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December 10, 2007

Hon. Jaclyn A. Brilling,
Secretary
State of New York Public
Service Commission
Three Empire State Plaza
Albany, NY 12223-1350

RE: Case 94-E-0952 - In the Matter of Competitive Opportunities Regarding Electric Service
Case 00-E-0165 - In the Matter of Competitive Metering
Case 02-M-0514 – Proceeding on Motion of the Commission to Investigate Competitive Metering for Gas Service

Dear Secretary Brilling:

Enclosed please find an original and five copies of the comments of Consolidated Edison Company of New York, Inc. and Orange and Rockland Utilities, Inc., in response to the Notice Seeking Comments issued October 10, 2007, in the above referenced proceedings.

The Companies are serving their comments on all active parties by email and regular mail as directed in the Notice.

Sincerely,

c: Active Parties List, Cases 94-E-0952 and 00-E-0165

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STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Case 94-E-0952 -	In the Matter of Competitive Opportunities Regarding Electric Service
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COMMENTS OF CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. AND ORANGE AND ROCKLAND UTILTIES, INC. IN RESPONSE TO NOTICE SEEKING COMMENT ON AMI STANDARD

In August 2006, the Commission directed the major utilities in New York to propose an Advanced Metering Infrastructure ("AMI") for electric and gas service if such a system could be cost-effectively deployed. Case 94-E-0952 et al., Order Relating to Electric and Gas Metering Services (Aug. 1, 2006) (the "Order"). Consolidated Edison Company of New York, Inc. ("Con Edison") and Orange and Rockland Utilities, Inc. (together, the "Companies") made a joint filing on March 28, 2007.

In the course of evaluating the utilities' filings, the Commission concluded that the plans must be measured against "a consistent standard." Case 94-E-0952, Notice Seeking Comment (Oct. 10, 2007) ("Notice"), p. 1. The standard should be "clear and comprehensive" with respect to "the functions they are intended to achieve." Notice, pp. 1-2. Furthermore, the success of AMI systems is said to require "an open standard that enables multi-vendor, interoperable equipment." Notice, p. 2. The Commission is, therefore, requesting comments "concerning the features and functions of AMI systems that should be considered as standard."[1] Id. In addition to listing in its Notice some features and functions that might be included in an AMI standard, the Commission asked

[1] The word "standard" is used in several senses in the Notice – as a term for the set of requirements for AMI as a whole, as a description of a system designed to achieve interoperability, and as a description of AMI features and functions. The context must determine the meaning.

whether any items should be excluded, whether other features or functions should be included, and whether the listed items are "accurately and/or sufficiently defined." If a definition is inadequate, the Commission asks how the definition might be improved.

The Companies offer their thoughts on the proposed AMI standard and other issues raised by the Notice.

The Commission's concern to evaluate the filings against a single standard is inconsistent with its views in initiating this proceeding. In the Order, the Commission addressed the questions whether Commission standards should be adopted for metering hardware and/or software and whether there should be statewide uniformity in data accessibility and communication. (Order, p. 24) The Commission concluded:

> The State's interest is best served by allowing utilities to make decisions relating to the kinds of advanced metering systems they plan to install, after consideration of population density, need for interface with systems of other market participants, data needs, and technical and economic feasibility, provided that the systems produce the appropriate data with unimpeded data access for authorized entities and consideration is given to facilitating access by third party providers. It appears that meter related technologies are undergoing a period of rapid development, that a number of different options and configurations may satisfy metering needs, and that the design and functions differ depending on the operational characteristics under consideration. Statement of a preference may stifle further innovations and it is too early in the development of these products to choose specific standard applications. Thus, each utility should select the most cost effective and functional technologies appropriate for its system and needs. Further, as Staff recommends, we encourage use of widely available products and prohibit networks and systems that are not open to access by other entities. Patented or trademarked products are acceptable, so long as they are non-exclusive products available to other entities. In order to ensure the selection of systems that meet these standards, we direct utilities to include their proposed selections in their advanced metering plans.

