Market Monitor Report

MC Webinar

December 14, 2020

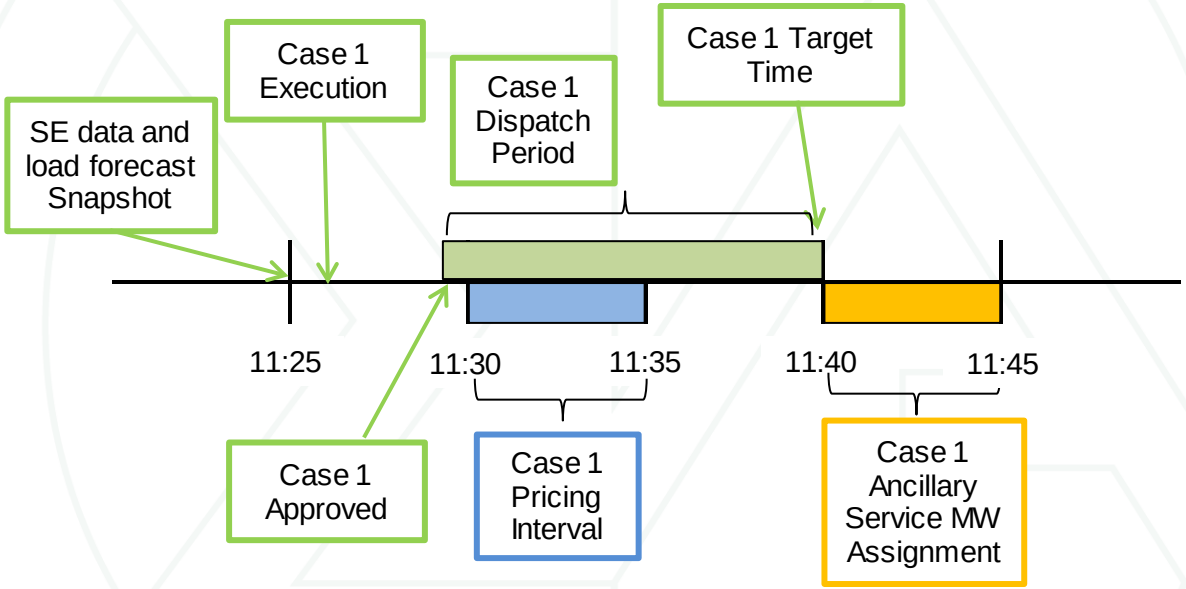
IMM

Monitoring Analytics

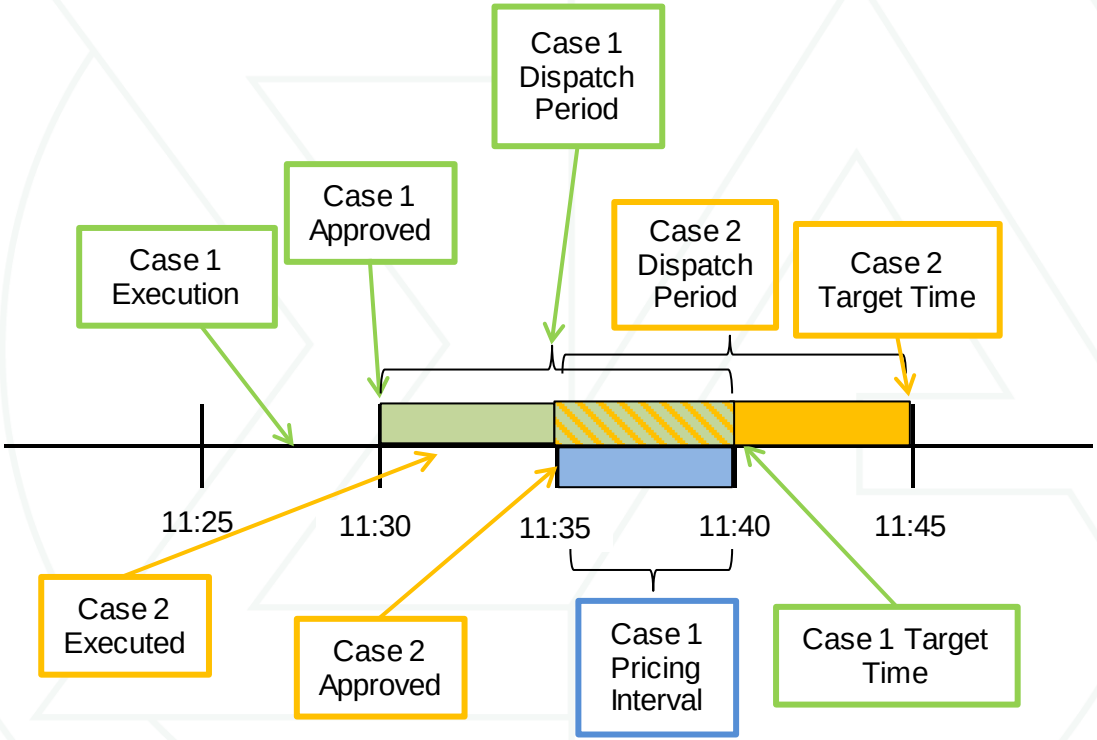
Five Minute Dispatch and Pricing

- **PJM implemented the short term changes to the five minute dispatch and pricing process on October 15, 2020.**
- **Prior to October 15, LPC used the latest approved RT SCED solution available regardless of the target time of the solution.**
- **Since October 15, LPC uses the latest approved RT SCED solution with the same target time as the end of the five minute pricing interval.**
- **These changes made the mismatch between dispatch and pricing worse.**

Pricing and dispatch: Pre Oct 15, 2020



Pricing and dispatch: Post Oct 15, 2020



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Dispatch and Pricing Alignment

- **From October 15 through November 30, 2020, prices were consistent with dispatch, on average, for only 38 seconds out of each five minute interval.**
- **Prices reflected the current dispatch instructions only 9.9 percent of the time.**
- **If done perfectly, prices would never have been consistent with dispatch. The small remaining overlap was the result of delays in approving the second RT SCED solution.**

Dispatch and Pricing Alignment

Period	RT SCED Automatic Execution Frequency	Dispatch Duration Reflected in Prices (Minutes:Seconds)	Percent Dispatch Duration Reflected in Prices
Jan 1, 2020 - Feb 23, 2020	Every 3 minutes	03:11	67.9%
Feb 24, 2020 - Jun 22, 2020	Every 4 minutes	03:27	67.2%
Jun 23, 2020 - Oct 14, 2020	Every 5 minutes	03:37	70.1%
Oct 15, 2020 - Nov 30, 2020	Every 5 minutes	00:38	9.9%

Dispatch and Pricing Alignment

- **Low overlap between dispatch and pricing due to:**
  - **Use of 10 minute ramp time in SCED, with prices in LPC for five minute intervals.**
