



STATE OF MICHIGAN

RICK SNYDER
GOVERNOR

DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS
PUBLIC SERVICE COMMISSION

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MEMORANDUM

DATE: July 9, 2015

TO: Michigan Public Service Commission

FROM: Paul Proudfoot – Director of Electric Reliability Division

SUBJECT: Staff comments and observations on filings under U-17751

MPSC Staff Comments RE:

**Self-Assessments by Electric Utilities of Ability to Meet Customers' Electric Requirements
and Associated Reserves
MPSC Case No. U-17751**

On December 4, 2014, the Commission issued an order in Case No. U-17751, requesting electric utilities, alternative electric suppliers, utility affiliates and certain power supply cooperatives and associations to supply a self-assessment of each entity's ability to meet its customers' expected electric requirements and associated reserves during the five-year period of 2015 through 2019. The self-assessment reports were to be filed March 28, 2015, and comments from interested persons regarding those self-assessment reports were to be filed with the Commission by April 20, 2015. Specifically the Commission stated:

"Each assessment should include the LSE's expected peak demand, the resources available to meet peak demand, and the amount of expected reserves. Each assessment should justify the expected reserve margin in light of the LSE's circumstances, including the reliability characteristics of its resource base and the characteristics and diversities of the customer load. Load forecasts should separately identify choice load and bundled load. Each assessment should also distinguish between in-state and out-of-state generation resources and analyze how this generation is expected to serve customer demand and meet MISO Module E capacity tracking requirements."

The primary concern regarding resource adequacy in Michigan is driven by the impending retirement of many of Michigan's older coal-fired generation units, due to environmental regulations recently imposed by the EPA. The retirement of these resources yields a significant impact on the amount of in-state generation resources that can be utilized to meet the projected peak demand requirements in the coming years. Generally speaking, the primary focus of the Staff's analysis of the filings received in this proceeding has been on MISO Local Resource

Zone (LRZ) 7, which comprises the Lower Peninsula of Michigan (with the exception of the southwest corner, served by Indiana Michigan Power, a PJM market participant). Additionally, to the extent that LRZ 7 could experience a capacity shortfall as soon as the 2016/2017 planning year, Staff is keenly interested in addressing these concerns in a proactive manner.

The term ‘capacity shortfall’, when used in the context of the relative capacity position of a particular LRZ, has the potential to be misinterpreted. The manner in which this term is defined can yield a significant impact on the results, and how those results can be interpreted. Staff proposes that for the purposes of its analysis, the term “capacity surplus (shortfall)” will be defined as:

The expected total load forecast plus the planning reserve margin requirements versus the total number of available planning resources residing within a particular LRZ.

When defined in this manner, the capacity surplus or shortfall of a particular zone is equal to the difference between the total amount of MW (or in the case of Staff’s analysis in this matter, Zonal Resource Credits (ZRCs)) that are owned or contractually obligated to a particular Load Serving Entity (LSE), and its respective Planning Reserve Margin Requirements (PRMR). The capacity resources must be physically located within LRZ 7. Provided that any shortfall experienced by a particular LRZ is less than the zonal Capacity Import Limit (CIL), as determined by MISO in the Loss of Load Expectation (LOLE) Working Group¹, and greater than the Local Clearing Requirement (LCR), the LRZ can theoretically meet its load and reserve obligations without violating the LOLE reliability criteria of one day of outage in 10 years due to an insufficient amount of resources. In other words, an LRZ can fall short of its planning reserve margin requirements, as long as the magnitude of the shortfall is less than the amount of resources that can physically be imported. Additionally, the LRZ must have a specified amount of capacity resources, equal to or greater than the LCR, physically located within the LRZ in order to meet the LOLE reliability criterion. Therefore, when defined in this context, the term ‘capacity shortfall’ will equal the amount of ZRCs that would be imported into a particular LRZ, provided that the capacity shortfall is less than the CIL attributed to the LRZ.

The only exception to this condition would occur if there were not sufficient capacity resources available in the MISO outside of the LRZ. In this specific case, even if the zonal capacity shortfall is less than the CIL, the LRZ could potentially not meet its capacity obligations, due to an overall lack of available resource on the MISO system. Within this caveat, in which there is an insufficient amount of resources available in MISO to import into a particular LRZ to satisfy its respective PRMR, the statistical likelihood of a resource adequacy related outage would increase exponentially, depending on the severity of the shortage.

