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7.0 INSPECTIONS and COMPLIANCE VERIFICATION

7.1 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 115kV service installation.

1. Prior to energization, the Customer's outdoor substation physical protection shall be in place in accordance with applicable codes and local requirements, i.e., fence, gates, signs, locks, grounding system.
2. Since the Village is classified as an "Electric Corporation", as defined in the NYS Public Service Law (PSL), then, under the purview of the PSC, a third party electrical inspection approval for this project is not required.

7.2 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:

7.2.1 Notifications to the Company

1. **Six (6) weeks** prior to the Company's field audit, the Village shall provide written documentation of their satisfactory construction completion status. This documentation from the Village or their NYS licensed professional engineer shall include:
 - i. All final corrected construction drawings.
 - ii. Their qualified contractor's functional testing schedule for the protective relay systems related to the interconnection with the Company's electric system. This notice shall include the final Testing and Commissioning Plan ("TCP"), pursuant to Section 9.0 below.
2. **Two (2) weeks** prior to the Company's field audit, the Village or their NYS licensed professional engineer shall provide written assurance of their field verification for the protective devices designated for utility interconnection before witness testing that includes at least the following:
 - i. Confirmation of the Company's accepted relay settings as set on the designated devices,
 - ii. Satisfactory relay calibration and functional tests of the designated relays, and
 - iii. Village supplied documentation:
 - a. Letter stating that all Company-designated protective device control wiring, including the wiring from the instrument transformers, has been verified against the accepted design drawings. Refer to the Company's ESB 755 for a sample letter.
 - b. Letter stating the satisfactory acceptance calibration and test performed on protective relays affecting the designated protective devices. A copy of the relay calibration test reports will be needed accompanying this letter for the designated devices.

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7.2.2 Company's Field Audit

For this Project, documented satisfactory completion of the Village's station according to the Company-accepted design and electric system bulletins applied as stated above is required for the Company's field audit acceptance.

7.2.3 Company's Witness of Interconnection Customer's Functional Tests

1. For this Project, the following are required for the Company's witness of the Village's station functional tests:
 - i. The Company's witness of the Village's functional testing shall be satisfied. This activity shall be coordinated with the 2 weeks advance notice requirement in Section 8.2.1 above directly with the Company's Protection & Telecommunications Operations Supervisor.
 - ii. The Village shall acknowledge satisfactory compliance with the requirements in Section 8.2.1 above of their protective system.
2. All other major equipment installation acceptance testing shall be affirmed with the Company in writing within **10 business days** after completion of the verification activities, refer to the Company's ESB 755 for a sample letter.

8.0 TESTING and COMMISSIONING

1. The Village's Testing and Commissioning Plan ("TCP") shall be submitted to the Company for review and acceptance. The TCP must be finalized, including Company acceptance, no later than **six (6) weeks** prior to functional testing and shall include, but not be limited to:
 - Referencing the accepted relay settings sheet, design functional one-line, three-line, and ac and dc elementary diagrams.
 - Identifying what systems and components will be witness tested.
 - Analog inputs are required to be injected in the microprocessor relays to actuate the output, and to see the correct device operate.
 - Jumpering of output contacts will not be accepted as it only verifies the circuit from the back of the relay and is not a true test with current or voltage injected into the relay to check operation at desired set points and output contacts picking up to operate and prove the protective scheme.
 - Phase relation angles between sources and relay inputs need to be verified.
3. Review by the Company's Protection & Telecommunications Operations department prior to implementation is required. If the Company's acceptance is conditional thereby requiring modifications to the TCP, the Village shall submit the final TCP, with the required modifications completed, at the same time that it provides the 6-week functional testing notification under Section 8.0 above.
4. The Village shall provide all testing documentation in accordance with the electric system bulletins referenced above.
 - i. Testing documentation required during witness testing will need to show correct functional operation consisting typically of a set of control schematics that are highlighted as each control function is successfully tested.
 - ii. The Village's qualified person shall submit to the Company a written summary of the satisfactory test results within **five (5) business days** after energization. This

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summary shall include the event reports from the microprocessor relays of the Company's designated protective devices showing the results of the witnessed functional tests.