  - **Dispatch signals sent about 10 minutes ahead of target time (slightly more than 10 minutes), while prices apply to five minute interval ending at target time.**
- **Prices lag dispatch signals by about five minutes.**
- **Long term solution will reduce ramp time in SCED to five minutes, aligning prices with dispatch signals.**

Intermediate Term Changes

- **PJM changed the automatic execution times for RT SCED:**
  - **February 24, 2020: from one case every three minutes to one case every four minutes.**
  - **June 22, 2020: changed from one case every four minutes to one case every five minutes.**
- **Dispatchers continue to have the ability to manually execute additional RT SCED cases at any time.**
- **Result was fewer approved RT SCED solutions.**
- **Result was more approved RT SCED solutions reflected in prices.**
- **Made mismatch between dispatch and pricing worse.**

Approved RT SCED Solutions in Prices

Month (2020)	Number of RT SCED Solutions	Number of Approved RT SCED Solutions	Number of Approved RT SCED Solutions Used in LPC	RT SCED Solutions Used in LPC as Percent of Approved RT SCED Solutions
Jan	51,022	11,860	7,612	64.2%
Feb	46,247	10,149	7,005	69.0%
Mar	38,680	9,914	7,799	78.7%
Apr	36,543	8,888	7,132	80.2%
May	36,648	9,416	7,590	80.6%
Jun	34,327	9,165	7,666	83.6%
Jul	30,342	9,241	8,190	88.6%
Aug	30,775	8,962	7,868	87.8%
Sep	30,632	8,972	7,881	87.8%
Oct	32,429	9,145	8,199	89.7%
Nov	30,360	8,695	8,004	92.1%
Dec				
Total	398,005	104,407	84,946	81.4%

Southeast Interface Pricing Point

- **PJM consolidated the Southeast and Southwest interface pricing points to a single interface with separate import and export prices (SouthIMP and SouthEXP) on October 1, 2006.**
- **PJM should replace SouthIMP and SouthEXP with a single South interface pricing point.**
- **The definitions of SouthIMP and SouthEXP are identical.**
  - **The values vary only when there is a failure to reflect actual line outages on virtual buses.**