The Companies believe that the Commission was correct in not including requirements that would favor one manufacturer's product over another's or limit innovative solutions.

The Notice indicates that the Commission still recognizes the complexity of AMI. However, the notion that a standard for such a complex system as AMI can be adopted in an entirely paper proceeding and without the application of any expertise may lead to poor decision making. Because AMI involves many technical considerations, and the equipment that comprises an AMI system is in a period of intense development, the Companies urge the Commission to direct Staff to conduct one or more technical conferences on AMI equipment and communications before adopting an AMI standard. Through meetings of utility personnel, meter and other equipment manufacturers, service providers and customers, their consultants and ESCOs, the Companies believe a set of common understandings and expectations for AMI can be developed. In the long run, these common understandings and expectations should prove more useful to all stakeholders than the adoption of an AMI standard.

The Companies' view of AMI functionality and adoption of an AMI standard

At its root, AMI is a system for meter reading in support of utility billing. How much infrastructure is required for this system is a result of determining what data needs to be collected and with what frequency. These decisions drive (1) meter selection, (2) local storage requirements at the meter and first point of data collection, and (3) the methods of communications between (a) the meter and the first point of data aggregation and (b) between the first point of data aggregation and the utility's data acquisition system(s). For example, an AMI providing hourly data on an hourly basis requires more communications infrastructure than one providing hourly data once each day. Similarly, the amount of local storage within the meter will likely vary inversely with the frequency of data transmission, that is, the more frequently the data is transmitted the less local

storage is required.

A system designed to capture data for utility billing cannot be expected to accommodate every type of data request, such as more data more frequently, without consequence. Increased frequency of transmission would have an adverse impact on the data collection and communications components of the system and their ability to provide all the required data messages. The Meter Data Management System ("MDMS") may also be affected by the need to process and store the increased volumes of data. If more data is required with greater frequency by some customers and third parties, the AMI would have to have a larger throughput capacity, which can be expected to have a higher cost, than a system providing only data for customary utility billing.[2] The needs of a small group of stakeholders for additional data more frequently must be balanced against the benefits of the much more dense and expensive system that would be needed to meet these requirements.

The stakeholders must decide whether the entire AMI system must be designed for the needs of these few customers or for a more reasonable expectation of meter data requirements. Similarly, outage notification may be useful to the utility but the communications network designed to deliver meter readings may not assure receipt of signals from every meter point when power has been lost for large numbers of customers in a particular area. The stakeholders must decide whether the AMI should be designed to provide communications for an outage signal from every meter point or follow a more realistic design that would provide enough information to permit the utility to manage the restoration efficiently. The design of an AMI is thus the configuration of a system that

balances the information to be provided, when it is to be provided, and the cost of providing it. As in any system that has to take such disparate factors into consideration, some desirable characteristics may not be achievable within the price that can be justified.

Proponents of AMI point to the fact that, with AMI, a utility can achieve more frequent collection of shorter-interval meter data. With this data, the utility can support time-based rate forms and verification of demand response program participation as well as determine when and where an outage has occurred and when service has been restored. However, the bulk of a utility's business case for AMI resides in the core function of meter reading to obtain the billing determinants necessary for basic billing routines. A system designed to meet the utility's need for basic meter reading functionality, through the remote acquisition of meter data sufficient for regular cycle billing, can be extended for other meter functions. Some functions, such as more frequent meter readings, do not require additional meter hardware, firmware or software but may require additional communications infrastructure. Other functions, such as remote service disconnection/reconnection and home area network capability, would require incremental hardware and firmware.