- iii. Refer to Exhibit 2 in ESB 755 for a sample letter to affirm the results.
- 5. Once the Company's designated protective devices have been witnessed for satisfactory operation, the Company has the right to seal or password protect the relay devices.

9.0 ENERGIZATION

9.1 Authorizations

- 1. The Company's Transmission Outage Authorization ("TOA") will be administered by the Company's Project Manager or Energization Coordinator to ensure all requirements are completed under the terms of this service plan. Typically a **Thirty-day (30)** advance notice is required when 115kV system interruptions are to be scheduled to ensure processing TOA requirements.
- 2. The Company's field audit including any witness testing of the Village's installation must be satisfied before energization.

9.2 Energization Plan

9.2.1 Energization Coordinator

- 1. Prior to the start of construction, the Village shall designate an Energization Coordinator ("EC"), and prepare and submit an Energization Plan ("EP") to the Company for review and comment.
- 2. The EP schedule shall be communicated with the Company's Transmission Control Center according to the TOA.

9.2.2 Energization Plan Development and Execution

- 1. The EP shall be developed in conjunction with the TCP, and shall comply with the Company's ESB 755 and NESC Section 44. The EP shall be submitted to the Company as part of the 6-week advanced notice of functional testing (see Section 1.0 above), and shall, pursuant to NESC Section 44, include but not be limited to, such items as:
 - Steps for the removal of grounds and releasing of corresponding clearances;
 - Switching control procedures;
 - Required phasing and synchronization tests; and
 - Load and operational tests required to place the apparatus or systems on line without risk to the electrical infrastructure.
- 2. The EP shall be executed upon meeting the following minimum pre-energization requirements for the Village's 115kV substation:
 - The Company requires advance written assurance of the Village's satisfactory completion of Sections 8.0 and 9.0 above.
 - Preoperational checks are required of the station DC battery and AC station service to be used for the control power during pre-energization testing.

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10.0 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.

11.0 REVISION HISTORY

<u>Version</u>	<u>Date</u>	<u>Description of Revision</u>
1.0	05/11/2012	Final version of document for Village of Solvay 115kV Mathews Ave. Substation Upgrade Project.

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ATTACHMENT A: Interconnection Customer's Proposal

November 8, 2010 - Revision #1
 Village of Solvay, NY
 Electric Department

Proposed Upgrade to Mathews Avenue 115-13.8-4.36 kV Substation

1. Overview
 (See dwg 001L-E1.5)

The existing 115 kV facilities are 60 years old and in deteriorated condition. The Village has reviewed its options and has decided to demolish the 115 kV lattice structure and 115 kV oil circuit breakers and replace those facilities with new tubular structural steel, 115 kV disconnect switches, 115 kV SF6 power circuit breakers, protective relaying, etc.

The Village proposes to de-energize Mathews Avenue substation, excepting 13.8-4.36 kV transformer TB1 and the 5 kV outdoor structure, and switch all substation load to 115-13.8 kV Industrial substation. The Village is in the process of upgrading Village feeders and installing necessary sectionalizing loadbreak switches to permit the transfer of distribution load to Industrial substation. This work will be completed in early 2011. Transfer of Mathews Avenue substation load to Industrial substation will result in loading to approximately the 80 MVA firm capability of the substation.

2. New Mathews Avenue Substation Facilities
 (see dwgs , 001Q-E21.2 to E30.0 and 001Q-E32 to 001Q-E38.1)

The new substation structures will be installed on the same footprint as the existing lattice structure. Existing structure foundations will be examined by a structural engineer to determine viability for future use. Existing 115 kV circuit breaker foundations will be reused and the power transformers, except 115-13.8 kV transformer TB5, will remain on existing foundations. Transformer TB5 will be relocated to a new foundation on the south side of the 115 kV structure. The 115 kV line entrance on the south-center of the lattice structure will be relocated to the east side of the structure. The 115 kV line entrance on the west side of the structure will remain at that location. Substation de-energization and upgrade construction work is proposed to be completed in the 2011 time frame, per the attached revised proposed schedule.

