National Grid Upstate New York
46kV Electric Service
for the
Interconnection Customer Facilities
of
Village of Ilion
Remington Ave.
Ilion, NY

(Work Order #9000109195)

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INTRODUCTION:

This document defines the electrical installation requirements for the Village of Ilion's ("Village") interconnection to the National Grid ("Company") electric system. The requirements specified herein are specific to the Village of Ilion Project ("Project").

National Grid currently provides electric service to Remington Arms ("Remington") via a 46kV tap. The tap was constructed solely to serve Remington and serves no other customers. Remington seeks to switch from taking electric service from National Grid to taking service from the Village.

ACRONYMS/SYNONYMS USED IN THIS PROJECT DOCUMENT:

Energization - "In Service"

ESB - "Electric System Bulletin"

FERC - "Federal Energy Regulatory Commission"

IA - "Interconnection Agreement"

NY ISO - "New York Independent System Operator"

NY PSL - "NYS Public Service Law"

NY PSC - "New York Public Service Commission"

NYPA - "New York Power Authority"

OATT - "Open Access Transmission Tariff"

PSL - "Public Service Law"

WO - "Work Order"

1.0 SCOPE

1. This Service Plan is used to communicate the Village's responsibilities to accept and the Company's responsibilities to provide a second wholesale delivery point to the Village conditioned upon, among other things, the Village assuming ownership of Remington's substation facility located on Remington Avenue in Ilion, N.Y. and providing the Company with proof of the transfer of ownership. This plan identifies the expected

scope, schedule, and costs of providing this second delivery 46kV service to the pre-existing Remington-owned substation specific to the Village's installation requirements subject to the Company's typical specifications in the ESB 750 series bulletins to supply Remington. This Service Plan may be used in conjunction with other Company agreements with the Village to provide service.

2. Any deviations or exceptions to this service plan shall be submitted to the Company in writing and are subject to the Company's sole discretionary approval prior to purchase and/or installation of equipment. The Company shall only grant deviations and exceptions from this service plan in writing.

3. The Company has evaluated the service proposal and the following is the Village's and Remington's service plan along with the Company's requirements for the Village's decision to proceed with any design development and installation activities. Also, the Company requires the information listed in ESB's 752 and 755 (as applicable) and items requested in this plan for review and acceptance to continue with the Village's written commitment to proceed.

2.0 OBJECTIVES

The objectives of this service plan include:

- Define the engineering design parameters, installation and operating requirements associated with the Village's and Remington's facilities and
- Describe all submittals required for review and acceptance of the Village's and Remington's facilities at various stages of the Project, including: engineering design, construction, testing and commissioning, energization, and close out, and the process for completing such submittals relative to the following:
  1. Assess Remington's affirmation of maintenance of the present 46kV Remington-owned substation according to ESB 755.
  2. Provide available 46kV short circuit current and system impedance values at Remington's present 46kV service point (receiving structure).
  3. Verify proper protective device coordination of Remington's existing main 46kV fuse and National Grid's 46kV supply.
  4. Verify National Grid's 46kV supply thermal and voltage limits for capability of Remington's existing 7.5MVA, 43.8-4.36Y/2.52kV transformer's maximum rating.
  5. Evaluate if the existing 4.16kV revenue metering equipment or portions can be sold to NYPA and if so, determine sale value. Also, determine the arrangement of the revenue meter and whether it can be transferred to NYPA or not through sale. Determine cost to retire National Grid metering (3, GE Type JE-42 2400-120V PT's and 3, GE Type JKL-3 1500:5A CT's) from Remington's substation.
  6. Evaluate NYPA's loss compensation as appropriate for the Village's transformer losses, station service transformer losses, and 4.16kV feeder (approx. 900 ft.) cable losses to the 46kV delivery point at the substation receiving structure.
  7. Provide past reliability performance of National Grid's 46kV supply to Remington.
  8. Assess condition of existing 46kV tap to Remington for planned maintenance and related cost.

3.0 PROJECT MANAGEMENT

1. Until the Village begins receiving wholesale delivery service from the Company at the new wholesale delivery point, all outside communications to and from the Company, rate discussions, billing, energization coordination, etc. shall be directed through the Energy Solutions Services Lead Account Manager:

   Mr. Thomas V. Higgins
   National Grid
   221 Old Campion Road
   New Hartford, NY 13413
   Ph: (315) 798-5158
   Fax: (315) 798-5187
   Email: Thomas.Higgins@us.ngrid.com

2. Once the Village begins receiving wholesale delivery service from the Company at the new wholesale delivery point, the Company's account management contact will be:

   Mr. William J. Donovan, Account Manager
   National Grid
   Transmission Commercial Services
   300 Erie Blvd. West
   Syracuse, NY 13202
   Ph: (315) 428-5854
   Email: William.Donovan@us.ngrid.com

3. All technical information, correspondence and communications related to the engineering design, construction, testing and commissioning, energization, and close out of the Village's and Remington's facilities and the Company's attachment facilities associated with the Project shall be coordinated through the Energy Solutions Services Lead Account Manager.

   Technical submittals for review from the Village's NYS licensed professional engineer shall be made in electronic media format and drawings are preferred in Adobe Acrobat (*.pdf). An AutoCAD or MicroStation (if available) copy of the site plan, with topographical grades are preferred electronic media for the station location receiving the Company's line. Three (3) sets of final design prints sealed by the Village's NYS licensed professional engineer including an electronic file on CD or DVD shall be acceptable. The Village's equipment vendor drawings, test reports, and qualified testing contractor reports need not be stamped but shall be provided under cover by their design professional.

