New York State Electric & Gas Corporation
And
Niagara Mohawk Power Corporation d/b/a National Grid

Auburn Transmission Project

Revised Exhibit E-1

Description of Proposed Transmission Facilities

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TABLE OF CONTENTS

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LIST OF ATTACHMENTS

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EXHIBIT E-1: DESCRIPTION OF PROPOSED TRANSMISSION FACILITIES

E-1.1 General

The Proposed Line is a new approximately 14.5 mile 115kV transmission line that would be installed between the NYSEG State Street Substation and the National Grid Elbridge Substation along an approximately 4.2 mile NYSEG ROW and along an approximately 10.3 mile portion of a National Grid ROW.

The Applicant proposes to install the Relocated Line 15 on the same double circuit structures along the National Grid ROW on which the Proposed Line will be installed.

The Applicant proposes to rebuild Line 972 by installing new wooden H-frame structures in the same locations as existing structures on the NYSEG ROW to create Rebuilt Line 972 for a distance of approximately 4.2 miles between the State Street Substation and the ROW Intersection.

The Applicant proposes to bus together Existing Lines 5 and 15 on the National Grid ROW to create Bused Line 5 for a distance of approximately 10.3 miles between the ROW Intersection and the Elbridge Substation.

E-1.2 Design Standards

The Project will be designed to meet or exceed all requirements for electrical clearances and mechanical strength for Grade B Construction set forth in the American National Standard, National Electrical Safety Code (ANSI C2, 2012 edition), as in effect at the time of design (hereafter referred to as "NESC"). Conductor-to-ground electrical clearances at short-time emergency (STE) New York Power Pool ratings used in the design of the Project will also meet those recommended in the NESC.

I. PROPOSED LINE:

LENGTH OF 115-kV TRANSMISSION	14.5 miles
LINE TO BE CONSTRUCTED	
TYPE OF CONSTRUCTION	
Wood H-Frame, Single-Circuit	4.2 miles
Steel Monopole, Double-Circuit:	10.3 miles
DESIGN VOLTAGE	115kV
OPERATING VOLTAGE	115kV
INITIAL OPERATING VOLTAGE	115kV
CONDUCTOR	
Type, Material, and Size:	Aluminum conductor, steel Reinforced (ACSR) 1192.5 kcmil 45/7 "Bunting"
Quantity:	3 per circuit, 1 per phase
Overall Diameter:	1.302 inches
Cross Sectional Area:	1.0010 square inches
Rated Strength:	32,000 pounds
STATIC WIRE	
Type, Material:	AFL OPGW PentaCore S4-61/61/583
Diameter:	0.583 inches
Quantity:	1 per circuit
Rated Strength:	20,900 pounds
Type, Material:	Alumoweld 7#7
Diameter:	0.433 inches
Quantity:	1 per circuit
Rated Strength:	19,060 pounds
INSULATORS	
Types/Design:	Porcelain suspension and polymer line post
Color:	Gray

STRUCTURES – WOOD H-FRAME, SINGLE-CIRCUIT

Type:	Tangent suspension, Tangent dead-end, Angle suspension, Angle dead-end
Material:	Douglas Fir, Southern Yellow Pine
Typical Height Above Ground:	65.5 feet
Preservative Treatment:	Pentachlorophenol
Color:	Brown

STRUCTURES – STEEL MONOPOLE, DOUBLE-CIRCUIT

Type:	Tangent suspension, Angle suspension, Dead-end
Material:	Steel, Galvanized
Typical Height Above Ground:	85 feet
Preservative Treatment:	Galvanized
Color:	Gray

FRAMING MATERIAL – WOOD H-FRAME, SINGLE-CIRCUIT

Components:	Cross-Arms, Knee Braces, Vee Braces, Cross Braces
Material:	Wood
Preservative Treatment:	Pentachlorophenol
Color:	Brown

FRAMING MATERIAL – STEEL MONOPOLE, DOUBLE-CIRCUIT

Components:	Davit Arms
Material:	Steel
Preservative Treatment:	Galvanized
Color:	Gray

II. RELOCATED LINE 15:

LENGTH OF 115-kV TRANSMISSION	10.3 miles
LINE TO BE RELOCATED	
TYPE OF CONSTRUCTION	
Steel Monopole, Double-Circuit:	10.3 miles
DESIGN VOLTAGE	115kV
OPERATING VOLTAGE	115kV
INITIAL OPERATING VOLTAGE	115kV
CONDUCTOR	
Type, Material, and Size:	Aluminum conductor, steel Reinforced (ACSR) 1192.5kcmil 45/7 "Bunting"
Quantity:	3 per circuit, 1 per phase
Overall Diameter:	1.302 inches
Cross Sectional Area:	1.0010 square inches
Rated Strength:	32,000 pounds
STATIC WIRE	
Type, Material:	3/8" Extra High Strength Steel
Diameter:	0.360 inches
Quantity:	1 per circuit
Rated Strength:	15,400 pounds
INSULATORS	
Types/Design:	Porcelain suspension and porcelain line post
Color:	Gray
STRUCTURES – STEEL MONOPOLE, DOUBLE-CIRCUIT	
Type:	Tangent suspension, Angle suspension, Dead-end
Material:	Steel, Galvanized
Typical Height Above Ground:	85 feet
Preservative Treatment:	Galvanized

