

March 16, 2016

MEMORANDUM

TO: Public Service Commission
FROM: Neil Templeton, Will Rosquist
SUBJECT: Dockets D2013.5.33 and D2014.5.46, NorthWestern Electricity Supply Cost Trackers

PURPOSE

This memo reviews evidence and argument in Dockets D2013.5.33 and D2014.5.46 regarding the question of whether the Commission should determine that incremental costs attributable to an outage at Colstrip Unit 4 (CU4) were prudently incurred and should be recovered from customers.

BACKGROUND

NorthWestern recovers electricity supply costs through an accounting mechanism that records actual electric expenses and customer loads, and facilitates the establishment of rates to recover projected expenses and true-up under- and over-recoveries from prior periods. Montana law defines electricity supply costs as “the actual costs incurred in providing electricity supply service through power purchase agreements, demand-side management, and energy efficiency programs...” Mont. Code. Ann. § 69-8-103(8). Historically, tracked expenses have included purchased power costs, operating costs for owned and leased generating plants, administrative expenses, and program costs and lost revenues associated with energy efficiency and demand-side management activities.

NorthWestern filed its applications in Dockets D2013.5.33 and Docket No. D2014.5.46 on May 31, 2013, and May 29, 2014, respectively. On February 28, 2014, in Docket D2013.5.33, NorthWestern filed a Motion to Defer Proceedings and Consolidate this Docket with the 2014 Electricity Supply Tracker (Motion). On May 6, 2014, the Commission granted NorthWestern’s Motion and consolidated the 2012-2013 and 2013-2014 Electricity Supply Tracker Dockets. Notice of Commn. Action (NCA), Docket Nos. D2013.5.33/D2014.5.46 (May 12, 2014). Montana Consumer Counsel (MCC) and Montana Environmental Information Center / Sierra Club (MEIC) were granted intervention and actively participated in the proceeding.

On May 5, 2013, CU4 was taken out of service for planned maintenance involving rotor removal and core inspection. Talen Energy Montana, LLC (Talen), the plant operator, contracted with Siemens Power Generation, Inc. (Siemens) to perform the maintenance. Upon completion of the maintenance, CU4 was returned to service on June 27, 2013. On July 1, 2013, CU4’s generator went offline after experiencing a stator ground fault which caused significant damage to the generator core. Siemens repaired the damaged core by removing the rotor again and replacing and restacking the stator core laminations. This repair work kept CU4 out of service until January 23, 2014. The CU4 plant owners’ insurer, FM Global, covered \$26.5 million of the cost to repair the core. NWE-40, 4:12-15; Tr. 261:23-25.

NorthWestern did not initially account for the incremental cost of replacing CU4 generation during the period the plant was out of service due to the core failure. After it had filed its application to recover these incremental costs, and after Commission staff estimated a possible incremental cost of \$11.135 million, NorthWestern provided an estimate of \$8.243 million. NWE-34, 11:1-2, MCC-4, 14:6-12.

Talen retained Ronald Halpern and Robert Ward, engineers specializing in large electric generators, to perform a root cause analysis (RCA) of the outage, which was completed on November 18, 2013. NWE-38, 5:18-6:3. The RCA concluded that a combination of inadequate interlaminar insulation and damage from the rotor, skid pan, or air gap baffles during generator reassembly likely caused stator laminations to short, generating heat that further damaged the core by melting laminations. NWE-38, 7:5-16; proprietary internal exhibit (RAH-4), p. 1. Halpern and Ward later filed rebuttal testimony on behalf of NorthWestern.

The ownership and operating agreement (operating agreement) between NorthWestern and the other Colstrip Unit 3 & 4 owners speaks to consequential damages, including replacement power costs, in the event of a maintenance-related outage. DR MCC-19, Attachment. Under the operating agreement, each of the plant's owners/users releases all other owners/users and their respective agents from any consequential damages, including any replacement power costs, arising out of the operation, maintenance, or repair of the plant. MCC-19, Attachment, Section 3, Amendment 2, p. 23.

In addition, the supply and service agreement between Siemens and Talen, which governed both the initial maintenance and the subsequent core repair, also speaks to consequential damages. According to that agreement, these parties agree that neither party, nor its suppliers, will be liable for:

[A]ny indirect, special, incidental or consequential loss or damage whatsoever; loss of anticipated profits or revenue (excluding any profit that may be due contractor for work performed); loss of use of material, equipment or power system; including, but not limited to capital cost, fuel cost and cost of purchased or replacement power; or loss of use or claims of customers."