4. All technical information related to this service plan, for the Company's review and acceptance of the Village of Ilion and Remington's 46kV facilities shall be directed, via the Company's Energy Solutions Services Lead Account Manager, to the Company's Customer Facilities Engineer:

   Mr. Neil F. LaBrake, Jr., P.E.
   National Grid
   Field Engineering-NY
   7496 Round Pond Road
   North Syracuse, NY 13212

Ph: (315) 452-7729
Fax: (315) 460-8996
Email: Neil.LeBrake-Jr@us.ngrid.com

5. The contact for Village of Ilion for discussing engineering and construction, if needed, of the 46kV Customer-owned station proposal is:

Design Professional:
C. J. Collins, P.E.
President
Utility Services Group, Inc.
122 Spensieri Avenue
Baldwinsville, New York 13027
Ph: (315) 247-8824
Email: ccollins@usg-e.com

4.0 REFERENCES

4.1 Company:

The following Company electric system bulletins[1] pertain to this Project and are incorporated into this service plan:

- ESB No. 750 – Specifications for Electrical Installations, April 2010 ("ESB 750")
- ESB No. 750 series Errata and Change Revision List, September 2010 ("ESB 750 Errata")
- ESB No. 752 – Service above 15,000 Volts, October 2004, 2nd printing April 2002 ("ESB 752")
- ESB No. 755 – Operation & Maintenance Requirements for Services Above 600 Volts, June 2003 ("ESB 755")

In addition to these bulletins as specific to this project,

- April 20, 2011 meeting between NYS PSC, Village of Ilion, Remington Arms, and National Grid.

4.2 Other:

Other references pertaining to this Project include:

- PSC No. 220 – Niagara Mohawk Power Corporation Electricity Tariff
  https://www2.dps.state.ny.us/ETS/jobs/display/download/4912540.pdf
- New York State Consolidated Laws, Public Service, Article 4, Section 65.[2]
- Regarding unqualified persons approaching the area of work: Laws of New York – Labor - Article 7 § 202-h. High-voltage proximity.
  http://www.labor.state.ny.us/workerprotection/safetyhealth/sh67.shtm

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[1] All ESB's are available at http://www.nationalgridus.com/electricalspecifications.

[2] The NY Public Service Law is the governing document where the utility derives its authority to assert its electric service connection requirements to those who take electric service from the utility's electric system. The utility is responsible to provide safe and adequate service in a just and reasonably charged manner. This is achieved through the Company's electricity tariff, PSC No. 220 in NY State and its Specifications for Electrical Installations. Refer to:
http://public.leginfo.state.ny.us/menugetf.cgi?COMMONQUERY=LAWS then select "PBS".

5.0 PROJECT DESCRIPTION

(See **Attachments A** through **D.**)

5.1 Project Location

1. The existing National Grid tap is approximately 0.69 miles (Structures #488-1 through #488-7 and #1 through #18 with conductors and final span into Remington). Refer to **Attachment A.**
2. The existing Remington 46kV substation is located on Remington Ave., Ilion, NY and is supplied from National Grid's 46kV structure #18.

5.2 Customer Data Provided

1. Remington presently takes 46kV overhead retail service from the Company's 46kV subtransmission system. Refer to **Attachments A** and **B.**
2. The Village proposes to take a second wholesale delivery point from National Grid at 46kV using the Remington substation, the ownership of which will be transferred to the Village, as shown in the Village's proposed one-line diagram in **Attachment B.**
3. Remington Arms provided their assessment of preventative maintenance of their 46kV substation; see their May 2nd, 2011 letter in **Attachment C.**

5.3 Customer Request

1. In order to comply with Remington's request to become a distribution customer of the Village, National Grid has considered establishing a second 46kV delivery point for the Village at Remington's location through Village ownership of Remington's existing 46-4.16kV substation, including the 4.16kV feeder to Remington's main 4.16kV switchgear. Present revenue metering is on the 4.16kV side of the transformer and is compensated for transformer losses to 46kV delivery. The Village proposes to retain the same metering arrangement through NYPA ownership. There would be no National Grid 46kV assets to be sold to the Village; however, the sole use portion of the existing tap will require terms whereby the Village agrees to be responsible for all operation and maintenance costs associated with the line in an executed Interconnection Agreement.
2. This proposal-in-concept was agreed to by the parties in an April 20th, 2011 meeting at the Village of Ilion offices; see **Attachment B.**
3. The Village's demand capacity is desired to be the existing installed 7.5MVA OA transformer.
4. The Village's desired in-service date is June 2011 for their 4.16kV distribution delivery to Remington.
5. The Village and Remington desire scope, cost, and schedule for providing service to meet their needs for the Village's second voltage delivery substation.

5.4 National Grid Work Scope

National Grid will review the Village's and Remington's documents, revise engineering and operating documents, provide sale price of existing metering equipment, and evaluate meter loss compensation for mutual acceptance attributable to the Village and Remington's proposal in accordance with National Grid's tariffs in New York State

(PSC No. 220 – Electricity). All terms and conditions included in PSC No. 220, the IA, and the NY ISO OATT shall apply to this project. All work shall also be performed during a mutually agreed upon schedule.

5.5 Customer Responsibilities

The Village and Remington are responsible for:

1. Providing the design and operating documentation for their 46kV substation's installation in accordance with the Company's ESB's 750, 752, and 755 and PSC No. 220 tariff.
2. Providing meter loss compensation calculations for the Company's review.
3. Providing necessary reimbursements and contributions in aid of construction, if necessary, for Company costs described in the following section according to National Grid's tariffs in New York State (PSC No. 220 – Electricity).