Color:	Gray

FRAMING MATERIAL – STEEL MONOPOLE, DOUBLE-CIRCUIT

Components:	Davit Arms
Material:	Steel
Preservative Treatment:	Galvanized
Color:	Gray

III. REBUILT LINE 972:

LENGTH OF 115-kV TRANSMISSION	4.2 miles

LINE TO BE REBUILT

TYPE OF CONSTRUCTION

Wood H-Frame, Single-Circuit	4.2 miles
DESIGN VOLTAGE	115kV
OPERATING VOLTAGE	115kV
INITIAL OPERATING VOLTAGE	115kV

CONDUCTOR

Type, Material, and Size:	Aluminum conductor, steel Reinforced (ACSR) 1192.5 kcmil 45/7 "Bunting"
Quantity:	3 per circuit, 1 per phase
Overall Diameter:	1.302 inches
Cross Sectional Area:	1.0010 square inches
Rated Strength:	32,000 pounds

STATIC WIRE

Type, Material:	Alumoweld 7#7
Diameter:	0.433 inches
Quantity:	2 per circuit
Rated Strength:	19,060 pounds

INSULATORS

Types/Design:	Porcelain suspension and polymer line post

Color:	Gray

STRUCTURES – WOOD H-FRAME, SINGLE-CIRCUIT

Type:	Tangent suspension, Tangent dead-end, Angle suspension, Angle dead-end
Material:	Douglas Fir, Southern Yellow Pine
Typical Height Above Ground:	65.5 feet
Preservative Treatment:	Pentachlorophenol
Color:	Brown

FRAMING MATERIAL – WOOD H-FRAME, SINGLE-CIRCUIT

Components:	Cross-Arms, Knee Braces, Vee Braces, Cross Braces
Material:	Wood
Preservative Treatment:	Pentachlorophenol
Color:	Brown

IV. BUSED LINE 5:

LENGTH OF 115-kV TRANSMISSION	10.3 miles
LINE TO BE BUSED	
DESIGN VOLTAGE	115kV
OPERATING VOLTAGE	115kV
INITIAL OPERATING VOLTAGE	115kV

CONDUCTOR (Existing)

Type, Material, and Size:	Aluminum conductor, steel Reinforced (ACSR) 336.4 kcmil 30/7 "Oriole"
Quantity:	6 per circuit, 2 per phase
Overall Diameter:	0.741 inches
Cross Sectional Area:	0.3259 square inches

Rated Strength:	17,300 pounds
CONDUCTOR (2 small reconductored segments, and a busing segment at each end of Bused Line 5)	
Type, Material, and Size:	Aluminum conductor, steel Reinforced (ACSR) 1113 kcmil 54/19 "Finch"
Quantity:	3 per circuit, 1 per phase
Overall Diameter:	1.293 inches
Cross Sectional Area:	0.9854 square inches
Rated Strength:	39,100 pounds
CONDUCTOR (all other Busing Wire)	
Type, Material, and Size:	Aluminum conductor, steel Reinforced (ACSR) 477 kcmil 26/7 "Hawk"
Quantity:	3 per circuit, 1 per phase
Overall Diameter:	0.858 inches
Cross Sectional Area:	0.4354 square inches
Rated Strength:	19,500 pounds

Design References

The design of the Project Lines will be in accordance with all applicable federal, state, and local codes and industry standards, unless stated otherwise. The industry codes and standards shall include, but shall not be limited to, the following:

- ANSI C2, The National Electric Safety Code 2012 (NESC)
- ASCE 72/SEI 48-05, Design of Steel Transmission Pole Structures

The following NYSEG standards will be used during design:

- Iberdrola USA Transmission Standards Manual

The following National Grid standards will be used during design:

- National Grid's transmission design standards

E-1.3 Foundation and Anchoring Details

The drawings that illustrate NYSEG's design standards for foundation, anchor, ground wire, and pole installation are depicted in Attachment E-1-1.

The drawings that illustrate National Grid's design standards for grounding steel structures and installation of corrugated metal pipe are provided in Attachment E-1-2.