Frequently Mitigated Unit Adders: Educational Document

Introduction

The Independent Market Monitor presented a problem statement to the Market Implementation Committee seeking to review the appropriateness of the Frequently Mitigated Unit adders in the context of the overall PJM market construct. The problem statement was approved by PJM Stakeholders on X.

The education document presented here will provide background material and historical information to enable a robust stakeholder discussion of this issue.

Cost-based Mitigation

In general, PJM generation resources make two offers into the market each day; the market offer (also called a price-based offer) and the cost-based offer. The cost-based offer is prepared according to guidelines detailed in Manual 15. Historically, the cost-based offer was used when PJM must run a generator out of economic-merit order to relieve a transmission constraint. The cost-based offer was used to prevent the exercise of market power. In more recent years, the Three Pivotal Supplier test (TPS test) is used to determine if the generator has the potential to exercise market power, and only in those cases is the cost-based offer used. This general method of market power mitigation is often called “offer capping” or “cost capping”.

The cost-based offer is also used in certain other circumstances.

Automatic Load Rejection: Black start generators are generators with the capability to start without outside power from the power grid. These units are used to restart the power grid in the event of a system-wide collapse. A typical scenario is a conventional generating unit with an on-site diesel backup generator. In the event of a power outage, the diesel is used to provide enough power to start the generator. Automatic Load Rejection Units are generating units with a high operating factor that have demonstrated the ability to automatically remain operating at reduced levels when disconnected from the grid. If a power outage occurs, these units detect it and automatically disconnect themselves from the grid and continue to operate while generating enough power to serve their own station load. ALR units can then provide black start restoration service almost immediately. In order to provide this service however, these generators must be operating continually. When these units are required to meet black start requirements but are not economically prudent to dispatch, they are run on their cost-based schedules and receive operating reserve payments making them whole to their cost-based offer. This offer capping can then result in the unit qualifying for FMU adders.

Reactive Power: Due to the electrical demands of the power system, it is sometimes necessary to run generation resources in particular areas for reactive power support. These units would not be run based on economic merit. When a unit is run for reactive power support, they are run on their cost-based schedules and receive operating

reserve payments making them whole to their cost-based offer. This offer capping can then result in the unit qualifying for FMU adders.

Frequently Mitigated Unit Adders

In 2004 the concept of the Frequently Mitigated Unit (FMU) adder was established. The FERC established the FMU adders to ensure that generators that were frequently needed to relieve transmission constraints were able to adequately recover their going-forward costs. (See detailed history below for more information.) Initially, a generator that was offer-capped more than 80 percent of its run hours over the prior twelve months, it was permitted to include a $40/MWh adder in its cost-based offer. Subsequent changes to that rule have led to the three tiered adder structure in place today as follows:[1]

- Tier 1: A unit that is offer-capped more than 60 but less than 70 percent of its run hours over the prior twelve months may include a $20/MWh adder.
- Tier 2: A unit that is offer-capped between 70 and 80 percent of its run hours over the prior twelve months may include an adder of $30/MWh or 15 percent of their cost-based offer, not to exceed $40/MWh.
- Tier 3: A unit that is offer-capped over 80 percent of its run hours over the prior twelve months may include an adder of $40/MWh

Each month, the Independent Market Monitor examines the offer capping statistics of each generator and notifies the owner of the allowed adder for the following month.

The construct also includes the concept of an Associated Unit (AU). Take the example of three generators at a single plant. One generator happens to be run more often and offer-capped enough to meet the Tier 1 threshold but the other units at the plant are not. If the offer was only included for the single generator, it would raise the cost-based offer of that generator above its companion units. PJM, seeing a lower cost unit available to solve the constraint, would run one of the other sister units until that unit met the threshold and this swapping would continue through time while the going-forward costs remained unrecovered. The sister generators have the same impact on the transmission constraints as the frequently mitigated unit, and so are considered Associated Units. These AUs are permitted to include the same adders as the initial FMU in order to prevent this type of flipping back and forth and allow for appropriate cost recovery. In the course of its monthly evaluation, the Independent Market Monitor also evaluates which units are AUs and notifies the owner accordingly.

[1] These adders can be found in Section 6.4.2 of the PJM Operating Agreement.