DR MEIC-69, p. 40.

The Seimens-Talen supply and service agreement also addresses third party rights, stating: "Nothing contained in this Agreement shall be construed or interpreted in any manner whatsoever as conferring any right of any nature upon any person or entity not a party to this Agreement." *Id.* p. 36, Tr. 309:9-18.

Talen and NorthWestern operate their respective shares of Colstrip Units 3 & 4 according to a reciprocal sharing agreement. DR MCC-24, Attachment 1. Under this agreement, NorthWestern and Talen each have rights to 15% of the generating capacity at CU3 and CU4. *Id.* p.2. As a result, while CU4 was out of service, each party lost 111 MW of production. NWE-33, 9:18-23.

Mont. Code Ann. § 69-8-210(1) states that the Commission must establish a mechanism that provides a utility full recovery of prudently incurred electricity supply costs, subject to the provisions of § 69-8-419, which states that a utility must manage a portfolio of supply resources, manage and mitigate risks related to the provision of supply service, and provide supply and related services at just and reasonable rates. In addition, Mont. Code Ann. § 69-8-421(9) states that the Commission can disallow rate recovery for costs that result from a utility's failure to reasonably manage, dispatch, operate, maintain or administer supply resources in a manner consistent with § 69-3-201, § 69-8-419, and Commission rules.

In a prior tracker docket involving an outage at the Dave Gates Generating Station (DGGS), the Commission did not allow NorthWestern to recover about \$1.4 million in additional costs for replacement service. Docket No. D2012.5.49, Order 7219h (October 28, 2013). The Commission found that rates would not be just and reasonable if they included additional costs attributed to the outage. The Commission's decision was based on four key findings:

- 1) NorthWestern failed to evaluate the availability, price, and terms of outage insurance, which guaranteed that any outage-related incremental costs would be unavoidable. NorthWestern's failure to evaluate outage insurance rendered it incapable of showing that outage-related incremental costs were prudently incurred. *Id.*, ¶ 34.
- 2) NorthWestern failed to identify the risk of incurring outage-related incremental costs, contrary to statutory objectives it is obligated to pursue in providing electricity supply service. *Id.* ¶ 114, MCA §§ 69-8-210(1), 69-8-419(2)(c).
- 3) NorthWestern did not reasonably manage and operate the plant because it allowed the plant's units to ramp at rates that exceeded specified limits, failed to monitor ramp rates, and failed to retain certain ramp rate data. The failure to reasonably manage and operate the plant caused the incremental costs and revealed management's inadequate situational awareness of a new one-of-a-kind power plant. Order 7219h, ¶¶ 35-36, 155.
- 4) As the plant's owner and operator, NorthWestern was in a better position than its customers to prevent the outage and its resulting costs. It would not be fair or equitable to impose the outage-related incremental costs on customers because that would allow NorthWestern to escape any cost responsibility for an outage that it was in the best position to prevent. *Id.* ¶ 29.

In this case, MCC and MEIC both oppose the recovery of CU4 outage-related costs from customers. These parties contend that NorthWestern did not demonstrate that CU4 outage-related incremental costs were prudently incurred. They assert that NorthWestern failed to evaluate the availability and price of outage insurance and failed to pursue or even investigate the possibility of recovering these costs from Siemens before including them for recovery from customers in electricity supply rates. MEIC also proposes reducing NorthWestern's allowed revenue to penalize the Company for failing to include sufficient information and analysis of the outage in its initial application. MEIC Response Br. p. 33. MCC also opposes USB-related lost revenue adjustments and the recovery of losses incurred through off-system hedges entered after

November 18, 2014, the date NorthWestern acquired the Hydros. However, due to the Stipulation between MCC and NorthWestern in D2014.7.58, this memorandum presumes that issues related to lost revenues and hedging are no longer contested in this case. *See Order 7375a, ¶¶ 66-69; MCC Response Brief, pp. 2-3; Docket No. D2014.7.58, Stipulation, ¶ 6(d).*

The table below shows outage-related testimony and hearing transcript references.

