BID SPECIFICATION

SCADA SYSTEM

FOR:

NEWPORT UTILITIES

NEWPORT, TENNESSEE

BID NUMBER: 922-02

RESPONSE DUE DATE:
Thursday November 3, 2022 at 2:00 PM

INVITATION TO BIDDERS

Sealed proposals for the furnishing, testing, and installation of the Newport Utilities SCADA System will be received by Newport Utilities at its office in Newport, Tennessee until 2:00 P.M. Thursday, November 3, 2022.

Proposals shall be received by:

John Johnson
Warehouse Supervisor
Newport Utilities
170 Cope Boulevard
Newport, Tennessee 37821

NUB's proposed schedule for this Project is as follows:

A. Contractor invitation on September 21, 2022.
B. Facilitate pre-bid meeting at 2:00pm on October 6, 2022 at NU Operations Center Auditorium located at 1419 West Highway 25-70, Newport, TN 37821. ***Attendance Required***
C. Questions due by October 20, 2022.
D. Bid opening at 2:00pm on November 3, 2022 at NU Main Office, 170 Cope Blvd, Newport TN
E. Notice of award on November 28, 2022.
F. FY23 Electric Capital Budget approval on June 30, 2022
G. SCADA work to commence on December 1, 2022.

At the discretion of Newport Utilities, Bidders may be requested to make a presentation describing their proposal and the key features of their SCADA system.

Newport Utilities reserves the right to reject any or all bids and to waive any informalities or technicalities therein.

No bidder may withdraw a bid for a period of forty-five (45) days after the above noted time.

INSTRUCTIONS TO BIDDERS

Each bidder shall examine carefully all specifications to familiarize themselves with all of the requirements, terms, and conditions thereof. Any information relating to the work furnished by Newport Utilities or others, or failure to make these examinations shall in no way relieve any bidder from the responsibility of fulfilling all of the terms of the contract, if awarded a contract.

The proposal provides quotation of a price for one or more bid items, which may be lump sum bid prices, alternate bid prices, or a combination thereof and will include delivery times. No payment will be made for items not set up in the proposal, unless otherwise provided by contract amendment.

Bidder is cautioned to verify the completeness of this specification package.

Two complete bid packets should be included in the bidder's submittal.

Bids that are sent by U.S. Postal Service or private carrier shall be clearly marked **BID ENVELOPE ENCLOSED**. The bid shall be sealed in a separate envelope and shall have the following information shown on the outside of the envelope.

BID FOR: SCADA System for Newport Utilities

BID DUE: 2:00 p.m., Thursday, November 3, 2022

NEWPORT UTILITIES: Newport Utilities
170 Cope Boulevard
Newport, Tennessee 38721

Submit all questions about the specifications to Newport Utilities, in writing. Replies will be issued to all prospective bidders of record. Newport Utilities will not be responsible for oral clarifications.

Bidder will provide the price for supplying a SCADA System as specified herein and under the terms and conditions specified herein on a Pricing Sheet of the Supplier's form to be bound herein. The Supplier's form shall include a total cost of system over a ten (10) year period.

Proposals will be evaluated using the following criteria:

a. Supplier experience in years.
b. Supplier shall provide five (5) customer reference projects with a similar configuration and functionality.
c. Experience in comparable applications
d. MultiSpeak 4.1 Compliant (Ref Multispeak.org) – GIS, Outage Management & Engineering Analysis
e. Support Services – 24/7
f. Ability to import graphics
g. Active User's Group and Training Programs.
h. Supplier's understanding of and responsiveness to the specified requirements.
i. System maintenance ease in adding and modifying display, screens, reports and databases.
j. Open systems characteristics.
k. Expandability of software.
l. Remote access and WEB access
m. Exporting Capability to Microsoft's Excel.
n. Delivery Schedule / Ability to meet project time-line.
o. Capability and availability of staff specifically identified for this project.
p. Analysis of software.
q. Evaluated initial cost.
r. Evaluated total life cycle cost.
s. Software support services
t. Documentation
u. Reliability
v. Analysis of narrative statement of SCADA master methodology and equipment - software installation.
w. Address of NERC CIP requirements
x. Length of time prices are valid for optional software applications

All necessary documentation to evaluate the proposal based on the above criteria must be included in the proposal submittal.

Supplier's Proposal

SCADA System

Via US Postal Service:
Newport Utilities
John Johnson
Warehouse Manager
PO Box 519
Newport, Tennessee 37821

Via overnight or hand delivery:
Newport Utilities
John Johnson
Warehouse Manager
170 Cope Boulevard
Newport, Tennessee 37821

The Undersigned (hereafter called **Supplier**) acknowledges by his signature that he has received and examined the documents entitled **SCADA System Specification** dated November 3, 2022 and has included the provisions of the specification in his proposal. The Supplier further acknowledges that he has received the following addenda:

Addendum No. _____ Dated _____
Addendum No. _____ Dated _____

The Supplier hereby proposes to sell and deliver to Newport Utilities (NU), upon the terms and conditions herein stated, the equipment specified for the following sum:

1. The prices set forth on the system which will include delivery to the designated site, startup, and testing.

2. The prices set forth herein do not include any sums which are or which may be payable by the Supplier on account of taxes imposed by any taxing authority upon the sale, purchase or use of the equipment. If any tax is applicable to the sale, purchase, or use of the equipment, the amount will be added to the purchase price and paid by the Newport Utilities.

3. The prices set forth herein will be firm if accepted by Newport Utilities within forty-five (45) days.

4. The time of delivery will be _____.

5. The Supplier will include engineering data with his proposal as specified and as required to evaluate the bid.

6. Exceptions:

Miscellaneous Items to be included with Proposal:	
A	Delivery time, if longer than 45 days include a delivery schedule. (Based on date of completed site acceptance testing)
B	Product literature
C	Detailed system block diagram
D	List of deliverables
E	Payment terms
F	Other items as required by specification
G	Description of additional capabilities of system and optional applications beyond those specified
H	Narrative describing other optional applications and availability
I	Length of time after system order that pricing will be honored for software applications not included in initial order

It is understood by the undersigned that Newport Utilities retains the right of accepting or rejecting all or any part of this proposal and to waive any informalities or technicalities therein. Counter-proposals will be subject to rejection at the discretion of the Newport Utilities. It is also understood by the undersigned that the Newport Utilities reserves the right to conduct investigations as he deems necessary to evaluate the proposals received and to award the bid for this system to the Supplier, who in Newport Utilities' evaluation will provide the system which will be in the best interest of this project.