5.6 Company Costs

The Company's Energy Solutions Services department shall communicate with the Village and Remington any required cost contributions in accordance with National Grid's tariffs in New York State (PSC No. 220 – Electricity), as well as any required reconciliation.[3] The following are general descriptions of, and non-binding good faith conceptual estimated costs for, the Company's components that are determined to be required by this Project according to PSC No. 220:

Table 5.6-1: Planning Grade Estimate

Conceptual Cost Line Total		Company Work Scope Item
$5,800	1.	Engineering review of Village of Ilion and Remington document submittals.
$5,800	2.	Company revision of engineering and operating documents.
$2,200	3.	Company evaluation of the Village's proposed meter loss compensation.
$13,800		**Total Company's Conceptual Project Cost Estimate**

Notes to Table 5.6-1:

1. *The conceptual cost estimate provided in this plan is according to the Company's rates and schedules in effect as of May 2011 and will be deemed withdrawn if not accepted by the Village of Ilion and Remington within 90 days. The estimate is grossed up for income tax and includes contingency on direct labor and material costs and sales tax only on materials. The accuracy of this "planning grade estimate" is expected to be +/- 25%.*
2. *The planning grade estimates provided do not include:*

[3] It is important to note that the Company will reconcile the charges after project completion, and the Customer will be responsible for all final charges which may be higher or lower than estimated according to this service plan and NMPC PSC No. 220.

- *interconnection study,*
- *application fees,*
- *applicable surcharges,*
- *overall project sales tax,*
- *property taxes,*
- *exit fees,*
- *future operation and maintenance costs,*
- *allowance for funds used during construction (AFUDC) assuming Customer upfront payment,*
- *adverse field conditions such as rock, water, weather, and Customer electrical equipment obstructions,*
- *extended construction hours to minimize outage time or National Grid's public duty to serve,*
- *the cost of any temporary construction service, or*
- *any required permits.*

3. *Cost adders estimated for overtime would be based on 1.5 and 2 times labor rates if required for work beyond normal business hours. Meals and equipment are also extra costs incurred for overtime labor.*

In addition to the costs above, the Company's existing secondary side 4.16kV metering transformers can be sold to the Village for their NYPA metering purposes. Any final sales price will be negotiated between the Village and Remington and the Company and PSC approval is required under Public Service Law section 70. The equipment being offered at **$90** is:

- 3, GE Type JE-42 2400-120V PT's,
- 3, GE Type JKL-3 1500:5A CT's, and
- meter box with wiring.

5.7 Company Scheduling

1. The Company is aware that the Village and Remington desires a **June 2011** in-service date; however this date is impacted by the asset sale requirements, meter loss compensation evaluation, FERC approval of the IA, payment of all applicable charges, update of the NY ISO service arrangement, and any other regulatory filing requirements.

5.8 Company's Conditions and Limitations

1. Refer to Section 5.6 for costs to be recovered that are associated with the supply additions and service.
2. The conceptual cost estimate provided in this plan is according to the Company's rates and schedules in effect as of May 2011 and will be deemed withdrawn if not accepted by the Village and Remington within **ninety (90) days.**
3. A letter of commitment is needed from the Village and Remington within **twenty (20) business days** of receiving the cost estimate for this service plan to proceed with the Company's work. If this commitment is not received by this date, then the terms and conditions of this Service Plan shall be reevaluated and subject to technical and schedule changes.

4. Company asset sale prices are subject to PSC approval under Public Service Law section 70.
5. The Company will strive to meet the Village and Remington's desired in-service date depending upon receipt of their commitment, final design and installation acceptance by the Company. However, equipment delivery, weather and soil conditions, right-of-way, environmental permits, and construction obstacles may affect this schedule.
6. The service recommendations in this plan are contingent upon the Company's review of the Village's and Remington's 46kV service facilities final documentation. Once the review is completed, a detailed service configuration and a revised service plan, if necessary, with detailed estimates can be provided.
7. If the Village and Remington take exception to this plan, they shall submit it in writing to the Company. The Company in its sole discretion will evaluate and respond with its resolution in writing.

6.0 COMPANY 46kV SERVICE CONFIGURATION and SYSTEM IMPACTS

6.1 46kV Supply

The Company evaluated the thermal and voltage limits for Remington's existing 7.5MVA, 43.8-4.36Y/2.52kV transformer's maximum rating on National Grid's 46kV supply (Schuyler-Valley #21). Remington has had a maximum 8.244MW demand, but has not reached that level in quite some time. This demand is within the Company's summer normal rating of the 46kV EPS' capability.

If the Village, after taking ownership of Remington's substation and the 4.16kV feeder to Remington's main 4.16kV switchgear, proposes to exceed this limit at any time in the future, then the Company needs to evaluate the Village's request under the following conditions pursuant to their Interconnection Agreement and NYPA's requirements:

1. The Company's winter and summer peak loading of the area EPS is not negatively impacted.
2. The Village's main overcurrent device(s) shall not exceed the Company's required settings. The Village's system shall coordinate with these settings.
3. The Village is advised that any future load growth beyond the present demand must be studied and at that time, they may be required to take higher voltage service or pay for certain system upgrades that would be identified in a planning study. However, there is no guarantee additional capacity at 46kV could be permitted.
4. The Company does not reserve capacity for customers. Once the Village's ownership of Remington's substation is complete, their limit for their Interconnection Agreement (IA) will be the actual measured peak demand after the first year. The Company's Transmission Commercial Services Account Manager will administer the IA demand contract with the Customer and the Company will monitor the billing meter readings. If the terms of the IA are exceeded, then actions are taken according to the IA.

5. The Village is advised to provide the Company with their expected demand for each month in the first 12 months for their initial request and update it annually with the Company's Transmission Commercial Services Account Manager.

