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March 14, 2024

The Honorable Jim Mortenson  
Administrative Law Judge  
Office of Administrative Hearings  
PO Box 64620  
St. Paul, MN 55164-0620

**Re: *In the Matter of the Application of Minnesota Power for a Certificate of Need and a High Voltage Transmission Line Route Permit for the HVDC Modernization Project in Solway Township, Saint Louis County, MPUC Docket Nos. E-015/CN-22-607 and E015/TL-22-611 OAH Docket No. 5-2500-39600***

Dear Judge Mortenson:

Accompanying this letter and filed on behalf of the Department of Commerce is the an errata to Rebuttal Testimony and Attachments of Michael N. Zajicek, which was filed on March 11, 2024. The purpose of the errata is to add an attachment that was inadvertently omitted from the original filing.

All parties on the service lists have been served.

Sincerely,

/s/ **Greg Merz**

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Enclosure

cc: Service Lists

BEFORE THE MINNESOTA OFFICE OF ADMINISTRATIVE HEARINGS  
600 North Robert Street  
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FOR THE MINNESOTA PUBLIC UTILITIES COMMISSION  
121 Seventh Place East, Suite 350  
St. Paul, MN 55101-2147

IN THE MATTER OF THE APPLICATION OF  
MINNESOTA POWER FOR THE HVDC  
MODERNIZATION PROJECT

MPUC Docket No. E015/CN-22-607  
OAH Docket No. 5-2500-39600

**REBUTTAL TESTIMONY AND ATTACHMENTS OF MICHAEL N. ZAJICEK**

**ON BEHALF OF**

**THE MINNESOTA DEPARTMENT OF COMMERCE  
DIVISION OF ENERGY RESROUCES**

**March 11, 2024**

REBUTTAL TESTIMONY AND ATTACHMENTS OF MICHAEL N. ZAJICEK  
IN THE MATTER OF THE APPLICATION OF MINNESOTA POWER FOR THE HVDC MODERNIZATION  
PROJECT

DOCKET NO. E015/CN-22-607  
OAH DOCKET NO. 5-2500-39600

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1     **I.     INTRODUCTION**

2     **Q.     Please state your name and occupation.**

3     A.     My name is Michael N. Zajicek. I am a Public Utilities Analyst Coordinator with the  
4           Minnesota Department of Commerce, Division of Energy Resources (DER or the  
5           Department).

6  
7     **Q.     Please state your business address.**

8     A.     My business address is 85 7th Place East, Suite 280, St. Paul, Minnesota 55101.

9

10    **Q.     Are you the same Michael N. Zajicek who filed testimony on behalf of the Division of**  
11           **Energy Resources of the Minnesota Department of Commerce (DOC or the**  
12           **Department) in this proceeding?**

13    A.     Yes, I filed direct testimony on Minnesota Power’s (MP or Company) proposed  
14           application for a Certificate of Need (CN) (CN Application) for the High Voltage Direct  
15           Current (HVDC) Modernization Project and the American Transmission Company LLC  
16           (ATC) proposed Arrowhead Alternative.

17

18    **II.    ORGANIZATION OF REBUTTAL TESTIMONY**

19    **Q.     What is the purpose of your rebuttal testimony?**

20    A.     My rebuttal testimony provides further analysis of the MP’s CN Application based on the  
21           information provided in further information requests, and responds to the direct

1 testimony of the following witnesses from MP and ATC regarding the Arrowhead

2 Alternative:

3 MP Witness Daniel Gunderson Ex. MP-\_\_\_ (Gunderson Direct)

4 MP Witness Christian Winter Ex. MP-\_\_\_ (Winter Direct)

5 ATC Witness Dustin Johaneck Ex. ATC-\_\_\_ (Johaneck Direct)

6 ATC Witness Robert McKee Ex. ATC-\_\_\_ (McKee Direct)

7 ATC Witness Thomas Dagenais Ex. ATC-\_\_\_ (Dagenais Direct)

8 ATC Witness Tobin Larsen Ex. ATC-\_\_\_ (Larsen Direct)

9 LPI Witness Kavita Maini Ex. LPI-\_\_\_ (Maini Direct)

10  
11 **Q. How is your rebuttal testimony organized?**

12 A. As multiple parties address certain issues, I have organized my rebuttal testimony by  
13 topic. I begin by discussing the CN requirements, and then discuss the Arrowhead  
14 Alternative before making my final recommendations.

15  
16 **III. CERTIFICATE OF NEED REQUIREMENTS**

17 **Q. What issue do you address in this section?**

18 A. I discuss the responses to information requests regarding various alternatives to the  
19 Project and make a final recommendation regarding the granting of a CN for the HVDC  
20 Modernization Project.

1 **Q. Please summarize your previous testimony regarding the Project's compliance with**  
2 **the certificate of need requirements.**

3 A. I discussed how the Project application meets the criteria for granting a CN under  
4 Minnesota rules and statutes, including Minnesota Rule 7849.0120, Minn. Stat. §  
5 216B.243, as well as a number of others. I generally concluded that the CN complied  
6 with most of the applicable rules and statues but requested additional information  
7 regarding a few alternatives. I also note that I did not analyze socioeconomic and  
8 environmental impacts as those are discussed in the Environmental Assessment (EA)  
9 produced by the Department's Energy Environmental Review & Analysis unit and the  
10 Commission should consider the EA when making its decision on whether to grant the  
11 CN. Ex. DOC-\_\_\_, at 5 to 30 (Zajicek Direct).

12  
13 **Q. What certificate of need requirements did you request additional information on?**

14 A. I requested additional information related to alternatives analyzed by the Company as  
15 required by Minn. R. 7849.0120 B. Specifically, I requested information regarding: 1)  
16 whether obtaining generation resources in Minnesota nearer to MP's service territory is  
17 a feasible alternative; 2) the feasibility and long-term costs of a no build alternative; and  
18 3) distributed generation as an alternative. Ex. DOC-\_\_\_, at 16 to 24 (Zajicek Direct).

19  
20 **Q. Did you receive the information you requested?**

21 A. Yes. MP provided information relating to the alternatives in response to information  
22 requests from the Department.

1 **Q. What information did Minnesota Power provide on obtaining alternative generation**  
2 **resources in Minnesota?**

3 A. Minnesota Power stated that retiring the HVDC line would require the Company, to  
4 provide system upgrades as required by MISO. Ex. DOC-\_\_\_\_, at MZ-R-1 (Zajicek Rebuttal  
5 Attachments). These upgrades would be required due to the impacts on congestion on  
6 other parts of the transmission system that would occur largely because MP's wind  
7 generation resources in North Dakota would no longer have their power transferred  
8 along the HVDC line, and instead it would flow into the surrounding AC transmission  
9 network. These upgrades are the same as MP's AC alternative, which is estimated to  
10 cost approximately \$1.4 billion, which is more expensive than the Project. Ex. DOC-\_\_\_\_,  
11 at 18 (Zajicek Direct).

12  
13 **Q. What information did Minnesota Power provide on the alternative of a no-build**  
14 **alternative?**

15 A. MP stated that as the owner of the HVDC line it would be required to work with MISO  
16 and neighboring utilities to identify and implement necessary upgrades to bring the  
17 system back to a state that it is at least as reliable as when the HVDC line was in service.  
18 As I previously noted MP estimated the costs of these required AC upgrades to be  
19 approximately \$1.4 billion. Ex. DOC-\_\_\_\_, at MZ-R-2 (Zajicek Rebuttal Attachments).

1 **Q. What information did the Company provide regarding the feasibility of distributed**  
2 **generation as an alternative to the Project?**

3 A. The Company stated that not implementing the Project is not viable due to the costs of  
4 transmission upgrades that would be required and that there is no generation, non-  
5 wire, or distributed generation solution that can replace the Project. Ex. DOC-\_\_\_\_, at  
6 MZ-R-3 (Zajicek Rebuttal Attachments). Again, any alternative that results in the  
7 retirement of the HVDC line requires more expensive AC upgrades.