In the Companies' plan filing, the Companies mention potential functions associated with AMI. Many do not depend on AMI as the sole means for their accomplishment; for these functions, the cost to implement an AMI solution as opposed to another solution must be a foremost consideration. Examples of possible AMI functions include:

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[2] The other alternative may be a meter upgrade and use of a different communications path into the utility's MDMS at the customer's expense. This fairly shifts the cost of providing additional meter data to the party

Integrated remote service reconnect
Distributed Generation detection and control
Remote meter programming
Power Quality monitoring/reporting
Home area network interface
Daily or on-demand reads
Interval data
Outage notification
Load profiling
Automated monthly reads
Tamper reporting

At least one item on this list, home area network interface, should not yet be considered a mature AMI function or feature. Zigbee, defined by the Institute for Electrical and Electronic Engineering ("IEEE") as a standard for mesh communications[3], is a prime example of the problems with the establishment of a "standard" intended to insure interoperability. As implemented, this interface in household appliances is not yet truly standardized, risking the possibility that Zigbee-enabled meters would be unable to communicate with the appliances they are supposed to control or other Zigbee-enabled devices. Because of the way Zigbee has been implemented by several manufacturers, the manufacturers can claim their devices and equipment are Zigbee-compliant and yet they may not be interoperable with other Zigbee devices that are also "Zigbee-compliant." These latter devices may comply with a modified Zigbee design.

Another function not included in this list is the provision of meter data to customers or third parties. In the Companies' view, these parties should obtain this information from a data repository such as the utility's MDMS, not directly from the

requesting it.

[3] A suite of high level communication protocols using small, low-power digital radios (a "wireless networking solution").

meter as a function of AMI.[4] Similarly, interfaces from the meter to home appliances should not be the focus of AMI. Con Edison remotely operates a direct load control program for central air conditioning without the benefit of direct meter to thermostat connectivity. The cost benefit of direct customer or third party access to the meter or the installation of a device to allow the customer to control household appliances has not been determined. Therefore, these functions should not be considered essential to AMI, and such functionality should not be part of an AMI standard. The Companies recognize that some additional functions may be useful for some customers; such additional functionality might be treated in the future in the same manner as the Companies' meter upgrade programs, that is, by a charge applicable to the customer requesting the additional functionality. If a standard for AMI is adopted, it should not burden utilities with the cost of functions that are not necessary or useful today for the vast majority of customers.

Besides naming these functions as components of an AMI standard, the Companies are unclear what an AMI standard would include. Additional detail might cause a significant reduction in the number of devices that can perform these functions and therefore qualify to be included in an AMI, a step that would necessarily increase the cost of AMI implementation by giving fewer vendors more control over the market. As it is, the market is rapidly shrinking with the merger of many firms in the AMI arena.

Adoption of a detailed AMI standard may have another potentially damaging effect. The standard might establish such rigid criteria for AMI, consistent with the

[4] This is not to say that customers should not have access to this information, merely that it should not come to them directly from the meter in an AMI system. The Companies propose that access be provided through a data repository similar to the manner in which they currently provide hourly data to

equipment commercially available today, that it cannot be modified to take advantage of technological and market changes. On the other hand, if the standard requires equipment that is not yet commercially available to provide the features and functions that are deemed essential, utilities may never be able to meet the standard while they await production to be established.

The Companies therefore urge the Commission to consider very carefully the reasons for adopting an AMI standard and the level of detail to be included. The Commission should avoid imposing a standard that is impracticable to satisfy or one so costly to meet that the net benefits of AMI are substantially reduced.

The Companies' comments in response to the Notice

Whether the items on the list are accurately and/or sufficiently defined; and if not, how to improve the definition

Accurate and sufficient definitions are necessary to establish a common understanding of the terminology of any standard contemplated. The Companies conclude that some of the items are not sufficiently defined. Three terms in particular do not provide the details that might make these terms useful in the discussion of AMI.

a) ANSI compliant (must meet all ANSI standards)

This criterion is requires further specification. ANSI's mission is "To enhance both the global competitiveness of U.S. business and the U.S. quality of life by promoting and facilitating voluntary consensus standards and conformity assessment systems, and safeguarding their integrity." ANSI standards are not mandatory, and the scope of ANSI

MHP customers. Customers requiring more frequent data on a more current basis may arrange with the utility for the installation of pulse initiators to develop this data at their own expense.

standards extends well beyond metering.[5] Without some greater specificity as to which standards must be met, the ANSI compliance of AMI components may be difficult to determine. Utilities may not be able to assure ANSI compliance for infrastructure services provided under contract by third parties on an ongoing basis. Consider communications services, for which utilities will likely contract with third parties to deliver meter data from the meter to the local area data collector (using a "local area network" or "LAN") and then to the data acquisition system (using a "wide area network" or "WAN"). Utilities may not be in a position to insist on ANSI-compliance with the proprietary systems used for LANs.

