Attachment C

FIRST AMENDMENT
TO
COST REIMBURSEMENT AGREEMENT

Dated as of May 29, 2015
("*Amendment Effective Date*")

Reference is made to that certain Cost Reimbursement Agreement entered into as of March 31, 2014 between **NIAGARA MOHAWK POWER CORPORATION** and **ROCHESTER GAS AND ELECTRIC CORPORATION** (the "*Agreement*"). Unless otherwise defined herein, all capitalized terms in this First Amendment to Cost Reimbursement Agreement ("*First Amendment*") shall have the meanings set forth in the Agreement.

WHEREAS, Customer has requested changes to the existing scope of Work under the Agreement with respect to Mortimer Station, Station 251 and related portions of transmission lines/circuits and equipment located inside the property line of the impacted National Grid Stations, such changes to include an upgrade of Mortimer Station to enable the Station to handle 400 MVA summer normal and 640 MVA long time emergency (LTE) due to the Customer's re-conductoring of line 901; and

WHEREAS, pursuant to Section 4.2 and Section 27.8 of the Agreement, the Parties wish to enter into this amendment to implement such changes in the Work and related changes to the Initial Prepayment amount, Work Cost Estimate and Projected Milestone Schedule;

NOW, THEREFORE, in consideration of the promises and mutual agreements contained herein and of other consideration, the receipt and sufficiency of which are hereby acknowledged, each of the Parties agrees to amend the Agreement as follows, such amendments to be effective from and after the Amendment Effective Date:

1. Section 6.1 of the Agreement is hereby deleted and replaced in its entirety with the following:

   The current good faith estimate of the Company Reimbursable Costs, exclusive of any applicable taxes, is One Million Three Hundred Thousand Dollars ($1,300,000) (the "*Work Cost Estimate*"). The Work Cost Estimate is an estimate only and shall not limit Customer's obligation to pay Company for all Company Reimbursable Costs actually incurred by Company or its Affiliates.

2. Section 7.1 of the Agreement is hereby deleted and replaced in its entirety with the following:

   Customer shall pay or reimburse Company for all Company Reimbursable Costs. The Company has previously invoiced Customer for, and Customer has paid, an initial prepayment of One Hundred Fifty Thousand Dollars ($150,000) (the "*Prior Prepayment*"). Company shall invoice Customer for an additional prepayment of Five Hundred Thousand Dollars $500,000 (the "*Additional Prepayment*", and, together with the Prior Prepayment, the "*Initial Prepayment*") and Customer shall

pay the Additional Prepayment to Company within thirty (30) Days of the invoice due date. Company shall not be obligated to commence or continue Work under this Agreement, as amended, prior to receiving payment in full of the Initial Prepayment.

3. Exhibit A to the Agreement (including Annex 1 thereto) is hereby deleted and replaced in its entirety by the revised Exhibit A (including Annex 1 and Annex 2 thereto) attached to this First Amendment.

4. Exhibit B to the Agreement is deleted and is replaced in its entirety by the revised Exhibit B attached to this First Amendment.

5. Exhibit D to the Agreement is deleted and is replaced in its entirety by the revised Exhibit D attached to this First Amendment.

For the avoidance of doubt and in conformance with Section 4.2 of the Agreement, any additional costs arising from the changes in the Work, as implemented by this First Amendment, shall be paid by the Customer as part of Company Reimbursable Costs when invoiced by the Company in accordance with Section 7.2 of the Agreement.

Except as specifically amended above, the Agreement shall remain in full force and effect in accordance with its terms, is hereby ratified and confirmed, and shall govern the rights and obligations of the Parties. This First Amendment is for the use and benefit of the Parties only, and not for the use and benefit of any other person, party, or entity.

This First Amendment may not be amended or modified in any way, and none of its provisions may be waived, except by a writing signed by an authorized representative of the Party against whom the amendment, modification or waiver is sought to be enforced.

This First Amendment may be executed in one or more counterparts, each of which will be deemed to be an original copy of this First Amendment, and all of which, when taken together, shall constitute one and the same agreement. The exchange of copies of this First Amendment and of signature pages by facsimile or other electronic transmission (including, without limitation, exchange of PDFs by electronic mail) shall constitute effective execution and delivery of this First Amendment as to the Parties hereto and may be used in lieu of the original First Amendment for all purposes.

[Signatures are on following page.]

IN WITNESS WHEREOF, the Parties have caused this First Amendment to be executed on their behalf by their respective duly authorized signatories as of the Amendment Effective Date.

NIAGARA MOHAWK POWER CORPORATION

By:_____
Name:
Title:

ROCHESTER GAS AND ELECTRIC CORPORATION

By:_____
Name:
Title:

Exhibit A: Scope of Work

Company shall perform the following Work under this Agreement:

1. Design, engineer, procure, construct, test and place into service the new Company-owned and/or operated facilities, and the modifications to existing Company-owned and/or operated facilities, as contemplated in the "STATION 251 & CIRCUIT 901 PROJECT DESCRIPTION" attached as Annex 1 to this Exhibit.

2. Design, engineer, procure, construct, test and place into service the new Company-owned and/or operated facilities, and the modifications to existing Company-owned and/or operated facilities, to upgrade the Mortimer Substation to allow it to handle 400 MVA Summer normal and 640 MVA long time emergency ("*LTE*") rating due to the re-conductoring of line 901 (line 901 is being upgraded by Customer to 2-1192.5MCM ACSR Bunting conductors.) This upgrade would include, without limitation, replacing Circuit Breaker R104, disconnect switches SW100, 102 and 106, and upgrading the bus work to a 3000 amp rating, modifying the 115kV take off structure to handle the new 2-1192.5 conductors on line 901, and replacing the bushing potential device with a CVT, all as more specifically referenced in Technical Scope Document for Substations "Mortimer – Protection and Station upgrades for line 901 re-conductoring" attached as Annex 2 to this Exhibit.

3. Perform engineering review and field verifications as required on the facilities referred to in Paragraphs 1 and 2 of this Exhibit.

4. Prepare, file for, and use commercially reasonable efforts to obtain any Required Approvals that must be obtained by Company to enable it to perform the work and any other of its obligations contemplated by this Exhibit and this Agreement.

5. Inspect, review, witness, examine and test, from time to time, Company's work contemplated herein and conduct other project management, administration and oversight activities in connection with the work contemplated by this Exhibit.

6. Review, from time to time, permitting, licensing, real property, and other materials relating to the work contemplated herein.

7. Retain and use outside experts, counsel, consultants, and contractors in furtherance of the work contemplated herein.

8. Perform any other reasonable tasks necessary or advisable in connection with the work contemplated by this Exhibit (including, without limitation, any changes thereto).

For the avoidance of doubt: the Company shall not have any responsibility for seeking or acquiring any real property rights in connection with the Work or the Project including, without limitation, licenses, consents, permissions, certificates, approvals, or authorizations, or fee, easement or right of way interests. Neither this Agreement nor the Company's Work include securing or arranging for Customer or any third party to have access rights in, through, over or under any real property owned or controlled by the Company.

NOTE: COMPANY's specifications for electrical requirements referenced for this Agreement include: ESB-750; ESB-752; ESB-755 and ESB-756, Appendix A as such may be amended, modified and superseded from time to time. See:

https://www.nationalgridus.com/niagaramohawk/construction/3_elec_specs.asp

Annex 1 to Exhibit A

STATION 251 & CIRCUIT 901
PROJECT DESCRIPTION

Mortimer Station -RG&E Line 901 Re-conductor protection and R104 upgrades

Project Funding Number: C056410

Work order number: 10017980563

Link to documentum:

http://docuweb3:8080/webtop/drl/objectId/0b0017c3805b73c8

Mortimer Line 901 Technical Scope Document 12/17 tech review meeting comments

- Added no thermal limiting component statement
- Section 1.5.6 deleted Syracuse
- Section 3.1.1 added statement that around grid analysis not substantially impacted by circuit breaker change out
- Section 4.9 added reference to replacing surge arrestors per SMP 419..01.2 by Substation Maintenance
- Section 4.4.1 changed hook stick switch SW102 gang operated
- Section 2.9.2 change structure for switch SW102 and 106 to accept gang operated switch (make box structure)
- Section 10.2.2 and 10.2.3 deleted
- Section 14.1.3 added switch SW 100 to list of retirements
- Section 16.12 change the date of EDC to 12/15 one-month delay also changed line item 17, 18, 19 and 21 to 12/15.
- Section 16.7 C &I section added item number 7 HMI annunciator and item number 8 Telebyte communication signal converter.
- Attachment #7 - updated to add SAM – 900 HMI

Annex 2 to Exhibit A

Technical Scope Document for Substations (Mortimer – Protection and Station upgrades for line 901 re-conductoring)

INTRODUCTION

This procedure describes the technical scope for substations. It includes approval, summary, and technical sections.

PURPOSE

The purpose of this procedure is to define the technical scope for substations.

ACCOUNTABILITY

This procedure applies to all National Grid personnel involved with the technical scope for substations.

COORDINATION

Coordination shall occur with the project team members.