6.2 46kV Reliability and Tap Assessment

1. The reliability from June 2005 to Sep. 2010 for the existing 46kV Schuyler-Valley #21 circuit, excluding planned and major storm events, is 1 sustained and 15 momentary interruptions. The data represents a 99.997517% availability in the past 5 years; however, it is not a prediction of future performance of the Company's supply system.
2. The condition of the existing 46kV tap to Remington (and the former Ilion Tap) for planned maintenance was reviewed. Upon routine site investigation in 2010, the Company identified the following equipment requiring replacement prior to 2014:
   - Structures #14 and #14S
   - Guys on Structures #13 and #13S
   - Insulators on Structure #13
   - Structures #488.1 through #488.4

   Design has been issued and work has yet to be scheduled for construction. The Company agrees to pay for the costs associated with this work. The Village agrees to pay for all future operation and maintenance costs associated with this sole use 46kV line.

6.3 46kV Operations

1. The maximum inrush current allowed at 46kV without contribution of Remington's equipment (e.g. transformer, motor, cable impedance's, etc.) is **143A** on the 46kV Schuyler-Valley #21 circuit for one start per day. Attention is called to Sections 8.0 and 10.0 of ESB 750-2010 regarding motor starting requirements and mitigation of disturbances. The Village and Remington shall take measures to sequence start Remington's motor loads and implement soft start controls to limit their inrush current.
2. The Company's 46kV overhead subtransmission delivery voltage typically operates between +/-5% of normal operating 46kV nominal conditions. Under emergency operation, voltage on this system could reach 110% or 90% of nominal prior to corrective action being taken. The Village and Remington are advised to consider this in planning their system requirements and equipment settings, however, no warranties or guarantees are implied.
3. Attention is called to Sections 10.0 and 12.0 of ESB 750-2010 regarding disturbances and capacitor installation. Also, reactive power loading by the Village and Remington on the Company's system may be subject to added costs per the terms of their IA.

6.4 46kV Service Connection to the EPS

The service connection will remain unchanged for this Project; refer to **Attachment D** for an illustration of the final service configuration from the 46kV supply.

7.0 46kV CUSTOMER-OWNED SUBSTATION

7.1 Interrupting Rating

1. The Village and Remington's service equipment shall be suitable for the maximum fault current available at its supply. Without any of Remington's equipment contribution, the following are National Grid's 46kV system characteristic maximum values[4] on a 100MVA base at the Village's proposed 46kV bus location.

   Source: 46kV Schuyler-Valley #21 circuit

   Available Fault Current:
   3-ph Fault = 5,525 amps, X/R Ratio = 2.55
   Ph-Grd Fault = 3,580 amps ($3I_0$), X/R Ratio = 3.51

   System Impedance:
   $Z_1 = Z_2 = 0.08397 + j\ 0.21401$ pu Ohm
   $Z_0 = 0.12341 + j\ 0.59574$ pu Ohm

   As changes occur to the Company's system these values will be affected. Future system modifications or load growth may require the service equipment to have a larger interrupting rating. Any costs associated with changes to Customer-owned equipment shall be borne by the Village.

7.2 Facility Provisions

7.2.1 General

1. The following are the Company's recommendations to the Village and Remington for the ownership transfer installation of the existing 46kV substation. The Village shall document their as-built design submittal with the Company and sealed by their design professional licensed in NY State, see Section 1.7 in ESB 750.
2. The Company's 46kV supply to Village is an effectively grounded wye source. 48.3kV maximum, 250kV BIL rating. Remington's present equipment meets this requirement.

7.2.2 46kV Incoming Line Termination

1. The Village's receiving structure shall be maintained for the existing attachment of the Company's 46kV three-phase line conductors: 1/0AWG (6/1) ACSR at 2,000 lbs. max. tension.
2. The Village shall maintain the provision for the required attachment eye for each phase conductor according to ESB 752.
3. The Company owns and maintains the existing insulators, hardware, and conductor termination for the incoming supply line attaching to the Village's receiving structure and line connection of the main disconnect switch.
4. The Village shall maintain the attachment height at NESC clearances above final grade.

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[4] Refer to Section 1.10 of the Company's ESB750–04/10 regarding the use of the information provided by the Company. Also, refer to Section 1.7 of the Company's ESB750–04/10 and ESB 755 regarding their responsibility for their electric service operating and maintenance requirements. NFPA 70E provides information where to find work safety practices for premises wiring.

5. The Village shall ensure labeling of the incoming phases exists and legible from grade level. Facing the Company's line, the phasing is 1-2-3 from left to right. This labeling shall be shown on the Village's as-built design drawings.

7.2.3 Main Disconnect Device

The integrity of the main 46kV disconnect switch shall be confirmed by the Village to meet the "load break" and other requirements in ESB 752. If not, then the switch shall be "quick break" and interlocked such that it cannot be opened under load. This switch shall be maintained capable of the available supply characteristics.

7.2.4 Surge Arresters

Surge arrester MCOV ratings for the Village's 46kV substation equipment and transformer shall be as recommended by the transformer manufacturer. This also applies to the balance of their equipment.

7.2.5 Main Overcurrent Protection

1. The protective device coordination of Remington's existing main 46kV fuse and National Grid's 46kV supply is acceptable with the **150E ampere** S&C Type SMD-2C 46kV fuses installed as their main overcurrent protective device.
2. The Village shall ensure fuses used as the main protective device will be coordinated with their system and shall not be greater than the Company-specified maximum rating. If a change is proposed, the Village shall submit their protective device coordination prepared by their licensed design professional in NYS to the Company for acceptance review by the Company's Protection Engineering group.