8  
9 **Q. Do you agree with the Company's analysis regarding the generation alternative, the**  
10 **no-build alternative, and the distributed generation alternative?**

11 A. Yes. As stated by the Company, MISO rules require MP to provide transmission upgrades  
12 to the system to account for the loss of the HVDC line on the MISO system. As MP owns  
13 significant generation resources in North Dakota that it would no longer be able to  
14 transmit over the HVDC line, those resources would likely cause significant increase in  
15 transmission congestion, which would need to be addressed by the Company. The  
16 Company's AC alternative addresses what the Company would be required to build by  
17 MISO if it retired the HVDC line, it covers both the generation and no-build alternatives.

18  
19 **Q. Do you have any other concerns with the Company's alternative analysis?**

20 A. No.



1 **Q. What do you conclude regarding the Company's alternative analysis?**

2 A. I conclude that MP's analysis appears to be reasonable and that the Project meets the  
3 requirements of Minn. R. 7849.0120 B.

4  
5 **Q. Are there any other concerns related to the certificate of need brought up by other  
6 parties?**

7 A. Yes. LPI witness Ms. Maini expressed concerns with the size of the Project. The  
8 Company is proposing to increase the capability of the new HVDC terminals up to 1500  
9 MWs and that it will be designed to be able to be upgraded by an additional 1500 MWs.  
10 Ex. LPI-\_\_\_, at 11-16 (Maini Direct). Additionally, Ms. Maini notes that the Project,  
11 especially with the potential for expansion, is not being cost shared with any other  
12 party. Ex. LPI-\_\_\_, at 18-19 (Maini Direct).

13  
14 **Q. How do you respond to Ms. Maini's concerns?**

15 A. I note that in regard to sizing of the Project, MP's 2021 Integrated Resources Plan  
16 (IRP) included analysis with the HVDC line upgrades. The resource plan approved by the  
17 Commission included an addition of 300 to 400 MW of wind resources.<sup>1</sup> Likely some  
18 portion of these wind resources would be located in North Dakota to take advantage of  
19 the HVDC line, and thus increases in size of the HVDC line are likely beneficial at least in  
20 the near term. Expanding the line further, however, up to 3000 MWs is not supported at

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<sup>1</sup> See Commission's *Order Approving Plan and Setting Additional Requirements* issued January 9, 2023. Docket No. E015/RP-21-33 edockets# [20231-191970-01](#)

1 this time, but it is my understand that that is a potential upgrade, not one being  
2 considered in this case.

3           Regarding cost sharing, I agree with Ms. Maini that it is unfortunate that MP has  
4 not been able to obtain any cost sharing opportunities for this Project. However, as I will  
5 discuss later, there are limited opportunities for cost sharing through the Midcontinent  
6 Independent Systems Operator (MISO) at this time and this Project does not currently  
7 qualify. I do note, that in response to a Department information request MP indicated  
8 that if MISO or another utility wish to expand the HVDC line beyond the 900 MW, or if  
9 MP chooses to sell capacity rights to some of that 900 MW capacity, then MP would be  
10 paid for any of those system upgrades and for use of its HVDC converter station facilities  
11 by either MISO or the utility. Ex. DOC-\_\_\_\_, MZ-R-4 (Zajicek Rebuttal Attachments). I  
12 encourage MP to pursue any opportunities to obtain cost sharing based on the regional  
13 benefits that become available.

14  
15 **Q. What do you recommend regarding the granting of a certificate of need for the**  
16 **Project?**

17 A. In my direct testimony I concluded that, other than the analysis of alternatives, the  
18 Project meets the applicable rules and statues. If the Commission finds that the  
19 proposed facility “will provide benefits to society in a manner compatible with  
20 protecting the natural and socioeconomic environments, including human health,” the  
21 Department recommends the Commission issue a certificate of need to MP for the  
22 HVDC Modernization Project.

1 **IV. ATC ARROWHEAD ALTERNATIVE**

2 **Q. What issue do you address in this section?**

3 A. I respond to MP's and ATC's testimony regarding the Arrowhead Alternative endpoint  
4 proposed by ATC.

5  
6 **Q. Please summarize your previous testimony regarding the ATC Alternative.**

7 A. In direct testimony I attempted to summarize the ATC proposal based on previous filings  
8 that ATC and MP submitted to the Commission, understanding that further details  
9 would be provided in other parties' direct testimony. I also discussed what appeared to  
10 be areas of disagreement between ATC and MP regarding the viability and costs of the  
11 Arrowhead Alternative. Of specific concern: 1) the 800 Mega Volt Amps (MVA) limit  
12 imposed by the Environmental Quality Board (EQB) on power flows through the ATC  
13 Arrowhead substation; 2) the resulting 800 MVA phase shifting transformer (PTS) that  
14 was installed to limit those power flows; 3) the cost savings potential of the Arrowhead  
15 Alternative; 4) the state and federal funding that MP has applied for; and 5) the  
16 potential for the Arrowhead Alternative to lead to delays for the Project. Ex. DOC-\_\_\_\_, at  
17 31 to 38 (Zajicek Direct).

18  
19 **Q. What conclusions did you make regarding the Arrowhead Alternative?**

20 A. I was unable to make conclusions about the viability or the potential impacts of the  
21 Arrowhead Alternative in my direct testimony as there was insufficient information  
22 available at the time. For this reason, I withheld making any recommendations until I

1 was able to review the direct testimony of other parties. Ex. DOC-\_\_\_\_, at 38 (Zajicek  
2 Direct).

3  
4 **Q. Having reviewed other parties' direct testimony, what issues do you address in your  
5 rebuttal testimony regarding the Arrowhead Alternative?**

6 A. I discuss the studies ATC and MP have provided regarding the viability of the Arrowhead  
7 Alternative and the 800 MVA limits, state and federal funding, the potential for the  
8 Arrowhead Alternative to cause delays for the Project, and the impacts on future  
9 expansion of each alternative.

10  
11 *1. Arrowhead Alternative Viability and 800 MVA limits*

12 **Q. Please summarize the 800 MVA limits currently in place at the 345 kV Arrowhead  
13 substation.**

14 A. There are two existing interrelated 800 MVA limits in place at ATC's 345 kV Arrowhead  
15 substation. These limits potentially impact the viability of the Arrowhead Alternative.  
16 In March 2001, the EQB granted a permit to MP and ATC to construct the Arrowhead  
17 345 kV substation. The permit included a limitation on the amount of power transmitted  
18 by the substation to 800 MVA. The 345 kV Arrowhead substation is interconnected to  
19 MP's 230 kV Arrowhead substation by an 801 MVA PST, which limits the flow into  
20 Wisconsin physically to a maximum of 801 MVA. Ex. MP-\_\_\_\_, at 67-68 (Winter Direct).  
21 To interconnect the HVDC Modernization Project at ATC's Arrowhead 345 kV substation,  
22 the 801 MVA limit would have to be reexamined and lifted. In direct testimony, ATC

1 discussed that the Arrowhead PST has generally been rendered obsolete for its original  
2 purposes and has only been operated in recent years for periodic testing. Ex. ATC-\_\_\_\_,  
3 at 37-38 (Dagenais Direct).

4  
5 **Q. What studies did ATC provide regarding the 800 MVA limit?**

6 A. ATC provided a steady state reliability analysis study, a dynamic stability reliability  
7 analysis study, and a steady state voltage stability analysis study. Ex. ATC-\_\_\_\_, at 16-29  
8 (Dagenais Direct). While these studies did not specifically address the 800 MVA limit,  
9 they assume the 800 MVA PST is bypassed or removed, allowing the system to surpass  
10 the 800 MVA limit with the installation of an additional transformer.