REFERENCES

Project Management Playbook

PR.02.00.012 - Preliminary Engineering Checklist

DEFINITIONS

C&I – Control and Integration

N/A – Not Applicable

SED – Substation Engineering and Design

TSD – Technical Scope Document for Substations

U/G - Underground

TRAINING

Project Management Playbook Training

SED Personnel – as needed / when revised per PR.01.00.007 – Subject Matter Experts

NOTE: Changes to this procedure may affect PR.02.00.012 – Preliminary Engineering Checklist

REVISION HISTORY

Version	Date	Description of Revision
1.0	05/06/09	Initial version of document.
2.0	12/28/09	Converted document to new format. Changed title from "Technical Requirements for Substations" to "Technical Scope Requirements for Substations" Changed "Technical Requirements: for" in header to "Application" Added Section 2.1.4 Revised Section 2.4.1 Revised Section 2.4.2.c Revised Section 2.4.3.c Revised Section 2.4.3.d Revised Section 2.4.3.g Revised Section 2.4.3.h Revised Section 2.4.3.k Revised Section 2.4.3.l Revised Section 2.4.4.c Revised Section 2.4.4.d Revised Section 2.4.4.g Revised Section 2.4.4.h Revised Section 2.4.4.k Revised Section 2.4.4.l Revised Section 2.4.5.c Revised Section 2.4.5.d Revised Section 2.4.5.g Revised Section 2.4.5.h Revised Section 2.4.5.k Revised Section 2.4.5.l Revised Section 2.4.6.c Revised Section 2.4.6.d Revised Section 2.4.6.g Revised Section 2.4.6.h Revised Section 2.4.6.k Revised Section 2.4.6.l Revised Section 2.5 Revised Section 2.6 Revised Section 2.7 Revised Section 2.8 Revised Section 2.13
2.1	2/16/10	Changed title from "Technical Scope Requirements for Substations" to "Technical Requirements for Substations" Added a check box stating "This project involves a change to the conductor size/thermal rating or equipment rating in the Transmission Facility (NE: 69 kV and above; NY: 115 kV and above)." on page 3. Removed Document Number, "Procedure: General – Substation Design", version and date revised of PR.02.00.018, and "Application" in header of document starting on the 4th page. Table of Contents relocated to after the Approvals section. Added Section 1.3 Safety By Design Added Attachment #5 – Project Schedule

		Added "Detailed" to Attachment #7 Added Project Schedule Template
2.2	11/29/10	Section 2.13 – Removed "(see Section 2.13.1 for template)" in Attachment #5 and added "(refer to Section 2.13.1 for example)" to Attachment #6. Section 2.13.1 – Revised "Project Schedule Template" to "Final Engineering Schedule Example"
3.0	12/10/12	Revised Title from "Technical Requirements for Substations" to "Technical Scope Document for Substations" and made appropriate revisions throughout the document. Revised document to reflect updated process including changes to departments, approvals, order no.'s, and company no.'s. Added Section 1.4 – Associated Work Section 1.5 – Added "Energy Delivery" and "Identify any scope exceptions". Section 2.2.4 – Added "and if so, indicate oil containment type." Added Section 2.4.3 – Lightning Protection and 2.4.4 – Indoor/Outdoor Lighting. Section 2.4.4.a – Added "transformer designation". Section 2.5 – Removed "action". Sections 2.5.1 and 2.5.2 – added "safety switches". Sections 2.6, 2.7, and 2.9 – Revised to "Provide a high level scope summary here" and added the appropriate Attachment(s) and description to each section. Section 2.10.1 – Added "cyber". Added Section 3.0 – References. Section 4.0 – Revised attachments. Revised Sponsor in footer from "Donald T. Angell" to "John E. Gavin".
4.0	4/18/14	Cover page – updated to clarify exceptions to presentation at Engineering Review Meeting. Approvals page – moved Protection Engineer to bottom of listing. Section 1.3 – added "If none specific to project N/A section" Reformatted multiple sections so that no section has more than three layers of subsections. Categorized sections for better flow and create a simpler format that would easily align with PR.02.00.012 – Preliminary Engineering Checklist. Added group classification numbering from PL.01.00.002 – Classification and Numbering to each category to aide in locating relevant procedures, guidelines, and standards related to the category.

Technical Scope

for

Mortimer – Protection and Station upgrades for line 901 re-conductoring

Order No. **10017980563** Company No. **5210 - Niagara Mohawk Power Corp**

Order No. _____ Company No. ____

Prepared By: **Tom McMahon**

Version: **1.0** Date: **12/17/14**

Check the following:

☒ This Technical Scope Document has been presented and approved at the Engineering Review Meeting dated 12/10/14.

☐ This Technical Scope Document is not required to be presented at the Engineering Review Meeting because it meets at least one of the following:
- Is a one for one asset replacement
- Is a substation retirement
- Is estimated to be $250k or less

☒ Preliminary Engineering Checklist (PR.02.00.012) completed and available in Documentum in accordance with PR.09.01.0JB – Documentum File Structure Job Aid.

☒ Environmental Guidance Form completed 10/30/14 and available in Documentum in accordance with PR.09.01.0JB – Documentum File Structure Job Aid.

☒ This project involves a change to the conductor size / thermal rating or equipment rating in a Transmission Facility (NE: 69 kV and above; NY: 115 kV and above).

Roles and Responsibilities: Instructions for completion of the Technical Scope Document

☒ **COVER PAGE**
To be completed by the Technical Lead and routed for approval.

☒ **APPROVALS**
Technical Scope Document is to be approved by the Project Team prior to the Engineering Review Meeting. The Functional Manager(s) review the Technical Scope Document at the Engineering Review Meeting. Based on the meeting, the Technical Lead is to forward the Technical Scope Document for Engineering Management Approval.

☒ **SECTION 1**
To be completed by the Technical Lead

☒ **ALL OTHER SECTIONS**
To be completed by the Engineering team including the Technical Lead.

The Technical Lead will take the lead on coordination and assembly of the technical section, and of its presentation for approval by the Engineering Management Review Committee. After approval, the Technical Lead will forward it to the Project Manager for inclusion in the Project Management Plan and file a copy in the Documentum project folder in accordance with PR.09.01.0JB – Documentum File Structure Job Aid.

The Project Manager will coordinate and assemble the Project Management Plan.

NOTES:

1. The red text in the template is guidance text for development of the Technical Scope Document content. When creating a TSD, replace the guidance text with project specific detail and change the text color to black.
2. Group Classification numbers refer to the second and third group of characters that define the policies, procedures, specifications, and standards relevant to a particular piece of equipment or process. The group classifications can be found in PL.01.00.002 – Classification and Numbering. The inclusion of the group classification is to aid in researching details for the particular topic.
3. N/A Primary Electrical Scope – Voltage Levels that are not needed. Recommend placing N/A in the section header (PRIMARY ELECTRICAL SCOPE – VOLTAGE LEVEL 3 (N/A)) and delete its associated subsections.
4. Once completed with the Technical Scope Document update the table of contents, especially if sections were N/A'd.

APPROVALS

The following are the project team member approvals. (Check each that apply.)

☒ Substation Technical Lead Approval	*Tom McMahon* Tom McMahon	*12/10/14* Date
☒ Substation Civil / Structural Engineer Approval	*Tim Guzzo* Tim Guzzo	*12/10/14* Date
☒ Control & Integration Engineer Approval	*James Gemmell* James Gemmell	*12/10/14* Date
☒ Meter Engineer Approval	*Nick Ritts* Nick Ritts	*12/10/14* Date
☒ Telecom Engineer Approval	*Ross Kennedy* Ross Kennedy	*12/10/14* Date
☐ Underground / D-Line Engineer Approval	*x* Enter name here	 Date
☒ Substation O&M Services Engineer Approval	*Steve Rhoads* Enter name here	*12/10/14* Date
☒ Protection Engineer Approval	*Charlie Hitchings* Charlie Hitchings	*12/10/14* Date

APPROVALS (Engineering Management)

Protection Engineering Manager Approval	*Mark Stanbro* Mark D Stanbro	*12/18/14* Date
Substation Engineering Manager Approval	*Daniel M. Reichard* Dan Reichard	*12/18/2014* Date

DOCUMENT CONTENTS

Table of Contents

1.0 SUMMARY

1.1 Introduction

The scope for this project is broken up into two (2) phases. Phase 1 is to upgrade the Line 901 protection, controls and communication at National Grid's Mortimer Substation. Line 901 is currently a three-terminal 115 kV line encompassing RG&E Station 23, RG&E Station 33 and National Grid Mortimer. The 115 kV line currently connects to the 115 kV Bus at Mortimer via Circuit Breaker R104. The Line 901 segment between RG&E Station 33 and Mortimer will be looped into the new RG&E Station 251, via separate breaker-and-a-half positions, thus, creating a new two-terminal segment between new Station 251 and Mortimer. Relay upgrades at Mortimer are required to make the protection compatible with the Line 90l protection to be installed at the new RG&E Station 251 remote terminal.

Phase 2 of the project is to upgrade the Mortimer Substation to be able to handle 400 MVA summer normal and 640 MVA long time emergency (LTE) due to the re-conductoring of line 901. Line 901 is being upgraded by RG&E to 2-1192.5MCM ACSR Bunting conductor. The scope at Mortimer Substation for phase 2 includes replacing Circuit Breaker R104, disconnect switches SW102 and 106, and bus work to a 3000 amp rating. Also the 115kV take off structure will be modified to handle the new 2-1192.5 conductor on line 901. In addition the bushing potential device will be replaced with a CVT.

This project corrects transmission thermal limiting components. So once these modifications are installed there will be no thermal limiting components at this station in support of the current RG&E proposed modifications.

Mortimer Substation is located in the Western Division, part of the Genesee Region at 1430 Brighton-Herietta Townline Road Brighton, NY.

The relevant report references are listed below:

1. RG&E SPR-1256 Station 23 new 115kV source – Revision 1 (12/2/13)
2. Mortimer Substation site meeting notes (6/23/14)

1.2 Site Safety

Standard safety procedures will be observed. During the installation of this station project, work will be performed near energized 115 kV and 13.2kV buses. Personnel need to be aware of this condition and exercise caution by establishing work area protection, performing job briefings, and wearing the appropriate personal protective equipment. All National Grid employees/ contractor(s) working on this project need to follow all company and OSHA safety rules, they should also refer to the "Employee Safety Hand book".

1.3 Safety by Design (Group Classification 02.00)

1.3.1 There are a significant number of underground facilities in the yard. Every effort has been made to locate all underground conduits, duct banks, etc. and ensure that the design provides for the indication and avoidance of the underground facilities where possible, to preclude an unsafe condition when digging for this project.

1.3.2 The existing Substation ground grid was analyzed. Additional grounding will be added to the area where the new circuit breakers are being installed. The existing ground grid will be upgraded as shown in grounding plan as part of this project.

1.4 Associated Work (Group Classification 02.00)

1.4.1 The associated transmission line work by RG&E to re-conductor line 901.

1.4.2 The associated station work to install protection, controls and communication equipment at RG&E Station 82.

1.4.3 The associated work to install a new substation RG&E Station 251.

1.5 Engineering & Design Delivery

1.5.1 Project Management will provide overall project management.

1.5.2 Substation Engineering and Design New York will manage final engineering and design.

1.5.3 Protection Engineering New York will provide all relay settings and perform all associated supporting calculations.

1.5.4 Substation west will provide testing and commissioning services on all substation equipment, unless specified otherwise (i.e. to be performed by the manufacturer or manufacturer's representative).

1.5.5 Substation Work Methods will oversee and direct the testing of power equipment.

1.5.6 Protection and Telecom Operations will install relay settings, perform relay testing and will provide control and protection system testing per SMP 400.80.2 – Substation Commissioning and Energization.

