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December 6, 2013

VIA ELECTRONIC FILING AND U.S. MAIL

The Honorable Eric L. Lipman
Office of Administrative Hearings
600 N. Robert Street
P.O. Box 64620
St. Paul, MN 55164-0620

Re: **Reply Brief and Proposed Findings of Calpine Corporation**

***In the Matter of the Petition Northern States Power Company to Initiate a
Competitive Resource Acquisition Process, MPUC Docket No. E-002/CN-12-1240;
OAH Docket No. 8-2500-30760.***

Dear Judge Lipman:

Pursuant to Your Honor's July 17, 2013 Second Prehearing Order, Calpine Corporation and its affiliate Mankato Energy Center, LLC ("Calpine") hereby submit their Reply Brief in the above-referenced proceedings. In addition, Calpine respectfully submits Proposed Findings of Fact ("Proposed Findings") for Your Honor's consideration. Calpine's Proposed Findings are derived principally from Calpine's post-hearing briefs filed in this proceeding and limited to the issues Calpine addressed.

Calpine's Proposed Findings contain **Trade Secret Information**, the disclosure of which would cause economic harm to Calpine and other Parties to this proceeding. In particular, the Proposed Findings contain commercially sensitive information respecting Calpine and other Parties' competitive bids submitted in this proceeding. Pursuant to Minn. Stat. § 13.37, subd. 1(b), the trade secret information set forth in Calpine's Proposed Findings is properly designated by Calpine and/or other Parties to this proceeding because it: (1) was supplied by Calpine (or by other Parties to Calpine under the Protective Order); (2) is the subject of reasonable efforts by Calpine and other Parties to maintain its secrecy; and (3) derives independent economic value, actual or potential, from not being generally known to or accessible by the public.

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Calpine has identified the Trade Secret and other Non-Public Information in its Proposed Findings pursuant to Minn. Rule 7829.0500. In addition, Calpine is filing both a “Non-Public” and “Public” version of its Proposed Findings. Those persons authorized to receive Trade Secret Information pursuant to Your Honor’s Protective Order will receive both the Public and Non-Public versions.

Thank you for your attention to this matter.

Sincerely,

/s/ *Brian M. Meloy*

Brian M. Meloy

STATE OF MINNESOTA
BEFORE THE
MINNESOTA PUBLIC UTILITIES COMMISSION

*In the Matter of the Petition of
Northern States Power Company to
Initiate a Competitive Resource
Acquisition Process*

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MPUC Docket No. E-002/CN-12-1240
OAH Docket No. 8-2500-30760

CERTIFICATE OF SERVICE

Catherine M. Wood, certifies that on December 6, 2013 she served true and correct copies of the **Reply Brief and Proposed Findings of Calpine Corporation** upon the following parties via e-filing and/or U.S. Mail:

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**STATE OF MINNESOTA
BEFORE THE OFFICE OF ADMINISTRATIVE HEARINGS
FOR THE
MINNESOTA PUBLIC UTILITIES COMMISSION**

<i>In the Matter of the Petition</i>)	
<i>Northern States Power Company</i>)	MPUC Docket No. E-002/CN-12-1240
<i>to Initiate a Competitive</i>)	OAH Docket No. 8-2500-30760
<i>Resource Acquisition Process</i>)	

REPLY BRIEF OF CALPINE CORPORATION

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**REPLY BRIEF
OF CALPINE CORPORATION**

Pursuant to Your Honor’s July 17, 2013 Second Prehearing Order, Calpine Corporation and its affiliate Mankato Energy Center, LLC (“Calpine”) hereby submit their Reply Brief in the above-referenced proceedings. Calpine limits its Reply Brief to address certain claims by Invenergy Thermal Development, LLC (“Invenergy”) that the record developed in this proceeding supports the selection of its proposed combustion turbine (“CT”) at Cannon Falls rather than Calpine’s combined cycle Expansion Proposal.¹

As discussed below, Invenergy’s arguments are without merit and elevate supposition over objective analysis. The detailed record developed in this case shows that consideration of ratepayer costs, Xcel’s changing resource mix needs, and Minnesota’s energy and environmental policy goals supports the selection of the Calpine Expansion in this procurement.