The proposed configuration for the new 115 kV substation facilities are presented on the above noted drawings. The electrical drawings are presented on sheets 001Q-E21.2 to E30.0. One line diagram E21.2, shows the proposed electrical configuration. The Village would like the capability to operate the substation off two 115 kV lines with live transfer and automatic throw over capabilities to eliminate the existing preferred/alternate supply arrangement.

The proposed 115 kV substation physical configuration, as seen on drawings 001Q-E32 to

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ATTACHMENT A (cont'd)

001Q-E37, will consist of 3 bus sections with 2 bus tie circuit breakers and 2 line breakers. Because of physical limitations, property is not available to construct a low profile substation. Rather, the existing structure footprint can be reused and the necessary 115 kV line entrances and exits for connections to the power transformer circuit breakers can be realized by employing a 2 layer strain bus configuration. The top layer strain buses are the main buses and the lower layer strain buses are tie buses for connections to the transformer circuit breakers. The line entrance phase spacing is 10 feet and interior strain bus spacing is 8 feet. All 115 kV disconnect switches are proposed to be group-operated, double end break type similar to the Southern States RDA-1 to maximize phase-phase clearances in the substation. Revenue metering current and voltage transformers ,as seen on drawings 001N-E35.0 and 001N-E37.0, are mounted on the incoming line structures.

3. Changes at Industrial Substation 115 kV Facilities

(See dwgs 001A-E10.4, 001A-E11.7 and 001A-E10.4ALT)

Industrial substation is currently configured for primary/alternate operation with 115 kV line #14 serving as the preferred source. The isolating devices on incoming lines #14 and #8 are motor-operated disconnect switches. The disconnect switches are electrically interlocked with break before make logic. This logic requires dropping the station before switching sources. The Village wants to modify the operation of the station from primary/alternate to dual line operation with the capability to operate the substation off two 115 kV lines with live transfer and automatic throw over capabilities similar to that being requested for Mathews Avenue substation. There are currently no transmission line relays at the substation, although that equipment could be added rather easily.

Drawing 001A-E10.4ALT shows the one line configuration with the addition of 115 kV line circuit breakers. Addition of these line breakers would produce a one line diagram similar to that proposed for Mathews Avenue substation, and would provide the improved capability to perform line switching operations with breakers instead of motor-operated airbreak switches. We have reviewed the station arrangement drawings and the incoming structure arrangement could be modified to accommodate the new line breakers.

4. 115 kV Transmission Issues

(See dwg 001Q-E38.1)

The pressing transmission issue is to firm Industrial substation for the 80 MVA load when Mathews Avenue substation load is switched to Industrial substation in 2011 for the Mathews Avenue rebuild. Capacity on the #14 line is adequate to serve the entire load as the Suez generator provides approximately 100 MW to line #14 where it connects to NGRID adjacent to Solvay's Industrial substation. Much of the Industrial substation load is Solvay Paperboard (now Rocktekn) to which the Suez generating plant serves as steam host. If the Suez generator is down, then the Solvay Paperboard load will also be down. Therefore, the 80 MVA firm capacity requirement is somewhat tempered by that relationship. Currently the

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ATTACHMENT A (cont'd)

capacity of the #8 alternate line is well below the 80 MVA level. 115 kV Line #12, which connects to Onondaga generating plant, crosses Bridge Street within a few hundred feet of the #8 line entrance to Industrial substation. This is a relatively new line with larger conductor that could provide the required firm capacity to Industrial substation for very little cost. Also, it is possible the necessary line capacity is available on the existing #8 line (#4/0 AWG conductor), but limited by the three terminal line connection to the G.E station just outside Geres Lock substation. Perhaps upgrade of one or two line sections could resolve the capacity issue on the #8 line.

