MIDTOWN GREENWAY COALITION INFORMATION REQUEST

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Xcel Energy

Docket No.: OAH 15-2500-20599-2
PUC No. E-002/TL-09-38

Response To: Midtown Greenway Coalition Information Request No. 27

Date Received: December 4, 2009

Question:

A. Please describe every substation that has been built underground (i) in Applicant's service territory and, (ii) to the degree known to Applicant, in any urban area within the United States. For any such substation, please state:

a) the location of the substation;
b) the voltage of the transmission and distribution lines connecting to that facility;
c) the date when it was constructed;
d) *[no request - consistent with original]*
e) the total cost of the project and the incremental cost, if any, for locating the substation underground;
f) how the costs of the substation were treated, including whether any incremental costs of locating the substation underground were rate based or assessed to a particular community;
g) the factors, including but not limited to local land use, development density, environmental conditions, or utility practices by which it was determined that the underground substation was or was not subject to a local surcharge.

B. Please provide a map or maps depicting the location of any underground transmission lines described in Part A.

Response:

27A

The only substation in the service territory of Northern States Power Company, a Minnesota corporation ("Xcel Energy"), that is not an above-ground substation is the Fifth Street Substation.

27A (i) a)

The Fifth Street Substation is located under the plaza between 5th Street and the Xcel Energy building, 414 Nicollet Mall, Minneapolis MN 55401. The Fifth Street Substation is not truly an underground substation in the same way as the Anaheim Public Utilities, Park Substation, referenced in section 27A (ii) a), since the Fifth Street Substation is connected to and partially in the basement of a building.

The Fifth Street Substation consists of a 154-ft by 103-ft area plus a 154-ft by 42-ft mezzanine area containing three 115kV transmission line terminations, three 115kV circuit breakers, one 115kV circuit switcher, four 110-13.8kV, 84MVA transformers, and thirty-five 12.5kV feeders. The Fifth Street Substation is composed of equipment and buswork typically found in above ground air insulated, outdoor, conventionally designed substations. Air insulated refers to the fact that the electrical insulation medium between phases/conductors is provided by air.

27A. (i) b)

The voltages of the transmission and distribution lines connecting to the Fifth Street Substation are 115kV and 13.8kV.

27A. (i) c)

The initial construction of the Fifth Street Substation occurred concurrently with the excavation and construction of the Xcel Energy building located at 414 Nicollet Mall. The Fifth Street Substation and the 414 Nicollet Mall building are not separate structures since they share some of the same electrical, structural, mechanical systems, and the same street level entrances.

No records reflecting specific construction data have been located. From the following drawings it is estimated that the substation was built between 1963 and 1970.

The earliest date on the Plot Plan (Excavating) Substation Area Drawing number NH-32107-C is 1-24-1963.

The earliest date on the Circuit Diagram Drawing number NF-27804-U is 9-11-1963.

The earliest date on the Plot Plan Finished Building & Plaza Drawing number NF-350312-C is 1-10-1964.

27A. (i) d)

[no request - consistent with original].

27A. (i) e)

The total initial cost of the Fifth Street Substation through 1970 was $4.1 Million, in 1970 dollars. No records were found after a reasonable search, nor are any believed to exist that calculate the

incremental cost difference between constructing the Fifth Street Substation underground, versus above ground.

27A. (i) f and g

The total cost of the Fifth Street Substation as defined in 27A (i) e) has been and is treated for ratemaking purposes just as any other facilities investment cost. There are two essential requirements for a local surcharge that are not met by this substation. There must be at least two feasible options to establish an incremental cost that would be subject to a local surcharge, and a request by the customer (usually a government entity) for the higher cost option. Neither requirement was met for this substation.

No records were found, nor does Xcel Energy believe any exist, that indicate requests were received from the community or customers for locating the Fifth Street Substation underground due to aesthetic or other concerns. The Fifth Street Substation and all the other related underground electrical facilities were built underground for operational/technical reasons.