11  
12 **Q. Did MP provide any studies regarding the 800 MVA limit?**

13 A. MP provided the results and discussion of a number of studies and stated that the  
14 studies the Company performed support MP's Project as filed. MP has also completed  
15 MISO studies including system impact studies for the Project. Ex. MP-\_\_\_\_, at 22-23  
16 (Winter Direct). MP states that the Company's studies indicate that the Arrowhead  
17 Alternative would regularly result in total power flowing through the 345 kV Arrowhead  
18 substation to exceed the 800 MVA limit thus violating the EQB limit. Ex. MP-\_\_\_\_, at 69  
19 (Winter Direct). MP's analysis indicates that the Arrowhead Alternative would result in  
20 additional 7-10% increase in the amount of power flowing into Wisconsin from the  
21 Arrowhead 345kV substation as compared to MP's proposed Project endpoint. Ex. MP-  
22 \_\_\_\_ , at 38 (Winter Direct).

1 **Q. Did you review the studies provided by ATC and MP?**

2 A. Yes, but I am not an engineer, nor do I have experience creating or analyzing these types  
3 of studies. Therefore, I am unable to provide a detailed analysis on the studies and  
4 cannot speak to their reliability. I rely on the analyses provided by both parties and  
5 encourage to Commission to consider the rebuttal testimony provided by each party as  
6 that testimony concerns the validity of both parties' studies.

7  
8 **Q. How does ATC summarize the results of its studies?**

9 A. ATC states that its steady state analysis indicates that the Arrowhead Alternative  
10 performs at least as well or better than MP's proposal in terms of system reliability. Ex.  
11 ATC-\_\_\_, at 29-30 and Schedules 4 and 5 (Dagenais Direct). ATC also states that its  
12 dynamic stability analysis shows that the facility would perform at least as well or better  
13 under certain contingencies with one exception, where a redispatch of a generator can  
14 adequately alleviate the voltage instability issues. Ex. ATC-\_\_\_, at 30-31 and Schedules 6  
15 (Dagenais Direct). Finally, ATC states that its voltage stability analysis indicates that the  
16 Arrowhead Alternative provides superior voltage stability and allows for increased west-  
17 to-east transfer ability compared to MP's proposal. Ex. ATC-\_\_\_, at 31 and Schedules 7  
18 and 5 (Dagenais Direct). ATC concludes that its studies show that, from a reliability  
19 perspective, the Arrowhead Alternative is superior and that the Arrowhead PST was not  
20 necessary for reliability purposes. Ex. ATC-\_\_\_, at 30-33 (Dagenais Direct).

1 **Q. Does ATC believe that the Arrowhead Alternative could cause flows through the**  
2 **Arrowhead 345 kV substation to exceed the 800 MVA Environmental Quality Board**  
3 **limit?**

4 A. Yes. As the existing transformer has a rating of 801 MVA the Project would eventually  
5 require installation of an additional transformer leading to a 1600 MVA transfer  
6 capacity. ATC admits that the 800 MVA limit could be exceeded. Ex. ATC-\_\_\_\_, at 37-39  
7 (Dagenais Direct).

8  
9 **Q. Was the Environmental Quality Board limit based on noise mitigation issues?**

10 A. No. In his direct testimony Mr. Winter provided the transcript of the EQB meeting  
11 where the 800 MVA limit was imposed. Ex. MP-\_\_\_\_, at 67 and Schedule 33 (Winter  
12 Direct). While noise mitigation was discussed, lower sound emitting transformers were  
13 installed to address that issue. Ex. MP-\_\_\_\_, at Schedule 33 (Winter Direct). MP states  
14 that the reason for the 800 MVA limit was to limit the power flow into Wisconsin, so  
15 that any subsequent increase in transfer capacity would be subject to regulatory review.  
16 Ex. MP-\_\_\_\_, at 67 (Winter Direct).

17  
18 **Q. Was the Environmental Quality Board limit based specifically on limiting power flows**  
19 **into Wisconsin?**

20 A. In part, yes. There were concerns expressed by witnesses around the idea that if the  
21 power flow into Wisconsin was not restricted, it would likely result in increased  
22 production of power from coal facilities in Minnesota and North Dakota, with Minnesota

1 bearing of the associated environmental impacts of increased pollution. Ex. MP-\_\_\_\_, at  
2 Schedule 33 Pages 60-61 (Winter Direct).  
3

4 **Q. If power flows to Wisconsin were increased as a result of this Project could it be**  
5 **possible that this would result in increased pollution in Minnesota?**

6 A. Potentially. While I do not provide detailed analysis of environmental impacts in  
7 Minnesota, it is possible for increased air pollution if the removal of the 800 MVA limit  
8 results in additional coal or natural gas resources being dispatched by MISO to be  
9 delivered into Wisconsin. However, there is substantially more clean energy on the  
10 system than there was in 2001, when the EQB made this decision.  
11

12 **Q. Could the Minnesota Public Utilities Commission lift the 800 MVA limit imposed by the**  
13 **EQB?**

14 A. It is my understanding the jurisdiction of energy matters such as this has been  
15 transferred to the Commission and thus it is within the Commission's authority to  
16 remove the 800 MVA limit on the Arrowhead 345 kV substation.  
17

18 **Q. What would be the impacts to power flows of implementing the Arrowhead**  
19 **Alternative and eliminating the 800 MVA limit?**

20 A. As I discussed previously, MP witness Mr. Winter stated that the Company's analysis  
21 indicates that the Arrowhead Alternative would result in additional 7-10% increase in  
22 the amount of power flowing into Wisconsin from the Arrowhead 345kV substation as



1 compared to MP's proposed Project endpoint. Ex. MP-\_\_\_\_, at 38 (Winter Direct). Under  
2 MP's proposed endpoint any increase in power flows into Wisconsin would be limited  
3 by the 800 MVA Arrowhead PST in the same way the current system operates. To put  
4 this number into context MP currently has around 550 MW of generation that is  
5 transferred along the HVDC line, a 7-10% increase in flows to Wisconsin would be 38.5  
6 to 55 MWs. Estimates vary, but according to the Nuclear Regulatory Commission 1 MW  
7 can power 400 to 900 homes, assuming the average of 650 the increase power flows  
8 into Wisconsin could power 25,025 to 35,750 homes.<sup>2</sup> Further in his testimony, ATC  
9 witness Mr. Dagenais also indicated that ATC's studies show that the Arrowhead  
10 Alternative would allow for increased west-to-east (Minnesota to Wisconsin) flow of  
11 electricity when compared to MP's proposal. Ex. ATC-\_\_\_\_, at 31 (Dagenais Direct). In  
12 response to an LPI information request, however, ATC stated that MP's study showing 7-  
13 10% increases in power flowing into Wisconsin was only one study point. At other times,  
14 such as when the North Dakota wind generators are not functioning or have low output,  
15 ATC states that it is likely that more power would flow from Wisconsin to Minnesota.  
16 MZ-R-5 (Zajicek Rebuttal Attachments).

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<sup>2</sup> See Nuclear Regulatory Commission's *What is a Megawatt?* At <https://www.nrc.gov/docs/ML1209/ML120960701.pdf>

1 **Q. How would the increased flow of power from Minnesota to Wisconsin affect the**  
2 **benefits from the Project for Minnesota customers?**

3 A. It would likely decrease the benefits for Minnesota customers as less of the power being  
4 transferred by the HVDC line would be available to them, likely leading to increases in  
5 the locational marginal price via MISO dispatch. While ATC notes that power flows may  
6 go in the other direction when the North Dakota wind generators are not producing  
7 power, this already occurs as long as power flows are below the 800 MVA limit. By ATC's  
8 own admission the Arrowhead PST has not been being used to limit power flows under  
9 the current operation of the system and therefore eliminating the Arrowhead PST would  
10 not likely result in large changes to power transfers from Wisconsin to Minnesota. Ex.  
11 ATC-\_\_\_, at 37-38 (Dagenais Direct). Where this impact will mostly be felt is if MP  
12 obtains more North Dakota wind generation, which is planned for it its IRP, which would  
13 increase the power flows along the HVDC line.<sup>3</sup> If those flows grow to the point where  
14 the Arrowhead PST would need to be used to limit power flows under the current layout  
15 (or in MP's Project proposal) than the Arrowhead Alternative would result in more  
16 benefits to Wisconsin that MP's proposed layout for the Project.