7.2.6 Revenue Metering

1. For this project, the Company is willing to sell the existing secondary side 4.16kV metering transformers (remaining-in-place) to the Village for their NYPA metering purposes. The sale of the metering transformers as discussed in Section 5.6 above is subject to PSL § 70 approval. However, the existing revenue meter with an internal cell phone will be removed and retained by the Company.
2. The Company will evaluate NYPA's compensation calculation as appropriate for the Village's transformer losses, station service transformer (25kVA) usage, and 4.16kV feeder (approx. 900 ft.) cable losses to the 46kV delivery point at the substation receiving structure. Refer to **Attachment A** for the present transformer test report at Remington.
3. The Company will provide for meter data reporting for an **interim period not to exceed 180 days.** The Village will be responsible for all provisions, costs, and coordinating with NYPA to install their meters under NYPA's metering installation requirements in the substation. For this interim period, the Company's existing revenue meter contacts for Customer Load Control information are presently installed on the active kWH billing meter for Remington as follows:
   a. Current Transformer Ratio: 240:1A
   b. Potential Transformer Ratio: 20-1V
   c. Meter Type: Sentinel Trilliant SS4S2L
   d. Meter Contact Device: For 9 meter disk revolutions, 20 contact closures are provided from the Form "C" Solid State Contacts.

e. Contact Closure of Pulse Value: Using both sides of the Form "C" contact (3 wire), each contact closure equals 2.16 kWH or 8.64 kW demand over a 15 minute period. If only 2 wires of the 3 wire circuit are used, each contact closure equals 4.32 kWH or 17.28 kW demand.

7.2.7 Grounding System

1. The desired ground grid resistance for the existing substation is **2.2 ohms maximum**; for a maximum 8,000 volts Ground Potential Rise (GPR). Or, the ground grid resistance shall be no greater than that which would exceed the step and touch voltage limits of E_{step} = 3134 volts and E_{touch} = 885 volts for 30 cycles.
   - Also, the Village is responsible to limit the ground potential rise (GPR) for communication conductors entering their substation that must be safeguarded and mitigate the zone of influence (ZOI) for point where the GPR is 300 volts peak asymmetrical of the voltage variations on the surface of the earth considering all systems connected having earth return paths. The Village is responsible to contact their communication provider for specific requirements in this regard.
   - Refer to IEEE Std. 80 for design of a substation ground grid. Remington's results of their existing ground grid integrity shall be submitted for Company acceptance review. Refer to IEEE Std. 81 for testing method standards.
   - The Village's substation ground grid design (plan, elevation, and details) for the installation and connections shall be documented with the Company.

7.2.8 Transformer

1. Remington's existing transformer is acceptable for continued operation. Refer to Remington's affirmation of their transformer's good condition in **Attachment C**.
2. In reference to Section 6.3 above and ESB 752, it is the Village's responsibility to provide their own voltage regulation for their electrical distribution needs.

7.2.9 Operating

1. The Company requires the Village's contact names and phone numbers for the operating instructions of their substation on Company documents. The Company's demarcation point will be at the line side (jaw or contact side) of the Village's main 46kV switch (21B).
2. Switch nomenclature is as assigned for the Village's substation and shown in the single-line diagram interconnection sketch (see **Attachment D**). The Village shall indicate these on their design documents and label their devices, including the incoming phases, in the switchgear.
3. The Village shall refer to ESB 755 for their operation and maintenance requirements and switching protocol responsibilities with the Company of their 46kV substation. Remington Arms' May 2, 2011 report of preventative maintenance of their 46kV substation was received by National Grid. Remington's overall assessment is that the electrical equipment is in good working order and operational; see **Attachment C**.
4. The Village shall maintain their inrush current on their 46kV service within the Company's maximum specified limit; see Section 6.3 above.

5. **The Company does not provide any guarantees or warranties, expressed or implied, with respect to work, equipment, and materials, otherwise referenced in this service plan. However, the Company will endeavor at all times to provide a regular and uninterrupted supply of electric service, but cannot guarantee such uninterrupted electric service and such service shall be governed by National Grid's tariffs in New York State (PSC No. 220 – Electricity) or Interconnection Agreement (IA).**

8.0 INSPECTIONS and COMPLIANCE VERIFICATION

8.1 Inspections

The Village shall adhere to the requirements of ESB 752, Section I.G for approvals and inspections prior to energization following any prior approved modification of the 46kV service installation.

8.2 Compliance and Verification

The Village shall adhere to all other Company related verification and compliance requirements as set forth in ESB's 750, 752, and 755. Such requirements include, but are not limited to satisfactory completion of the Village's substation revenue metering installation and programming by NYPA mutually agreed with the Company.

9.0 TESTING and COMMISSIONING

For this Project which is already in-service, there is no requirement for a Testing and Commissioning Plan ("TCP") where the Company has mutual interest in the service connection.

10.0 ENERGIZATION

For this Project which is already in-service, there are no energization requirements where the Company has mutual interest in the service connection.