**I.
DISCUSSION**

Through its Initial Brief, Calpine demonstrated that that (1) each quantitative economic analysis supports the selection of Calpine’s Expansion Proposal as the most reasonable and

¹ Calpine’s decision to limit its Reply Brief to address discrete Invenergy arguments related to the merits of CT versus combined cycle capacity should not be viewed as acquiescence to, or agreement with, other arguments or theories advanced by Invenergy or other parties to this proceeding. Calpine’s positions on the threshold issues raised in this proceeding are set forth in detail in its Initial Brief.

prudent strategy for Xcel; (2) the modeling results and economic analyses understate the value of Calpine's Expansion vis-à-vis competing proposals; (3) qualitative non-price factors support the selection of Calpine's Expansion Proposal; (4) Invenenergy's argument that combined cycle resources are not needed is not supported by the record; and (5) the Commission should direct Xcel to enter into power purchase agreement ("PPA") negotiations with Calpine. Nothing in Invenenergy's Initial Brief substantively refutes these facts and Calpine will not repeat the arguments it made in its Initial Brief here.

In its Initial Brief, however, Invenenergy selectively and incompletely mines the record to support its theory that Xcel requires peaking capacity rather than combined cycle capacity offered by Calpine. Specifically, Invenenergy alleges that (1) Xcel's existing combined cycle capacity is underutilized and Calpine's Expansion will impose higher capacity costs on Xcel ratepayers;² (2) Xcel's system requires additional peaking (rather than combined cycle) capacity to respond to reliability issues resulting from the integration of intermediate wind resources;³ (3) Xcel is experiencing declining load factors and requires only peaking resources;⁴ and (4) Calpine's Expansion will not serve as a viable hedge against future baseload resource retirements.⁵ As demonstrated in Calpine's Initial Brief and set forth below, these arguments are simply not supported by the record.

A. INVENERGY'S ARGUMENT THAT CALPINE'S COMBINED-CYCLE CAPACITY WILL IMPOSE HIGHER COSTS ON CONSUMERS IGNORES THE ECONOMIC MODELING IN THIS PROCEEDING.

In its Initial Brief, Invenenergy argues that Xcel's existing combined cycle capacity is underutilized and that selecting Calpine's Expansion would result in imposing higher capacity

² Invenenergy Initial Brief at pp. 29-33.

³ *Id.* at pp. 20-21.

⁴ *Id.* at pp. 22-23.

⁵ *Id.* at pp. 45-47.

costs onto Xcel ratepayers.⁶ According to Invenergy, “adding even more combined cycle capacity to the Xcel system, with its corresponding higher capacity cost, simply makes no economic sense in the face of the existing resources, most notably the existing Calpine combined cycle plant, remaining under-utilized.”⁷ Such claims both mischaracterize current and future Xcel system conditions and ignore the fact that asset utilization is specifically and explicitly incorporated in the modeling of ratepayer impacts.⁸

As set forth in Calpine’s Initial Brief,⁹ the value to ratepayers of combined cycle versus CT capacity varies significantly based upon how often the resources are expected to be called on to run, which is expressed as the resource’s average annual capacity factor (“CF”).¹⁰ Invenergy, however, did not undertake any substantive analysis to determine likely CFs of any resources proposed in this proceeding. Calpine, the Department and Xcel did undertake such analysis and all concluded that Calpine’s Expansion will be dispatched significantly more often than CT resources proposed in this proceeding because of its efficiency advantage.¹¹

Witness Paul J. Hibbard demonstrated that Calpine’s Expansion Proposal is the least expensive option among the thermal energy resources offered in this procurement by Xcel, Calpine, and Invenergy based on the levelized cost of electricity (“LCOE”) as seen from the

⁶ *Id.* at p. 29.

⁷ Invenergy Initial Brief at p. 33.

⁸ Exhibit No. 53, Rebuttal Testimony Paul J. Hibbard at p. 13, line 12-14 (“Hibbard Rebuttal”).

⁹ In its Initial Brief, Calpine outlined in detail how asset utilization impacts the economics of the gas-fired resources proposed in this proceeding. Even under scenarios using conservative assumptions regarding the expected utilization of Calpine’s Expansion, the evidence still shows that Calpine’s Expansion is the most economic resource. *See* Calpine’s Initial Brief at pp. 9-14.

¹⁰ Exhibit No. 51, Direct Testimony of Paul J. Hibbard at p. 18, lines 7-9 (“Hibbard Direct”).