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<sup>3</sup> See Commission's *Order Approving Plan and Setting Additional Requirements* issued January 9, 2023. Docket No. E015/RP-21-33 edockets# 20231-191970-01

1 **Q. Has either party attempted to quantify the impact in terms of dollars on the benefit**  
2 **going to Wisconsin in this case?**

3 A. Yes. In response to a Department information request MP attempted to estimate the  
4 impact of losing 7-10 percent of the power from the HVDC line. MP indicated that at  
5 that 7-10 percent increased flow amount approximately 375,000 to 550,000 MWh  
6 annually would flow to Wisconsin instead of Minnesota Power customers. MP  
7 approximated obtaining replacement power for those lost MWh using the Boswell  
8 Energy Center costs and estimated over the next 30 years these costs could amount to  
9 \$150 million to \$210 million. This value does not include the costs of any ancillary  
10 service that might be required to balance voltages in MP's service area. However, MP  
11 states that this is an extremely simplistic estimate to the point where they consider it  
12 "illustrative and does not represent a firm outlook, but represents that material value of  
13 the power and energy flows in question." MZ-R-6 (Zajicek Rebuttal Attachments).

14  
15 **Q. Do you believe that the MP estimate is accurate?**

16 A. No. I believe that, as MP stated, at best it is representative of the fact that there would  
17 be costs associated with power flows into Wisconsin, and that given the long life of the  
18 Project those costs may add up. However, there are a number of concerns I have with  
19 the estimate that lead me to believe it likely over-estimates the cost to MP's customers.  
20 ATC stated that MP's estimate of 7-10% increased power flowing into Wisconsin  
21 represented only one time period and one set of conditions, and likely during other  
22 times that value would vary, likely being lower. MZ-R-5 (Zajicek Rebuttal Attachments). I

1 agree with this analysis and therefore believe that MP's estimate likely exaggerates the  
2 cost impact of the Arrowhead Alternative. It is also likely that both parties will provide  
3 rebuttal testimony regarding these power flows and I recommend that the Commission  
4 consider that information when analyzing the impact on Minnesota ratepayers.

5  
6 **Q. How are costs of the Project being recovered?**

7 A. Both proposals assume costs will be recovered from Minnesota Power's customers.

8  
9 **Q. Is this unusual?**

10 A. No. The only categories of projects that receive cost sharing under MISO are Multi-Value  
11 Projects (MVP)<sup>4</sup> and Market Efficiency Projects (MEP)<sup>5</sup> and very few projects fall into  
12 these categories, including this one. Only projects found to provide regional  
13 transmission solutions that meet one of three goals qualify as MVPs: 1) provide  
14 reliability and economically enable regional public policy needs; 2) provide multiple  
15 types of regional economic value; or 3) provide a combination of regional reliability and  
16 economic value. Generally, MVP and MEP projects address interstate border issues, and  
17 involve new projects or updating existing systems to alleviate specific constraints that  
18 are currently in operation on the system. The proposed project does not qualify as an  
19 MVP or MEP project and does not qualify for cost sharing under MISO rules.

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<sup>4</sup> See MISO *Multi-Value Projects* at <https://www.misoenergy.org/planning/multi-value-projects-mvps/#t=10&p=0&s=Updated&sd=desc>

<sup>5</sup> See MCR *MISO's New Criteria for Market Efficiency Projects* at <https://www.mcr-group.com/transmission/insights/misos-new-criteria-for-market-efficiency-projects/>

1 **Q. Could cost sharing for the Project still be implemented?**

2 A. Yes, MP and ATC could enter into an agreement to share some portion of the cost of the  
3 Project. However, no such agreement has been made and ATC has proposed that  
4 Minnesota Power customers would pay for the Arrowhead Alternative in its entirety. Ex.  
5 DOC-\_\_\_\_, at MZ-R-7 (Zajicek Rebuttal Attachments).

6  
7 **Q. Based on your analysis of the discussion of the studies submitted by the parties, what**  
8 **do you conclude with regard to the 800 MVA limit and the viability of the Arrowhead**  
9 **Alternative?**

10 A. Based on my review I conclude that the Arrowhead Alternative is a viable endpoint  
11 alternative for the Project and, based on the estimates provided by ATC, would likely be  
12 less costly than MP's proposal in construction costs. The Arrowhead Alternative would  
13 require the Commission to remove the 800 MVA limit and the Arrowhead 800 MVA PST  
14 would be removed to accommodate the flow of power into MP's system.<sup>6</sup> This,  
15 however, would likely lead to increased power flows to Wisconsin to Minnesota, which  
16 would at least to some extent decrease the benefits of the Project to MP's customers,  
17 although ATC suggests that the power flows may be lower than MP suggested. I also  
18 conclude that MP's estimate of the costs to Minnesota Power's customers of the extra  
19 power flows to Wisconsin likely overestimates the impact. Given the nature of the  
20 disagreement about the extent of increased power flows into Wisconsin, I recommend

---

<sup>6</sup> Removal of the Arrowhead PST is included in ATC's Arrowhead Alternative.

1 that the Commission consider the testimony on the topic by both parties to determine  
2 what weight to give the issue when making its decision.

3  
4 *2. State and Federal Funding*

5 **Q. Please summarize the state and federal funding issue related to the Arrowhead**  
6 **Alternative.**

7 A. MP has applied for several sources of state and federal funding to off-set costs of the  
8 Project. Some of these funds are dependent on MP achieving certain milestones related  
9 to construction of the Project. MP has expressed concerns that if the Arrowhead  
10 Alternative results in delays for the Project, some of these funds could be at risk of being  
11 lost. Ex. MP-\_\_\_, at 19-21 (Gunderson Direct).

12  
13 **Q. Did you provide testimony related to the state and federal funding in your direct**  
14 **testimony?**

15 A. Yes. However, the direct testimony of MP in this case clarified certain aspects of the  
16 funding and clarified what funding sources the Company has applied for, been granted,  
17 or is in the process of negotiating.

18  
19 **Q. Please summarize what funding MP has applied for or been granted for the Project.**

20 A. MP has been granted a \$15 million grant from the Minnesota legislature. The Minnesota  
21 Department of Commerce has granted \$10 million in matching funds from the State  
22 Competitiveness Fund Match Program if MP receives federal funding. In my direct

1 testimony I incorrectly stated that the DOC State Competitiveness Fund Match Program  
2 had granted the Company \$15 million Ex. DOC-\_\_\_\_, at 33 (Zajicek Direct). Further, the  
3 Project has been selected for and is in negotiations to receive \$50 million in federal  
4 funding from the Department of Energy (DOE) through the Grid Resilience and  
5 Innovation Partnerships (GRIP) Program round 1. MP has also submitted an application  
6 for an additional \$50 million in the second round of GRIP funding. Ex. MP-\_\_\_\_, at 13-14  
7 (Gunderson Direct). In response to a Department information request MP indicated that  
8 it was notified by the DOE on February 29, 2024, that it was encouraged to submit a full  
9 application for GRIP round 2 funding based on its concept paper. The Company's full  
10 application to the DOE is due in May 2024. Ex. DOC-\_\_\_\_, MZ-R-8 (Zajicek Rebuttal  
11 Attachments). Finally, MP states that North Dakota is currently considering granting MP  
12 loans with favorable interest rates to support the Project. Ex. MP-\_\_\_\_, at 18 (Gunderson  
13 Direct).