And even with respect to equipment and materials purchased by utilities, ANSI compliance may be unnecessary for the components of AMI to function as required and with safety and may contribute unnecessarily to increased cost. Requiring utilities to contract only with parties that can assure ANSI compliance with respect to the equipment and services provided by these parties may limit the utilities' choices. Thus, before ANSI compliance is mandated, some analysis of the value of applying specific ANSI standards should be conducted and the benefits identified. If compliance with one or more ANSI standards is required, the Commission should adopt some criteria that will justify the selection of equipment or materials that are non-compliant if there will be no reduction in safety or efficiency and the cost will be less.

[5] The Companies recognize that the Commission's regulations and the Metering Manual provide for compliance of approved metering equipment with applicable ANSI standards. If this is what was intended by the inclusion of ANSI standards on the list, then the Companies do not object provided the requirement is defined by reference to Part 93.

m) Upgrade capability

The Companies do not understand in what respect the system should be capable of being upgraded. Upgrade capability does not appear to refer to embedded programming in the meter ("firmware") which is mentioned separately as a component of the proposed standard. It is not clear whether this criterion refers to whether the hardware or software can be modified or whether the software can be modified remotely. The most desirable condition would be hardware that can be upgraded in the field and software that can be modified remotely under security, assuming that these are the least cost alternatives to removing and replacing equipment in order to make changes in functionality. Whether either is practicable is a question to be addressed by the manufacturers. If their answer is negative in any respect, the Commission must determine whether it is cost beneficial to insist on a standard in this regard.

g) Capability to remotely read meters on-demand

The criterion for "on-demand" readings does not indicate who would be requesting such readings, whether the utility, the customer, or a third party, or what information is being sought. Further definition is needed to evaluate how the requirement might be met.

Whether the list is sufficiently comprehensive, or whether additional features or functions should be specified.

In the Companies' view, the list is over-extensive, as indicated in these comments. Other features and functions are possible, and their incorporation in an AMI should be a matter of utility choice where they would be cost-effective. For example, load limiting and remote disconnection and reconnection of electric service are possible

with the addition of a hardware switch in the meter. A change in Commission policy on the use of such switches to address customer credit issues might make such a device a reasonable incremental investment for the utility, provided the switch may be strategically deployed. The ability to use this switch to terminate service to accounts for which the Company has satisfied the Commission's termination of service rules may allow the Company to justify this investment. A "pay for use" electric service would also utilize this switch, and the availability of such service could also contribute to the cost justification.

Whether the list includes items that should not become part of a Commission standard.

e) On-board meter memory capable of storing at least 60 days of readings.

There is no explanation why a meter should have such extensive storage capacity. For example, if readings were taken every 5 minutes, the meter would have to store 60 days x 24 hours/days x 12 readings/hour, or 17,280 readings.

The Companies expect that meters in their AMI system would be interrogated once daily. Thus, there would be no reason to require such large on-board memory at the meter. If adopted, this requirement would impose higher costs for meters. The local data collector will have some data storage to provide some redundancy for the system. Although the cost of memory has decreased substantially in recent years, central storage is likely to be less costly than memory in the meter itself. A standard that dictates where the storage must be located may disqualify some meters from consideration, which may also result in higher meter prices paid by utilities.

f) Direct, real-time (defined as a time lag of five minutes or less) remote read-only access for customers or competitive providers to meter data

The Companies believe that customers and other third parties should have remote access to meter data through a web-based portal into a utility system, similar to the manner in which Con Edison currently provides access to hourly interval data for MHP customers.[6] Thus, this criterion should not be necessary in terms of the expectations for AMI but would be applicable to designing how the information derived through AMI is made available.

