

Exhibit No.:
Issues: Weather Normalization
Witness: Shawn E. Lange
Sponsoring Party: MO PSC Staff
Type of Exhibit: Rebuttal Testimony
Case No.: EC-2014-0223
Date Testimony Prepared: June 6, 2014

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY OPERATIONS

REGULATORY REVIEW DIVISION

REBUTTAL TESTIMONY

OF

SHAWN E. LANGE

NORANDA ALUMINUM, INC., et al, COMPLAINANT,

v.

**UNION ELECTRIC COMPANY, d/b/a
AMEREN MISSOURI RESPONDENT**

CASE NO. EC-2014-0223

*Jefferson City, Missouri
June 2014*

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI**

Noranda Aluminum, Inc., et al,)	
)	
Complainants,)	
)	
v.)	Case No. EC-2014-0223
)	
Union Electric Company, d/b/a)	
Ameren Missouri)	
)	
Respondent.)	

AFFIDAVIT OF SHAWN E. LANGE

STATE OF MISSOURI)
) ss
COUNTY OF COLE)

Shawn E. Lange, of lawful age, on his oath states: that he has participated in the preparation of the following Rebuttal Testimony in question and answer form, consisting of 4 pages of Rebuttal Testimony to be presented in the above case, that the answers in the following Rebuttal Testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true to the best of his knowledge and belief.

Shawn E. Lange

Shawn E. Lange

Subscribed and sworn to before me this 6th day of June, 2014.

SUSAN L. SUNDERMEYER Notary Public - Notary Seal State of Missouri Commissioned for Callaway County My Commission Expires: October 03, 2014 Commission Number: 10942086
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Susan L. Sundermeyer

Notary Public

1 **REBUTTAL TESTIMONY**

2 **OF**

3 **SHAWN E. LANGE**

4 **NORANDA ALUMINUM, INC., et al, COMPLAINANT,**

5 **v.**

6 **UNION ELECTRIC COMPANY, d/b/a**
7 **AMEREN MISSOURI RESPONDENT**

8 **CASE NO. EC-2014-0223**

9 Q. Please state your name and business address.

10 A. My name is Shawn E. Lange and my business address is Missouri Public
11 Service Commission, P.O. Box 360, Jefferson City, MO 65102.

12 Q. What is your present position with the Missouri Public Service Commission
13 (Commission)?

14 A. I am a Utility Engineering Specialist III in the Engineering Analysis Section,
15 Energy Unit, Regulatory Review Division.

16 Q. Would you please review your educational background and work experience.

17 A. In December of 2002, I received a Bachelor of Science Degree in Mechanical
18 Engineering from the University of Missouri, at Rolla. I joined the Commission Staff (Staff)
19 in January 2005. I am a registered Engineer-in-Training in the State of Missouri. A copy of
20 my credentials and case experience is attached as Schedule SEL-1.

21 Q. What is the purpose of your rebuttal testimony?

22 A. The purpose of my testimony is to present to the Commission Staff's weather
23 adjustment and 365-days adjustment methodology that was applied to class usage for the
24 Residential (RES), Small General Service (SGS), Large General Service (LGS), and Small
25 Primary Service (SPS) rate classes of Union Electric Company d/b/a Ameren Missouri

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1 (“Ameren Missouri” or “Company”). The same method was also used to calculate the 365-
2 days adjustment for the Large Primary Service (LPS) class. Staff witness Dr. Seoung Joun
3 Won calculated the corresponding adjustments to class revenues based on these adjustments
4 to class usage.

5 **NORMALIZATION OF USAGE**

6 Q. Why is it necessary to weather normalize electricity usage?

7 A. Electricity use is very sensitive to weather conditions. Because of the high
8 saturation of air conditioning and the presence of significant electric space heating in Ameren
9 Missouri’s service territory, the magnitude and shape of Ameren Missouri’s load is directly
10 related to daily temperatures. Since the actual daily temperatures during the test year varied
11 from normal conditions, a weather impact analysis must be performed to adjust for these
12 abnormal conditions. Staff witness Dr. Seoung Joun Won provided the actual and normal
13 weather that was used in the weather impact analysis.

14 Q. What method did you use to calculate the weather adjustments to class usage?

15 A. Staff’s model and methodology contained elements important in the class level
16 weather normalization process: use of daily load research data to determine non-linear, class-
17 specific responses to changes in temperature with the incorporation of different base usage
18 parameters to account for different days of the week, months of the year and holidays. The
19 results of Staff’s analysis were provided to Staff witness Dr. Seoung Joun Won.

20 Q. What software was used to calculate the weather adjustments to class usage?

21 A. Staff used the Itron product MetrixND to calculate the weather adjustments to
22 class usage.

23 Q. Do any Missouri electric utilities use MetrixND?

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1 A. Yes. Kansas City Power and Light Company (KCPL), KCPL Greater
2 Missouri Operations Company (GMO), Ameren Missouri, and The Empire District Electric
3 Company (Empire) have all used MetrixND to analyze loads in their Missouri resource
4 planning process and to normalize sales in their most recent rate cases.