1.5.7 Equipment and material will be procured by National Grid.

1.5.8 External contractor will be providing construction services.

1.5.9 National Grid Standard Construction Specification for Electric Stations, SP.08.00.001, shall be utilized for all construction details.

1.5.10 A mobile substation will not be required during the outage in order to maintain distribution loads associated with this substation. It is anticipated that work will be done in a manner to allow for three of the four transformers to be energized at all times.

1.6 Assumptions, Exceptions, and Risks

1.6.1 External contractor will be providing construction services.

1.6.2 National Grid Standard Construction Specification for Electric Stations, SP.08.00.001, shall be utilized for all construction details.

1.6.3 The geotechnical and soil resistivity reports were completed prior to submission of this Technical Scope Document.

1.6.4 The transmission thermal ratings will be changed by this modification and transmission planning will have to make the proper notifications to the NYISO as per TGP26 and OP-16 procedures.

2.0 CIVIL / STRUCTURAL SCOPE

2.1 Site Work (Group Classification 03.01)

2.1.1 The work will be confined to the existing station fenced yard and right of way. No station expansion to the existing station fenced yard / right of way are required.

2.1.2 Oil containment will be not be required for the new circuit breaker.

2.2 Fencing (Group Classification 03.05)

2.2.1 N/A

2.3 Flood Risk (ST.02.00.004)

2.3.1 The station is located in Zone X, referencing panel FM36055C0332G. Zone X is an area that has been determined to be outside the 0.2% annual chance floodplain, and therefore outside the 500 year floodplain. Therefore, no flood mitigation will be required.

2.4 Foundations (Group Classification 03.03)

2.4.1 Re-use foundations for the equipment listed below:

a. The existing foundation at R104 is to be re-used and/or repaired due to cracking.

b. Reuse the existing foundation for the existing steel take-off structure.

c. A new foundation for the 115kV CVT stand.

2.5 Walls (Group Classification 03.03)

2.5.1 N/A

2.6 Cable Trench (Group Classification 04.15)

2.6.1 N/A.

2.7 Oil Containment (Group Classification 03.01)

2.7.1 Additional oil containment is not required for this site.

2.8 "SPCC" Plan (PL.01.00.004 & 006)

2.8.1 According to the SPCC plan there have been no historical releases subject to SPCC reporting requirements at this substation. Requirements for SPCC regulated facilities are identified in the Code of Federal Regulations (CFR), in Title 40, Part 112.

2.8.2 The existing SPCC plan will be revised to remove the applicable R104 oil volume.

2.9 Structures (Group Classification 03.02)

2.9.1 Mortimer disconnect switches are all mounted on the existing steel structures. The switch mounting structures will be evaluated for the added size and weight. New mounting plates will be designed for the 3000 amp switches. The proper clearances will be analyzed as part of final design.

2.9.2 Switch structures for SW102 and 106 will be modified to accept gang operated disconnects.

2.9.3 The existing structural supports will be evaluated for the new loading of the new 2- 1192.5 Conductors.

2.10 Pre-engineered (site built) Buildings (Group Classification 03.04)

2.10.1 N/A

2.11 Factory Fabricated Control / Equipment Enclosures (Group Classification 03.04)

2.11.1 N/A

2.12 Environmental

2.12.1 According to the NYSDEC Environmental Resource Map there are no State wetlands, rare plants, or rare animals in the immediate area of the station.

3.0 PRIMARY ELECTRICAL SCOPE – GENERAL

3.1 Ground Grid (Group Classification 04.12)

3.1.1 As a result of changing out the circuit breaker the ground grid analysis will not be substantially impacted. The ground grid will be modified if necessary based on the final design review of the station grounding.

3.1.2 New disconnect switches, and circuit breaker will be grounded according to the National Grid Standard ST.04.12.003 Substation Grounding.

3.1.3 All the cable terminations and cable grounding will be done according to the National Grid Standard ST.04.12.003.

3.2 Lightning Protection (Group Classification 04.14)

3.2.1 The existing lightning protection coverage is adequate because the station footprint has not changed.

3.3 U/G Duct Banks (Group Classification 04.15)

3.3.1 N/A

3.4 Conduits (Group Classification 04.15)

3.4.1 Two (2) new 4" conduits will be run from Station 82 to Mortimer for the new fiber optic communications cable. One will be spare.

3.4.2 New 4" conduits for control and power cables will be installed from the circuit breaker to the control house.

3.4.3 A new 2" conduit will be run from the CVT to the control house

3.4.4 Conduit size and length will be re-confirmed during final engineering.

3.4.5 Protection package A and B will be run in separate conduits in order to comply with NPCC bulk power directory 4 requirements.

3.4.6 CT cable, power cable and control cable shall not be routed in the same conduit.

3.5 Indoor / Outdoor Lighting (Group Classification 04.11)

3.5.1 N/A

3.6 Low Voltage (600V) Power and Control Cables (Group Classification 05.08)

3.6.1 New control cables will be installed between the new 115kV equipment and the control house.

3.6.2 National Grid requires that all cables, cable sizes and cable types comply with standard ST.05.08.001 – Low Voltage Power, Control and Instrumentation Cable.

3.6.3 The following circuits are not to be intermixed in the same cable:

3.6.4 DC and control circuits including alarms (125VDC), #12 minimum

3.6.5 CT circuits (5A), #10 minimum

3.6.6 Communication circuits (Telephone, Carrier, and Fiber optics) as required

3.6.7 Low Voltage AC station service and lighting circuits (less than 600VAC, 20 amps continuous, 75A momentary) as required.

3.6.8 High Voltage Power (greater than 600VAC and/or above 20A continuous, 75A momentary) as required.

3.6.9 Control cable quantity will be determined during final engineering.

3.7 Fiber Optic Cables (Group Classification 05.05)

3.7.1 Install new fiber optic cable from Station 82 to Mortimer Station for communications equipment. Use AFL Telecom cable specification DNA-30327 or equivalent.

3.7.2 Use 1/1/4" diameter orange inner duct in the conduit or trench and control house for the fiber installation to prevent damage to the fiber optic cable.

3.7.3 Terminate fiber optic cable in patch and splice panels with bulkhead connectors.

4.0 PRIMARY ELECTRICAL SCOPE – VOLTAGE LEVEL 1 (115KV)

4.1 Power Transformer (Group Classification 04.02)

4.1.1 N/A

4.2 Metal-Clad Switchgear (Group Classification 04.05)

4.2.1 N/A

4.3 Circuit Interrupter (Group Classification 04.01)

4.3.1 Replace GE type "FK" Oil Circuit Breaker R104 with a 115kV 3000A 63kA SF6 Breaker per specification SP.04.01.002 46kV-345kV Power Circuit Breakers (SF6). The circuit breaker will have dual trip coils in order to comply with NPCC bulk power directory 4 requirements. However Mortimer does not have two battery sources and we will not meet all the bulk power requirements. The station was not designed to meet bulk power requirements.

4.3.2 See section 9 for Revenue Metering CT requirements.

4.4 Disconnect Switches (Group Classification 04.09)

4.4.1 Replace disconnect switches SW102 and 106 with 123kV 3000 amp group operated air break, vertical break switch per specification SP.04.09.001 Group operated outdoor air break disconnect switch.

4.4.2 Replace gang disconnect switch SW100 with a 123kV 2000 amp group operated air break, vertical break switch per specification SP.04.09.001 Group operated outdoor air break disconnect switch.

4.4.3

4.5 Capacitor Banks (Group Classification 04.08)

4.5.1 N/A

4.6 Reactor (Group Classification 04.13)

4.6.1 N/A

4.7 Instrument Transformer (Group Classification 04.03)

4.7.1 Replace existing bushing potential device with single phase 115kV CVT with 2 secondary windings with ratios of 1000/600:1.

4.8 Line Traps / Tuners (Group Classification 04.07)

4.8.1 N/A

4.9 Surge Arresters (Group Classification 04.19)

4.9.1 The surge arrestor will be evaluated by Station Maintenance for possible replacement per SMP 419.01.2.

4.10 Voltage Regulators (Group Classification 04.04)

4.10.1 N/A

4.11 Primary Bus Work (Group Classification 04.17)

4.11.1 Replace the existing 3.5" IPS AL bus with a 5" ISP AL bus to meet 400MVA load for summer normal and 640MVA for LTE.

4.11.2 Replace existing strain bus 500 CU 37 STR with 2- 1250 CU 37 STR conductor.

4.12 High Voltage U/G Power Cable (>1000Volts)

4.12.1 N/A

5.0 PRIMARY ELECTRICAL SCOPE – VOLTAGE LEVEL 2 (N/A)

5.1 Power Transformer (Group Classification 04.02)

5.1.1 N/A

5.2 Metal-Clad Switchgear (Group Classification 04.05)

5.2.1 N/A

5.3 Circuit Interrupter (Group Classification 04.01)

5.3.1 N/A

5.4 Disconnect Switches (Group Classification 04.09)

5.4.1 N/A

5.5 Capacitor Banks (Group Classification 04.08)

5.5.1 N/A

5.6 Reactor (Group Classification 04.13)

5.6.1 N/A

5.7 Instrument Transformer (Group Classification 04.03)

5.7.1 N/A

5.8 Line Traps / Tuners (Group Classification 04.07)

5.8.1 N/A

5.9 Surge Arresters (Group Classification 04.19)

5.9.1 N/A

5.10 Voltage Regulators (Group Classification 04.04)

5.10.1 N/A

5.11 Primary Bus Work (Group Classification 04.17)

5.11.1 N/A

5.12 High Voltage U/G Power Cable (>1000Volts)

5.12.1 N/A

6.0 STATION SERVICE SCOPE

6.1 DC Power (Group Classification 05.06)

6.1.1 The existing 250VDC station service will be used for tripping and closing control power of the new 115kV circuit breaker. Two separate breakers will be utilized for the two trip coils. The existing DC service is adequate to handle the load.

6.2 AC Power (Group Classification 05.07)

6.2.1 The existing 120/240VAC station service will be used for breaker compartment power, SF6 tank heaters and cabinet lighting. The existing AC service is adequate for the additional heater load.

6.3 Standby Generator (Group Classification 05.07)

6.3.1 N/A

7.0 PROTECTION SCOPE

7.1 Protection Details (Group Classification 10.00, 10.01, & 10.02)

7.1.1 115KV LINE 901 PROTECTION:

This line protection was designed to work in conjunction with the line protection on the remote end at RG&E's new station 251 as defined in RG&E's proposal scope document.