¹¹ *See e.g.*, Xcel Witness Steve Wishart’s testimony that Calpine’s clear “efficiency advantage” as a combined cycle resource must be factored into an economic analysis. Exhibit No. 44, Direct Testimony of Steve Wishart at p. 17, lines 5-15 (“Wishart Direct”).

perspective of Xcel's ratepayers.¹² As explained in detail in Calpine's Initial Brief, Mr. Hibbard's LCOE analysis used conservative assumptions regarding asset utilization, which were consistent with the operation of existing combined cycle resources on Xcel's system (High Bridge and Riverside) with similar efficiency advantages.¹³

Similarly, the Department of Commerce's ("Department") and Xcel's Strategist analyses, which analyzed the present value of societal costs ("PVSC") of different combinations of bids, similarly support the selection of Calpine's Expansion. As both Department Witness Dr. Rakow and Xcel Witness Mr. Steve Wishart confirmed at hearing, the utilization of existing resources and the resources proposed in this proceeding are fully accounted for by Xcel¹⁴ and the Department's Strategist modeling.¹⁵ As Mr. Paul Hibbard testified at hearing:

The Strategist dispatch analysis would model each unit at its relative heat rates and variable costs. And so that to the extent a unit is currently operating a low capacity factor, under the same conditions going forward it would continue to do so. And the end result of that being, basically, that the Strategist analysis over time not only accounts for the economic factors that drive the existing units' current utilization, but also accounts for the new units' relative efficiency. So that the results that come out, for example, showing that Mankato is among the best from a ratepayer perspective takes into account that utilization of existing resources with the new resource integrated into the analysis.^{16]}

¹² See Calpine's Initial Brief at pp. 6-9. Xcel's concerns with relying on Calpine's LCOE analysis as set forth in Xcel's Initial Brief at pp. 22-23 have been anticipated and addressed in Calpine's Initial Brief at pp. 9-10.

¹³ See Calpine's Initial Brief at p. 11; *see also*, Hibbard Direct at p. 17, lines 11-17.

¹⁴ Invenegy also alleges that Xcel's withdrawal of its proposed combined cycle facility at Black Dog indicates that Xcel agrees that peaking, instead of combined cycle, resources should be added to its system. *See* Invenegy Initial Brief at p. 26. This is not the case. In addition to Xcel's own modeling confirming that Calpine's Expansion should move forward to PPA negotiations, Xcel Witness James Alders specifically rejected Invenegy's theory. At hearing, Mr. Alders stated that the "combined cycle projects that we had developed prior to this were larger in scale and, in particular, that Black Dog proposal for a combined cycle unit to replace both Units 3 and 4, and part of our motivation for withdrawing that application was that we – our system didn't need a unit of that scale." Hearing Transcript, Volume 1 (October 22, 2013) at p. 131, lines 3-11.

¹⁵ Hearing Transcript, Volume 1 (October 22, 2013) at p. 91, line 18 through p. 93, line 11 (Wishart oral testimony), and Hearing Transcript, Volume 2 (October 23, 2013) p. 53, lines 3-25 (Dr. Rakow oral testimony).

¹⁶ Hearing Transcript, Volume 1 (October 22, 2013) at p. 70, line 13 through p. 71, line 2.

In this respect, the LCOE and PVSC analyses presented in this proceeding represent the costs to Xcel's ratepayers under a wide range of potential capacity factors for competing resources, and a wide range of potential future conditions, fully addressing in an objective manner the impact of asset utilization on ratepayer costs.¹⁷ Therefore, Invenenergy's claim that Calpine's combined cycle Expansion would "impose unnecessary costs on Xcel ratepayers"¹⁸ is simply unfounded.

In the face of such facts, Invenenergy attempts to marginalize the economic analyses in the record by arguing that "no modeling is necessary"¹⁹ to support its position and that "adding still more combined cycle capacity fails the common sense test."²⁰ The "common sense test," however, is not a viable substitute for the results of the extensive modeling undertaken in this case. In this proceeding, three parties submitted comprehensive quantitative economic analyses outlining the objective merits of the proposed resources (taking into account expected asset utilization) – all of which support the selection of Calpine's Expansion Proposal to meet all or a portion of Xcel's future resource needs.

B. INVENERGY'S ARGUMENT THAT XCEL REQUIRES ADDITIONAL PEAKING CAPACITY TO SUPPORT WIND INTEGRATION IS WITHOUT MERIT.

In its Initial Brief, Invenenergy argues that additional peaking capacity is necessary on Xcel's system to address reliability issues associated with the integration of wind capacity. Invenenergy asserts that "PSCo has nearly twice as much peaking capacity as wind capacity – capacity that proved beneficial when PSCo experienced an unexpected wind ramp down of

¹⁷ As Xcel notes in its Initial Brief, the Strategist model "includes a detailed hourly generation dispatch simulation where generators are ranked from lowest to highest based on generation costs and then dispatched in order to meet customers' hourly demand." Xcel Initial Brief at p. 23.

¹⁸ Invenenergy Initial Brief at p. 29.

¹⁹ *Id.* at pp. 22-23.