The second issue is dealing with upgrade of the firm capacity to Mathews Avenue substation. The Village is anticipating construction of a new tissue manufacturing factory adjacent to Mathews Avenue substation. The factory, with load estimated at 22-24 MVA, is expected to go commercial in late 2012 or early 2013. Both 115 kV lines #11 and #12 pass by Mathews Avenue substation rather closely on the north side of the station. These lines, both of recent construction and with larger conductor than the #2 and #8 lines currently serving the substation, could provide the required firm capacity to Mathews Avenue substation for very little cost. Also note that reconfiguration of the line entrance from the existing #2 line from the south-central side of the substation will likely make connection to line #2 from the east difficult. If line #2 is retained as a supply to the substation, it would probably be preferable to route it to the west side line entrance location.

5. Project Schedule
 (see attached bar chart schedule)

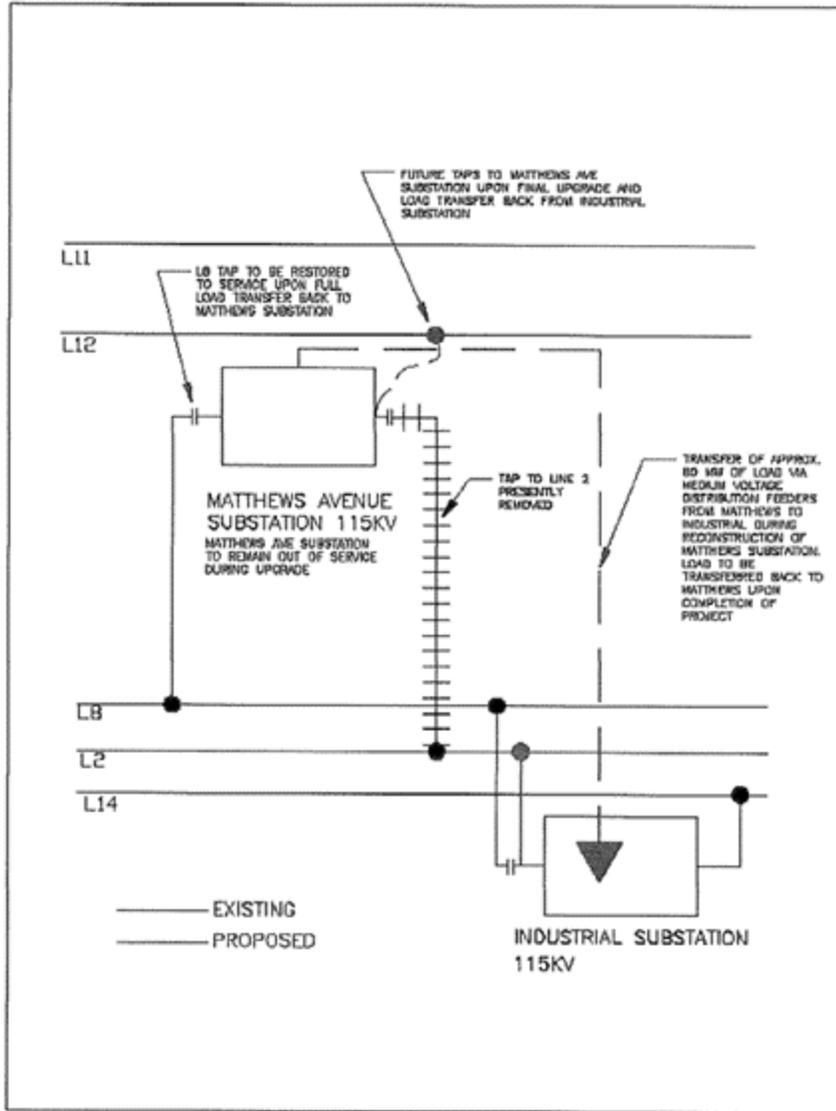
The attached project schedule shows our preliminary plans for implementation of the 115 kV line work and rebuild of the Mathews Avenue substation. Studies, engineering and equipment procurement activities are proposed to be completed in year 2010. Construction is proposed for year 2011. As indicated above, the Village will be completing the necessary distribution upgrade work to switch Mathews Avenue load to Industrial substation by early 2011.

November 2, 2010
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ATTACHMENT B: Company's Proposed 115kV Modifications & Additions Sketch



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