SUPPLIER: _____

BY: _____

TITLE: _____

ADDRESS: _____

TELEPHONE NO.: _____

FAX NO.: _____

E-MAIL ADDRESS: _____

NU REPRESENTATIVE: _____

DATE SIGNED: _____

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1. Introduction

1.1. General Overview

1.1.1. This document describes the requirements for a new Supervisory Control and Data Acquisition (SCADA) system for Newport Utilities.

1.1.2. All exceptions and/or clarifications shall be indicated in a Table of Compliance and shall be referenced to the specific paragraph of this specification.

1.1.3. Supplier proposals shall explicitly address every item of listed qualifications. Where the Supplier's system exceeds the specified requirements, it should be noted. The Supplier must state if the Software Supplier and Integrator Supplier are two separate entities or if it is handled by one Supplier only. Newport Utilities reserves the right to reject any or all bids or select the bid that is deemed to be in the best interest of Newport Utilities' needs.

1.1.4. Provide a list of the Supplier's acronyms used in this proposal and define Supplier's terms not commonly used in the industry.

1.2. Standards

1.2.1. IEEE Std C37.1-1994, IEEE Standard Definition, Specification, and Analysis of Systems Used for Supervisory Control, Data Acquisition, and Automatic Control

1.2.2. North American Electric Reliability Corporation (NERC), Critical Infrastructure Protection (CIP)

1.2.3. MultiSpeak Version 4.1

1.2.4. Supplier shall list other standards that apply to the design and manufacture of the proposed system including ANSI, IEC, NEMA and EPRI.

1.3. Organization of Proposal

Prospective bidders shall follow the following proposal format:

1.3.1. SECTION 1 – SUMMARY. This section shall demonstrate an understanding of the task at hand and include a narrative describing the proposed solution.

1.3.2. SECTION 2 – TECHNICAL PROPOSAL. This section shall detail the proposed project implementation, architecture, table of compliance, project schedule, training plan, and maintenance plan.

1.3.3. SECTION 3 – TECHNICAL DESCRIPTION. This section shall describe the base SCADA software and all proposed applications.

1.3.4. SECTION 4 – COMMERCIAL PROPOSAL. This section shall include the price list, terms and conditions, list of deliverables, software product license, subcontractors, and payment schedule.

1.3.5. SECTION 5 – QUALIFICATIONS. This section shall detail the Bidders qualifications for the project, including: quality control program, case studies, customer testimonials, project team resumes.

1.4. Supplier Requirements

The Supplier shall be able to fulfill the following qualification requirements:

1.4.1. Supplier shall state the number of years of experience in the design and manufacture of systems of the type specified.

1.4.2. Provide a brief statement about the Supplier's company including history, strategic partnerships, recent mergers or acquisitions.

1.4.3. State when the proposed SCADA solution became commercially available.

1.4.4. Supplier shall be ISO 9001:2000 certified. A copy of certification shall be provided with Supplier's proposal.

1.4.5. Describe the expected serviceable life in this proposal and provide any supporting data.

1.4.6. Describe any third party equipment, software or technology that is utilized to provide the AMI solution.

1.4.7. List any planned enhancements/revisions for the next 1-5 years, and how they might impact the SCADA system.

1.4.8. List any future "over the horizon" developments that are presently being considered and how they might impact the SCADA system.

1.4.9. Supplier shall provide five (5) customer reference projects with a similar configuration and functionality to the system proposed. The list of reference projects shall include at least the following information: customer name, customer address, and contact name and phone number.

1.4.10. Supplier shall provide five (5) customer reference projects in Tennessee geographically closest to Newport, TN. If Supplier does not have five (5) customer reference projects in TN, please list the five (5) geographically closest customer reference projects to Newport, TN.

1.4.11. Supplier shall provide support services with a 24/7 availability from a dedicated in-house customer support department for the software supplied for the system.

1.4.12. Supplier shall state whether there are any anticipated changes in ownership or major corporate policy changes in the next 12 months.

1.4.13. Supplier shall state whether there are or there have been any legal claims or litigation actions against them regarding the performance of projects.

1.4.14. Supplier shall provide documentation with their proposal that demonstrates that their personnel having unescorted physical access to the SCADA system have an appropriate level of personnel risk assessment, training, and security awareness in accordance with NERC CIP-004-001.

1.4.15. Supplier shall identify sufficient and qualified staff to complete the project satisfactorily and in the agreed upon time frame. Supplier shall designate a Project Manager to work with Newport Utilities Project Manager.

1.4.16. Supplier must provide a breakdown of the system requirements to run the SCADA software on a virtual machine.

1.4.17. Supplier must provide a breakdown of the cost for the system, including software package, support package(s), training, implementation, "turn-key" option for screens, etc.

1.5. Supplier's Responsibilities

The Supplier shall be responsible for the following:

1.5.1. Design, factory test, deliver, install and commission a complete, new SCADA system according to the present specifications.

1.5.2. Provide training courses at the Supplier's or Newport Utilities's facilities.

1.5.3. Provide on-site supervision of installation and commissioning of the system.

1.5.4. Provide technical support and assistance during the commercial operation of the system.

1.5.5. Interface with any existing RTUs and IEDs via DNP 3.0 Level 3.

1.5.6. Interface with existing AMI system, Honeywell/Elster Netsense and NISC Meter Data Management (MDM).

1.6. Newport Utilities's Responsibilities

The Newport Utilities shall be responsible for the following:

1.6.1. Provide a project person for the coordination of all project activities with Supplier's project manager.

1.6.2. Attend the training courses at the Supplier's facilities and/or on site.

2. System Hardware

2.1. Host Servers

2.1.1. The Host Servers must be able run under VMWare 7.0.

2.1.2. The Host Servers shall run the latest MS Windows 2016 Server Edition or newer operating system (OS) or Red Hat Linux.

2.1.3. The Supplier shall provide OS patch management in accordance with NERC CIP standards. All OS patches shall be evaluated by the Supplier and the results provided to Newport Utilities within 30 days of patch release.

2.1.4. The Host Servers shall support the optional use of time code signals or other time standards as the basis for system time or Sequence of Events time tagging at 1 ms. The system shall keep time in an absolute time base (e.g. Coordinated Universal Time or other standard) for time tagging of all data, alarms, and events.

