



METER READING SYSTEMS BID SPECIFICATIONS



SPECIFICATIONS

This document is intended for Utilities and Consultants and provides specifications for Neptune's Handheld, Mobile and Fixed Network Systems.

1 Scope of Work

(Utility) issues this RFP to procure a meter reading system capable of meeting the current and future meter reading needs within our service area. The scope of work involves, but is not limited to, providing and installing a meter reading system which includes software, hardware and all necessary training and installation support. The reading equipment shall be capable of receiving meter readings while utilizing a handheld reading device and/or a mobile reading unit and/or a targeted fixed network. It is the intent of (Utility) to have the Vendor provide the meter reading equipment compatible with Neptune and Sensus water meters equipped with absolute encoder registers.

The system must have the capability to be upgraded to radio frequency technology to improve meter reading efficiency including addressing "hard-to-read" meters and increasing meter reader safety. The Vendor shall describe the upgrade requirements to incorporate RF technology.

Once upgraded to allow radio frequency reading, the system shall still be able to probe water meters or allow manual entry within the same route without detaching the probe or radio interface unit.

The proposed system must be provided by the same company or an equity partner (specifics must be submitted with the proposal).

All system parts furnished (reading equipment, RF transmitters, meters with absolute encoders) shall be produced from an ISO 9001 manufacturing facility.

2 System Overview

The meter reading system shall be adaptable to walk-by, mobile or targeted fixed network methods of collecting data. The transition from walk-by to mobile to fixed network shall be seamless and allow all methods to operate together in a hybrid system.

The meter reading system shall include a walk-by system providing a migration path from the walk-by to mobile through to targeted fixed network applications. The difference between the three systems shall be the method of gathering the meter readings. The systems are not mutually exclusive — they can be used together seamlessly. The first shall use the handheld data collection device; the second shall use a mobile data collection device driven near the customer premises to collect reads; and the third shall use a fixed network data collector to continually receive, store and communicate data from meters within range. Each method shall add its unique value to (Utility) and the choice shall be driven by the needs of (Utility) and its customers.

- **Host Software** — The software package installed on the host system at the utility site. Its main function shall be to make route assignments to send to the data collection device and to transfer collected information to the billing/CIS system via a transfer file. The utility will be responsible for the transfer file.
- **Data Collection Device** — The means of communication between the meter interface unit (MIU) installed at the meter site and the host software. In a walk-by system, it must be a handheld computer capable of reading meters using keyed-entry, probing or RF communications with an attached receiver device. In the case of a mobile application, the data collection device must be a portable personal computer integrated to an RF receiver that can be installed in any vehicle. For the fixed network application, the data collection device must be an environmentally sealed control box able to adapt to various installation settings. It must also demonstrate the ability to receive, store and communicate meter readings to the host software for further use and analysis.
- **Meters/Meter Interface Units** — Meters connected to electronic devices that shall collect meter usage from an encoder meter register and shall transmit the meter reading and a unique ID number to the data collection device.

3 Host Software

The Host Software must be meter reading software that will transfer files between the Utility Billing/CIS System and the data collection devices. The utility will provide the transfer file to the vendor's file format provided it is a standard ASCII format. The host software must be configurable for either a standalone installation or operate in a client/server environment.

3.1 Computer Platform

The meter reading software must be capable of running in a standalone mode and have the capability to support a Windows Client / Server environment. When operating in either standalone or client/server configurations, the PC computer will be equipped with a minimum Intel 800MHz Processor with at least 256MB of RAM, 1.5 GB of available space on the hard disk space, Super VGA (1024x768) or higher resolution video adapter and monitor, keyboard and mouse or compatible pointing device, 24X minimum CD-ROM drive and compatible printer. In addition, the software must be able to operate with Windows 2000®/ Windows XP® or later operating system. System must be equipped with an Ethernet network adapter.

When operating in a client/server environment, the meter reading software shall operate on a server with Intel 800MHz or higher, with at least 256MB RAM, 4.0 GB of available space on the hard disk space, Super VGA (1024x768) or higher resolution video adapter and monitor, keyboard and mouse or compatible pointing device, 24X minimum CD-ROM drive and compatible printer. In addition, the software must be able to operate with Windows Server 2000®/Windows Server 2003®. Server must be equipped with an Ethernet network adapter.

