tr>
</tbody>
</table>

3.1 Day-Ahead Make-Whole-Payment Amount

| Description | Modifications are needed to the calculations that produce DaMwpCpAmt. See Protocols 4.5.8.12 (4) for further detail. |

3.2 RUC Make-Whole-Payment Amount

| Description | Modifications are needed to the calculations that produce RtMwpCpAmt. See Protocols 4.5.9.8 (4) for further detail. |
### 3.3 Real-Time Out-of-Merit Amount

<table>
<thead>
<tr>
<th>Description</th>
<th>Modifications are needed to the calculations that produce RtOom5minAmt. See Protocols 4.5.9.9 for further detail.</th>
</tr>
</thead>
</table>

### 3.4 RUC Make-Whole-Payment Distribution Amount

<table>
<thead>
<tr>
<th>Description</th>
<th>Modifications are needed to the calculations that produce RtMwpDistHrlyAmt. See Protocols 4.5.9.10 for further detail.</th>
</tr>
</thead>
</table>

### 3.5 Unused Regulation-Up Mileage Make-Whole-Payment Amount

<table>
<thead>
<tr>
<th>Description</th>
<th>Modifications are needed to the calculations that produce RegUpUnusedMileMwp5minAmt. See Protocols 4.5.9.28 (1) for further detail.</th>
</tr>
</thead>
</table>

### 3.6 Unused Regulation-Down Mileage Make-Whole-Payment Amount

<table>
<thead>
<tr>
<th>Description</th>
<th>Modifications are needed to the calculations that produce RegDnUnusedMileMwp5minAmt. See Protocols 4.5.9.29 (1) for further detail.</th>
</tr>
</thead>
</table>