Furthermore, this requirement assumes that the meter will be programmed to provide five-minute readings. For most customers and most applications, this is not necessary and should not be required. Data storage for this level of meter readings from all customers would quickly overwhelm any MDMS that might be specified. For customers who require this type of information, AMI is not necessary. Pulse initiators incorporated into the meter tied into customer energy management systems can provide this information on whatever basis customers or their consultants find appropriate. The Companies also note that raw meter data will not be used for billing; meter data is run through the utilities' validation routines before being used for billing. A specification about how often data may be obtained by customers and third parties also suggests that the Commission will expect utilities to provide interface devices as part of their AMI. Utility-provided interfaces should not be expected. Interfaces with utility-installed pulse initiators to connect with customer equipment should be competitively supplied. Similarly, displays of energy consumption and/or commodity pricing should be competitively supplied and operated over a different system that derives usage

information from the utility's MDMS.

h) open standards-based communications

The most common communications associated with AMI has two components: a LAN, from the meters to a local data collector, and a WAN, from the local data collector to the utility's data acquisition system. LAN components currently use proprietary hardware and protocols and would not be able to satisfy a requirement for "open" communications. For this reason, this should not be a part of an AMI standard.

j) Ability to send signals to customer equipment to trigger demand response functions, and/or connect with a home area network (HAN) to provide direct or customer activated load control

Several different technologies are currently available that could be used for this purpose. However, they are not proven, and they do not have widespread acceptance or implementation. It would be a mistake to dictate use of a particular technology that may be abandoned in the near term.[7]

Whether there are any other matters related to such an AMI standard not otherwise addressed by the above questions.

The emphasis on interoperability is inappropriate. What customers want is access to data, not access to the meter or to the metering system. Little or no interest has been shown in competitive metering in the last eight years. Thus, to engage in protracted discussion whether any or all components of an AMI must be interoperable is not likely to be profitable in any sense, either in economic terms or in terms of ultimate benefit to any party, especially if the effect of these discussions is to delay the installation of AMI

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[6] Access is currently provided through a third-party service. The Companies presently anticipate replacing this service with a utility-based service following successful implementation of their MDMS.

[7] The example of the VHS versus Betamax competition comes to mind. Consumers who purchased Betamax video players found themselves with orphaned equipment.

in the near term.

In the course of preparing their joint plan, Con Edison and Orange and Rockland developed a very comprehensive understanding of the physical and/or functional characteristics of AMI systems and components commercially available at the time. The plan they submitted described generally what types of systems the Companies expected to purchase but provided no details. Because of various challenges in their service territories, which were described in their plan, the Companies decided that they could not specify the equipment and communications systems they would use in AMI without pre-deployment trials that would validate their assumptions.

Using the functionality described by the Commission in its August Order as a starting point, the Companies developed their AMI models, coupling costs and benefits in an effort to determine which combinations of products possessed the technical feasibility, best cost per point, and richest feature set. While some functionality, like remote meter reading, is straightforward and is readily provided by all products in the AMI space, other functionality such as voltage reporting for each phase is not. It became apparent during this evaluation that some module/meter combinations were more tightly integrated than others and that, in order to obtain certain functionalities, it might be necessary to pick a specific meter/module combination.

The Companies' analysis also included a review of protocols and components that could be considered interoperable. The Companies determined that while there was a fair amount of interoperability in some areas (e.g., AMI communications modules can be retrofit onto meters from many vendors), in other areas, the technology of some components is proprietary. The Companies recognize this as a disadvantage in the

selection of a product; they always desire to have as many sources as possible in order to take fullest advantage of the competitive bidding process as well as to be assured of supply resources. However, they believe that the selection of components and systems that have the highest likelihood of providing the desired functionality and working properly in their service territories should have a higher priority.

Interoperability is most apparent in wide area network (WAN) communications and least apparent at the lowest level of the network (communications from meter to meter or meter to data collection point). Different systems with varying architectures and capable of communicating over very different topographies will be needed in order to provide AMI functionality to all customers. Their technical differences are what allow these systems to be used in specific applications under specific conditions to provide the highest performance for the lowest price. Requiring interoperability at every level of an AMI may reduce the cost-effectiveness of the system without any corresponding benefit.