5 Q. Has Staff previously used MetrixND?

6 A. Yes, Staff has used MetrixND in rate cases involving Empire, Ameren
7 Missouri, KCP&L, and GMO.

8 Q. What is a 365-days adjustment?

9 A. Ameren Missouri's customers' usage is measured and rate revenue is collected
10 over a period known as a revenue month, which is the interval that Ameren Missouri reads
11 customers' meters and issues bills. A bill rendered for a given revenue month may charge for
12 usage in parts of two calendar months, but revenue months take their names from the name of
13 the calendar month in which the customer's bill is rendered. For example, the usage of a
14 customer was read on June 8 and then again on July 8. The bill was sent to the customer on
15 July 15. The revenue month for this bill is July even though the majority of the usage
16 measured for this bill was used in June.

17 The length of a revenue month is dependent upon the interval between meter readings
18 and does not necessarily have the same number of days that occur in a given calendar month
19 of the same name; that is, a revenue month may have more than or less than the number of
20 days for the same-named calendar month. For the example given above, the usage is for 30
21 days (June 8 through July 8) even though the revenue month is July which has 31 days. When
22 revenue month usage is totaled over the year, the resulting revenue year will include usage
23 from the immediately prior calendar year and assign usage to the next calendar year, meaning

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1 a revenue year may contain more than or less than 365 days. Therefore, since the costs and
2 expenses are for a calendar year, Staff calculates a normalization adjustment to bring the
3 revenue year into a 365-day interval. This adjustment is referred to as a 365-days adjustment.

4 Q. How was the 365-days adjustment determined?

5 A. I calculated the 365-days adjustment as the difference between the
6 weather-normalized, calendar-month sales and the weather-normalized, billing-month sales.

7 Q. Does this conclude your rebuttal testimony?

8 A. Yes, it does.

SHAWN E. LANGE

PRESENT POSITION:

I am a Utility Engineering Specialist III in the Engineering Analysis Section, Energy Unit, Utility Operations Department, Regulatory Review Division.

EDUCATIONAL BACKGROUND AND WORK EXPERIENCE:

In December 2002, I received a Bachelor of Science Degree in Mechanical Engineering from the University of Missouri, at Rolla now known as the Missouri University of Science and Technology. I joined the Commission Staff in January 2005. I am a registered Engineer-in-Training in the State of Missouri. I have spoke at NCDC's workshop on alternative climate normals.

TESTIMONY FILED:

Case Number	Utility	Testimony	Issue
ER-2005-0436	Aquila Inc.	Direct	Weather Normalization
		Rebuttal	Weather Normalization
		Surrebuttal	Weather Normalization
ER-2006-0314	Kansas City Power & Light Company	Direct	Weather Normalization
		Rebuttal	Weather Normalization
ER-2006-0315	Empire District Electric Company	Direct	Weather Normalization
		Surrebuttal	Weather Normalization
ER-2007-0002	Union Electric Company d/b/a AmerenUE	Direct	Weather Normalization
ER-2007-0004	Aquila Inc.	Direct	Weather Normalization
ER-2007-0291	Kansas City Power & Light Company	Staff Report	Weather Normalization
		Rebuttal	Weather Normalization
ER-2008-0093	Empire District Electric Company	Staff Report	Weather Normalization
ER-2008-0318	Union Electric Company d/b/a AmerenUE	Staff Report	Weather Normalization
ER-2009-0089	Kansas City Power & Light Company	Staff Report	Net System Input
ER-2009-0090	KCP&L Greater Missouri Operations Company	Staff Report	Net System Input

Case Number	Utility	Testimony	Issue
ER-2010-0036	Union Electric Company d/b/a AmerenUE	Staff Report	Net System Input
ER-2010-0130	Empire District Electric Company	Staff Report	Variable Fuel Costs
		Surrebuttal	Variable Fuel Costs
ER-2010-0355	Kansas City Power & Light Company	Staff Report	Variable Fuel Costs
ER-2010-0356	KCP&L Greater Missouri Operations Company	Staff Report	Engineering Review-Sibley 3 SCR
ER-2011-0004	Empire District Electric Company	Staff Report	Variable Fuel Costs
ER-2011-0028	Union Electric Company d/b/a Ameren Missouri	Staff Report	Net System Input
ER-2012-0166	Union Electric Company d/b/a Ameren Missouri	Staff Report	Weather Normalization
		Surrebuttal	Weather Normalization Maryland Heights In-Service
ER-2012-0174	Kansas City Power & Light Company	Staff Report	Weather Normalization Net System Input Variable Fuel Costs
		Surrebuttal	Weather Normalization
ER-2012-0175	KCP&L Greater Missouri Operations Company	Staff Report	Weather Normalization Net System Input
		Surrebuttal	Weather Normalization
ER-2012-0345	Empire District Electric Company	Rebuttal	Interim Rates
		Staff Report	Weather Normalization