RFP 16-0080

As per the request in Section 2.6 stating, "**Offeror shall provide a response to each of the line items listed in the System Requirements section, stating compliance or noncompliance and an explanation, for each line item, in detail. Failure to comply with this requirement may deem the Offeror nonresponsive."**

The City is offering this document to all Offerors. Filling out this form is not mandatory but may be used to help complete the requirements of the RFP.

Section 3
System Requirements

The City desires a proven two-way communication to all endpoints, which offer remote monitoring and control functions to various devices on the proposed City system. The offered AMI solution shall address and support the following energy-related features and functions identified in Sections 3.1 through 3.9 of this RFP.

Section 3
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3.1 System Overview

The utility desires to own, operate, and maintain its own AMI network. The network should have battery backup for all infrastructure devices and be designed so there is no single point of failure. Ease of installation is of primary importance, with flexible installation options on utility poles, streetlights, and other utility-owned property.

With this information in mind, please provide a description and architecture diagram of each element of the Offeror's proposed solution. Describe each system element including any single points of failure for the following:

- Endpoints
- Routers
- Collectors

- Communications
- Server(s)

Offeror's response:

3.2 General Requirements

- Daily retrieval of all electric meter data with at least 99 percent of all meters successfully read each day without estimation.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- All data retrieved shall be time-stamped by the endpoint.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The host system must transmit all necessary billing data, without estimates, for at least 99 percent of the meters in each billing cycle to the customer information system on a daily basis within 48 hours of the end of the billing cycle.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- All alarms, including power failure, shall be programmable by event type and be reported via an unsolicited event message.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The communications system shall support real time, on-demand meter reading requests, and shall have an average response time of 30 seconds or less at least 90 percent of the time.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The communications system shall enable remote reprogramming of all endpoints.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The communications system shall enable remote firmware upgrades to all electric endpoints and meters without a field visit.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Time stamp of readings and actual endpoint reading time shall be within one minute of the system reference time (e.g., National Institute of Standards and Technology).

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- All system hardware must be capable of reporting diagnostic, tamper alerts, and errors to the data collection system.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The system shall support advanced metering functions such as demand, time of use (TOU), load profiling, and multichannel capability (e.g., KVA, KVARH).

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

3.3 AMI Communication Requirements

- The AMI solution shall support either a single- or multi-layer infrastructure (i.e., local area network (LAN) and wide area network (WAN)).

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The LAN must utilize two-way communication from the endpoint device to the collector for all electric devices including endpoints, routers, and collectors.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The WAN must support multiple communication technologies from the collector device to the central host server (e.g., wired or wireless: TCP/IP-based, GPRS, CDMA, Ethernet, BPL, or WiFi).

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The AMI solution must support the following two-way communication methods:
    - Scheduled data messages (programmable for daily, hourly, sub-hourly).
    - Proactive messages (unsolicited messages sent as events occur).
    - On-demand messages (in near real time).
    - Broadcast messages (also providing control functions).

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The AMI solution software shall be designed so that increases in data requirements (e.g., moving from daily reads of all customers to 15-minute interval reads of all customers) do not raise the operation and maintenance cost of the system. Please

describe your network design methods to ensure the AMI System can accommodate future growth and technological advances.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

The City will provide communications via TCP/IP protocol from collectors to the central host server(s). Offerors shall provide an estimate of the total number of collectors (and repeaters, if applicable) required for reading a specific set of meters. In the event of communication loss from endpoint to collector or collector to central host server, there must be no loss of data or endpoint information.

Offeror's response:

3.4 IT Security Requirements

The proposed system must protect confidentiality using advanced encryption techniques as follows:

- The system must support Advanced Encryption Standard (AES) 256-bit encryption at the head-end and at the meter level.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The system must utilize SSL 128-bit encryption when transporting data over the wide area network (WAN) from the collector to the head-end system.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The system must utilize SSL 128-bit encryption when transporting data over the WAN.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Ability to upgrade encryption as technology advances on future updates.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

The proposed system must utilize advanced techniques to ensure authentication and integrity of data as follows:

- Role-Based Access Controls (RBAC) within the head-end enabling the utility to restrict operational and data access on a granular basis to both individuals and systems with an explicit need.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Native and Lightweight Directory Access Protocol (LDAP) head-end user authentication mechanisms. The native authentication mechanism is based on user ID and hashed passwords.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Elliptic Curve Cryptography- (ECC) based downstream digital signatures applied to utility configurable messages classes.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Hash Message Authentication Codes (HMACs) of encrypted messages.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Using Public Key Infrastructure (PKI) and various ECC digital signature mechanisms, the head-end and interconnected systems must collect, validate, and store nonreputable message acknowledgements.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Mobile administration software must make use of digital certificates issued by the head-end to authenticate field tools.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Compliance with Smart Grid security standards and guidelines such as NERC CIP and NISTIR 7628.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Offeror is strongly encourage to interact with the City (Light and Power and IT Divisions) in performing penetration testing of both the network and the head-end system using City-approved third-party security experts. The results of these tests shall be provided on request in order to demonstrate the strength of the solution's end-to-end security.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

3.5 AMI Hardware Component Requirements

3.5.1 Single and Polyphase Meters and Endpoint Devices

- Proposed electric meters and installed endpoints that are manufactured, sold, and supported by a single Offeror to ensure competitive pricing and effective support is preferred by the City.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- All endpoints must be integrated at the meter manufacturer's facility.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Prior to delivery from the factory, the meter manufacturer shall test each meter to certify the accuracy and proper operation of the meter. A file with meter attribute information and test results shall be electronically provided prior to every shipment from the manufacturer.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Proposed electric meters and installed endpoints must be capable of transmitting Smart Energy Profile (SEP 1.X). Required quantities are listed with the meter form data.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Single-phase electric residential meters proposed by the Offeror must be rated as follows: operating temperature from -40 degrees Celsius to +85 degrees Celsius, nominal voltage 120VAC to 480VAC, operating voltage 80% to 115% of nominal voltage, relative humidity of 5% to 95% noncondensing, voltage burden less than or equal to 1.9 watts maximum.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Polyphase meters proposed by the offeror must be rated as follows: operating temperature from -40 degrees Celsius to +85 degrees Celsius, nominal voltage 120-480V autoranging power supply, operating voltage 80% to 120% of nominal

voltage, relative humidity of 5% to 95% noncondensing, voltage burden less than or equal to 1.8 watts maximum.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Along with being able to program meters remotely, meters must be field programmable. Meters must support optical port lockout for security purposes.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Meters must support tilt detection.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Meters must offer display options for +kWh, -kWh, Net kWh, added kWh, Time-of-Use and Demand.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Meter firmware must be remotely programmable over the AMI network.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Meters must meet the following applicable ANSI Standards including: C12.1, C12.10, C12.18, C12.19, C12.20 (0.2 and 0.5 Accuracy Classes).

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Endpoints must be capable of providing the following information:
    - Daily kWh reading with time stamp.
    - Daily maximum kW demand (15-, 30-, or 60-minute rolling or block demand) with time stamp.
    - Time-of-Use billing data.
    - Load profile data with or without the use of a load-profile-enabled meter.
    - Tamper detection, reverse energy flow detection, and endpoint health diagnostics.
    - The number of momentary outages and events.
    - Duration of sustained outages in minutes.
    - Offerors should describe the process to upgrade to SEP 2.0 in the future.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Offerors should describe additional information available from the endpoints.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Endpoints must be certified to comply with FCC Part 15 rules.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Single-phase residential electric endpoints must be preprogrammed for standard single-phase residential meters and require no programming prior to installation.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Single-phase residential electric endpoints shall allow interrogation and reprogramming over the AMI System without interruption of the service connection.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Single-phase residential electric endpoints shall synchronize to a single host system time source and shall not exceed a one-minute time drift.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Data displayed on the single-phase residential electric meter must match the reading provided by the AMI System.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Single-phase residential electric endpoints shall have a programmable outage and restoration notification time; this shall be reprogrammable from the host system.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Single-phase residential electric endpoints shall have data storage capability to store over 30 days of 15-minute load profile data; this data shall not be lost during power outages.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

3.5.2 AMI Network Infrastructure Devices

Any network device placed in the field must meet the following minimum requirements.

