

Interconnection Study for Lakeland Substation:

New York Independent System Operator, Inc.
Service (Interconnection) Agreement No. 325
Under FERC Electric Tariff
Original Volume No. 1

Original Sheet No. 48

Exhibit B
[Interconnection Study]
Village of Solway Municipal Electric Department Lakeland Distribution Station
July 24, 2003

Purpose

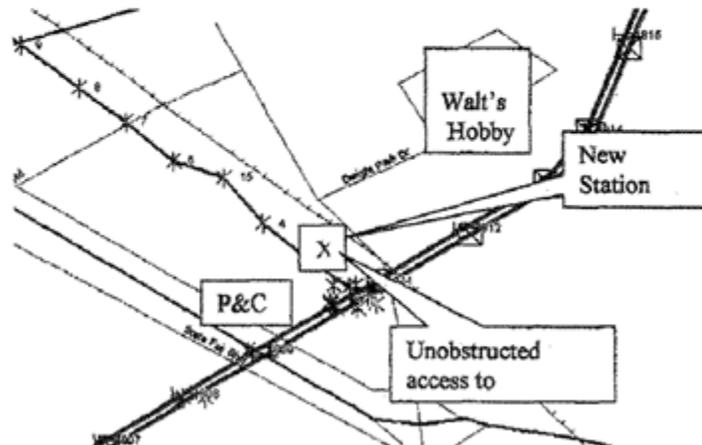
This report is prepared in response to a specific request from the Village of Solway Municipal Electric Department (the Village) to interconnect a new distribution station to NMPC/National Grid 115 kV circuits in the vicinity of Lakeland N.Y. This report will serve to confirm the scope of Village's proposed project and specify aspects of the interconnection.

Background

The Village intends to build a new distribution substation in Lakeland N.Y. immediately adjacent to NMPC/National Grid 115 kV Transmission circuits. **Figure One** indicates this location.

This new station will consist of a single step-down transformer with a top rating of 20 MVA. The Village has provided a conceptual single line diagram and plot plan as shown in the attached **Exhibits One and Two**, respectively.

Figure One



Issued by:
Herbert Schrayshuen
V.P. Transmission Commercial Services National Grid USA
For: Niagara Mohawk Power Corporation
Issued on: September 5, 2003

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Exhibit B
[Interconnection Study Cont.]
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Interconnection

Access can be provided to two NMPC 115 kV circuits at this location. The station will be permitted to tap both the Elbridge-Woodard #4 and the Gerelock- G.E. #8 circuits.

The station will normally operate from the circuit immediately adjacent to the station, which is the Elbridge-Woodard #4 circuit. The second tap from the Gerelock- G.E. #8 line will be used for emergency purposes only when prevailing system conditions allow such operation.

This interconnection is limited to a maximum of 20 MVA. The Village is required to maintain a minimum Power Factor of 95% on peak at the points of interconnection. Operation within these limits will help ensure normal operational supply voltages will remain within the standard range of +/- 5 % of nominal 115kV.

Emergency Use of the #8 Line

At the present time, NMPC can use the Gerelock- G.E. #8 line to supply the Village's Mathews Ave or Industrial (Bridge St.) substations in emergency or maintenance conditions. The new Lakeland station will be the third Village station that will use the line for such purposes.

Since NMPC does not receive telemetry for operational loading and equipment status at any of the Village Stations, it must be assumed that the stations are near maximum levels when switching requests are received. The overall size of the station loads may require that NMPC limit the use of the #8 line by the Village to one station at a time. That is, simultaneous use of the #8 line by more than one Village Station will in all likelihood not be permitted.

Interconnection Construction

Project information supplied to date indicates the new station will be located immediately adjacent to the 115 kV circuits with unobstructed access to the station.