Other features and functions proposed for an AMI standard

The Commission requested comments on the following features and functions. The Companies agree that functions 4, 7, 9, 11, and 12 are components of an AMI.

a) ANSI compliant (must meet all ANSI standards)
   Comment: See above.
b) Bi-directional registration (supports net metering)
   Comment: Net metering can occur with the single register available in most meters. These meters will not provide separate data for imports and exports and may not be effective to record net metering on a time-of-use account. A meter with added functionality would likely be available at a greater cost; however, such meters should not be required for all customers because they will probably not be used to the full extent of their functionality by many customers.
c) Visual read capability for cumulative usage
   Comment: This function can be incorporated but should be unnecessary for any stakeholder. Because the utility will not be reading the meter by viewing

it, the utility does not require visual read capability. Customers do not have a right to have a meter that has a visual read cumulative register. In Con Edison's service territory, where multi-tenanted residential and commercial premises dominate the building stock and many meters are located in basements, most tenants have never seen the meter by which their service is measured. The possibility that a Meter Data Services Provider would want or need visual read capability is extremely remote.

d) Ability to provide time-stamped interval data, at hourly or shorter time intervals
   Comment: It should be clear that this is a communications function and not a meter function.
e) On-board meter memory capable of storing at least 60 days of readings
   Comment: See above.
f) Direct, real-time (defined as a time lag of five minutes or less) remote read-only access for customer and/or competitive providers to meter data
   Comment: See above.
g) Capability to remotely read meters on-demand
   Comment: See above.
h) Utilizes open standards-based communication protocols and platforms, e.g., broadband, PLC, internet, XML, MV-90, Zigbee, DNP3, etc.
   Comment: See generally above.
i) Two-way communications capability, including ability to remotely upgrade firmware
   Comment: Two-way communications is a basic component of AMI. The ability for the system to upgrade firmware by this means is desirable: it will reduce the cost of meter maintenance by allowing the utility to avoid "touching" the meter each time an upgrade must be made. Manufacturers are generally incorporating remote upgrade as a standard feature of their meters.
j) Ability to send signals to customer equipment to trigger demand response functions, and/or connect with a home area network (HAN) to provide direct or customer activated load control
   Comment: See generally above.
k) Positive notification of outage/restoration.
   Comment: The ability of AMI to provide positive notification to the utility of an outage or the restoration of service depends on the combination of the meter and AMI module and whether that combination is tightly or loosely integrated. The Companies also note that outage notification signals issued by all the meters in a particular area in response to a loss of service may not all be received by the utility's data acquisition system simply because the communications system is sized for ordinary levels of data transmission, not for the "flood" of data that may occur. The outage signals received will provide the utility with enough information to assess the bounds of the outage, even if not every meter outage signal is received. An AMI system sized to receive positive outage notification from every single meter point would have to be enormously oversized for ordinary levels of data transmission, a costly investment.

l) Self diagnostics, including tamper flagging capability
Comment: All meters will have the capability for self-diagnostics and tamper-flagging. Whether all the information developed through such self diagnostics is returned to the utility's data acquisitions system or must be captured in the field depends on various factors and would likely require filtering to eliminate nuisance messages.

m) Upgrade capability
Comment: See above.

The absence of a specific comment on any of these features or functions should not be taken as the Companies' agreement that it is clear what is intended by reference to that feature or function or how that function is to be implemented.

Conclusion

For the foregoing reasons, the Companies ask that the Commission conduct one or more technical conferences to develop understanding of AMI technology. The Companies believe that only with such conferences can any decision regarding the desired characteristics of or expectations for AMI be made with full understanding of the possibilities and the issues. The Companies further ask that the Commission reconsider whether all or any of the functions or features listed in the Notice must be incorporated into the utilities' AMI plans.

Dated: December 10, 2007
New York, NY

Respectfully submitted,

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