3.2 Basic Functions

The software must provide easy management of the meter reading data. After the readings are collected, they must be unloaded to the PC for review and reporting and exported to a file to be sent to the Utility Billing/CIS System. New meter reading routes must then be imported into the database and prepared for loading into the handheld.

The meter reading software shall manage the routes that are loaded into the data collection device and be able to split them into multiple routes if necessary.

The meter reading software must include the following:

- Loads/unloads from the handhelds by serial communications at a minimum speed of 19,200 bps and via Ethernet communications at a minimum speed of 10 Mbps.
- Allows PC operator to review and edit any account in the meter reading database.
- Generates route and activity reports defined by the user.
- Provides database backup/restore functions.
- Allows user to merge several separate files into one database.
- Enables the user to setup and save custom report formats.
- Enables the user to specify the data to be exported from the database for transferring to the billing system.
- Allows for database records to be automatically deleted during the export process.
- Enables the user to search the database for records matching specified information.
- Allows the user to define up to 100 notes.

3.2.1 Typical Read Cycle

In a typical Read Cycle, the meter reading system must allow the following operations:

- Merging of routes into the existing database for loading onto a data collection device.
- The selection of routes to be read, splitting of routes and assignment of routes to a data collection device. Generate the route file and load it onto the data collection device or Flash Drive.
- Unloading routes from the data collection device.
- Posting of readings from the data collection device onto appropriate accounts within the database.
- Making a backup copy of the routes within the database (including current system configuration files).
- Printing pre-selected reports.
- Exporting routes out of the database to be sent back to the utility billing system.

3.2.2 Reports

Standard reports must include:

- Route Assignments
- Accounts with Readings
- Accounts without Readings
- ID Compare
- Returned With Notes
- Hi/Lo Fails
- Found Meters
- Dashes/Opens

The software must also provide a powerful custom report generator, allowing the user to select and order specific fields from the database to be printed; in addition, allows the entire database to be sorted by criteria such as date, reader ID or other specified fields.

3.2.3 Special Reports

Special Reports must provide meter reader productivity information. The reporting module must also be a detailed productivity report that will list total number of readings for a specific meter reader and book as well as the time elapsed between each read entered. Also available must be a summary of start time, stop time, elapsed time, mean, maximum and minimum read times.

4 Data Collection Devices

4.1 In a Walk-by System

In a walk-by system, the system must give the user the ability to collect metering data in several ways:

- Keyed entry
- Inductive probing
- RF communication: The meter must be attached to an RF meter interface unit (MIU); the handheld must have an RF receiving device (Handheld Interface Unit (HHIU))

The proposed walk-by data collection system must include:

- Handheld data collector device which shall be a combination of a handheld unit and an HHIU and its antenna.
- Communication cradles for charging and loading the handheld unit.
- Probes for interrogating Neptune and Sensus absolute encoders.

4.1.1 Handheld Data Collector Device

4.1.1.1 Basic Functions

The handheld data collection device shall have the capability to collect and store meter readings at any time of the meter reading route by any of the following methods:

- Manual use through the use of an alphanumeric keypad.
- Probing of water meters equipped with supported absolute encoders.
- Via radio frequency.

The unit shall be able to obtain all types of readings on any particular route without requiring:

- Reprogramming of the handheld computer.
- Physical change of software contained within the unit while in the field.
- Access through special software menus contained within a given route/program.

The handheld data collection device must be able to multi-task by collecting data while in keyed entry (manual) meter reading mode.

4.1.1.2 Hardware Requirements

4.1.1.2.1 Processor and PC Compatibility

The handheld data collection device must be PC compatible and run Windows CE.NET 4.2. At minimum, the handheld must operate with a Intel X-Scale PXA255 Processor at 400 MHz.

4.1.1.2.2 Case

- The unit must be able to withstand a minimum six-foot drop to concrete.
- The handheld must meet and exceed MIL-STD 810F standard, method 516.5, procedure IV for drop tests.
- The handheld shall be ergonomically designed to be comfortable for handheld meter reading.

