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ICC Staff Cross Exhibit 3

I.C.C. DOCKET NO. 12-0598

ICC Staff EXHIBIT No. 3 Cross

Witness Dennis Kramer

Date 12/19/13 Reporter BOZ

~~Ameren~~ Transmission Company of Illinois's
Response to ICC Staff Data Requests
Docket No. 12-0598
Petition for a Certificate of Public Convenience and Necessity, pursuant to Section 8-406.1 of the Illinois Public Utilities Act, and an Order pursuant to Section 8-503 of the Public Utilities Act, to Construct, Operate and Maintain a New High Voltage Electric Service Line and Related Facilities in Various Counties in the State of Illinois.
Data Request Response Date: 5/6/2013

ENG 8.07

Referring to lines 163-178 of ATXI Ex. 11.0, and ATXI Ex. 11.1:

a) Please identify the size and impedance for the 138 kV conductors that ATXI assumed in its analysis, along with the conductor's capacity (in amps) under summer peak conditions.

b) Would use of a different 138 kV conductor with lower-impedance result in voltages above 95% at each of the buses identified on pages 2 and 4 of ATXI Ex. 11.1, which includes the Zion Substation location at a site further to the south than the site ATXI proposes. If no, why not?

c) Please state whether ATXI's analysis included losses and voltage drop on the proposed 345 kV transmission line as well as the 138 kV transmission line when modeling the more southerly location for the Mt. Zion substation.

d) In ATXI's analysis, what load, in MW, would be supplied by each of the longer 138 kV lines originating at Mt. Zion substation with the contingencies shown on pages 1 and 3 of ATXI Ex. 11.1?

e) In ATXI's analysis, what load, in MW, would be supplied by each the shorter 138 kV transmission lines originating at Mt. Zion substation with the contingencies as shown in ATXI Ex. 2.13 and 2.14?

f) Please state whether ATXI's analysis results are based upon 2021 summer peak load levels. If no, please state the year ATXI assumed in its analysis. If yes, please list the specific local voltage and/or reliability problems that would exist in the Decatur area during the summer of 2016 if the Pana-Mt. Zion segment were not completed prior to that time.

RESPONSE

Prepared By: Dennis D. Kramer
Title: Director, Transmission Policy and Planning
Phone Number: 314 554 2238

a) The exact conductor type and characteristics will be determined during the physical design process based on a number of considerations (pole type, span length, conductor weight, etc.). During the transmission planning process a representative conductor impedance and rating that is commonly used on the Ameren system was assumed. The conductor capacity (during summer emergency

conditions) was assumed to be 2000A. The table below shows the impedances used in the models.

Mt Zion-PPG 138 KV lines	R (pu)	X (pu)	B (pu)
Staff proposal	0.009090	0.124410	0.045270
Project	0.000303	0.004147	0.001509

b) No. There is no practical alternative that would reduce the impedance enough to raise the voltages above 95% at each of the buses identified on pages 2 and 4 of ATXI Ex. 11.1. Ameren Services reanalyzed the staff proposal and assumed the 138 kV line impedance was only 50% of the values provided in response to (a.) above. The analysis indicated that even with this extreme and practically unachievable reduction in impedance there were still several buses with voltages below 95%. See the attached analysis results.

c) Yes. The entire transmission system was modeled so losses and voltage drop due to the proposed 345 kV line and the 138 kV lines were included when modeling the more southerly location for the Mt. Zion substation.

d) These 138 kV lines are part of the network and therefore the power flow (in MW) on these lines will vary depending on system conditions (generation dispatch, load levels, transmission outages, etc.).
The 138 kV line flows with both Oreana 345/138 kV transformers out of service would be approximately 110 MW on each line.
The 138 kV line flows with both Oreana to ADM North 138 kV lines out of service would be approximately 108 MW on each line.

e) These 138 kV lines are part of the network and therefore the power flow (in MW) on these lines will vary depending on system conditions (generation dispatch, load levels, transmission outages, etc.).
The 138 kV line flows with both Oreana 345/138 kV transformers out of service would be approximately 192 MW on each line.
The 138 kV line flows with both Oreana to ADM North 138 kV lines out of service would be approximately 189 MW on each line.

f) Yes. ATXI used a 2021 Summer Peak model to assess voltage conditions in the Decatur area.
ATXI reexamined the results of the 2021 Summer Peak load analysis and reconfirmed the reliability issues identified in the Decatur area would be present in the 2016 timeframe. This is without including any recently announced customer load increases in the model.

ENG 8.07 b Attachment

Post-contingency voltages for the outage of the two Oreana 345/138 kV transformers assuming the impedance of the Mt Zion-PPG 138 kV lines was only 50% of the values provided in response to (a.)

BUSES WITH VOLTAGE LESS THAN 0.9500:

BUS#	X-- NAME --X	BASKV	AREA	V(PU)	V(KV)
348852	4OREANA	138.00	357	0.9457	130.51
348870	4CATERPILLAR	138.00	357	0.9489	130.94
348853	4ADM NORTH	138.00	357	0.9459	130.54
348871	4FARIESPRKWY	138.00	357	0.9469	130.67

Post-contingency voltages for the outage of the two Oreana to ADM North 138 kV lines assuming the impedance of the Mt Zion-PPG 138 kV lines was only 50% of the values provided in response to (a.)

BUSES WITH VOLTAGE LESS THAN 0.9500:

BUS#	X-- NAME --X	BASKV	AREA	V(PU)	V(KV)
348853	4ADM NORTH	138.00	357	0.9486	130.91
348871	4FARIESPRKWY	138.00	357	0.9495	131.03