14  
15 **Q. What is MP's concern related to its ability to obtain these state and federal funds if**  
16 **the Arrowhead Alternative is selected?**

17 A. In Mr. Gunderson's direct testimony, he clarified that the MP does not believe the \$15  
18 million from the Minnesota legislature is at risk. He states that he believes the risk to  
19 the \$50 million GRIP round 1 funding and the \$10 million DOC matching funds only  
20 arises if the Arrowhead Alternative causes substantial delays such that MP fails to meet  
21 certain milestones that will be required to be completed within 60 months of the  
22 funding negotiations with the DOE being completed. MP states, however, that its

1 application for the GRIP round 2 funding would not be compatible with the Arrowhead  
2 Alternative and thus if the Company was selected to receive GRIP round 2 funding and  
3 the Commission orders the Arrowhead Alternative be pursued, it would be unable to  
4 receive those funds. Ex. MP-\_\_\_\_, at 19-21 (Gunderson Direct).

5  
6 **Q. Are there any other risks to these funds other than the risk of delays?**

7 A. I am not aware of any other risks to these funds. I discuss the risks of delay later in my  
8 testimony.

9  
10 **Q. What are the milestone requirements that MP must achieve to receive GRIP round 1**  
11 **funding?**

12 A. MP has not provided any details on the potential milestones for receiving GRIP round 1  
13 funding other than that they must be completed within 60 months, which would be  
14 sometime in 2029 assuming negotiations are completed in the next quarter as projected  
15 by MP. While MP states that they are making an effort to achieve an in-service data of  
16 Q4 2027 for the AC connections and the entire Project in 2028, which would achieve the  
17 60-month milestones required to obtain the GRIP round 1 funding, this is not  
18 guaranteed. Ex. MP-\_\_\_\_, at 19-21 (Gunderson Direct). I reviewed public information  
19 provided by the DOE on the GRIP program and the DOE states that "Payment will be  
20 based on expenditures incurred and authorized based on activities billed."<sup>7</sup> Although

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<sup>7</sup> See Energy.gov *Frequently Asked Questions on the Grid RESilience and Innovation Partnerships (GRIP) Program* available at <https://www.energy.gov/gdo/frequently-asked-questions-grid-resilience-and-innovation-partnerships-grip-program>



1 not entirely clear, based on my review it seems likely that some portion of the funding  
2 will be paid out based on earlier milestones for the Project, and failure to complete the  
3 entire Project by the final milestone likely would not result in the loss of all \$50 million  
4 in funding. However, to be certain I recommend that the Commission request MP  
5 provide information regarding what portion of funding might be lost if the final 60-  
6 month milestone is missed for the Project.

7  
8 **Q. Please explain why you mentioned that the Company is making an effort to achieve an**  
9 **in-service date of Q4 2027, but the Company's CN filing stated an in-service date of**  
10 **2030?**

11 A. In its CN application the Company stated that it has guaranteed a production slot with a  
12 HVDC manufacturer, but that it would prefer to have the in-service date of 2027 if  
13 possible.<sup>8</sup> It is not clear if MP will be able to meet this earlier in-service date even under  
14 the Company's proposed Project design.

15  
16 **Q. How should the Commission consider GRIP round 2 funding when making its**  
17 **decisions?**

18 A. As the Company's application for GRIP round 2 funding is still pending, it represents  
19 largely theoretical offset to the Project's total cost, and it would be difficult to base  
20 decisions on the availability of this funding at this time. As I stated previously MP was

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<sup>8</sup> See MP's *Initial Filing—Combined Application and Appendices A-H* filed 6/1/2023 in Docket E015/CN-22-607 edockets# [20236-196333-03](#) and associated other Appendices filings Page 17

1 encouraged to submit a full application for GRIP round 2 funding based on its concept  
2 paper. Ex. DOC-\_\_\_\_, MZ-R-8 (Zajicek Rebuttal Attachments). However, this step is not a  
3 guarantee that MP will receive additional federal funding for the Project.  
4

5 **Q. Does MP state why the Arrowhead Alternative would be ineligible to receive GRIP**  
6 **round 2 funding?**

7 A. In his direct testimony Mr. Gunderson only stated that “Minnesota Power’s DOE GRIP  
8 round two application will only support interconnection components of Minnesota  
9 Power’s Project configuration, including the St. Louis County 345 kV/230kV Substation.”

10 In response to an information request MP elaborated that the Project qualifies due to  
11 the use of innovative technologies, including those at the proposed St. Louis County  
12 substation such as online monitoring equipment and advanced communication  
13 protocols. MP clarified that if the Arrowhead Alternative was selected by the  
14 Commission the Project would no longer be eligible for GRIP round 2 funding because  
15 the full application must be consistent with the configuration proposed in MP’s concept  
16 paper, which was specific to the St. Louis County substation. MZ-R-8 (Zajicek Rebuttal  
17 Attachments).  
18

19 **Q. What do you conclude regarding state and federal funding as related to the**  
20 **Arrowhead Alternative?**

21 A. As MP is in the final negotiation stages for federal GRIP round 1 funding and the DOE  
22 has announced the Project as a partner, it is very likely that the Project receives the

1 grant of \$50 million. MP states that any delays to the Project make achieving the 60-  
2 month milestone deadline more difficult and risk the loss of this funding. However, MP  
3 has not provided any information regarding the potential milestones for the grant, and  
4 it is unclear whether delay risks the entire \$50 million or some portion of it. If the entire  
5 amount would be lost, that represents a significant risk, but if only a smaller portion of  
6 the funding would be lost from missing the final deadline it could be a lower amount  
7 than the potential savings from the Arrowhead Alternative. Additionally, MP has a  
8 guaranteed production slot from its HVDC provider for an in-service date in 2030 but  
9 hopes to achieve an earlier in-service date. If MP is unable to accelerate its in-service  
10 date, it likely will already miss the 60-month milestone requirement for the DOE GRIP  
11 round 1 funding.

12 For this reason, the Commission should consider whether it believes that MP is  
13 capable of meeting the GRIP round 1 60-month milestones and if the Arrowhead  
14 Alternative would cause delays that would prevent the Project from achieving those  
15 milestones if it were selected. I discuss the risks of delay related to the Arrowhead  
16 Alternative later in my testimony. As the GRIP round 2 funding is still in the application  
17 phase it should receive relatively little weight when making any decisions.

18  
19 **Q. Does MP request that the Commission impose any conditions on ATC if the Arrowhead**  
20 **Alternative is selected related to federal funds?**

21 A. Yes. Mr. Gunderson proposes that ATC must comply with all compliance requirements  
22 set forth in the cooperative agreement for the federal grant from the DOE and in the

1 event that ATC's action or inaction results in the loss of any funding, that ATC be  
2 required to provide financial support to make up for any loss of funding. Ex. MP-\_\_\_\_, at  
3 35 (Gunderson Direct).

4  
5 **Q. Is such a condition within the Commission's authority to impose?**

6 A. I am not a lawyer and am unable to provide any testimony regarding this condition, or  
7 any others proposed by MP, is within the Commission's authority. However, the  
8 Department will address this in briefs.

9  
10 *3. Risk of Delays*

11 **Q. Please summarize what the risks of delays are to the Project?**

12 A. As discussed previously, if delays cause MP to fail to achieve its milestones for federal  
13 GRIP funding, some cost mitigating grants could be lost. In addition, outages are  
14 increasing on the line and if the converter station's primary equipment fails and is  
15 unable to be repaired there could be significant outage costs, with delays potentially  
16 leading to an overall increase in cost. However, future outage costs are not knowable  
17 and mainly represent a potential risk. While parties have discussed potential delays in  
18 obtaining transformers and breakers for the Project, the primary point of concern seems  
19 to be various studies that might need to be redone that would delay MISO approval and  
20 delay the design and construction process for the HVDC Converters themselves. For this  
21 reason, I focus on the potential delays to the studies rather than discuss other specific  
22 equipment delays.