²⁰ *Id.* at pp. 46-47.

nearly 800 MW within 30 minutes last year.”²¹ According to Invenergy, “Xcel’s current peaking capacity fails to even match its existing wind capacity” and “after the addition of another 750 MW of wind, Xcel’s peaking capacity will decrease to only two-thirds of its wind capacity, leaving it particularly vulnerable to wind ramp down events.”²² There is nothing in the record to support this claim.

At Hearing, Invenergy Witness Mr. Ron Norman agreed with Department witness Dr. Steven Rakow that “MISO’s dispatch includes not only Xcel’s generating units, but the generating units of many utilities in Minnesota and the surrounding states. And that any potential needs regarding load following, adjusting for the output of intermittent resources . . . must be considered in the broader, regional context of MISO rather than Xcel’s system in isolation.”²³ Mr. Norman further agreed that because of MISO’s centralized dispatch of generation resources across a broad market footprint, other MISO resources could be used to address the intermittency of wind resources on Xcel’s system.²⁴ However, Mr. Norman did not conduct any analysis within MISO generally, or Minnesota specifically, to determine the sufficiency of peaking capacity to address reliability issues associated with wind integration.²⁵

Moreover, Mr. Norman acknowledged that unlike Xcel, PSCo is not part of an organized market like MISO where generation resources are centrally dispatched and “in general” must rely on its own or contracted-for generation resources to address reliability concerns associated

²¹ Invenergy Initial Brief at p. 20.

²² *Id.* at pp. 20-21.

²³ Hearing Transcript, Volume 2 (October 23, 2013) at p. 17, lines 7-16.

²⁴ *See* Hearing Transcript, Volume 2 (October 23, 2013) at p. 18, line 25 through p. 19, line 2 (Mr. Norman stating “I certainly would expect that other resources within MISO could be used to address intermittency of wind resources.”).

²⁵ *See* Hearing Transcript, Volume 2 (October 23, 2013) at p. 18, line 19 through p. 20, line 10.

with wind integration.²⁶ When faced with these basic facts, Mr. Norman was forced to concede that he is “not necessarily suggesting that there was a strong concern or major concern about the reliability of the Xcel system as a result.”²⁷ Invenergy’s claim that Xcel’s system is “particularly vulnerable to wind ramp down events” because it lacks additional peaking capacity is clearly unsupported.²⁸

C. INVENERGY’S ARGUMENT THAT XCEL REQUIRES PEAKING CAPACITY BECAUSE OF ITS DECLINING LOAD FACTOR IS UNSUPPORTED.

In its Initial Brief, Invenergy claims that Xcel’s “continually declining load factor” supports Invenergy’s argument that CT or peaking resources best match Xcel’s resource needs. According to Invenergy, through the Direct Testimony of Mr. Sachin Shah, the Department noted that in Xcel’s most recent forecast:

Xcel predicts a significant change in the overall load factor of its system. Specifically, Xcel’s prediction that customers will use less energy overall while making higher demands on Xcel’s peak means that Xcel predicts that its load factor will decrease significantly over time, with customers demanding ever more from Xcel’s peak while using less energy overall.[²⁹]

What Invenergy fails to note, however, is that the Department concluded in that very testimony that Xcel had not provided a basis for its prediction.³⁰

At hearing, Mr. Shah confirmed that Xcel had not responded to his testimony on this issue and has yet to provide a basis for its prediction that Xcel’s load factor will decline over

²⁶ Hearing Transcript, Volume 2 (October 23, 2013) at p. 20, lines 11-25.

²⁷ Hearing Transcript, Volume 2 (October 23, 2013) at p. 20, lines 2-5.

²⁸ It should also be noted that if allowed to operate on interruptible fuel, the record shows Invenergy’s proposed Cannon Falls CT may not be available in the winter months to address any reliability need that arises. While Invenergy suggests in its Initial Brief that it has back-up fuel capability (*e.g.*, Invenergy Initial Brief at p. 47), the record is clear that such capability is not adequate. As Xcel Witness Wishart noted, “...the fuel tanks at the [Cannon Falls] site are barely sufficient to support the operation of a single turbine. For reliable winter operation the amount of on-site fuel storage would need to be expanded. Invenergy has not included these costs in their bid and has not provided supplemental information on the issue.” Wishart Direct at p. 50, lines 1-5.

²⁹ Invenergy Initial Brief at p. 22 (citing Exhibit No. 76, Direct Testimony of Mr. Sachin Shah at p. 10, lines 1-6 (“Shah Direct”)).