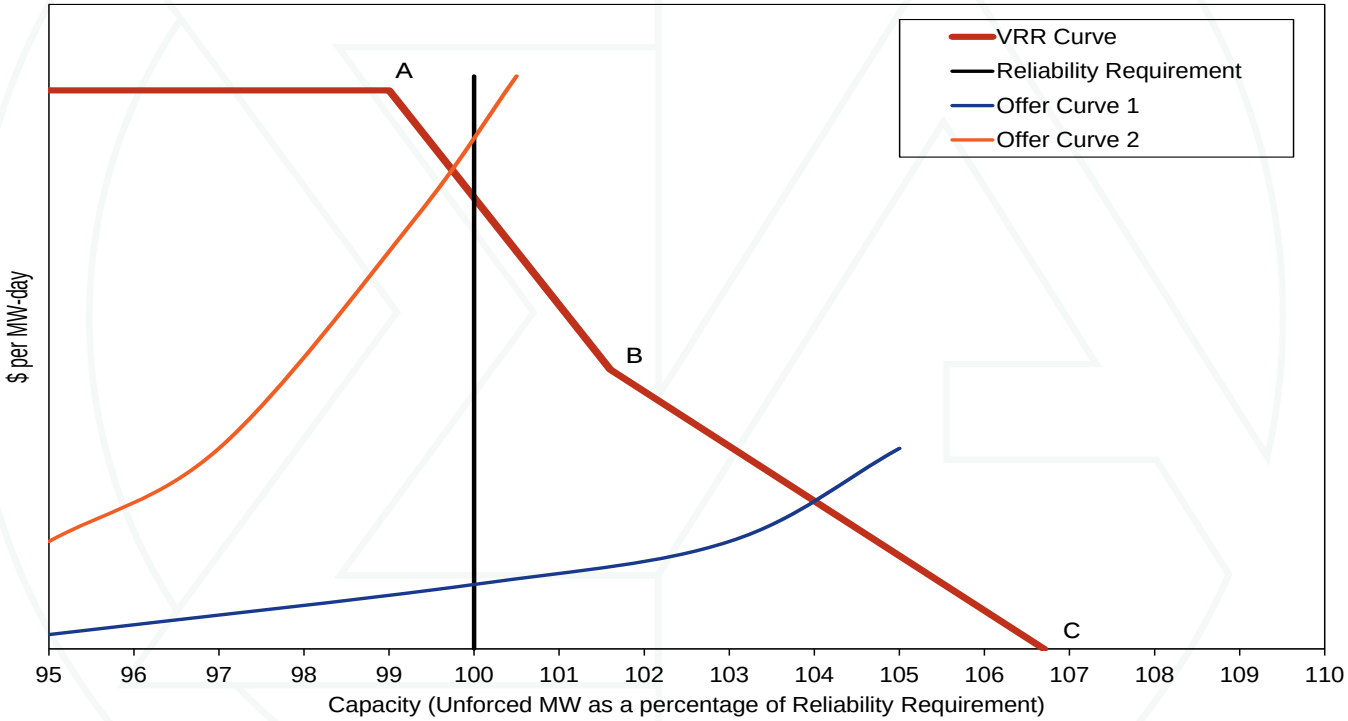
Southeast Interface Pricing Point

- **The real-time Southeast interface pricing point remains only to price energy under the reserve sharing agreement with VACAR.**
- **The Southeast interface pricing point is not eligible for INCs, DECs or UTC transactions, or for FTRs.**

Southeast Interface Pricing Point

- **There are no provisions for grandfathering the Southeast interface pricing point in the VACAR reserve sharing agreements.**
- **The Southeast interface pricing point should be immediately terminated and any future emergency transactions scheduled under the VACAR reserve sharing agreement should be priced at the SouthIMP/EXP pricing point.**
  - **In the event future changes are made to the SouthIMP/EXP pricing points, these transactions should be assigned to the applicable default pricing point for that area.**

VRR curve impact on customer payments



CRF Issues

- **CRF: capital recovery factor**
  - **A rate, multiplied by the investment, which provides for a return on and of capital over a defined time period**
  - **CRFs are calculated using a standard financial model that accounts for the weighted average cost of capital and its components, including depreciation and taxes.**
  - **For example, a five year CRF will allow the recovery of 100 percent of the investment plus a return over five years.**