¹ 2015 Loss of Load Expectation Study Report

<https://www.misoenergy.org/Library/Repository/Study/LOLE/2015%20LOLE%20Study%20Report.pdf>

Local Resource Zone 7 (LRZ 7)

Table 1

U-17751 Results - LRZ 7 Capacity Position (UCAP MW)

Line #	Item	PY 2016-2017	PY 2017-2018	PY 2018-2019	PY 2019-2020
1	Planning Reserve Margin Requirements (PRMR) [1]	22,700.00	22,700.00	22,700.00	22,700.00
2	Local Clearing Requirement (LCR) [2]	21,442.00	21,442.00	21,442.00	21,442.00
3	Capacity Import Limit (CIL) [3]	3,666.00	3,666.00	3,666.00	3,666.00
4	Total Company Owned - LRZ 7 [4]	18,286.59	18,347.99	18,405.59	18,455.89
5	Total PPA/Contract - LRZ 7	3,066.50	2,766.40	2,699.40	2,658.80
6	Total Qualified Demand Response Resources including PRMUCAP - LRZ 7	828.65	897.47	934.11	964.28
7	Total LRZ 7 Planning Resources	22,181.75	22,011.86	22,039.11	22,078.97
8	Total Owned or Contracted Planning Resources - LRZ 7 [5]	22,657.75	22,342.86	22,370.11	22,409.97
LRZ 7 Resources Vs. MISO LCR					
9	(Line 7 - Line 2)	739.75	569.86	597.11	636.97
10	LRZ 7 Capacity Surplus (Shortfall) (Line 7 - Line 1)	(518.25)	(688.14)	(660.89)	(621.03)
Total Contracted Resources Vs. MISO PRMR					
11	(Line 8 - Line 1) [5]	(42.25)	(357.14)	(329.89)	(290.03)

[1] MISO Published LRZ 7 PRMR for planning year 2015/16 is 22,678. PRMR is not published for future planning years. For the purpose of its analysis, Staff assumes that the PRMR remains constant.

[2] MISO published LRZ 7 LCR for planning year 2015/16 is 21,442. LCR is not published for future planning years. For the purpose of its analysis, Staff assumes that the LCR remains constant.

[3] MISO published LRZ 7 CIL for planning year 2016/17 is 3,666. CIL is not published for planning years beyond 2016/17. For the purpose of its analysis, Staff assumes that the CIL remains constant.

[4] Based on representations made in LSE filings, Staff included capacity resources which do not possess executed MISO Generator Interconnection Agreement, if the LSE identified a planned in-service date on or before the applicable planning year.

[5] Includes capacity resources outside of LRZ 7 that are owned or contracted to an LSE within LRZ 7.

On April 14, 2015 the MISO published summary of the annual Planning Resource Auction results for the 2015/2016 planning year, by which capacity resources, either within or outside the LRZ in question, may be obtained by an LSE in order to meet its peak load obligations. Of particular interest to Staff is the Local Clearing Requirement (LCR). The LCR is loosely defined as the amount of planning resources required within a particular zone in order to meet the 1 day in 10 years LOLE criteria. Staff recognizes the importance of a particular LRZ meeting its LCR, as established by MISO. Failure to do so will not only threaten the reliability standards established through the MISO Loss of Load Expectation process, it will also yield a financial burden to all rate-payers within the LRZ. As indicated by line 9 of table 1, Staff's findings in this matter indicate that LRZ 7 is not likely to fall short of the LCR for the foreseeable future.

