Exhibit No.: Issues: Witness: Sponsoring Party: Type of Exhibit: Case No.: Date Testimony Prepared:

Weather Normalization Shawn E. Lange MO PSC Staff Rebuttal Testimony EC-2014-0223 June 6, 2014 Filed

August 5, 2014 Data Center Missouri Public Service Commission

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

Statt Exhibit No. Date 7-28-M Reporter 74 File No. E-C-2014.0223

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

Noranda Aluminum, Inc., et al, Complainants, v. Union Electric Company, d/b/a Ameren Missouri

Case No. EC-2014-0223

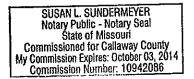
AFFIDAVIT OF SHAWN E. LANGE

Respondent.

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.

Subscribed and sworn to before me this b^{\pm} day of June, 2014.



undermeyer Notary Public

1	REBUTTAL TESTIMONY				
2	OF				
3	SHAWN E. LANGE				
4	NORANDA ALUMINUM, INC., et al, COMPLAINANT,				
5 6 7	v. UNION ELECTRIC COMPANY, d/b/a 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	1 Service Commission, P.O. Box 360, Jefferson City, MO 65102.				
12	Q. What is your present position with the Missouri Public Service Commission				
13	3 (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	8 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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Rebuttal Testimony of Shawn E. Lange

Q.

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

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NORMALIZATION OF USAGE

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- Why is it necessary to weather normalize electricity usage?

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

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

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

Q. What software was used to calculate the weather adjustments to class usage?
A. Staff used the Itron product MetrixND to calculate the weather adjustments to
class usage.

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Q. Do any Missouri electric utilities use MetrixND?

Rebuttal Testimony of Shawn E. Lange

Q.

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

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Has Staff previously used MetrixND?

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

Q. What is a 365-days adjustment?

9 Ameren Missouri's customers' usage is measured and rate revenue is collected A. 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.

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

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

Q. How was the 365-days adjustment determined?

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

Q. Does this conclude your rebuttal testimony?

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 &	Direct	Weather Normalization
	Light Company	Rebuttal	Weather Normalization
ER-2006-0315	Empire District Electric	Direct	Weather Normalization
	Company	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 &	Staff Report	Weather Normalization
	Light Company	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

Utility	Testimony	Issue
Union Electric Company d/b/a AmerenUE	Staff Report	Net System Input
Empire District Electric Company	Staff Report	Variable Fuel Costs
	Surrebuttal	Variable Fuel Costs
Kansas City Power & Light Company	Staff Report	Variable Fuel Costs
KCP&L Greater Missouri Operations Company	Staff Report	Engineering Review- Sibley 3 SCR
Empire District Electric Company	Staff Report	Variable Fuel Costs
Union Electric Company d/b/a Ameren Missouri	Staff Report	Net System Input
Union Electric	Staff Report	Weather Normalization
Missouri	Surrebuttal	Weather Normalization
		Maryland Heights In- Service
Kansas City Power & Light Company	Staff Report	Weather Normalization Net System Input Variable Fuel Costs
- - -	Surrebuttal	Weather Normalization
KCP&L Greater Missouri Operations	Staff Report	Weather Normalization Net System Input
Company	Surrebuttal	Weather Normalization
Empire District Electric	Rebuttal	Interim Rates
Company	Staff Report	Weather Normalization
	Union Electric Company d/b/a AmerenUE Empire District Electric Company Kansas City Power & Light Company KCP&L Greater Missouri Operations Company Empire District Electric Company d/b/a Ameren Missouri Union Electric Company d/b/a Ameren Missouri Union Electric Company d/b/a Ameren Missouri Kansas City Power & Light Company KCP&L Greater Missouri Operations Company Empire District Electric	Union Electric Company d/b/a AmerenUEStaff ReportEmpire District Electric CompanySurrebuttalKansas City Power & Light CompanyStaff ReportKCP&L Greater Missouri Operations CompanyStaff ReportEmpire District Electric CompanyStaff ReportUnion Electric Company d/b/a Ameren MissouriStaff ReportSurrebuttalStaff ReportKansas City Power & Light CompanyStaff ReportKansas City Power & Light CompanyStaff ReportKCP&L Greater Missouri Operations CompanyStaff ReportKCP&L Greater Missouri Operations CompanyStaff ReportKCP&L Greater Missouri Operations CompanyStaff ReportEmpire District Electric Korpet Electric Korpet ElectricStaff ReportKCP&L Greater Missouri Operations CompanyStaff Report

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