To: Michael Robinson, MISO Liaison to the MISO DRWG, and Ted Kuhn, MISO staff
From: OMS Demand Response and Technology Working Group
Subject: Capacity Value of Load Modifying Resources
Date: 9-19-2014

Considerations for Determination of LMR Capacity Value:
Preliminary Comments of the OMS DR&TWG

I. Background

During the agenda item of "New Business" at the MISO Demand Response Working Group (DRWG) meeting on September 3, 2014, a stakeholder brought up the topic of a specific MISO Independent Market Monitor (IMM) recommendation relating to Demand Response (DR). The IMM recommended in the 2013 State of the Market Report that MISO evaluate capacity credits provided to Load Modifying Resources (LMR) to increase their accuracy. Additionally, within the text of the report, the IMM wrote that "limited experience suggests response rate of little more than 50 percent," and refers to this derated capacity amount as "Realistic DR." The implication is that the IMM recommends 50 percent capacity crediting for LMRs. After discussing this IMM recommendation, state government staff from the Organization of MISO States (OMS) Demand Response and Technology Working Group (DR&TWG) submits these preliminary comments.

II. Summary

OMS state staff supports an evaluation of the capacity value that is credited to LMRs in the MISO capacity construct in Module E. We outline discussion points below that should be discussed when addressing this issue at the MISO DRWG.

The evaluation of the capacity value of LMRs should take into account how the load, which is subject to reduction, is treated in load forecasting. For example, there has been some discussion that control of air conditioning load should receive a lesser credit because it is not

available during the winter season. However, it should also be recognized that there is no air conditioner load in the winter peak forecast.

The evaluation should also be consistent with the methods and assumptions used in the Loss of Load Expectation (LOLE) study that is the basis for the Planning Reserve Margin (PRM). Again, using controlled air conditioner load as an example, there is no basis to discount controlled air conditioner load if there is no Loss of Load Expectation in the 1 in 10 probability distribution during the non-summer months.

Additionally, there are on-going efforts, primarily in the MISO Supply Adequacy Working Group, to discuss a shift from an annual capacity construct to one based on seasonal differences. With this in mind, as the MISO DRWG works to address this IMM recommendation, MISO stakeholder efforts to design a seasonal capacity construct should be included in the discussion. This may also help address the IMM's concerns about LMR availability during winter events.

MISO DRWG evaluation should consider both MISO and stakeholder analyses of LMR response capabilities to MISO deployment. The IMM cites one event that occurred in 2006 to base his recommendation upon (more on this in section III below). A single data point is likely not a sufficient basis from which to make a significant change to LMR capacity crediting. MISO staff stated at the last DRWG meeting that MISO is currently performing a relevant analysis to this topic. If substantive results can be drawn from this analysis it will better inform the discussion of appropriate capacity crediting of LMRs. To the extent that stakeholders have additional data, to either better inform MISO's analysis or provide supplemental analysis, this will also help inform the discussion. Sector comments that result from the MISO Advisory Committee DR December Hot Topic may also be informative.

Evaluation of capacity credit for LMRs should also work from existing eligibility criteria in the MISO Business Practices Manuals (BPMs) and Module E. Section III below outlines a few of these criteria for reference. These criteria within the BPMs may have been established after the 2006 emergency event that the IMM cites, and if so this needs to be part of the conversation as well in order to present steps already taken to address this issue.

Finally, beyond efforts to look at a seasonal capacity construct, other MISO efforts to improve market efficiency that may relate to LMRs, such as pricing under emergencies and ELMP design and implementation, should be discussed in this evaluation as contributing elements that each individually work in part to address the IMM recommendation.

In summation, OMS state staff would support an effort at the MISO DRWG to evaluate appropriate capacity crediting of LMRs to the extent this effort considers current business practices and LMR qualifying criteria, as well as on-going efforts to improve market efficiencies that are relevant to this discussion. These include load forecasting and LOLE methodology, MISO and other analyses that go beyond the IMM's reference to a single event, and other MISO stakeholder efforts such as the initial design of a seasonal capacity construct, ELMP implementation, and emergency pricing.

III. Supporting Comments and Analysis

In the 2013 State of the Market Report,[1] the IMM included a recommendation (2011-14) that the capacity value credited to Load Modifying Resources (LMRs) should be evaluated:[2]

> ***2011-14: Evaluate capacity credits provided to LMR to increase their accuracy.*** *In order for the capacity market to produce outcomes that are consistent with market fundamentals, it is important that the supply be accurately represented. LMR (excluding BTMG) can currently be fully deducted from an LSE's capacity requirement under*

[1] The 2013 State of the Market Report can be downloaded at: https://www.misoenergy.org/Library/Repository/Report/IMM/2013%20State%20of%20the%20Market%20Report.pdf

[2] Similar recommendations were made by the IMM in previous State of the Market reports.