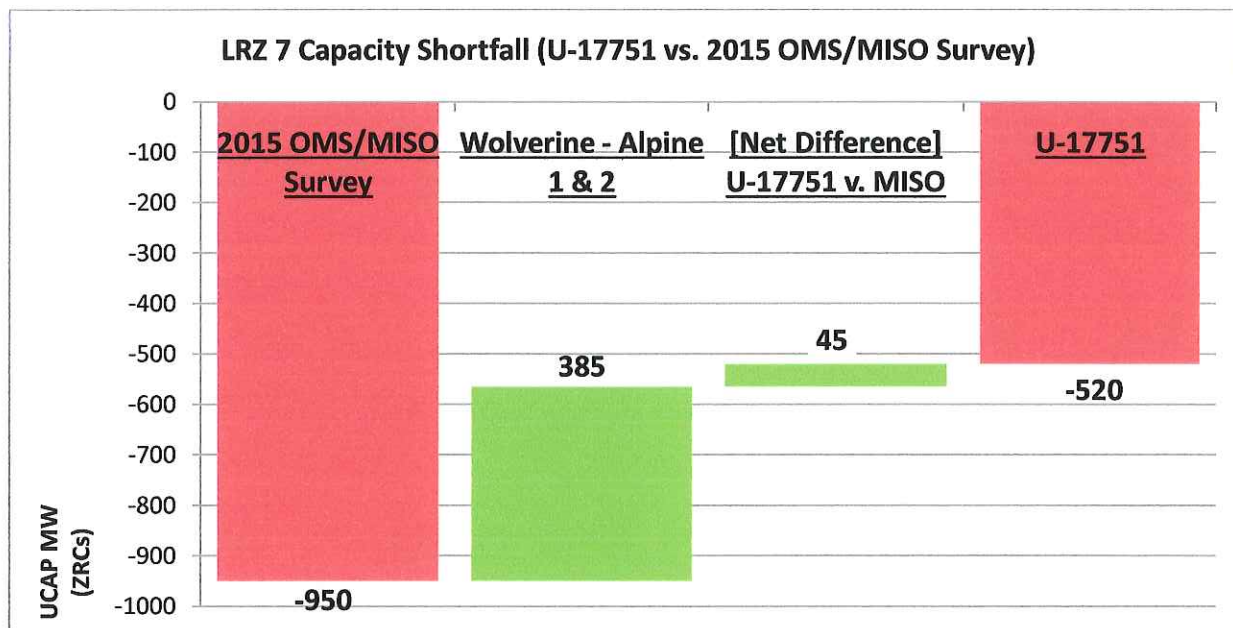
Line 10 of Table 1 outlines the capacity position of LRZ 7 relative to the Planning Reserve Margin Requirements. Based on Staff's analysis of LSE filings in this docket, when only generation resources physically located within LRZ 7 are considered, there is an expected shortfall of approximately 520 ZRCs in the 2016/17 planning year. Therefore, Staff would expect approximately 520 ZRCs to be imported into LRZ 7 in the 2016/17 planning year.

In June 2015 the OMS/MISO published the results of their latest resource adequacy survey, which indicated that LRZ 7 would experience a capacity shortfall of approximately 1,200 MW in the 2016/17 planning year. Staff conferred with MISO to reconcile the differences between our respective shortfall projections. The findings of this reconciliation are as follows:

- OMS/MISO survey results are presented in terms of Installed Capacity (ICAP).
 - Staff's analysis was performed on an Unforced Capacity Basis².
 - 1 UCAP MW is equal to 1 ZRC.
 - OMS/MISO capacity shortfall in UCAP basis is approximately 900-1000 ZRCs.
- Staff included capacity resources that do not possess a signed Generator Interconnection Agreement (GIA) with MISO.
 - Wolverine Power Supply Cooperative Alpine Plant 1 and 2. Projected to be in service in 2016, these units will provide approximately 385 ZRCs of capacity in LRZ 7.³

Accounting for these known and measurable differences shows that Staff's analysis of the filings in Commission Case No. U-17751 and the 2015 OMS/MISO Survey show a very similar outlook of the relative capacity position of LRZ 7, a difference of approximately 45 ZRCs. For the purpose of a forward looking capacity assessment, Staff considers a difference of 45 ZRCs to be insignificant. Table 2 below outlines the differences between each respective study methodology.

Table 2



² Unforced Capacity (UCAP) of a particular generating unit is a measure of the amount of capacity available to an LSE to meet its capacity obligations, when accounting for historical unplanned outages.

³ Wolverine Power Supply Cooperative U-17751 filing, p. 14.
<http://efile.mpsc.state.mi.us/efile/docs/17751/0013.pdf>

However, when resources that are located outside of LRZ 7 but are owned or under contract for capacity within LRZ 7 are considered in addition to the in-zone resources, Staff expects the magnitude of the shortfall to appear lower. The results of this comparison are outlined in Table 1, Line 11. In this case, the projected amount of capacity that will be imported into LRZ 7 is expected to be well within the CIL constraints as defined by MISO. Therefore, as long as the absolute value of the capacity shortfall (line 10) is less than the CIL (Line 3) Staff assumes that additional capacity can be imported from elsewhere in MISO to satisfy the Planning Reserve Margin Requirements (assuming that the MISO Planning Resource Auction contains an adequate amount of capacity resources to satisfy its total capacity obligation). LSE filings in U-17751 represented approximately 500 ZRCs of capacity resource either owned or contracted for outside of LRZ 7. Since Staff has no means to examine the details of such contracts, the availability of such capacity resources remains uncertain. However, as indicated by Line 11 of Table 1, the availability of these out-of-zone resources in the 2016/17 planning year make the apparent capacity shortfall appear much smaller.