4.1.1.2.3 Display

- The handheld screen must be 3.5" (89mm) QVGA TFT transfective color LCD with backlighting. The size of the display characters must be selectable, allowing the use of larger characters that are easiest to read. The screen must have a minimum of 240 by 320 pixels (a total of 76,800 pixels) and is CGA compatible for both text and graphics.
- The manufacturer's specification on the contrast ratio on the LCD display must be 9:1 at 76° F (25° Celsius) and provide automatic contrast adjustment based on temperature which will give clear readings in extreme temperature. There must also be a manual contrast adjustment feature which will allow the user to adjust the contrast to his or her satisfaction.
- The display must have no degradation when exposed to storage temperatures of -40°C to +70°C (-40°F to 158°F) and operating temperature of -20°C to + 50°C (-4°F to +122°F).

4.1.1.2.4 Keyboard

- The keyboard must have independent large keys of silicone rubber with adequate separation for use with gloved hand.
- The keyboard must provide tactile feedback and be fully alphanumeric.
- There must be an audible beep indicating key has been fully depressed; there must also be an auto-repeat function on keys and a rapid response between keying and seeing results on the screen.
- The keyboard must be fully PC compatible and programmable.

4.1.1.2.5 Battery

- The battery capacity must be sufficient for a minimum of 8 hours of meter reading.
- The handheld must come with a power management system designed to conserve power.
- The handheld must come with an integrated intelligent fast charge capability that allows for full charge in 4 hours.
- Rechargeable Lithium Ion batteries shall be made with a technology that does not develop memory effect.
- The back-up battery must be a rechargeable Nickel Metal Hydride battery.

4.1.1.2.6 Memory

The handheld data collection device must include 64MB of DRAM and 128MB FLASH memory.

4.1.1.2.7 Carrying Method

A hand strap must be provided with each unit and must provide ease of use for right- or left-handed operators.

4.1.1.2.8 Size

The handheld data collection device dimensions with RF HHIU must not be larger than:

- Length: 10.5" (267 mm)
- Width: 4.08" (104 mm)
- Height: 3.25" (83 mm)

4.1.1.2.9 Weight

The unit's weight must be less than 2.0 lbs (907g) with the battery pack installed.

4.1.1.3 Environmental Characteristics

The handheld must include but not be limited to the following:

- The unit must operate in temperature range of -20°C to +50°C (-4° F to +122° F).
- The device shall be water resistant, capable of unlimited exposure to spray or splash (such as rain or snow).
- The device must be protected against an 8kV static discharge without loss of data.
- The unit must be resistant to various chemical products and must be sealed to keep out dust, humidity, and water.
- The device must be shock resistant exceeding IEC 68-2-32 method 1 (a 1-meter drop on concrete).
- The unit must be CE and FCC certified.

4.1.1.4 Software Requirements

4.1.1.4.1 Basic Functions

The handheld software must be easy to use and give the meter reader control over the route in searching for accounts, tagging accounts for later action, entering related notes and manually reading meters.

The handheld software must include entry of meter readings.

In addition, the handheld software shall include but shall not be limited to the following basic features:

- User customizable key assignments.
- Allows manual or automatic entry of meter readings, ID numbers and note codes.
- Performs high/low test on readings.
- Date and time stamped to each reading.
- Identifies type of reading — manual keyed, probed or RF MIU.
- Must be able to read ARB® I - VI and Sensus ECR® II AND ECR III (* denotes support for the ECR III encoder when programmed as an ECR II with 6 wheels) encoders via either wireless probed reading or via RF MIU.
- Performs unread meter search.
- Found meter processing for new accounts.
- Forward and reverse walk order allowed.
- Data search capability (Display, Notes and ID).
- Auto-Search for automatic reading of encoded meters.
- Displays the number of read and unread accounts on demand.

- Left-to-right, right-to-left or calculator entry of manual meter readings.
- Can capture multiple meter readings from a single ARB VI pad; i.e., two networked ARB VI encoders.
- Collect the information for the host to generate reports on leak detection, tamper detection, and backflow conditions when used with Neptune R900 encoder and E-Coder register.

4.1.1.4.2 Sounds

- Successful meter readings will be confirmed by an audible tone.