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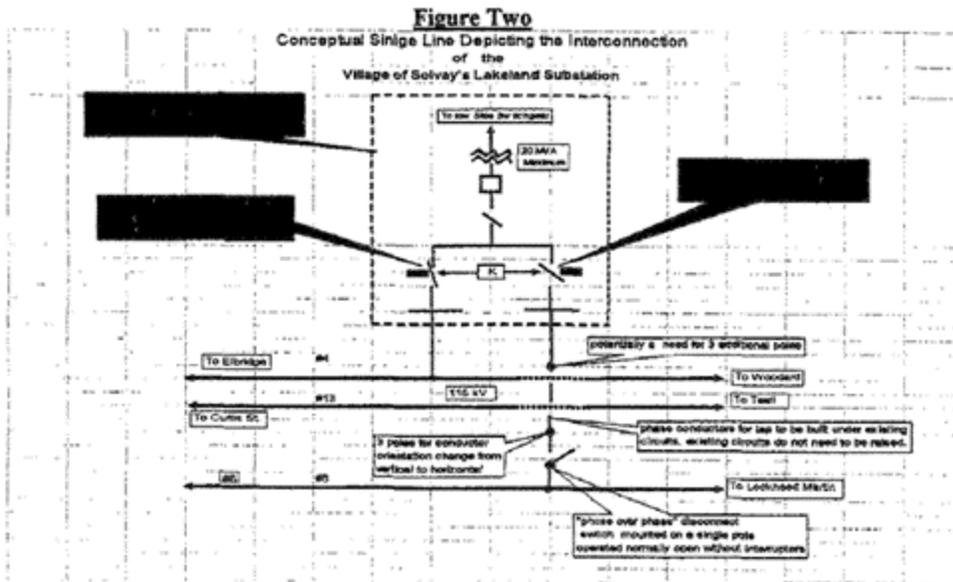
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Village of Solvay Municipal Electric Department Lakeland Distribution Station
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Figure Two below conceptually depicts the interconnection in a single line format. The tap from the #8 line will be physically constructed under the existing #4 and #13 circuits.

The #4 and #13 circuits will not need to be raised. An additional pole mounted disconnect switch located on the Right-of-Way is included in this design. This switch will be used to keep the conductors comprising the tap that cross beneath the #4 and #13 circuits de-energized when the emergency supply from the #8 line is not in use. This will help prevent the loss of the #8 line in the event conductors fall from the #4 or #13 circuits.



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Construction Schedule and Costs

The following general schedule and cost will apply:

- Summer 2003Sign Interconnection Agreement
- Winter 2003/2004Complete design of taps
- Spring 2004Construction of taps

The conceptual cost estimate for this interconnection is \$228,000.

Installation Requirements

Solvay shall submit all design drawings approved and stamped by their design professional licensed in the State of New York. Six (6) copies of all design documents according to NMPC ESB 752 shall be submitted to NMPC for design review and acceptance. Refer to the following web link for NMPC ESB's 750, 752 and 755 as applicable to Solvay's station installation, operation and maintenance requirements:

<http://www.niagaramohawk.com/electricalspecifications>.

Solvay will be required to install NYPA approved metering at the 115kV delivery voltage.

Operational Considerations

The lack of telemetry indicating both the 115 kV switch status and overall station load is a concern. It is therefore required that NMPC will have control authority over the 115 kV disconnect switches inside this new station. The Village is required to arrive at a mutually agreed upon operating procedure and conform to NMPC's ESB 755.

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Parallel switching between the #4 and #8 circuits will not be permitted. The station transformer must first be de-energized before 115 kV switches will be operated to make either the #4 line (normal supply) or #8 line (emergency use) available for service.