27A. (ii) a)

The only other substation that Xcel Energy has identified to be an independent underground substation, *i.e.* not connected to, or in the basement of a building, in the United States is the Anaheim Public Utilities, Park Substation, located in Anaheim, CA.

Nevertheless, although the Anaheim Public Utilities, Park Substation is an underground substation, its construction was more typical of a substation built within a building above ground versus a substation built below ground level. The Park Substation was built on a level site at slightly below existing grade and then covered with dirt to make it appear as a substation built within the side of a small hill. The costs and construction challenges would have been greater had the substation been constructed completely underground.

To gather additional information regarding the Park Substation, Applicant contacted Anaheim Public Utilities. The following information was obtained from drawings received from Keith Tieszen at Anaheim Public Utilities on 12-22-09.

The Anaheim Public Utilities, Park Substation consist of a 110-ft by 130-ft building containing five 69kV lines, eight 69kV gas insulated circuit breakers, two 67-12.47kV, 56MVA transformers, twelve 12.5kV feeders, and four 12kV, 3600kVAR capacitor banks. The Park Substation is composed of equipment and buswork typically found in a gas-insulated substations (GIS). Gas insulated refers to the fact that the electrical insulation medium between phases/conductors is provided by sulfur hexafluoride (SF_6) gas versus air. The SF_6 gas and the conductors are contained in pipes that allow for the phase spacing of electrical components to be very close. Typically gas-insulated substations are more expensive and have a more compact design than air insulated substations.

27A. (ii) b)

The voltages of the transmission and distribution lines connecting to the Park Substation are 69kV and 12.5kV.

This information was obtained from the following website:
http://www.anaheim.net/utilities/news/article.asp?id=762.

27A. (ii) c)

The Park Substation was dedicated on October 17, 2006.

This information was obtained from the following website:
http://www.anaheim.net/utilities/IMAGES/ParkSubinTDWorld.pdf.

27A. (ii) d)

[no request - consistent with original].

27A. (ii) e)

The total cost of the Park Substation was $19.5 million.

This information was obtained from the following website:
http://www.anaheim.net/utilities/IMAGES/ParkSubinTDWorld.pdf.

The following response to this Information Request was obtained via e-mail from Brian Beelner at Anaheim Public Utilities on 12-23-09.

"Anaheim Public Utilities currently has an underground conversion program within our territory that assesses a 4% surcharge on all customer energy bills. The funds derived from this surcharge only pays for the undergrounding of overhead distribution and transmission facilities (up to 69 kV). The surcharge did not pay for our "Park Substation," which coincidentally is underground as well. The substation was paid for out of normal energy and demand based charges as is typical with substation costs. The undergrounding program only pays for the conversion of facilities that are currently overhead to underground. I have attached a link to our rule that regulates this program- it is Rule no. 20 section A(3) on page 3.20.2."

http://www.anaheim.net/utilities/waterrules/elec_rules/RULE20.pdf

27A. (ii) f)

The following response to this Information Request was obtained verbally from Keith Tieszen at Anaheim Public Utilities on 12-22-09.

Anaheim Public Utilities did not separate out any incremental costs of locating the substation underground.

27A. (ii) g)

The following response to this Information Request was obtained verbally from Keith Tieszen at Anaheim Public Utilities on 12-22-09:Anaheim Public Utilities did not consider any of the listed factors in its decision not to charge a local surcharge for placing the substation underground.

Also please refer to the response for section 27A. (ii) e).

27B.

The attached map, Attachment 2, "Underground Transmission Lines Connected to Fifth Street Substation Rev 12-22-09" depicts the location of the underground transmission lines associated with the Xcel Energy Fifth Street Substation.

Xcel Energy has requested information responsive to this request for the Park Substation from Anaheim Public Utilities. As of the date of this response, no information has been received. If Xcel Energy receives additional information, it will supplement this request.

Response By:	Ed Smith
Title:	Principal Specialty Engineer
Department:	Substation Engineering
Date:	12/29/09