The "A" protection will be provided by a Schweitzer 411L line differential relay with back up step distance protection. It will communicate with station 251 via an existing fiber optic cable between the two stations. The 411L will interface

with this fiber through G.E. JMUX communications equipment. Direct Transfer Trip (DTT) transmit and receive will be utilized in this relay for Breaker Back Up (BBU). A failed center breaker in station 251's breaker and half configuration will send DTT to Mortimer breaker R104. A failure of R104 at Mortimer for a bus section No. 1 fault or a line 901 fault will send DTT to station 251. In addition to the 411L a Schweitzer 351-6 overcurrent relay will be used as an auxiliary tripping relay to trip R104 and drive the auto reclosing to lockout when DTT is received from station 251.

The "B" protection will be provided by a G.E. L90 line differential relay with back up step distance protection. It will communicate with station 251 via a new diverse direct fiber optic cable to be installed between the two stations. This protection package, like the "A", will provide BBU and DTT. A Schweitzer 351-6 relay will be used for DTT receive tripping. Both the primary and the secondary line differential and DTT schemes will be supervised "43" ON-OFF control switches.

Auto reclosing of breaker R104 will be accomplished with a Schweitzer 351-6 overcurrent relay. It will be programmed to mimic the existing electromechanical scheme and will operate on live-bus/dead-line or synch check. It will also be incorporated into the existing bus protection "Stall" scheme and will be driven to lock out for a failure of breaker R104 and DTT receive. The existing breaker R104 is equipped with a bushing potential device on the line side that is used for auto reclosing and synch check. R104 is being replaced, therefore a new single phase 69KV -115V CVT will be installed in place of the bushing potential device and brought to the new reclosing relay.

8.0 CONTROL AND INTEGRATION SCOPE

8.1 Control and Integration Details (Group Classification 05.01, 05.03, & 05.10)

8.1.1 Energy Management System

a. Control and Trip / Close status monitoring of R104 will be maintained on RTU1. Reclosing control and status monitoring for R104 will be added to RTU1. Analog telemetry will continue to be monitored through RTU2. All new relaying alarms and status points will be added to RTU2.

b. A new SEL-2032 communications processor will be added to facilitate both status monitoring for the new relays as well as fault record retrieval. This device will be connected via Ethernet back to the existing Garretcom DX900 gateway device to allow remote access through the Crossbow system. This new SEL-2032 will connect to the RTU via DNP3 by connecting to the existing RS485 network associated with the existing SEL-

2020 devices. A coaxial connection between the SEL-2032 and the Arbiter GPS clock is also required.

c. A new ASE SAM-900 HMI will be installed to perform local annunciation. The old annunciator will be removed from panel 3F. All alarms that are repeated to the RTU from this old annunciator will now be run directly to the RTU. A pair of new Telebyte RS232 to RS485 converters will be installed to facilitate traffic between the new HMI and the RTU. Power for the converter located within the SAM cabinet will be provided by the SAM 12v power supply.

d. The new JMUX trouble alarms will be ganged together and connected to RTU2.

e. All RS-485 networks shall be terminated at both ends with 120Ω resistors to eliminate reflections on the line.

f. The RTU Points List tables in the Attachments Section contain the EMS points that will be required on both RTU1 and RTU2 at Mortimer Station.

g. The overall connection scheme for the RTU and IEDs is shown in the Mortimer Station RTU Visio Diagram in Attachments Section.

8.1.2 Panel Metering

a. The existing Bitronics panel meter for R104 will remain as is, returning analog quantities to RTU2. Additional analog monitoring will be maintained through the existing Ion revenue meter.

8.1.3 Control Switchboard

a. An RE-01 dual trip coil control switch will be provided for the new circuit breaker. This control switches will be installed in the relay panel for R104 and will provide local and remote status and control functionality for trip (open)/close.

b. An RE-43A/M switch will be provided for the new R104 circuit breaker. This switches will be installed in the relay panel for the breaker and will provide local and remote status and control functionality for Reclose auto / manual within the breaker. A site visit will be used to determine exact placement for the larger RE-43A/M switches during final design.

c. All test switch designations and model configurations listed in the Control & Integration Material List may require modification during Final Engineering and Design to best accommodate the switchboard panel and equipment layout of the final station design.

9.0 REVENUE METERING SCOPE

9.1 Revenue Metering Details (Group Classification 05.09)

9.1.1 New circuit breaker CT's must be of revenue grade or +/-0.3% accuracy.

9.1.2 Revenue metering CTs must be recognized by the NYS Department of Public Service - Approved Meter List 6/30/14.

10.0 COMMUNICATIONS SCOPE

10.1 Communications Details (Group Classification 05.05)

10.1.1 General: The Telecom related work to be performed at Mortimer includes the following:

1. Install a new 72 strand fiber optic cable between Mortimer and RG&E Station 82
2. Install a new 72 strand fiber optic cable between Mortimer and RG&E Station 251
3. Install a new equipment cabinet to house JMUX equipment for communications to support protection circuit

10.1.2 Conduits: The following to be provided:

1. Two (2) 4" schedule 80 conduits to the substation fence will be needed to provide a pathway for the 72 strand fiber optic cable between Mortimer and RG&E Station 82. RG&E will be responsible for placing and terminating the fiber optic cable. One spare for future use.
2. One (1) 4" schedule 80 conduit from control house to Breaker R104 bay line 901 termination structure to circular AFL splice can for the 72 strand fiber optic cable between Mortimer and Station 251 via Line 901 OPGW. RG&E will be responsible for placing and terminating the fiber optic cable.

10.1.3 Fiber Optic: Two (2) fiber optic patch panels in Mortimer Control House, provided by RG&E, will be provided for the termination of the (2) 72 strand fiber optic cables, one for Station 82 and one for Station 251. The fiber optic cables will be terminated by RG&E.

10.1.4 Power: The following electrical circuits are to be provided

1. Two (2) 130VDC circuit is needed to the RG&E Equipment
2. One (1) 120VAC circuit is needed to the RG&E Equipment

10.1.5 Add one JMUX OC-48 shelf, provided by RG&E, mounted in the RG&E equipment cabinet. The JMUX will connect to the new 72 strand fiber optic cable and become part of the RG&E SONET Ring

10.2 Circuit Requirements:

10.2.1 Protection:

a. Relay communications for the primary Line 901 protection current differential and DTT schemes will be through the JMUX

b. Relay comms for the Line 901 secondary Line 901 protection current differential and DTT schemes will be direct fiber optic interconnections to the RG&E fiber optic patch panel

10.2.2 Security: None

10.3 Attachment #8 list additions, changes or modifications to the Communications system.

11.0 MISCELLANEOUS SCOPE

11.1 Site Security (Group Classification 02.04 & 03.04)

11.1.1 N/A

11.2 Animal Intrusion Protection (Group Classification 04.18)

11.2.1 N/A

11.3 Fire Alarm / Fire Protection (ST.02.00.004)

11.3.1 N/A

11.4 Insulators and Surge Arresters

11.4.1 During line 901 outage the old brown insulators should be replaced and upgraded to the new standard under the direction of the O&M Engineer.

11.5 Steel Structure painting

11.5.1 N/A

12.0 TEMPORARY FACILITIES / MOBILE TRANSFORMER SCOPE

12.1 Temporary Facilities

12.1.1 N/A

12.2 Mobile Transformer

12.2.1 N/A

13.0 SPARE PARTS

13.1 Spare Parts Details

13.1.1 Substation O&M Services project team member will identify and order all required spare parts.

14.0 REMOVALS AND RETIREMENTS SCOPE

14.1 Removals and Retirements Details

14.1.1 Existing R104 oil circuit breaker will be removed and will be send to investment recovery.

14.1.2 Two (2) existing hook stick disconnects 102 and 106 and the associated steel structures will be removed and sent to investment recovery.

14.1.3 One (1) gang operated switch SW100 will be removed and sent to investment recovery

14.1.4 The existing bus work 3.5" AL IPS bus tube and copper strain bus will be removed and sent to investment recovery.

15.0 REFERENCES

Document Number	Sheet	Revision	Document Title
C22305W	2	32	Single Line Diagram
C10435W	1	20	Conduit Plan
C31690W	1,2	3	R104 GE OCB type FK
D61887W	2	7	EMS point assignments
C22206W	1	7	Interconnection diagram R104 OCB
C22474W	10	14	Panel 12F line 901 R104
C22274W	2B	6	Elementary wiring diagram Line 901 OCB R104
C16753W	1	14	Electric assembly plan
STAD-Mortimer	1,2	2	Operating Diagram
SPR-1256	-	1	RG&E Station 23 new 115kV source from Mortimer technical requirements

Note: This is a compilation of documents used to develop the Technical Scope ONLY. It is not an all inclusive list of references or list of drawings affected for Step 2B: Final Engineering and Design.

16.0 LIST OF ATTACHMENTS

Attachment #1: Existing operating diagram

Attachment #2: Proposed one-line diagram reflecting the project additions / removals