> *Module E. This effectively provides a 100 percent capacity credit to DR resources that are not tested to ensure their capability. These resources have been shown to only have the ability to provide a fraction of the total claimed capability in the past. For example, MISO has reported that less than one- half of these resources were available during the winter shortages in early 2014. In addition, only roughly one-half of this DR capability was responsive when they were deployed during shortage conditions in summer 2006. If this capability had been derated by 50 percent in the most recent PRA conducted in April 2014, the price would have risen from roughly $16 to $84 per MW-day. This shows that qualifying this capability at a level that accurately reflects its expected ability to reduce load can substantially affect the PRA results and economic signals provided by MISO's markets. Therefore, we continue to recommend adopting testing procedures if possible, and/or derating these resources based on their actual performance or expected performance when called.*
>
> *<u>Status</u>: In the last couple of years some progress has been made in requiring additional documentation of capability through State programs, auditors, or MISO mock tests. In addition, MISO has continued to develop improved communication systems to enable LBAs to report curtailment of registered resources and voluntary curtailments of unregistered resources. While MISO's efforts provide more audit capability and situational awareness, these resources are still not tested in any way comparably to other resources and the limited deployment experience suggests response rates far below other resource categories.*[3]

OMS state staff believes that the IMM has reached definitive conclusions concerning the capacity value of LMRs based on little data or analysis. For example, it is likely that during the event which occurred in the summer of 2006, many of the demand response resources participating in MISO at that time had already reduced their loads in anticipation that an emergency event would be called later that day. Therefore it is incorrect to conclude that these loads were not "responsive." It would be helpful if MISO can elaborate if data still exist that provide a more robust narrative of what LMR activities occurred before and during the 2006 emergency event.

The IMM also makes conclusions about the "availability" of LMRs during the winter of 2014. It is important to note that no emergency event occurred during the winter of 2014, so there is no measurement of actual performance. Again, it is likely that some of these loads had

[3] 2013 IMM State of the Market Report, p. 90.

already been reduced in anticipation of an actual emergency event. In any case, the IMM has reached a conclusion with little analysis.

In addition to the IMM, skepticism has been expressed by some members of the MISO Board of Directors concerning the availability and persistence of "legacy" Load Modifying Resources in the event these programs are called upon more often in future years. It should be noted that there are Demand Response as well as Resource Adequacy BPM criteria, some of which are noted below, that LMRs must meet in order to qualify as a capacity resource:

- *The LMR must be equal to or greater than 100 kw (but a group of smaller resources may be aggregated to meet this standard.*
- *The LMR must be available for reducing Demand by its maximum reduction level (or to its firm service level) with no more than 12 hours of notification.*
- *The LMR must be able to maintain the target level of Demand reduction (or firm service level) for at least (4) four continuous hours.*
- *The LMR must be capable of being interrupted by MISO at least the first five (5) times during the Peak Season of any Planning Year.*
- *The LMR cannot be a resource for which curtailment is an economic option, rather than an obligation, during Emergency Events.*
- *Only one Market Participant can claim the LMR's Capacity credit.*
- *An LMR that is also an EDR resource is obligated to reduce load when instructed to do so during and Emergency Event regardless of the projected or actual Real-Time Energy Market LMP.4*

Market Participants must take additional steps to qualify under the Resource Adequacy BPM:

- *Documenting in the MECT the DR's capability to reduce demand to a targeted Demand reduction level or firm service level using one of the following options:*
- *Provide documentation from the state that has jurisdiction that provides the amount and type of DR and the procedures for achieving the Demand reduction;*
- *Verification from a third party auditor that is unaffiliated with the MP that documents the DR's ability to reduce to the targeted Demand reduction level or firm service when called upon to perform by MISO or the LBA.*
- *Provide past performance data that demonstrates the DR's ability to reduce to the targeted Demand reduction level or firm service level when called upon to perform by*

[4] Demand Response Business Practice Manual, BPM-026, p.64. To download BPMs, you may find files on this MISO webpage:
https://www.misoenergy.org/Library/BusinessPracticesManuals/Pages/BusinessPracticesManuals.aspx

MISO or the LBA. If past performance data does not exist from the previous Planning Year, then a mock test can be used to support the validity of the DR. The mock test should employ all systems necessary to initiate a Demand reduction short of actual Demand reduction.

- *For the 2013-2014 Planning Year, test, performance data, third party audit or other documentation supporting the registered MW should be from June 1, 2012 to March 1, 2013. Beginning in Planning Year 2014-2015 and thereafter, test, performance data, third party audit or documentation supporting the MW being registered should be from September 1 to August 31st immediately preceding the applicable Planning Year. Results should be submitted to MISO by October 31st.*
- *Documenting in the MECT the Measurement and Verification (M&V) protocol that will be used to determine if such DR performed when called upon by MISO or the LBA during Emergencies. A DR that is sensitive to temperature changes must identify the extent of such temperature sensitivity with sufficient detail to enable MISO to verify whether the DR would be subject to the penalties set forth in Section 69A.3.9 of the Tariff. Temperature sensitivity must at a minimum include identifying the measure used for temperature changes and elasticity of the LSE's load to weather. An MP that registers a DR as a Planning Resource must confirm that the DR is able to meet all of the requirements in Section 69A.3.5 of the Tariff.*[5]

Additionally, LMRs may also face penalties for not responding to a MISO emergency event:

> *A Market Participant that has cleared ZRCs in the PRA from an approved will be subject to the penalties described in Section 69A.3.9 of the Tariff if the LMR fails to respond in an amount greater than or equal to the target level of a Load reduction for DR or target level of generation increase for a BTMG as directed by MISO or the LBA. Such LSE shall be assessed the costs that were otherwise incurred to replace the energy deficiency at the time the LMR was dispatched.*[6]

All of these relevant LMR criteria that MISO stakeholders have already established should be referred to in discussions about capacity crediting, and also should be used as a starting point from which to build upon and improve accuracy.

[5] Resource Adequacy Business Practice Manual, BPM-011r14, pp70-71.
[6] Resource Adequacy Business Practice Manual, BPM-011r14, p62.