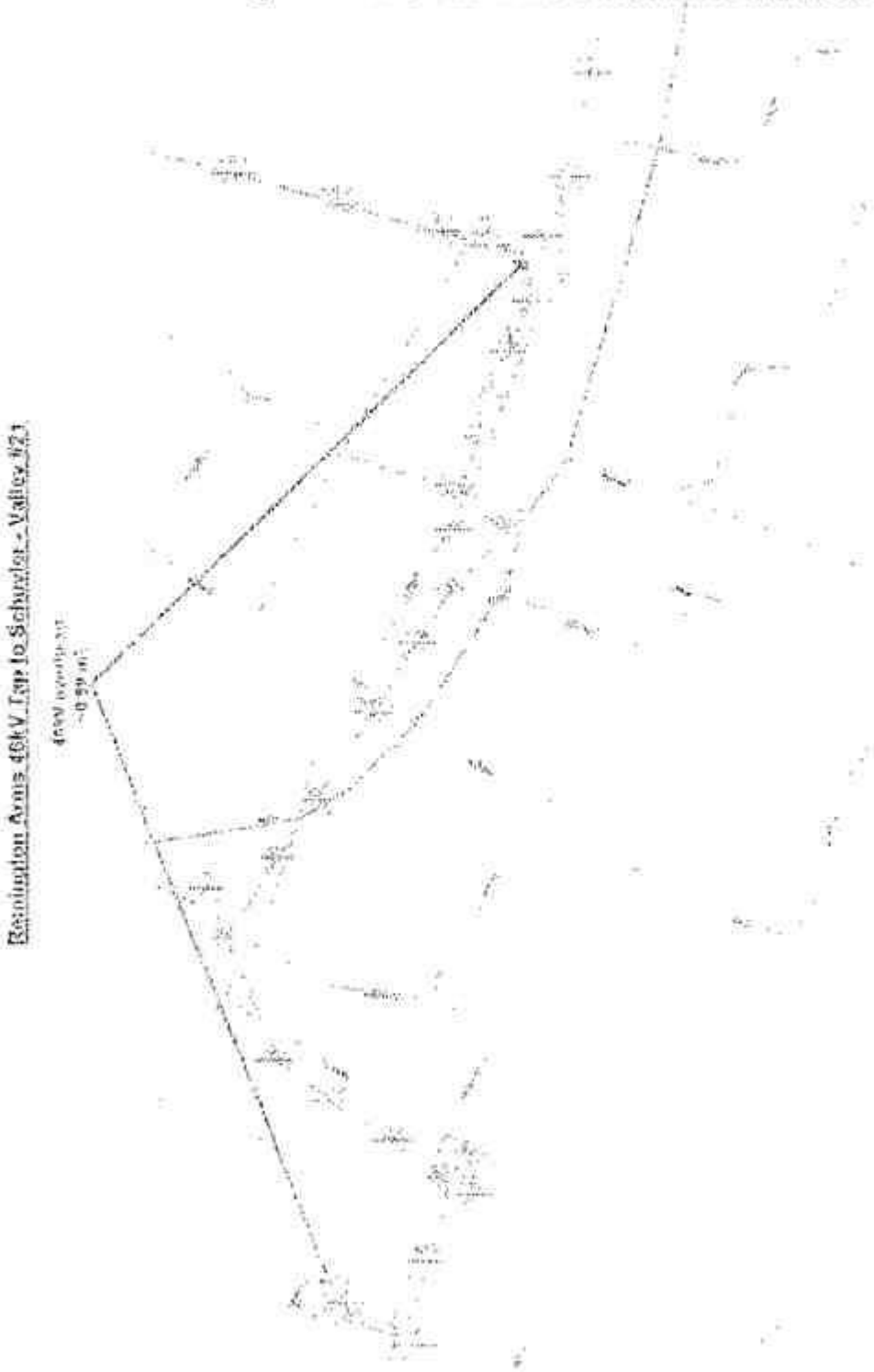
11.0 CUSTOMER's AS-BUILTS

The Village shall provide the Company "As Built" drawings, information and documents in accordance with the provisions of the service plan and the Company's ESB 752 within **ninety (90) days** after energization. Refer to Section 3.0 of this specification for submittal requirements.

12.0 REVISION HISTORY

Version	Date	Description of Revision
1.0	06/03/2011	First version of new document for Village of Ilion 2nd delivery 46kV service.

ATTACHMENT A: Existing 46kV Service Installation Sketches and Transformer Data



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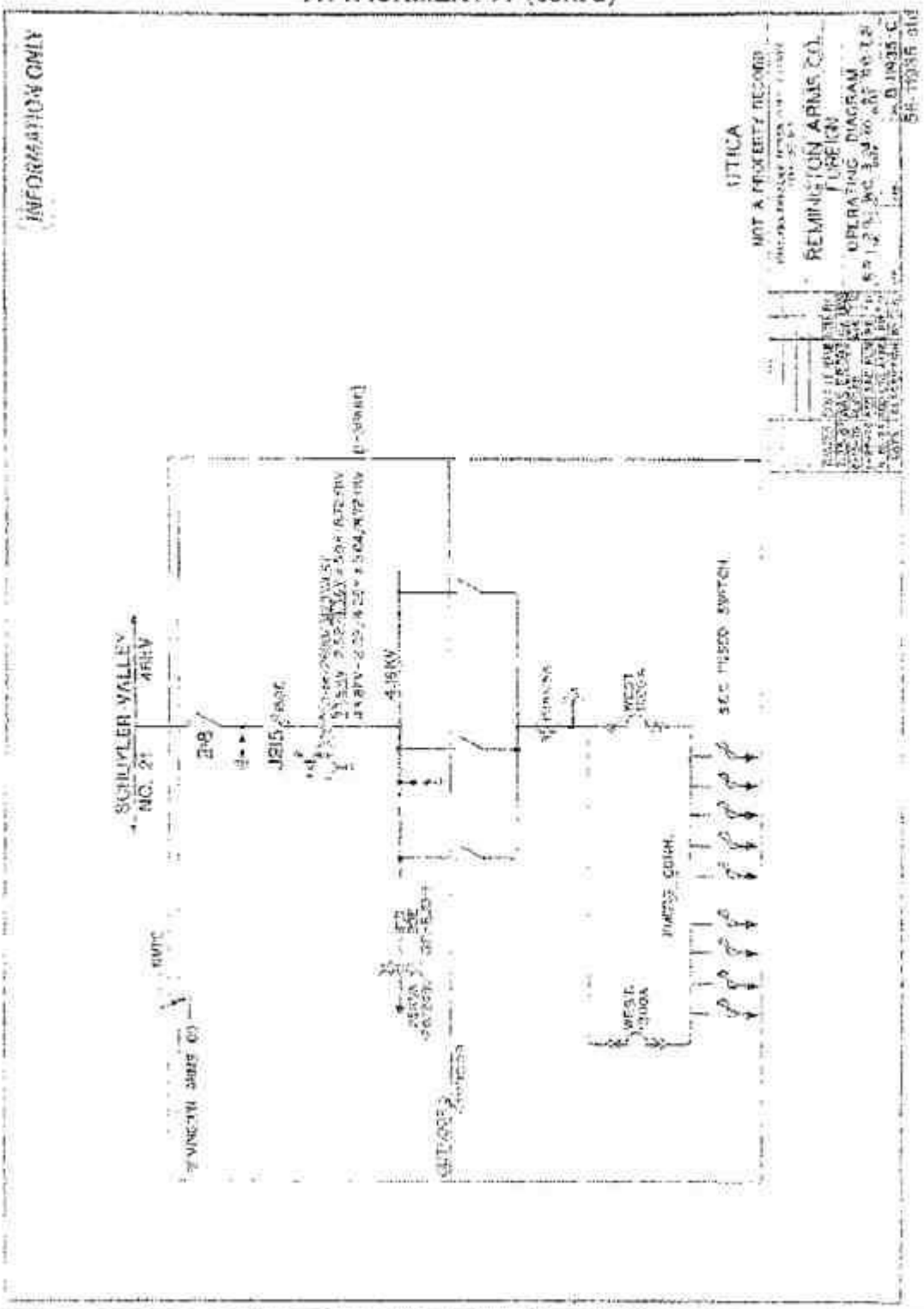