Attachment #3: Preliminary Protection Single Lines sheet 1

Attachment #4: Preliminary Protection Single Lines sheet 2

Attachment #5: Photographs

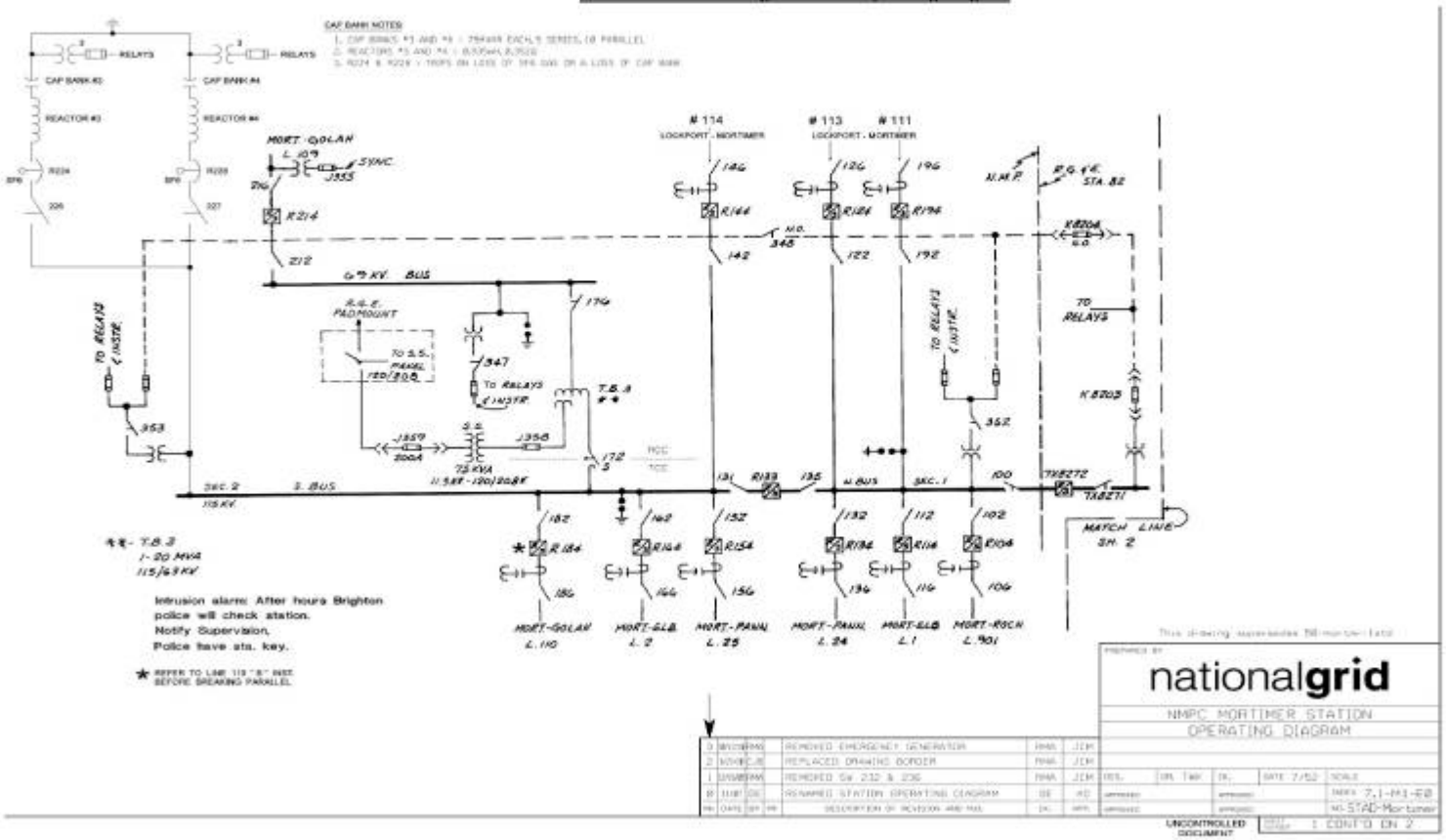
Attachment #6: Preliminary Protection Relay List

Attachment #7: Preliminary C&I Equipment List

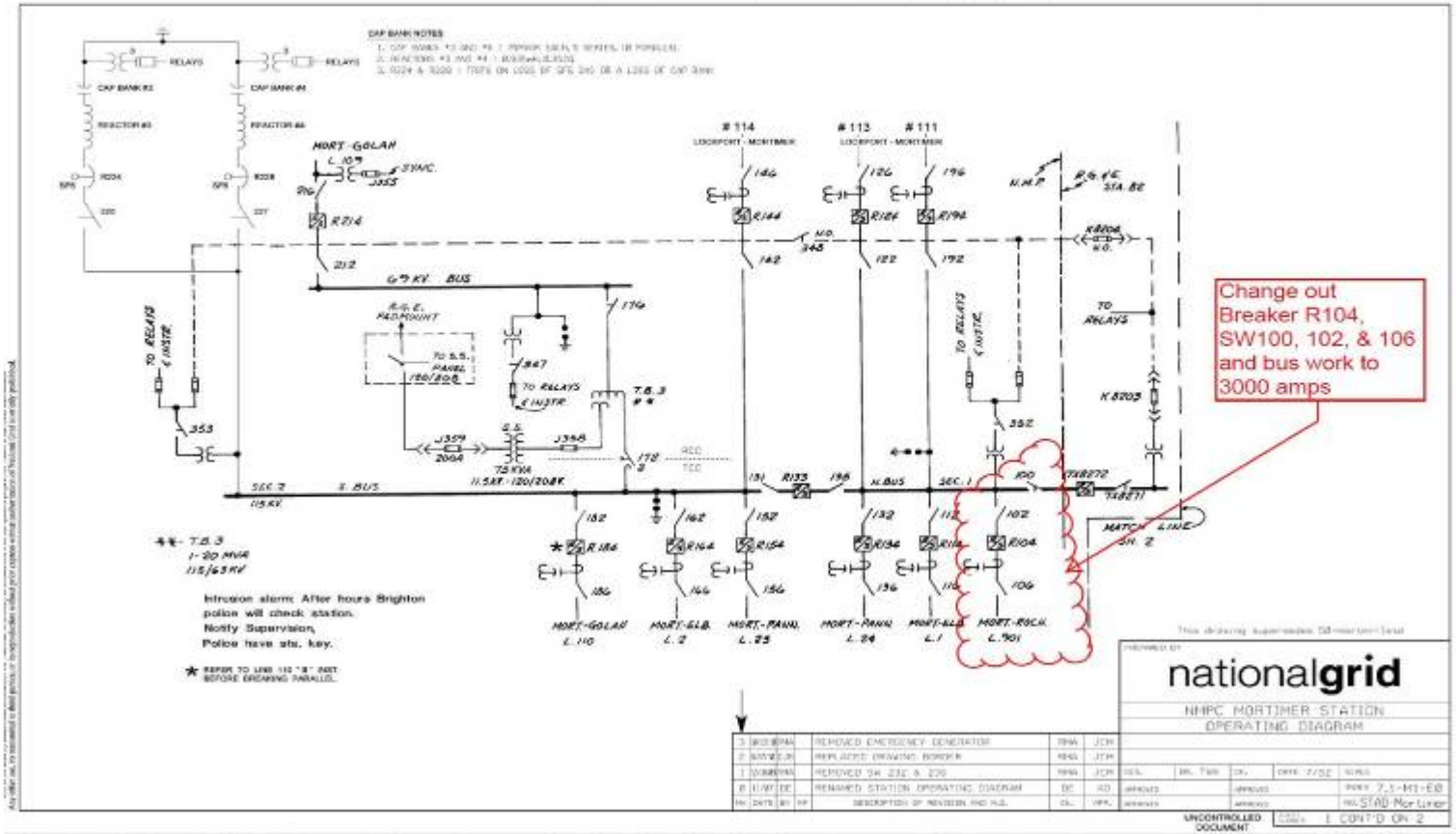
Attachment #8: Preliminary Telecom Equipment List

Attachment #9: Final Engineering and Design Milestone Schedule

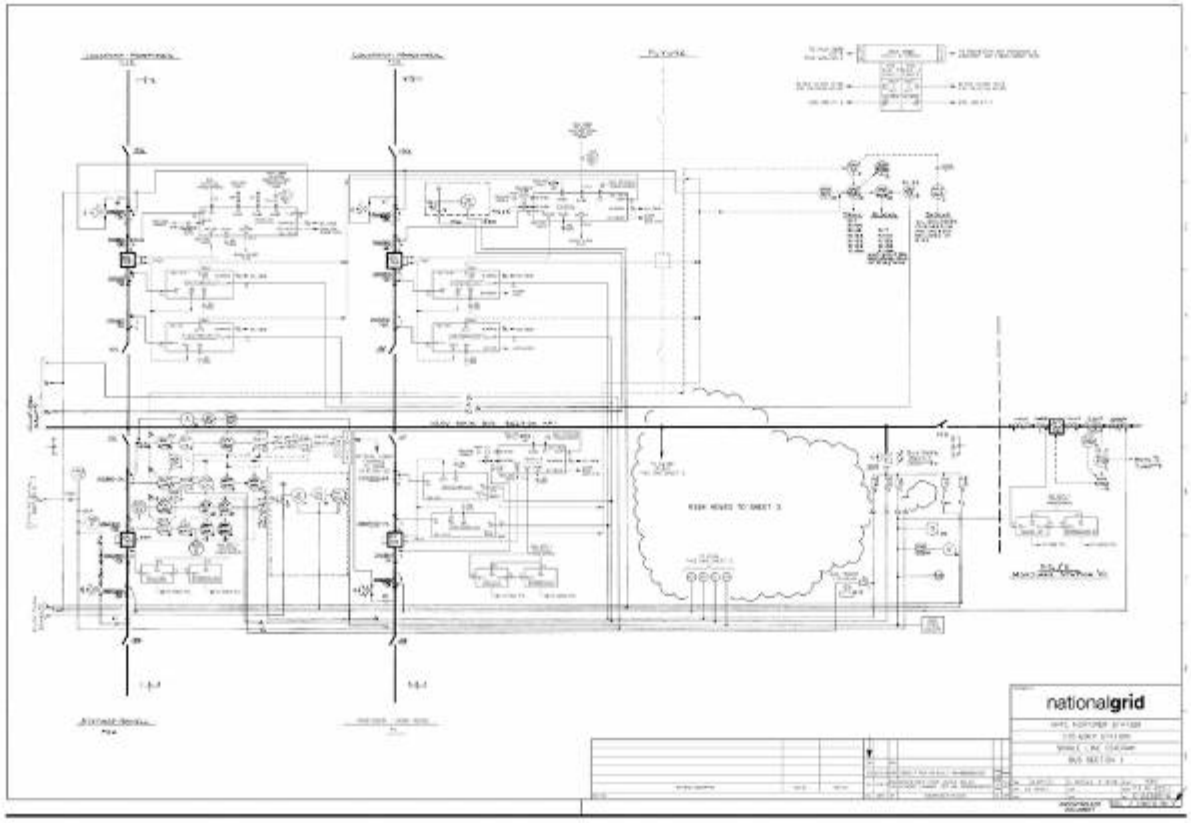
16.1 **Attachment #1: Existing One Line / Operating Diagram**