4.1.2 Communications/ Charging Equipment

4.1.2.1 Communication

Communications between the handheld and the PC software must be established using a cradle connected via an Ethernet 10 Base T Cradle with one additional option of an RS232 on Lemo connector, up to 230 kbps full duplex. The handheld must have an embedded Ethernet controller for communication with the cradle. In addition, the following basic features must be included:

- Extensive error checking is provided to assure data integrity during communications between the handheld and the PC.
- A typical route of four to five hundred accounts could be loaded or unloaded in less than one minute and must be able to load up to 5000 records into a single handheld unit.
- Routes/books can be split at the PC level.
- Once loaded, routes may be individually selected on the handheld.

4.1.2.2 Charging / Communications Cradles

- The communications/charging cradle will be housed in a suitable material that can be wall or tabletop mounted.
- It will have the capability of recharging the handheld unit within 4 hours and also provide the communication port connection to the computer.
- The cradle will hold one handheld at a time and be capable of connecting in a series to accommodate additional units.
- The cradle will be capable of communicating with the host computer at 10 Mbps.
- Multiple handhelds must be able to be connected to the host computer.
- The charging units must carry the Underwriters Laboratory (UL) seal of approval.

4.1.3 Probes

The handheld must be compatible with a wireless probe capable of reading Neptune ARB V, Neptune ProRead AutoDetect and Sensus ECR® II and ECR III * (*denotes support for the ECR III encoder when programmed as an ECR II with 6 wheels) encoder water meters.

4.1.4 Radio Frequency Capability

The reading system must be capable of being upgraded to radio frequency communications. (Utility) plans to read water meters equipped with radio frequency meter interface units. Only absolute encoder registers from Neptune or Sensus will be acceptable. In the radio read system, the encoder registers will be connected to a MIU that shall provide the radio link from the meter to the handheld interface unit.

The handheld radio frequency adapter must be available as a retrofit kit for existing handheld units.

4.1.4.1 Radio Frequency Reading Function

The function of the handheld in radio frequency mode is to provide (Utility) the capability of reading meters via radio signals. The handheld must be capable of receiving RF readings. All transmissions from supported MIUs will be collected. The reading of any MIU shall be automatically stored in the proper account record without the intervention of the meter reader.

Should any MIU not be able to be read during the route, the software shall support storage of a flag in the account record, indicating clearly that the MIU could not be read.

When reading the meters in the RF mode, it should not require the meter reader to activate any wake-up tone.

The handheld reading equipment must provide a test mode to verify operation of the MIU. This test mode must be accessible from within the meter reading application as well as accessible from a device main screen (no login required). The test application must be capable of reporting statistics for an individual MIU or displaying all MIUs within range.

4.1.4.2 Handheld Interface Unit (HHIU)

The Handheld Interface Unit must be attached to the handheld to allow radio-frequency communications with water meters that have an RF MIU connected externally. The HHIU must be sealed and secured tightly to the handheld unit by a locking mechanism.

The antenna shall be externally mounted and replaceable.

The HHIU must be Part 15 FCC compliant.

The HHIU must collect the meter readings as well as the ID# of the MIU connected to the meter. The following specifications must be met:

- Radio Characteristics:
 - Receiving Frequency: 910-920 MHz
 - Protocol: data error checking in every received data
- Size and Weight: Physical specifications of the handheld unit with the HHIU must be within the following parameters:
 - Length without antenna: 10.5"
 - Width: 4.08"
 - Height: 3.25"
 - Weight (with battery pack): 2.0 lbs
- Probe Compatibility:
 - Compatibility with Neptune Advantage II Probe, Neptune Pocket ProReader RF, Northrop Grumman Logicon Probe or Sensus AutoGun.
- Environmental Operating Conditions:
 - Operating conditions: -4°F to +122°F (-20°C to +50°C)
 - Storage temperature: -22°F to +158°F (-30°C to +70°C)
 - Designed to withstand shock and vibrations per MIL-STD-810 F, method 516.5, procedure IV.
 - Designed to withstand electrostatic discharges per EN61000-4-2.
 - Humidity: 5 to 95% (non-condensing)
- Data Collection Device Battery Life:
 - The data collection device batteries must provide enough power to support RF meter reading for a minimum of 8 hours.
- Capabilities:
 - The HHIU must be capable of processing a minimum of 30 meter readings per minute. "Processing" must include accuracy of the message confirmation.
- Retrofit Kit:
 - The HHIU adapter should be available as a retrofit kit for the existing handheld units and should not require the return of the handheld to the supplier.