3. System Configuration Requirements

3.1. Master Station

3.1.1. The master station consists of a redundant configuration with dual host computers (SCADA servers), with separate operator workstations (SCADA clients all interconnected by a high-speed local area network (LAN). The system supports the TCP/IP protocol which will be used by the SCADA system for all network communications. The active host server maintains the standby server in a fully synchronized state via the network. In the event of a failure of the active machine, the standby server automatically assumes control of all peripherals and communication lines with no action required from the system operator.

3.1.2. If the primary server fails, the standby will automatically assume its role-without loss of data. When the primary is absent, the clients will automatically access the standby server. When the primary server is brought back online, it will be re-synchronized automatically, ensuring no gaps in history files.

3.1.3. Upon system recovery, in the case where the master station and redundant station shutdown or enter a failure state, the system should only send alarms for any change of state that occurred between the system failure and recovered time.

3.1.4. The master station shall be capable of synchronizing its clock.

3.1.5. The system should support the capability of doing modifications on an inactive server for testing and be able to push the modifications to the active server at a later time.

3.2. Communication

3.2.1. The SCADA system must support the following open protocol:

- DNP3.0 Level 3 (serial and TCP/IP)

3.2.2. The communication software shall maintain communication statistics for each RTU.

These statistics shall be available as database points so that they can be incorporated in user-defined displays, reports, and alarms.

3.3. SCADA Configuration

3.3.1. The system software shall be capable of accommodating in its database an unlimited quantity of status and control points, analog input points, text points, communication lines, RTUs, IEDs, reports, graphic symbols. Any software upgrades or additional licenses must be disclosed if needed to increase the number of aforementioned items into the system.

3.3.2. The database size shall be limited only by the memory, disc capacity and resources of the server hardware. Therefore, there shall be no artificial limit to the data capacity; the system software shall handle the requirements of a large system.

3.3.3. The system platform shall be scalable including the capability for a distributed architecture with multiple distributed peer workstations, performing concurrent task processing, supporting engineering, management and development activities at various sites.

3.3.4. The Supplier must disclose the max continuous throughput of alarms the system can handle in a 60 second window.

3.3.5. Supplier shall provide documentation of 99.98% system availability in accordance with IEEE Std C37.1-1994.

3.4. Workstation Licenses

3.4.1. The proposed system shall be provided with software and licensing for 10 workstation consoles. As an alternate, the systems shall be licensed to allow 10 control accounts to be logged in concurrently.

3.4.2. As an option, additional licenses shall be available for purchase with the system and after installation with pricing provided.

3.4.3. The system shall be able to support any number of workstation consoles without the need to update the system hardware and software.

4. System Functional Requirements

4.1. Data Acquisition

4.1.1. The system shall be able to monitor analog values such as Volts, Amps, Watts, VARs, Pressure and Flow at each remote location. Convert these values to a digital format. Transmit changed values back to the Master Station. Convert these values into engineering units. Display these values on single line diagrams and provide alarm limit checking. Provide historical storage at user definable interval and retention periods.

4.2. Supervisory Control

4.2.1. The system shall utilize a Select Before Operate (SBO) procedure that is fully compliant with IEEE Std C37-.1-1994, 7.4.1 Operations Security Features.

4.2.2. The system shall require secure handshaking with the RTU before any controls are executed. In such cases, control of a point requires the following exchange of messages:

- Master to RTU - control point selection
- RTU to Master - point address checkback
- Master to RTU - control execution
- RTU to Master - execute acknowledge

4.2.3. If the scan task does not receive proper acknowledgement of either the select request or the execute command, a checkback failure alarm should be raised. If the acknowledgements are correct, but the expected status change does not occur within the point's control response timeout, a control failure alarm should be raised. An optional multiple status change validation feature should be available to handle cases where a control causes multiple status changes to occur.

4.3. Communication

4.3.1. The software subsystem for the proposed protocols shall implement all features of the RTUs and IEDs that are required by Newport Utilities. As a minimum, the following functions shall be included:

- Rapid polling of RTUs for exceptions
- Select Before Operate control execution
- Variable control durations for momentary controls
- Detect and report multiple changes of state between poll cycles , if the RTU does not buffer changes but instead reports a "multiple change detect" bit
- Automatic interleaving of multiple priority messages, e.g. automatic "fast scan" after a control and "error scan" after a communication error
- Scheduled accumulator freezes and polls
- Scheduled integrity (general interrogation) polls
- Time synchronization of the RTUs
- Sequence of events data uploading and processing

4.3.2. When a user-definable error retry count expires for an RTU, the system shall declare the RTU failed by means of a status point and an accompanying alarm. On RTU failure, the system shall mark all points that are telemetered by the RTU as "telemetry failed". For each point, this telemetry failed quality code shall not clear until a value is subsequently received from the point.

4.3.3. The user shall be able to define alternate communication ports (or IP addresses) that can be used to reach the RTUs. On a series of communication errors with an RTU, the system shall switch ports after a user-definable port retry count expires. A separate port status point for each RTU shall be maintained to indicate which port is currently being used to poll each RTU. If the communication line is looped, it shall be possible to determine between which two RTUs a break exists by examining the values of the port status points.

4.3.4. For each RTU, the system shall maintain communication statistics in the form of analog points that may be viewed on displays, printed in reports, or stored in historical data files. Such statistics shall include percentage of successful communication, number of timeouts and number of security errors.

4.3.5. Each communication protocol software module shall support a communication monitoring facility that allows an administrator to view the messages issued to and returned from the RTUs. The operator shall be able to monitor individual RTUs or all RTUs.

4.4. Data Processing

4.4.1. The system shall provide support for multiple status changes that result from control commands. For each control point, it shall be possible to specify a list of multiple status points that may change as a result of a command. If not all the expected transitions occur within the control point response time-out, the system shall generate an alarm for the control point as well as an additional alarm for each associated point that did not undergo the expected transitions.

4.4.2. The system shall scan every analog input in the RTUs at predefined scanning intervals. Any failure to complete a scan shall be marked with a data quality flag. Also the system shall scan each analog input every second and compare that input to the previously reported input. When the difference between these values exceeds its reporting band, the analog value shall be reported (report-by-exception).

4.4.3. The system shall be capable of checking the analog values for at least three sets of limits: warning, emergency and reasonability. Each of these three sets of limits shall be provided with an upper limit, a lower limit and a deadband.

4.4.4. To allow the removal of noise readings around the zero mark of the engineering scale, a range of engineering values inside the point value range shall be specified which shall clamp the input value to zero. For example, if the zero clamp deadband is 3.0, any input value which is converted to between +3.0 and -3.0 engineering units will be clamped to zero.