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Filing History

The information below is intended to provide stakeholders a summary overview of the relevant developments on this issue in the regulatory arena. The history on this particular issue is a long one, and intertwined with other related issues and this document will provide only an overview. This document is not intended to provide a complete legal analysis of the filing history nor advocate any point of view regarding the filings, and stakeholders should consult their own legal counsel for such an analysis.

April 2, 2003: Reliant Energy Mid-Atlantic Power Holdings files a complaint at the FERC that the offer caps on certain generation facilities operating in areas subject to chronic transmission constraints were not just and reasonable.

July 9, 2003: The Commission finds that Reliant had not sustained its burden of proof and denied the complaint. However the Commission noted that PJM recognized that the existing provisions for compensation for Reliability Must Run (RMR) units may not be the most appropriate mechanism. The Commission directed PJM to re-examine the mechanism and file a compliance filing.

September 30, 2003: PJM filed a compliance filing revising the offer price cap rules and establishing a Local Market Auction to address long term scarcity conditions in load pockets.

December 19, 2003: The Commission orders a technical conference on the subject.

February 4-5, 2004: The technical conference is held.

May 6, 2004: The Commission issues an order detailing reliability compensation policy and ruling on PJM's specific mechanisms. The FERC finds that the offer capping rules work effectively and are fair to most generating units but finds that some narrow changes are needed, as the current rules do not offer adequate opportunity for frequently mitigated units to recover their going forward costs. The order establishes the 80 percent run hour threshold and accepts the concept of the Three Pivotal Supplier test, while rejecting the notion of a Local Market Auction.

November 2, 2004: PJM files a compliance filing, establishing the 80 percent, $40/MWh compensation for FMUs.

January 25, 2005: The FERC issues an order accepting the 80 percent, $40/MWh compensation level.

November 16, 2005: A settlement agreement is filed by PJM. This settlement includes new offer capping tiers for units mitigated more than 60 percent and more than 70 percent of their run hours and establishes the treatment of Associated Units.

January 27, 2006: The FERC accepts the settlement agreement.

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Scope and Scale of FMU Impacts

In order to further inform the stakeholder discussion of FMU adders and the impacts, the following statistics are presented to give stakeholders a sense of the overall scope of the FMU adders.

In 2012, analysis by the Independent Market Monitor shows that the component of the PJM real-time LMP attributable to FMU adders was $0.10, or 0.3 percent of the overall average price for the year. In aggregate, this represents approximately $79 million. In 2011, the values were similar, being $0.12 or 0.3 percent of the average LMP.

Table 1 below shows the overall frequency of offer capping in the Energy Markets.[2] Offer capping levels overall have historically been very low.

Table 1 - Offer-capping statistics: 2008 - 2012

	Real Time		Day Ahead	
	Unit Hours Capped	MW Capped	Unit Hours Capped	MW Capped
2008	1.0%	0.2%	0.2%	0.1%
2009	0.4%	0.1%	0.1%	0.0%
2010	1.2%	0.4%	0.2%	0.1%
2011	0.9%	0.4%	0.0%	0.0%
2012	1.2%	0.8%	0.6%	0.4%

Table 2 below shows the number of generating units grouped by categories of capped run hours and capped percentage of run hours.[3] The data can be used to understand the number of generating units that are capped at various frequencies and run hours.

[2] State of the Market Report for PJM, Monitoring Analytics, Table 2-10, page 59