³⁰ Shah Direct at p. 10, lines 6-7

time.³¹ Furthermore, Invenergy does not provide any evidence that Xcel's prediction is accurate or will prove to be true over a 20-year life of a PPA that will result from this procurement. While Invenergy Witness Norman observed that Xcel's annual system load factors fell from 2008-2011,³² Mr. Norman conceded that great economic recession experienced over this time frame could have contributed to the declining load factors.³³ Again, Invenergy's attempt to argue that peaking rather than combined cycle resources are needed by Xcel is contrary to the weight of the evidence.

D. INVENERGY'S ARGUMENT THAT CALPINE'S EXPANSION WILL NOT SERVE AS A HEDGE AGAINST FUTURE RESOURCES RETIREMENTS MISSES THE MARK.

In the course of this proceeding, Calpine noted that among the thermal resources proposed in this proceeding, only Calpine's proposed combined cycle technology allows the proposed Expansion to operate as an intermediate or baseload resource. Therefore, in evaluating the merits of adding additional combined cycle capability to Xcel's system, Calpine urged the Commission to consider the potential that a significant quantity of baseload coal-fired resources may become uneconomic as a result of changes in the dispatch of resources due to low natural gas costs and/or existing and future environmental requirements that will be relevant within the timeframe of interest in the current proceeding. According to Calpine Witness Hibbard:

The Commission should consider this risk in its evaluation of the resources competing in this procurement, since new regulations – possibly including requirements on CO₂ emissions at existing power plants – will influence asset decisions by the time this procurement's resources come on line. The potential loss of baseload resources in Xcel's service territory heightens the need for replacement with intermediate or baseload capacity, such as can be provided by CC units.^[34]

³¹ Hearing Transcript, Volume 2 (October 23, 2013) at p. 33, lines 1-3.

³² Exhibit No. 73, Rebuttal Testimony of Ron Norman at p. 12, lines 1-2 (“Norman Rebuttal”).

³³ Hearing Transcript, Volume 2 (October 23, 2013) at p. 21, line 19 through p. 22, line 6.

³⁴ Hibbard Rebuttal at p. 16, lines 11-17.

In response to Calpine’s argument, Invenergy asserts that “nothing in the record supports the notion that the Xcel system will face heretofore unforeseen retirements of baseload resources in the 2017-2019 time frame of concern in this proceeding.”³⁵ Invenergy’s criticism misses the mark; this proceeding is about securing a long-term generation resource that will provide capacity and energy to Xcel’s customers through at least 2036 – not simply from 2017-2019.³⁶ Furthermore, contrary to Invenergy’s aversions,³⁷ the future of Xcel’s Sherburne County (“Sherco”) generating facility is uncertain as evidenced by the on-going Commission proceedings in Docket No. E002/RP-13-368.

Simply, the record shows that selecting only CT peaking capacity in this proceeding – compared to combined cycle capacity or a mix of CT and combined cycle capacity – would diminish the resilience of Xcel’s resource mix to respond to higher-than-expected load growth and future resource retirements.³⁸ In contrast, the CTs proposed by Xcel and Invenergy are expected to operate only as peaking resources during limited hours each year.³⁹

The ability of Calpine’s Expansion to serve as a hedge against future market uncertainty is an important attribute from a public policy perspective that the Commission should take into consideration in its evaluation of the bids. Selection of Calpine’s Expansion will provide the Commission with greater flexibility in making future resource decisions beyond the 2017-2019 timeframe. Nothing in the record or Invenergy’s Initial Brief refutes this basic fact.

³⁵ Invenergy Initial Brief at p. 45.

³⁶ Both Invenergy and Calpine proposed a 20-year PPA with Xcel beginning as early as 2016 in Invenergy’s case. *See e.g.*, Invenergy’s Initial Brief at p. 34.

³⁷ Invenergy Initial Brief at pp. 45-46

³⁸ Hibbard Rebuttal at p. 16, lines 15-17.

³⁹ As Calpine Witness Todd Thornton testified, “[p]eaking units are often selected not because they provide greater value to the market in terms of energy production or operational flexibility, but simply because they typically require a lower capital investment than a combined-cycle unit.” Exhibit No. 55, Direct Testimony of Mr. Todd Thornton at p. 11, lines 17-20 (“Thornton Direct”).

II.
CONCLUSION

The record in this proceeding shows that Calpine's Expansion Proposal achieves the goal of installing additional electric generation capacity to help meet customer demand with state-of-the-art, environmentally responsible and cost effective combined cycle technology. Accordingly, the Commission should direct Xcel to enter into PPA negotiations with Calpine to secure the clear benefits of the Calpine Expansion for Xcel's customers.

Dated: December 6, 2013

Respectfully submitted,

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