4.4.5. The system shall provide a rate-of-change for analog input values by computing the difference between the new and previous value and dividing this by the difference between the current time and the time the point was last updated. The rate-of-change shall be checked against the limits for rate-of-change.

4.4.6. The system shall be able to process accumulators received from the RTUs. The system shall send a command to freeze the accumulators either to all RTUs or to select RTUs. However this freeze command shall not reset the accumulators in the individual RTUs. Upon receiving the accumulator readings at the master station, the system shall automatically calculate the difference from the last reading. The system shall retrieve the hourly accumulators every hour from the RTUs and shall convert them to engineering units. The system shall also be able to retrieve accumulators at user-definable intervals from 15 to 30 minute intervals.

4.4.7. The system shall support operator–entered data points as if they were regular status or telemetry points assigned to the system, even though there is no corresponding data point being reported from the RTU in the field.

4.4.8. Any point in the system database shall be able to be deactivated using a control sequence. Once a point has been deactivated, the state of the device as recorded in the system database shall no longer be updated by the communications software. The deactivated point shall remain in the state last reported prior to deactivation, unless the state is changed.

4.4.9. Once a data point has been deactivated, the state of the device may be changed in the database. Manual replacement allows the actual current state of a failed field device to be maintained by the system operator even though it is not reported by a RTU.

4.5. Authentication and Access-Control

4.5.1. The system shall have the ability to temporarily disable a user account without deleting it.

4.5.2. The system shall have the ability to deny remote access for a user account.

4.5.3. User account passwords shall be a minimum 128-bit encrypted and neither stored nor transmitted in plaintext. The system shall allow for selection of password length greater than twelve (12) characters, and have password complexity settings for inclusion of alpha, numeric, and mixed case character requirements in the password. The system shall allow the password frequency of change to be set to 1, 30, 90, 180, or 365 days. It shall also allow setting the password to never expire.

4.5.4. The system shall allow a settable number of failed login attempts by an account, and a blocked timeout period of time to block the user login if the number of failed login attempts is exceeded.

4.5.5. The system shall allow for an inactivity timeout setting to be enabled, whereas after a settable amount of time of inactivity the account is logged out.

4.5.6. Account activity logging shall be configurable for login success and failures. The logging mechanisms shall be configurable for the remote Syslog protocol.

4.6. User Rights

4.6.1. Each user account shall be assigned a set of user rights that determines the actions that the user may take. This shall provide individual control over various operating and editing functions. These user rights shall include the ability to: view, acknowledge, block, unblock, and silence alarms; edit database, maps, reports, analog limits, and notes; manual set, control, and tag/un-tag points.

4.6.2. The proposed system shall be able to handle an unlimited number of user accounts with their corresponding user rights and privileges.

4.7. Areas of Responsibility

4.7.1. The SCADA software shall be able to be partitioned into 128 areas (or zones) of responsibility. The user shall have the ability to assign any combination of the 128 zones to each database point (telemetered or calculated) and/or to each login account.

4.7.2. The user shall be able to create any number of zone groups containing various combinations of the 128 zones and to give each zone group a name.

4.7.3. An operator shall be able to monitor and manipulate only those points whose zones overlap those of his login account.

4.8. Tag Management

4.8.1. The system shall allow operators to inhibit control of devices by means of a secure, multi-level tagging feature. This feature shall allow operators to apply at least eight tags to each point, each tag being stored with a date/time stamp and optional operator-entered description.

4.8.2. Each point shall be able to be provided with a visual attribute showing that the point has one or more tags on each display where that point is shown. If a point is tagged, the display shall show the symbol that corresponds to the highest-level tag on the point.

4.8.3. It shall be possible to specify that the tag dialog remembers the last choice of action, tag type, tag number, tag description, time the tag is applied, and user account applying the tag.

4.8.4. The system shall provide the capability to configure a custom set of tag types that are mapped to the following four basic types of tags: Inhibit ON and OFF controls, Inhibit ON control only, Inhibit OFF control only, Information only (no control inhibit).

4.8.5. The system shall permit no means of bypassing the control inhibit caused by a tag. This applies to any and every application supplied by the Supplier or written by Newport Utilities using the Supplier's API.

4.8.6. A group tag function shall be provided that allows an operator to define a tag, select multiple points and apply the same tag to all selected points.

4.9. World Map Display

4.9.1. The Supplier shall state if they have the capability to provide a single world coordinates based graphical view of the system, along with its features/limitations.

4.10. IED Control Panel Templates

4.10.1. The system shall support Intelligent Electronic Device (IED) control panel templates that graphically represent IED's within the database. The template will allow dynamic elements and database values to be superimposed over a graphic representation of the IED faceplate. The template shall support multiple pages of IED information.

4.10.2. The user shall be able to copy and paste a template instance, and reassign the template to a new IED, with all database values automatically updated to the new IED. When edit changes are made to the template, all instances of the template will be updated.

4.10.3. The user shall be able to create custom templates. The user shall be able to import and export templates for sharing with other system users.

4.10.4. The Supplier shall provide in their proposal a complete list of all templates that are currently available for the system. Any associated costs for adding templates to the system will be detailed and listed as options in the price proposal.

4.11. Full Graphics Editor

4.11.1. A full graphics editor shall be provided as an integral part of the database and display building tools. Access to the editing capabilities shall be available at all local and remote consoles; however, its availability shall be limited by user access privileges.

4.11.2. A copy of the supporting libraries shall reside on each workstation console, such that when viewed in live mode, only dynamic data such as point values and alarms shall be retrieved from the host server in order to minimize network traffic and make feasible connections even with large displays.

4.11.3. The full graphics editor shall allow the user to create any number of layers and displays. The editor shall allow the user to assign zoom levels to each layer for automatic decluttering. The editor shall allow the user to specify an image file for any display that is to be used as a background for the display. The image file formats that can be used for this shall include JPG, GIF and BMP.

4.11.4. The full graphics editor shall contain easy-to-use tools for re-layering, re-coloring and re-styling (text) as well as duplication (copy/cut and paste), stretch and re-size. It shall include a Find and Replace function that finds all instances of a text string anywhere on the display, and allows automatic replacement by another text string.

4.11.5. The full graphics editor shall have the ability to preview edits on a screen before committing the edits to the system.

4.11.6. The full graphics editor shall have the ability to animate or toggle the state of graphics (i.e. switches) without a control or status point attached to the graphic.