1 **Q. Does ATC believe that the Arrowhead Alternative can achieve the targeted in-service**  
2 **dates of the Project?**

3 A. Yes. In his direct testimony Mr. Johanek provides a high-level schedule for construction  
4 of the Arrowhead Alternative that shows that ATC can meet the April 2030 in-service  
5 date for the Project. Ex. ATC-\_\_\_\_, at 8-9 (Johanek Direct). ATC notes that the existing  
6 345 kV/230 kV would be sufficient to support the Project prior to the planned  
7 installation of a second transformer in the Arrowhead Alternative, so delays related to  
8 being able to obtain additional transformers could be accommodated. Ex. ATC-\_\_\_\_, at  
9 20-21 (Dagenais Direct).

10  
11 **Q. Does MP have concerns related to the Arrowhead Alternative causing delays for the**  
12 **Project?**

13 A. Yes. MP is concerned that the Arrowhead Alternative will result in delays of certain  
14 studies and require the Company to re-do MISO processes. MP expresses concerns  
15 about ATC's ability to procure certain components for the Arrowhead substations on  
16 time due to long lead-times necessary.

17  
18 **Q. Please summarize MP's concerns with the Arrowhead Alternative with respect to**  
19 **delays to the Project due to necessary studies required to be completed or redone.**

20 A. First, as discussed previously, MP has stated that while it has a confirmed slot to obtain  
21 the equipment necessary for a 2030 in-service date, the Company is attempting to  
22 achieve a 2027/2028 in-service data if possible. Ex. MP-\_\_\_\_, at 19-21 (Gunderson

1 Direct). To that that end, MP witness Mr. Gunderson expressed concerns that, given the  
2 mostly conceptual nature of the Arrowhead Alternative as of September 2023, ATC  
3 would not be able to achieve the 2030 in-service date let alone an accelerated 2028 in-  
4 service date. Ex. MP-\_\_\_\_, at 23-24 (Gunderson Direct). Mr. Winter further elaborated on  
5 MP's concerns, noting that the Project has completed a number of studies, including  
6 MISO required studies, and obtained a Facilities Construction Agreement (FCA) with  
7 MISO. The FCA outlines the terms and obligations associated with constructing the  
8 upgrades necessary to accommodate the Project on the MISO system. Mr. Winter states  
9 that many of these studies would likely need to be redone given the alternative  
10 endpoint, and that it is likely that the FCA would need to be restudied and renegotiated.  
11 Mr. Winter states that according to the MISO business manual the restudies could take  
12 up to 300 days. Further, Mr. Winter states that MP's studies provide technical  
13 information necessary for the HVDC supplier to begin its design and construction of the  
14 HVDC converter stations, and therefore if the studies need to be updated the design  
15 process for the HVDC converter stations would need to be paused. Mr. Winter estimates  
16 that it would take up to 6 months of this study process before MP could begin updating  
17 the input studies for the HVDC supplier as it would require detailed designs for the ATC  
18 Arrowhead Alternative, and that total delays from the MISO process and HVDC  
19 converter station designs could amount to approximately 12 months. MP indicates that  
20 if delays exceed 15 months, the Company would likely lose its slot with the HVDC  
21 manufacturer, which would push the project back by 24 months. Ex. MP-\_\_\_\_, at 22-34  
22 (Winter Direct). Mr. Winter states that the studies required by the HVDC supplier have

1           been in progress for over a year and likely will continue until 2025 even under MP's  
2           proposed Project timeline Ex. MP-\_\_\_\_, at 71-72 (Winter Direct).

3  
4           **Q.   What analysis did you perform to attempt to confirm these delay risks.**

5           A.   As I am not an engineer, I am unable to speak to the necessity of updating certain  
6           studies for the HVDC converter stations. However, I consulted with MISO regarding the  
7           potential need to re-do or update MISO studies and the associated timeline and I have  
8           reviewed MISO's business practices manual regarding this process. Some TSRs have  
9           taken up to 300 days to process.<sup>9</sup> Ex. DOC-\_\_\_\_, MZ-R-11 (Zajicek Rebuttal Attachments).

10          I conclude that because the Arrowhead Alternative changes the endpoint and removes  
11          the Arrowhead PST, it is possible that a new TSR would be needed for the Project.

12                 In response to an information request ATC indicated that its proposed high-level  
13          schedule does not specifically account for the time that might be required for MISO to  
14          study the Arrowhead Alternative, but that sufficient time is included in the schedule,  
15          since regardless of which alternative is selected, MP will need to seek further MISO  
16          approvals that allow for input from other stakeholders. MZ-R-9 (Zajicek Rebuttal  
17          Attachments).

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<sup>9</sup> MISO Business Practices Manual 20 available at <https://www.misoenergy.org/legal/rules-manuals-and-agreements/business-practice-manuals/>

1 **Q. Please summarize MP's concerns related to the procurement of equipment for the**  
2 **Arrowhead Alternative.**

3 A. Mr. Winter states that MP has already executed a transformer slot reservation and  
4 supply agreement for the St. Louis County 345 kV/230 kV transformers which sets a  
5 delivery date of August 2027. Mr. Winter also states that MP has been informed that  
6 lead times for circuit breakers are up to almost three years. Ex. MP-\_\_\_\_, at 75-77  
7 (Winter Direct). MP stated that, based on a response from ATC to an information  
8 request, ATC has not begun any procurement processes and MP is concerned that given  
9 these long lead times ATC will not be able to secure the necessary equipment early  
10 enough to prevent delays. Ex. MP-\_\_\_\_, at 24-25 (Gunderson Direct).

11  
12 **Q. Did ATC build lead-times for equipment into its schedule?**

13 A. Yes. ATC built lead times into its schedule based on times communicated to them by  
14 their vendors and ATC expressed confidence that they can achieve the 2030 in-service  
15 date.

16  
17 **Q. Based on your review, what do you conclude?**

18 A. I conclude that MP's primary goal appears to be achieving an in-service date earlier than  
19 its guaranteed 2030 production slot with its HVDC vendor. I am unable to speak to the  
20 feasibility of MP achieving this goal. However, given ATC's own schedule targeting a  
21 2030 in-service date and based on the likely delays related to the MISO process and  
22 studies necessary to complete the necessary HVDC planning before design can begin, I



1 am convinced that achieving an in-service date earlier than the 2030 date is unlikely.  
2 Assuming the 60-month milestones require the Project to be completed by 2029, it is  
3 likely that some portion of the federal funding might be lost. However, no information  
4 has been submitted by MP stating how much of the \$50 million might be lost due to  
5 missing that deadline, and MP has not responded to my information request regarding  
6 the GRIP round 1 milestones prior to rebuttal testimony despite it being served in a  
7 timely manner.

8  
9 *4. Future Expansion Considerations*

10 **Q. Please summarize the future expansion considerations and explain how they relate to**  
11 **the Arrowhead Alternative.**

12 A. In its CN application MP stated that the new St. Louis County substation would be  
13 designed to accommodate future expansion of the HVDC system and regional high  
14 voltage AC transmission development and will include room for several 345 kV line  
15 additions and an additional 345 kV/230 kV transformer.<sup>10</sup> In Mr. Winter's direct  
16 testimony, he states that the St. Louis County substation was originally a MISO concept  
17 for establishing a regional transmission hub in northeastern Minnesota. MP expressed  
18 concern that the Arrowhead 345 kV substation has limited room to be expanded to  
19 facilitate future additional 345 kV transmission connections, as the Arrowhead 345 kV  
20 substation is bordered on three sides by constraints to expansion either due to other

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<sup>10</sup> See MP's *Initial Filing—Combined Application and Appendices A-H* filed 6/1/2023 in Docket E015/CN-22-607 edockets# [20236-196333-03](#) and associated other Appendices filings Pages 6 and 11

1 existing infrastructure or environmental considerations due to wetlands and a trout  
2 stream. Ex. MP-\_\_\_\_, at Page 86 (Winter Direct).