* HHIU should also be capable of supporting Itron R300® and Itron electric ERT®s in the event the utility utilizes RF electric meters.

4.2 Mobile Data Collection System

The mobile data collection device must be a portable, compact electronic system mountable in any vehicle. It must collect the data broadcast by the MIUs and store it onto a USB Flash Drive to be downloaded to the host computer at the utility office.

The unit shall be easily transportable from vehicle to vehicle or vehicle to office.

4.2.1 Hardware Specifications

The key components of the collection device must consist of a Portable Personal Computer (PPC) and an integrated radio receiver unit packaged in rugged, weatherproof, compact carrying case enclosure.

The mobile data collection device must be easily installed in any vehicle that will drive to the field for meter reading. It must be mounted securely in the passenger seat with a standard seat belt. Through a 12 VDC plug-in power cord, the unit must be powered from the vehicle's power supply (cigarette lighter).

The system must include a magnetic base antenna and the antenna chord as well as all necessary power and communication cables.

For water applications the dimensions must be no longer than the following parameters: 18.5" x15.5"x11.375". The weight shall not be more than 48 lbs.

For water and electric applications with wake-up ERTs, the dimensions must be no larger than the following parameters: 20"x20"x15.25" (50.8x50.8x38.74 cm). The weight shall not be more than 68 lbs.

The system must comply with FCC specification: Part 15.

The PPC must be a ruggedized laptop PC. The system must have flash upgradeable BIOS with advanced power management interface. The keyboard must have a spill-proof membrane and backlight with intensity control and built-in solid state mouse. The display must be transmissive, having a light sensor that automatically adjusts screen intensity per ambient light, a shock/scratch-resistant anti-glare plate and incorporate touch technology. The unit must be enclosed in a hard mount case including an extendable handle and wheels.

Mobile unit should also be capable of supporting Itron R300 and Itron electric bubble-up ERTs, in the event the utility supports electric meters.

4.2.2 Environmental Conditions

The mobile data collection device must work in the following environmental conditions:

- Operating Temperatures: 32°F to +122°F (0°C to +50°C)
- Storage Temperature: -40°F to +185°F (-40°C to +85°C)
- Operating Humidity: 5 to 95% non-condensing relative humidity

4.2.3 Software Requirements

4.2.3.1 Computer Platform

The laptop computer must use Windows XP as a minimum for the platform operating system.

4.2.3.2 Basic Functions

The software must be a dialog-based, intuitive, easy-to-use meter reading application.

After the meter reader starts the reading process, the software must be fully automated to collect the meter reading data received from the radio receiver unit and store it in an Export file which can be used by the host software to update the mainframe route data. The system must utilize a USB flash drive for data storage and transfer.

Self-diagnostic tests must be run upon booting up the laptop or on request to ensure the good functionality of the system, including the collection method.

Unit must be capable of optimizing the memory storage space by filtering out the duplicate readings from the same MIU and keeping only the last reading received.

Each reading record must contain a MIU ID and a time stamp of the reading.

The software must have the option to provide found meter processing for new accounts.

The software must be capable of performing high/ low test on readings.

The software interface must allow the user to select a single route to view the route status.

The mobile data collection software unit must allow a manual reading to be entered into the account record.

The software must allow freeform notes to be entered to record conditions in the field that require noting and may require an additional Work Order created to address at a later date.

The software must be capable of displaying meter points and read success and unread accounts via GIS mapping interface. The software must be capable of collecting the following information for the host to generate reports: leak detection, tamper detection and backflow conditions (when used with Neptune R900 encoder and E-Coder register).

The mobile data collection unit must allow for GPS location tracking of the meter reading vehicle.

The mobile data collection unit must allow for wireless importing and exporting of route files.

4.2.4 Performance Requirements

The antenna must be omni-directional and support a gain of 5 dB minimum.