4.12. Drawing Tools

4.12.1. The proposed system shall include drawing tools as part of a full graphics editor to allow the user to add to and/or modify the drawings that were imported via DWG/DXF file. The editor shall support at least 99 undo and redo editing changes.

4.12.2. On import of a DWG/DXF file, the colors, text styles and symbols that are contained in the DWG/DXF file should be imported into the libraries, where they may be customized or used as is.

4.12.3. A user-extendable library of ready-to-use symbols, colors and text styles shall be provided. It shall be possible to import and export library items such as Pmacros (interactive graphics) and symbols for sharing with other users.

4.13. Notes

4.13.1. The displays shall support a system of “post-it” notes that allows operators to add and remove note icons on any display. Clicking on a note icon shall cause a pop-up window to appear to show free-form notes on any topic. The notes can be entered and modified in this window.

4.13.2. The system shall also support notes that are specific to database points. Such notes shall be accessible from a pushbutton in the point dialog box that appears when the point is selected. When a point has some notes, the pushbutton icon in the dialog box shall be highlighted.

4.13.3. Point-specific notes shall also be accessible from the alarms display. When a point-related alarm is selected, a pushbutton in the tool bar should highlight if there are notes for the selected point. Clicking on this pushbutton shall bring up the point’s notes.

4.14. Database Editor

4.14.1. The database editor shall provide a graphical tree-like representation of the complete database and shall support easy navigation throughout the database to the desired items to be edited. Database items to be edited in this way shall include Stations, Communication Lines, Communication Channels, RTUs, IEDs, as well as all the individual database points (analog values, status indications, accumulators, etc).

4.14.2. The database editor shall operate as a “client” program which communicates with a “server” program running on the host computer. However the database editor shall be able to run on any computer that is connected to the host server via the network. With this arrangement, it shall be possible to manage the maintenance of the database from any suitably configured PC on the network or from the master server.

4.14.3. The database editor shall include features which will make it easy to create and modify the database such as:

- using a Station Cloning feature to create an entire new station and all its points, based on an existing station;
- copying, cutting and pasting in the Windows environment;
- using a model feature to create points and other database items that are based on previously created ones;

- using a Station Rename feature to copy a portion of an existing display, and to reassign all those dynamic points to points in a different station, all in one operation;
- editing or modifying the database on an MS Excel spreadsheet and importing it into the system real-time database;
- deleting existing database points;
- deleting an entire station with all associated points

4.14.4. All changes and updates of the database shall be completed and validated while the system is in online operation. Under no circumstances shall the real-time system operation be interrupted or disturbed by the database editing and maintenance process.

4.15. IED Wizard Templates

4.15.1. The system shall support Intelligent Electronic Device (IED) wizard templates for automating the creation of points for IEDs on the system.

4.15.2. The user shall be able to select from a list of available templates, define the IED name, communication line, IED address, and communication statistics for total message count, good message count, and bad message count received from the IED.

4.15.3. The template shall contain all available points for the given IED and allow the user to select the points to be included in the database. All of the telemetry and control addresses and RTU-to-IED mapping shall be automatically generated. It shall be possible for the user to create and utilize custom templates.

4.15.4. The Supplier shall provide in their proposal a complete list of all templates that are currently available for the system. Any associated costs for adding templates to the system will be detailed and listed as options in the price proposal.

4.16. Alarms

4.16.1. Alarms and operational events shall be continuously synchronized in real-time to the standby host server, in the case of a dual-redundant system configuration.

4.16.2. The proposed system shall be able to handle a minimum of 100 alarms or events per second per operator consoles regardless of the other workload.

4.16.3. The system shall provide at least five (5) alarm priority levels. Alarms with priority zero - the lowest, shall be considered to be pre-acknowledged. Such alarms shall neither sound any audio alarm signals nor cause points to flash on the display. Supplier shall list the number of alarm levels available.

4.16.4. For each analog point, the user shall be able to define three sets of nested upper and lower alarm limits, with a separate deadband for each limit. In addition, analog points shall be able to generate an alarm when a rate of change is exceeded, either in the increasing or decreasing direction, or both. Each alarm limit shall support a separate alarm priority.

4.16.5. The system shall provide the operator with a visible “telemetry failure” indication when the value of any displayed point is not currently being updated by the system because of an RTU or communication line failure. Any points that are calculated using, as inputs, the values of other telemetry failed points, shall also be marked telemetry failed.

4.16.6. The user shall be able to specify any Windows sound file (*.WAV) to be used for the audio alarm signal. The system shall allow the user to browse for sounds and to test play the selected sounds. The system shall allow different sounds for each alarm type and a different set of sounds for each workstation.

4.16.7. The system shall provide an “alarm banner” where alarms are displayed on any screen and will update as new alarms appear. The alarm banner must have the ability to acknowledge, suppress, and clear any alarm based on user permissions. The alarm banner must also be able to display the timestamp and description of all alarms.

4.16.8. The system shall provide summary lists for all unacknowledged, acknowledged, blocked, suppressed and for all alarms. The user shall be able to perform alarm filtering based on certain

parameters or filters. The filtering of alarm summary lists shall be performed from a template where the operator can enter the filtering parameters and obtain the filtered lists.

4.16.9. A data point may be alarm-inhibited with a control sequence issued by an operator. Once an alarm has been inhibited, its status in memory shall be updated by the communications software. However, changes of state shall not generate alarms on the system. Therefore, operator display that show an alarm-inhibited point are required to show the point's current state plus an inhibit flag.

4.16.10. The system shall have the ability to “escalate” unacknowledged alarms after a specified time period. “Escalating” the alarms may include a popup display, an audio alarm, or sending the alarm to a specific group or user via email or text.

4.16.11. All alarms shall be logged regardless of priority to at least three destinations: alarm summary displays, event printers and operator log files.

4.17. Reports

4.17.1. The system shall support a report generation capability that will allow the user a high level of flexibility in the definition, formatting and scheduling of on-demand and periodic reports. The reports shall include data from both the real-time database and historical database. The system will allow the user to schedule reports for automatic printing or saving to hard disk.

4.17.2. A report editor shall be available to allow the user to define reports by specifying a database table, a set of desired data fields and the selection criteria for retrieving records from the database table.

4.17.3. The system shall include a scheduling facility that will allow the operator to define the schedules and destinations for all reports. It shall be possible to direct a scheduled report to multiple printers, one or more of which can be directories on disk.