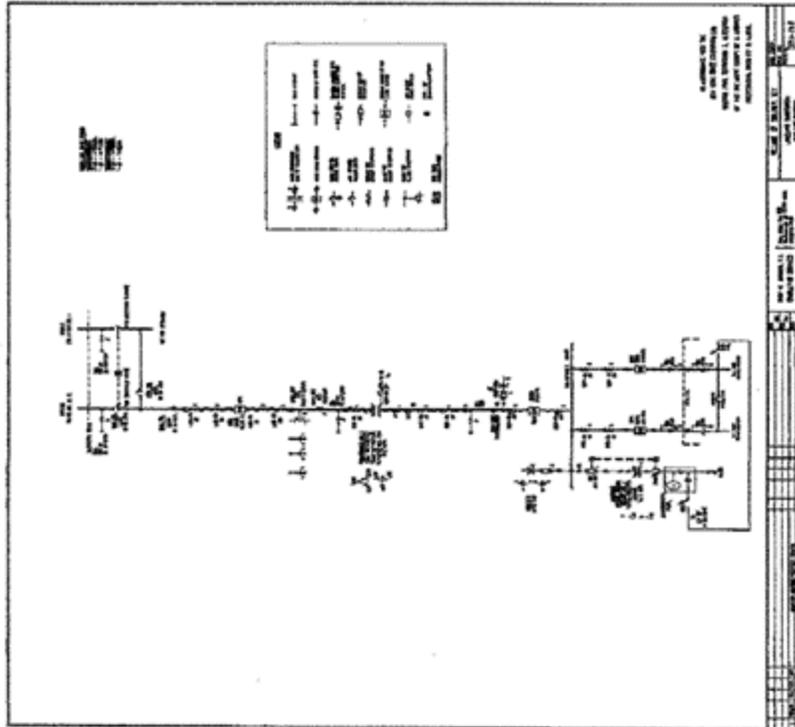
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Exhibit One



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Interconnection Study for Industrial Substation:

Interconnection Study
For
The Village of Solvay's
New Substation

October 9, 1998

Niagara Mohawk Power Corporation
Transmission Planning

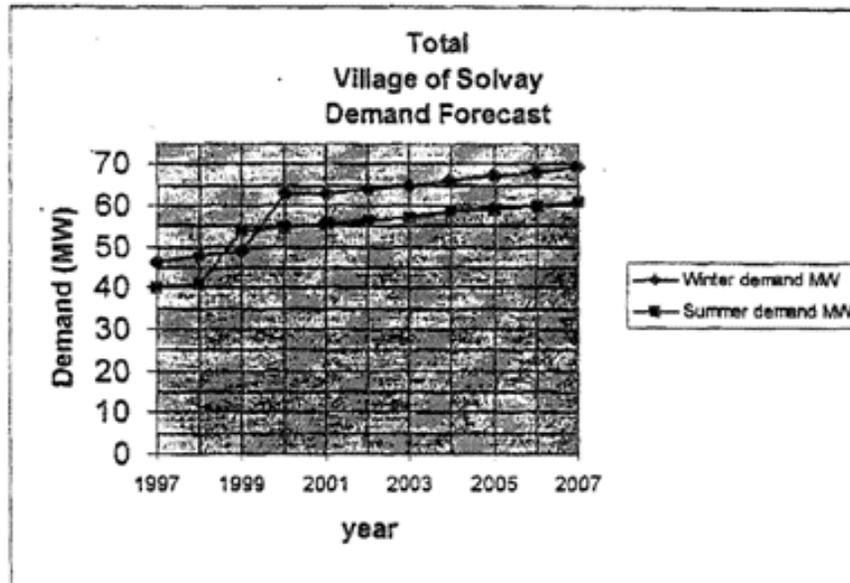
**Interconnection Study
For
The Village of Solvay's**

New Substation

I) Background

The Village of Solvay plans to build a new 115/13.8 kV substation located on Bridge Street in the Village in close proximity to Niagara Mohawk Power Corporation's (NMPC's) Solvay Station. This new station will ultimately have a delivery capability of 80 MVA and will be constructed in two phases. The first phase will consist of two 40 MVA transformers resulting in an initial station rating of 40 MVA. The final phase will add a third bank for a total of 120 MVA of transformation and 115 kV breakers completing the associated bus. Appendix A contains a single line of the proposed station

A ten year demand forecast was provided for the Village in total as well as for both the new station and their existing Mathew's Ave station. This information (appendix B) is



displayed in Figures one and two and shows that the new station will initially be loaded to approximately 22 MW, 12 MW of new load and 10 MW transferred from their Mathew's Ave station.

Figure One

**Interconnection Study
For
The Village of Solvay's
New Substation**

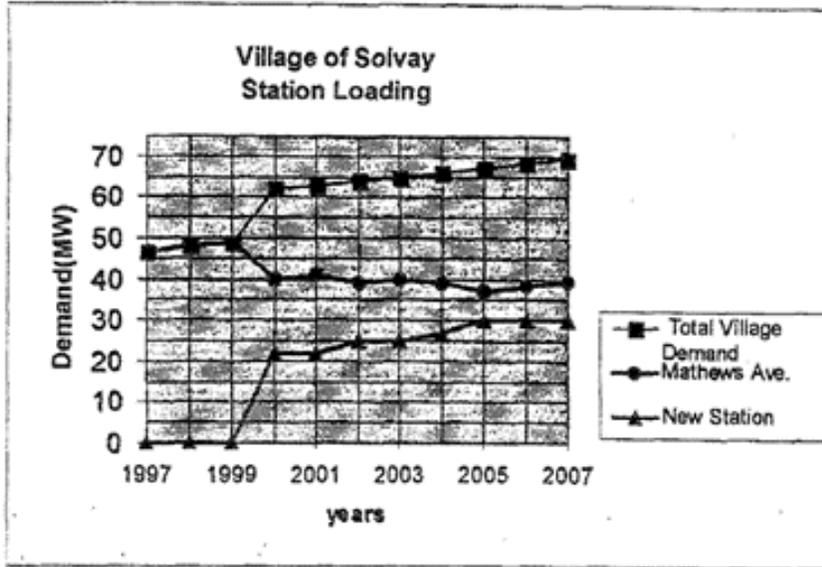


Figure Two

Recent discussions with the Village have indicated the possibility that the new station's initial loading may be somewhat higher than indicated in this forecast.

II) Existing System

The existing portion of the 115 kV transmission system between Geres Lock and Solvay delivers a peak demand of approximately 109 MVA in the summer and 118 MVA in the winter. A single line of the area is shown in Figure three.

Presently the Village's Mathews Ave station, Crucible Steel and NMPC's Solvay station are supplied via two circuits (the #2 and #14 lines). For reliability purposes each of circuits has the thermal capability of delivering the area's peak demand. On an emergency basis (after manual switching) the Mathews Ave station can be supplied from the #8 line. This circuit is today an extension of the #8 Geres Lock to G.E. line created by an approximately 0.5 mile tap.

**Interconnection Study
For
The Village of Solvay's**

New Substation

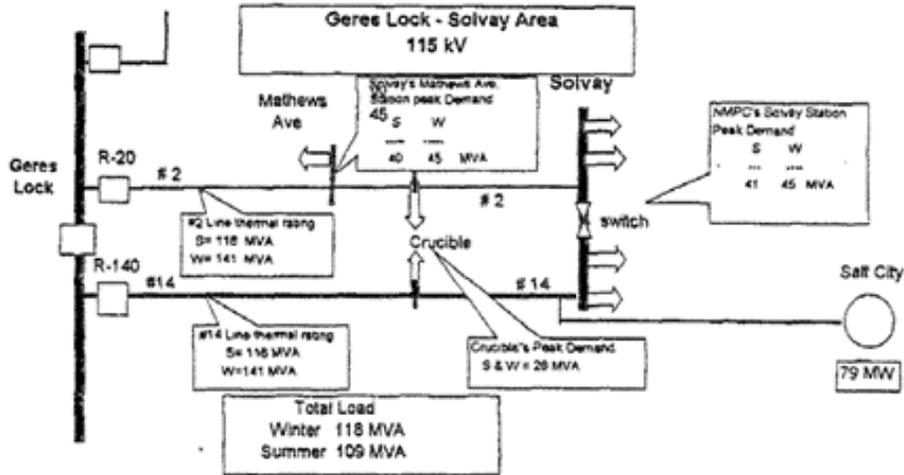


Figure Three

The #14 line today is considered to have approximately 40 MVA of "margin" during summer peak conditions for the loss of the #2 line.

III) Interconnection Plan

The interconnection plan recommended in this study differs from those recommended in previous studies. Changes to the delivery capability of the proposed station, its bus configuration, the availability of transmission facilities and problems associated with right-of-way acquisition have all contributed to the changes in the recommended plan.

The presently proposed station will have a rating in excess of 80 MVA when completed and represents a capability far larger than considered in previous studies. A station with this capability is typically provided with redundant ties to the system and designed with a bus configuration to provide continuous service for the loss of any transformer or 115 kV tie line.

In addition, previous investigations have assumed that 115 kV lines interconnecting Independent Generators (NUGS) were available for use. This investigation has revealed that these lines are considered part dedicated NUG interconnection facilities and thus for all practical purposes their use is not an option.

**Interconnection Study
For
The Village of Solvay's
New Substation**

It has, in addition, come to NMPC's attention that land acquisition necessary for access to the NUG interconnection facility is also a problem that may severely impact plans..

The Interconnection Plan recommended in this study will provide two 115 kV circuits to the new substation from either end of the Geres Lock bus and will progress in phases following capability additions to the new substation.

Phase I of this plan provides a normal and emergency supply and is shown in Figure Four. The normal supply will be provided via a tap from the #14 line. An emergency supply is provided by an extension of the #8 line. Both supplies are provided with disconnect switches as shown. The emergency supply (#8 ckt) can be used by either the Mathew's Ave station or the new station. The simultaneous emergency use by both stations may not be allowed due to a voltage concern with R-80 open at Geres Lock. This phase of the plan is rated for 40 MVA (summer) and 50 MVA (winter). The total cost of Phase I is estimated to be \$481,000.

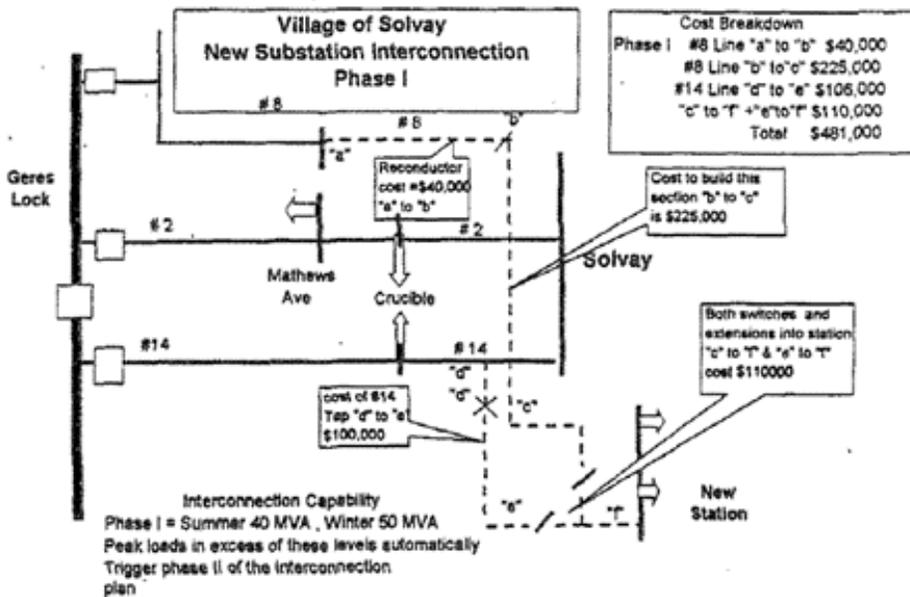


Figure Four