3  
4 **Q. Please summarize ATC's position on the feasibility of expanding the Arrowhead**  
5 **substation in the future.**

6 A. ATC witness Mr. Larsen states that, after interconnecting the Project under the  
7 Arrowhead Alternative, the Arrowhead 345 kV substation would have one additional  
8 open position that could accommodate additional transmission lines in the future.  
9 However, Mr. Larsen also states that the substation's footprint can be expanded and  
10 there is some space to the south and west of the facility that is available and avoids the  
11 wetlands and trout stream discussed by Mr. Winter. Mr. Larson concludes that  
12 ultimately if the need to expand the substation arises ATC will conduct a more thorough  
13 analysis at that time. Ex. ATC-\_\_\_\_, at 8-9 (Larsen Direct).

14  
15 **Q. How much space is available for the future expansion of the Arrowhead substation**  
16 **given the constraints?**

17 A. ATC stated that it cannot provide an estimate at this time of either the space available  
18 or the potential number of 345 kV lines that could be accommodated as it has not  
19 conducted detailed planning for any expansion. However, ATC states that MISO's March  
20 4, 2024, initial draft portfolio for its Long Range Transmission Plan Tranche 2 does not  
21 currently include any 345 kV lines in the area or a new St. Louis County Substation. MZ-  
22 R-10 (Zajicek Rebuttal Attachments).

1 **Q. Would it be possible to expand the Arrowhead substation beyond the currently**  
2 **available space?**

3 A. Any future expansion would need to be assessed in more detail in the future.  
4

5 **Q. Is it necessary for the Project to have space for future expansion?**

6 A. No. While it is prudent to plan ahead, it is not strictly necessary for the Project to be  
7 designed to accommodate future 345 kV expansion in the area. ATC's discussion of  
8 MISO's most recent Long Range Transmission Plan further questions whether the  
9 availability for future expansion in the area is particularly important, as MISO seems to  
10 have no plans at the time to expand the local 345 kV system. MZ-R-10 (Zajicek Rebuttal  
11 Attachments).

12  
13 **Q. Are there costs associated with preparing the Project for future expansion**  
14 **opportunities?**

15 A. Yes. As the St. Louis County substation is being designed with to accommodate potential  
16 future 345 kV expansion in the area, some portion of the costs associated with the  
17 Project are directly related with ensuring that the substation supports future  
18 expandability. Similarly, there would be costs if the Arrowhead substation were to be  
19 expanded in the future. Any costs to expand the Arrowhead substation in the future,  
20 however, are not included in this CN and might be recovered differently through MISO  
21 and from different customers depending on the nature of the expansion.

1 **Q. What do you conclude regarding the consideration that should be given to the future**  
2 **expandability aspects of the Project?**

3 A. Given that the St. Louis County substation is being designed to accommodate potential  
4 future expansion of the 345 kV system and based on the limited space available to  
5 expand the Arrowhead 345 kV Substation it is likely that MP's proposal is more  
6 supportive of future expansion.<sup>11</sup> However, given the apparent lack of MISO plans to  
7 expand in the area, I don't believe that the support for future expansion of the 345 kV  
8 system is the most important aspect of the Project and this issue and should be given  
9 relatively less weight than other considerations.

10  
11 *5. Recommendations*

12 **Q. What do you conclude regarding the Arrowhead Alternative?**

13 A. I conclude that the Arrowhead Alternative is a viable alternative and likely has lower  
14 initial capital costs but may result in delays to the Project and the potential loss of state  
15 and federal funding opportunities, although the size of these potential losses is unclear.  
16 I also conclude that, the Arrowhead Alternative would require the Commission to lift the  
17 800 MVA limit on the Arrowhead 345 kV substation and require the removal of the  
18 Arrowhead PST, and that it would likely lead to increase power flows into Wisconsin.  
19 Increased power flows into Wisconsin from the Project would likely result in decreased  
20 benefits from the Project for Minnesota customers, but MP's estimate likely

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<sup>11</sup> See MP's *Initial Filing—Combined Application and Appendices A-H* filed 6/1/2023 in Docket E015/CN-22-607 edockets# 20236-196333-03 and associated other Appendices filings Pages 6 and 11

1 overestimates the impact. MP's proposed St. Louis County Substation would likely have  
2 more room for future 345 kV expansion and already includes some of the costs in the  
3 Project. However, the Arrowhead substation could potentially be expanded, and the  
4 costs would have the potential to be cost shared depending on MISO process and  
5 requirements. The benefits of extra room for expansion of the St. Louis County  
6 Substation appear to be limited due to an apparent lack of MISO plans to expand the  
7 345 kV system in the area.

8  
9 **Q. What do you recommend regarding the Arrowhead Alternative?**

10 A. I recommend that the Commission weight the risks I've presented in my testimony vs  
11 the potential savings and reliability benefits for the Arrowhead Alternative. Considering  
12 the complicated nature of the Project and the Arrowhead Alternative there is not a clear  
13 winner between the different endpoints. The Commission will need to decide on what it  
14 believes the likelihood of MP receiving offsetting federal and state funds to be, what  
15 risks delays from the Arrowhead Alternative might have to those funds, and the  
16 potential impact of more power flowing to Wisconsin from the Project if the Arrowhead  
17 Alternative is implemented.

18 Specifically, I recommend that the Commission consider:

- 19 1. the construction cost savings of the Arrowhead Alternative;
- 20 2. the potential increased power flows into Wisconsin and the associated impact on  
21 the benefits Minnesota ratepayers receive from the Project;

1 3. the risks for delays to the Project from the Arrowhead Alternative due to various  
2 studies needing to be redone;

3 4. the potential impact of delays on state and federal funding and the relative size  
4 of that impact;

5 5. if the Commission believes it to be likely that MP is able to obtain an in-service  
6 date prior to 2030; and

7 6. what weight to put on the benefits of the proposed St. Louis County substation's  
8 design for future expandability of the local 345 kV transmission system.

9 Finally, I also recommend that the Commission require MP to provide  
10 information regarding the milestones for obtaining federal funds from the GRIP round 1  
11 funding and what portion of those funds might be lost if there are delays that cause the  
12 Project to not be completed by the 60-month deadline prior to making its decision.

13  
14 **V. SUMMARY OF RECOMMENDATIONS**

15 **Q. Please summarize your conclusions.**

16 A. I recommend that If the Commission finds that the proposed facility "will provide  
17 benefits to society in a manner compatible with protecting the natural and  
18 socioeconomic environments, including human health," the Commission issue a  
19 certificate of need to MP for the HVDC Modernization Project;

20 Regarding the Arrowhead Alternative, I recommend that Commission consider:

21 1. the construction cost savings of the Arrowhead Alternative;

- 1           2.       the potential increased power flows into Wisconsin and the associated impact on
- 2           the benefits Minnesota ratepayers receive from the Project;
- 3           3.       the risks for delays to the Project from the Arrowhead Alternative due to various
- 4           studies needing to be redone;
- 5           4.       the potential impact of delays on state and federal funding and the relative size
- 6           of that impact;
- 7           5.       if the Commission believes it to be likely that MP is able to obtain an in-service
- 8           date prior to 2030; and
- 9           6.       what weight to put on the benefits of the proposed St. Louis County substation's
- 10          design for future expandability of the local 345 kV transmission system.

11                   Finally, I also recommend that the Commission require MP to provide

12           information regarding the milestones for obtaining federal funds from the GRIP round 1

13           funding and what portion of those funds might be lost if there are delays that cause the

14           Project to not be completed by the 60-month deadline prior to making its decision.

15

16   **Q.   Does this conclude your rebuttal testimony?**

17   A.   Yes.

**From:** [Tricia DeBleekere](#)  
**To:** [Zajicek, Michael \(COMM\)](#); [MacAlister, Jamie \(COMM\)](#)  
**Subject:** RE: [EXT]RE: [EXT]Minnesota Power HVDC Project MTEP Project #4295  
**Date:** Thursday, March 7, 2024 2:27:45 PM  
**Attachments:** [image002.png](#)  
[image003.png](#)

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You don't often get email from [pdebleekere@misoenergy.org](mailto:pdebleekere@misoenergy.org). [Learn why this is important](#)

Hi Michael,

This is what we have compiled/reviewed with our team regarding this project and the processes.

