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Rochester Gas and Electric Corporation

Rochester Transmission Project Enhancement

Exhibit E-4

Engineering Justification

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EXHIBIT E-4: ENGINEERING JUSTIFICATION

E-4.1 Summary of the Proposed Plan and Its Benefits

Rochester Gas and Electric Corporation's (RG&E's or the Applicant's) ability to ensure reliable service to customers in its Western Division is dependent on the ability of its 115-kilovolt (kV) transmission system to operate under all the specified contingencies required by the applicable reliability criteria. The North American Electric Reliability Corporation (NERC), Northeast Power Coordinating Council (NPCC) and the New York State Reliability Council (NYSRC) have established reliability criteria to which each utility must design and operate its transmission system or face sanctions or fines. The intention of these criteria is to prevent severe system disturbances that could impact large portions of the transmission system. RG&E has determined that under certain contingencies a part of its system will fail to meet NERC Standard TPL-001-4: Transmission System Planning Performance Requirements. Construction of Proposed Line 949 will enable RG&E to meet this NERC requirement.

E-4.2 System Description

The Rochester Area electric system consists of several 115kV lines and a large 34.5kV network. These transmission and sub-transmission systems are (or will be) supplied by four main sources (three existing and one future): 1) Station 80, which taps New York Power Authority's (NYPA's) 345kV bulk transmission system; 2) Station 122, which also taps NYPA's 345kV bulk transmission system; 3) Station 255, which is scheduled to go into service in summer 2020, which will tap NYPA's 345kV bulk transmission system adjacent to Station 80; and 4) the Exelon Generation-owned R.E. Ginna Nuclear Power Plant, which is the largest single source to the Rochester Area. A long-term outage of the Ginna Nuclear Power Plant would require RG&E to increase its capacity coming from its other sources into the transmission system. All of the substations mentioned above contain 345/115kV transformation, which connect into the internal RG&E 115kV transmission system.

E-4.3 Need for the Proposed Project

N-1 single-element, as well as a pair of N-1-1 single element contingencies, can cause the 115kV substations Station 418 and Station 48 to become radial resulting in low voltages and thermal overloads. The Rochester Transmission Project Enhancement (RTP Enhancement or the Project) is the preferred solution to mitigate these reliability concerns by strengthening the 115kV network in Western Rochester by tying together Station 418 and Station 48, preventing this condition from occurring.

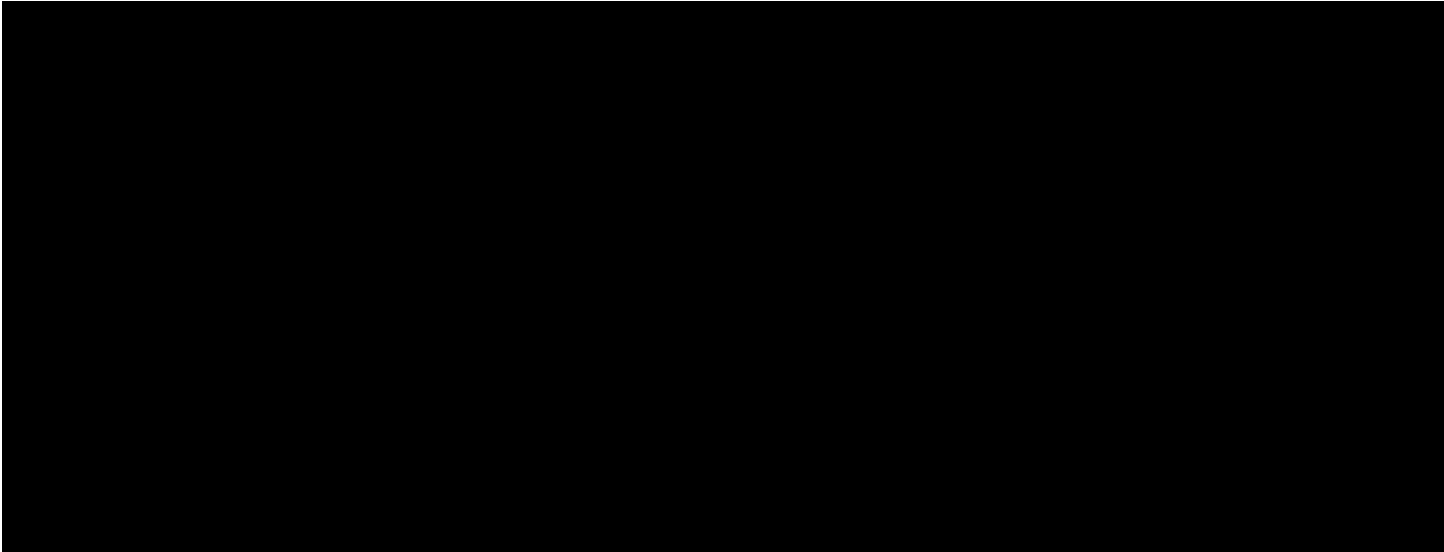
The following is a description of the critical contingencies impacting this area that the Project will address:

NERC P1; N-1, Single-Element Contingency

A fault on 115kV Line 910 from Station 418 to Station 67 results in Station 418 becoming the last station at the end of a radial line. This results in a thermal overload on 115kV Line 947.

NERC P6; N-1-1 Multiple Contingency

The loss of 115kV Line 910 leaves a portion of western Rochester served radially via Line 947 out of Station 7. A subsequent contingency affecting the 51 mega volt amperes reactive (MVAR) 115kV shunt capacitor at Station 113 can result in low voltage violations.



E-4.4 Proposed Plan and Its Benefits

In accordance with NERC Standard TPL-001-4: Transmission System Planning Performance Requirements, the Project will correct transmission system deficiencies by providing an additional 115kV line connecting Station 48 to Station 418, reinforcing the Bulk Electric supply and ensuring reliable service under the N-1 and N-1-1 contingency loss of other Bulk Electric System elements.

In consultation with the New York Independent System Operator (NYISO), RG&E performed all the necessary analyses for a System Impact Study (SIS) screening and determined that an SIS is not necessary for the Project. This is documented in the correspondence, dated June 4, 2019, provided as Attachment E-4-A.

A one-line diagram for both pre-Project and post-Project configurations is provided as Figure E-4-1.

E-4.5 Construction Schedule

The proposed date for completion of the Project is August 2022. A delay in the construction of Proposed Line 949 between Stations 48 and 418 will impact customers in the local area should the contingencies identified occur. This will also have an impact upon RG&E's compliance with NERC, NPCC, and NYSRC standards.

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