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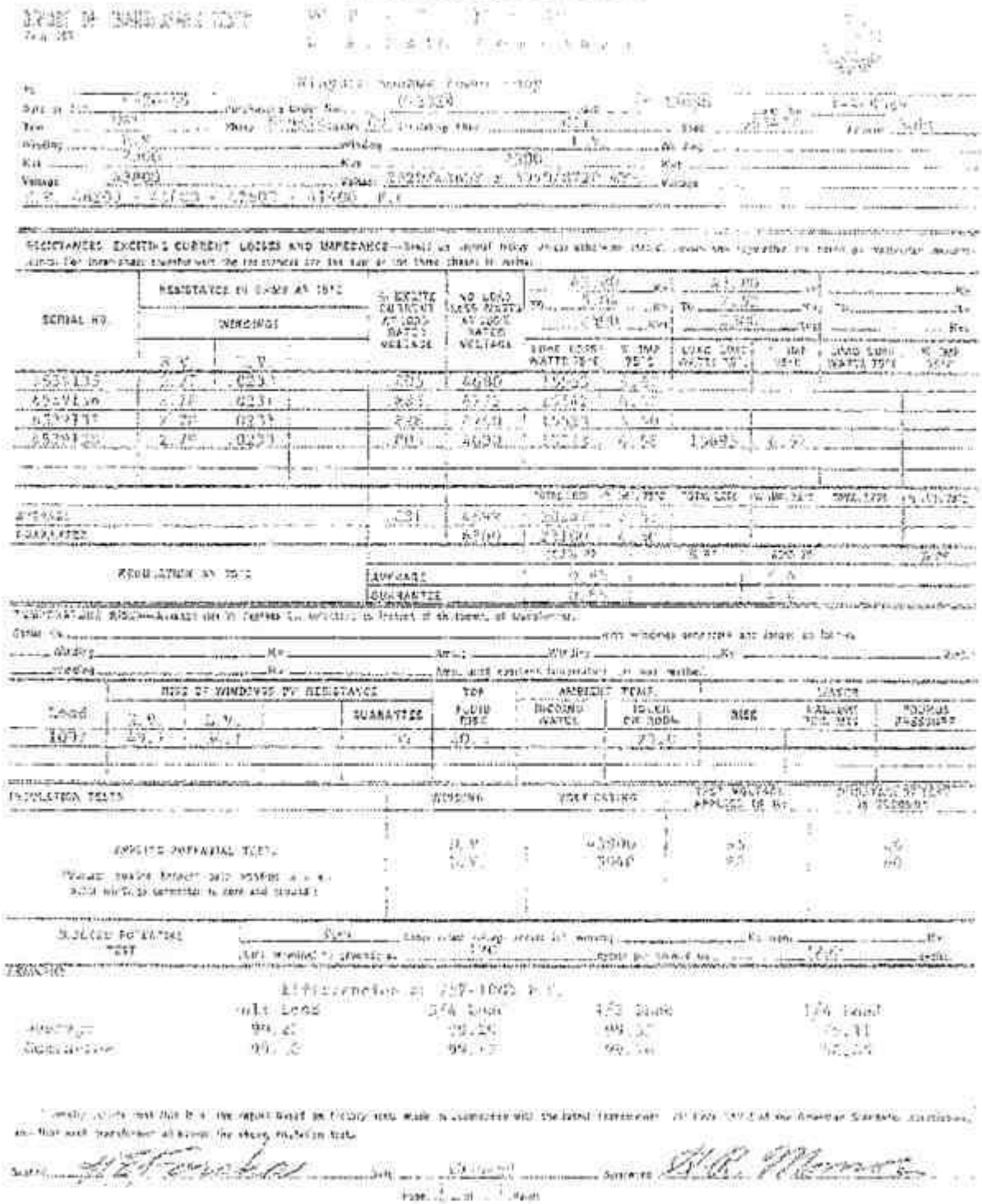
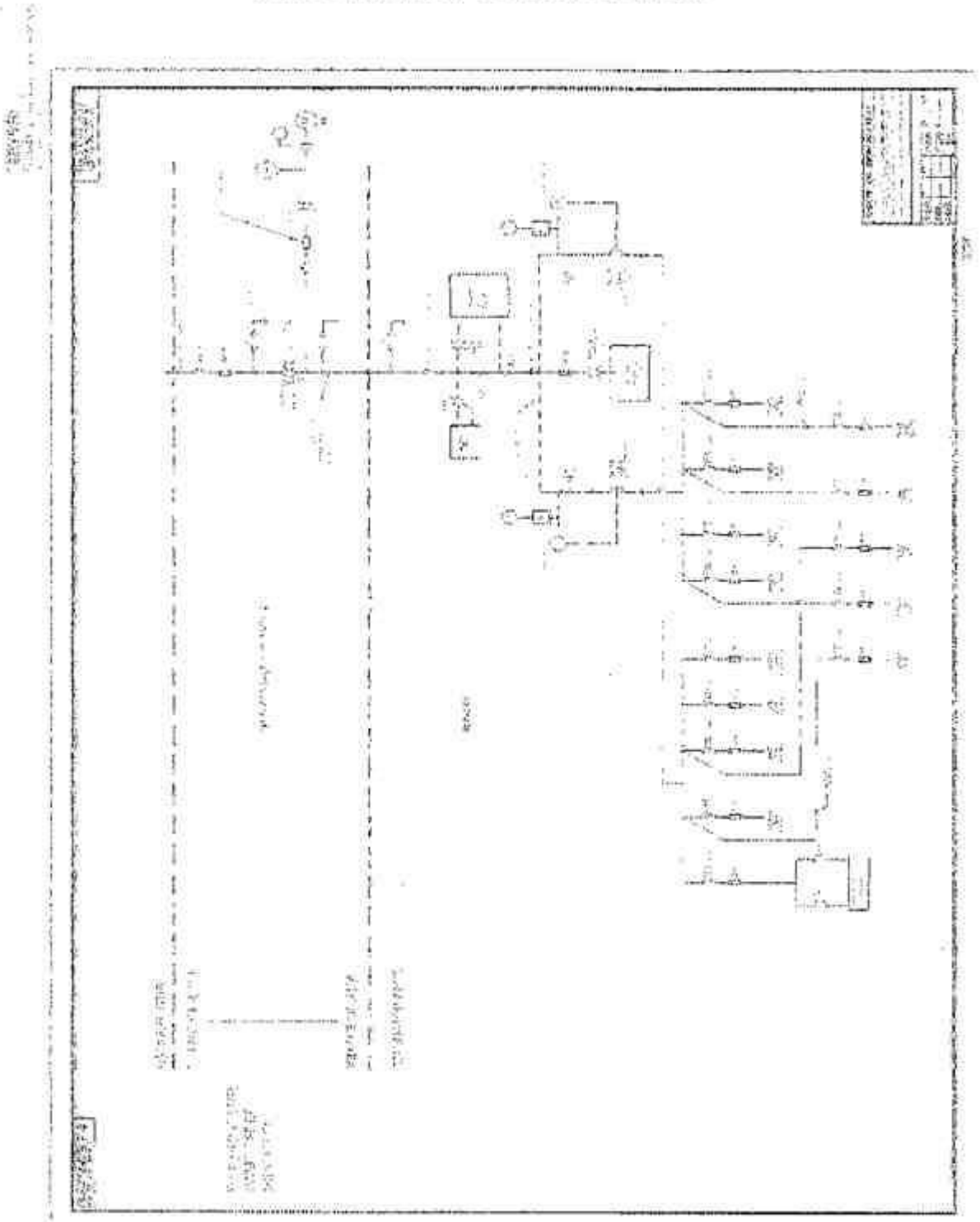