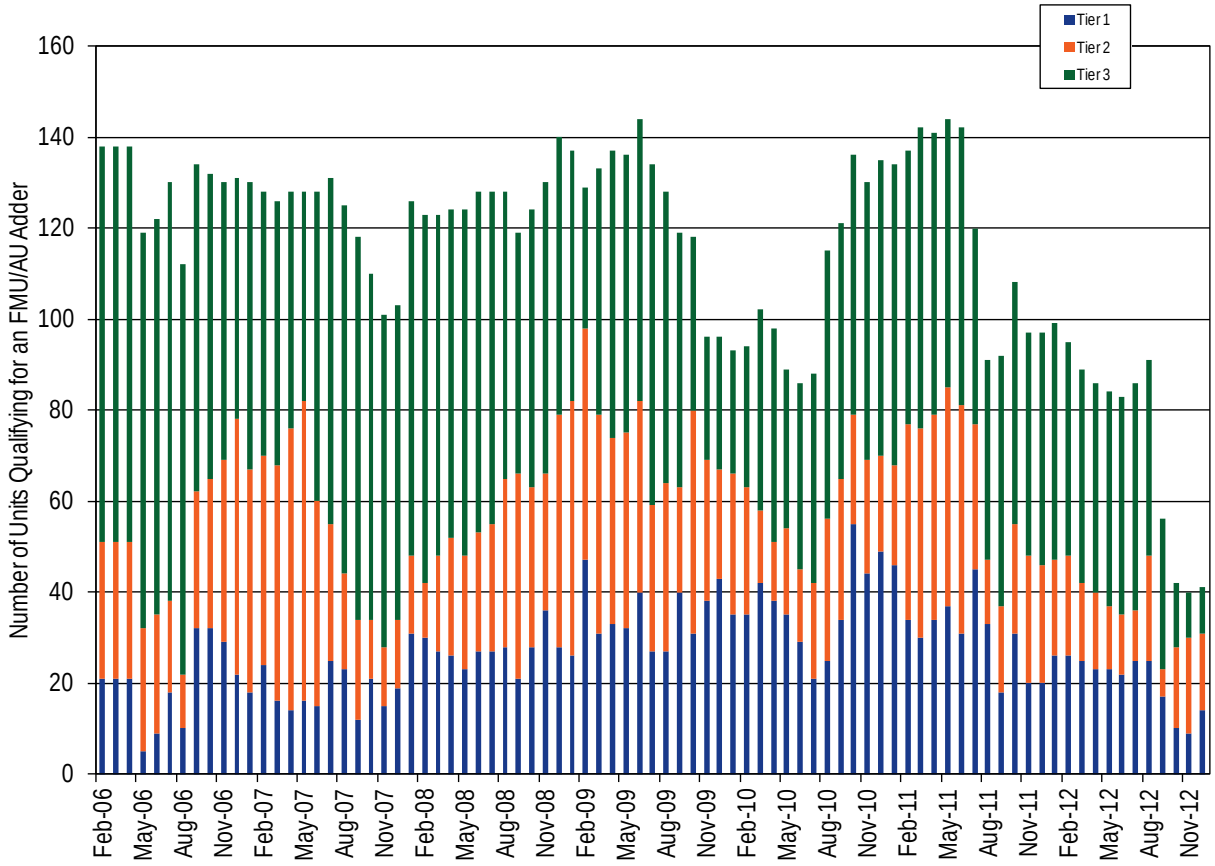
Table 2 - Real-time offer-capped unit statistics: 2011 and 2012

Run Hours Offer-Capped, Percent Greater Than Or Equal To:		Offer-Capped Hours					
		Hours ? 500	Hours ? 400 and < 500	Hours ? 300 and < 400	Hours ? 200 and < 300	Hours ? 100 and < 200	Hours ? 1 and < 100
	2012	0	2	0	1	1	1
90%	2011	0	0	0	6	9	4
	2012	0	1	0	0	2	4
80% and < 90%	2011	0	0	1	2	5	9
	2012	0	0	0	0	1	2
75% and < 80%	2011	0	0	0	0	3	3
	2012	0	0	0	0	1	2
70% and < 75%	2011	0	0	0	0	0	10
	2012	1	0	0	1	1	8
60% and < 70%	2011	0	1	0	1	1	20
	2012	7	0	1	0	1	10
50% and < 60%	2011	0	0	0	2	13	23
	2012	5	1	1	2	8	49
25% and < 50%	2011	2	0	0	5	19	70
	2012	6	0	0	3	13	58
10% and < 25%	2011	9	2	0	0	2	49

[3] State of the Market Report for PJM, Monitoring Analytics, Table 2-11, page 59

Figure 1 shows the number of units qualifying for FMU adder tiers over time. The data includes associated units.

Figure 1 - Frequently mitigated units and associated units (By month): February, 2006 through December, 2012



Interactions between the Energy Markets and the RPM Capacity Market

Explain EAS offset.