Outage Exhibits and Transcript Reference by Witness				
Party	Witness	Testimony	Exhibit	Transcript Reference
NWE	Kevin Markovich	Direct	NWE-33	Tr. 53:18-83:12
NWE	Kevin Markovich	Rebuttal	NWE-34	
NWE	Patrick Corcoran	Rebuttal	NWE-35	Tr. 85:18-99:16
NWE	James Goetz	Rebuttal	NWE-36	Tr. 289:16-314:25
NWE	Fred Lyon	Rebuttal	NWE-37	Tr. 101:13-140:23
NWE	Ronald Halpern	Rebuttal	NWE-38	Tr. 143:4-186:14
NWE	Robert Ward	Rebuttal	NWE-39	Tr. 188:20-198:16
NWE	Michael Barnes	Rebuttal	NWE-40	Tr. 201:2-286:22
MCC	John Wilson	Response	MCC-4	Tr. 340:19-355:22
MEIC	David Schlissel	Response	MEIC-1	Tr. 358:2-377:9

ANALYSIS

MEIC and MCC generally assert that incremental costs attributable to the need to repair CU4’s damaged stator core laminations should not be recovered from customers because NorthWestern failed to adequately identify and manage outage risk and, therefore, cannot demonstrate the prudence of replacement power costs, and failed to pursue alternative means of cost recovery. We evaluate whether the evidence supports these assertions, drawing on the Commission’s decisions in Order 7219h where appropriate.

NorthWestern took at least two significant steps to mitigate CU4 outage risk: First, the reciprocal sharing agreement with Talen reduced by half the generating capacity lost as a result of the outage; and second, property insurance purchased under the terms and conditions of the operating agreement substantially protected CU4 owners from costs associated with repairing the core damage. Tr. 261:19-263:2. The remainder of this memo analyzes whether NorthWestern should have taken other actions to identify and cost-effectively mitigate CU4 outage risk, or more reasonably manage, operate, and maintain the plant.

Outage Insurance

MEIC and MCC contend that NorthWestern failed to investigate the availability and price of outage insurance prior to the outage. MEIC Resp. Br. pp. 14-26; MCC Post-Hrg Br. pp. 12-13. NorthWestern witness, Michael Barnes, countered that none of the CU4 owners had outage insurance covering replacement power costs at the time of the July 1, 2013, outage. NWE-40, 9:4-7. Barnes' testimony indicates that an analysis of whether customers would have benefited from outage insurance based on historical information is sensitive to the time period analyzed. Analyses that Barnes performed after the outage show that purchasing outage insurance over the periods 2002-2014 and 2010-2014 would not have been cost effective, but purchasing it over the period 2009-2014 would have been cost effective. NWE-40, 8:18-17:13; internal exhibit (MJB-2); Tr. 265:12-267:9. MCC witness, John Wilson, testified that Barnes' analyses were distorted by premium quotes obtained after an "adverse experience." Tr. 341:17-23.

Like property insurance, outage insurance has a cost. Because the timing of forced outages are generally unpredictable, it follows that a primary purpose of acquiring outage insurance is to spread potentially significant outage-related replacement power costs over a longer period of time so that they are not incurred all at once when an outage occurs. Since insurers intend to profit from the sale of their products, it is reasonable to expect that, over the long-term, insurance premium payments to an insurer will exceed the insurer's outlays. Therefore, outage insurance should be considered a hedge against significant short-term supply cost increases due to an outage. In the long-term, total costs will likely be higher but the risk of cost spikes from outages is reduced.

NorthWestern did not evaluate outage insurance for CU4 prior to the outage. As it did in the case of the DGGs outage, the Commission could find that NorthWestern failed to show that replacement power costs were prudently incurred, given that in this case, as in the DGGs case, the failure to evaluate the availability, price, and terms of outage insurance guaranteed that outage-related incremental replacement costs would be unavoidable. However, the CU4 outage differs from the DGGs case because CU4 is not a new, one-of-a-kind plant. CU4 is similar to many operating coal plants and has a long operating history. In addition, there is evidence that the Colstrip co-owners, having similar information as NorthWestern, did not purchase outage insurance, although there is no evidence on whether or not they recently evaluated such insurance. Although this case involves the same issue as the DGGs outage case – whether incremental replacement costs were prudent when NorthWestern failed to evaluate outage insurance – the underlying facts are different. The Commission should consider the different factual circumstances related to the CU4 outage when deciding whether, in this case, the outage costs were prudently incurred.