ATTACHMENT B: Customer's Proposal



ATTACHMENT C: Customer's Affirmation of 46kV Substation Preventive Maintenance

Remington.

May 2, 2011

Subject: Preventive Maintenance of 46kV Service Equipment at Remington Arms Co, Ilion, NY

Dear National Grid Account Manager:

Our 46kV/4.16kV substation was originally built and owned by Niagara Mohawk Power Corp. Remington Arms purchased the substation in 1985. Specific items listed in ESB 755-2003 are per the Niagara Mohawk Power Corporation record at the time of transfer.

The (3) 2500 kVA transformers (1 spare) and substation equipment have had the following maintenance performed on them since 1986:

- PCB test in 1980s, Remington and Niagara Mohawk and were classified as Non-PCB.
- Yearly oil sampling by SD Myers - liquid screen, inhibitor content, liquid power factor, Karl Fischer, Furan, gas level, [illegible] - these results were reviewed by our DuPont engineers (from 1986-1993) and by ETS engineers (the company has changed names many times) or Wilson & Wilson (Curt Wilson) in more recent years (attached is the most recent test). [illegible] action deemed necessary.
- Our plant has a yearly power shutdown when routine maintenance and inspection of our power distribution system is performed. During this shutdown the main substation is visually inspected and depending on the work being done in the main switchgear vault, the substation main disconnect is operated.
- In 1994, one of the 46kV lightning arresters was damaged (as far as anyone knows, there was never a direct lightning strike) - all 3 were replaced with ABB [illegible] 39kV arresters.
- In 2003, ETS (Grand Eagle Services at the time) inspected and tested the spare transformer to verify its usability [illegible]. No significant problems were found.
- In 2003, the (4) transformers were painted.
- In 2006, an arc flash occurred in our main switchgear vault, caused by a squirrel which caused 2 46kV fuses to open. These were replaced with the same S&C SMD-20 150E fuses that were original from Niagara Mohawk. Superficial damage was done to the metering CTs and were inspected by National Grid and a fuse replaced by National Grid on one PT.
- As far as I know, the 46kV fuse rating and type are as originally specified by Niagara Mohawk when the substation was built in 1959.

Dave Williams
Staff Electrical Engineer

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ATTACHMENT D: Service Plan 46kV Interconnection