Hypothetically, if a particular LRZ is projected to experience a capacity shortfall that approached the magnitude of its CIL, it would likely cause concern amongst the stakeholders with responsibilities regarding resource adequacy. However, it is important to note that the process by which the CIL is calculated is a probabilistic determination. Even if the capacity shortfall exceeded the CIL, this would not necessarily mean that the LRZ in question would experience an outage due to insufficient available planning resources. The probability of such an outage, however, would exceed the generally accepted criteria that govern the resource adequacy planning process.

Indiana Michigan Power (PJM)

The 2015-2019 electric supply reliability plan filed by Indiana Michigan Power (I&M) in U-17751 reflects the Company as a stand-alone utility, due to the termination of the AEP Interconnection Agreement which occurred in December 2013.⁴ As a member of the PJM energy market, I&M is subject to the rules and regulations of the PJM capacity market structure. In response to the Polar Vortex in 2014, PJM developed new penalties and enhanced performance requirements for generators in their “Capacity Performance” proposal (ER15-623). These requirements apply to LSEs participating in the PJM capacity market as well as those electing the Fixed Resource Requirement (FRR) option (i.e., Indiana Michigan Power). The MPSC filed comments against the “Capacity Performance” proposal on the basis that it infringed on the State’s regulatory authority. FERC approved the proposal on Tuesday, June 9th, 2015⁵.

I&M does not anticipate further retirements of any owned plants on its system through 2019. Additionally, the Company expects the peak load, and associated Planning Reserve Margin

⁴ Indiana Michigan Power U-17751 filing, p. 1.
<http://efile.mpsc.state.mi.us/efile/docs/17751/0014.pdf>

⁵ <http://www.pjm.com/committees-and-groups/committees/elc.aspx>

Requirements (PRMR), on its system to remain relatively constant through 2019. Table 3 below outlines the details of I&M's filing in U-17751.

Table 3

Item	PY 2015-2016	PY 2016-2017	PY 2017-2018	PY 2018-2019	PY 2019-2020
Total Planning Reserve Margin (expected reserves), UCAP MW	4,755	4,658	4,696	4,616	4,636
Total Company Owned Generation, UCAP MW	4,222	4,080	4,123	4,152	4,152
Total Qualified Demand Response Resources including PRMUCAP, MW	319	319	319	319	319
Total PPA, UCAP MW	192	203	203	205	209
Total Planning Resources, UCAP MW	4,733	4,602	4,644	4,676	4,680
UCAP Surplus/(Shortfall), MW	(22)	(56)	(52)	60	44

Based on the data provided by I&M, the generation resources owned by the Company, plus limited bilateral purchases in years in which a capacity deficit exists, are expected to be adequate to serve I&M's load obligations.

Local Resource Zone 2 (MI Upper Peninsula)

The MISO LRZ 2 encompasses most of north and eastern Wisconsin in addition to the entire Upper Peninsula of Michigan. There is no defined capacity import or export limit between States within the boundaries of a particular LRZ. Considering this, aggregation of data supplied by UP utilities in their filings for the purposes of determining a net capacity position (similar to Staff's analysis of LRZ 7) is not applicable.

A primary cause of uncertainty surrounding resource adequacy and operational reliability in the UP is centered on the future of the Presque Isle Power Plant (PIPP) owned and operated by Wisconsin Electric Power Company (We Energies). WE Energies announced its intention to retire the plant in 2014 but the plant was placed under a System Support Resource (SSR) agreement under MISO's tariff because the continued operation of PIPP was necessary to support the reliable operation of the bulk electric system. Currently, the PIPP is no longer operating under and SSR agreement. Due to these reliability issues and the resulting SSR agreement, it is assumed that PIPP will remain in service through the entire study horizon examined in this case. It has been announced that a 280 MW natural gas fired cogeneration plant will be built in the UP to replace a portion of the capacity lost with the retirement of PIPP. The unit is currently in the Generator Interconnection Queue at MISO, project number J394, and is undergoing analysis in the Definitive Planning Phase. This unit, if constructed, will replace the capacity at PIPP when it retires in 2020.

The 2015 OMS/MISO survey results indicate a capacity surplus of approximately 1,000 MW in the 2016/17 planning year for LRZ 2. Notwithstanding the localized reliability issues in the UP, the results of the OMS/MISO survey indicate that LRZ 2 is projected to have an adequate supply of capacity resources to meet its PRMR in the 2016/17 planning year.