Alternative Cost Recovery Options

MEIC asserts that NorthWestern's outage-related incremental costs were not prudently incurred, in part because NorthWestern did not evaluate whether some or all of the replacement costs could be recovered from Siemens. MEIC Resp. Br. pp. 26-30. Generally speaking, in the public utility context, prudence involves exercising judgment and choosing those alternatives that a reasonable utility manager would choose in the same or similar circumstances given the same information. In that regard, Barnes testified that to his knowledge, neither NorthWestern's CU4 co-owners, who were party to the same operating agreement as NorthWestern, nor the insurer, FM Global, filed or intends to file suit against Siemens. NWE-40, 4:7-15. There is no evidence of the internal deliberations of these entities regarding the merits of legal action against Siemens, but NorthWestern testified that such action, whether against Siemens or Talen, would have little chance of succeeding. NWE-36, 7:2-8:10, 9:5-10:20. However, NorthWestern did not show that it evaluated options for recovering replacement costs from Talen or Siemens before it filed its application to recover replacement costs from customers; it ultimately evaluated legal probabilities late in this proceeding, when it hired James Goetz to rebut MEIC's testimony. The Commission could find that NorthWestern's failure to show that it timely evaluated alternatives to recovering replacement costs from customers represents: 1) a failure to prudently manage the CU4 resource; 2) a failure to identify, manage, and mitigate risk; and 3) a failure to thoroughly document management decision-making pursuant to Admin. R. Mont. 38.5.8201(3).

MEIC's argument that outage-related incremental costs are imprudent when a utility fails to thoroughly consider and analyze legal action against the entity that caused the outage is a new argument that the Commission did not hear or address in the case of the DGGS outage.

Management, Operation, and Maintenance of CU4

CU4's generator core is composed of thousands of steel laminations stacked face-to-face and insulated from each other by an extremely thin (a fraction of one thousandth of an inch) coating of a material called Alkophos. NWE-38, 8:5-9; Tr. 147:2-12. Alkophos is intended to prevent interlaminar contact and shorting that would allow that portion of the core to act as a conductor and generate heat. NWE-38, 8:11-14. According to the RCA, a combination of inadequate interlaminar Alkophos insulation and damage from the rotor, skid pan, or air gap baffles during generator reassembly likely caused laminations to short, resulting in sufficient heat to melt the core and require an extended repair outage. Inadequate insulation may be found either on the faces of the laminations, or on the edge of the laminate. Tr. 147:13-148:5; 190:8-22; proprietary internal exhibit (RAH-4), pp. 28-29, 43. Contact between four or five laminations can create enough heat to melt the core. NWE-38, 8:14-17; proprietary internal exhibit (RAH-4), p. 29.

In order to test generator cores for potentially damaging shorts between laminations the utility industry uses an instrument called an electromagnetic core imperfection detector (El Cid). It is considered standard practice to perform El Cid tests on generator cores during outages and

following core maintenance. NWE-38, 12:11-15. Halpern testified that while it is possible to perform an El Cid test after reinstalling the rotor and removing the skid pan, it is not common. Tr. 176:4-5; 177:1-5. Ward testified that an El Cid test takes about four hours to complete. *Id.* 191:5-6.

Three El Cid tests were performed on CU4's core during the generator overhaul, all of them before the rotor was reinstalled. According to Halpern, these tests would have detected any shorts between laminations at the time of the tests. Tr. 150:10-151:4. However, because these El Cid tests were performed before the rotor was reinstalled, they could not have detected any shorts caused by the rotor, skid pan, or air gap baffles contacting the core during reassembly. *Id.* 169:15-170:6. Halpern stated that he knows of no utility that performs El Cid tests after installing the rotor and removing the skid pan. He stated that such testing is not warranted because the statistical probability of core damage from reassembly of the rotor "very, very low." *Id.* 177:17-22, 182:12-19.

Although the statistical probability of damaging the core during reassembly of the rotor may be very low, this does not mean that the risk is low because risk, in this instance, is an amalgam of probability and cost. In fact, Siemens knew there were operational risks of rotor-out maintenance before the CU4 event. Halpern acknowledged the risk associated with rotor-out maintenance and confirmed that the risk is one reason for an observed increase in the time period between major generator maintenance events in the industry. Tr. 154:16-25; DR MEIC-89, Attachment 2, 12:13-23.

The source of the risk is clear. Halpern testified that a 50 ton generator rotor must be inserted into the cylinder within the core with only an inch or two clearance around the rotor's perimeter. A slight shift in the position of the rotor can damage the core without the maintenance crew even knowing. *Id.* 178:12-25. With respect to the CU4 event, he stated that it was probably very subtle and went unnoticed. *Id.* 183:22-184:7. Yet the result was tens of millions of dollars in repair costs, loss of service for about six months, and incremental replacement power costs of over \$8 million for NorthWestern alone.