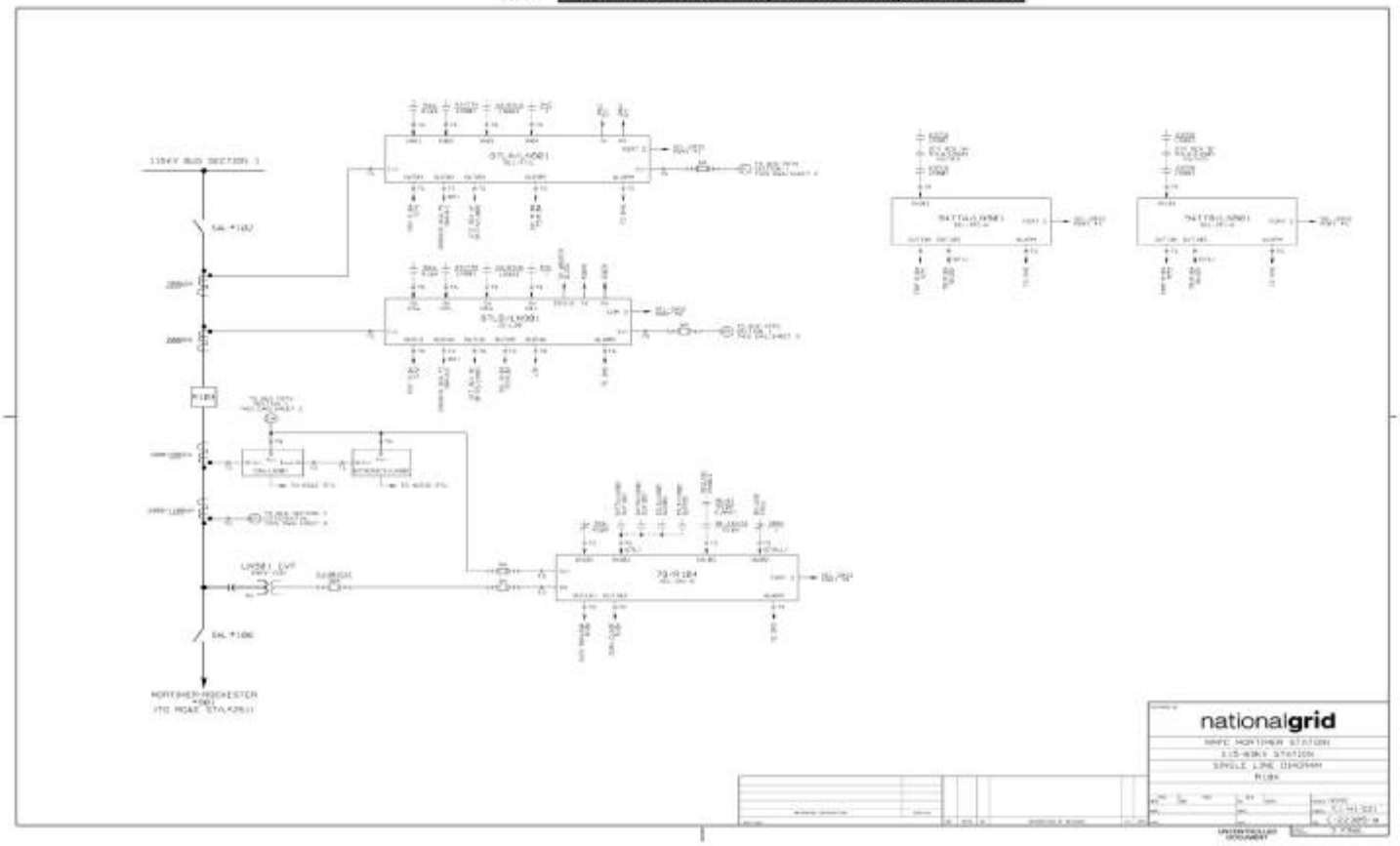
16.2 **Attachment #2: Proposed One Line / Operating Diagram**



16.3 **Attachment #3: Preliminary Protection Single Lines sheet 1**



16.4 **Attachment #4: Preliminary Protection Single Lines sheet 2**



16.5 Attachment #5: Photographs

Pic1 Breaker

Pic 2 disconnect switches 102 and 106

16.6 Attachment #6: Preliminary Protection Relay List

Item	ANSI/IEEE Device Designation	Quantity	Description Comments
Mortimer Line 901 PROTECTION			
1	87LA/LN901	1	Schweitzer: SEL-411L Line Differential Relay Part No: **0411L1X6X5C6C0XH5E676XX** Key Code: 8302 5U Horizontal Rack Mount 125/250 VDC Power Supply 250 VDC Control Voltage Additional I/O Board 850nm multi mode IEEE C37.94 Fiber Interface
2	87LB/LN901	1	G.E. L90 Line Differential Relay Part No: **N00-HKH-F8L-H6U-L6U-NXX-SXX-UXX-W7K** Horizontal Rack Mount 125/250 VDC Power Supply 1300nm single mode, LASER, 2 Channel Fiber Interface **NOTE: This Relay MUST be ordered with the same Software Number as RG&E's relay or they will not work together!**
3	94TTA/LN901 94TTB/LN901 79/R104	3	Schweitzer: SEL-351-6 Overcurrent Relay Part No: **035163C4E562X1** Key Code: 6141 3U Horizontal Rack Mount 125/250 VDC Power Supply 250 VDC Control Voltage Additional I/O Board
4	43TTA/LN901 43TTB/LN901	2	G.E. ON-OFF Switch, Type SBM Part No: **16SBMF2A08S1A3V1** 6-Stage, 2 Position Fixed Oval Handle Nameplate Engraving: OFF – ON Escutcheon to read "TRANSFER TRIP"
5	43/87LA/LN901 43/87LB/LN901	2	G.E. ON-OFF Switch, Type SBM Part No: **16SBMF2A08S1A3V1** 6-Stage, 2 Position Fixed Oval Handle Nameplate Engraving: OFF – ON Escutcheon to read "LINE DIFF"

Note: The above relay model numbers are subject to change to reflect current National Grid Standards in Step 2B: Final Engineering and Design. The proposed model numbers must be reviewed by National Grid prior to placing an order.

16.7 Attachment #7-1: Preliminary C&I Equipment List

Item	ANSI/IEEE Device Designation	Quantity	Description Comments
1	Control Handles: RE-01/R104	1	Electroswitch Control Switch Relay, Series 24, Dual Trip Coil Model #: 88PD57LB Rating: $125V_{DC}$ Decks: 5 Indication: Green/Red/Red LED's Escutcheon: Breaker Control – Trip/Close
2	Reclose On/Off Switch: RE-43A/M/R104	1	Series 24 Latching Switch Relay W/ Annunciator Namplate Model #: 92PA03MQ Rating: $125V_{DC}$ Decks: 3 Escutcheon: Reclosing Switch - Manual/Auto
3	Communications Processor	1	Schweitzer Communication Processor, Model: SEL2032 Part Number: 203203X344G0XX Mounting: Horizontal Rack Mount Memory: Standard Database and Settings Storage with Archive Storage Memory Special Hardware Options: None Power Supply: 38-200 Vdc, 85-140 Vac I/O Board; Control Input Voltage: 4 Outputs, 16 Inputs; 125 Vdc* Protocol Card #1: Ethernet Card with DNP3 Protocol Connection Option for Protocol Card #1: Two 10/100BASE-T* Protocol Card #2: No Card
4	Communications Cables SEL-2032 to Relays Coaxial Cable for IRIG-B	T B D	Misc. Serial Cables Models to be determined during final design
5	RS-485 Communication Cable	T B D	Belden 9842
6	RS232 / RS485 Transceiver SEL-2886	2	Schweitzer Serial Interface Converter: SEL-2886 RS232 to RS485 conversion Port Powered

16.7 Attachment #7-1: Preliminary C&I Equipment List

Item	ANSI/IEEE Device Designation	Quantity	Description Comments
7	HMI	1	ASE SAM (SAM-900-125) Includes 17" touch screen monitor with 19" rack-mount bracket, single board Pentium IV computer with 19" rack-mount bracket, 4 serial and 2 network ports, Windows O/S, SAM alarm annunciation software, SPT data acquisition software (Support for DNP3 and Modbus, protocols: serial and network versions) Pullout Keyboard (SAM-KB) 19" Rack Mount Keyboard Touchpad and Tray
8	Telebyte Communication Signal Converters	2	Telebyte Communication Signal Converters (Model 365M), (wired for 4 ea.) Aux Power Input 12VDC w/LED Display.

Note: Please refer to ST.05.03.048 – Test Switches for metering and control handle test switch standard specifications.

16.8 Attachment #7-2: C&I Point Assignment (RTU1)

Mortimer RTU1 Status Points

IED Point No.	EMS Point No.	EMS Description	2020 Port	Input Source	Device
16	15	BKR R104			
17	16	R104 RECLOSE OFF		DI-XT3	RTU
18	17	SPARE017			
19	18	NBUS BKRAIR			
20	19	SBUS BKRAIR			

Mortimer RTU1 SBO Points

IED Point No.	EMS Point No.	EMS Description	2020 Port	Output Source	Device
1	0	BKR R214		XT1	RTU
2	1	R214 RECLOSE OFF			
3	2	R144 RECLOSE OFF			
4	3	R233 RECLOSE OFF			
5	4	BKR R233		XT2	RTU
6	5	BKR R235			
7	6	BKR R154			
8	7	R235 RECLOSE OFF			
9	8	BKR R133		XT3	RTU
10	9	SPARE009			
11	10	BKR R134			
12	11	SPARE011			
13	12	SPARE012		XT4	RTU
14	13	BKR R104			
15	14	R104 RECLOSE OFF			
16	15	SPARE015			