CRF History

- **The CRF table was created in 2007 as part of the new RPM capacity market design**
  - **The CRF table provided for the accelerated return of incremental investment in capacity resources based on concerns about the fact that some old units would be making substantial investments related to pollution control.**
  - **The same CRF table was used in the black start rules.**

CRF Issues

- The CRF table includes assumptions that are no longer correct. The CRF values are significantly too high.
  - Tax depreciation rules reduce taxes
  - Corporate tax rate lower
- CRF tables should be revised immediately.
  - Capacity market tariff.
  - Black start tariff.
- The IMM posted a market message on CRF issue.
  - Attached

Notification of Subpoena

- https://www.monitoringanalytics.com/reports/Market_Messages/Messages/IMM_Notification_to_Members_of_Subpoena_20201209.pdf

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DATE: **December 4, 2020**

TO: **PJM Market Participants**

FROM: **IMM**

SUBJECT: **CRF issues in the capacity market**

As a result of the significant changes to the federal tax code in December 2017, the CRF (capital recovery factor) tables in PJM OATT Attachment DD § 6.8(a) and Schedule 6A are not correct. These tables should have been updated in 2018 and should be updated prior to the next capacity market auction. Correct CRFs will ensure that offer caps and offer floors in the capacity market are correct. The required changes are clear and unambiguous. The calculations have been made and the accuracy of the calculations has not been disputed. An immediate filing to change the table based only on the known changes to the tax code would avoid potential uncertainty and confusion among market participants and would avoid any potential delay in running or finalizing the results of the capacity auctions. PJM could file the changes under FPA Section 205.

The CRF is a rate, multiplied by the relevant investment, which defines the annual payment needed to provide a return on and of capital for the investment over a defined time period. CRFs were and are calculated using a standard financial model that incorporates the weighted average cost of capital and its components, including the rate of return on equity and the interest rate on debt and the capital structure, in addition to depreciation and taxes. For example, a five year CRF will allow the recovery of 100 percent of the investment plus a return over five years. The CRF is not a black box. The basis for the CRF was clear when the CRF values were calculated in 2007 and the basis has been explained again in the PJM stakeholder process.[1] Any market participant should be able to calculate CRF rates using the same assumptions. This issue has been made clear to PJM and to PJM stakeholders since the summer.

The current CRF table in Attachment DD was created in 2007 as part of the new RPM capacity market design. The CRF table provided for the accelerated return of incremental investment (PI) in capacity resources based on concerns about the fact that some relatively old generating units would be required to make substantial investments related to pollution controls. The cost associated with the incremental investment (APIR) is part of the avoidable cost rate (ACR), which was the only offer cap in use at the time. APIR is equal to PI * CRF. The same CRF values, for the black start time periods, were used in OATT Schedule 6A. The CRF issues related to black start are currently being discussed in the PJM stakeholder process.

[1] "Black Start Issues," presented at the August 6, 2020, and September 3, 2020, PJM Operating Committee Meetings, and revised on September 9, 2020. The presentations can be found at: <https://www.monitoringanalytics.com/reports/Presentations/2020.shtml>.

The current CRF table includes tax rates and depreciation provisions in the tax code that are no longer correct. The result is that the current tariff CRF values are significantly too high. A combination of modified depreciation rules and a reduction of the corporate tax rate has reduced the calculated CRF values required to provide the same return on and of capital as provided by the prior CRF values when the prior tax provisions were in effect. A reduced amount of revenue is required in order to provide full recovery on and of the relevant capital investment. Table 1 includes the existing and new CRF values based solely on changes to the federal tax code.

To the extent that APIR is part of ACR offer caps or MOPR offer floors in any future capacity market auction, the CRF table should be modified to reflect the current tax code. Use of the current CRF values would overstate ACR offer caps and overstate MOPR offer floors. It is logically possible that the CRF values will not affect any offers but that will not be known until all offer caps and floors are calculated. The modified CRF values should be included in the PJM tariff for use in unit specific calculations of ACR offer caps and MOPR offer floors. In the future, the CRF values should always reflect the currently applicable tax code, or known changes to the applicable tax code, which would apply to the relevant investment.

Table 1

Age of Existing Unit	Remaining Life of Plant	Current Levelized CRF	Adjusted Levelized CRF
1 to 5	30	0.107	0.082
6 to 10	25	0.114	0.088
11 to 15	20	0.125	0.096
16 to 20	15	0.146	0.111
21 to 25	10	0.198	0.144
25 Plus	5	0.363	0.246
Mandatory CapEx	4	0.450	0.297
40 Plus Alternative	1	1.100	1.075