Given the known risk, NorthWestern's claim that it is not industry standard practice to perform another El Cid test following the insertion of the rotor into the core, when that test could detect potentially catastrophic core damage that might otherwise go unnoticed, is at least questionable, if not unpersuasive, particularly in light of its own testimony that such a test is neither prohibitively expensive nor time consuming. Tr. 191:3-6, 228:4-8. In fact, this conclusion seems valid in light of Talen's decision, following the CU4 event, to modify its rotor-out inspection procedures so that an additional El Cid test is performed after installing the rotor and removing the skid pan. DR MEIC-062(c), Tr. 227:11-19.

After acknowledging the known risk of damaging the core while installing the rotor, NorthWestern contended that it was more likely that core damage occurred during installation of the air gap baffles. Ward suggested that he was about 75 percent sure that the stator laminations were damaged during this process. Tr. 196:21-23. Notably, the RCA does not reach the same conclusion; it finds that damage likely resulted from rotor insertion, skid pan insertion and removal, or air gap baffle installation, but it does not assign separate likelihoods. The record does

show that an El Cid test cannot be performed after installation of the air gap baffles because there is not sufficient space for the equipment. NWE-38, 12:15-17. However, Ward declined to say whether something could have been done better to avert damaging the core while installing the air gap baffles. Tr. 198:14-16. Ward's conspicuous non-answer to a direct question about other risk-mitigating options at that stage of reassembly provided scant support for NorthWestern's position.

In sum, the record shows: 1) there is a risk of core damage during the rotor reassembly phase of a rotor-out maintenance operation; 2) NorthWestern was aware of the risk; 3) damage during rotor reassembly was determined to be the likely cause of the CU4 outage; 4) an El Cid test performed after rotor installation and skid pan removal can cost-effectively identify core damage attributable to the rotor installation procedure; and 5) an El Cid test was not performed at this stage of the reassembly of the CU4 generator during its rotor-out maintenance. There is conflicting evidence in the record regarding whether the CU4 maintenance procedure conformed to industry standards. As it did in the DGGs case, the Commission could find that NorthWestern failed to show that it reasonably managed, operated, and maintained CU4.

NorthWestern bears the burden of demonstrating that its electricity supply costs were prudently incurred. In this case NorthWestern is seeking full recovery of its outage-related incremental replacement power costs, and so NorthWestern must carry the burden of showing that all such costs were prudently incurred. Based on the record in this case, the Commission could find that NorthWestern did not adequately demonstrate the outage-related incremental costs were prudently incurred.

Other Concerns

NorthWestern proposed to recover these costs from customers within its application filed May 29, 2014. Its application acknowledged but did not quantify the incremental replacement power costs attributable to the outage.

The RCA was completed on November 18, 2013, yet NorthWestern failed to mention the RCA or sponsor testimony from Halpern and Ward, the authors of the RCA, in its May 2014 application. MEIC requested final reports from any investigation into the cause of the outage in data request MEIC-9 on September 29, 2014. NorthWestern submitted a protected copy of the RCA on February 18, 2015 in an updated response to this request, 15 months after the final report was completed.

MEIC criticized NorthWestern for failing to submit adequate information on outage-related incremental costs in its initial application. MEIC Resp. Br. pp. 30-32. MEIC claims this failure forced intervenors to obtain information through the discovery process and hampered their ability to evaluate the Company's proposal. *Id.* p. 32. MEIC argued that NorthWestern should have known that information concerning the cause of the outage such as the RCA would be essential to an investigation of cost prudence, and should have made efforts to protect such information and

disclose it with its initial filing or very shortly thereafter. *Id.* MEIC claimed that NorthWestern's failure to do so unnecessarily delayed the proceeding. *Id.*

Even if there was no obligation to sponsor them, it is noteworthy that NorthWestern did not sponsor witnesses from Talen or Siemens, the two entities with the most direct knowledge of the outage and its probable causes. In fact, NorthWestern sponsored a number of new expert witnesses in rebuttal and could have sponsored Talen and Siemens witnesses at that time.

NorthWestern's failure to present basic information in the early stages of this proceeding about the cause and cost of the outage from the individuals with the most direct knowledge was procedurally unfair to intervenors. By withholding this basic information until later in this proceeding, NorthWestern made it harder to meet its burden of proof. For the reasons discussed above, it probably did not.