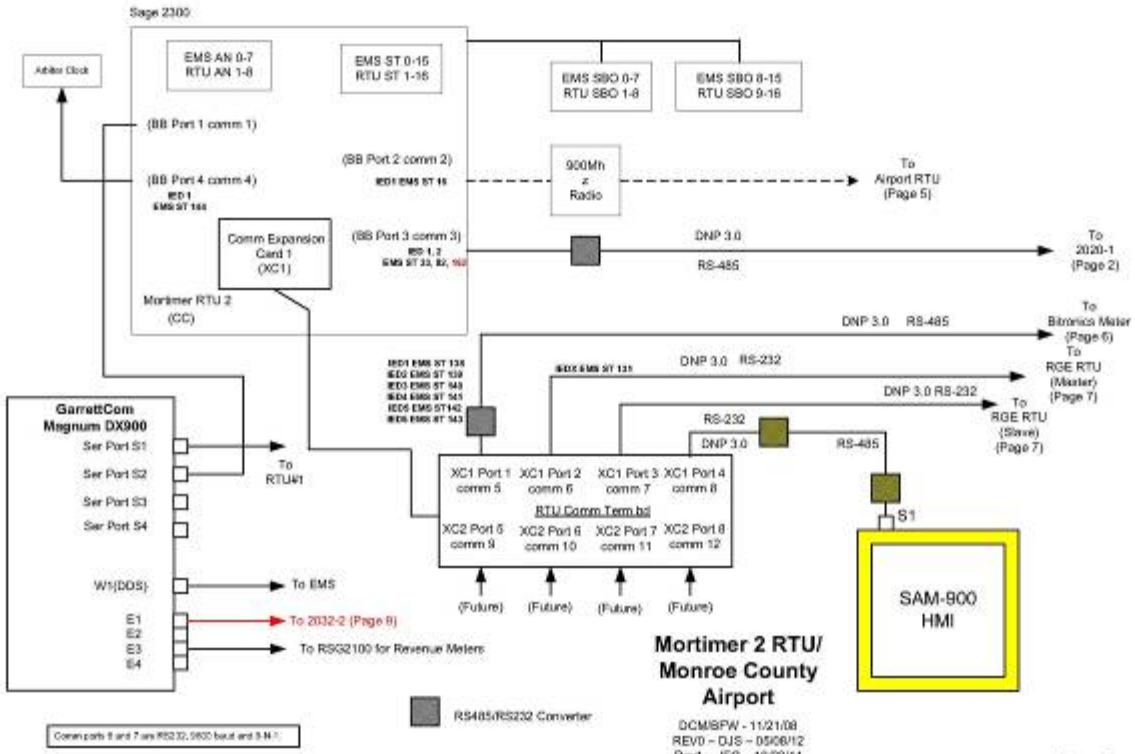
16.9 Attachment #7-3: C&I Point Assignment (RTU2)

IED Point No	EMS Point No	Mortimer RTU2 Status Points Description	2020 Port	Input Source	Device
	0	RTU Cutoff		Mortimer Sage RTU	Baseboard
	1	69S R/L			
	2	Fuse monitor			
	3	2020 Relay Fail			
	4	Ln 1 relay fail			
	5	Mortimer IMUX 2000 Failure			
	6	Mortimer (Rochester Pump) LN111 Block Reclose Failure (MTS Card)			
	7	Mortimer (Rochester Pump) LN113 Block Reclose Failure (MTS Card)			
	8	Mortimer (Rochester Pump) LN114 Block Reclose Failure (MTS Card)			
	9	R194 Reclose OFF (RE-43A/M)			
	10	R124 Reclose OFF (RE-43A/M)			
	11	R144 Reclose OFF (RE-43A/M)			
	12	2032-2 Trouble			
	13	JMUX Trouble			
	14	spare			
	15	spare			

MORTIMER RTU2 STATUS POINTS CONTINUED

IED Point No	EMS Point No	Description	2020 Port	Input Source	Device
27	157	Rochester Pump 87LB/LN114 Relay Trouble (BPRO)		Airport M1/C RTU	ST-XT-01
28	158	Rochester Pump SEL-2032 Trouble		|	|
29	159	Rochester Pump Arbiter Clock Fault		|	|
30	160	Rochester Pump Arbiter Clock Loss of Sat. Lock		▼	▼
48	161	R194 Reclosing Blocked (OUT103)	2020-1 p6	SEL-351A	79/R194
	162	2032-2 Comm Sts		SEL-2032-2	SEL-2032-2
0	163	LN901 LINE DIFFERENTIAL 'A' RELAY TROUBLE (87LA/LN901)		|	IN1
1	164	LN901 LINE DIFFERENTIAL 'B' RELAY TROUBLE (87LB/LN901)		|	IN2
2	165	LN901 'A' RELAY TROUBLE (94TTA/LN901)		|	IN3
3	166	LN901 'B' RELAY TROUBLE (94TTB/LN901)		|	IN4
4	167	R104 RECLOSING RELAY TROUBLE (79/R104)		|	IN5
5	168	LN901 'B' LOSS OF POTENTIAL (LOP)		|	IN6
6	169	43/87LA/LN901 Differential OFF		|	IN7
7	170	43/87LB/LN901 Differential OFF		|	IN8
8	171	43TTA/LN901 OFF		|	IN9
9	172	43TTB/LN901 OFF		|	IN10
10	173	R104 Maintenance Test Switch Position		|	IN11
11	174	R104 Breaker Trouble		|	IN12
12	175	R104 Low SF6 Gas Alarm		|	IN13
13	176	R104 Low SF6 Gas Lockout		▼	IN14
14	177	LN901 LINE DIFFERENTIAL 'A' RELAY COMM STATUS	2032-2 p1	SEL-411L	87LA/LN901
15	178	LN901 LINE DIFFERENTIAL 'A' RELAY COMMUNICATIONS CHANNEL TROUBLE	|	|	|
16	179	LN901 'A' LOSS OF POTENTIAL (LOP)	▼	▼	▼
17	180	R104 RECLOSING RELAY COMM STATUS	2020-2 p5	SEL-351-6	79/R104
18	181	R104 RECLOSING BLOCKED (OUT103)	▼	▼	▼

16.10 **Attachment #7- 4 : C&I Layout Diagrams**



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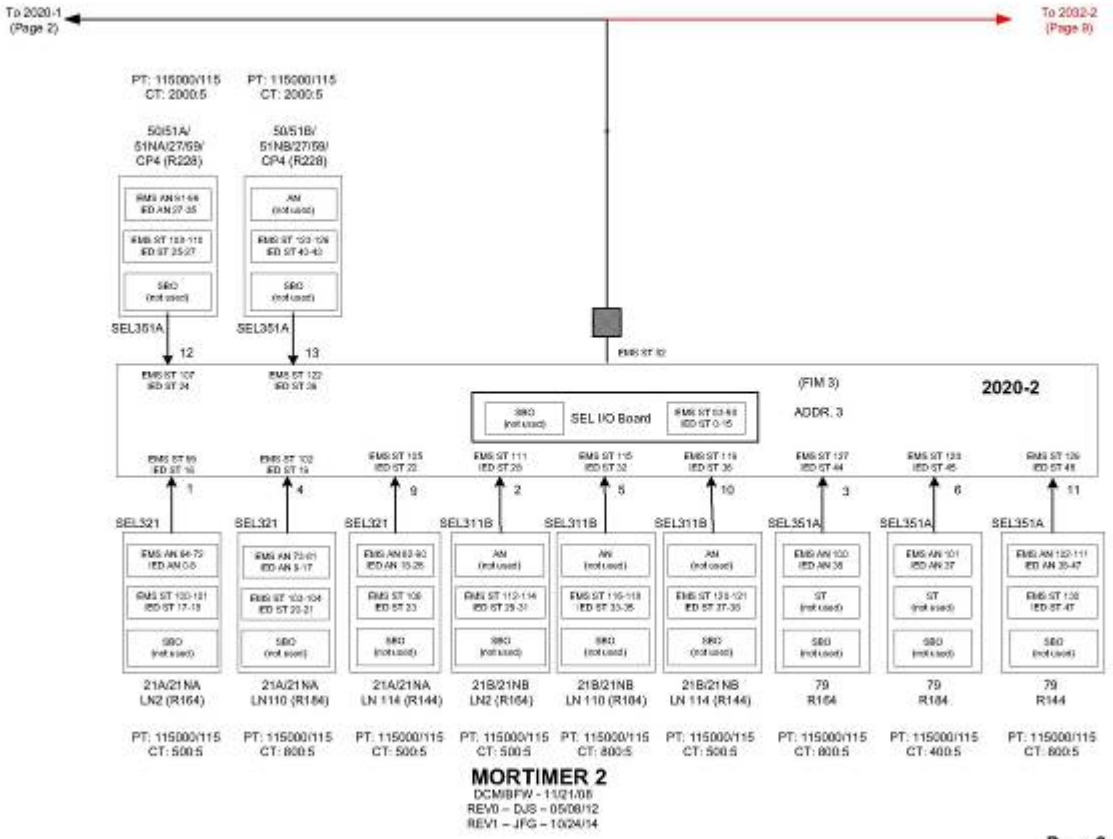
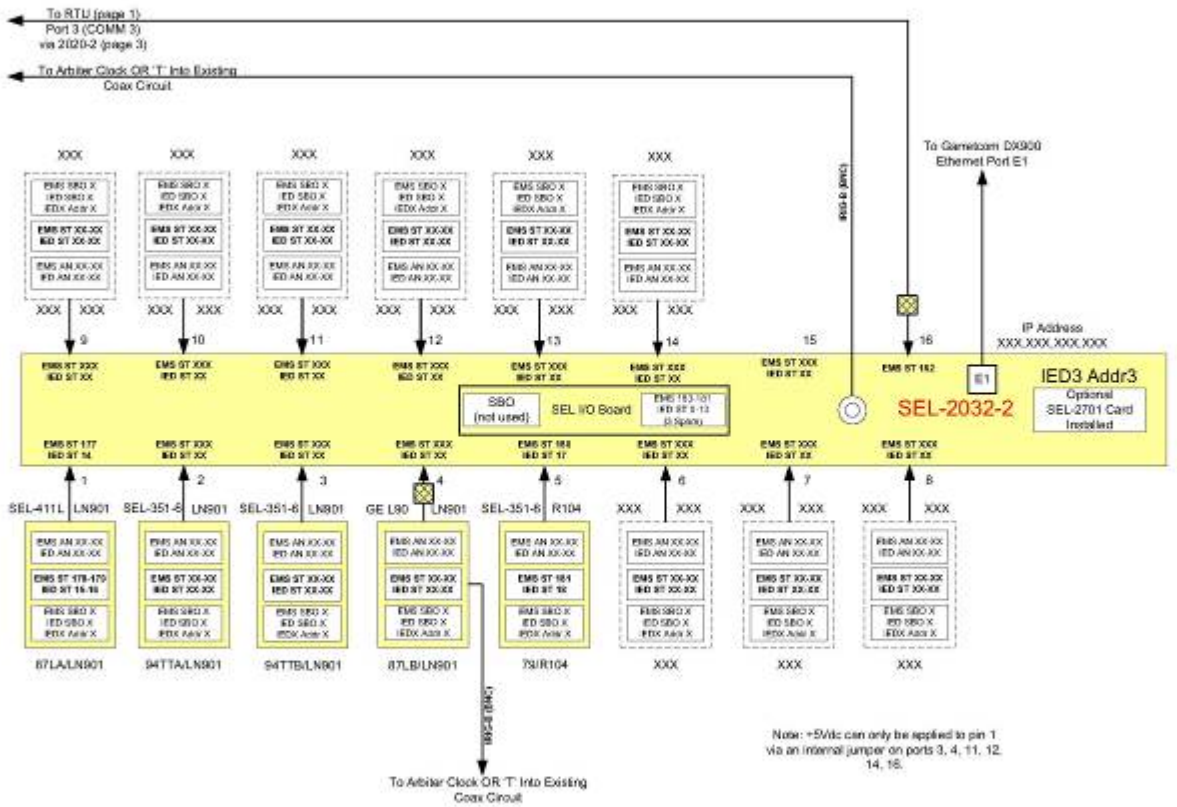