### **MISO FCA and TSR Background/Status of MTEP 4295**

The MISO Tariff and BPMs do not list specific project changes necessitating restarting the Facilities Construction Agreement (FCA) or triggering a new Transmission Service Request (TSR) process; instead, MISO applies its engineering judgment to determine if there is a need for a new system impact study (SIS).

Transmission service is granted based upon analysis of a specific source and sink, and the results of study methodology outlined in Module B (Transmission Service). In general, if the source and sink of the TSR changed, or if there were major topological changes to consider, the TSR process would need to start again. Restarting the process could impact required network upgrades, captured in Appendix A of the FCA. Since there is not an option to “re-evaluate” a request, the existing request would likely need to be terminated and the process restarted with a new service request.

MTEP project 4295 was a \$800 million project submitted into Appendix B of MTEP13 to upgrade the existing Square Butte – Arrowhead HVDC line to new equipment. The actual System Impact Studies, Facilities Studies, and eventual Facilities Construction Agreement were facilitated through the TSR requests submitted for additional transmission service across the HVDC. Those TSR requests were submitted in 2020 and the last request was finalized in 2023. Those studies can be found on our OASIS.

[https://www.oasis.oati.com/woa/docs/MISO/MISODocs/Transmission\\_Studies.html](https://www.oasis.oati.com/woa/docs/MISO/MISODocs/Transmission_Studies.html) The Facilities Construction Agreements were submitted to FERC yesterday for approval under [Docket No. ER24-1409-000](#), with a requested effective date of February 28, 2024 (but, again, noting it has been under study since 2020).

Restarting the TSR process requires a new system impact study. A facilities study is only required if a need for network upgrades came out of the system impact study. Transmission service requests are first-come, first-served, so restarting the process would require a new study to include any updates from higher-queued TSRs or changes in the models. If the changes to the source and sink were to affect the results of the SIS and associated upgrades, the potential cost of moving the parameters could be large, particularly considering that network upgrades in this case approached \$1 billion.

Another factor to consider is timeline. Some TSRs have taken 300 days to process in the past. As part of the process, MISO includes a good-faith estimate of the time needed to complete



the study, which depends on the number of studies ahead of it and the complexity of the study itself. The timeline also depends on the availability and timeliness of the Transmission Owners involved. Deposits are required for each System Impact Study (\$20,000) and Facilities Study (\$100,000.)

**Tricia DeBleekere**

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[pdebleeckere@misoenergy.org](mailto:pdebleeckere@misoenergy.org)



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**From:** Zajicek, Michael (COMM) <[michael.zajicek@state.mn.us](mailto:michael.zajicek@state.mn.us)>  
**Sent:** Thursday, March 7, 2024 2:15 PM  
**To:** MacAlister, Jamie (COMM) <[jamie.macalister@state.mn.us](mailto:jamie.macalister@state.mn.us)>; Tricia DeBleekere <[PDeBleekere@misoenergy.org](mailto:PDeBleekere@misoenergy.org)>  
**Subject:** [EXT]RE: [EXT]Minnesota Power HVDC Project MTEP Project #4295

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Hi Tricia,

Just wanted to check back in on this. Sorry it was such short notice but unfortunately testimony deadlines are what they are.

Thanks!

Michael Zajicek

---

**From:** MacAlister, Jamie (COMM) <[jamie.macalister@state.mn.us](mailto:jamie.macalister@state.mn.us)>  
**Sent:** Wednesday, February 28, 2024 9:08 PM  
**To:** Tricia DeBleekere <[PDeBleekere@misoenergy.org](mailto:PDeBleekere@misoenergy.org)>; Zajicek, Michael (COMM) <[michael.zajicek@state.mn.us](mailto:michael.zajicek@state.mn.us)>  
**Subject:** RE: [EXT]Minnesota Power HVDC Project MTEP Project #4295

Hi Tricia,

Thanks for the quick response! If we could get something by idle of next week, say 3/7, that would be great!

Nice to hear from you, too!

JM

Jamie MacAlister (she/her)  
Supervisor, Planning and Telecom Units  
651-539-1775  
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85 7th Place East, Suite 280 | Saint Paul, MN 55101



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**From:** Tricia DeBleeckere <[PDeBleeckere@misoenergy.org](mailto:PDeBleeckere@misoenergy.org)>  
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**Cc:** MacAlister, Jamie (COMM) <[jamie.macalister@state.mn.us](mailto:jamie.macalister@state.mn.us)>  
**Subject:** Re: [EXT]Minnesota Power HVDC Project MTEP Project #4295

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Hi Michael (and Jamie!),  
I'll have someone look into this. I assume it won't take too long to get back to you, but do you have a date you'd need this by?

Nice to hear from you both!  
Tricia

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**From:** Zajicek, Michael (COMM) <[michael.zajicek@state.mn.us](mailto:michael.zajicek@state.mn.us)>  
**Sent:** Wednesday, February 28, 2024 1:38:37 PM  
**To:** Tricia DeBleeckere <[PDeBleeckere@misoenergy.org](mailto:PDeBleeckere@misoenergy.org)>  
**Cc:** MacAlister, Jamie (COMM) <[jamie.macalister@state.mn.us](mailto:jamie.macalister@state.mn.us)>  
**Subject:** [EXT]Minnesota Power HVDC Project MTEP Project #4295

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Hi Tricia,

I was wondering if you might be able to put me in touch with someone that would know a little bit about Minnesota Power's HVDC Project (MTEP #4295). Specifically we have a ongoing contested case regarding the endpoint of the line between Minnesota Power and American Transmission Company (ATC) with a short deadline (Testimony due March 11) and wanted to confirm some information with MISO.

MP stated they have a Facilities Construction Agreement (FCA) with MISO and have completed the Transmission Service Request (TSR) study process for the Project. ATC is proposing an alternative endpoint in the case, and MP is stating that the existing FCA would need to be modified or cancelled and the TSR study process would need to be restarted beginning with a new system impact study, followed potentially by a facilities study, before the FCA could be updated or a new one issued. MP also states that after this MISO would need to determine how the Long Range Transmission Plan Tranche 2 model would be impacted.

MP states that the MISO Business Practices Manual 20 lays out the process and timelines for most of these steps and estimates that overall it would take up to 300 days before negotiations for a new FCA could occur. Overall MP estimates that delays of approximately 12 months could result due to MISO studies needing to be redone.

I was hoping you could put me in contact with someone who could confirm if this process would need to be restarted assuming a change in the endpoint of the project, and if the timelines MP stated seem correct.

I realize this email has both a lot of information and also not nearly as much as might be needed to fully assess everything, so please let me know if you have any questions.

Thanks!

**Michael Zajicek**  
Public Utilities Analyst Coordinator  
Minnesota Department of Commerce  
Regulatory Planning Analysis

651-539-1830

[mn.gov/commerce](http://mn.gov/commerce)

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MZ-R-11

MPUC Docket No. E015/CN-22-607

OAH Docket No. 5-2500-39600

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## **CERTIFICATE OF SERVICE**

I, Sharon Ferguson, hereby certify that I have this day, served copies of the following document on the attached list of persons by electronic filing, certified mail, e-mail, or by depositing a true and correct copy thereof properly enveloped with postage paid in the United States Mail at St. Paul, Minnesota.

**Minnesota Department of Commerce  
Errata to Rebuttal Testimony of Michael Zajicek**

**Docket No. E015/CN-22-607 and E015/TL-22-611**

Dated this **14<sup>th</sup>** day of **March 2024**

**/s/Sharon Ferguson**

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