4.18. Data Collection and Storage

4.18.1. The system will provide a historical data collection facility that allows the user to define the points that are to be sampled, the sample frequency and how long to retain the sample data. In each dataset, the oldest samples should be overwritten by the newest.

4.18.2. The historical data software shall be capable of sampling at intervals as low as 1 second. There should be no upper bound on the duration of samples within each dataset, and thus no upper bound on the amount of historical data that can be stored other than the limitation imposed by available disk space.

4.18.3. The historic data shall be able to be archived on disk into data files for later analysis and to generate reports on a user selectable schedule.

4.18.4. The historical data software shall allow the user to specify recording of statistics in the sample records. The statistics shall include time averages, summations, maximums and minimums, and times of maximums and minimums and shall be based on user-definable observation intervals.

4.18.5. The system shall also allow the user to create “secondary” datasets that extract information from primary datasets. For example, a primary dataset could contain 15-second samples for several days. A secondary dataset could extract daily maximums and minimums, as well as the times of the maximums and minimums and record these for ten years.

4.18.6. The historical data software shall log all system actions, including operator–commanded changes and operator–entered device tags. The system should also capture when an operator acknowledges and deletes alarms so as to evaluate the time between and alarm and a subsequent action. The events processor shall be able to create interactive event summaries that can be viewed in a display, saved to a disk file, or sent to a printer.

4.19. Data Trending

4.19.1. The proposed system shall provide the ability to store and view any data value from the database in a trend graphical format. The system shall bring up pixel-resolution trend graphs of historical data. Sample rates as low as 1 second must be supported.

4.19.2. Trend graphs shall be displayed in separate windows that can be moved, re-sized and minimized to an icon. The trend graph window shall include tools that allow the user to configure and customize the graph display.

4.19.3. Different types of charts may be selected, including horizontal or vertical line charts, horizontal or vertical bar charts, horizontal or vertical filled area charts. Different line styles may be used with different width and fill patterns. Foreground color for the traces and background color of the charts may be assigned individually to each chart.

4.19.4. Database data point limits may also be presented on each trend. Color presentation indicates trend points that have exceeded assigned limits.

4.19.5. A trend graph window shall have the ability to plot at least ten (10) points from the historical database. The trend graph displays shall be interactive allowing the operator to quickly adjust the time frame, duration and resolution of the graph. Initially, the trend axis shall be automatically scaled in time and engineering units based on the data points under trend.

4.19.6. In cases where there are more samples in the dataset than can be displayed in the graph window, it shall be possible to scroll back in time. It shall be possible to see the numeric values and time-stamp of the traces at any time position in the graph by manipulating a time cursor inside the trend graph.

4.19.7. The user shall be able to display trend comparison graphs from left to right, for at least ten comparison trends. In trend comparison graphs, the time origin at the extreme left of the graph is a fixed time of the day; however it may be a different day for each trend. The purpose of this is to allow the user to observe the build-up of the current day's trace, e.g. a load curve, against that of other days in the past, typically the days that contained the last week peak or the current month peak, etc. The trend comparison graph shall have an option to set a start time and day of the week so that the trend graph is automatically launched.

4.20. Interface to Microsoft Excel

4.20.1. The system shall support current and historical database access from clients running MS Excel. It shall be possible to directly connect to the SCADA host from within MS Excel by defining the Host name and valid user account with username and password. The client application shall support redundant Host and automatically reconnect to the active Host upon failover. All current and historical tables and fields shall be accessible through this interface.

4.20.2. For current data, the user shall be able to select a database table, data fields within the table, and logic criteria (<, >, =, AND, OR) for point selection. In addition, the user shall be able to browse for points and drag-drop them into the point selection dialog. The user shall be able to select the MS Excel worksheet, start row, and start column for where the data will be populated, and to include the column headings from the database table. The user shall be able to optionally define a time interval at which the current data is automatically updated on the worksheet.

4.20.3. For Historical data, the user shall be able to select points contained within a historical dataset. The user shall be able to define a time type by defining the start and finish date and time, or the number of previous days, hours, and minutes. The user shall be able to select data condition codes to be included with the samples. The user shall be able to select the MS Excel worksheet, start row, and start column for where the data will be populated, and to include the column headings from the database table.

4.20.4. The real-time database shall be accessible via Microsoft Open Database Connectivity (ODBC) interfaces to import and export data from the SCADA database to standard commercial applications such as Microsoft Excel or Access.

4.21. Recording of Event Data

4.21.1. For purposes of analysis and reporting, the proposed system shall provide an event data recording function that records all status changes, operator controls, changes for selected analog points and Sequence of Events (SOE) data. Non-SOE events shall be time-stamped to the nearest second.

4.21.2. The system shall be capable of processing digital indications from RTU or RTU equivalents which are tagged with the time of event occurrence (SOEs) provided that the RTU protocol supports this feature. The system shall provide a separate SOE Summary List with the chronologically or reverse chronologically sorted SOEs.

4.21.3. The event data shall be stored in a date file that can contain 30 days of event data. On command or on schedule the data file may be dumped into an offline file for backup and be available for recovery.

4.21.4. Event data reports shall be filterable by date, time, and event type as well as by point name with wildcards.

4.22. Disturbance Data Capture

4.22.1. The proposed system shall provide a disturbance data capture function that allows the user to analyze the entire state of the system leading up to, during and after a disturbance. All changes in analog and status points system-wide are recorded when a user defined disturbance is detected.

4.22.2. The user shall be able to define the pre- and post-disturbance duration and sampling rates. The pre-disturbance duration shall be definable from 1 to 15 minutes with a sampling rate of 15 seconds to 15 minutes. The post-disturbance duration shall be definable from 1 to 15 minutes, with a sampling rate of 5 seconds to 15 minutes

4.22.3. A disturbance data capture editor shall be provided that allows the user to specify which points can trigger disturbance captures, and for each point, what would signal a disturbance. Status can trigger a disturbance capture for any change of state which is either Abnormal, or Open, or Closed, or any other change. Analog points can trigger a disturbance capture for any limit violation. There should be no limit other than that imposed by disk space on the number of disturbance capture files that can be accumulated.

4.22.4. The system shall keep a log of all disturbances, detailing the date and time of the disturbance, the point that triggered the disturbance, the reason code, and the recorded length pre- and post-disturbance.

4.22.5. The disturbance data capture shall include a viewer facility which allows the user to analyze points from anywhere in the system for a given disturbance. The viewer facility shall also allow the user to select any disturbance file and export it to commercial applications via ODBC or SQL for further analysis.