MORTIMER 2
DCM/BFW - 11/21/08
REV0 – DJS – 05/08/12
REV1 – JFG – 10/24/14

Page 3



Mortimer RTU#2
Rev 1 10/21/14 JFG

16.11 Attachment #8: Preliminary Telecom Equipment List

Item	ANSI/IEEE Device Designation	Quantity	Description Comments
	JMUX configuration (to Be provided by RG&E)	1 1 4 4 1 1 2 1 1 1 2 1 2 2 2 1 1 1 1 1 1	Common Equipment shelf (B86430-OI) JMUX Channel Shelf (3RU) (B86430-04) Power Converters 130V (B8643 1-03) Power Unit Paddle Boards (86431-90) Service Unit (B86434-02) Service Unit! IP Service Unit Paddle Board (86434-92) OC-48 JMUX Unit 1310nm IR-I, SMF, LC (886419-01 !AA) Cable Assy Xover CAT6, RJ-45, Shielded. 7" (135-86419-01) 28VT JMUX to JIF cable (Left side) (035-86430-65) 28VT JMUX to JIF cable (Right side) (035-86430-66) CDAX Units (886486-01) CDAX Paddle Board (86486-91) DATA-NX64F Units (64-768K) (886464-02) DATA-NX64F Unit Fiber PB (C37.94 MMF) (86464-98) 4W-VP' E&M Units (B86444-05) 4W-VP' Split Combine Paddle Board (86444-91) VT/DSO Ribbon Cable Kit (86430-52) Computer Test Cable Kit (86430-53) 2.488Mb/s TRANSCEIVER, 131 Onm, IR-I, 13dB, SMF, LC 1RU Spacer Panel, with removable Front (PB000086) VistaNET Network Interface (VNI) RTU License
	Fiber Optic Materials (to Be provided by RG&E)	TBD 1 1 12 12 2 1	72 strand fiber optic cable, SMF-28e+, full dielectric Corning Bulk Head Housing (CCH-04U) Corning Splice Housing (CSH-03U-F) Corning Splice Trays (M67-078) Corning Bulkhead and pigtails (CCH-CPI2-A9-PO3RH) Fiber optic patch panels Circular AFL splice Can

16.12 Attachment #9: Preliminary Final Engineering and Design Schedule

Engineering & Design Milestone Schedule

No	Description	Scheduled Dates/Durations[1]
1.	Relay, C&I & Telecom Design Briefs Issued (NE only)	N/A
2.	If EPC / MSA, develop EPC / MSA bid Technical document	N/A
3.	Develop planning grade estimate (Level 3 projects only)	11/14
4.	Planning Sanction and DOA approval	12/14
5.	Notification from PM to start Final Engineering & Design	1/15
6.	Issue PO to EPC / MSA consultant (if applicable)	1/15
7.	Design Kickoff Meeting (PR.02.00.013)	2/15
8.	Major equipment / material procurement completed	7/15
9.	Primary/Civil/Structural design finished	09/15
10.	AC/DC Elementaries design finished	09/15
11.	Secondary wiring design finished	09/15
12.	Primary/Civil/Structural constructability review	10/15
13.	AC/DC Elementaries constructability review	10/15
14.	Secondary wiring constructability review	10/15
15.	Primary/Civil/Structural issued for construction (IFC)	11/15
16.	AC/DC Elementaries and secondary wiring IFC	11/15
17.	Engineering & Design Complete (EDC)	12/15
18.	If outsourced construction, complete construction bid specification	12/15
19.	Input to PM for Construction Field Issue Document	12/15
20.	Develop project grade estimate (Level 3 projects only)	N/A
21.	Minor equipment / material procurement completed	12/15

NOTES:

1. For resourcing, it is preferred that we indicate the month & year instead of durations. The schedule development is based on task 5 above.
2. There may be only one or multiple constructability reviews depending on project specifics and regional needs. Customize to meet project needs. NY generally has one constructability review, if this is so put same date in for all.
3. There may be only one or multiple issue for construction (IFC) depending on project specifics and regional needs. Customize to meet project needs. NY generally issues all drawings at once, if this is so put same date in for all. EDC indicates all drawings issued for construction.

17.0 REVISION HISTORY OF PROJECT DOCUMENT

Version	Date	Description of Revision
1.0	11/12/14	Initial revision of document. Based on site visit, discussions with field personnel and review of drawings.

Exhibit B: Projected Milestone Schedule

PROJECTED MILESTONE SCHEDULE

Task	Milestone	Date	Responsible Party
1.	Preliminary Engineering	Complete as of the Amendment Effective Date. Technical Scope Document issued.	Customer/Company
2.	Final Design	10 Months after Amendment Effective Date	Customer/Company
3.	Material & Equipment Procurement	10 Months after Amendment Effective Date	Company
4.	Construction	13 Months after Amendment Effective Date	Company
5	Close Out	16 Months after Amendment Effective Date	Customer / Company

The dates above represent the Parties' preliminary schedule, which is subject to adjustment, alteration, and extension. Neither Party shall be liable for failure to meet the above Preliminary Milestone Schedule, any milestone, any in-service date, or any other projected or preliminary schedule in connection with this Agreement, the Work or the Project. National Grid does not and cannot guarantee or covenant that any outage necessary in connection with the Work will occur when presently scheduled or on any other particular date or dates and shall have no liability arising from any change in the date or dates of such outages.

Exhibit B: Projected Milestone Schedule

PROJECTED MILESTONE SCHEDULE

Task	Milestone	Date	Responsible Party
1.	Preliminary Engineering	Complete as of the Amendment Effective Date. Technical Scope Document issued.	Customer/Company
2.	Final Design	10 Months after Amendment Effective Date	Customer/Company
3.	Material & Equipment Procurement	10 Months after Amendment Effective Date	Company
4.	Construction	13 Months after Amendment Effective Date	Company
5	Close Out	16 Months after Amendment Effective Date	Customer / Company

The dates above represent the Parties' preliminary schedule, which is subject to adjustment, alteration, and extension. Neither Party shall be liable for failure to meet the above Preliminary Milestone Schedule, any milestone, any in-service date, or any other projected or preliminary schedule in connection with this Agreement, the Work or the Project. National Grid does not and cannot guarantee or covenant that any outage necessary in connection with the Work will occur when presently scheduled or on any other particular date or dates and shall have no liability arising from any change in the date or dates of such outages.

Exhibit C: Insurance Requirements

- Workers Compensation and Employers Liability Insurance as required by the State of **New York.** If required, coverage shall include the U.S. Longshore and Harbor Workers' Compensation Act and the Jones Act.

- Public Liability (Including Contractual Liability), covering all activities and operations to be performed by it under this Agreement, with the following minimum limits:

  (A) Bodily Injury - $1,000,000/$1,000,000
  Property Damage - $1,000,000/$1,000,000
  OR
  (B) Combined Single Limit - $1,000,000
  OR
  (C) Bodily Injury and Property Damage per Occurrence - $1,000,000
  General Aggregate & Product Aggregate - $2,000,000 each

- Umbrella or Excess Liability, coverage with a minimum limit of $ 4,000,000.

1. Upon request, either Party shall promptly provide the requesting Party with either evidence of insurance or certificates of insurance evidencing the insurance coverage above. Customer shall provide such certificates or evidence of insurance to Company at the following address:

   To: National Grid c/o NIAGARA MOHAWK POWER CORPORATION
   Attention: Risk Management, A-4
   300 Erie Boulevard West
   Syracuse, NY 13202

Company shall provide such certificates or evidence of insurance to Customer at the following address:

To: RG&E
Attention: David Fingado
1300 Scottsville Road
Rochester, NY 14624

2. Should any of the above-described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

3. If a party fails to secure or maintain any insurance coverage, or any insurance coverage is canceled before the completion of all services provided under this Agreement, and such party fails immediately to procure such insurance as specified

herein, then the non-defaulting party has the right but not the obligation to procure such insurance and, at its option, either bill the cost thereof to the defaulting party or deduct the cost thereof from any sum due the defaulting party under this Agreement.

4. To the extent requested, both Parties shall furnish to each other copies of any accidents report(s) sent to the Party's insurance carriers covering accidents or incidents occurring in connection with or as a result of the performance of the Work for the Project under this Agreement.

5. Each Party shall comply with any governmental and/or site-specific insurance requirements even if not stated herein.

6. By the date that such coverage is required, each Party represents to the other that it will have full policy limits available and shall notify each other in writing when coverages required herein have been reduced as a result of claim payments, expenses, or both.

7. Customer shall name the Company as an additional insured for all coverages except Workers' Compensation and Employers Liability Insurance in order to provide the Company with protection from liability arising out of activities of Customer relating to the Project and associated Work.

Exhibit D: Estimated Cost Breakdown

Project Description	Project Engineer	Cost Component	Total Cost
Modifications to Mortimer line 901 phase II replace R104 along with disconnects, upgrade bus to 3000 amps	Tom McMahon	Hours	43000
		Straight Time Rate	$40.00
		Labor Dollars	$172,000
		Labor OH Rate	0.9409
Project Risk		Labor Overhead Dollars	$161,835
Low		Materials - Inventory	$552,398
		Stores Handling Rate	0.12
		Stores Handling Dollars	$65,928
Comments/Assumptions		Materials - Vendor	$130,000
Per pending Contract Approval by RG&E		Contractors	$110,000
		Transportation rate	0.3407
		Transportation dollars	$58,600
		CAD Transmission rate	0.1100
		Capital Overhead Dollars	$31,820
		Tax Rate	0.08
		Tax total	$19,200
		Total Estimated Cost	$1,300,000

For the avoidance of doubt: this Exhibit provides an estimated cost breakdown of the Work Cost Estimate; the Work Cost Estimate and this Exhibit are estimates only and shall not limit Customer's obligation to pay Company for all Company Reimbursable Costs actually incurred by Company or its Affiliates.