The receiver utilized must operate with a minimum sensitivity of greater than 110 dBm.

The receiver module must process at minimum 72 discreet channels across a 10 MHz bandwidth utilizing a digital signal processor capable of capturing 8 meter readings simultaneously from these channels.

The receiver module must operate with a dynamic range of greater than or equal to 100 dB with a message success rate greater than 50%.

The mobile data collection device must be able to maintain a minimum sustained processing rate of 70 unique meter reading accounts per second.

The mobile data collection device must reject a minimum 45 dB of noise energy above the target message in adjacent channels.

The mobile data collection device must operate effectively at posted speed limits

4.3 Fixed Network System

4.3.1 Basic Requirements

The system must be able to operate in parallel with other meter reading technologies such as walk-by handheld and mobile systems and utilize a common interface to the CIS/billing software system. The system must also support the migration of technologies.

The system is comprised of two major components: data collection software and fixed network data collection units.

The system must be capable of automatically retrieving consumption information from the same MIUs being read by walk-by and mobile data collection devices to manage customer account and meter reading information, to provide usage analysis information and to provide a flexible host interface to Utility's CIS system.

The software must be capable of storing meter readings with the capability to store up to 96 readings per day per meter. The software must also provide meter reading management reports, usage analysis reports (flow profiling, leak detection, tamper detection and backflow conditions), on-demand/off-cycle reads and system management diagnostics. Must provide comprehensive coverage for all selected strategic C&I customers, both indoor, outside and in pit/vaults utilizing a single or hybrid technology solution.

The network architecture should provide scalability and adequate bandwidth to provide hourly reading requirements.

The WAN architecture must be flexible to allow communications via common public communication networks such as cellular and landline telephone systems.

System must utilize an unlicensed radio frequency band for LAN communications.

Network management tools must be available to properly monitor the performance of the system to ensure reliable data delivery to Utility for all billing and/or other customer service applications.

Both the fixed network WAN and host software system shall remain the property of the Utility. All costs associated with the ongoing operation of the system will be the responsibility of the utility.

The Utility shall be responsible for the operation and maintenance of the fixed network system.

4.3.2 Hardware Requirements

Must demonstrate ability to read Neptune ARB, ProRead, Sensus ECR II and ECR III* water meters for commercial and industrial accounts.

Fixed Network data collection must support flexible installation configurations for rooftop, pole and wall installations.

The Fixed Network data collection units shall consist of a modular construction with field replaceable components.

The data collection units shall consist of the following:

- NEMA 4X all-weather proof enclosure
- 110V power supply or solar cell with battery back-up
- LAN: Receiver shall support unlicensed communication protocol from MIUs and comply with FCC part 15.247
- WAN: Cell modem or landline telephone modem

Must be able to provide at minimum hourly meter reading resolution.

Must be able to store a minimum of 3 days of data in the Fixed Network data collector.

The data collection unit must meet the following environmental operating requirements:

- Temperature range: -30C to +85C
- Humidity: 0 to 95% non-condensing inside enclosure

4.3.3 Software Requirements

Host software and hardware shall provide all the control needed in the network and provide for the essential functions of network management, meter communications, reporting, database configuration and alarms monitoring. It shall comply with prevailing industry standards and should run on a Windows compatible PC. Host software shall interface with handheld & mobile meter reading software utilizing a common interface to CIS/billing software.

Single-user PCs must meet the following **minimum** requirements:

- Windows 2000®/Windows XP®*
- Intel 800-megahertz (MHz) processor or faster
- At least 512 megabytes (MB) of RAM (1 GB is recommended)
- At least 1.5 gigabytes (GB) of available space on the hard disk
- CD-ROM or DVD-ROM drive
- Keyboard and a Microsoft mouse or some other compatible pointing device
- Video adapter and monitor with Super VGA (1024 X 768) or higher resolution
- 56 kilobits per second (Kbps) or higher-speed modem
- Network adapter appropriate for the type of local-area, wide-area, wireless or home network you wish to connect to, and access to an appropriate network infrastructure; access to third-party networks may require additional charges
- FTP Access (recommended)

Multiple User installation

The **minimum** recommendation for server installation:

- Windows **Server** 2000®/Windows **Server** 2003®*
- Intel 800-MHz, Dual Pentium II 500-MHz or compatible processor or higher, depending on Utility system configuration
- 256MB RAM (512MB RAM or higher recommended), depending on Utility system configuration
- 56 kilobits per second (Kbps) or higher-speed modem
- Network adapter appropriate for the type of local-area, wide-area, wireless or home network Utility wishes to connect to, and access to an appropriate network infrastructure; access to third-party networks may require additional charges
- CD-ROM drive
- Video graphics adapter capable of 256 colors and 1024 X 768 pixels
- 4 gigabyte (GB) available hard disk space
- Recommends using a RAID configuration for the server installation

Utility will interface its CIS system to the host application through a standard, flexible interface from a standard PC. All billing reads must be supported through this interface.

The meter reading data communicated to the CIS system shall be provided in a flat file format.

Communications to host software shall take place utilizing public communication networks and be capable of communicating data directly.

The host system shall be PC based and interfaced to the WAN/LAN through the defined public communication networks.

The system shall remotely upgrade Fixed Network unit software without impacting system operation.

Software must support reading performance reports, usage analysis and advanced usage analysis capabilities.

Software must be able to export data to Microsoft Excel and Word applications.

The Fixed Network data collection system shall have the capability to provide the following data to Utility on a daily basis for monthly billing applications:

- Scheduled meter readings from all C&I water meters for monthly billing purposes.
- On-demand meter readings for resolution of customer billing disputes and improved customer service.
- Off-cycle reading capabilities for final reads.

4.3.4 Training and Support

A proven, detailed training plan must be developed by the vendor with approval by the Utility based on results of pre-implementation meetings. The following are items to be determined during these meetings:

- Identify the training personnel and the employees to be trained.
- Identify training schedules for hardware, software and total system products.
- Define acceptance criteria for system deployment.

The vendor shall be responsible for fully training Utility personnel in the system mapping, deployment planning and installation of the fixed network LAN and WAN components.

4.3.5 Support Services

The vendor shall have a Customer Support Department. The Customer Support Department is required to maintain a telephone Help Desk and must have the capability of continuing the support through the use of a service agreement. A list of required services to be provided by the Help Desk includes but is not limited to the following:

- Answer and resolve hardware/operation/maintenance questions and problems.
- Answer and resolve software operation questions and problems.

- Evaluation of information for updates or revisions.
- Evaluation of personnel for training needs.
- Additional on-site training or evaluation as needed.

The Help Desk must be available weekdays between 8:00 a.m. and 7:00 p.m. EST with after-hours numbers available as needed.

5 Installation and Training

Complete installation and operating instructions will be included for all of the supplied hardware and software equipment. The training must be supplied by the system manufacturer or approved VAR. Proposal must include any additional costs for training and assistance to install and begin operation of the system. The Vendor will also inform the customer of what pre-installation activities are to be completed and what support material will be needed for the initial installation.

6 Performance Warranties

In evaluating bid submittals, warranty coverage will be considered. The Vendor shall be required to state its warranty and/or guarantee policy with respect to each item of proposed equipment. The procedure for submitting warranty claims must also be provided.

As a minimum, the electronics shall be warranted for one year from date of shipment for defects in material and workmanship.

7 System Maintenance and Support

In addition to warranty periods, Vendors are required to supply information on required or optional maintenance programs beyond the warranty period for both hardware and software.

Vendor must offer multiple-year maintenance contracts so (Utility) can take advantage of multi-year discounts.

The location of and procedures for obtaining such support shall be stated. A toll-free Help Desk number must be provided for system support.

8 Vendor Qualifications

The qualified Vendor will have a minimum of thirty years experience with meter reading systems. The selected Vendor shall be thoroughly versed in encoder meter technology and be a major supplier in the marketplace. The proposed system shall be manufactured and maintained by the selected Vendor or an equity partner. All Vendors shall document which water meter manufacturers and models they are capable of interrogating with the proposed meter reading equipment.

A customer reference list shall be enclosed with the proposal.

Neptune engages in ongoing research and development to improve and enhance its products. Therefore, Neptune reserves the right to change product or system specifications without notice.

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