4.23. Remote Alarm Annunciation

4.23.1. The proposed system shall include the ability to remotely transmit any pre-defined alarm condition to any e-mail or SMS (short-message-service). There shall be no limit in the number of alarm conditions that are required to be remotely annunciated. This function shall be fully integrated into the SCADA system and no third party software shall be required to achieve the functionality. The communication between the remote alarm annunciation system and the annunciation providers shall be available over serial connections, e.g. modems, as well as over TCP/IP wide area networks, e.g. Ethernet, VPN, Sonet/SDH, satellite, etc.

4.23.2. The system shall have the capability to send e-mails for alarm messages. The user shall be able to define which points are annunciated in this fashion, and for each point, which alarms, e.g., which states for a status point and which limits for analog point.

4.23.3. The user shall be able to define a schedule for remote alarm annunciation so that it starts

automatically after hours and turns off automatically in the morning. The user shall also be able to specify an annunciation time delay, so that if someone is in the building but not in the control room, he/she will have time to come back to the control room and respond to the alarm before the alarm notification is escalated. The user shall be able to specify a re-annunciation time interval, such that if the alarm is not acknowledged after this time interval, the alarm notification will be re-issued.

4.24. MultiSpeak Interoperability

4.24.1. The system shall be certified to MultiSpeak Version 4.1 for:

- 4.24.1.1. Interface 3 SCADA-LM
- 4.24.1.2. Interface 8 EA-SCADA
- 4.24.1.3. Interface 9 OA-SCADA/SCADA-OA
- 4.24.1.4. Interface 23 SCADA-DGV
- 4.24.1.5. Interface 24 GIS-SCADA

4.24.2. For each interface the Supplier shall provide certified interoperability test results.

4.24.3. The base system shall include MultiSpeak Interface 8 EA-SCADA.

4.24.4. As an option, pricing shall be included for MutiSpeak Interface 3 SCADA-LM

4.24.5. As an option, pricing shall be included for MutiSpeak Interface 9 OA-SCADA/SCADA-OA

4.24.6. As an option, pricing shall be included for MutiSpeak Interface 23 SCADA-DGV

4.24.7. As an option, pricing shall be included for MutiSpeak Interface 24 GIS-SCADA

4.25. Web Server Application

The system shall include a Web Server Application to serve real-time SCADA information to users via a commercial off the shelf web browser, without the need for building custom web pages or maintenance of a separate system. This application should be operating system and web browser independent. The application is to provide access to SCADA information for real-time and historical reporting with proper user authentication. It shall allow the user to call up and view any graphical display, substation one- line, or tabular display and support panning, zooming, dynamic line coloring and other dynamic features based on login privileges. Refresh of dynamic data, alarms, and graphics shall be user defined and achieved on a periodic basis every few seconds.

4.26. Voltage Reduction, VAR Control, & ELCP

4.26.1. The system shall include an application to monitor and apply voltage reduction or VAR control at specified locations within the power system by use of voltage regulators, switched capacitors, or other devices.

4.26.2. The VAR control must work in accordance with the VR process and should turn on first when entering a VR state and turn off last when exiting a VR state. The system should also have the capability of independently turning on or off the VR or VAR process.

4.26.3. The system should be able to operate in a “closed loop” state by evaluating the lowest voltage in a voltage regulator zone of control, A, B, or C phase, from a selected subset of meters via Honeywell/Elster Netsense AMI and NISC Meter Data Management (MDM) or in a “open loop” state without AMI values. NISC Meter Data Management (MDM) is the preferred method for implementing a “closed loop”.

4.26.4. The application should work similar to our present voltage reduction system and information will be provided as reference in the pre-bid meeting. Suppler shall describe the method in which they would accomplish this process. The system should allow modification of the VR and VAR processes, including the AMI list of meters.

4.26.5. The system should enable us to easily setup controls for TVA's Emergency Load Curtailment Program. This should allow us to designate multiple breakers to open in a 30 minute window at which point the breakers will close back in and it will progress to the next step where a different set of designated breakers will open. This should be able to configurable for 5%, 10%, 15%, 20%, 25%, 30%, 35%, and 40% load profiles and should be able to handle an infinite amount of "steps" for each profile. Each profile should be configurable to allow modification of the group of breakers selected. The supplier shall describe the method in which they would accomplish this process.

4.27. Calculations

4.27.1. The system shall include a periodic calculations program that allows the user to define both arithmetic and boolean calculations.

4.27.2. The following built-in functions shall be available:

- Arithmetic (+, -, *, /) operations
- Boolean (AND, OR, XOR, NOT) operations
- Comparisons (GT, LT, EQ, etc)
- Trigonometric functions (sine and cosine)
- Exponential and natural logarithm
- General digital filter
- Minute/hourly/daily/weekly/monthly sample
- Minute/hourly/daily/weekly/monthly reset
- Average over time
- Current date and time
- Accumulated time open/closed
- Hourly/daily maximum, minimum and average
- Normalized rate accumulation
- Interlock (inhibit control)
- Setpoint Deviation
- AGA-3 and AGA-7 load flow calculations
- Electrical power functions

4.27.3. It shall be possible for the system user to create custom complex functions using expressions and a high-level language which shall be intuitive and similar to other popular visual development environments such as Microsoft Visual Basic.

4.27.4. Supplier should indicate built-in calculations that are predefined such as those calculating, phase current, unbalanced current, voltage, watts, vars, VA, or power factor when given the other necessary parameters.

4.28. Command Sequencing

4.28.1. As an option, Supplier shall provide pricing for an object-oriented visual programming development environment to allow the user to develop custom calculations and control programs. Since this environment will be used by non-programmers, the program development tools shall be intuitive and similar to other popular visual development environments such as Microsoft Visual Basic.

4.28.2. The programming environment shall allow the user to select a statement from a menu leaving the user to just insert the arguments.

4.28.3. The environment shall support comments and all of the functions described below:

5.27.3.1. Math/logic functions, with the following expressions:

- ¾ arithmetic (*,/,+,-)
- logical operators (AND,OR, NOT, XOR)
- magnitude comparison (>, <, =)
- absolute value
- integer truncation

- square root
- circular functions (SIN, COS, TAN, ASIN, ACOS, ATAN)
- exponential & logarithm
- maximum and minimum in list
- time/date

5.27.3.2. Read and write status and analog points. Full alarm processing on calculated results.

5.27.3.3. Issue controls and setpoints.

5.27.3.4. Raise alarms.

5.27.3.5. Add and remove tags.

5.27.3.6. Issue hard copy report requests.

5.27.3.7. Call other command sequences as subroutines.

5.27.3.8. Conditional (IF-THEN-ELSE) branching and DO WHILE loops.

5.27.3.9. Variable delay commands

5.27.3.10. Two-dimensional table look-up in arrays of up to 256 x 256 elements

5.27.3.11. Ability to force on/off status points or enter a value into a telemetry point for diagnostic testing.

4.28.4. The system shall provide the capability to build customized template functions which become part of the library of functions available for use in command sequences and calculations.

4.29. Data Transcription

4.29.1. As an option, Supplier shall provide pricing for the proposed system to provide an application which allows the user to transcribe real-time database values, historical data, operation messages and alarm and event logs including SOEs onto a relational database management system.

4.29.2. The transcription application shall use as a platform the commercial relational database management systems of Microsoft Access, SQL Server, Sybase, and Oracle.

4.29.3. The ability of transcribing the current real-time database values shall be bi-directional, i.e. it shall be possible to transcribe data from a table into a relational database into real-time database points. If a real-time database point is manually set, the transcription program shall not update it.

4.29.4. The transcription application shall provide the ability to transcribe data to multiple databases on multiple platforms. For each target database, the user shall be able to specify exactly what is to be transcribed, e.g. what points and what historical data tables. Also the user shall be able to specify the schedule of transcriptions.

5. System Implementation

5.1. Project Schedule and Coordination

5.1.1. The Supplier shall submit a schedule with the proposal as identified in the Bid Submittal Instructions.

5.1.2. Within thirty (30) days of contract execution, the Supplier's project manager will hold a meeting with Newport Utilities' project manager and available team members at the Newport Utilities' office to discuss schedule, project details, and introduce the project team.

5.1.3. Within fourteen (14) days of the project meeting, the Supplier will submit a detailed schedule showing each major and minor project task, including critical dates and tasks for Newport Utilities. This schedule shall be consistent to the schedule made part of the Bid Proposal, only with added detail.

5.1.4. The schedule shall be subject to review and approval by Newport Utilities' project manager.

5.2. Supplier Supplied Database and Screens

5.2.1. Newport Utilities requests Supplier to list the price of developing the screens for a subset of the electrical substations and water and wastewater locations as well as a price for developing the entire system.

5.2.2. The screens for the electric substations and devices should be similar to the provided screens from the existing electric SCADA system. The current electric system graphics and database will be provided for reference.

5.2.3. The screens for the water locations should be similar to the provided screens from the existing water SCADA system. The current water system graphics and database will be provided for reference.

5.2.4. The screens for the wastewater locations should be similar to the provided screens from the existing water SCADA system. The current wastewater system graphics and database will be provided for reference.

5.3. System Testing

5.3.1. The Supplier shall prepare test documentation and test logs necessary for all factory and site acceptance tests. The purpose of these tests is to demonstrate that the functional, performance, availability and other requirements in this specification are met.

5.3.2. The test procedure document shall be prepared by the Supplier and shall follow a consistent format and be submitted to Newport Utilities for review. Newport Utilities reserves the right to modify, add to or remove items from the test procedure document as they see fit.

5.3.3. Discrepancies found during the testing shall be documented and maintained in a problem log file. The subsequent correction shall be described and representatives of Newport Utilities and the Supplier shall verify proper operation.

5.3.4. Faulty and/or incorrect operation of major functions (major discrepancies) may, at the discretion of Newport Utilities, be cause for the suspension or restarting of the entire test, pending the correction of the problem. Minor discrepancies shall be corrected and re-tested. Newport Utilities may request that other modules that may be impacted by the correction be re-tested also.

5.3.5. As an option, Supplier shall provide pricing for only Site Acceptance Tests with the above qualifications. Site startup and testing pricing and/or number of days should be adjusted to anticipate additional time needed.

5.4. Startup / Installation

5.4.1. The Supplier shall be responsible for starting up the system. The purpose of system startup shall be for the Supplier to verify that all system functions operate properly under actual field conditions per the factory acceptance test. This shall include all application programs.

5.4.2. The system startup shall include helping establish communications at the master station to at least two substations, water locations reporting to the existing system, and at least 8 wastewater sites as determined by Newport Utilities.

5.4.3. Successful completion of startup means the Newport Utilities is satisfied that the system has met all requirements described in this specification, excluding warranty provisions and other items that survive the startup milestone.

5.5. Support Plan

5.5.1. The system shall be covered by warranty for the first year of operation.

5.5.2. The Supplier shall provide pricing for a 5-year support plan to begin at the conclusion

of the warranty period.

5.5.3. The Supplier shall provide pricing for a 10-year support plan to begin at the conclusion of the warranty period.

5.5.4. The Supplier shall provide 24x7 technical support for this system during the warranty and support plan period and identify other optional levels of support and their costs.

5.5.5. The Supplier shall provide software patch management in accordance with NERC CIP standards. All Supplier software patches will be tested against all software applications provided in this proposal, on a comparable hardware platform, and the results of those test made available to Newport Utilities within 30 days of patch release.

5.5.6. The Supplier shall provide online access to software updates, manuals, and knowledge base.

5.5.7. Newport Utilities shall have the option to accept or decline the support plan prior to the warranty or initial support plan period ending. The Supplier shall properly inform Newport Utilities 30/60/90 days before expiration of the warranty or initial support plan period that there is a need to address continuation of a support plan.

5.5.8. The Supplier shall provide detailed information on the support plan offered including number of incidences/hours of working hours and after hours support and charges for additional support requests.

5.6. Training

5.6.1. The Supplier shall make available to Newport Utilities, training on the operation, maintenance, failover/startup, recovery, application software, database, and display maintenance. The class training shall be conducted at Newport Utilities' facilities unless otherwise agreed to by both parties.

5.6.2. Training course outlines shall be included in the Supplier's bid. Each course outline shall include, in addition to the subject matter, a short review of the prerequisite subjects, how this course fits into the overall training program, and its objective.

5.6.3. Persons with sufficient training experience shall conduct training. These trainers shall have sufficient expertise on the subject of the training.

5.6.4. A suggested training plan and schedule suitable to the needs of Newport Utilities shall be provided as part of the proposal. The plan and schedule shall include a description of the training classes.

5.6.5. As an option, Supplier shall supply pricing for training at the Supplier's facilities, should the customer choose to travel.