June 9, 2003

At the recent New York State Electric Meter Engineer's Committee (NYSEMEC) meeting on May 8, 2003, the NYISO asked the group to address the following:

Question: "Minimum equipment requirements for meter functionality to obtain hourly profile data to be delivered daily".

Pursuant to that request, the following is NYSEMEC's response to the above question. This reply is limited to the measurement, collection and validation of revenue grade, gross watt-hour values that are used by the NYISO for billing purposes. This reply is exclusive of any processes that may be used by Meter Authorities or the NYISO following the validation of gross watt-hour values.

Data supplied to the NYISO for revenue purposes, from new or upgraded installations, shall at minimum be based on measurements made with "instruments" that are in compliance with the requirements detailed in Appendix A of the NYISO CCR manual. These instruments shall be traceable to NIST, approved for revenue purposes by the NYPSC and meet or exceed all ANSI C12 (Code for Electricity Metering) requirements in effect at the time of their design. To facilitate the transfer of revenue quality data on a daily basis, the revenue meters must be remotely accessible through use of conventional dial up or other communication technology. Revenue quality (register and profile) data must be retrieved and validated by an industry-approved translation billing system, such as MV90. Where applicable, SCADA data shall be checked against revenue data for validation reasons. On occasion, visual register reads may also be needed to perform validations upon request. Additionally, as a further comparison, revenue information that is collected by the translation system should be compared against SCADA integrated instantaneous and accumulated hourly pulse values. However, the source for final revenue reconciliation must be from the revenue quality installation and data collection system. In addition, the revenue quality installation may also be the source for meeting SCADA real time data requirements (i.e. metering data collected by SCADA RTU's for operational reasons). Metered quantities that are used for the purpose of operating the "power system" may also be derived from discrete transducers.

Data supplied to the NYISO for revenue purposes from a number of existing installations may not meet the above minimum specifications. As a result, the accuracy of this data is in question. For these existing installations, accuracy can be affected in two ways. First, the metering instruments may not conform to revenue quality standards (i.e. measurement accuracy is not revenue grade). These instruments are not NYPSC approved and may not be traceable to the NIST. Second, the method that is used to collect the data may itself be flawed and introduce excessive errors due to deficiencies in sampling speed and data synchronization issues. An example of the first, is the use of integrated instantaneous analog signals from transducers for revenue metering purposes. This scheme is subject to incremental error that varies as a function of load magnitude. It has insufficient sampling speed to accurately capture normal variations in load. Also, these devices (transducers) are not NYPSC approved for revenue applications and do not meet the same quality standards associated with revenue quality instruments (i.e. ANSI C12 series). The lack of hourly profile data may also exacerbate the problem. Reliance on manual meter reads may increase errors in the revenue data due to resolution constraints of the meter register and lack of a common time base that can often result in data synchronization errors.

The NYSEMEC cautions the adaptation of the costly wholesale replacement of instrument transformers. Besides being an expensive, and in some cases unnecessary option, the replacement of instrument transformers may provide the least amount of benefit and should be considered as a last resort. Exceptions to this are in extreme cases where other less expensive options are not applicable (e.g. the use of CCVT's as a source for metering potential).

The degree of error in existing installations that do not meet the above minimum specifications can vary. A number of these installations may indeed meet revenue quality standards. To

determine the degree of error, evaluation criteria must be developed and agreed to by all stakeholders. Following this, a comprehensive study must be completed on each of these installations where various metering components are evaluated against these accepted criteria. However, in most cases, the data required to perform these studies is not available and often non-existent. It may be that the only workable option to gauge the magnitude of these errors is through on-site testing. In either case, this could be an expensive and lengthy process.

NYSEMEC recommends that before such comprehensive studies and / or testing are performed and before they are initiated, it should be determined if more significant sources of error exist that are process related. These are the processes used by the TO's and ISO on the data collection and processing end (i.e. the processes used after revenue data has been collected and validated). A comprehensive review of these processes may uncover significant source(s) of errors adding to and / or compounding the current billing discrepancies.

Following this and if necessary, the NYSEMEC recommends that the NYISO defines the criteria for evaluating non-compliant installations (excluding revenue data processes following gross watt-hour validation). The NYSEMEC will support the NYISO in this endeavor.

NYSEMEC recommends that the NYISO encourage the upgrade of installations that do not meet the minimum requirements especially in cases that involve minimum expense but promise to provide maximum benefit.

The NYSEMEC recommends that a program be instituted that prioritizes these sites and at the outset, targets those locations that will provide the highest return on investment. Such a program would need to be implemented over a number of years and include a mechanism for cost recovery. In most cases, these "minimum expense", "high benefit" candidates would involve installation of revenue grade meters. Its reasonable to conclude that because the direction of net error is very difficult if not impossible to predict, such a program should be in the best interest of all the stakeholders.