

Rochester Gas and Electric Corporation

Rochester Transmission Project Enhancement

Exhibit E-2

Other Facilities

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EXHIBIT E-2: OTHER FACILITIES

The Rochester Transmission Project Enhancement (RTP Enhancement or the Project) requires substation infrastructure work at two existing terminal facilities: Rochester Gas and Electric Corporation's (RG&E or the Applicant) Stations 48 and 418.

E-2.1 Station 48

E-2.1.1 Existing Substation

Location: The existing Station 48 is located in the northwestern part of the City of Rochester, south of Lexington Avenue.

Description: The existing Station 48 consists of an air insulated 115/34.5/11/4 kilovolt (kV) station with sectionalized bus configuration on all voltage levels described below:

- 115kV Single Bus-Bar Configuration: Sectionalized bus with two incoming bays on each section and a tie breaker between the two sections.
- 34.5kV Single Bus-Bar Configuration: Sectionalized bus with one incoming breaker on each section and two tie breakers between the sections.
- 11kV Single Bus-Bar Configuration: Sectionalized bus with one incoming breaker on each section and three tie breakers between the sections.
- 4kV Single Bus-Bar Configuration: Sectionalized bus with one incoming breaker on each section and a tie breakers between the sections.

The two existing control buildings were installed to house the system protection, communication and alternating current (AC) / direct current (DC) system equipment.

Figure E-2-1 is a one-line diagram that depicts the existing configuration of Station 48 in black.

E-2.1.2 Proposed Modifications

The following is a description of the proposed modifications at Station 48.

The required work at Station 48 includes the installation of one new 115kV circuit breaker at the new bay, replacement of one 115kV tie breaker at the existing location, and one A-frame structure for the new bay. Each breaker will be associated with two disconnect switches.

The following work will be required at Station 48:

- One 115kV, 3000-amp (A) Circuit Breaker with corresponding disconnect switches;
- One 115kV, 3000A Tie Breaker with corresponding disconnect switches;
- Three 96kV station class Surge Arrester;
- Three 115kV Coupling Capacitor Voltage Transformer (CCVT);
- One A-frame;
- Extension of a 115kV bus work up to the new bay;
- Extension of the fence;
- Extension of grounding mesh; and
- A new cable trench and/or conduit system to the existing Control House for protection and control purpose.

Figure 5-7 in Exhibit 5 depicts the area of the proposed expansion for Station 48.

Expansion of the existing substation footprint will be required to accommodate the new 115kV electrical equipment.

Figure E-2-1 depicts the new line bay and how it interconnects with the existing facilities in Station 48. Modifications proposed to support the Project are shown in red.

Structure type and quantities are outlined below:

- One A-frame structure;
- Three Lightning arrester stand structures;
- Four motor-operated disconnect (MOD) switches stand structures;
- Three CCVT stand structures;
- One three-phase bus support structure;
- Five single-phase bus support structures; and

- One Lightning Mast.

Other required activities include the following:

- Foundation will be required for major equipment and for structures.
- Installation of new circuit breaker in yard and installation of two disconnect switches on both sides of the breaker.
- Installation of tie breaker and associated disconnect switch in the existing bus.
- Installation of surge arresters.
- Installation of coupling capacitor voltage transformer
- Expansion of the yard.
- Installation and commissioning of new equipment and protection and controls systems.
- Extension of the fence.
- Extension of grounding grid.

E-2.2 Station 418

E-2.2.1 Existing Substation

Location: The existing Station 418 is located in the western part of the Town of Gates, northwest of Buffalo Road.

Description: The existing Station 418 is an air-insulated 115/12kV substation with two existing 115kV lines and four 115/12 kV transformers. At the time of this Application, the station is being expanded by another project, the Applicant's Rochester Area Reliability Project (RARP), which is adding to Station 418 a new 115kV line: Line 940, which will run from Station 418 to Station 255. RARP is providing adjustments to Station 418 through a footprint expansion.

Figure E-2-2 is a one-line diagram that depicts the existing configuration of Station 418, inclusive of modifications the Applicant is making as part of RARP, in black.

E-2.2.2 Proposed Modifications

The following is a description of the proposed modifications at Station 418.

The Project will modify Station 418 by constructing new 115kV circuit breakers within the expansion area and a new line terminal for the termination of Proposed Line 949 on the western side of the substation, which will expand the bus and tie into 115kV Bus Section 1. With this new bay in place the current incoming line sequencing to the substation can be shifted. In addition, the re-termination of two existing 115kV transmission lines at the Station 418, Line 947 (renumbered from Line 917) and Line 910, will also be completed to accommodate and support the connection of Proposed Line 949.

Figure E-2-2 depicts the new line bay and how it interconnects with the existing facilities in Station 418. Removal modifications proposed as part of the Project are indicated by green color and addition modifications proposed to support the Project are shown in red.

E-2.3 Secondary Electrical Work

E-2.3.1 Bus Protection at Station 48

At Station 48, the relays outlined in Table E-2-1 will be used for protection of 115kV buses.

Table E-2-1 Station 48 Protection Relays

Equipment	System ‘A’ Relay	System ‘B’ Relay
115kV Bus Section 1	GE-B30 (B1-115/87BA) ESW 7810 (86P-1/115KV)	SEL-487B (87BS-1/115) ESW 7810 (86BS-1/115KV)
115kV Bus Section 2	GE-B30 (B2-115/87BA) ESW 7810 (86BP-2/115KV)	SEL-487B (87BS-2/115) ESW 7810 (86BS-2/115KV)

E-2.3.2 Line Protection at Stations 48 and 418

At both Station 48 and Station 418, the relays outlined in Table E-2-2 will be used for the protection of Proposed Line 949.

Table E-2-2 Stations 48 and 418 Protection Relays

Equipment	System ‘A’ Relay or Primary Relay	System ‘B’ Relay or Secondary Relay
Line 949	SEL-411L (949/87LA)	GE L90 (949/87LB)

E-2.3.3 Breaker Control and Backup Protection

In addition to the above protection relays, the relays outlined in Table E-2-3 will be used for breaker control and breaker backup protection on bus 1 of Station 48.

Table E-2-3 Station 48 Backup Protection Relays

115 kV Primary	
Equipment	Relay
94602	SEL-451 (94902/115KA) GE 957804D (86BFA/94902) GE 957802D (86/TTR/949)
7X4872	SEL-451 (7X4872/115KA) ESW 7810 (86BB/7X4872)

E-2.3.4 Tele-Protection Requirements

Line 949 to Station 418 shall use SEL-411L line differential and distance relays for system “A” protection. The SEL-411L relays shall communicate and send Direct Transfer Trip (DTT) [Breaker Failure Transfer Trip (BFTT)] over Synchronous Optical Network (SONET) ring using GE JMUX equipment to Station 418. The system “A” SEL-411L will also have a “hot stand-by” communication via direct fiber.

System “B” relays will be GE-L90 line differential relays. The GE-L90 relays shall communicate and send DTT (BFTT) through direct fiber over optical ground wire (OPGW) fiber over OPGW fiber optic connection to Station 418.

The tele-protection equipment is summarized in Table E-2-4.

Table E-2-4 Tele-Protection Equipment

Equipment	System ‘A’ Relay	System ‘A’ Relay Communication	System ‘B’ Relay	System ‘B’ Relay Communication
Line 949	SEL-411L	SONET JMUX	GE L90	Direct F/O

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