- Utilize a 120 or /277 (+10% / -20%) VAC power input.
- Utilize an outdoor NEMA enclosure, rated for -40° C to +70° C with remote antenna capability that can be pole- or wall-mounted.
- Allow remote firmware upgrades.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Utilize 256-bit Advanced Encryption Standard (AES) using unique keys at the endpoint to protect home or premise's information from interception.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The system's data collectors shall have, at a minimum, eight hours of battery backup and remain fully operational during that time; no data loss may occur if the life of the battery is exceeded.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The AMI System shall not rely on any collector device as a single point of failure for data retrieval of any specific endpoint's data.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

3.6 Central Host Server

Central host server shall:

- Be capable of control and monitoring functions for multiple AMI technologies to provide future feature flexibility.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Provide a one-page dashboard of system health with instant indication of endpoint status, collector alerts, endpoint alerts, deployment status, validation threshold alerts, email alerts, and not logging alerts.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Flexible billing extracts must be able to properly interface with Advanced Utility Systems—CIS Infinity.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Provide possible energy theft detection and reporting.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Offer customized reports.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Support online viewing of reports and extraction to common formats such as Microsoft Excel or Adobe PDF.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Provide audit reporting capabilities.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Provide methods of user authentication.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Provide support for flexible data extract formats.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Provide mapping capabilities for display of detected outages.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Be web browser-based.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Operate using Microsoft 2012 and SQL Server 2008R2.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

Offeror shall provide an estimate of the capacity/bandwidth required between the central host server and the collectors.

Offeror shall provide screen shots of central host server dashboard and key reports available from the proposed system.

Offeror shall provide details of the system's MDM capabilities, if available.

Offeror shall offer and describe available IT hosting services, including disaster recovery and data backup capabilities provided at the hosting site.

Offeror's response:

3.7 Advanced System Requirements

3.7.1 Outage Detection

- The system endpoints shall be configurable to provide unsolicited power outage alerts in the event of power loss within 30 seconds or less.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- All communication modules installed in electric meters must provide a "last gasp" packet of data in the event of a power outage to ensure rapid and accurate response to the outage condition.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Power outage and power restoration notifications for electric devices shall be detected and reported to the central host server with an average response time of less than ten (10) minutes.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Offer the capability to alert City employees via email, text message, or any IP-based device.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- Provide notification thresholds which are configurable in the central host server software system.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

3.7.2 Remote Disconnect/Reconnect

- The remote disconnect/reconnect device is strongly preferred to be an internal switch under the meter cover.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The device must be capable of operating continuously at 200 amps and must be rated for a minimum of 10,000 operations.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The system must provide verification of the device's status after operation.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The system must provide an option to operate the internal switch as a service limiter based on a programmable load threshold. Please describe how you implement this capability.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The device must fit standard residential meters with no modifications or connections.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

- The remote disconnect/reconnect device must have provisions to prohibit reconnection of service if load-side voltage is detected. The voltage threshold must be programmable from the central server.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

3.7.3 Advanced AMI System Applications

- The Offeror shall define how the AMI System supports or will support the following advanced system applications.
    - The AMI solution shall allow support of remote distribution automation functions such as capacitor bank, recloser, voltage regulator control, and other distribution network devices without physical change-out of field-installed devices. Describe how your system performs distribution automation functions over the AMI communication network without being affected by AMI traffic.
    - The AMI solution shall allow support of load control devices (i.e., relays) without physical change-out of field-installed devices.
    - The AMI solution shall allow for network and available software support for a dynamic voltage management solution for energy conservation and stable supply across the City distribution grid including, but not limited to, the following features:
        - Implement, track, and sustain continuous improvement of a utilities distribution power delivery to its customers.
        - Reduce the energy usage for utilities without a change in how customers use energy.
        - Analyze each circuit and locate potential service delivery issues proactively.

- Validate energy reduction using rigorous statistical methods.

Comply ☐ **Does Not Comply** ☐

Deviation from Specification:

3.8 System Training Requirements

The Offeror must identify standard training procedures for all required City personnel. The proposal must include training costs, number of days required for on-site training, and complete list of training topics and personnel required to attend.

Offeror's response:

3.9 AMI System Implementation Requirements

Offeror shall describe its account management approach, including the turnover process from presale through post-implementation support.

For this project, Offeror shall be responsible for supplying, delivering, installing, training, and ensuring the proposed AMI System is operational prior to full deployment. This shall include but not be limited to:

- AMI system deployment management and support.
- Network deployment planning and installation training.
- Host system controller configuration and installation.
- Support for the development of an interface and integration with the utility billing system (Advanced Utility Systems—CIS Infinity), the outage management system, and other enterprise applications.
- Establishing with the utility and supporting initial functional testing of the system.

Utility and subcontractor support for complete field network and meter installation

Offeror's response: