

Technical Document

VES Niagara^{AX} User Guide

May 28, 2008



VES Niagara^{AX} User Guide

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PREFACE

Preface contents

- [“Document Change Log”](#)
This section provides a list of significant changes to this document, listed in order of document publishing and revision date.
- [“About this document”](#)
This section describes this document in terms of its purpose, content, and target audience.
- [“Related documentation”](#)
This section contains a list of other relevant VES documentation.

Document Change Log

Updates (changes/additions) to this document are listed as follows.

- May 21, 2008
 - Updated document formatting
 - The following sections were revised to reflect changes in licensing.
 - [“About VES Reports”](#) on page 1-5
 - [“Licensing Information”](#) on page 2-2, including: [“About the license.properties file”](#) on page 2-3, and [“About the “station.limit” license feature \(NiagaraAX-3.3\)”](#) on page 2-4.
 - Added two sections to the Preface: [“About this document”](#), and [“Related documentation”](#).
 - Removed three appendices from the NiagaraAX User Guide and replaced information with references to other NiagaraAX documents.
- November 27, 2006
 - Added description of Niagara Units. [“About Niagara units”](#) on page 3-45
 - Added information about using delta logging. [“About Delta Logging”](#) on page 3-47.
 - Added information about importing data files. [“Importing data files”](#) on page 5-2.
 - Added information about importing SQL database files. [“Importing Sql databases”](#) on page 5-5.
 - Added information about exporting files from NiagaraAX. [“Exporting history files”](#) on page 5-8.
 - Added overview information about using NiagaraAX drivers. [“NiagaraAX drivers”](#) on page 5-9.
 - Added three chapters from the NiagaraAX User Guide as appendices:
 - [“About Workbench”](#) on page A-1
 - [“About Histories”](#) on page B-1
 - [“Driver architecture”](#) on page C-1
- July 20, 2006
Initial release of VES Niagara^{AX} User Guide.

About this document

This document provides user-level information about the Vykon Energy Suite. The following chapters are included:

- **Overview**
This chapter provides a description of VES software in terms of the modules that comprise the software, the software system architecture, and a summary description of all the reports that are included.
- **Installation**
This chapter describes the modular nature of the software, licensing requirements and issues, host system requirements, and installation and initial startup procedures.

- **Configuration**
This chapter describes many of the important setup and structuring concepts that are required for running reports. Topics in this chapter include descriptions of how to properly name and specify sites, groups of sites, meters and data points that you want to monitor. In addition, this section includes descriptions of how to work with rates and scheduling to design effective reports.
- **Reports**
This chapter describes each of the reports that is included with E² Profiler and Cost Profiler. Example reports provide and illustrate possible configurations of each report.
- **Data**
This chapter provides both general and specific guidance for working with energy data. Example screens are used to illustrate how to use many of the parameter fields to import, export, and edit data. In addition, sections in this chapter provide a very basic overview of some of the more common NiagaraAX drivers. Also included, is a section that describes how to work with the “demo data” that is provided with the product.

Although this document includes basic descriptions of some principles and technologies, it is assumed that the reader has a basic understanding of NiagaraAX.

Related documentation

The following documents contain important information that pertains to NiagaraAX:

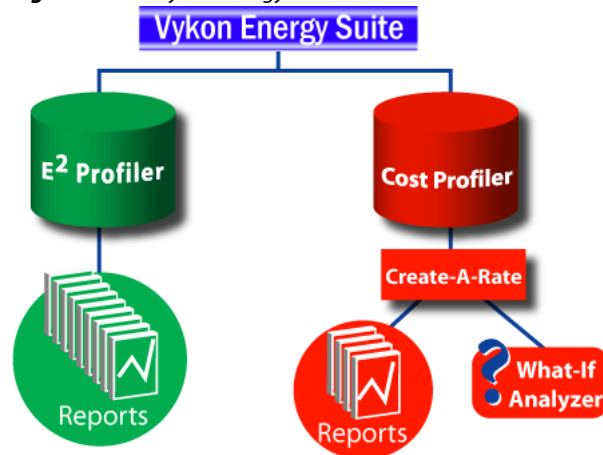
- *NiagaraAX User Guide* (especially the chapters “About Workbench” and “About Histories”)
- *NiagaraAX Drivers Guide*

CHAPTER 1

Vykon Energy Suite

Vykon Energy Suite (VES) is an enterprise energy management application that is designed to help manage energy and facilities. VES provides a bundled solution of hardware and software that provides connectivity to metering technologies and other third-party systems and devices. It also enables energy and facility managers to manage these systems in real - time using a browser, thus providing significant operational and energy savings. Fully web based, intuitive navigation tools make it easy to get the information when you need it, where you need it.

Figure 1-1 Vykon Energy Suite.



VES includes the following two modules, as illustrated in [Figure 1-1](#):

- **E2 Profiler**
a web-based energy-profiling tool designed to help you manage your enterprise through detailed energy - related data reporting.
- **Cost Profiler**
a web-based reporting package that allows detailed comparison of energy costs through the use of a variety of energy cost analysis tools.

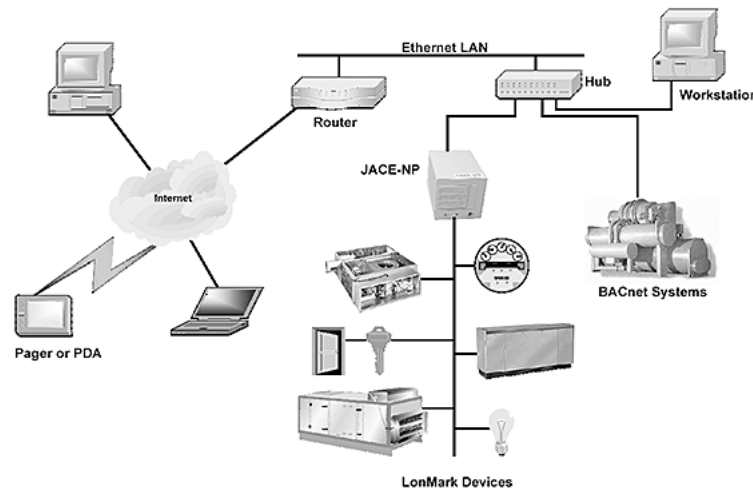
System Architecture

The physical hardware that makes up a VES system architecture can vary from a single JACE site to an enterprise with multiple JACE's spanning multiple sites.

- **Single Site / Single JACE**

The simplest configuration is a stand-alone JACE which can provide the stepping stone to a building's energy use and control systems. Typically the JACE is connected directly to the energy meters or via an integration bus such as Modbus or LON. Connectivity is provided via dial-up networking, ISP, or from an existing LAN. Access is provided via a web enabled device or browser typically managed from off-site using the Internet.

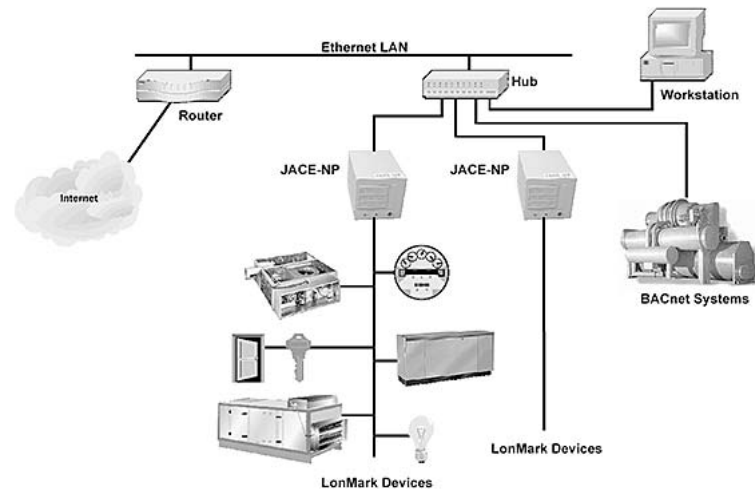
Figure 1-2 Single site / single JACE architecture.



- **Single Site / Multiple JACEs**

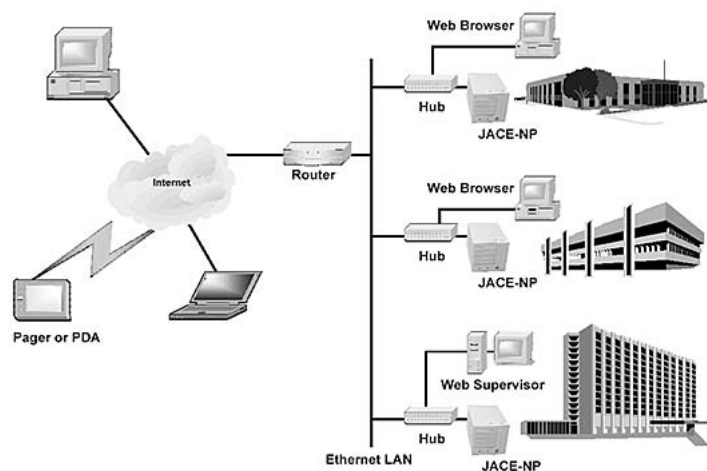
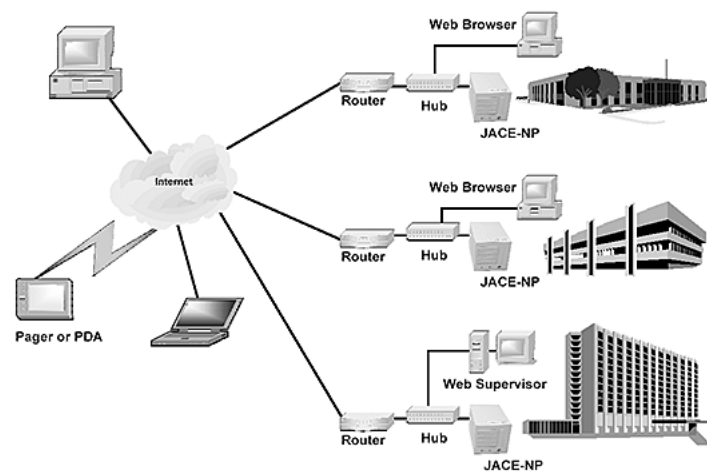
In this configuration the penetration into the building is deeper than energy monitoring and simple control. Here the Niagara Framework is providing real time control and monitoring of many pieces of equipment and subsystems. The integration buses, such as LON, are populated with unitary controllers providing the local control. Other integrations such as BACnet provide integration to larger pieces of equipment such as chillers. Various diverse subsystems such as power monitoring, lighting, and card access can be tied together into one homogeneous system. The multiple JACE controllers are managed by a Supervisor providing the engineering platform as well as an archive destination for logged data. Access is provided locally at the Supervisor or local browser user interface. Additionally, the system can be monitored and controlled anywhere in the world via the Internet.

Figure 1-3 Single site multiple JACEs architecture.



- **Multiple Sites / Multiple JACEs**

At the Enterprise level, the Niagara Framework is scalable to handle even the largest of multi site configurations. Here, each site will have its own JACE, typical to the previous configurations, providing local energy monitoring and control. One site would also host the Supervisor for global management of data and administrative functions. The enterprise could be connected via a WAN or by a VPN over the Internet. By using the NiagaraAX Framework as the automation infrastructure, diverse systems from many sites are pulled together into one enterprise solution. VES can use this infrastructure for data gathering and reporting, and ultimately close the loop for real-time control.

Figure 1-4 Multiple sites multiple JACEs on a WAN.**Figure 1-5** Multiple sites multiple JACE's over the Internet.

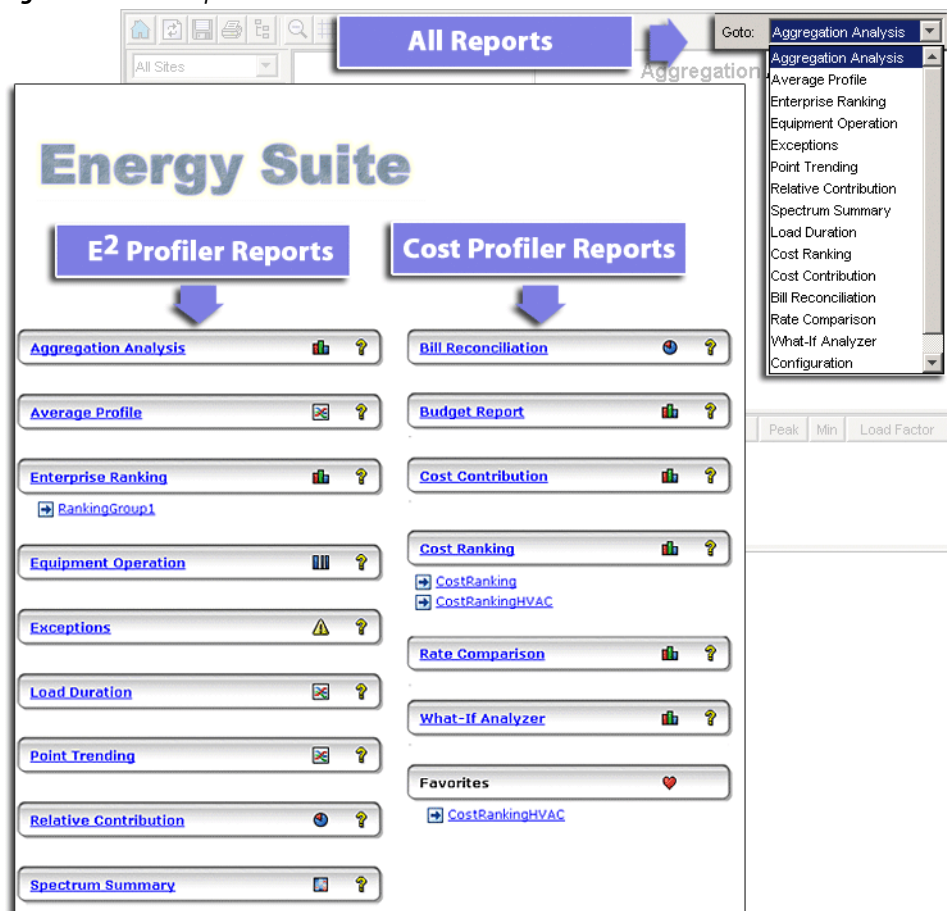
About VES Reports

VES reports are provided by both the E2 Profiler module and the Cost Profiler module. If your installation of NiagaraAX is licensed for both modules, you have access to all these reports.

Note: Starting with NiagaraAX-3.3, E2 Profiler module and the Cost Profiler are both included under a single licensed instance of VES. Refer to the “[Licensing Information](#)” section on page 2-2 for more information about licensing.

Although the different modules provide different types of reports, all reports are selected from the VES user interface, or from the browser interface, as shown in [Figure 1-6](#).

Figure 1-6 VES reports.



The following sections provide an overview of both categories of VES reports:

- [Types of E2 Profiler Reports](#)
- [Types of Cost Profiler Reports](#)

Types of E2 Profiler Reports

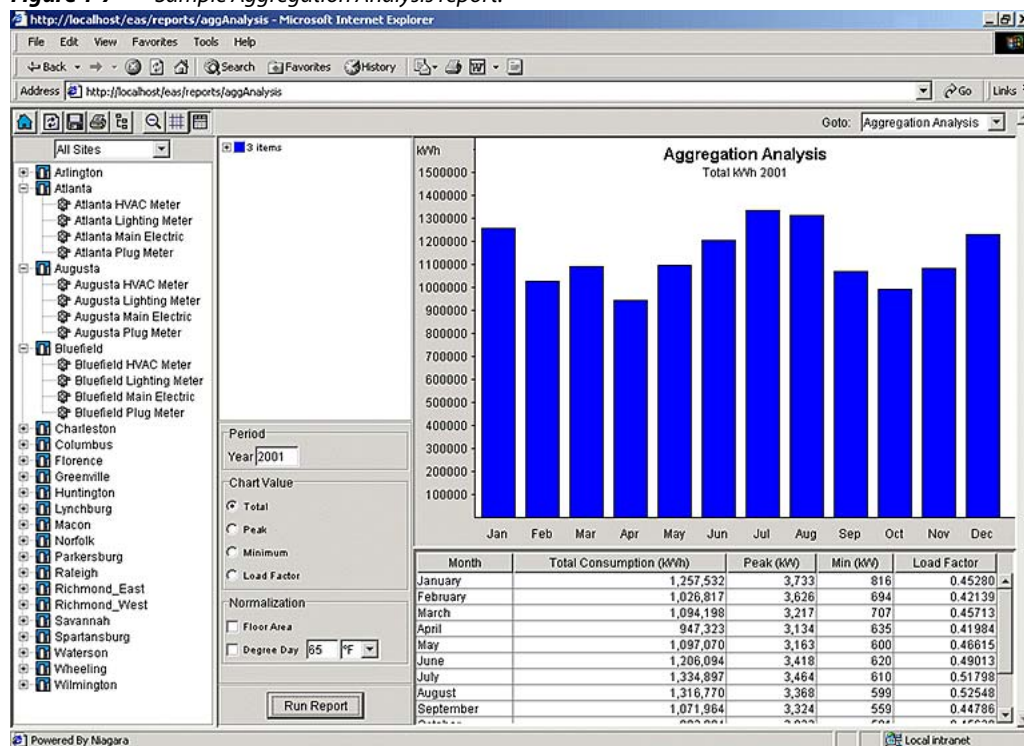
E2 Profiler is an advanced, user-friendly energy profiling tool designed to help you manage your enterprise. You can trend and analyze digital or analog data values such as energy, temperatures, production, and facility data. Depending on the combination of values and report selected, you can easily identify correlations to see how building characteristics and equipment affect energy consumption and demand profiles. Armed with such information, you can adjust operations and schedules accordingly. Each of the following reports has the flexibility to analyze an unlimited number of values, and turns raw data into useful information for easy interpretation:

- [Aggregation Analysis Report](#)
- [Average Daily Profile Report](#)
- [Spectrum Summary Report](#)
- [Enterprise Ranking Report](#)
- [Relative Contribution Report](#)
- [Equipment Operation Report](#)
- [Point Trending Report](#)
- [Exception Report](#)
- [Load Duration Report](#)
- [Correlation Report](#)

Aggregation Analysis Report

The Aggregation Analysis Report is useful when negotiating energy contracts. This report aggregates multiple points and displays the total, peak, minimum, and load factor for various sites, meters, time periods and commodities. Use this information to increase total energy procured and determine complementary loads to improve your load factor and enhance your negotiating position. This information allows you to negotiate a contract based on your consumption patterns versus arbitrary classifications of commercial or industrial customers.

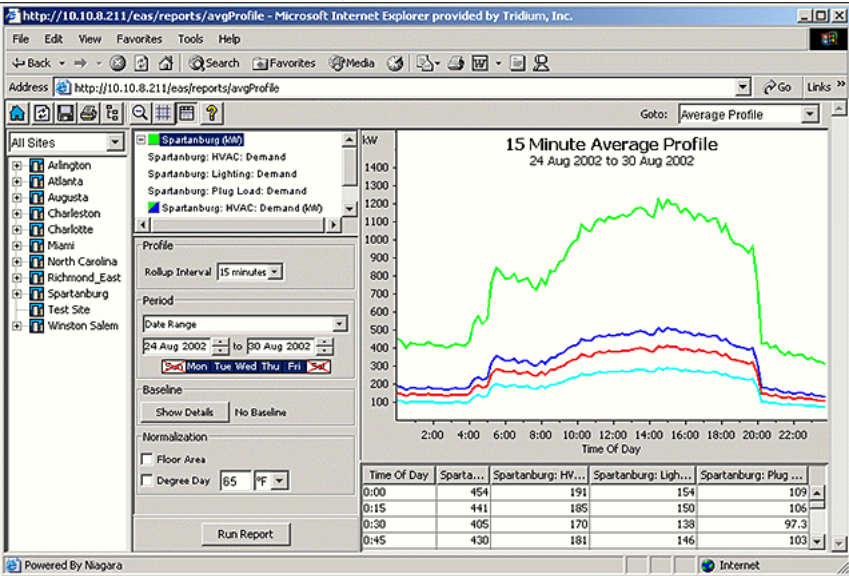
Figure 1-7 Sample Aggregation Analysis report.



Average Daily Profile Report

The Average Profile report is useful when negotiating energy contracts. By understanding energy consumption patterns, you have the information necessary to negotiate an energy contract tailored to the unique needs of your business. Because E2 Profiler gives you the ability to define parameters such as time periods, measurement units, facilities, and more, you can identify unfavorable peaks and patterns, adjust behavior, and create an energy procurement strategy instead of hoping for the best. Having this information reduces consumption volatility, and makes your load more attractive for energy providers, which can reduce your energy costs.

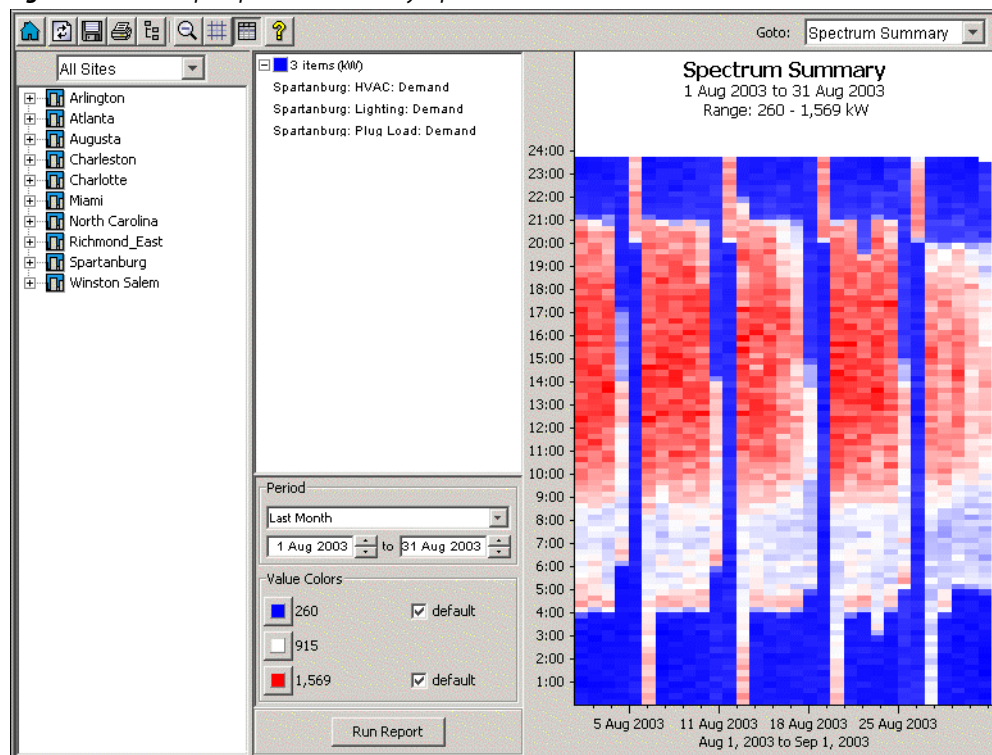
Figure 1-8 Sample Average Daily Profile Report.



Spectrum Summary Report

The Spectrum Summary Report provides a quick view of any point or aggregated point with color coding identifying the reasonableness of the data value. Information in this report is presented in a colorful fashion, making evaluation quick and easy. If all data values are within historical ranges, the report colors will be in a consistent pattern and the user can move on to other functions. If there are unusual or inconsistent values, the pattern will not be consistent and you will know with a quick glance that further analysis is required.

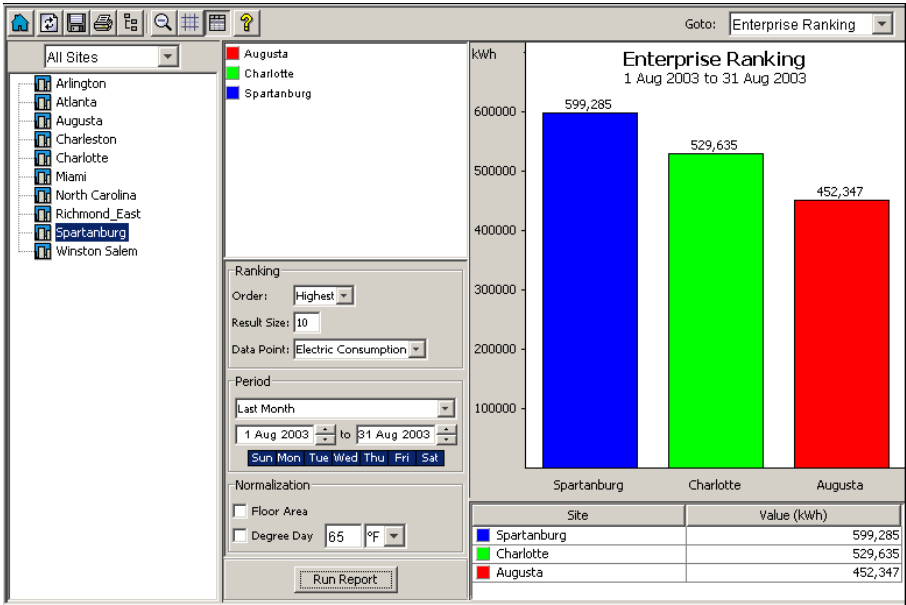
Figure 1-9 Sample Spectrum Summary report.



Enterprise Ranking Report

The function of this report is to identify the highest and lowest sites or points with a common characteristic. You can identify the most efficient facilities in your enterprise and benchmark against other facilities, or determine the least efficient facility and perform further analysis. Energy managers also use this report to rank lighting, HVAC, and refrigeration strategies within your enterprise. With this information, you can identify best in class equipment for energy consuming loads and reduce energy consumption across the enterprise.

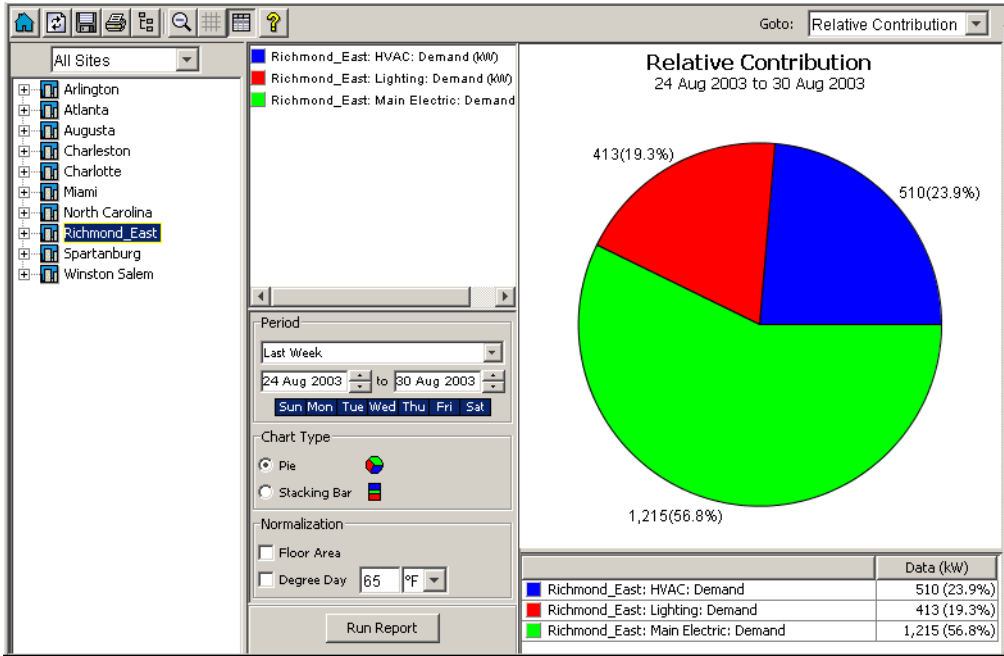
Figure 1-10 Sample Enterprise Ranking report.



Relative Contribution Report

Once facilities are identified as inefficient in the Enterprise Ranking Report, energy managers can determine which equipment contributes most to the total at that facility. Users select a series of data points and run a Relative Contribution Report, which calculates the total consumption and displays the individual contribution of each underlying component. Use this report to determine how appliances within a building contribute to the total energy load at a facility or see how different buildings contribute to an aggregated load. This becomes especially powerful when normalized for square footage and weather. Armed with this insight, you can identify the most logical place to allocate capital expenditures.

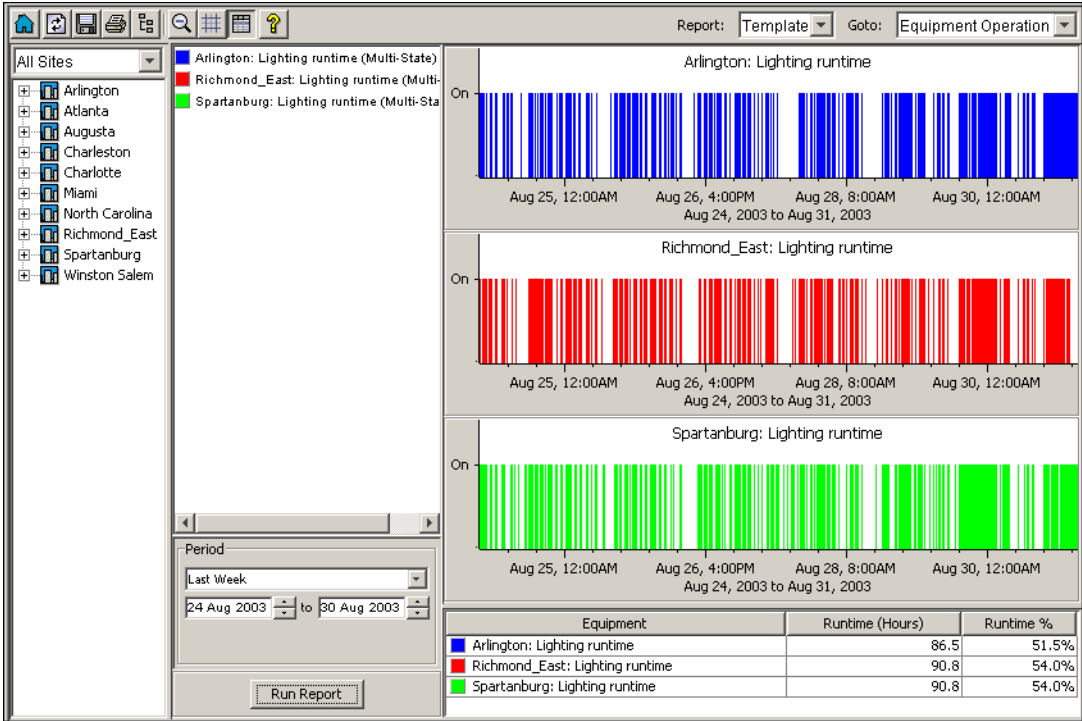
Figure 1-11 Sample Relative Contribution report.



Equipment Operation Report

Once the Relative Contribution Report identifies the points contributing most to a total, The Equipment Operation Report gives you the ability to run exceptions on that equipment to determine run times compared to similar equipment in the enterprise. With E2 Profiler, you can identify run times of various points such as HVAC, lighting, fans, refrigeration, chillers, and more. Results are expressed in both time and percentages, and shown in tabular and graphical format. With this information you can determine if your equipment run time is in line with the manufacturers specifications and schedule maintenance accordingly.

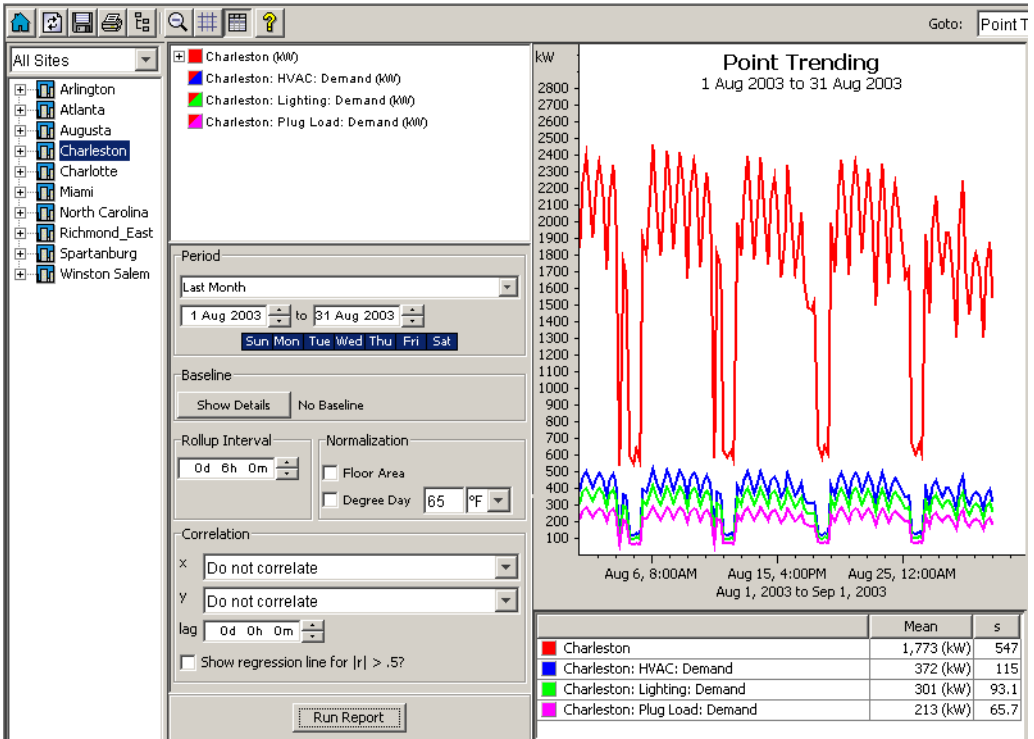
Figure 1-12 Sample Equipment Operation report.



Point Trending Report

Trend lines are very useful for showing a graphical representation of multiple data values. E2 Profiler allows you to select any points or series of points and provide trend lines over a specified time period. Any data value in the database can be trended for any period of time. You have the option of converting different measurement units for gas, electric, and temperatures into a common measurement unit to perform analysis on the “normalized” data, or you can maintain data in its natural state. For example, you may want to convert gas and electric to KBtu to determine the most efficient energy mix, but maintain intrinsic values for temperature and consumption to determine a correlation between outdoor air temperature and electric consumption. With this feature, you can do things like identify best practices for fuels and see how building characteristics affect consumption.

Figure 1-13 Sample Point Trending report.



Exception Report

This report will identify all data values for the specified period that do not fall in a user-defined range. When there are excessive values for any data point, the user can identify exactly when it occurred and the value of the event, and analyze the value further to make sure the event isn't repeated. The data can be normalized for weather and production to reduce false positives.

Figure 1-14 Sample Exception report.

Goto: Exceptions

Summary

	# Exceptions
Charlotte: Main Electric: Consumption (kWh)	78
Charlotte: Main Electric: Demand (kW)	79
Charlotte: HVAC: Consumption (kWh)	78
Charlotte: HVAC: Demand (kW)	79
Charlotte: Lighting: Consumption (kWh)	78
Charlotte: Lighting: Demand (kW)	79

Report Period

Date Range: 1 Jul 2003 to 31 Jul 2003

Rollup Interval: 0d 0h 15m

Baseline Period

Start: Same start date
1 Jul 2003

Duration: 30 (days)

Temperature

Temperature data color: [dropdown]

☐ Adjust Baseline

Comparison Details

Use Baseline & Percentage

Threshold %: 20

Show violations of: ☒ Lower Limit ☒ Upper Limit

Included Days: Sun Mon Tue Wed Thu Fri Sat

Included Times: 00:00 to 24:00 ☐ Exclusive

Max #Exceptions: 1000

Run Report

Get CIs

Use Baseline & Percentage

Use Baseline & Percentage

Use Specified Range of Values

Use Baseline to Statistically Determined Limits

Load Duration Report

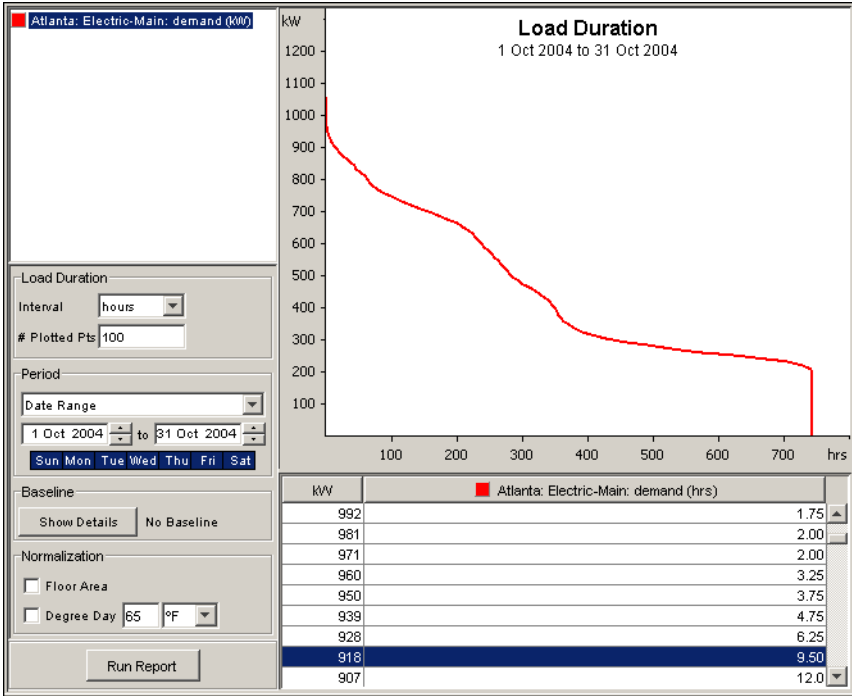
This report provides the ability to identify the duration, or length of time, that demand (or consumption) for a point, aggregate point, or group of points exceeds certain levels. The load duration report is useful when you are considering using demand-limiting strategies or possible capital investments.

Note: *The demand component of electric rates typically constitutes 30% to 50% of total electric costs. Lowering peak demand can generate significant savings.*

This report, along with the exception report and the What-If Analyzer, help identify return on investment before a project is implemented. For example, an energy manager may identify the peak for a demand meter using the exception report, then identify how much time (or the duration) that kW is above certain levels near the peak. Once determined, the What-If Analyzer quantifies the financial effect resulting from lowering the kW by that amount.

As with other reports, you may aggregate and disaggregate meters, run baselines, and normalize for square footage and temperature.

Figure 1-15 Sample Load Duration report.

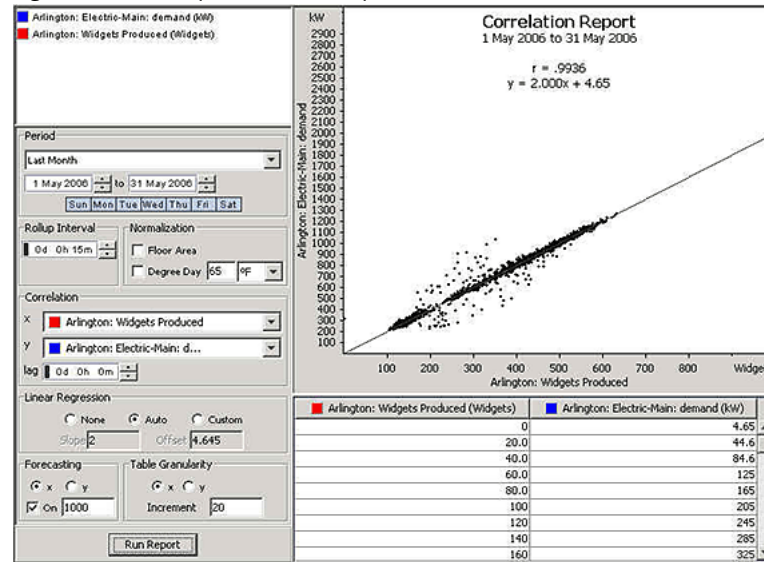


Correlation Report

This report provides the ability to correlate two logs of data over a user defined period of time. This can be useful for determining the relationship between any two data points. It allows you to select the data points to use for the x and y axis of a correlation chart (scatter plot), and then use the configuration parameters to enable a linear regression trend line, set up linear regression forecasting, and adjust the tabular results. This report also uses features from the other E2 Profiler reports.

As with other reports, you may aggregate and disaggregate meters, run baselines, and normalize for square footage and temperature.

Figure 1-16 Sample Correlation report.



Types of Cost Profiler Reports

Cost Profiler is an advanced, user friendly cost profiling tool designed to help you manage your energy costs. It provides a web based reporting package that gives you detailed information about your energy management parameters and helps you identify management alternatives. Using Cost Profiler, you can compare energy costs based on metered interval data and applicable rate structures in order to benchmark facilities, identify inefficiencies, implement changes, and measure results.

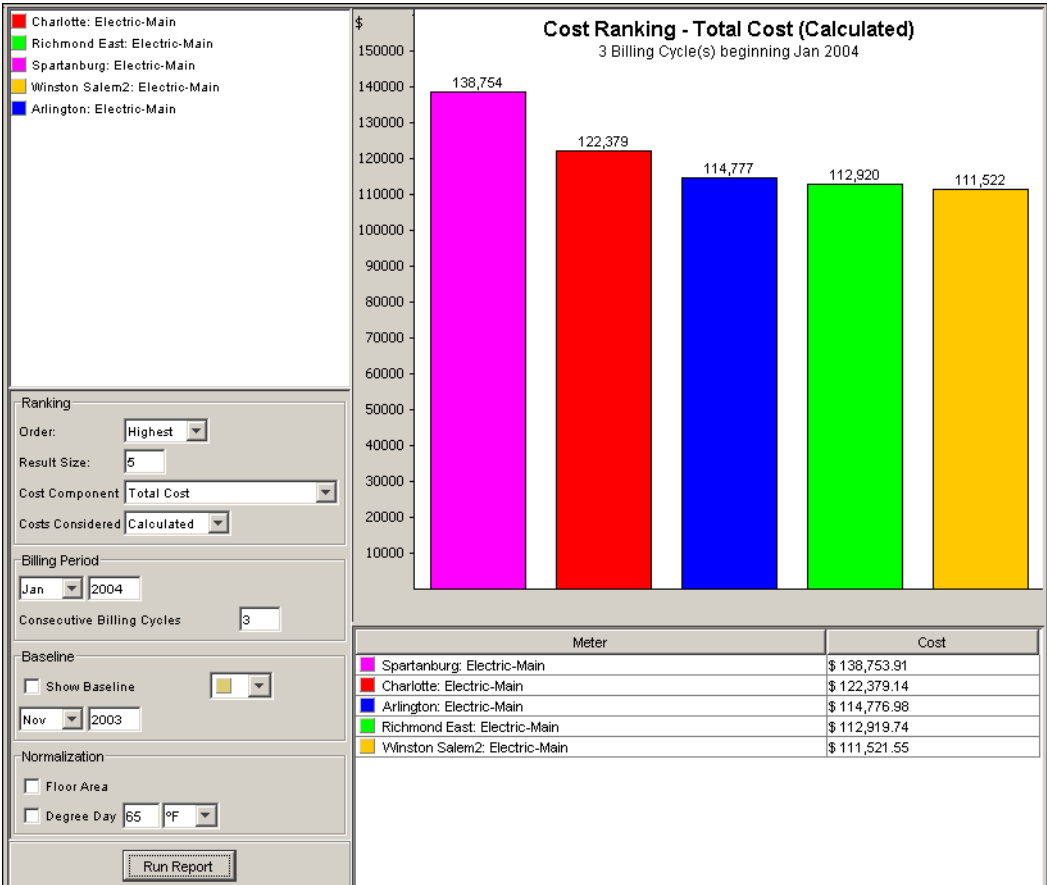
The following reports provide both demand side and supply side analysis benefits to help pro actively manage budgets, make accurate cost projections, and reduce energy costs:

- [Cost Ranking Report](#)
- [Cost Contribution Report](#)
- [Bill Reconciliation Report](#)
- [Rate Comparison Report](#)
- [Budget Report](#)
- [What-If Analyzer](#)

Cost Ranking Report

The function of this report, shown in [Figure 1-17](#), is similar to [Enterprise Ranking Report](#), in the E2 Profiler module. It identifies the sites or points that are highest and lowest in terms of **cost**.

Figure 1-17 Sample Cost Ranking report.



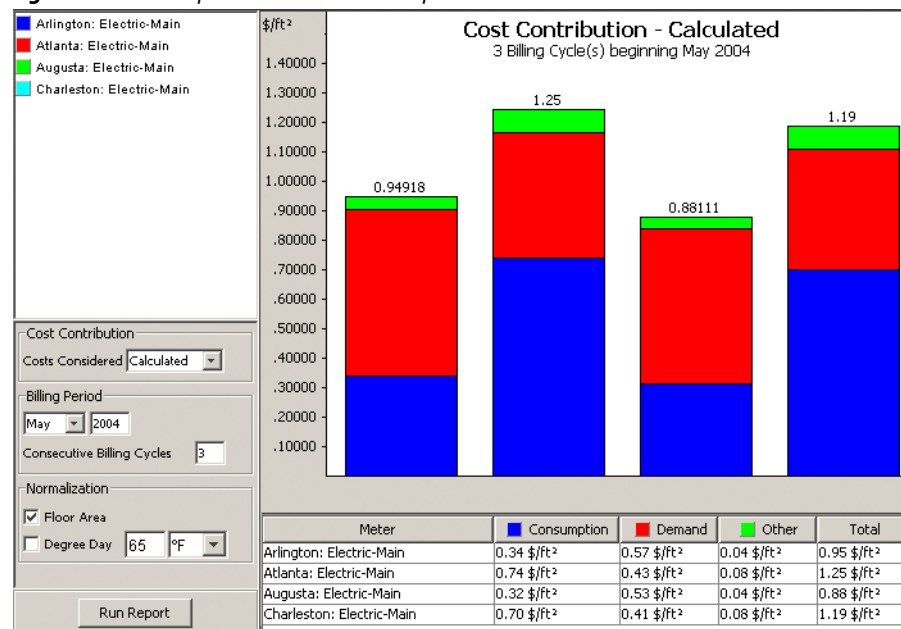
Using this report, you can identify the least expensive facilities in your enterprise and benchmark against other facilities. Or you can determine the most efficient facility and perform further analysis. You can select meters and manually rank costs for applicable cost components or leave the legend empty and define the sample size of the analysis. By selecting sites or commodities, you are able to identify the least expensive and the most expensive sites or meters and cost components in the enterprise. Reporting is available for single or multiple billing cycles and may include historical baselines.

Cost Contribution Report

The purpose of this report, shown in [Figure 1-18](#), is to determine how meters – whether submeters within a building or main meters across an enterprise – contribute to the aggregate energy enterprise. Because individual rates have different rate components, this report categorizes the components into the general categories of:

- demand
- consumption
- other
- User Definable Fields (UDF)

Figure 1-18 Sample Cost Contribution report.



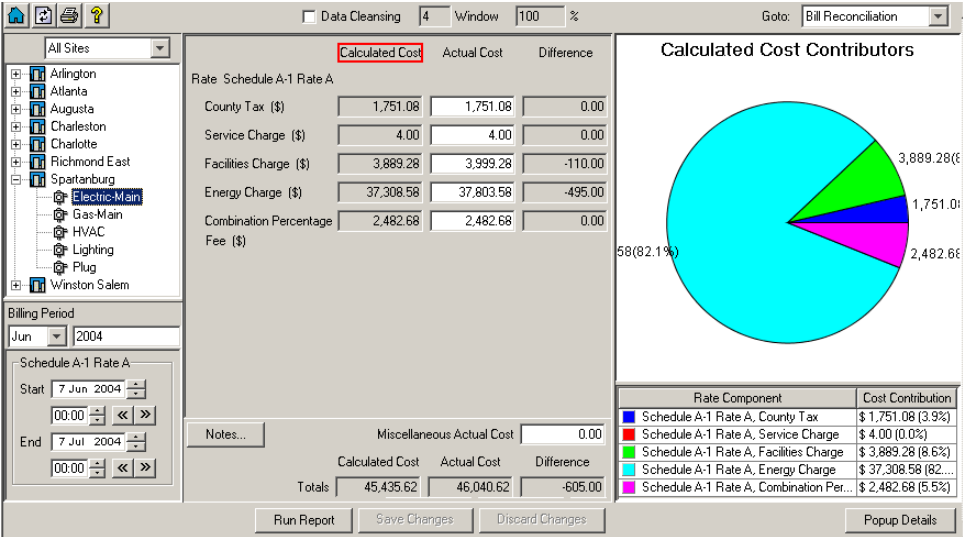
When you configure rate components in Create A Rate (see, “[About Create A Rate](#),” page 3-9) you select the component **category label**. For example, one site may have four demand components in the rate including On Peak Demand, Off peak Demand, Partial Peak Demand, and Historical Ratchet. Each of these four components can be *categorized* as a demand component and compared to sites that have rates that may only have one constant demand component.

Bill Reconciliation Report

This report allows you to compare utility invoices to your own calculated values in order to validate invoices or identify billing errors. You can establish a historical baseline with manually entered data from utility invoices.

Once you receive an invoice, you can build a report in Cost Profiler using the same meters, billing cycles, and rates that are used on the invoice. The report in Cost Profiler should match the invoice, thus allowing you to “reconcile” the invoice from a utility.

Figure 1-19 Sample Bill Reconciliation report.



The Bill Reconciliation report shows important details of the account, thereby giving you all the necessary contact and account information to contact and negotiate any discrepancies found.

Rate Comparison Report

This report allows you to try to determine if you can save money by simply changing energy providers or tariff rates. The Rate Comparison report allows you to compare calculated costs side-by-side using rates you have already set up in Create A Rate (see “[About Create A Rate](#),” page 3-9 for more information about Create A Rate).

Figure 1-20 shows an example of the Rate Comparison report that displays costs calculated by the currently attached rate to the costs of an alternative rate that is selected and applied to the same meter. Comparisons may be done on single meters or meters may be aggregated.

Figure 1-20 Sample Rate Comparison report.

Attached Rate Details		Alternate Rate Details	
Spartanburg Electric-Main		Schedule A-1 Rate B	
Rate	Schedule A-1 Rate A	Rate	Schedule A-1 Rate B
Consumption	38,804.78	Consumption	19,290.78
Demand	3,992.68	Demand	3,992.68
Other	4,402.13	Other	1,695.56
Grand Total	47,199.59	Grand Total	24,979.01

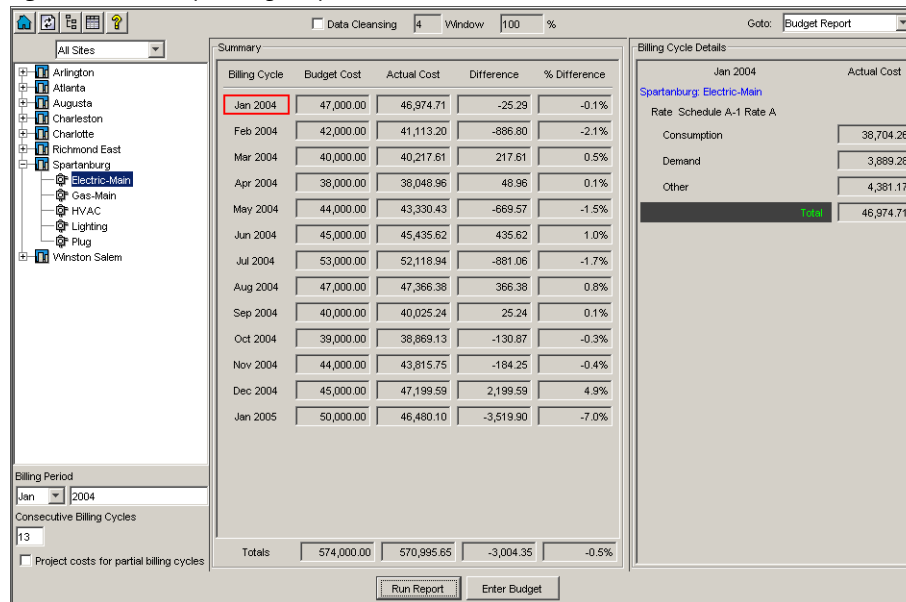
Difference		Difference	
Grand Total Difference	22,220.58 (52.9%)	Consumption Difference	19,514.00 (49.7%)
Demand Difference	0.00 (100.0%)	Other Difference	2,706.57 (38.5%)

You can apply any rate that is available in the “Alternate Rate” window and re-run the report as desired using any billing periods desired. All reports show the calculated costs displayed in groups that match they way that you categorized each rate component in Create A Rate. This allows you to easily determine how demand, consumption, and other general rate categories compare between rates. You can show or hide report details by using a Detail toggle button on the toolbar.

Budget Report

The Budget report provides an easy way to enter your budgets and compare your budgeted costs with your actual costs. You can manually enter budgets for each month of the year, or use historical data (if you have it) to immediately populate your budgeted fields with the previous year's actual costs. The budgeted numbers may be edited and saved – or latest changes may be discarded at any point prior to saving.

Figure 1-21 Sample Budget report.



This report also allows you to look at projected (estimated) costs for the current billing cycle (partial billing cycle). Since the projected costs are estimated, a “confidence factor” is calculated to help you consider how much trust to put in the projection. The higher the “confidence factor,” the more reliable the projection numbers are.

What-If Analyzer

The purpose of the What-If Analyzer is to allow you to look at calculated costs (and components that are used to determine costs) and make “trial” adjustments to these components to see the effect that these changes have on the overall costs for a meter.

As with other reports, you can run the What-If Analyzer on a single meter, or you can aggregate meters and run the report on the aggregate. Figure 1-22 shows an example of the What-If Analyzer report. Calculated costs are listed, by billing cycle, side-by-side with the “Adjusted Cost” that you have created by adjusting: demand, consumption, or a component fee.

Figure 1-22 What-If Analyzer report.

Summary of Billing Cycles			Billing Cycle Details				
Billing Cycle	Calculated Cost	Adjusted Cost	Feb 2004	Calculated Units	Fee (per Unit)	Calculated Cost	Adjusted Cost
Jan 2004	46,974.71	46,967.92	Spartanburg: Electric-Main, Rate Schedule A-1 Rate A				
Feb 2004	41,113.20	41,099.61	County Tax (\$)	N.A.	1,584.49	1,584.49	1,584.49
Mar 2004	40,217.61	40,217.61	Service Charge (\$)	N.A.	4.00	4.00	4.00
Apr 2004	38,048.96	38,048.96	Facilities Charge (\$ / kWh)	1,728.57	2.25	3,889.28	3,889.28
May 2004	43,330.43	43,330.43	Energy Charge (\$ / kWh)	491,247.29	0.06794	33,388.93	33,375.34
Jun 2004	45,435.62	45,435.62	Combination Percentage Fee (\$)	N.A.	2,246.50	2,246.50	2,246.50
Jul 2004	52,118.94	52,118.94					
Aug 2004	47,366.38	47,366.38					
Sep 2004	40,025.24	40,025.24					
Oct 2004	38,869.13	38,869.13					
Nov 2004	43,815.75	43,815.75					
Dec 2004	47,199.59	47,199.59					
Grand Total	524,515.55	524,495.17	Feb 2004 Total			41,113.20	41,099.61
Savings		20.38	Feb 2004 Savings				13.59
Reset All			Reset Feb 2004				
Run Report							

Like other reports, the What-If Analyzer reports may be adjusted and run again, saved, or discarded.

CHAPTER 2

VES Installation

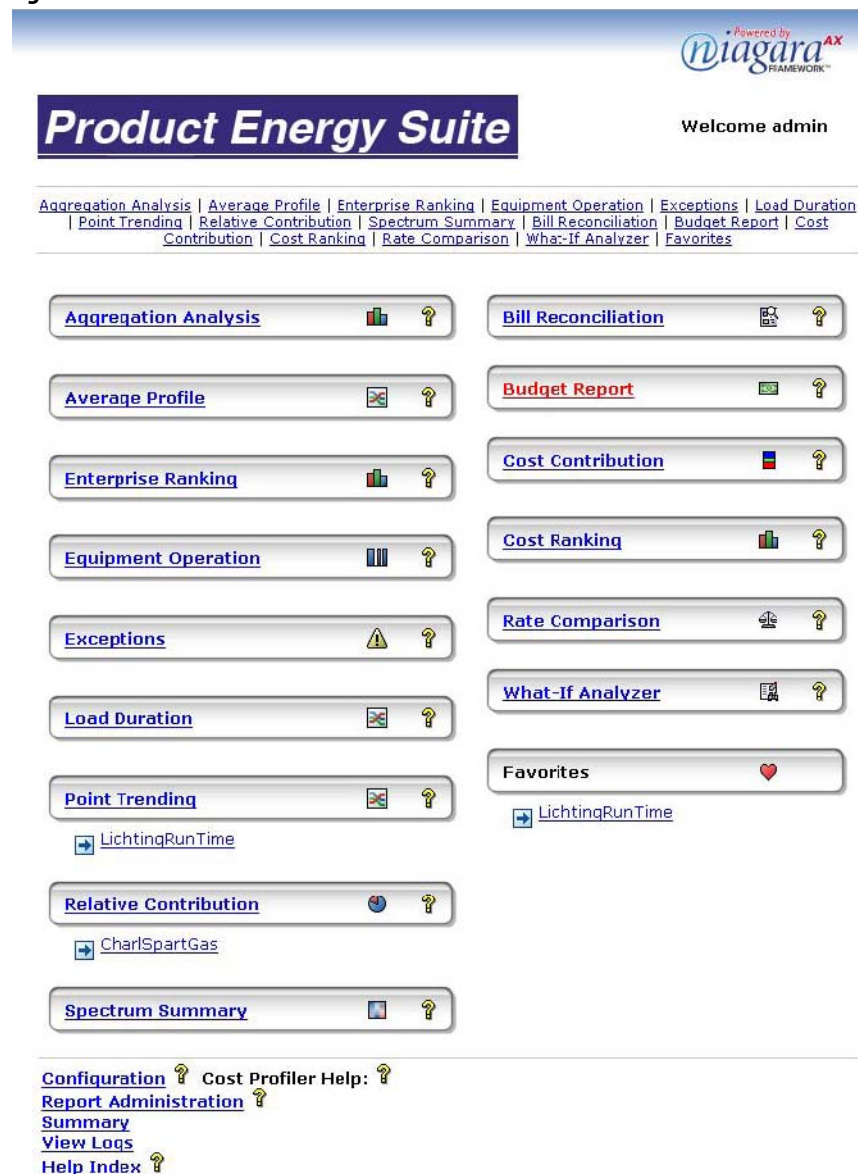
Vykon Energy Suite allows you to easily process data from your facility archives using the E2 Profiler and the Cost Profiler modules. This tool runs from within your web browser and interacts with the Web Supervisor where the data is being stored.

VES provides a number of different report templates for your use in viewing and analyzing the volumes of data information that may be collected at a particular facility or installation.

Before data can be viewed through the VES reports it must first exist in the NiagaraAX history logs.

This chapter includes the following topics:

- [“Licensing Information”](#)
- [“VES Product Overview”](#)
- [“VES Software and Hardware Requirements”](#)
- [“Installing VES”](#)
- [“Starting VES from the client browser”](#)

Figure 2-1 Browser User Interface to VES with E2 Profiler and Cost Profiler.

Note: Be sure to check for version compatibility before installation. For example, NiagaraAX VES will only run on a WebSupervisor that is running NiagaraAX-3.x.

Licensing Information

VES is distributed as a Java Archive file (jar file). Both E2 Profiler and Cost Profiler are distributed in the same jar file. Cost Profiler features, including Create A Rate, Attach A Rate, Cost Profiling, and What-If Analyzer are all included in the Cost Profiler module, and therefore will be distributed in the same jar file.

In order to license your software, you must purchase one or more VES modules for NiagaraAX and receive a license file (license.properties) that specifies that you are licensed. You cannot add points or meters to your database in a production environment until you have an appropriate license file.

Note: Prior to NiagaraAX-3.3 (NiagaraAX 3.0, 3.1, and 3.2), licensing determines which VES modules you have access to. Starting with NiagaraAX-3.3 E2 Profiler and Cost Profiler are concurrently licensed with VES.

About demo mode

In order to use VES in “demo” mode, you simply need the “eas” feature included in you license file. Demo mode allows you to run all reports using the demo data only. You can create rates and attach them to meters for use in Cost Profiler. However, you are not allowed to create new data points in demo mode; you are limited to using the demo data only.

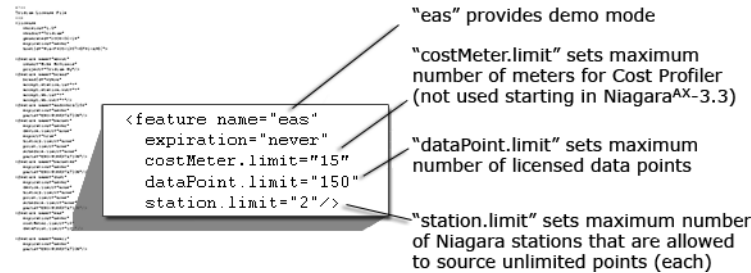
About the license.properties file

Both E2 Profiler and Cost Profiler have individual license components.

Note: Starting in NiagaraAX-3.3, the Cost Profiler license checks are removed (no check for a “costMeter.limit”) so there is unlimited use of Cost Profiler available.

The following items must be present in the license.properties file in order for VES to be licensed properly, (see Figure 2-2).

Figure 2-2 Example license file



- **feature**
The feature property for E2 Profiler and Cost Profiler must have a name="eas" parameter. This parameter provides all the functionality of the “demo mode. In order to create and use new data, you must have one or more additional parameters set, as follows.
- **expiration**
This property must have a valid expiration date set. Valid dates include future calendar dates and “never”.
- **costMeter.limit**

Note: Starting in NiagaraAX-3.3, this property is not used.

This property specifies the number of meters allowed for Cost Profiler. If the costMeter.limit property is not set, VES is not licensed for the Cost Profiler module and none of the Cost Profiler reports are visible (unless you are running in “demo” mode).

Note: In demo mode you see all reports, but the reports reflect only the demo data.

An example “costMeter.limit” entry for Cost Profiler reads as follows:
costMeter.limit="15"

- **dataPoint.limit**
This property specifies the number of data points allowed for the E2 Profiler. If the dataPoint.limit property is not set, VES is either not licensed for the E2 Profiler module (and none of the E2 Profiler reports are visible) or it is running in “demo” mode, which means no dataPoint.limit or station.limit is defined.

Note: In demo mode you see all reports, but the reports reflect only the demo data.

An example “dataPoint.limit” entry for E2 Profiler reads as follows:
dataPoint.limit="150"

- **station.limit**
This property specifies the maximum number of stations that are each allowed to be the source of an unlimited number of histories for use as VES data points. The “dataPoint.limit” is used to set the maximum number of data points that are allowed for histories that are sourced from stations that are not included in the station.limit group or from other sources.

Note: In demo mode you see all reports, but the reports reflect only the demo data.

An example “station.limit” entry reads as follows:
station.limit="2"

In addition to the other license properties, in VES Niagara^{AX} build 3.1.11 and later, the following attributes provide licensing at the report level, as described:

- **allCostReports**
Licenses all Cost Profiler reports
- **allE2Reports**
Licenses all E2 Profiler reports
- **aggAnalysis**
Licenses the Aggregation Analysis report
- **avgProfile**
Licenses the Average Profile report

- billReconcile
Licenses the Bill Reconciliation report
- budgetReport
Licenses the Budget report
- configuration
Licenses the Configuration report
- correlationReport
Licenses the Correlation report
- costContribution
Licenses the Cost Contribution report
- costRank
Licenses the Cost Ranking report
- entRanking
Licenses the Enterprise Ranking report
- equipOp
Licenses the Equipment Operation report
- exception
Licenses the Exceptions report
- loadDuration
Licenses the Load Duration report
- pointTrending
Licenses the Point Trending report
- rateComparison
Licenses the Rate Comparison report
- relContribution
Licenses the Relative Contribution report
- reportAdmin
Licenses the Report Administration report
- spectrum
Licenses the Spectrum Summary report
- whatIfAnalyzer
Licenses the What-If Analyzer report

About the “station.limit” license feature (NiagaraAX-3.3)

Starting with NiagaraAX-3.3, VES uses a “station.limit” parameter as part of the “eas” feature-line in a NiagaraAX license file.

In addition to the “dataPoint.limit” parameter (which can be used in all VES releases) the “station.limit” parameter is used for managing data points that are allowed to be sourced from Niagara stations under the NiagaraNetwork. The following terms describe concepts and parameters that relate to the way the station.limit parameter affects the allowed data points.

Eas Config property The Eas Config property is automatically added to a Niagara station (under the NiagaraNetwork) when that station is added under a NiagaraNetwork that contains the EasService

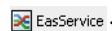
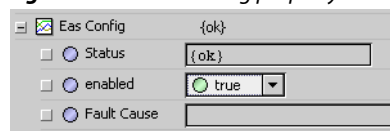


Figure 2-3 Eas Config property added to a station data property sheet



When this property is present, you can set its enabled parameter to “true” (default) or “false” in order to allow or prevent the use of unlimited data points from the associated station. When this property is set to “true”, VES may use **unlimited data points** from the station. Each station that has the Eas Config property enabled counts towards the maximum number of stations specified by the station.limit license parameter.

unlimited histories (data points) When the Eas Config property is enabled on a station that has not exceeded the station.limit value, VES may use an unlimited number of histories from that station. The data points represented by these histories do not count against the total allowed data points that are specified by the “dataPoint.limit” parameter.

station.limit value The station.limit value is set in the license file (see [Figure 2-2](#)) and specifies the maximum number of stations that are allowed to be the source of unlimited histories for use as VES data points. For example, if the station.limit value is “2” then two stations are allowed to provide an unlimited number of data points. If a third station is added and enabled, a message appears in the Fault Cause property display: “Could not register this NiagaraStation (check eas station license limit).” Setting this station’s property to “false” clears the fault and displays the following message in the Fault Cause property: “Disabled (this station will not count towards the Eas station limit).” In this case the data points for this station are counted toward the total number of data points, as specified by the license file’s dataPoint.limit parameter.

dataPoint.limit The dataPoint.limit parameter has a value that is set in the license file (see [Figure 2-2](#)) that limits the total number of data points that are allowed to be used from all sources. These sources may include (for example) remote stations under the NiagaraNetwork, csv files, relational databases, and others. Stations that have their Eas Config property enabled can provide an unlimited number of data points that do not count toward this datapoint.limit value.

VES Product Overview

VES is an enterprise energy management application designed to help manage energy and facilities. Vykon provides a bundled solution of hardware that provides connectivity to metering technologies and other third-party systems in real-time through a browser. Significant operational energy savings are realized with implementation of one or more of the following VES modules:

E2 Profiler

This module allows you to trend and analyze digital or analog data values such as energy, temperatures, production, and facility data. Depending on the combination of values and report selected, you easily can identify correlations to see how building characteristics and equipment affect energy consumption and demand profiles. You can adjust operations and schedules based on this information. Each report has the flexibility to analyze an unlimited number of values, and turn raw data into useful information for easy interpretation.

E2 Profiler provides a variety of report templates that are described in “[Types of E2 Profiler Reports](#),” page 1-6.

Cost Profiler

This module provides a web-based report package that shows comparisons of energy costs based on metered interval data and applicable rate structures. These reports allow you to benchmark facilities, identify inefficiencies, implement changes, and measure results. Cost Profiler allows you to model your rates, do cost analysis, and perform variable factors analysis using the following variety of reports. Cost Profiler reports are described in “[Types of Cost Profiler Reports](#),” page 1-16.

VES Software and Hardware Requirements

Following, is the recommended software and hardware configuration for the workstation running the VES software:

- Processor: Intel Pentium III, 500 MHz or higher
- Operating System: Microsoft Windows NT 4.0 with Service Pack 4 or higher or Windows 2000
- Web Browser: Microsoft Internet Explorer 5.0 or later; Mozilla Firefox 1.5 or greater.
- Sun Java Runtime Environment (JRE): 1.4.0 or later.

Note: VES will only work correctly with the 1.4.0 or later version of the Sun JRE.

- If you already have a different version of the Sun JRE installed on the workstation, the installation process will not install the correct version over the existing one.
- If you have an existing version of the Sun JRE installed on the workstation, uninstall that version **before** beginning the installation process. The installation process automatically installs the correct version on the workstation.
- Hard Drive: 1 GB min., 5 GB for applications needing more archiving capacity.
- Display: Video card and monitor capable of 1024 x 768 pixel resolution.
- Network Support: Ethernet adapter (10/100 megabit).
- Internet Access: 56 KB modem or full-time high-speed ISP connection (such as T1, ADSL, or cable modem) recommended for remote site access.

Installing VES

The Niagara software must be a version that is compatible with the VES software release and be licensed with the features as indicated in “[Licensing Information](#),” page 2-2.

The installation process may be broken down into the following tasks:

- [Install the eas module](#)
- [Install the updated wbApplet \(NiagaraAX 3.0 only\)](#)
- [Install and start EasService](#)
- [Configure EasService](#)

In addition to these tasks, if you don’t have the Java plug-in installed, the first time you run VES you need to install the Java plug-in, as described in: “[Start VES and install the Java Plug-in.](#),” page 2-8.

Install the eas module

Step 1 Using Windows Explorer, navigate to the directory that contains the eas.jar file. See figure [Figure 2-4](#).

Figure 2-4 eas.jar and easdemo.jar files.

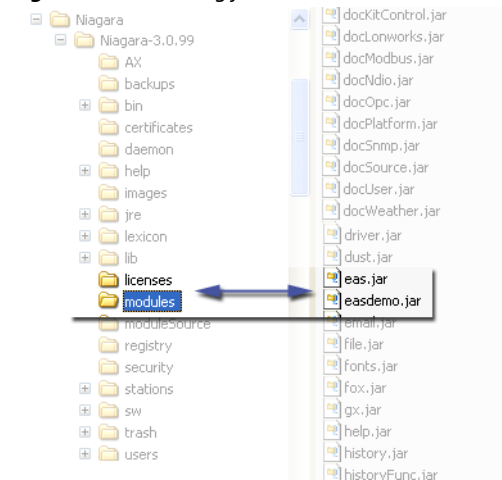
eas.jar	7,410 KB	Executable Jar File
easdemo.jar	2,848 KB	Executable Jar File

Step 2 Select and copy the eas.jar file.

Note: Copy both the eas.jar file and the easdemo.jar file if you want to have the ability to generate demo data.

Step 3 Paste the copied jar file(s) into your NiagaraAX installation directory, under the /modules folder, as shown in [Figure 2-5](#).

Figure 2-5 Pasting jar files into the “modules” folder.



Step 4 Restart any running stations and instances of workbench to complete the module installation.

Note: The module will not appear in the station directory until the station is restarted.

Install the updated wbApplet (NiagaraAX 3.0 only)

This procedure applies only to installations of VES for users of NiagaraAX 3.0. Users of NiagaraAX 3.1 do not need to perform this procedure.

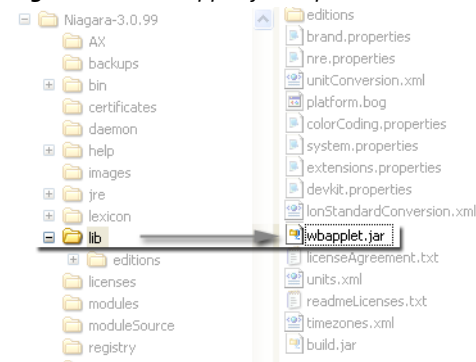
Step 1 Using Windows Explorer, navigate to the directory on your installation CD that contains the wbapplet.jar file.

Step 2 Select and copy the wbapplet.jar file.

Note: If you already have a wbapplet.jar file in your /lib folder, rename it before pasting the new one in the folder if you want to save it. Otherwise, simply allow the new file to overwrite the old one in the following step.

Step 3 Paste the wbapplet.jar file into /lib directory, under the NiagaraAX installation folder, as shown in [Figure 2-6](#).

Figure 2-6 *wbapplet.jar file pasted into the "lib" folder.*



Step 4 Restart the updated station or workbench application.

Install and start EasService

You must put the eas.jar module into the modules directory, as described in [“Install the eas module,”](#) page 2-6, before you can install and start the service in your station.

The following notes apply to installing the EasService:

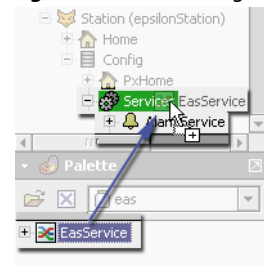
- The host must be licensed for the service.
- A station should have only ONE service of a particular type. Do not add a service that already exists.
- You can verify that the EasService is installed and begin configuring it by double-clicking on the service to display the EasService property sheet
- The EasService is intended only for Web Supervisor stations. It has no use in a JACE station.

Step 1 In workbench, open the eas palette.

The EasService module  appears in the palette.

Step 2 Copy and paste the EasService module into the station Services directory, as shown in [Figure 2-7](#).

Figure 2-7 *Installing the EasService under the Station Services directory.*



The EasService is installed.

Configure EasService

Before configuring the EasService, you need to have a database installed and you must have a user name and password that provides administrative privileges to the database. Refer to [“Installing MSDE 2000 Release A,”](#) page 2-11 for information about installing a database.

Step 1 In the station nav tree, under the Config>Services node, double-click on the EasService icon.
The EasService property sheet displays.

Step 2 In the EasService property sheet, expand the Database Configuration node.
The Database Configuration properties display.

Step 3 In the **Database Type** field, select the type of database you are using. Choices are:

- Sql (use this option for SQL or for MSDE)
- Oracle

Step 4 In the **Host Address** field, select the type of connection (IP or dialup) and enter the IP address of the database host.

Step 5 In the **port** field, enter the desired port number (default port is 1433 for SQL and it is 1521 for Oracle).

Step 6 In the **Database User** and **Password** fields, type in a username and password that provides administrative privileges for access to the database.

Step 7 In the **Sql Server Create New Database** field, choose true if you want to create a new database with this installation. Choose **false** if you want to connect to an existing database.

Note: The *Sql Server Create New Database* property only works for local instances of *Sql Server*. If you set this property to true for a remote instance of *Sql Server*, it will have no effect (it will not create a new database).

Step 8 In the **Sql Server Database Name** field, type in a database name, as follows:

- If you are creating a new database, enter the desired name of your new database. If no name is entered, a database name is created that is the same as the station name.
- If you are connecting to an existing database, type in the name of the existing database. If you don't enter a name, the connection will look for a name that matches the station name. If no match is found, the connection fails.

Step 9 If the station is not connected already, right-click on the Database Configuration component, in the property sheet, and select **Actions > Open Database** from the popup menu.
The Database should connect (Database Connected property displays **true**).

Note: If any problems are encountered while opening the database, the *EasService "Fault Cause"* property should display a reason for the fault. If the *EasService* is in fault (for example, if the database is closed) then VES will not operate properly.

Starting VES from the client browser

The Java Plug-in is used to display the VES configuration and report tools from within a browser view.

Note: If you do not have a Java Plug-in already installed on your system, the *EasService* should automatically start an installation of the Java Plug-in the first time that you run VES in your browser

- Opening the VES Home Page (which is an HTML-only page) does not start the Java Plug-in installation; you must select a report or a configuration screen.

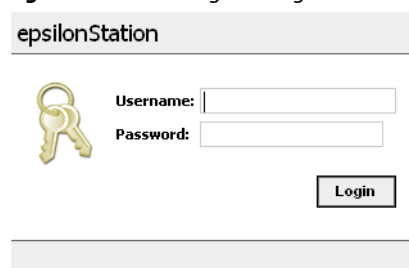
Start VES and install the Java Plug-in.

This procedure describes the Java Plug-in installation process.

Step 1 After installing the VES software, open the client web browser and go to the following URL: `http://<hostname>/eas`
where `<hostname>` is the name, IP address, or localhost of the Web Supervisor workstation with the installed VES software.

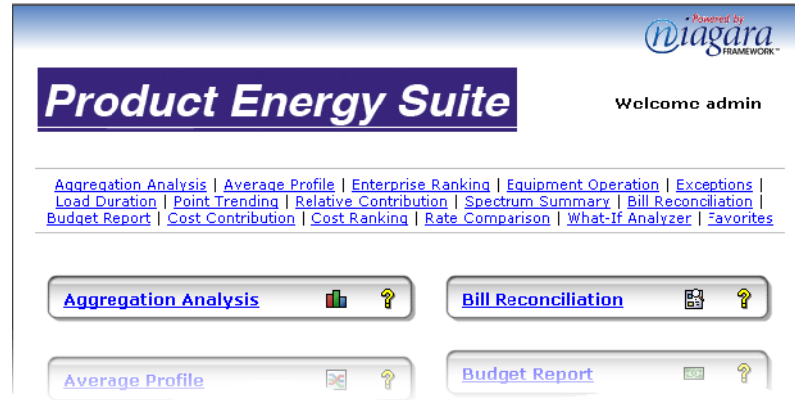
The VES login page displays, as shown in [Figure 2-8](#).

Figure 2-8 VES login dialog box.



Step 2 Enter appropriate (station) login information to gain access to the VES home page.

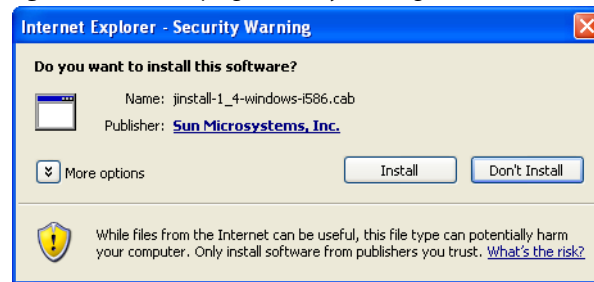
Figure 2-9 VES home page.



The VES home page displays.

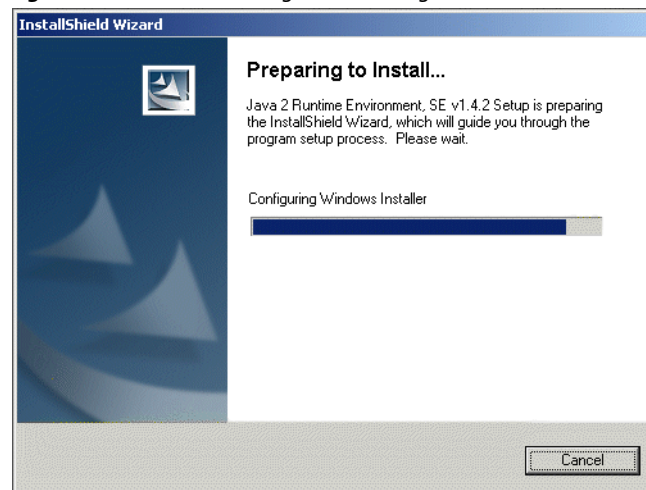
- Step 3** From the VES home page, select any report type by clicking on its link. Unless you already have the required Java Plug-in installed, a browser Security Warning dialog box appears to ask permission to install the Java Plug-in.

Figure 2-10 Java plugin security warning



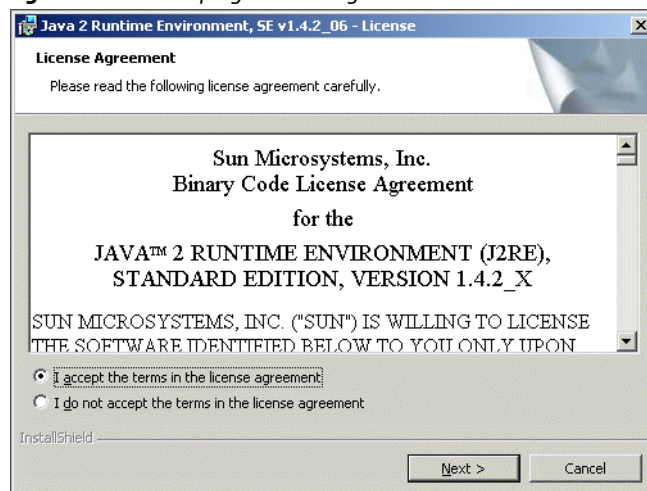
- Step 4** Click the **Install** button.
An installation routine for the Java Plug-in is launched.

Figure 2-11 Installer configuration dialog box.



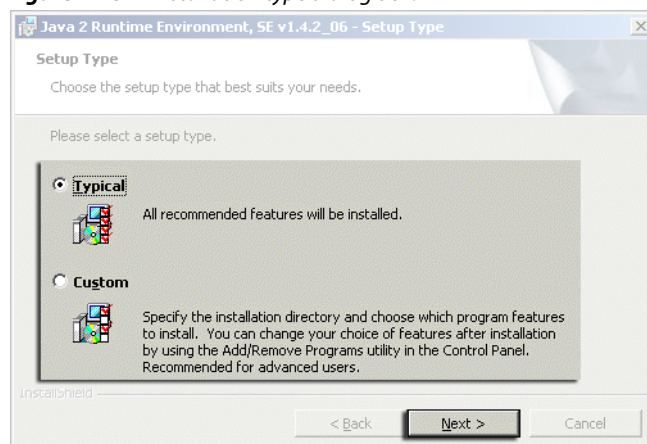
- Step 5** Click Yes or (Next) if prompted to install and run the Java 2 Runtime Environment.
- Note:** A software license agreement screen appears during installation of the Java plug-in. This is for the Java plug-in, not for the VES software product.
- The installation wizard prompts you to accept the License Agreement.

Figure 2-12 Java plugin license agreement.



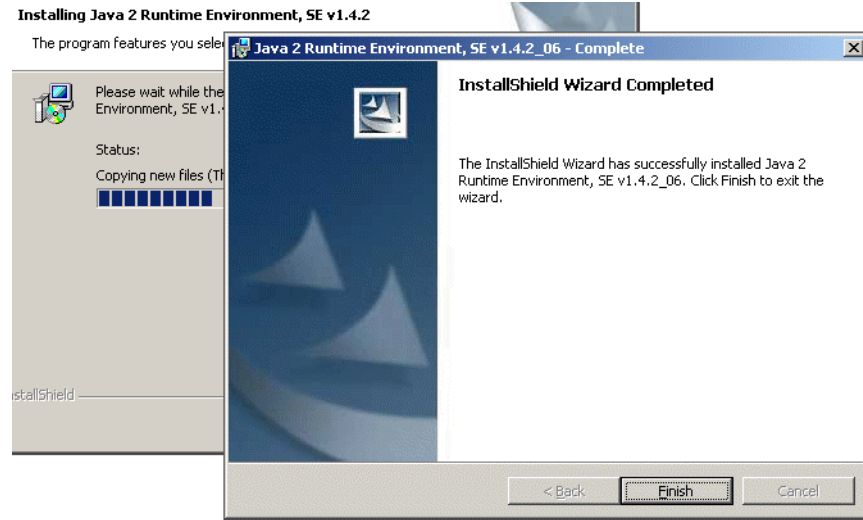
- Step 6** Select the “I accept...” option and click the **Next** button.
The **Installation Type** dialog box appears:

Figure 2-13 Installation type dialog box.



- Step 7** Select the “Typical Installation” option and click the Next button.
A progress bar is displayed for each software module as it is installed until the Java Plug-in installation is completed.

Figure 2-14 Installation complete dialog box.



- Step 8** Click the **Finish** button. If you are prompted to enter a password, enter the appropriate station login credentials and click the **OK** button.
The requested VES report displays in the browser.

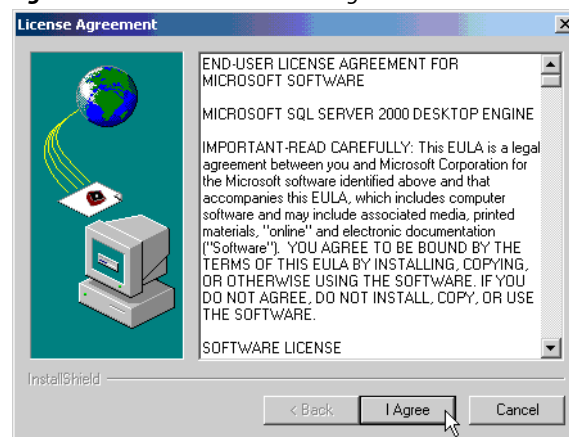
Installing MSDE 2000 Release A

VES requires the support of a relational database. Perform this procedure only if you do not already have a relational database installed.

Note: *This process was documented on 3/1/06. The links to the Microsoft website, along with the installation steps are subject to change based on Microsoft's terms. This is provided as a reference only. Individual installations may require customization.*

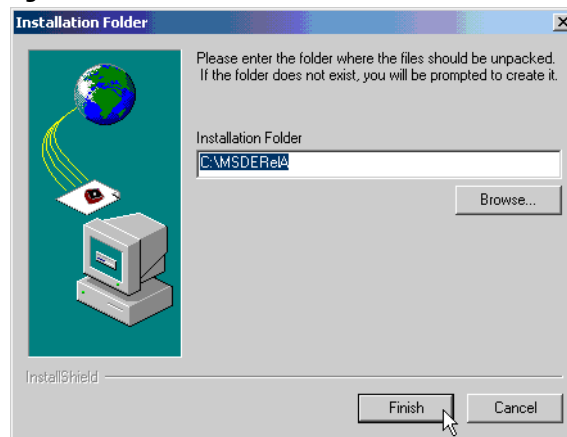
- Step 1** Download and the following installation executable (MSDE2000A.exe) from the Microsoft website and save it on your desktop or other convenient location: <http://www.microsoft.com/downloads/details.aspx?FamilyID=413744d1-a0bc-479f-bafa-e4b278eb9147&DisplayLang=en>
- Step 2** Double-click on the MSDE2000A.exe file to start the installation wizard.
The following license agreement dialog box appears as one of the wizard screens.

Figure 2-15 MSDE 2000 license agreement.



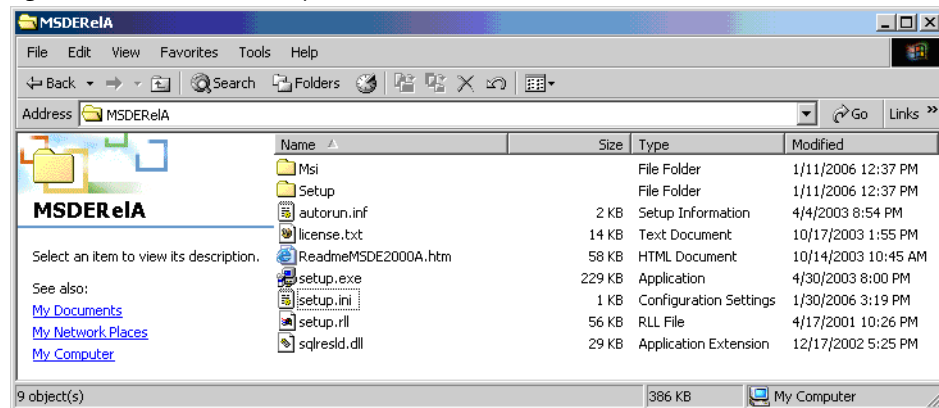
- Step 3** Read the license agreement and click the **Agree** button to continue installation.
- Note:** *The remainder of the MSDE installation occurs after you unpack the setup files. The next step simply specifies where to unpack the setup files. In most cases, you can just use the default and click the **Finish** button.*
- The **Installation Folder** dialog box appears, as shown in [Figure 2-16](#).

Figure 2-16 MSDE 2000 installation folder.



- Step 4** Using Windows Explorer, navigate to the directory where you unpacked the setup files. The default location is C:\MSDERelA as shown in Figure 2-17.

Figure 2-17 MSDE 2000 setup files.



- Step 5** Specify appropriate setup parameters by editing the setup.ini file (use WordPad or another text editor) as follows:

Note: The setup parameters in the setup.ini file are used to configure MSDE so that VES is able to connect to it. Following are two examples of how you can modify the setup.ini file. Other optional modifications are possible. Refer to appropriate MSDE documentation for more details: (http://download.microsoft.com/download/d/5/4/d5402c33-65de-4464-9d82-d1de2971d9db/ReadmeMSDE2000A.htm#_downloading_and_extracting_sp3).

The following setup.ini file causes MSDE to be installed with a blank system administrator password (i.e. the password for the 'sa' user):

```
[Options]
BLANKSAPWD=1
DISABLENETWORKPROTOCOLS=0
SECURITYMODE=SQL
```

Or, if you desire, you can modify the setup.ini file to specify a default strong system administrator password (i.e. the password for the 'sa' user):

```
[Options]
SAPWD="AStrongPassword"
DISABLENETWORKPROTOCOLS=0
SECURITYMODE=SQL
```

- Step 6** Save any changes you make to the setup.ini file.

Note: If you set a system administrator password or add other users/passwords, then you must be sure to enter the matching user/password in the EasService property sheets (under the 'Database Configuration' sub-property). This is required in order for VES to connect to MSDE. Refer to "Configure EasService," page 2-7 for more details.

Once you have modified the setup.ini file, you are ready to run the setup.exe.

Step 7 Navigate to the directory where you unpacked the setup files (same as in step 3 and step 4, the default is C:\MSDErelA), and run the setup.exe.

This completes the installation process after a few minutes.

After the installation has completed, verify that the MSDE service has started by doing one of the following steps.

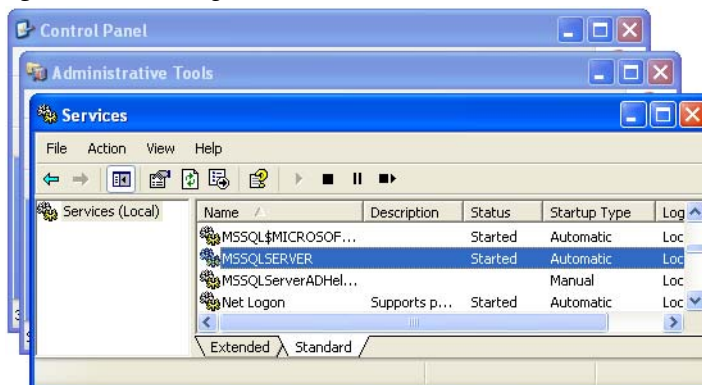
Step 8 Restart the computer, so that the MSDE service automatically starts after reboot.

OR do the following step:

Step 9 Manually start the MSDE service, as follows:

- Open the **Services** window by opening, consecutively, the following windows: **Control Panel**, **Administrative Tools**, **Services** (see Figure 2-16).
- Start the 'MSSQLSERVER' service if it is not already started.

Figure 2-18 Starting MSSQL Service



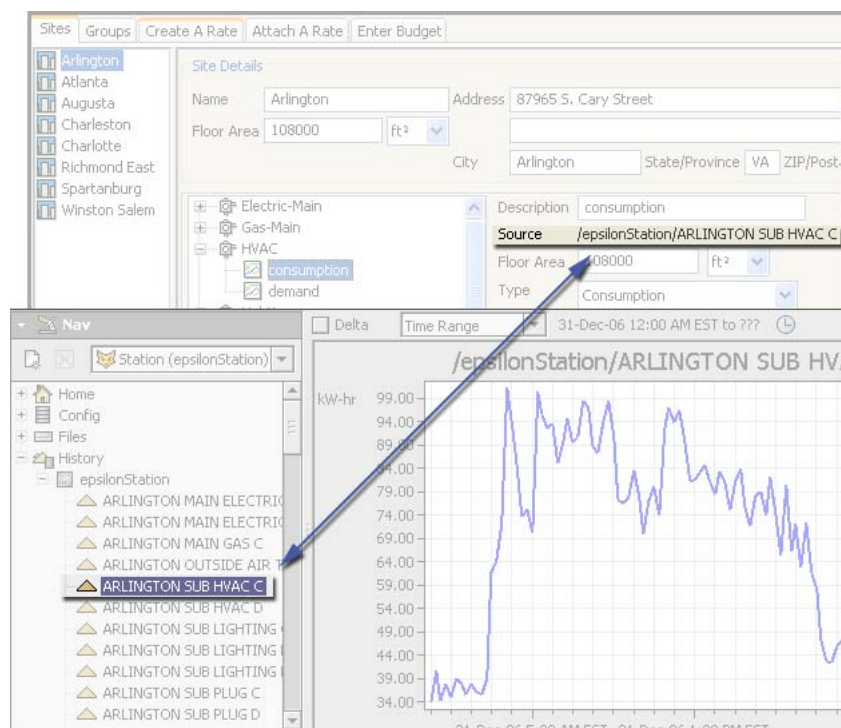
Note: By default, this service should start automatically whenever the computer is rebooted. However, the first time you install MSDE, it may not start automatically, so you can manually start it here (or simply reboot to have Windows start it automatically)

CHAPTER 3

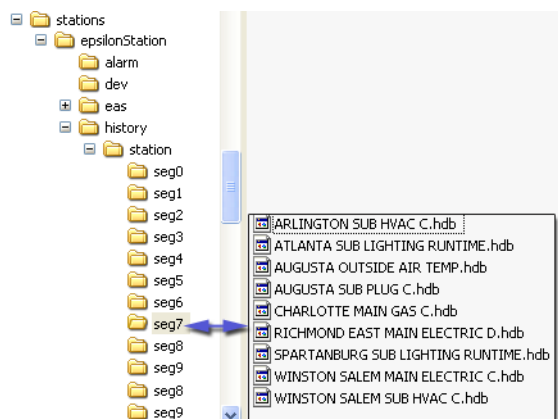
Configuring VES

When you configure VES, you create a data architecture in which the highest item in the architectural tree is a Site definition. As you add data points, they map to individual history files in the station's history database (see [Figure 3-1](#)).

Figure 3-1 Data point - history relationship.



The NiagaraAX histories are stored in a time-series database. This is a highly optimized database that allows the time-series data reports to generate faster than would be possible using a relational database. When you are finished adding all of your data points, you have a configured, multi-level data tree structure with Sites, Meters, Sub-meters, and data points.

Figure 3-2 History files under the station directory.

Configuring Sites and Groups

A Site is a collection of points in the eas database that corresponds directly to history log archives in the NiagaraAX station database.

Note: The maximum number of points (E2 Profiler) and the maximum number of meters (Cost Profiler) allowed is specified in the license file of the Web Supervisor (see [“Licensing Information,”](#) page 2-2).

The Site configuration function is where you establish which NiagaraAX history logs are to be considered as part of the VES database. Each history log archive that needs to be tracked in VES must be added as a data point in a Site.

Figure 3-3 Site Configuration screen.

Property	Value	Unit
division	Services	Alphanumeric
region	Southeast	Alphanumeric
utilityProvider	Duke	Alphanumeric

Generally, the following three steps comprise the site and group configuration process:

- [Adding a Site](#)
- [“Adding Meters and Data Points”](#)
- [“Adding Groups and Subgroups”](#)

Site Naming Conventions

When creating new sites, it is a good practice to keep site names clear, concise, and relevant. A good way to do this is by naming sites using only their unique properties as part of the name and relying on the inherent properties and units of the data to provide sufficient additional nomenclature.

For example, if you have a site named “Main Plant,” then an HVAC consumption meter within that site could be named “Electric HVAC”. It is unnecessary to repeat the term “Main Plant” in the meter name since the meter will be under the “Main Plant” in the tree view and obviously be part of that site.

Within the configuration function, in addition to creating Sites, you can create Groups and Subgroups. For more information about Groups and Subgroups, refer to [“Adding Groups and Subgroups,”](#) page 3-5.


Adding a Site

The following procedures describe how to use your Web Supervisor PC to add a site to the VES database.

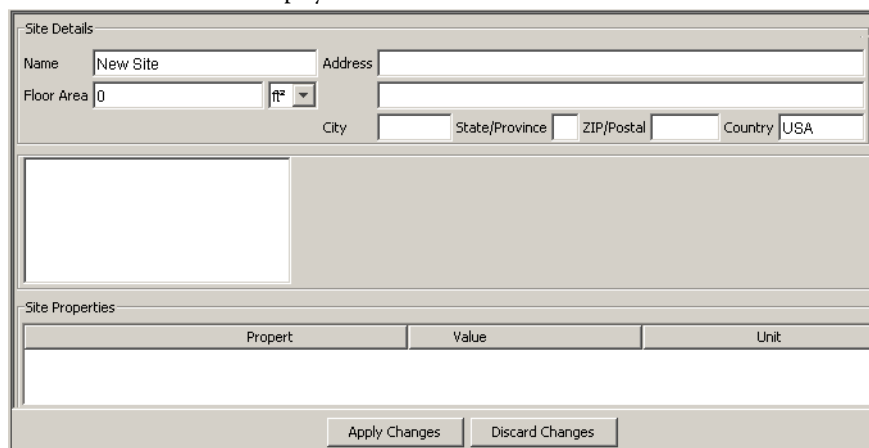
Launching the Configuration Tool.

- Step 1 Launch VES from your browser using the following URL: `http://hostname/eas`
The Enter Network Password dialog box should appear.
- Step 2 Enter appropriate login information to gain access to the VES home page.
- Step 3 From the VES home page, clicking on the Configuration link.
- Step 4 Enter your security information for the Java Plug-in, if required.
The Configuration tool screen appears.

Creating a new Site

- Step 1 In the Configuration tool, click the **Create New Site** button. .

The Site Details window displays.



- Step 2 In the Name field, type the name of your site. (for example, **Charlotte**)
- Step 3 In the **Address** field, type the address of your site.
- Step 4 Continue filling in the following details:
 - Floor area: (in square feet)
 - City
 - State
 - Zip Code
 - Country
- Step 5 Click **Apply Changes**
The site now exists.

Note: *Even though the site exists, you still need to associate a data point with the site.*

Adding Meters and Data Points


It is a good practice, though not required, to put data points under meters, especially if you are using, or plan to use Cost Profiler. However, some types of data – outside air temperature (OAT) values for example, would not normally go under a meter. Consumption and demand points, on the other hand, should always go under a meter.

To add meters and data points to your new site, perform the following procedures:

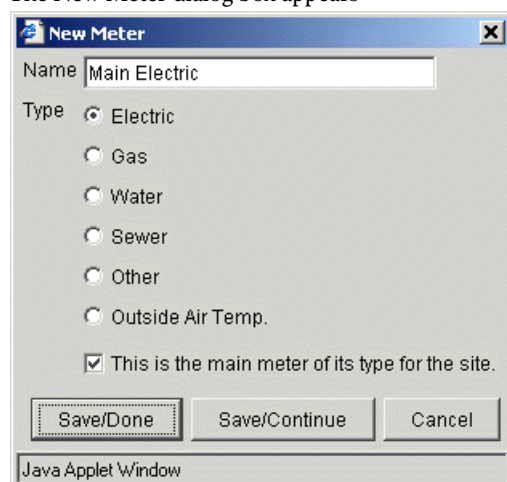
- [“Adding a Meter”](#)
- [“Adding a Data Point”](#)

Adding a Meter

- Step 1 Select the site in the tree that you want to add meters and points to.

- Step 2 On the Configuration tool screen, click the **New Meter** button. 

The New Meter dialog box appears

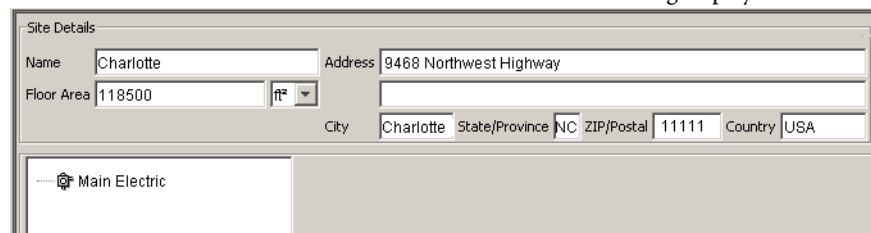


The New Meter dialog box is a Java Applet Window. It contains a text field for 'Name' with the value 'Main Electric'. Below it, the 'Type' section has radio buttons for 'Electric' (selected), 'Gas', 'Water', 'Sewer', 'Other', and 'Outside Air Temp.'. There is a checkbox labeled 'This is the main meter of its type for the site.' which is checked. At the bottom are three buttons: 'Save/Done', 'Save/Continue', and 'Cancel'.

Note: Only one Main Meter (for each meter type) is allowed per site.


- Step 3 In the New Meter dialog box, type in the name of your meter and select the appropriate **Type** option. Also, if appropriate, check the box that indicates that this is the main meter of its type for the site.
- Step 4 Click the **Save/Done** button.
- The New Meter dialog box disappears and the new meter appears in the display tree for your site.
- Step 5 Click the **Apply Changes** button

The new meter is added. Your results should look like the following display.

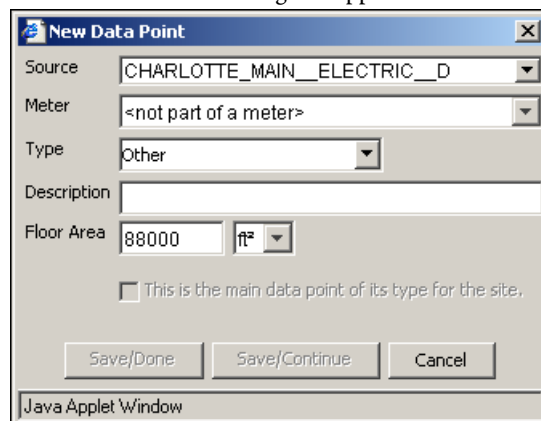


The Site Details display shows a form with the following fields: 'Name' (Charlotte), 'Address' (9468 Northwest Highway), 'Floor Area' (118500 ft²), 'City' (Charlotte), 'State/Province' (NC), 'ZIP/Postal' (11111), and 'Country' (USA). Below the form, there is a tree view showing a folder icon and the text 'Main Electric'.

Adding a Data Point

- Step 1 Select the site or meter that you want to add a data point to and then click on the **New Data Point** button. 

The **New Data Point** dialog box appears.



The New Data Point dialog box is a Java Applet Window. It contains a 'Source' dropdown menu with the value 'CHARLOTTE_MAIN_ELECTRIC_D'. Below it, the 'Meter' dropdown menu has the value '<not part of a meter>'. The 'Type' dropdown menu has the value 'Other'. There is a 'Description' text field. Below it, the 'Floor Area' text field has the value '88000' and a unit dropdown menu set to 'ft²'. There is a checkbox labeled 'This is the main data point of its type for the site.' which is unchecked. At the bottom are three buttons: 'Save/Done', 'Save/Continue', and 'Cancel'.

Note: When using the **Source** list, be careful when selecting your desired data point. If you confuse data points from similarly spelled sites (i.e., Charlotte vs. Charleston) your report data will be incorrect.

- Step 2 Select a data point source from the data Source list. This list includes all the histories that are not already used and are “numeric” or “boolean” data types.

- Step 3 Select a meter from the Meter list and a type (consumption, demand, etc.) from the **Type** list, as shown below

The left screenshot shows a form with the following fields: Meter (Main Electric), Type (<not part of a meter>), Description (<type new meter name here>), Floor Area (Main Gas), Plug Load (HVAC), and Time Zone (Lighting). The right screenshot shows a form with the following fields: Type (Other), Description (Consumption), Power Factor (Demand), Reactive Energy (Power Factor), Apparent Energy (Reactive Energy), Reactive Power (Apparent Energy), Apparent Power (Reactive Power), and Other (Other).

- Step 4 Complete any remaining fields, as required (Description, Unit, Floor Area, and Time Zone) to create an appropriate data point.
- Step 5 Click **Save/Continue** and repeat steps Step 2 through Step 4 until you have added all your desired data points.
- Step 6 Click **Save/Done** to complete adding your data points.

The screenshot shows a tree view of data points. The tree view shows a hierarchy of data points: HVAC, Lighting, Main Electric, Main Gas, Plug Load, Outside air temperature, and Lighting runtime. The 'Main Electric' meter is expanded, showing 'Consumption' and 'Demand' data points. Arrows point to these data points with labels: 'New data points added under Main Electric meter' and 'Data points added directly under Site'.

Your results should appear similar to the above illustration.

- Step 7 Click the **Apply Changes** button. You have now finished creating your site.

Adding Groups and Subgroups

After points are created in the VES database, you can recombine these points into multiple different functional collections called Groups. You can also create Subgroups to further sort your data points within Point Groups. A single point may coexist in multiple groups. There is no limit to the number of Groups or Subgroups that you can create.

By identifying data points as part of a saved “Point Group”, you can reduce the need to manually find and select individual points over and over again. For example, a maintenance supervisor in the Midwest Region may frequently need a report on chiller points in Indiana. Instead of having to individually select the same chiller points each time a report is generated, a “Chiller_IN” Point Group can be created that contains that set of points. The supervisor can then refer to this group each time a new report on those data points needs to be created.

Point groups can be edited or deleted without affecting the actual data points in the database, since groups are simply functional collections of the data points for the purpose of running the reports. Deleting the data point from a group or deleting a group does not delete the actual data point record from the database.

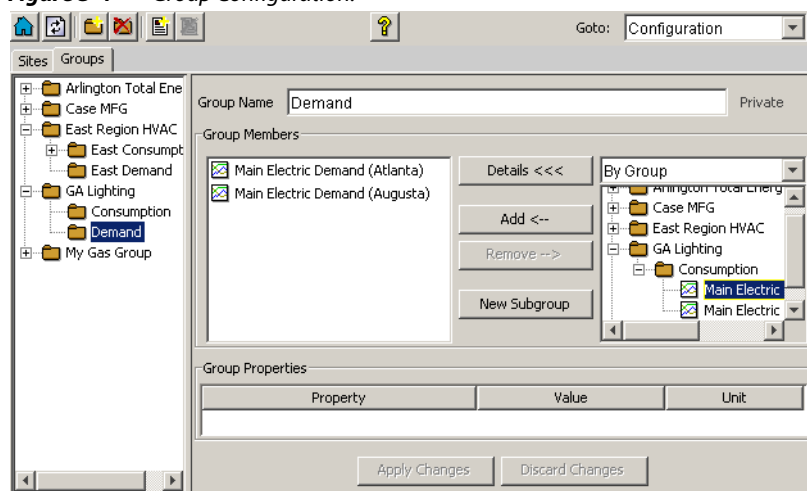
Note: For a user to create Sites, the user must have Admin Write permissions in the station. For a user to create Groups, the user must have Operator Write permissions. To make Groups public, the user must have Admin Write permissions.

Public groups

Users with Admin rights can create public groups; without Admin user rights you can only create groups for your own use.

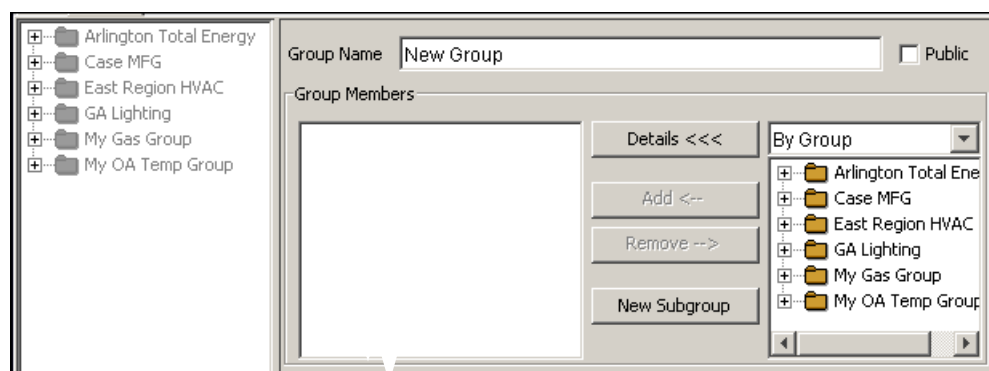
The following is a sample view of a Group within the Configuration tool.

Figure 3-4 Group Configuration.



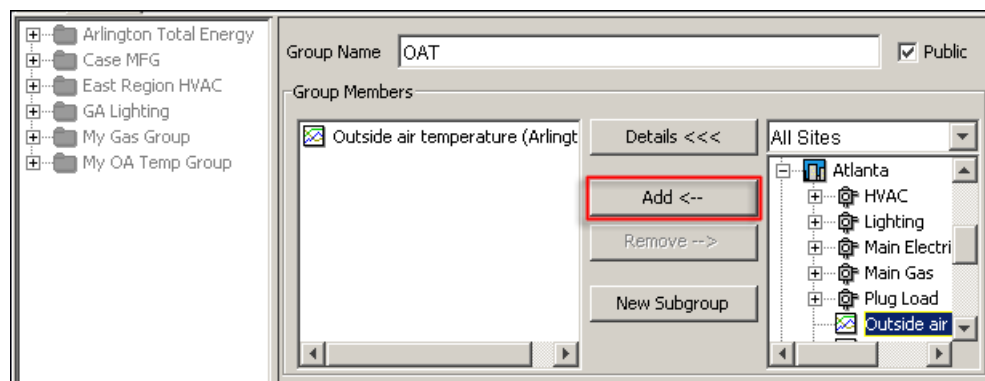
Creating a Group.

- Step 1 In the Configuration tool, click the **Groups** Tab and select **Create New Group**. 



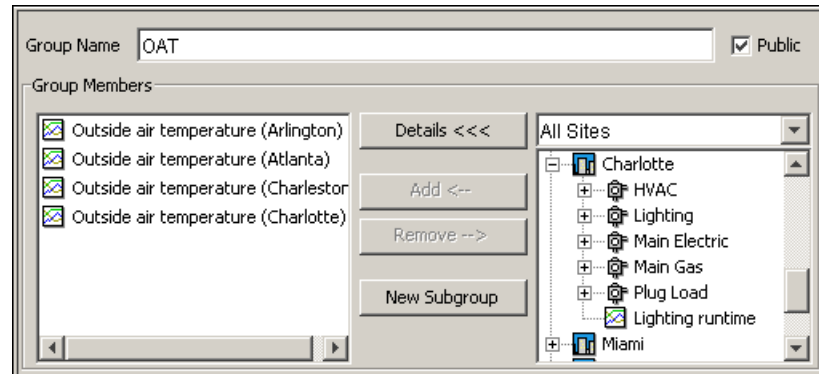
You should now see a Group Details window as shown above.

- Step 2 In the Group Name field, type the desired group name.
- Step 3 Click in the Public option check box to make this group available to all users
- Note:** Only users with Admin Write permissions can create public groups. Public groups can be viewed and used by all users. When you create a private group, only you and users with Admin read permissions will be able to see the group.
- Step 4 In the right column, pull down the Group categories and select All Sites.
- Step 5 Click on the plus sign beside the desired site to expand the site in the tree and then select the dat23a point that you want to add.
- Step 6 With the desired data point selected, click the **Add** .button, as shown below:



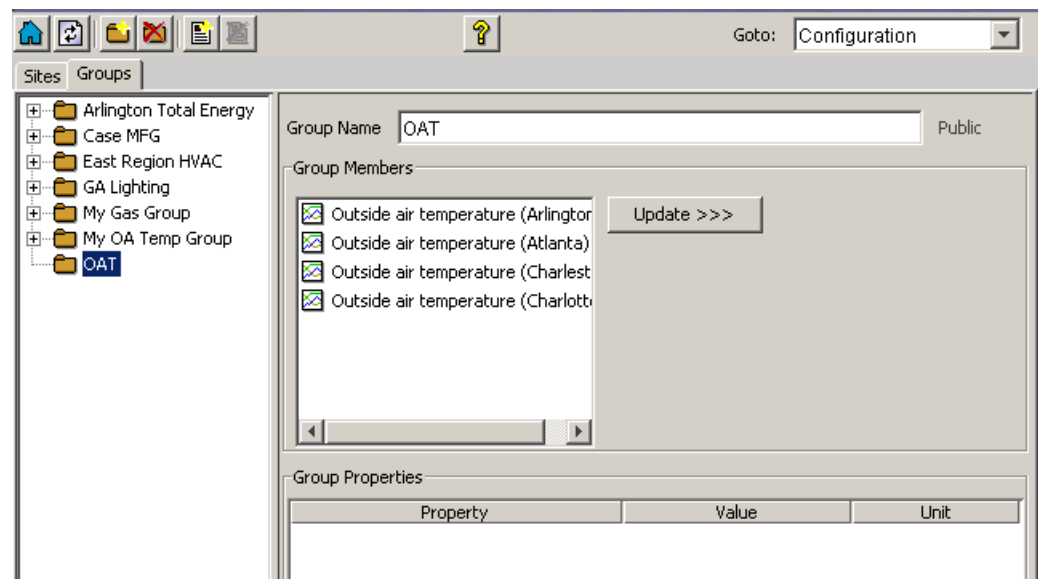
The data point should move from the right column to the left-hand column. Note that the data point is no longer in the right-hand column.

- Step 7 Repeat steps 5 and Step 6, above, to add the remaining desired data points to your group. You can hold down the **CTRL** key to select multiple data points.



Your screen should now look similar to the above graphic.

- Step 8 Press **Apply** to save the group configuration and complete the creation of your new group.

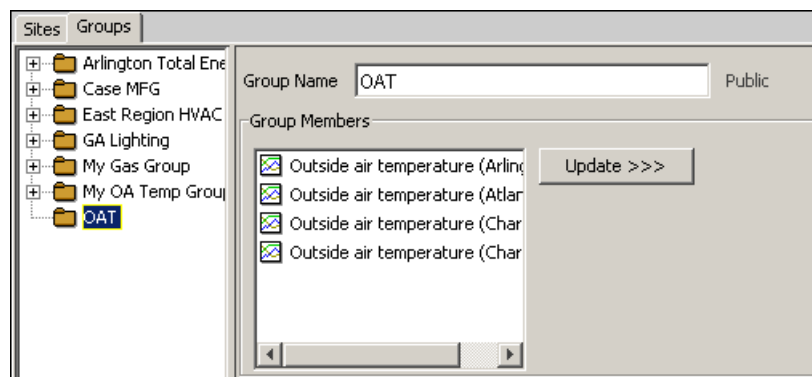


Your completed group window should look like the above graphic.

Note: Using the Subgroup function allows you to manage your groups more efficiently by creating collections of data points in categories that make sense to you.

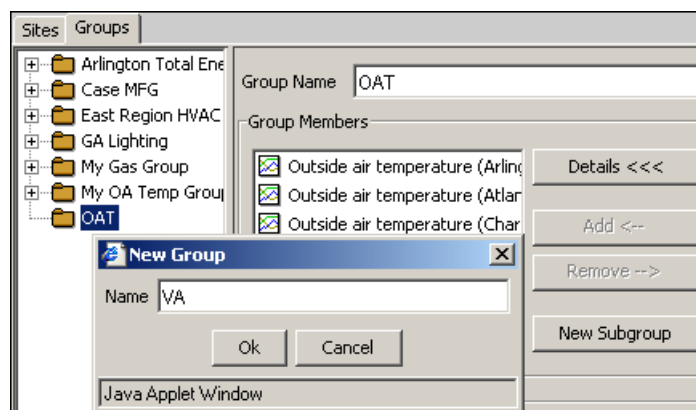
Creating a Subgroup.

- Step 1 In the Configuration tool, with the Groups Tab selected, select the Group to which you would like to add a Subgroup and click **Update**.

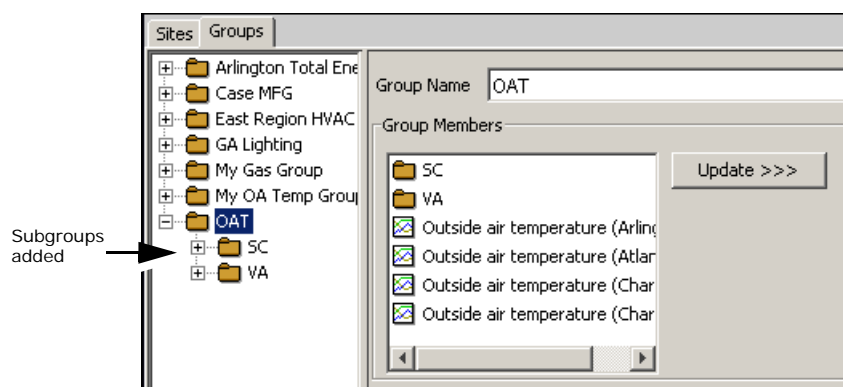


The New Subgroup button appears.

Step 2 Click **New Subgroup**, type the desired name of the new Subgroup in the Name dialog box and click **OK**.



Step 3 Repeat the above steps to add more Subgroups, if desired. When you have added all the Subgroups that you want, click **Apply Changes** to complete the procedure.



The new Subgroup(s) will appear in your tree view, as shown above.

Working with Rates (Cost Profiler)

Before using Cost Profiler to generate reports, you must create and define the rates that apply to your needs. Once you create your rates, you must attach them to the appropriate meters and then you are ready to run Cost Profiler reports. The following sections describe how to create rates and attach rates to your meters:

- [“About Create A Rate”](#)
- [“About Attach A Rate”](#)

About Create A Rate

As the foundation of Cost Profiler, Create A Rate is a sophisticated rates modeler that handles various rate types or components, allowing you to enter tariff rates from utility companies so you can create cost reports. All rates used in Cost Profiler are manually entered and maintained by the user. Once entered, the rate is kept in the rates database (XML file in station file system) that can be emailed and imported into other projects. The web based application provides cost reporting using any standard web browser. The “Create A Rate” process includes the following tasks:

1. Create a new rate
2. Add rate details
3. Add rate components
4. Add rate component details
5. Schedule a Rate Component

Figure 3-5 Create A Rate Process.

- **Rates Pane**

The rates window on the Create A Rate tab displays all rates, or may be filtered to show selected rates.

Figure 3-6 Rates Pane.

- **Rate Details Pane**

Once a new rate has been entered, you need to specify the energy provider, phone number, website, currency, consumption and demand units of the rate. The location should be that of the energy provider, not the site, as this will allow the user to easily link to their site or call their phone when issues require. Websites and emails should be filled in as they become hyperlinks in the Cost Profiler application. To add details, simply fill out the fields in the Rate Details pane, as shown in Figure 3-7.

Figure 3-7 Rate Details Pane.

The screenshot shows the 'Rate Details' pane with the following fields and values:

- Name: Prorated
- Energy Provider: Star Energy
- Provider Phone: 888.222.1338
- Provider Website: www.star.energy.com
- Location: Universal City
- Currency: \$
- Consumption Units: kWh
- Demand Units: kW
- Reactive Energy Units: kVARh
- Apparent Energy Units: kVAh
- Reactive Power Units: kVAR
- Apparent Power Units: kVA

There is a 'Hide Units <<' button located between the Consumption/Demand Units and the Reactive/Apparent Energy/Power Units sections.

- Default Units for Reactive and Apparent Energy and Power**
 The “More Units” button displays or hides a set of options that allow you to set the default units for reactive and apparent energy and power rate components. Unit options are listed below.
 - Reactive Power units
 - VAR, kVAR, MVAR
 - Applied Power units
 - VA, kVA, MVA
 - Reactive Energy units
 - VARh, kVARh, MVARh
 - Applied Energy units
 - VAh, kVAh, MVAh
- Available Components Pane**
 This pane contains all the rate components that you have to select from. Add these to your active rate components by selecting the desired rate component in the Available Components pane and then select “Add Rate Component” from the right click menu or select “Copy” from the right click menu and paste the component into the Rates Component pane. You can also simply double-click the component to add it.
 You can also paste into the Available Components pane if you want to save and re-use any pre-configured rate components from the Rate Components pane. By doing this, you may build up a “library” of pre-configured rate components that will be saved and available for future use.

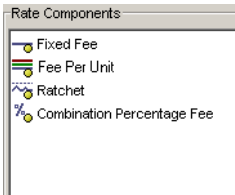
Figure 3-8 Available Components Pane.

The screenshot shows the 'Available Components' pane with the following components listed:

- Fixed Fee
- Fee Per Unit
- Peak Charge
- Ratchet
- Historical Ratchet
- Combination Percentage Fee
- Choice Component
- Scheduled Fee Per Unit
- Scheduled Peak Charge

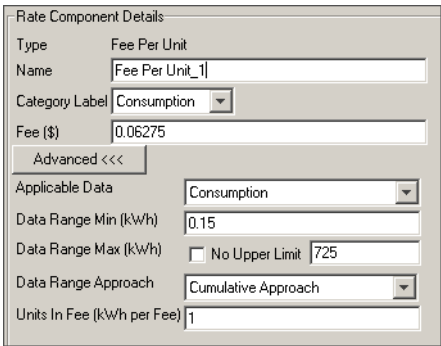
- Rate Components Pane**
 This pane displays all rate components that have been added to the rate. To see details about a rate component, you must select it.

Figure 3-9 Rate Components Pane.



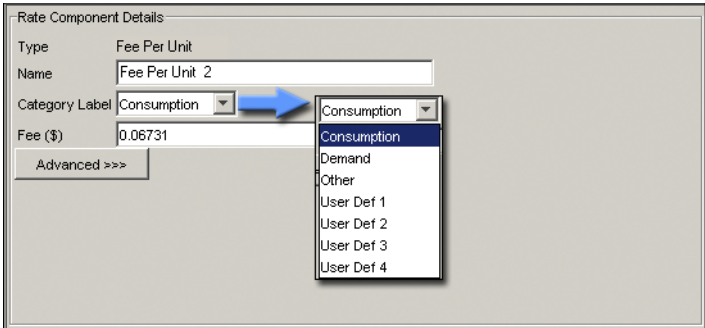
- **Rate Component Details Pane**
Once you add the desired components to your rate, use the Rate Component Details pane (refer to Figure 3-10) to do the following:
 - change the generic component name to the specific rate component name
 - categorize the component
 - set data parameters, if required
 - assign a fee

Figure 3-10 Rate Component Details Pane.



- **Name**
This field lets you enter any custom name that you want for the rate component. Because the rate component category is defined by the Category Label, the name has no effect on how the rate component is grouped by Cost Profiler.
- **Category Label**
There are three categories of components plus four user defined labels. You must categorize each rate component to allow reporting in Cost Profiler between rates that don't name components the same, or that have different levels of a single component. For example, if one rate has three demand charges for different times of day and another rate in the same report has only one, categorizing the three demand charges in the former rate will allow the user to compare the total demand charges for each rate.

Figure 3-11 Category Label.



Note: It is very important to define the category for each rate component. These categories are used in several Cost Profiler reports. Each of the seven generic rate components has a default category but can be manipulated depending on the rate.

The following table defines the default category for each generic rate component:

Table 3-1 Generic rate component default category.

Rate Component	Default Category
Fixed Fee	Other
Fee Per Unit	Consumption
Scheduled Fee Per Unit	Consumption
Peak Charge	Demand
Scheduled Peak Charge	Demand
Ratchet	Demand
Historical Ratchet	Demand
Combination Percentage Fee	Other
Choice Component	Other

- **Fee**
This field is used to enter a fixed (flat) fee per billing cycle, if you are using a fixed fee rate component. Otherwise, it is a fee per unit (demand or consumption).
 - **Original Fee**
This field is used with the Scheduled Fee Per Unit rate component and with the Scheduled Peak Charges rate component. Use this field to enter the fee that is in effect **before** the “[Transition Time](#)”.
 - **New Fee**
This field is used with the Scheduled Fee Per Unit rate component and with the Scheduled Peak Charge rate component. Use this field to enter the fee that is in effect **after** the “[Transition Time](#)”.
 - **Transition Time**
This field is used with the Scheduled Fee Per Unit rate component and with the Scheduled Peak Charge rate component. Use this field to specify the exact time that the “[Original Fee](#)” ends and the “[New Fee](#)” begins. Enter the day, month, year, hour, and minute that the change takes place.
 - **Transition Approach**
This field is used with the Scheduled Fee Per Unit rate component only. Use this field to choose one of two options that are available for calculating the cost during the billing cycle when the transition occurs. The two transition approaches: Pro-Rated and Absolute, are described below:
 - **Pro-Rated**
This option is the default option for the Transition Approach field and is the underlying method that is always used for the “[Scheduled Peak Charge](#)” rate component. It uses the information about a billing cycle’s “[Transition Time](#)”, start time and end time, and calculates two Pro-Rate Factors. The Pro-Rate Factors are then used with the “[Original Fee](#)”, the “[New Fee](#)” and the Consumed Units (or Peak Units for Scheduled Peak Charge) to calculate the total cost, as shown in the following equations:

$$\text{ScheduledFeePerUnitCost} = \frac{\text{OriginalFee} \times \text{ConsumedUnits} \times \text{ProRateFactor1}}{\text{OriginalFee} \times \text{ConsumedUnits} \times \text{ProRateFactor1} + \text{NewFee} \times \text{ConsumedUnits} \times \text{ProRateFactor2}}$$

$$\text{ScheduledPeakChargeCost} = \frac{\text{OriginalFee} \times \text{PeakUnits} \times \text{ProRateFactor1}}{\text{OriginalFee} \times \text{PeakUnits} \times \text{ProRateFactor1} + \text{NewFee} \times \text{PeakUnits} \times \text{ProRateFactor2}}$$
 - **Absolute**
This option simply separates the consumption into two time periods. The consumption before the “[Transition Time](#)” is applied to the “[Original Fee](#)”, the consumption after the Transition Time is applied to the “[New Fee](#)” and the two products are summed to calculate the total cost.
- Note:** The consumption level at the time of the transition will be maintained, so that any applicable data range minimum or maximum will observe the appropriate value.
- **Minimum Contract Peak Level**
This is a parameter used to define a “no lower than” value to be used for defining a peak level in a ratchet component. See “[Ratchet](#),” page 3-16 and “[Contract Ratchet](#),” page 3-16 for more details.
 - **Advanced Tab**
The Advanced Tab appears in the Rate Component Details pane when you are working with any of the following types of components:
 - Fee Per Unit
 - Scheduled Fee Per Unit

- Ratchet
- Historical Ratchet
- Peak Charge
- Scheduled Peak Charge

The following fields are available under this tab and give you the ability to enter multi-tiered rates:

- **Applicable Data**

This option provides the choice of different data categories to allow you to choose the type of data to use for a particular rate component calculation. For the Peak Charge, Scheduled Peak Charge, Ratchet, or Historical Ratchet, the default data choice is Demand, but may be changed to Reactive Power or Apparent Power. For Fee Per Unit and Scheduled Fee Per Unit, the default data choice is Consumption, but may be changed to Reactive Energy or Apparent Energy.

- **Data Range Min**

The minimum consumption (or demand) that this rate component is applicable for.

- **Data Range Max**

The maximum consumption (or demand) that this rate is applicable for.

- **Data Range Approach**

The Data Range Approach property applies to all rate components that look at data:

- Fee Per Unit
- Scheduled Fee Per Unit
- Peak Charge
- Scheduled Peak Charge
- Ratchet
- Historical Ratchet

The Data Range Approach property has the following three options that determine how the Data Range Min and Max values are applied:

- **Cumulative Approach**

With this option, if the total units for a billing period exceed the Data Range Max value, then the Data Range Max value is used for the cost calculation. For example, consider a situation where there are two peak charges, both using the cumulative approach. One peak charge has a range of 0 - 100kW and the second has a range of 100kW and above. If the demand for the billing cycle is 150kW, then the cost for the first peak charge is equal to the fee multiplied by 100kW, and the cost for the second peak charge is the fee multiplied by 50kW. The Cumulative Approach is the default Data Range Approach selection.

- **Overall Units Approach**

With this option, the total units for a billing period are used in determining if the rate component is in range. For example, consider a situation where there are 3 peak charges. One charge has a range of 0 - 100kW, the second charge has a range of 100kW-200kW, and the third has a range of 200kW and above. If the total demand for the billing cycle is 150kW, then the cost for the first and third peak charges is zero, and the cost for the second peak charge is its fee times 150kW, since the overall total units for the billing cycle fall within its range.

- **Individual Data Units Approach**

With this option, each individual data point's units over the billing cycle are compared against the data range to determine if the value should be used in the cost calculation. For example, consider a case where there is a peak charge using this approach with a range of 0 - 100kW. As each individual data point (usually at 15 minute intervals) is read, the current kW value is checked to see if it is in range. If it is in range, then the kW value is used in the cost calculation – otherwise it is skipped.

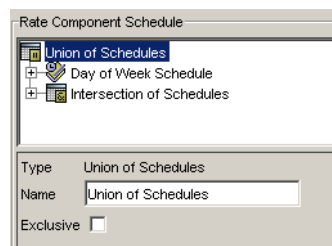
- **Units in Fee**

this field is available for accommodating different fee per unit definitions, if needed.

- **Rate Component Schedule Pane**

The Rate Component Schedule pane is used to add, copy, or remove schedules from a rate component. Refer to [“Types of Schedules,”](#) page 3-19 for details about using the Rate Component Schedule pane.

Figure 3-12 Rate Component Schedule Pane.



Using the Advanced Tab – example

The following conditions may be addressed using the fields under the Advanced tab.

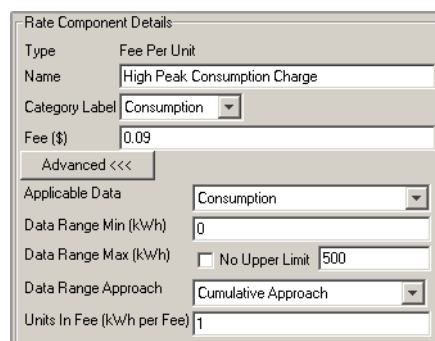
- A rate of 0.09 per kWh is applicable from the first kWh measured for the billing period through 500 kWh.
- The rate per kWh drops to 0.055 per kWh for all kWh over 500.

To enter data to reflect this rate, do the following:

1. In the Rate Components pane, select a Fee Per Unit rate component.
2. Click the Advanced tab. The Advanced tab fields appear.
3. Type in 0 for the Data Range Min value.
4. Type in 500 for the Data Range Max data value.

Note: When the “No Upper Limit” check box is selected, there is no upper limit for the rate.

Figure 3-13 Example of Using Multi-tiered Rates.



5. Add another “Fee Per Unit” component to address the 501st (and higher) unit of energy.

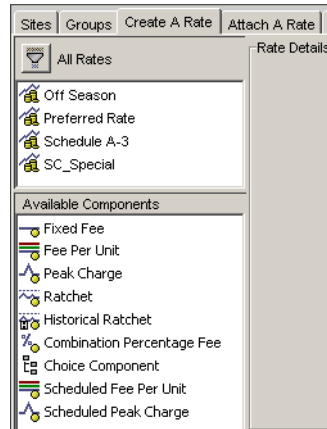
Creating a new rate

You need to create the rates before you can use them.

To create a new rate, do the following:

- Step 1 Right-click on the rates pane and select “New Rate”.
The “New Rate” dialog box appears.

Figure 3-14 New Rate dialog box.



Step 2 Type in the name of your new rate and click “OK”. The new rate is added to the list – details need to be added to the rate.

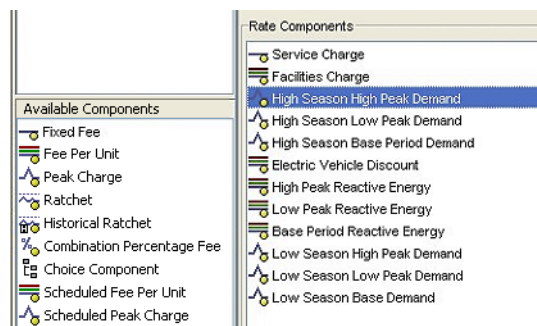
Generic Rate Components

Tariff rates, especially electric rates, can have multiple cost components including demand, consumption, transmission, generation, distribution, and so on. Create A Rate was developed with seven generic cost components that can be mixed and matched to model published tariff rates. Each generic rate component can be manipulated to meet specific rates.

Any single generic rate component or combination of components can be used in a given rate. In fact, it is common for a single component to be used multiple times in the same rate when different schedules or rates apply a single component.

Each of the generic rate components has an icon to remind you of the type of cost component after the name has been changed. For example, shows the name of each component was changed as it was entered, to match the nomenclature used in the rate from the utility. In the left pane of the illustration, the seven generic components are listed. In the right pane, under “Rate Components”, several rate cost components are added and renamed to match those names found in the published rate. There are four Fee Per Unit charges that you can identify by their associated icons.

Figure 3-15 Rate Icons



The generic rate components include the following:

- **Fixed Fee**
The Fixed Fee component is for monthly charges. This fee never varies regardless of the consumption levels. It is most commonly be used for monthly service charges.
- **Fee Per Unit**
This is a charge per unit of consumption (this includes reactive/apparent energy). The consumption can be any commodity or measurement unit including kWh, KBTU, BTU, Therms, CCF, Gallons, etc. This cost component can be used anytime there is a constant charge for consumption. This component can also be used when credits (negative charges) are given per consumption unit.
- **Scheduled Fee Per Unit**
This rate has all the same features as the “Fee Per Unit” rate component but, in addition, it provides several properties that are used for calculations when there is a rate change at some time during the

billing cycle. With this rate, you enter an “Original Fee”, a “New Fee”, and a “Transition Time” and choose from two available methods of calculation: “Pro-Rated” or “Absolute”.

- **Peak Charge**
The Peak Charge cost component is used for demand (this includes reactive/apparent power) and only when there is a peak charge or flow charge. It will generally only be used with electric rates, but when flow charges on gas or other commodities exist in a rate, can be seen in other commodities. The component looks at peak times of usage and applies charges to the highest record in the time period. For electric charges that have changing peak charges seasonally or over the course of a day or week, there can be multiple peak components including on-peak, off-peak, partial-peak, summer, etc.
- **Scheduled Peak Charge**
This rate has all the same features as the “Peak Charge” rate, but in addition, it provides several properties that are used for calculations when there is a rate change at some time during the billing cycle. With this rate, you enter an “Original Fee”, a “New Fee”, and a “Transition Time”.
- **Ratchet**
A ratchet is a charge by the energy provider to the customer that was created to help reduce the asset risk of the utility provider. It is the floor, or lowest level of demand (including reactive/apparent power) that will be charged in a given period. Energy providers implemented ratchet clauses to protect themselves from highly volatile consumption patterns. Because the energy provider is required to provide power 24/7, substantial capacity is unused during off peak periods and assets are under utilized. The greater the range between peak and minimum, the greater unused infrastructure an energy provider must accept. As a hedge for required infrastructure (generation, transmission, distribution, substations) energy providers created a minimum level of demand that will be billed on a monthly or seasonal basis.
There are two types of ratchets: Contract and Historical.
- **Contract Ratchet**
The first ratchet is contract demand, which is based on the size and type of a building, not the historical data for the specific building or account. The energy provider determines the contract demand ratchet when an account is setup, and although the kW level generally doesn't change, different percentages of the kW level may be applied over the course of a year. Contract demand is a generalization that categorizes buildings and accounts into categories such as mid-size fast food service, general use office, and northeast large retail. Because it is a categorization based on generalizations and not historical data, efficient buildings are grouped with non-efficient buildings with similar characteristics, thereby penalizing the more efficient buildings in the category. shows that a fee of \$3.20 is used to apply to the peak demand. If the peak demand for the specified period is higher than 250 kW, then that “higher” demand will be used to calculate the ratchet. Otherwise, the contract ratchet amount will be 250 kW times the fee, or $250\text{kW} \times \$3.20 = \800 .

Figure 3-16 Contract Ratchet Details

Rate Component Details	
Type	Ratchet
Name	Ratchet
Category Label	Demand
Fee (\$)	3.20
Minimum Contract Peak Level (kW)	250
Advanced >>>	

- **Historical Ratchet**
This is (most often) a twelve-month ratchet, which is based on historical data of a specific account. To determine a twelve-month ratchet an energy provider must determine the highest peak over the previous twelve months. Once a peak is determined, a percentage is applied to determine the ratchet level. If the highest peak over the previous twelve months was 2,000 kW and the percentage applied is 50%, the customer will never be charged for less than 1,000 kW. When users reduce their peak, they reduce the minimum they will be billed for. For example, if a 70% factor is used for a 12-month ratchet, and peak kW goes from 2,000 to 1,500, the customer will be charged for 350 kW less ($2000 - 1500 \times 0.7$). This reduction could save the customer tens of thousands of dollars annually.

Figure 3-17 Historical Ratchet Details.

Rate Component Details	
Type	Historical Ratchet
Name	Historical Ratchet
Category Label	Demand
Fee (\$)	2.41
Minimum Contract Peak Level (kW)	0
Percentage	50
Ratchet Lifetime	12
Billing Cycle(s)	
Advanced >>>	

To determine the ratchet level, annual peak must be identified. If less than a year of data exists (new account), the highest peak to date will be the peak and remain in effect for a period of time equal to the “Ratchet Lifetime” setting or until it is surpassed.

- **Percentage**
This helps determine the ratchet level. The twelve month peak is multiplied by a factor to determine the lowest level kW the customer is charged throughout the year. This percentage is user definable. If different percentages are used throughout the year, the appropriate percentage may be applied to corresponding times. For example, if the user runs a report for an account to determine annual costs, Cost Profiler assigns different percentages to the same point during different periods. If the percentage were 50% in the summer versus 60% in the winter, Cost Profiler would adjust accordingly.
- **Ratchet Lifetime**
A twelve-month peak is valid for twelve months from the time it occurs unless it is surpassed over the course of the subsequent twelve months. As a result, Cost Profiler determines when to replace an existing peak with a new one. For example, if 2000 kW is set in June 2001 and isn't surpassed for twelve months, then the highest peak that occurred between June 2001 and June 2002 is the new peak. If that occurs in August of 2001, that peak is only valid for July and August of 2002. As a result, it is important to understand the billing cycle and what month a peak occurred.
- **Combination Percentage Fee**
The Combination Percentage Fee is a component that applies a percentage charge to any cost component or combination of components of charges already entered in the rate. This component will commonly be used for taxes and applied to all or most of the cost components in the rate. This component can not be entered until after components its percentage fee will be applied to be entered.

Note: It is possible to set up a looping condition error with the combination percentage fee component. Make sure that the percentage fee that you set in your rate component does not apply to a component that uses a percentage fee that refers back to this parent component. Refer to [“About Component Looping Error”](#) for more details.

- **About Component Looping Error**
Combination Percentage Fee components may legitimately refer to other Combination Percentage Fee components. However, to avoid a looping condition error, two Combination Percentage Fee components cannot both have each other as target components in their percentage (cost) calculation. One may refer to the other, but both may not refer to each other. For example, **Component A** may refer to **Component B** or **Component B** may refer to **Component A** but **Component A** may not refer to **Component B** if **Component B** refers to **Component A**.
- **Choice Component.**
You can add a Choice Component the same way that you add any other component. However, there are properties of the choice component that you can set to enable comparisons, between “child components.” You add a child component to a Choice Component by copying it from the available components list and pasting the child component directly on the Choice Component in the Rate Component window.
- **Using the “Use Highest” or “Use Lowest” Option**
These two options provide you with a way to select the highest or lowest cost from the list of child components that are entered under the Choice Component. When “Use Highest” is selected, the report uses the child component with the highest cost. When the “Use Lowest” option is selected, the report uses the child component with the lowest cost.
For example, if there is a rate that states that a fee will be applied to EITHER a fee based on the peak kW (demand) OR a fixed fee of \$500, whichever is higher, you would use the Choice Com-

ponent and add two child rate components. The “Use Highest” option uses the child component with the highest cost.

In , the user has configured an “either/or” rate component by adding the generic “Choice Component”, then adding two child components: Peak Charge and Fixed Fee. In this example, the Choice Component configuration will compute the peak charge, then compare to a fixed fee and use the higher of the two.

Figure 3-18 Choice Rate Component Details.

- **Using the “Use Sum” Option**
Another way to use the Choice Component is with the “Use Sum” option. When selected, this option causes the Choice Component to use the cost that is the sum of all its child components. This is useful if you want to have a single line on your bill reconciliation report for a component that consists of multiple sub-components totalled together.
- **Using the “Use Difference” Option**
Another possible use of the Choice Component is the “Use Difference” option. This option, when selected, causes the Choice Component to use the cost that is the difference of all its child components. In this case, the sum of the **second** and all subsequent child components is subtracted from the **first** child component.

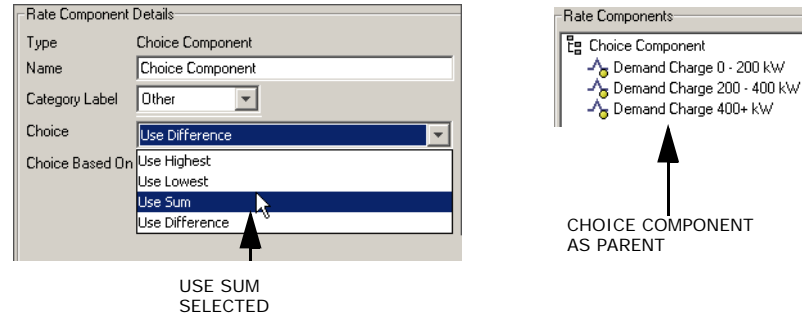
Using the Choice Component Sum Option—example

You can use the “Sum” option of the Choice Component to create a single line item for three separate demand components. For example, you may have a demand charge that is composed of 3 parts:

- a fee for 0 - 200 kW
- a fee for 200 - 400 kW
- a fee for 400+ kW

This could be addressed by using three different Peak Charge components in Create A Rate to model the overall demand charge. However, if you want to summarize these three components using a single component, you can use the Choice Component as a parent component and add each of the separate demand components as child components, as shown in .

Figure 3-19 Using the “Use Sum” Option.



Note: Unlike each of the other generic rate components, you cannot paste a Combination Percentage Fee as a child rate component under a Choice Component. The Combination Percentage Fee is a unique rate component that must look at sibling rate components.

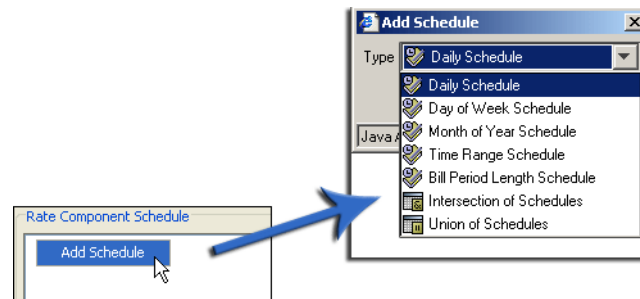
Types of Schedules

As individual rate components are added to model a tariff rate, each can have its own schedule, which is what provides the flexibility in Create A Rate.

Note: Once you create a schedule for a rate component, you can copy and paste to any other rate component. For example, if “Off Peak Consumption” and “Off Peak Demand” have the same schedule, the user can configure the schedule for one and apply to the other. Simply right-click on the parent schedule created for one, and copy into the “Rate Component Schedule” dialog box for the next and click Apply.

There are five schedules that can be applied plus the Intersection of Schedules and Union of Schedules.

Figure 3-20 Add a Schedule.

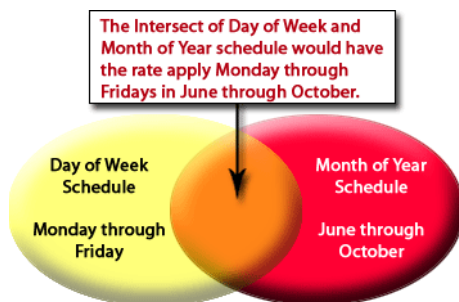


- **Daily Schedule**
Allows users to set the time of day a fee is valid. If a fee is applicable at two times (for example 8:00 AM to 10:00 AM and again from 4:00 PM to 6:00 PM), the user will either use a Union of Schedules with two Daily Schedules as children, or will define the time of day the fee is not applicable and check the “Exclusive” check box.
- **Day of Week**
Allows users to define the days applicable to the rate fee. On peak and partial peak times are generally going to be associated with weekdays.
- **Month of Year**
Allows users to define which month or months a rate is applicable.
- **Time Range**
Allows users to define the exact Start and End time for a schedule, in terms of (time and date) for a rate component. For example, June 21 at 11:45 through Oct. 19 at 11:45.
- **Bill Period Length Schedule**
Allows users to define the number of days (or range of days) that the billing period must cover in order for the rate component to be valid. This is used when an initial kWh charge is prorated. For example, if a bill is for 30 days, then the first 750 kWh might be for a certain set price. However, if the bill is for 31 days, then the set price might be for the first 775 kWh. Or, if the bill is for only 29 days, then the initial kWh charge might cover just the first 725 kWh. This schedule may be applied to Fee per Unit, Scheduled Fee Per Unit, Peak Charge, Scheduled Peak Charge, Ratchet, or Historical Ratchet.
- **Union of Schedules**

Allows users to add subsequent schedules that have a valid fee for one or the other. For example, a union of daily schedules for 8:00 AM to noon, and 16:00 to 20:00 would be two daily schedules under a union. When the time of day falls into either of these daily schedules, the fee applies.

- **Intersection of Schedules**
Allows users to add subsequent schedules that intersect. For example, this can be used when a rate is valid for June through October, Monday through Friday, from noon to 4:00. When each of these three variables (schedules) intersects, the rate will apply.

Figure 3-21 Intersection of schedules.

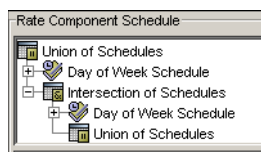


There can be multiple layers of union schedules, intersect schedules, and individual schedules. For example, a rate that applies Monday through Friday from 12:00 through 8:00 and again from 18:00 through 12:00, as well as all day on Saturday and Sunday, would have a Union of Schedules, as follows:

Day of Week schedule identifying Saturday and Sunday, with an Intersection of Schedules, with the

- Day of Week schedule identifying Monday through Friday
- and a Union of Schedules under it to show two daily schedules that the rate would apply during weekdays (see [Figure 3-22](#)).

Figure 3-22 Example of Multiple Union Schedules.



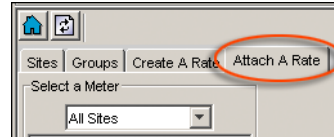
- **Exclusive**
The **exclusive** option allows the user to exclude certain periods for a rate. For example, if the “on peak” period is from 10:00 to 16:00 and all other times are off peak, enter a peak energy charge with corresponding Daily Schedule, then simply duplicate the rate component and select the “**Exclusive**” check box to apply a new rate to all other times. This check box is for convenience only. See the example in [Figure 3-23](#).

Figure 3-23 Exclusive Schedule.

About Attach A Rate

Once a tariff rate has been entered in Create A Rate, it can be assigned to a meter or multiple meters that are on that same rate. This is done by clicking the Attach-A-Rate tab on the VES configuration screen, as shown in .

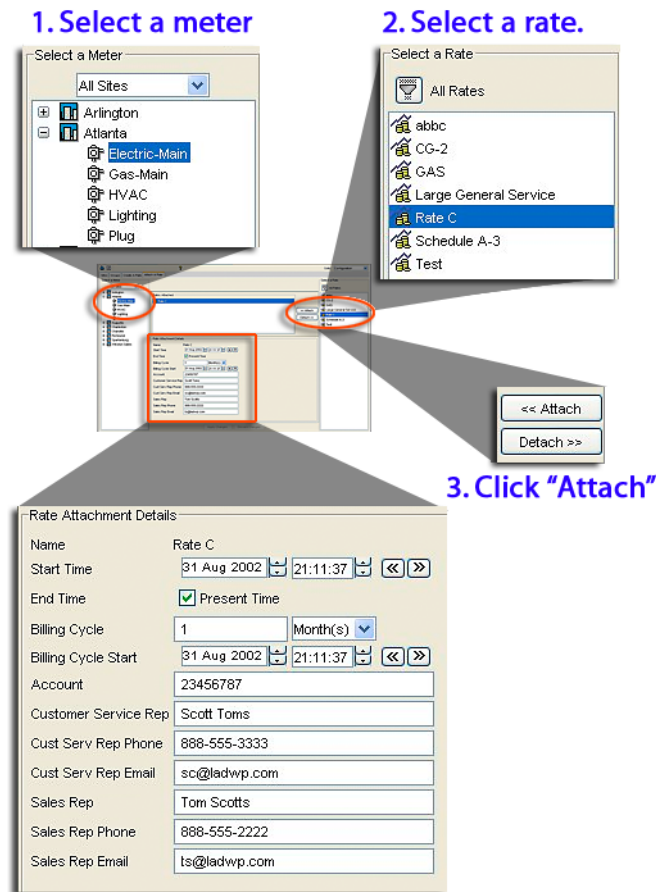
Figure 3-24 Attach A Rate tab.



The tree navigation on the left side of the screen lists all the sites with underlying meters and data points. The user navigates to, and selects the desired meter. Once a meter is selected, the user selects the applicable tariff rate from the list on the right side of the configuration screen. Finally, when both a meter and a rate have been selected, the user clicks the **Attach** button to attach the rate. shows the four steps used to attach a rate.

Note: You can right-click any rate in the Select A Rate pane and select “View Attached Meters” from the popup menu to see a list of all meters attached to the selected rate.

Figure 3-25 Attach A Rate screen.



4. Define parameters.

- **Rate Details**
Once a meter and rate have been selected, details of the rate attachment appear below the “Rates Attached” dialog box. It is very important that these are completed.
- **Rate Name**
Automatically populated when a rate is attached to a meter. The rate name is defined in Create A Rate.
- **Start Time**
This is the date and time that the rate was originally applied to the meter. In many cases, it will be from the beginning of the account, but many times customers change rates after the original rate. Start Time is inclusive and End Time is exclusive.
- **End Date**

This is the ending date that a rate was applied to a meter. The Present check box will always be selected for rates that are current. When a new rate is applied to a meter, the Present check box is deselected and the ending time and date of the original rate is entered. When the replacement rate is attached to the meter, the new rate will have the Present check box selected. Start Time is inclusive and End Time is exclusive.

- **Billing Cycle**
The billing cycle needs to be entered for each meter. A rate entered in Create A Rate may be applied to several meters, but many of these meters will have different billing cycles. Cost Profiler reports provide costs for billing cycles by default, but the billing cycle needs to be manually entered for each meter for this to default to the proper billing cycle.

Note: *It is important that accurate billing cycles are entered when attaching a rate to a meter. These billing cycles will be used in the Cost Profiler reports versus calendar months to mimic actual costs as closely as possible.*

- **Other Categories**
Account number, customer service representative and contact information, etc., are optional fields, but this information should be entered to make the Bill Reconciliation Report as useful as possible. This information can generally be found on utility invoices. Websites and emails should be filled in as they become hyperlinks in the Cost Profiler application.

Note: *Make sure to fill in as much account and contact information as possible as there are hyperlinks to websites and email addresses in the Bill Reconciliation report.*

The VES User Interface

Although the VES user interface varies depending on the type of report that you select, many areas of the user interface are common to all reports. The following common areas of the user interface are described in the following paragraphs:

- [VES Home Page](#)
- [Reports Page](#)
 - [Report Toolbar](#)
 - [Report Selector](#)
 - [Site Tree Window](#)
 - [Filtering Sites](#)
 - [Assigning site designators](#)
 - [Assigning Special Site Properties](#)
 - [Selecting data points](#)
 - [Report Selector](#)
 - [Report Selector](#)

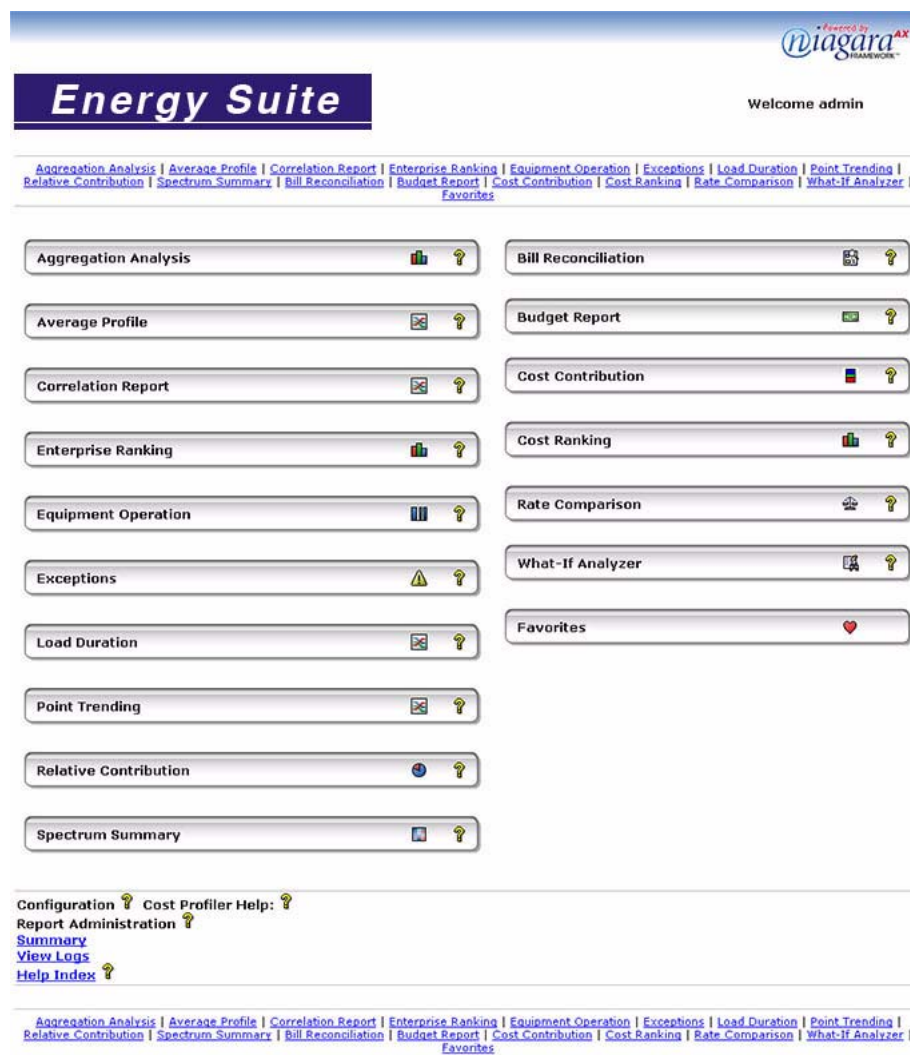
VES Home Page

The VES home page provides you with a list of all the report templates as well as a list of any saved reports that you have created. Each link on the page provides a link to a specific report template. When you select a link, it opens the appropriate report template. When you save reports, a link to the saved report appears under the appropriate category on the home page. You can also create links to “private reports” under the “Favorites” category.

Figure 3-26 shows the default VES home page. If you would like to change your VES Home page, you have two options for customizing this view using the workbench interface. These options are described in:

- [“The Semi Custom Home Page,”](#) page 3-23
- [“The fullCustom Home Page,”](#) page 3-24

Figure 3-26 VES Default Home Page.



The Semi Custom Home Page

The Semi Custom Home Page allows you to have a VES home page that looks different from the default page. The semiCustom Home Page option allows you some degree of customization by allowing you to add information to the lower portion of the page. You specify this option in the EasService property sheet view, using workbench.

An example semiCustom Home page is shown in [Figure 3-27](#).

Figure 3-27 The semiCustom Home Page.

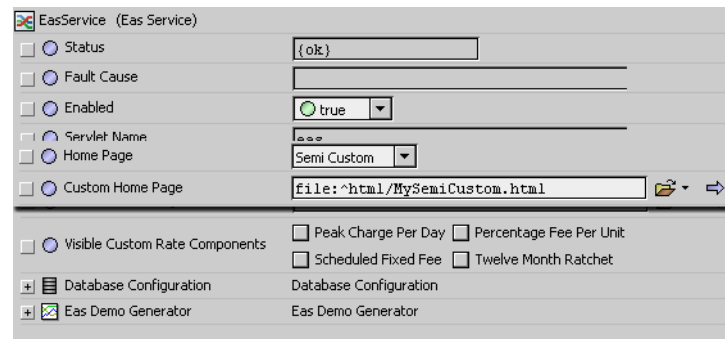


Set SemiCustom Home Page

- Step 1 In the workbench nav tree, expand the Services node and double-click on the EasServices node.

The EasService property sheet displays, as shown in [Figure 3-28](#).

Figure 3-28 Setting a Semi Custom Home Page on the configuration property sheet.



- Step 2 In the Home Page property field, select the **Semi Custom** option.
- Step 3 In the Custom Home Page field type or browse to the path and file name of the html file that you want to use for your Semi Custom Home Page.
- Step 4 Click the **Save** button.
The Semi Custom Home Page is set.

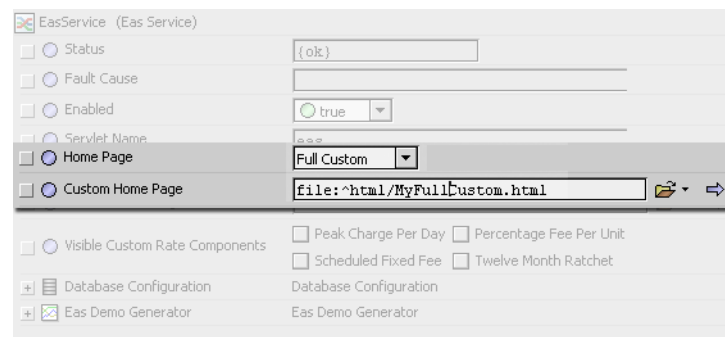
The fullCustom Home Page

The fullCustom Home page allows full flexibility in creating your own home page. Like the semiCustom Home page, you specify this option in the EasService property sheet view using workbench.

Set Full Custom Home Page

- Step 1 In the workbench nav tree, expand the Services node and double-click on the EasServices node.
The EasService property sheet displays, as shown in [Figure 3-29](#).

Figure 3-29 Setting a Full Custom Home Page on the configuration property sheet.



- Step 2 In the Home Page property field, select the **Full Custom** option.
- Step 3 In the Custom Home Page field type or browse to the path and file name of the html file that you want to use for your Full Custom Home Page.
- Note:** All html must be “server relative” and paths to source objects must be written in ORD form. Refer to the NiagaraAX User Guide for more information about ORDs.
- Step 4 Click the **Save** button.
The Full Custom Home Page is set.

Customizing using the <server> tag

You can customize your web pages using the <server> tag. The following paragraphs provide a short description and an example of how to use this tag.

Report names

Report Type names can be inserted into a web page using the <server> tag, as follows:

Report names example

(This example causes the web page to print out the titles of all of the possible types of reports):

```
<a><server>reportName: key=aggAnalysis</server></a> |
```

```
<a><server>reportName: key=avgProfile</server></a> |  
<a><server>reportName: key=entRanking</server></a> |  
<a><server>reportName: key=equipOp</server></a> |  
<a><server>reportName: key=exception</server></a> |  
<a><server>reportName: key=pointTrending</server></a> |  
<a><server>reportName: key=relContribution</server></a> |  
<a><server>reportName: key=spectrum</server></a> |  
<a><server>reportName: key=favorites</server></a> |  
<a><server>reportName: key=loadDuration</server></a> |  
<a><server>reportName: key=billReconcile</server></a> |  
<a><server>reportName: key=costContribution</server></a> |  
<a><server>reportName: key=costRank</server></a> |  
<a><server>reportName: key=rateComparison</server></a> |  
<a><server>reportName: key=whatIfAnalyzer</server></a> |  
<a><server>reportName: key=budgetReport</server></a> |
```

Report template anchors:

Report template anchors (used to link to the report templates) can be inserted into a web page using the <server>templateAnchor: key=name</server>

Template anchors example:

This example causes an <a> tag for the Aggregation Analysis template to be inserted into the html:

```
<server>templateAnchor: key=aggAnalysis</server>
```

Links to saved reports

Links to all of the saved reports for a given category can be listed in the default page format using <server>savedReports: key=name</server>

List link example:

This example causes a list of linkable saved reports for the Relative Contribution category to be inserted into the html:

```
<server>savedReports: key=relContribution</server>
```

Links saved reports, by category

Links to all of the saved reports for a given category can be listed in the new fashion (arrow style) using the

```
<server>savedReportsArrowStyle: key=name</server>
```

List link example with arrow

This example causes a list of linkable saved reports for the Relative Contribution category to be inserted into the html with an arrow preceding the name):

```
<server>savedReportsArrowStyle: key=relContribution</server>
```

Brand logo

To insert the home logo for the brand (if no brand, > inserts nothing) use

```
<server>homeLogo</server>
```

Brand logo example

(If the brand was set to Invensys in the license file, the Invensys logo would be inserted):

```
<server>homeLogo</server>
```

Brand logo (in table format)

To insert the home logo for the brand (if no brand, inserts nothing) in table form (i.e. with <td align=left.</td> enclosing) use <server>homeLogoTable</server>

Brand logo in table format example

If the brand was set to Invensys in the license file, the Invensys logo would be inserted.

```
<table width="95%" align="center">  
<tr>  
    <server>homeLogoTable</server>  
</tr>  
</table>
```

Application logo

To insert the application logo (i.e. the Niagara Energy Application logo) use the <server>appLogo</server>

Application logo example:

```
<server>appLogo</server>
```

To insert the application logo (i.e. the Niagara Energy Application logo) in table form (i.e. with <td align=left>... </td> enclosing) use <server>appLogoTable</server>

Application logo (in a table format) example

```
<table width="95%" align="center">
<tr>
<server>appLogoTable</server>
</tr>
</table>
```

Summary Information

To insert the summary information (i.e. Module version, Number of Configured Sites, and Number of Configured Data Points) use <server>summary</server>

Example:

<server>summary</server> causes the following information to appear on the web page:

```
Module Version: 2.301.428.v1
Configured Sites: 12
Configured Data Points: 48 of unlimited
Meters with attached rates: 17 of unlimited (Cost Profiler)
```

Localize a known name

To localize a known name (i.e. look into the lexicon for the given language and return the translated value for the given key) use the <server>localize: key=keyName</server>

Localize a known name example

looks into the lexicon to find the translation for the createNewReport key:

```
<server>localize: key=createNewReport</server>
```

Custom html page

To insert the custom html page (i.e. the html file referenced in the customPage property of the EasService config sheet) use the <server>insertCustomPage</server>

Custom html page example:

```
<server>insertCustomPage</server>
```

Help page anchor (link)

To insert an anchor (link) for the help page for a given category, use <server>helpAnchor: key=reportType</server>

Help page anchor example

This inserts a table entry with the ? icon that is linkable to the Enterprise Ranking help page:

```
<td><server>helpAnchor: key=entRanking</server></a></td>
```

Current user's name

To insert the current user's name into the page, use <server>userName</server>

Current user's name example

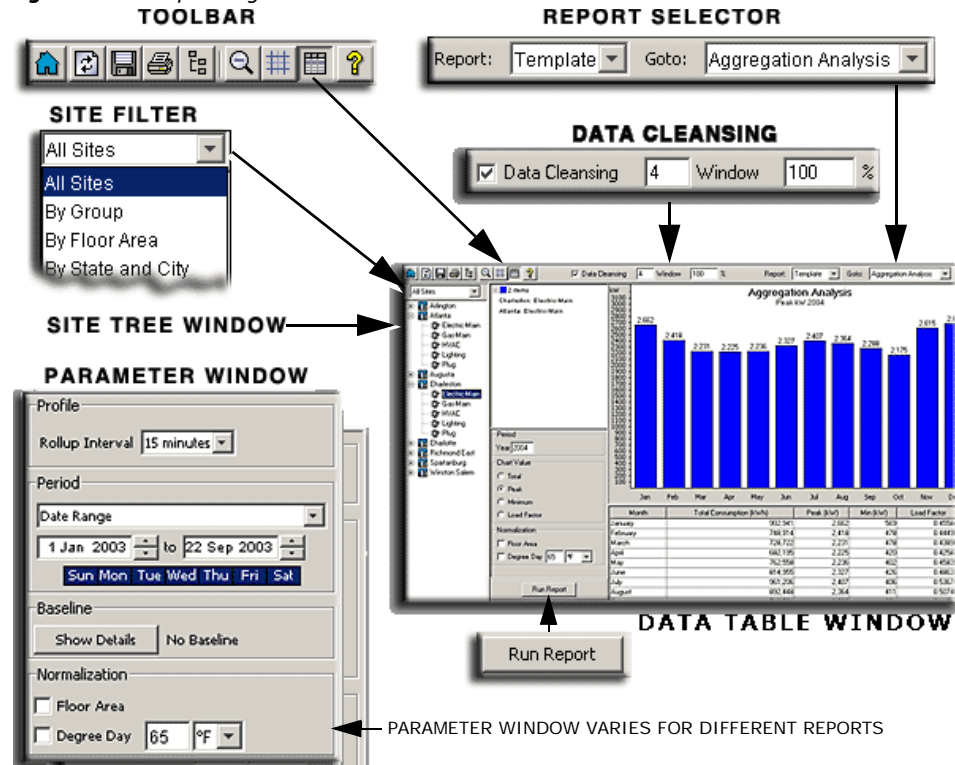
This translates the word "Welcome" to the language used, and displays "Welcome userName":

```
<a class="bold"><server>localize: key=welcomes</server>
<server>userName</server></a>
```

Reports Page

All report templates have the following common window areas:

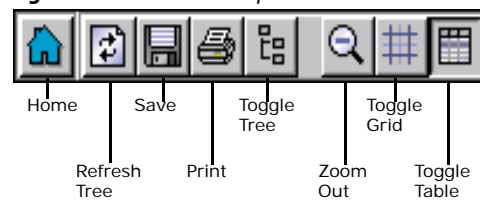
Figure 3-30 Report Page User Interface.



Report Toolbar

The toolbar display changes for some reports. For information about the report-specific toolbars refer to individual report descriptions under “Using VES Reports.” The following illustration shows the most common tool bar configuration and the following paragraphs provide a brief description of each tool.

Figure 3-31 General Report Toolbar.

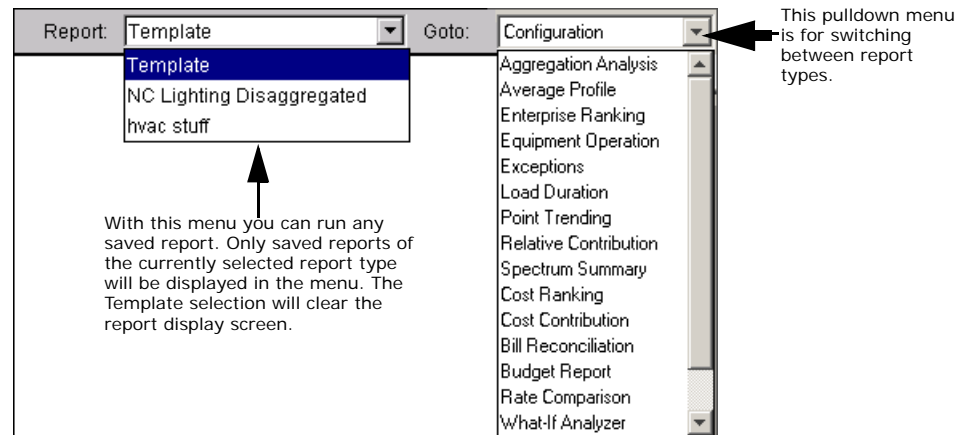


- **Home**
Takes you to your VES home page.
- **Refresh Tree**
This button will collapse and refresh the entire Site Tree.
- **Save**
Allows you to name the report, decide if it should be made public, and save the report in the system. The newly created report will be saved and can be viewed either under the link for that report type or under the Favorites link. The Favorites link is unique to the user that is logged in.
- **Print**
This button prints the contents of the chart and table display frames.
- **Toggle Tree**
This button toggles open and closed the tree view window.
- **Zoom Out**
After zooming in on the active chart frame, clicking on this button will zoom out the display by steps.
- **Toggle Grid**
This button toggles on and off the grid on the chart frame.
- **Toggle Table**

This button toggles open and closed the table display frame.

Report Selector

Figure 3-32 Report Pulldown Menus.



- **Report**
This list will not appear unless you have saved a report with the current report template. When you select a report from this list, the saved report of your choice will appear. This menu will display all public and private saved reports of the report type currently being displayed.
- **Goto**
This menu takes you to any of the report templates available within the VES.

Site Tree Window

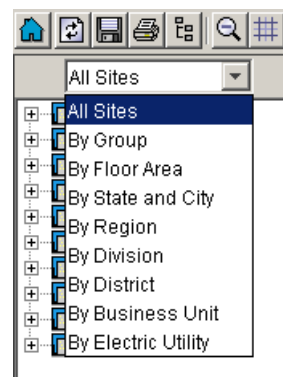
The Site Tree Pane provides a graphical tree display of all the selected sites. You can expand and collapse individual sites to display or hide the data points that are listed for those sites. Common tasks performed within this window include:

- “Filtering Sites”
- “Assigning site designators”
- “Selecting data points”

Filtering Sites

The Site Filter is a drop down list that allows you to filter the tree view to include or exclude certain sites according to their assigned designations. You can select individual site designations or select All Sites for presentation in the Site Tree Window.

There are two default designations that allow you to sort By Floor Area and By State and City. You may assign additional designations of: Division, District, Region, Electric Utility, and Business Unit. Having one or more of these designations assigned to sites in the database will allow you to filter the tree view to include or exclude certain sites according to their assigned designations.




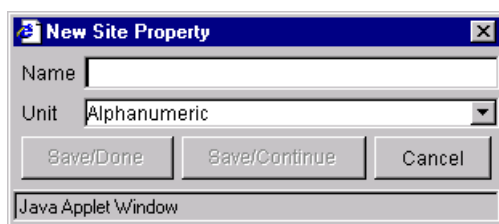
Assigning site designators

You can assign multiple designators to a site to allow that site to be included in various filtering schemes. To assign Site Properties, perform the procedure “Assigning Special Site Properties,” page 3-29.

Assigning Special Site Properties

- Step 1 Open the Configuration tool.
Step 2 Select a Site.

- Step 3 On the Toolbar, click the **New Property** button .



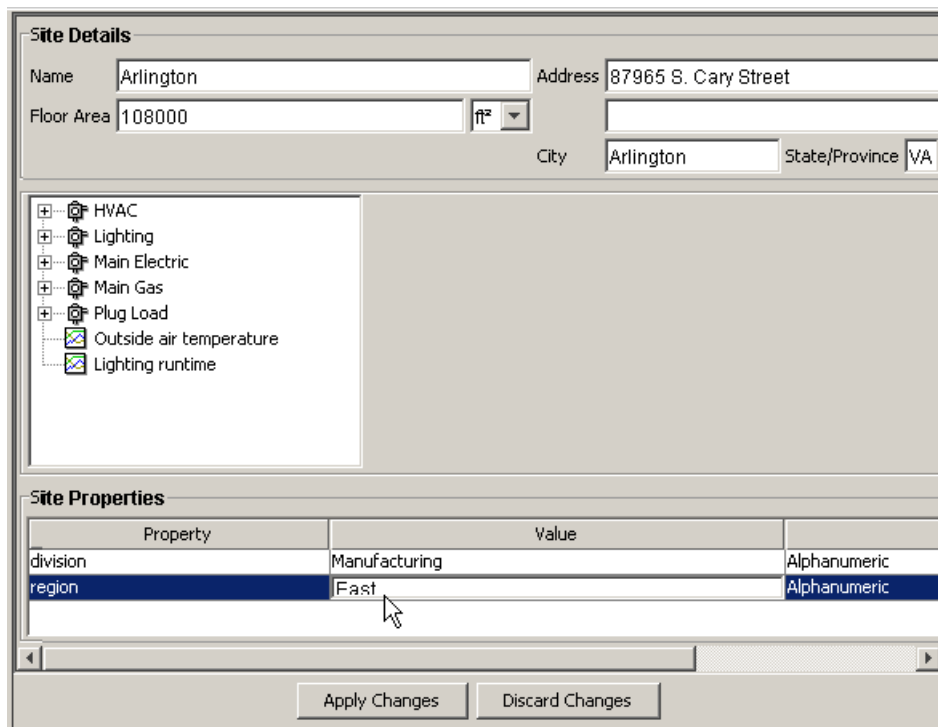
The dialog box titled "New Site Property" contains a "Name" text field, a "Unit" dropdown menu set to "Alphanumeric", and three buttons: "Save/Done", "Save/Continue", and "Cancel". At the bottom, it says "Java Applet Window".

The **New Site Property** dialog box appears.

- Step 4 In the **Name** field, you must type one of the pre-allowed designators. Your choices are:
- division
 - district
 - region
 - electricUtility
 - businessUnit

Note: You must type the name exactly as stated above or your property will not work, and your site will not show up in the tree when you filter by that designation. For instance, to sort by Electric Utility, type in *electricUtility*.

- Step 5 In the **Unit Field**, select **null**.
Step 6 If you want to assign this site to multiple designators, select Save/Continue and then repeat steps 3-5 for each designator.
Step 7 For the last New Property, or if you only designated one property, select Save/Done.
Step 8 You must now assign a grouping name for the property. This grouping name is the Site Property's Value.
Step 9 In the Site Properties box at the bottom on the configuration screen, put the cursor in the appropriate **Value** box and type the user defined value of the selected filter and site and press **Enter** on the keyboard, then click **Apply Changes**.



The screen is divided into two main sections. The top section, "Site Details", contains fields for Name (Arlington), Address (87965 S. Cary Street), Floor Area (108000), City (Arlington), and State/Province (VA). Below this is a tree view of site components: HVAC, Lighting, Main Electric, Main Gas, Plug Load, Outside air temperature, and Lighting runtime. The bottom section, "Site Properties", contains a table with two columns: "Property" and "Value".

Property	Value
division	Manufacturing
region	Fast

At the bottom of the screen are two buttons: "Apply Changes" and "Discard Changes".

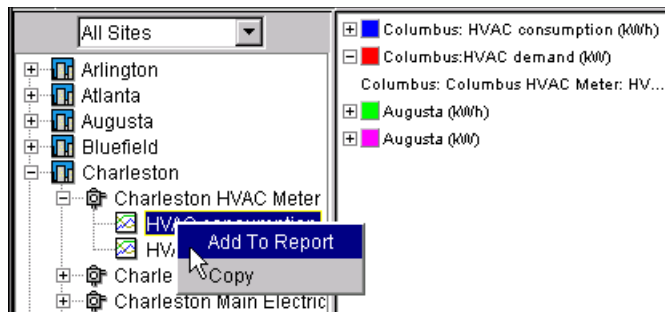
Selecting data points

To select data points, go to the report template page and navigate to the desired point or group of points by expanding the appropriate sites and meters. You can select individual data points or groups of data points. When you want a report to run against a particular data point, you have to put that data point into the selection window, as described in “[Selecting Data Points to Chart.](#)” page 3-30.

If you want to aggregate points (see “[Aggregating Data Points.](#)”).

Selecting Data Points to Chart.

- Step 1 Right-click in the tree on a Site, Meter, Group or Sub-group folder, or directly on a data point. This will bring up a shortcut menu.



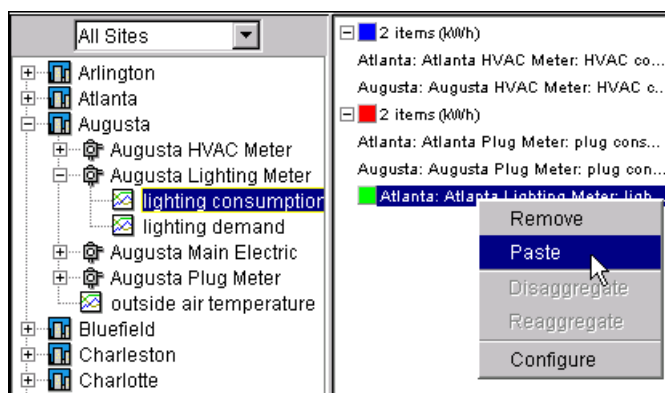
- Step 2 Select Add To Report. The object is added to the Selection Window. If you select an object that has child objects below it, all applicable child objects are transferred to the Selection Window.

Note: *Add To Report puts the object selected and all applicable sub-components into the Selection Window at the root level. Copy also allows you to paste the selected object into the window or into another object already in the Selection Window (aggregation). See “[Aggregating Data Points.](#)” page 3-30, for steps required to aggregate data points.*

Aggregating Data Points.

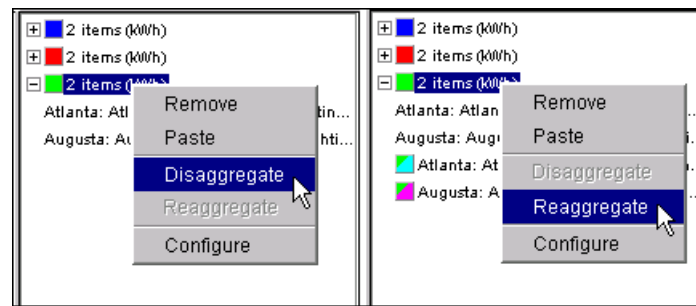
- Step 1 Right-click in the tree on a Site, Meter, Group or Sub-group folder, or directly on a data point. This will bring up a shortcut menu.
- Step 2 Select Copy. The data point is copied to your clipboard.
- Step 3 Right click on the object in the Selection Window to which you want to aggregate and select Paste from the shortcut menu.

The data point is added to (and aggregated with) the selected data point.



The Copy and Paste functions allow you to aggregate data points and chart them as a single value. For more information about aggregating, refer to “[Aggregating Data Points.](#)” page 3-30.

- Step 4 To dis-aggregate and re-aggregate data points, right-click on a data point in the Selection Window and select the appropriate command.



Selected Points Window

This Window displays all the points that you have “added” from the Site Window Tree. You can expand and collapse the tree display.

Parameter Window

The Parameter Window display may be different, depending on the type of report that you have selected. The parameters that you choose for your report directly affect what data will be displayed in your report as well as how the data will be displayed. Therefore, understanding each parameter is important to getting the most out of your report. Some parameters are simple to understand while others may reflect less familiar and very powerful statistical analysis concepts. The following paragraphs describe parameter window options and settings, including:

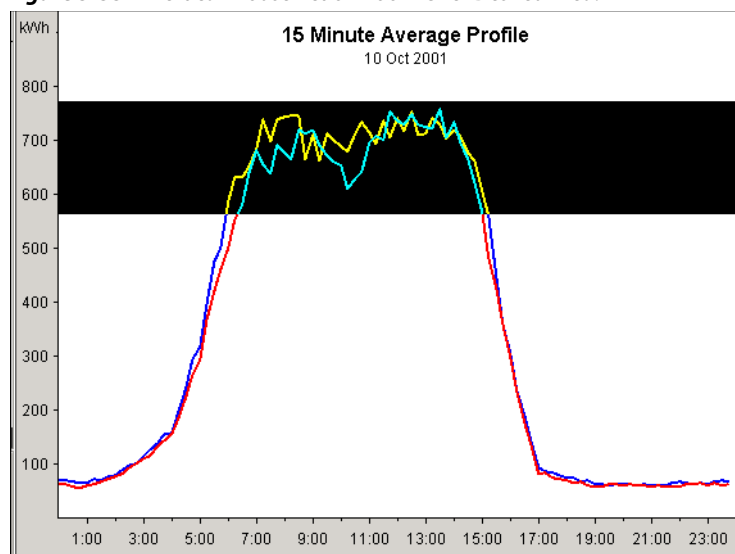
- **Period**
The period parameter allows you to select a time period for your report. For most reports, you are able to select a common time period such as Last Week, Last Month, Last Year, Year-to-Date, Last 10 Days, etc. If none of the common periods are suitable, a date range for the reporting period can be manually defined. Period list options.
- **Rollup**
Rollup (or Rollup Interval) is an interval of time that is used to determine what (and how) data is presented in your report. Each point displayed, using the rollup, represents a designated time interval before the specified plot time. A rollup value of 1 hour will present data at a granularity level of every one hour, while a rollup value of 15 minutes will show data for every 15 minutes of logged data. Refer to “[About the Rollup Parameter](#),” page 3-35 for more information about Rollup.
- **Normalization**
VES can normalize report results for floor area, production, and for outside air temperature (OAT) if the database includes such variables. Refer to “[Types of Normalization](#),” page 3-35 for more information about Normalization.
- **Baseline Period**
Baseline Period is the set of data values, within the trended log, by which all the rest of the data is compared. This allows you to compare a data value against itself at another period of time (i.e., Main kWh for last week vs. Main kWh for the same week in the previous year). You can select a predefined start date from the **Period** list (Custom Period, Same Start Date, 1 Week Prior, 1 Month Prior, or 1 Year Prior) then select how many days worth of original data are in the baseline period. The software takes that defined number of days and repeats the baseline period for the entire charted time.
- **Scatter Plot**
The Scatter plot in the Point Trending report allows you to see and estimate how one data point depends on another. For instance, one of the most effective uses of the Scatter Plot is to see how consumption is dependent upon Outdoor Air Temperature. By determining the dependencies like this, you can come to a better understanding of how to determine future energy needs based upon past performance.
- **Time Lag**
Sometimes there is a time lag between cause and effect: it takes some time for the building system to react to a temperature change. In this case we can make dependence more pronounced if we would use temperature measured some time prior to measurement of the consumption value. This time shift is a lag. By varying lag we can get the highest possible correlation between two variables

Chart and Graph Window

The Chart and Graph Window presents a graphical display of your report data. You will often need to zoom in or out in this window to optimize the view of your data. The “[Vertical Mouse Action Zoom](#),” and “[Horizontal Mouse Action Zoom](#)” paragraphs describe how to do this common task.

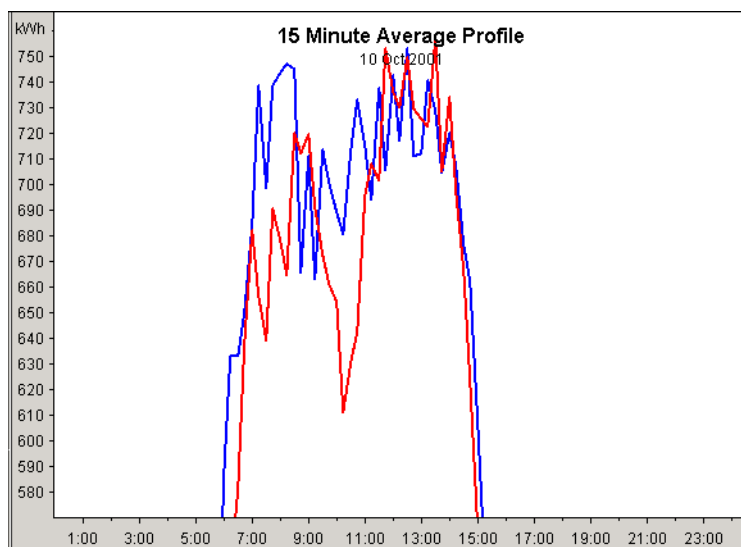
Vertical Mouse Action Zoom

Figure 3-33 Vertical Mouse Action Zoom Over Desired Area.




To zoom in, drag the mouse vertically over the desired area.

Figure 3-34 Result of Vertical Mouse Action Zoom.

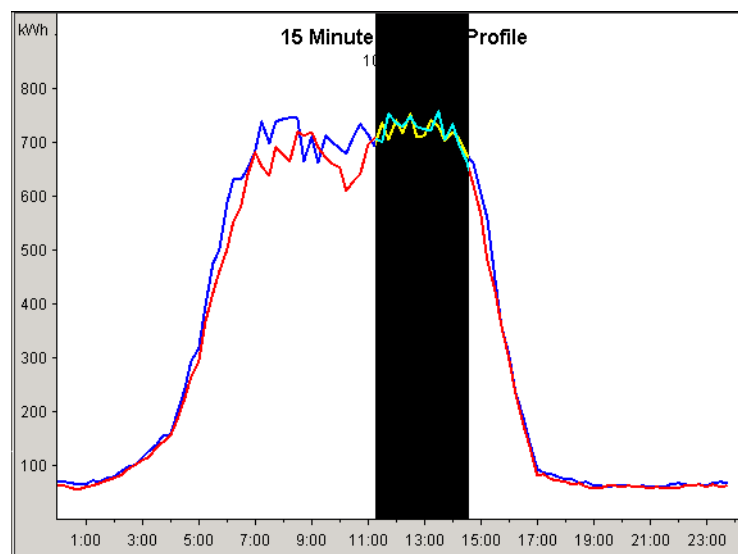


This is an example of what is displayed when the mouse button is released.

Note: Remember the Zoom Out Button is available on the Report Toolbar. 

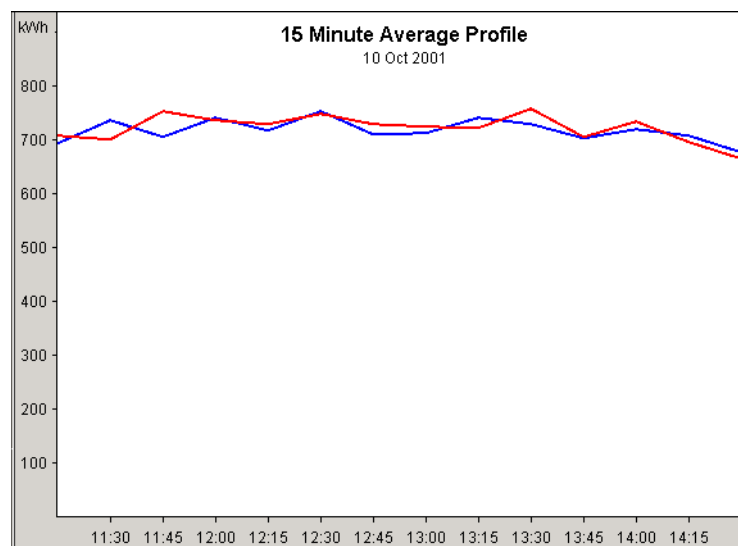
Horizontal Mouse Action Zoom

Figure 3-35 Horizontal Mouse Action Zoom Over Desired Area.



To zoom in, with the left mouse button depressed, the mouse is dragged horizontally over the desired selection. When the button is released, the area over which the mouse was dragged is displayed in an expanded view.

Figure 3-36 Result of Horizontal Mouse Action Zoom.



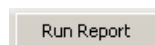
This is an example of what is displayed when the mouse button is released.

Data Table Window

The Data Table Window displays report data in a tabular format that can be exported to a spreadsheet. The layout of the data may be modified to help you better analyze your data and to make management and purchasing decisions. For example, you can click on the column headers to resort columns to help you see the highest and lowest levels of use. You can also drag and drop columns by clicking on the column header.

Run Report Button

Click **Run Report** to generate or update your report.



VES Features and Concepts

The following sections describe a variety of important VES features and concepts:

- [“Using Dynamic Profiling”](#)
- [“Using the Universal Comparison Feature”](#)
- [“About the Rollup Parameter”](#)
- [“Types of Normalization”](#)
- [“About the Baseline Period”](#)
- [“About the Scatter Plot”](#)
- [“About Localization”](#)
- [“About Exporting the Table View”](#)
- [“About Aggregating Data Points”](#)
- [“About Niagara units”](#)
- [“About Delta Logging”](#)
- [“About Data Cleansing”](#)

Using Dynamic Profiling

VES includes a feature that allows you to dynamically transition between reports while maintaining defined parameters. This is useful when you have identified certain aspects of a site that need closer attention and you want to transition to a different report to drill into the data further without re-selecting the values to be graphed.

For example, if the selected data points and parameters are applicable to both reports, you can simply select the other report from the **Goto** list and when the report template changes in the view, the new report will already have the data points and parameters selected.

Dynamic profiling is only useful when transitioning between reports that compare the same type of data. For example, you can transition between an Average Daily Profile report and a Point Trending report because they both look at point data. However, you could not use dynamic profiling between the Point Trending report (which uses point data) and the Equipment Operation report (which uses digital data) or between the Exceptions Report (point data) and the Enterprise Ranking report (site data). In addition to data compatibility, the period parameter must be compatible. For example, the Aggregation Analysis report will not display data down at the weekly level, so you cannot transition a weekly date range report into an Aggregation Report at the same level.

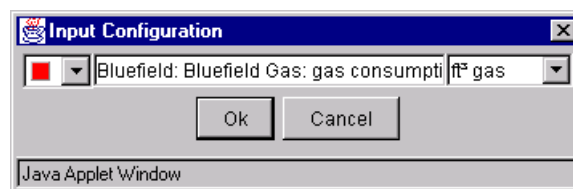
Using the Universal Comparison Feature

This feature converts data point's engineering values from electricity, gas, and other fuels to a common measurement unit. This isn't just changing the label, but actually converting the data from one measurement unit to another. Once the consumption values are converted to a common unit, you have a better ability to compare efficiency or to analyze the total energy breakdown for a site or group of facilities. Values can be converted to KBTU, MMBTU, CCF gas, therms, etc.

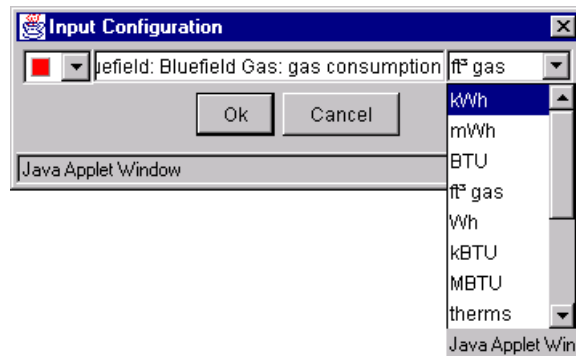
Note: *The Universal Comparison feature does not change Default units. Default units are only changed in the Configuration screen - not in the report templates screen.*

Changing the Common Energy Units.

- Step 1 Right click on a data point in the selection window.
- Step 2 Select Configure. You will get the Input Configuration dialog.



- Step 3 Pull down the energy unit field, and select the one of your choice.



Step 4 Click on OK

Note: You can also modify the displayed name and the charted color of the selected object from this same Configuration dialog.

About the Rollup Parameter

The meaning of the rollup parameter depends on the type of data that it represents. For example, data that represents a “consumption” type value (i.e., Electric Consumption or Gas Consumption) will be added, continually over the interval period. On the other hand, data that represents a “demand” type value (i.e., Electric Demand or Gas Demand) will use the peak value over the rollup interval range (not the average). Therefore, the point that is plotted on your report graph may represent a “total” for the interval period (i.e., total consumption for every 15 minute interval) or your point may represent an “average” for the interval period (i.e., average hourly temperature). If it is used for demand, it represents the peak for the interval period. The following list summarizes how the different types of data are represented by the rollup parameter:

- Consumption type values are added (total).
- Demand type values use the max (peak).
- Outside air temperature or other type values use the average.

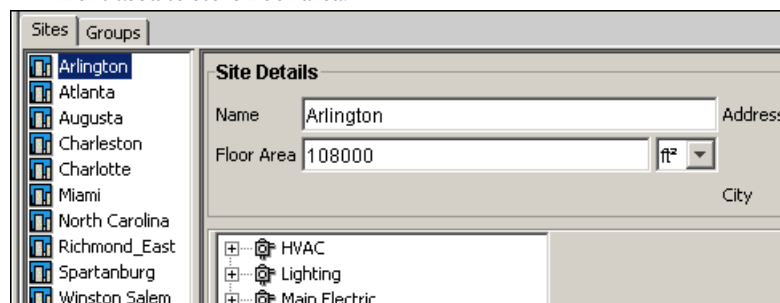
Most reports can specify a minimum interval as low as 15 minutes. The Equipment Operation report, however, may specify a 1 minute interval, if the information is being logged in the workstation at that frequency.

For information about report - specific parameters, including the ones in the following chart, refer to the specific report descriptions.

Types of Normalization

The following types of normalization are available:

- Floor Area Normalization
If you desire, you can normalize the data based upon the floor area of the facility. This means that any values in the resulting report graph will be per square foot (or meter), since that is the measurement used to store floor area.



- Degree Day Normalization
Weather can be removed as a factor (or “normalized”) by selecting the Degree Day option in the Report Parameters window **Normalization** field. Essentially, the software reports what the demand and consumption values would have been if Heating and/or Cooling were not a factor. For more information about Degree Day Normalization, refer to [“Degree Day Normalization,”](#) page 3-36.
- Product Normalization

This feature allows you to normalize your data points by another data point, normally a data point that measures units of production. Refer to “[Product Normalization](#),” page 3-36 for more information about product normalization.

Degree Day Normalization

The Degree Day normalization option provides an answer to the question “What would be the value of consumption, if temperature during the report period would be equal to some base temperature?” The base temperature is usually set to 65°F, which is the balance temperature (at balance temperature no cooling or heating is required to maintain required indoor air temperature).

The degree-day normalization is a three step process:

1. First, the degree-day values are calculated for each day of the report period except days that were excluded from report via the 'days of week' widget. This calculation is done by averaging the high and low Outside Air Temperature (OAT) for a site for every day and subtracting from it 65°F.

Note: *OAT data can be linked from one site to another so that you do not have to log that data for every site in order to calculate degree-day.*

The difference in temperature is the number of Cooling or Heating degree days. So if today's average temperature is 67°F, then today we would have two Cooling Degree Days.

2. Second, we determine the slope of the linear regression line (the 'A' parameter in regression formula $Y=A*X+B$). This calculation is explained under Scatter Plot above. The only difference is that we substitute the degree days that were calculated in place of the actual temperature in the graph.
3. Third, Based on the slope we can calculate the average amount of energy that is needed at 65°F. Since we assume no heating or cooling is required at 65°F, all energy consumption must be independent of Outside Air Temperature. The slope (calculated in the previous step) shows us the calculated consumption as it is directly related to Outside Air Temperature. Deviations of plotted consumption away from the slope indicate energy consumption that is not attributable to a change in Outside Air Temperature. As we normalize the consumption values to the established base temperature (zero degree day), we will see the amount of consumption accounting for non-temperature related load. Subtracting temperature normalized consumption from observed consumption, we can get the amount of energy consumed by heating/cooling equipment (if they are not metered separately).

This allows us to compare sites located in different weather regions or compare data collected during different weather conditions.

Note: *Degree-day normalization only applies to temperature dependent points. Do not attempt to perform degree-day normalization for points (such as lighting) that do not normally have any relationship to temperature.*

Product Normalization

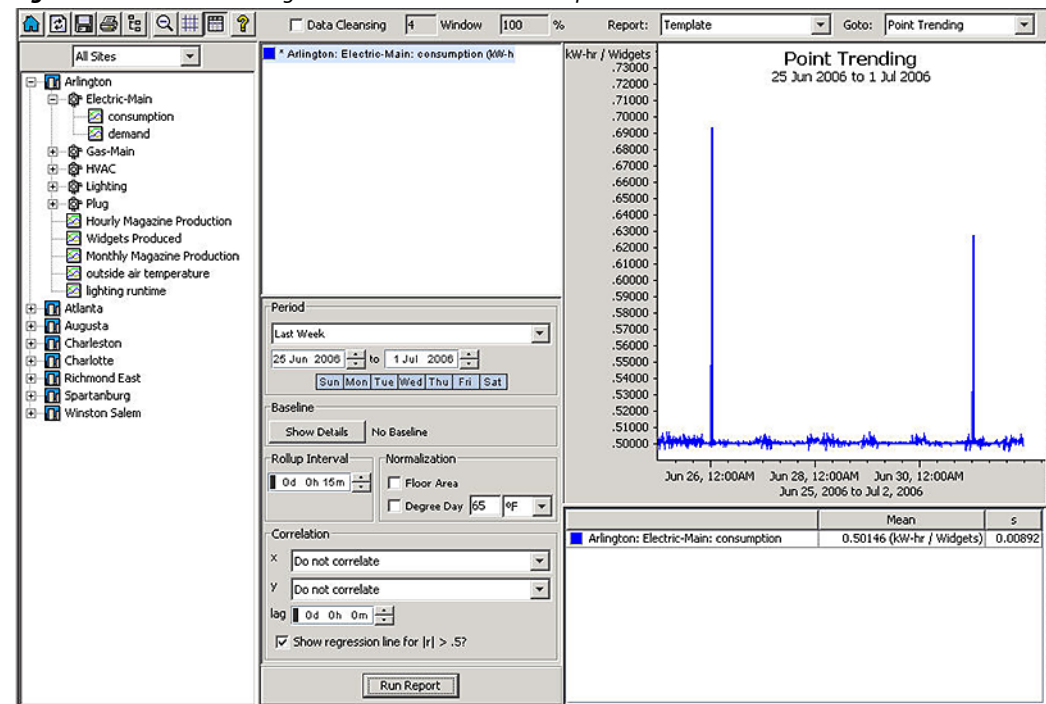
This feature is most often useful when you want to answer the question: “How do my energy usages and costs relate to my units of production?” For example, if your company produces widgets, and you can log and measure widgets produced over some interval of time, then you could use the production normalization feature to determine energy use per widget, cost per widget, etc. You can use Niagara to log production unit data in a history format. However, since it is likely that your production unit logs are recorded in another format (i.e. in a relational database or CSV form), you will likely need to use the import drivers of Niagara to pull this data into a history format. Once in a history format, you can pull the data into VES just like you would create any other data point in VES (using the Configuration report).

Note: *Be aware of the following, when you are working with Product Normalization:*

- When pulling your production unit data into VES in the Configuration report, you will most likely want to assign the data point as an 'Other Consumption' or 'Production Units' type. This is necessary since production unit data normally behaves like a consumption data point (i.e. for rollups), and if you use the 'Other' type, VES will not know to treat the data point as a consumption type point.
- It is important to have production unit logs that collect data at a frequent interval. VES reports work best when the data is collected at 15 minute, 20 minute, 30 minute, or 1 hour intervals (i.e. as close as possible to matching the interval that the energy usage data is collected). VES will attempt to compensate for production unit data that is collected at greater intervals than the recommended intervals, however, it must use rollups to determine missing gaps of timestamped data when correlating with the energy usage data. For the best results, use a collection interval for production units that matches the collection interval of the energy usage data, and always specify a date range in a report that spans at least a handful of collected data. The recommended collection interval is 15 minutes.

In the example below, the Point Trending report is using the production normalization feature to show the relationship between energy consumption and widgets produced. You will notice that the results are specified in units of kW-hr/Widgets.

Figure 3-37 Point Trending Product Normalization Example



In order to use the production normalization feature in VES, you need to specify a normalizing data point on a report input. This process assumes that you have already pulled your production unit data into VES as a configured data point. There are two methods to assign a normalizing data point to a report input, as described below:

- “Product normalization using dialog box”**

After you have added report inputs to a VES report, you can right-click on these inputs and select the **Configure** option to display a dialog window that allows you to make changes to the configuration of the report input. You can also double click on the report input to bring up the **Configure** dialog box. There is a checkbox for “Normalized By”, and if you check it, then you can also click the “Select” button which will prompt you to locate and select the data point to use as the normalizer. Click ‘OK’ to save the changes, and you will notice that the report input will get a light blue background and have a preceding asterisk (*) which indicates that the report input is normalized by another data point. Refer to “Product normalization using dialog box” for a detailed description of this procedure.
- “Product normalization using Copy and Paste”**

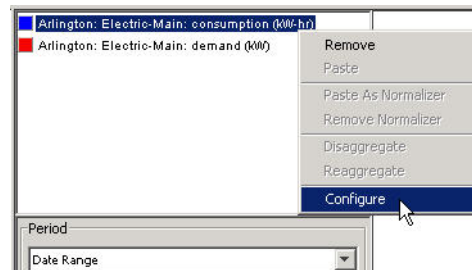
This method can only be used in certain reports (Average Profile, Correlation Report, Exceptions, Load Duration, Point Trending, Relative Contribution, and Spectrum Summary). After you have added report inputs to the VES report, you can use the site tree on the left to locate and select the normalizing data point. Right-click on a data point and select **Copy**. You can then highlight the report input to which you wish to assign the normalizing data point, and right click on it and select **Paste As Normalizer**. The report input displays a light blue background and has a preceding asterisk (*) which indicates that the report input is normalized by another data point. Refer to “Product normalization using Copy and Paste” for a detailed description of this procedure.

Product normalization using dialog box

After you have added report inputs to a VES report, you can normalize an input using product normalization, as described, below:

- Step 1 Right-click on an input.
- The right-click menu appears, as shown in [Figure 3-38](#), displaying available menu options.

Figure 3-38 Selecting the Configure menu item



Note: You can highlight multiple report inputs at the same time and batch configure them to be normalized by the same data point. Select multiple data points in the Select dialog box by holding down the Ctrl button when selecting

Step 2 Select **Configure** from the menu, as shown in [Figure 3-38](#).

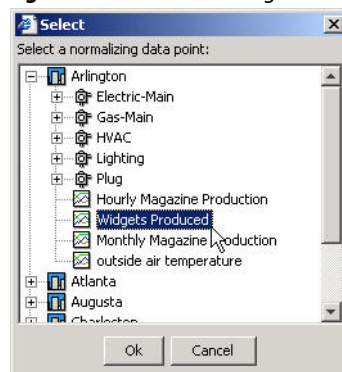
The Input Configuration dialog box displays (this allows you to make changes to the configuration of the report input).

Figure 3-39 Input Configuration Dialog Box



Step 3 In the Input Configuration dialog box, select the **Normalized By:** check box and click the **Select** button. The **Select** dialog box appears, as shown in [Figure 3-38](#).

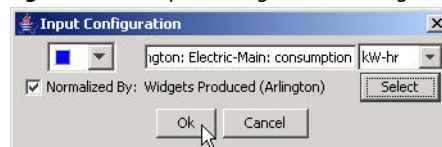
Figure 3-40 Select Dialog Box



Step 4 In the **Select** dialog box, select the data point that you want to use for normalization and click the **OK** button.

The **Input Configuration** dialog box displays the data point in the text field, as shown in [Figure 3-41](#).

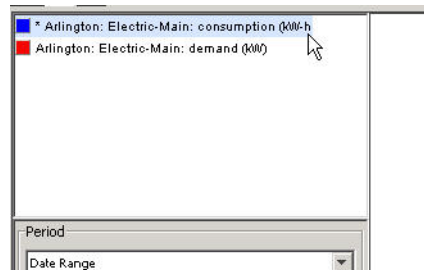
Figure 3-41 Input Configuration Dialog Box with Input



Step 5 In the **Input Configuration** dialog box, click the **OK** button.

The report input displays with a light blue background and the input name is preceded by an asterisk (*), as shown in [Figure 3-42](#). This indicates that the report input is normalized by the selected data point.

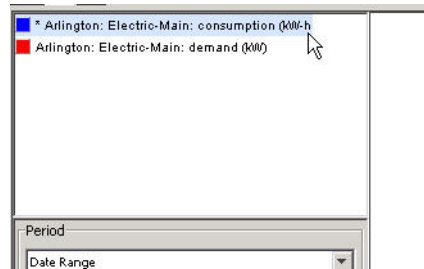
Figure 3-42 Normalized Data Point Displays in the Input Window



Product normalization using Copy and Paste

- Step 1 In the site tree, right-click on the data point that you want to use for product normalization. The right-click menu appears.
- Step 2 From the right-click menu, select **Copy**.
- Step 3 In the Input window, right-click on the report input that you want to normalize. The right-click menu appears.
- Step 4 Select **Paste As Normalizer** from the right-click menu.
The report input displays with a light blue background and the input name is preceded by an asterisk (*), as shown in [Figure 3-42](#). This indicates that the report input is normalized by the selected data point.

Figure 3-43 Normalized Data Point Displays in the Input Window

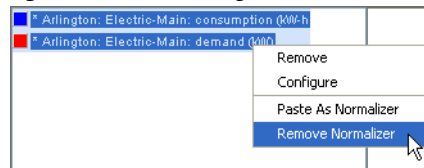


Remove product normalization

To remove product normalizing data from one or more data points, do the following:

- Step 1 In the selection window, select one or more inputs that you want to remove product normalization from and right-click on the selection. The right-click menu appears.
- Step 2 From the right-click menu, select **Remove Normalizer** as shown in [Figure 3-44](#).

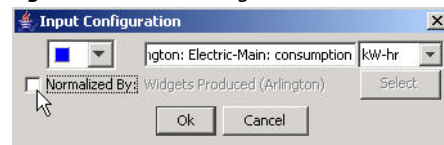
Figure 3-44 Removing Product Normalization (Right-Click Menu)



The normalizing data is removed from the selected input(s) and the input appears without the asterisk (*) or light blue background.

Note: You can also remove product normalization from one or more inputs by selecting **Configure** from the right-click menu and clearing the "Normalized By:" check box.

Figure 3-45 Removing Product Normalization (Input Configuration Dialog Box)



About the Baseline Period

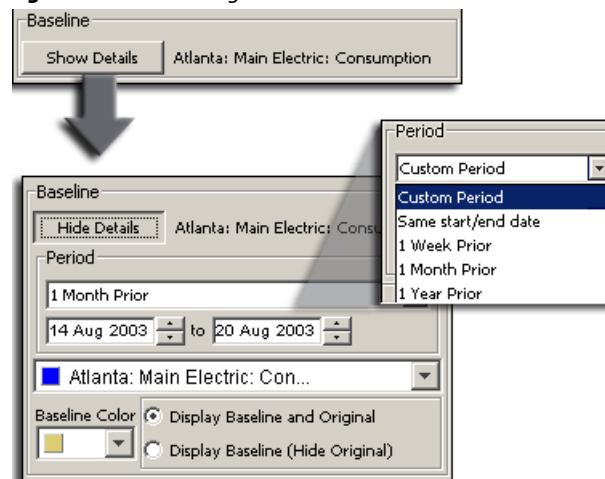
Baseline Period is the set of data values, within the trended log, by which all the rest of the data is compared. This allows you to compare a data value against itself at another period of time (i.e., Main kWh for last week vs. Main kWh for the same week in the previous year). You can select a predefined start date from the Period list (Custom Period, Same Start Date, 1 Week Prior, 1 Month Prior, or 1 Year Prior) then select how many days worth of original data are in the baseline period. The software takes that defined number of days and repeats the baseline period for the entire charted time.

The following procedure describes how to set the baseline parameters for reports that allow detailed baseline parameters.

Setting the Baseline Parameters.

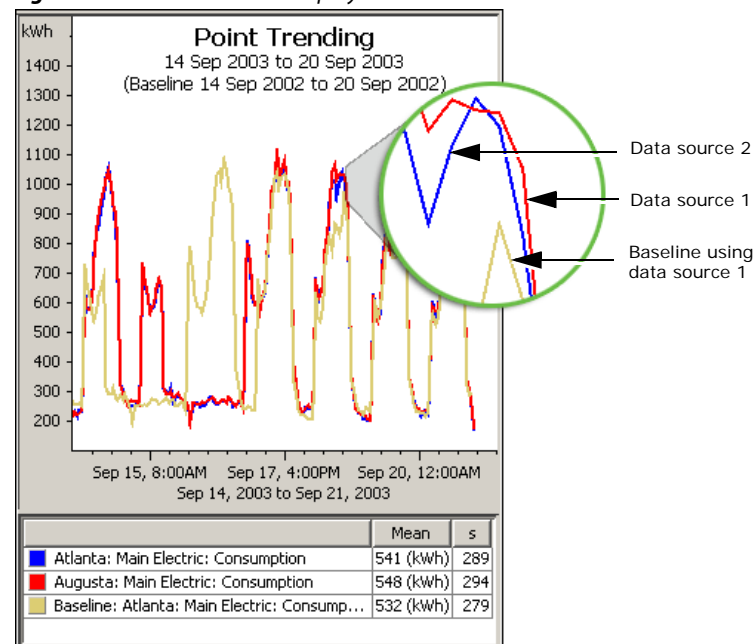
- Step 1 Once you have selected points to be charted, along with a date range, click **Show Details** to define the baseline parameters.
- Step 2 From the data point list, select the point that you wish to use as a baseline.
- Step 3 Define the baseline period by selecting a common period from the **Period** list or by manually defining the baseline period, as shown in [Figure 3-46](#).

Figure 3-46 Selecting the Baseline Point.



- Step 4 Select a color for the baseline trend from the **Baseline Color** list and choose a **Display** option to complete the Baseline Period setup as shown in [Figure 3-47](#) and described in the following paragraphs:

Figure 3-47 Data Sources Display Colors.



- Display Baseline and Original
displays a data plot that represents the data point baseline parameter selections and an additional plot for the full range of your original data point.
- Display Baseline (Hide Original)
plots your baseline data only. This data is from the data source that you selected.

Step 5 Click **Run Report** to create the report.

About the Scatter Plot

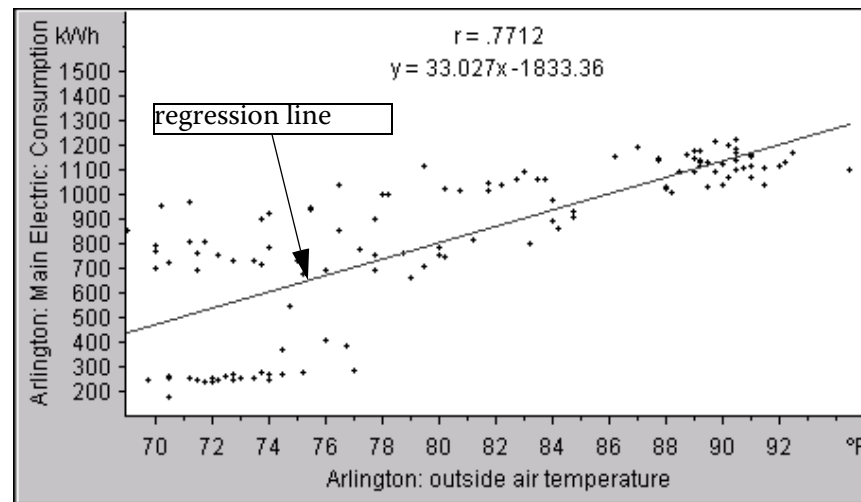
The Scatter plot in the Point Trending report allows you to see and estimate how one data point depends on another. For instance, one of the most effective uses of the Scatter Plot is to see how consumption is dependent upon Outdoor Air Temperature. By determining the dependencies like this, you can come to a better understanding of how to determine future energy needs based upon past performance.

This section will attempt to explain the use of the Scatter Plot for this scenario. That is, the dependence of Consumption on Outside Air Temperature.

The software will plot, or graph, on the X and Y axis all of the intersection points of Consumption (kWh) and Outside Air Temperature (T °F).

For instance, at any given date/time sample of kWh there is a corresponding date/time sample of Temperature. With T on the X-axis and kWh on the Y-axis, when you graph the two values, they represent one spot on the graph. The scatterplot software will plot all the values for T and kWh on the graph for the date range and rollup interval selected.

Figure 3-48 Example scatter plot

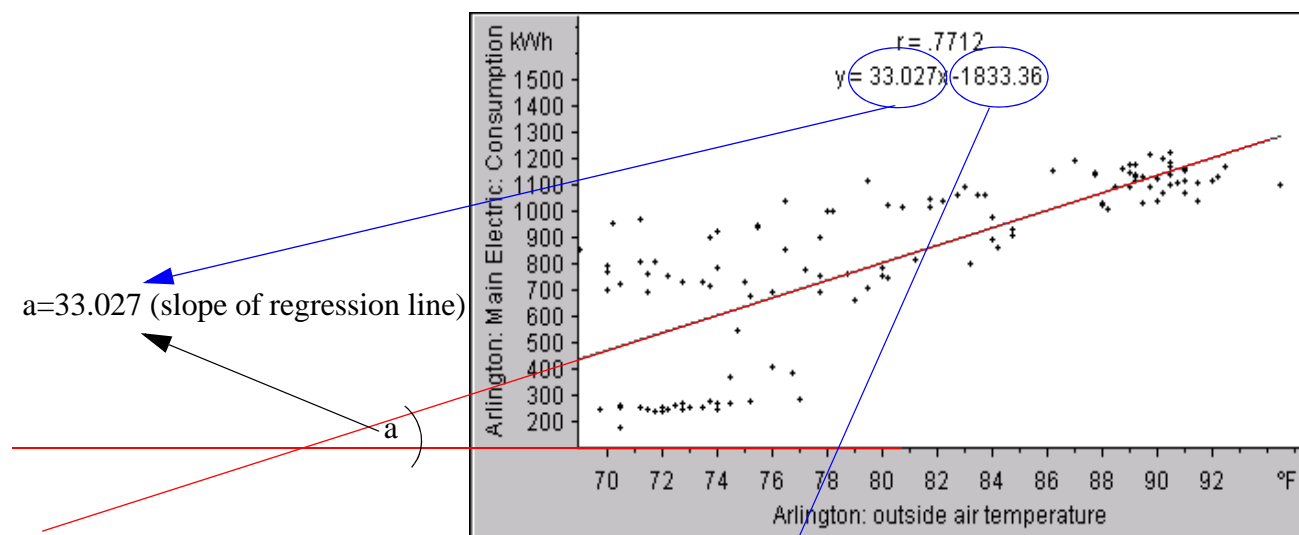


Then, the software attempts to determine the linear regression of the plotted points on the graph. The software will draw a straight line on the plotted points where the average error away from the line is the least amount possible for all points plotted. Lets say you could place a straight line on the plot and pivot the line at the center of all the plotted points. As you pivot the line around and move the line up and down, there will be a place where the average deviation (error) away from the line for all the points is the very least it could be. This is the place where the line stays. This is then the indication of linear regression.

Now in reality, a correlation coefficient of 1.0 would probably never be reached, but if the correlation coefficient is above 0.5, the software can draw the regression line in the scatter plot to help you better visualize the relationship. A correlation coefficient (r) of 0.0 would indicate that there is no dependency of the one data point to the other data point.

In general, squared r shows the part of Y defined by X , so for the plot example above where $r = .7712$, we can say that OutSide Air Temperature variation (X) is accounted for about 59% of Consumption variation (Y). ($.77 \times .77 = 0.5929$)

Once the line of regression is calculated, it is an easy exercise to calculate consumption for any given temperature. To calculate consumption for our example data points (kWh and Temperature), the software will use the simple formula $kWh = A * Temp + B$ ($y = A * x + B$). A is the slope of the regression line, and B is the measurement or value at which the regression line crosses the 0°F temperature.



If you could follow the slope line all the way down to 0°F, you would see that it crosses 0°F at -1833.36 kWh. While this might not be a valid number for a human observer, it is valid for the software calculations.

Calculated consumption will not exactly match the observed consumption curve because there are factors other than temperature that affect consumption. This type of calculation is used in the Normalization for Degree Day calculations that the software can perform.

Time Lag

Sometimes there is a time lag between cause and effect: it takes some time for the building system to react to a temperature change. In this case we can make dependence more pronounced if we would use temperature measured some time prior to measurement of the consumption value. This time shift is a lag. By varying lag we can get the highest possible correlation between two variables.

Figure 3-49 Plotted values for a 30 minute time lag setting.

Timestamp	3:45PM	4:00PM	4:15PM	4:30PM	4:45PM	5:00PM	5:15PM	5:30PM	5:45PM	6:00PM	6:15PM
Temp.	95	97	99	100	100	100	100	98	97	95	94
KWH	814	821	828	833	839	850	868	890	925	912	902
KWH with minus 30 min. lag	828	833	839	850	868	890	925	912	902	898	891

So you can use the Lag setting to make the software adjust the compared data points by shifting correlated values in degrees of Days, Hours, or Minutes.

About Localization

VES supports many languages by using “lexicon” files. If you need to change the language of your VES interface, you may do so by modifying the lexicon file so that it displays a different language. The following procedure describes how to do this.

NiagaraAX provides non-English language support by use of lexicons. Lexicons are identified by Java locale codes, such as “fr” (French) or “de” (German). When installing NiagaraAX on your PC, an installation step asks you to select “language packages”—these are lexicons. Typically, you install only those you might need, even though a “Select All” option is available. Each lexicon is a folder that contains a collection of lexicon files (moduleName.lexicon). Lexicon files are text files that map various entity “keys” (such as interface names or error and status values) to localized language characters. Often, mapped characters use special encoding.

Note: *Factory-supplied lexicons on a NiagaraAX installation CD typically require review and editing before they can be used on an actual job. If needed, you can install lexicons from a NiagaraAX CD to your Workbench PC by simply copying them from the CD’s lexicon folder into a “lexicon” directory created under your Niagara release directory.*

Lexicon files installed on your PC can be accessed and modified using a simple text editor. However, you typically use the Workbench’s lexicon editor:

Tools > Lexicon Editor

The lexicon editor not only provides edit features, but also shows the default (English) value for each line entry. In addition, the editor provides a “Lexicon Report” view, useful to see various statuses about a lexicon and its contained files. Once reviewed and edited, you typically install any needed lexicon into all JACE platforms. For more details, see “Lexicon Editor” and “Lexicon Installer” in the NiagaraAX User Guide.

About Exporting the Table View

The data that displays in the table below a chart in any report can be exported to a .CSV file. The software will initiate a File Download dialog box to give you the option of saving the data or opening it as a .CSV file.

Note: *Clicking on the column header will sort the table according to that column. Clicking again will toggle the sort between ascending and descending values. You can also drag and drop the columns to change column location.*

If you select Save, you will be able to browse to your hard drive and save the file where you wish. If you elect to open the file, your native .CSV file program will open the file.

Figure 3-50 Saving the Table View.

Time of Day	Columbus: HVAC consumption	Columbus: HVAC demand
0:00	2.66	58.2
0:15	2.59	60.6
0:30	2.55	63.3
0:45	2.55	60.4
1:00	2.50	58.9
1:15	2.51	60.9
1:30	2.50	63.3
1:45	2.53	65.5
2:00	2.51	56.1
2:15	2.54	59.1
2:30	2.53	59.2
2:45	2.56	60.0

Exporting Table Data.

This data export function will export manipulated data (i.e., “Average Daily HVAC consumption for last week”). Raw data may be exported from the log file (hostname/eas/log).

- Step 1 When you want to export the tabled data to a spread sheet program, right click in the table and select **Export to New Window**.
- Step 2 The File Download dialog box appears with two options; Save this file to disk or Open this file from its current location. Select the Open file option, and click “OK.”
- Note:** If you select to save the data to a file, you will be prompted for a file name and a storage location.
- Step 3 The data should automatically be displayed, as shown below, in the program in your computer that is defined as the default program for opening .CSV files.

Figure 3-51 Opening the Exported Table Data.

	A	B	C	D	E	F	G	H	I
1	0:00	2.66	58.2						
2	0:15	2.59	60.6						
3	0:30	2.55	63.3						
4	0:45	2.55	60.4						
5	1:00	2.5	58.9						
6	1:15	2.51	60.9						
7	1:30	2.5	63.3						
8	1:45	2.53	65.5						
9	2:00	2.51	56.1						
10	2:15	2.54	59.1						
11	2:30	2.53	59.2						
12	2:45	2.56	60.0						

About Aggregating Data Points

Aggregation is simply combining data points (or meters) from multiple buildings for reporting purposes. Reports in VES allow you to look at a single meters OR – through aggregation – combine as many meters as you want, as long as they are available in your site tree. One reason for aggregating meters is to see if you can get a better energy rate through aggregation and to see how the better rate affects your overall cost. This is useful for customers that have multiple buildings in the same geographic area. College campuses, for example, typically have dozens of buildings and each has its own meter and rate. For example, the Rate Comparison report (see “[About the Rate Comparison Report](#),” page 4-38) allows you to aggregate meters and determine what the cost would be if the meters are aggregated, regardless of the unique billing cycles for the individual meters.

Benefits of aggregating include:

- **Load flattening**
Often the aggregate cost is different because aggregating tends to flatten loads, as individual meters peak at different times and compensate one another.
- **Single rate**
By combining all meters under a single rate, you may qualify for a better rate and realize associated cost savings – and you may simplify billing.

About Data Cleansing

Data cleansing is an algorithm that searches through data and looks for “outliers.”

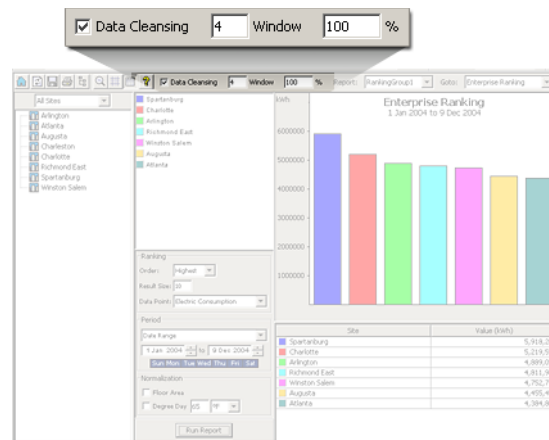
Note: *It is possible to alter good data and miss filtering some bad data points using Data Cleansing. Remember that data cleansing is an approximation.*

- An “outlier” is a data value that is far apart from the rest of the data; an extreme value either much lower or much higher than the rest of the values in the data set. Outliers are known to skew means or averages. This doesn’t mean that the data point is necessarily bad but in most cases the information is more helpful without the inclusion of this “unusual” data.

Data cleansing is available on all reports and includes the following parameters, as shown in :

- **Data Cleansing check box**
Data cleansing is disabled by default. Select the check box to enable data cleansing. Clear the check box to disable data cleansing. When data cleansing is enabled, the following two parameters are available and allow you to specify the “intensity” of the search for outliers in the data.
- **Window**
Enter an integer in the Window field to define the number of surrounding data points to consider when determining whether a given point is an outlier. For example, if you use the default value of “4”, it will look at the two points before and after the point under investigation (PUI). This is a surrounding “window” of 4 points from which a standard deviation will be calculated and used with the percentage parameter, as described, below.
- **Percentage**
Enter a value in this field to specify the percent of standard deviation (calculated from the window of points) to apply for identifying whether or not the PUI should be considered a valid value (not an outlier). If the PUI falls outside of this valid range, then it is considered to be an outlier and its value is replaced by the linear interpolation of the surrounding 2 valid points. If the PUI falls within the range, then the data point is used and considered valid.

Figure 3-52 Data Cleansing Fields



About Niagara units

In NiagaraAX there is a database of all units that are available in Workbench. You can select and assign these units in Workbench using the “Facets” field. If you need to use a unit that is not available in Workbench, you can add the unit by editing the facets database.

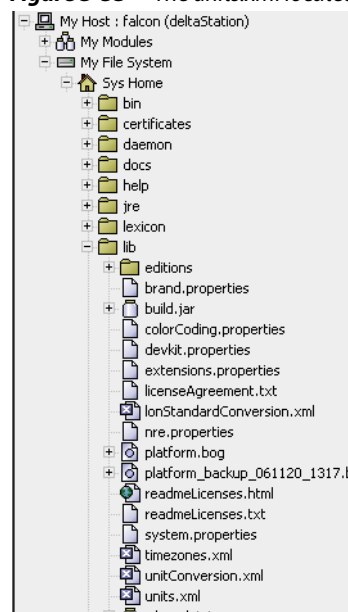
Refer to the “[Add a new unit to Workbench](#)” procedure to add a unit to NiagaraAX Workbench.

Add a new unit to Workbench

The following procedure is performed from the NiagaraAX Workbench.

- Step 1 In the NiagaraAX Workbench nav tree, expand the tree by clicking the **My File System > Sys Home > lib** nodes.

Figure 3-53 The units.xml located file in the Workbench nav tree



Step 2 Under the lib folder, double-click the “units.xml” to open it in the text file editor view.

Note: The “units.xml” file contains a list of all the units that are available in NiagaraAX Workbench. Units are grouped by categories.

The “units.xml” file displays in the Workbench text editor view.

Step 3 In the “units.xml” file, under the appropriate category, inside a <unit> </unit> element pair, type in the desired new unit and abbreviation using the syntax common to all units within the <quantity> element tags.

Each unit has a name (n) and an abbreviation (s) as shown in the example in Figure 3-54. In this example, the full unit name (n) is “footballfields”. This is the name that appears in a VES chart or graph. The abbreviated unit name (s) is “ff”. This is the name that appears on a numeric point property sheet (for example).

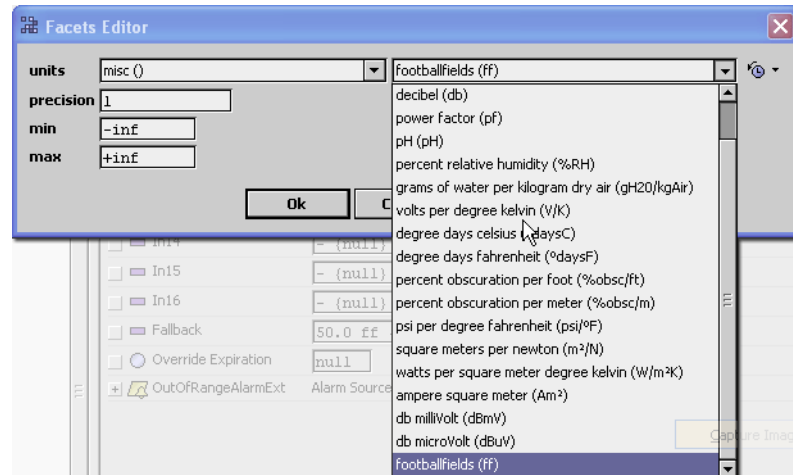
Figure 3-54 The units.xml file contents

```
<unitdb>
<!-- Misc -->
<quantity n="misc" dim="">
  <unit n="null" />
  <unit n="percent" s="%"/>
  <unit n="decibel" s="db"/>
  <unit n="power factor" s="pf"/>
  <unit n="pH" s="pH"/>
  <unit n="percent relative humidity" s="%RH"/>
  <unit n="grams of water per kilogram dry air" s="gH2O/kgAir"/>
  <unit n="volts per degree kelvin" s="V/K"/>
  <unit n="degree days celsius" s="°C#xba;daysC"/>
  <unit n="degree days fahrenheit" s="°F#xba;daysF"/>
  <unit n="percent obscuration per foot" s="%obsc/ft"/>
  <unit n="percent obscuration per meter" s="%obsc/m"/>
  <unit n="psi per degree fahrenheit" s="psi/°F#xba;F"/>
  <unit n="square meters per newton" s="m²#xb2;/N"/>
  <unit n="watts per square meter degree kelvin" s="W/m²#xb2;K"/>
  <unit n="ampere square meter" s="A#xb2;m²"/>
  <unit n="db milliVolt" s="dBmV"/>
  <unit n="db microVolt" s="dBuV"/>
  <unit n="footballfields" s="ff"/>
</quantity>
```

Step 4 Select File > Save from the Workbench main menu to save the “units.xml” file.

The new unit is now saved as part of the units database, however, you must restart Workbench for the change to visible in the **Facets Editor** dialog box, as shown in Figure 3-55.

Figure 3-55 New unit available in Facets Editor dialog box

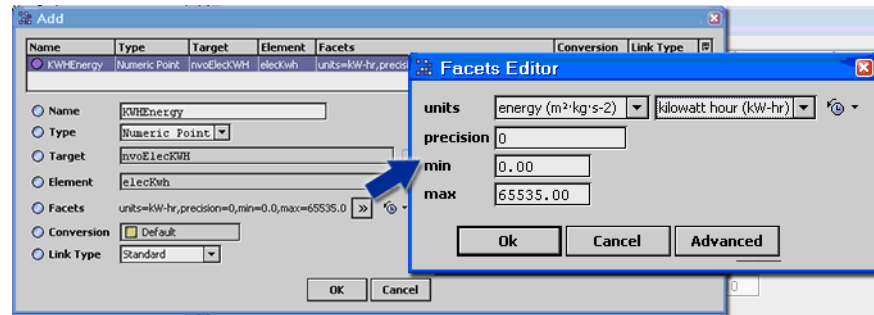


Assign a value facet (unit) to a control point

The following procedure is performed from the NiagaraAX Workbench. The units that are assigned in NiagaraAX Workbench are the units that the history files display in VES. Therefore, to ensure that you have the proper units for your data, you must set the proper units in the Numeric Interval Point extension, as described in the following procedure.

- Step 1 In NiagaraAX Workbench, open the **Facets Editor** dialog box, as shown in [Figure 3-56](#), from the point that contains the history extension that you are interested in. You can use the **Add** dialog box or **Edit** dialog box if you are in the **Point Manager** view. Alternatively, you can use the point's **Property Sheet** view to access the Facets slot.

Figure 3-56 The Facets Editor dialog box



- Step 2 In the **Facets Editor** dialog box complete the following fields:
- **units**
 - from the first (left) field, select the category of units that you are interested in.
 - from the second (right) field, select the units that you that you want to assign to the history extension.
 - **precision**: type in a number equal to the number of decimal points that you want to collect in your data.
- Step 3 Click the **Ok** button to complete the unit assignment.
The unit is now assigned to the history file data and appears in collected data files.


About Delta Logging

For consumption values, VES is capable of displaying data from either a totalized history or a delta history. In VES, delta values offer significant advantages over totalizing values when data editing is necessary. Therefore, you may want to use delta values.

A totalized value is taken from the meter reading at the end of each interval and is easily identified as each consecutive value in the history log is larger than the previous value. Therefore, “delta value” represents the actual consumption that was recorded for the period. In order to use delta logging in VES, a delta value property must be added to the appropriate point component in NiagaraAX Workbench so that the values in VES are correctly displayed when they are brought into VES.

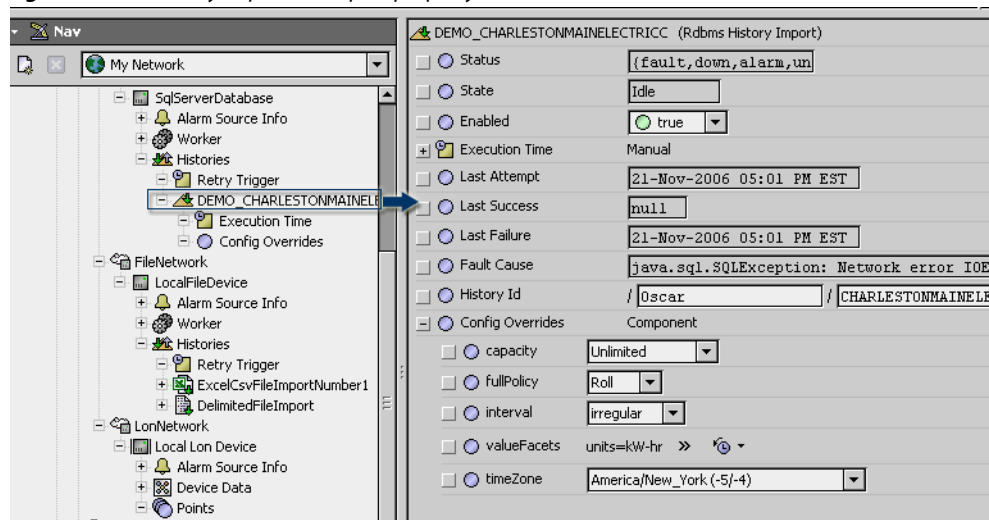
The procedure to use delta values is as follows. A slot must be added to the Config or Config Overrides.

Adding a slot for delta logging

In order to use delta logs in VES, you need to add a “useDelta” slot to the Config Overrides Component of the History Import descriptor .

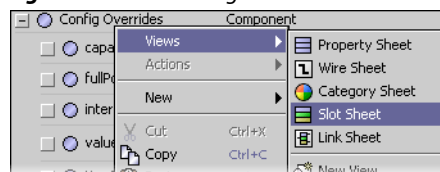
- Step 1 In NiagaraAX Workbench nav tree, double-click on the history file that you are interested in importing. The History Import property sheet view displays, as shown in [Figure 3-57](#).

Figure 3-57 History Import descriptor property sheet view



- Step 2 In the property sheet view, right-click on the Config Overrides component and select Views > Slot Sheet from the popup menu ([Figure 3-58](#)).

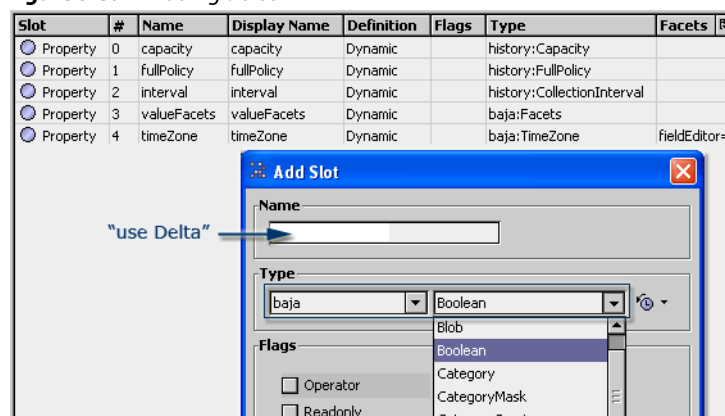
Figure 3-58 Selecting slot sheet view of Config Overrides component



The Slot Sheet view displays.

- Step 3 Right-click in the Config Overrides Slot Sheet view, and select Add Slot from the popup menu. The Add Slot dialog box displays over the slot sheet view, as shown in [Figure 3-59](#).

Figure 3-59 Adding a slot



- Step 4 In the Add Slot dialog box, type “useDelta” in the Name field and in the two Type fields select baja (left drop-down list) and Boolean (right drop-down list). Click the **Ok** button to add the slot. The “useDelta” slot is added to the component and visible in the slot sheet view, as shown in [Figure 3-60](#).

Figure 3-60 Slot sheet with useDelta slot added

Slot	#	Name	Display Name	Definition	Flags	Type	Facets
<input type="radio"/> Property	0	capacity	capacity	Dynamic		history:Capacity	
<input type="radio"/> Property	1	fullPolicy	fullPolicy	Dynamic		history:FullPolicy	
<input type="radio"/> Property	2	interval	interval	Dynamic		history:CollectionInterval	
<input type="radio"/> Property	3	valueFacets	valueFacets	Dynamic		baja:Facets	
<input type="radio"/> Property	4	timeZone	timeZone	Dynamic		baja:TimeZone	fieldEditor=
<input type="radio"/> Property	5	useDelta	useDelta	Dynamic		baja:Boolean	

The “useDelta” boolean property is now available in the Config Overrides component and it is visible in the property sheet view, as shown in [Figure 3-61](#).

Figure 3-61 Property sheet with useDelta slot added

DEMO_CHARLESTONMAINELECTRIC (Rdbms History Import)

☐ Status: {fault,down,alarm,un}

☐ State: Idle

☐ Enabled: true

☒ Execution Time: Manual

☐ Last Attempt: 21-Nov-2006 05:01 PM EST

☐ Last Success: null

☐ Last Failure: 21-Nov-2006 05:01 PM EST

☐ Fault Cause: java.sql.SQLException: Network error IOE

☐ History Id: /Oscar / CHARLESTONMAINELECTR

☒ Config Overrides: Component

☐ capacity: Unlimited

☐ fullPolicy: Roll

☐ interval: irregular

☐ valueFacets: units=kW-hr >> K

☐ timeZone: America/New_York (-5/-4)

☐ useDelta: false

Common report and log tasks

The following procedures describe some of the common tasks related to working with reports. For more specific details about creating each type of report, refer to [“Using VES Reports,”](#) page 4-1. Some of the common report-related tasks include:

- [Creating a report](#)
- [Saving a report](#)
- [Viewing the eas Summary Page](#)
- [Accessing the eas log page](#)
- [Viewing individual eas logs](#)

Creating a report

- Step 1 Select the report type from the appropriate link on the VES home page. The eas servlet in the server will feed the empty template to the browser.
- Step 2 Select data points to analyze.
- Step 3 Define parameters such as time periods, normalization methods, etc.
- Step 4 Run the report. The values in the profiling database that match the defined parameters are processed, and the filtered data populates the report view.

Saving Reports

Users have the ability to save reports and can designate whether a saved report is public or private (only for the author of the saved report). When a report is saved, it is saved in the following two places:

- If it is a private report, it will be saved in the Favorites link.
- It will be saved as a subgroup of the current report template link.

Note: *If a report is saved with a common date range, such as Last Week, the saved report will always go to the preceding week at the time of viewing. If you save a custom period, the saved report will show the data for that specified date range.*

Saving a report

- Step 1 On the workbench toolbar, click the Save icon.
The Report Name dialog box appears.

- Step 2 In the Report Name dialog box, type the desired name of the report and choose one, both or none of the following:
- Public - for saving the report as a “Public” report type.
 - Auto Run - for saving the report so that it will automatically run when opened.
- No choices result in creating a “Private” report that will not Auto Run.

Viewing the eas Summary Page

The eas Summary page displays the following data (see Figure 3-62):

- eas module version
- number of configured sites
- number of configured data points
- number of attached meters
- number of licensed meters

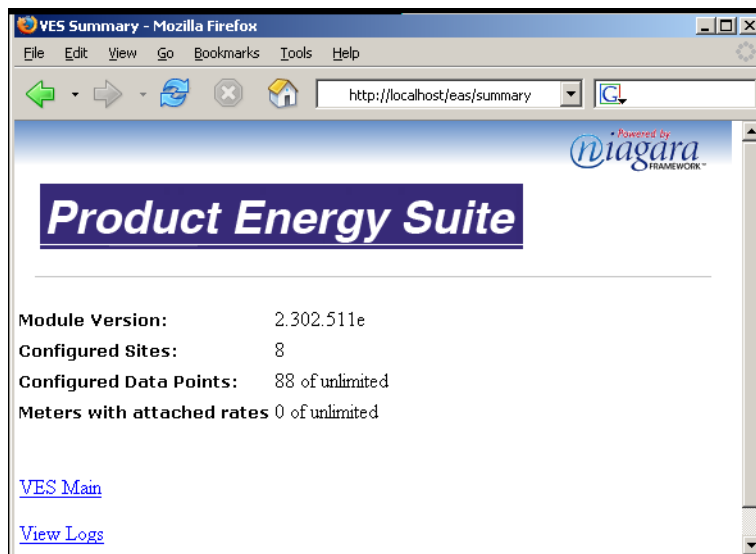
To display this page type the following in the browser address field:

`http://hostname/eas/summary`

where hostname is the name or IP Address of the Niagara eas host.

The summary page also displays links to the log page and to the home page.

Figure 3-62 Summary Page.



Accessing the eas log page

You can access the eas log page to display an index of all logs for data points that have been brought into the eas database. Each log is individually available from a link on this index page.

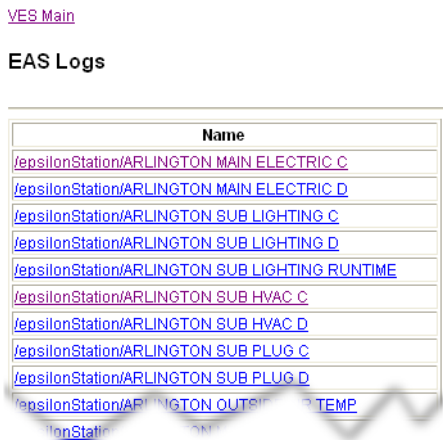
To open the eas log page, do either one the following:

- Step 1 Type the following line in the browser address bar: `http://hostname/eas/log`
OR

- From the eas Summary page, click on the **View Logs** link.

The eas log page displays and appears similar to the graphic shown in Figure 3-63:

Figure 3-63 eas log page.



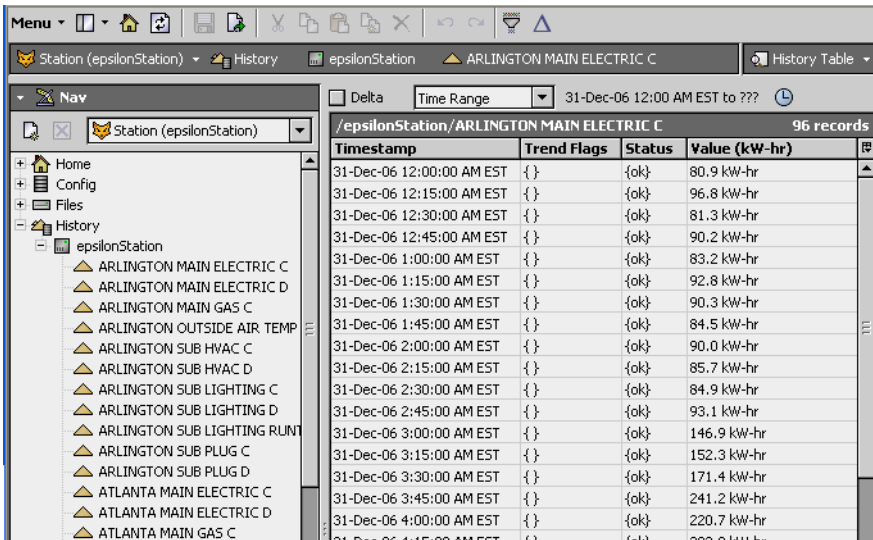
Viewing individual eas logs

Each eas log is an individual history log that you can display in any of the workbench history views. You can open a log from the eas Logs page or, if you open workbench, you can open a log directly from the history space.

To view a history log, do the following:

- Step 1
- From the eas Logs page, click on the desired log.
The workbench loads in your browser and the log displays in the History Table view, as shown in [Figure 3-65](#). You can choose a different view (History Chart, Collection Table, History Summary View, History Editor) using the View Selector.

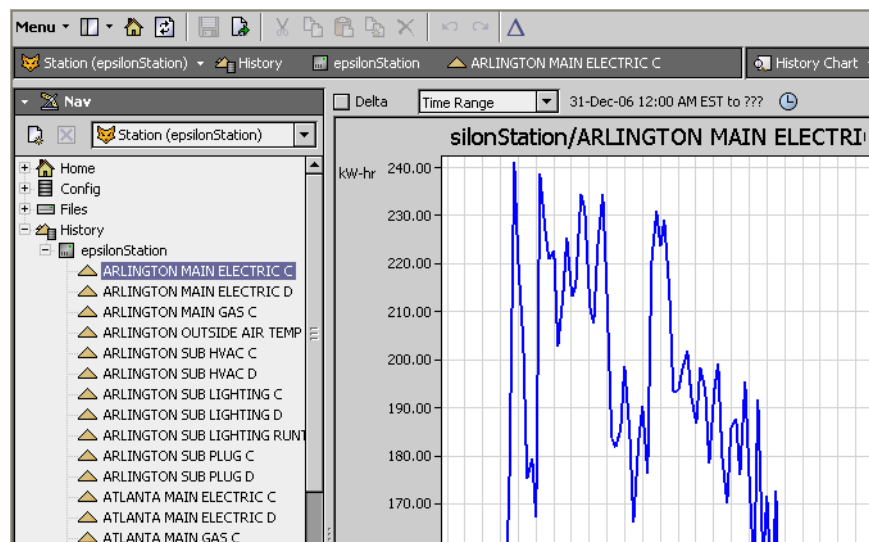
Figure 3-64 Viewing a history log using the workbench History Chart view.



OR

- From the workbench nav tree, under the History node: expand the station node to display the list of available history logs. Double-click the desired history log.
- The workbench loads in your browser and the log displays in the History Chart view, as shown in [Figure 3-65](#). You can choose a different view (History Table, Collection Table, History Summary View, History Editor) using the View Selector.

Figure 3-65 Viewing a history log using the workbench History Table view.



CHAPTER 4

Using VES Reports

Reports are the primary means of analyzing data in VES and are available for both the E2 Profiler module and for the Cost Profiler module. For an overview of all the VES reports, refer to [“About VES Reports,”](#) page 1-5. For information about using specific reports, refer to the descriptions listed under the following two primary headings:

- [Using E2 Profiler Reports](#)
- [Using Cost Profiler Reports](#)

Using E² Profiler Reports

This section describe how to use each of the various report templates in the E² Profiler:

- [“About the Aggregation Analysis Report”](#)
- [“About the Average Daily Profile Report”](#)
- [“About the Spectrum Summary Report”](#)
- [“About the Enterprise Ranking Report”](#)
- [“About the Relative Contribution Report”](#)
- [“About the Equipment Operation Report”](#)
- [“About the Point Trending Report”](#)
- [“About the Exceptions Report”](#)
- [“About the Load Duration Report”](#)
- [“About the Correlation Report”](#)
- [“Report Administration”](#)

About the Aggregation Analysis Report

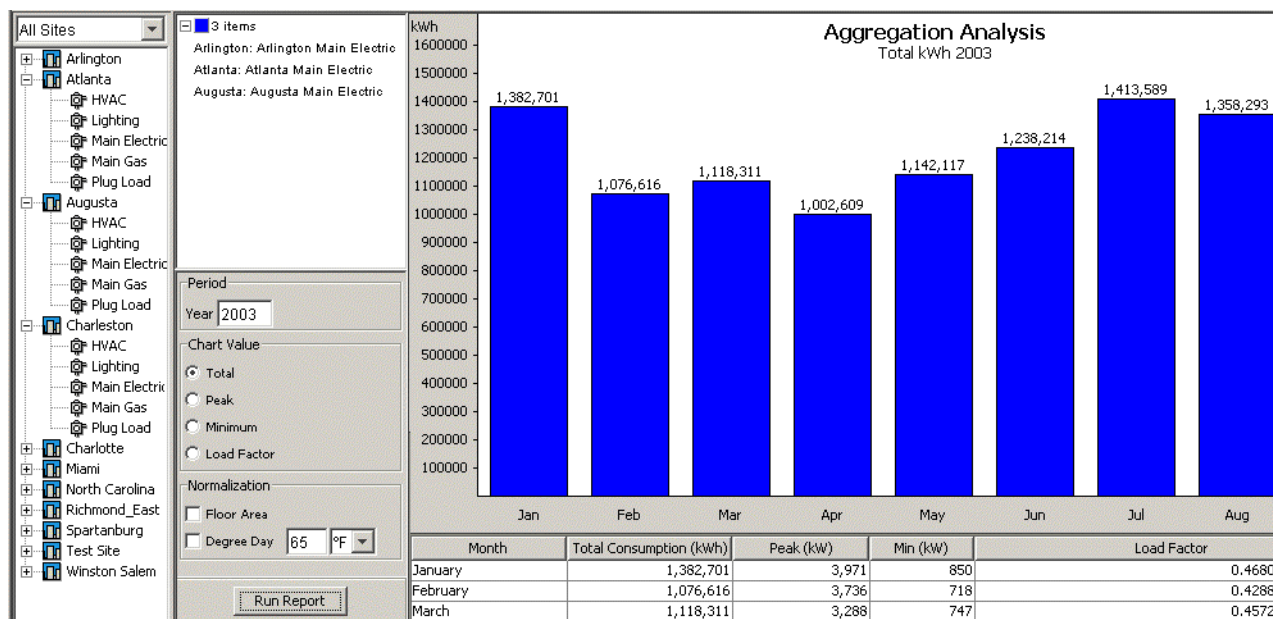
This report aggregates (totalizes) multiple data points and shows the peak, minimum, and total consumption as well as computes load factor. This information is used to make decisions about demand limiting. By reducing peak consumption and leveling the total load, volatility is reduced and energy customers can make significant improvements in their energy procurement. This report helps identify complementary combinations and unattractive peaks. Organizations can use this report when writing Requests for Proposal (RFP) for commodity procurement.

Once you select this report, you define the parameters to chart, including: sites, data points, and time period. Additionally, you may choose whether or not to take floor area or weather into account when analyzing the data.

Note: *This report only examines points that are in meters. You must configure energy points into meters using the Configuration tool in order to run those points in the Aggregation Analysis report.*

The following graphic is an example of an Aggregation Analysis Report.

Figure 4-1 Aggregated Analysis Report Example.



This example shows a report of electrical demand and consumption aggregated for three facilities. The report shows aggregated peak usage for each month of the year.

Creating the Aggregation Analysis Report

Perform the following tasks to create an aggregation analysis report:

- [Start the report](#)
- [Select meters to aggregate.](#)
- [Set report parameters](#)

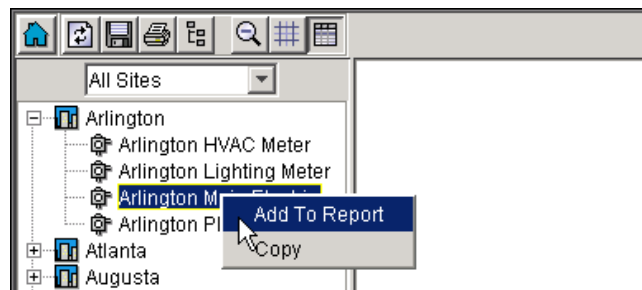
Note: The following tasks assume the default home page setup. If you modify your home page to use the customHome page or semiCustom home page, navigation and screens will look different.

Start the report

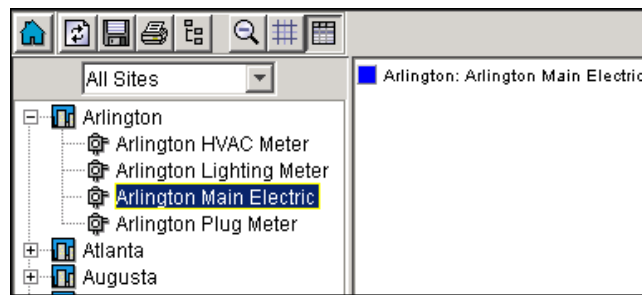
- Step 1 Launch VES from your browser using the following URL: `http://hostname/eas` where hostname is the name or IP address of the Web Supervisor.
- Step 2 Enter appropriate login information to gain access to the home page.
- Step 3 From the home page, open Aggregation Analysis by clicking on the Aggregation Analysis link.
- Step 4 Click on New. You may need to enter security information again for the Java Plug-in.

Select meters to aggregate.

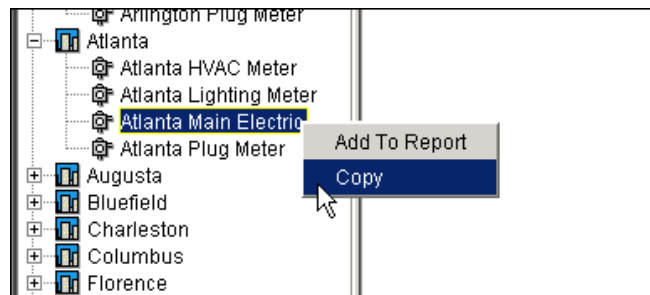
- Step 1 With the Aggregation Analysis Report open, expand a site, right click on the meter to bring up the selection menu, and select Add to Report.



You will see now that the meter has been put in the Input Window.

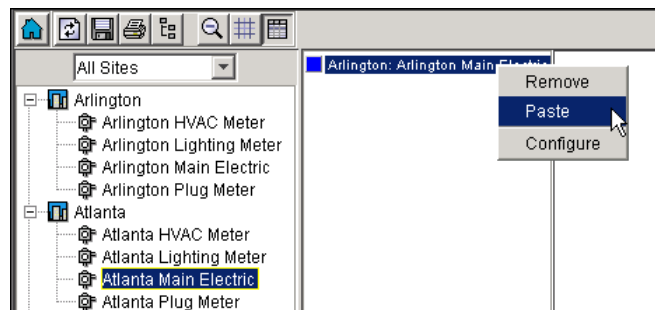


Step 2 To add other meters, expand the sites, right-click and select Copy.



Note: In this report, the Copy/Paste commands perform the same function as Add to Report.

Step 3 Right-Click on the selection that is already in the input Window, and select Paste.



Step 4 Repeat Steps 2 & 3 to add any other meters to the Aggregation Analysis Report.

Set report parameters

Step 1 Define the Time Period covered (Year field only).

Step 2 Select the Value that you want to Chart (refer to the following paragraphs).

Selectable options are Total, Peak, Minimum, and Load Factor. These options are mutually exclusive for the report, so you can only view one of these values at a time. However, after running the report, you can switch your value selection and the chart will automatically change to reflect the newly selected option.

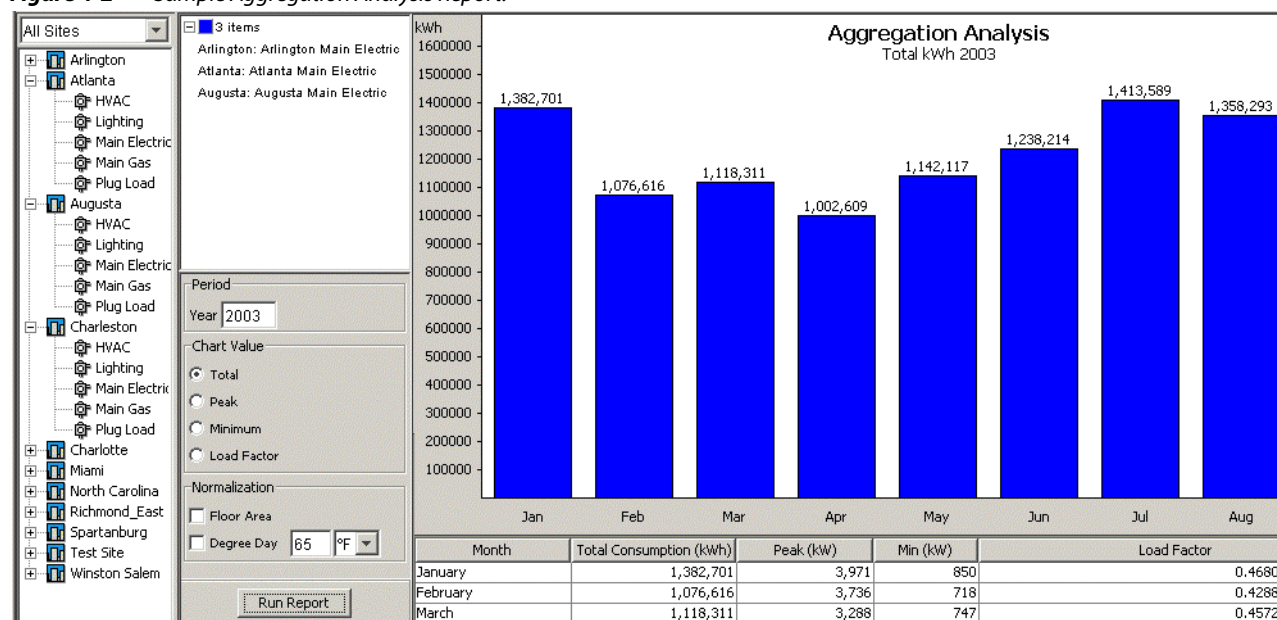
- Total
This is the total sum of all metered values for each month of the selected year.
- Peak
This will show the peak metered value within all the logs for each month of the selected year.
- Minimum
This will show the minimum metered value within all the logs for each month of the selected year.
- Load Factor
(consumption / peakDemand) / hoursInTimePeriod

Step 3 Choose a Normalization option, if desired.

Note: Degree Days are a practical method for determining cumulative temperatures over the course of a season. Originally designed to evaluate energy demand and consumption, degree days are based on how far the average temperature departs from a human comfort level of 65° F. Each degree of temperature above 65° F is counted as one cooling degree day, and each degree of temperature below 65° F is counted as one heating degree day. For example, a day with an average temperature of 80° F will have 15 cooling degree days.

Step 4 Click **Run Report**

Your results should resemble [Figure 4-2](#):

Figure 4-2 Sample Aggregation Analysis Report.

Note: Click on the column headers to resort columns to help you see the highest and lowest levels of use. This should help you analyze your data to make management and purchasing decisions. You can also drag and drop columns by clicking on the column header.

- Load Factor indicates how flat the load is. 1 is flat and will never be achieved, but the higher the number, between 0 and 1, the more flat the load will be.

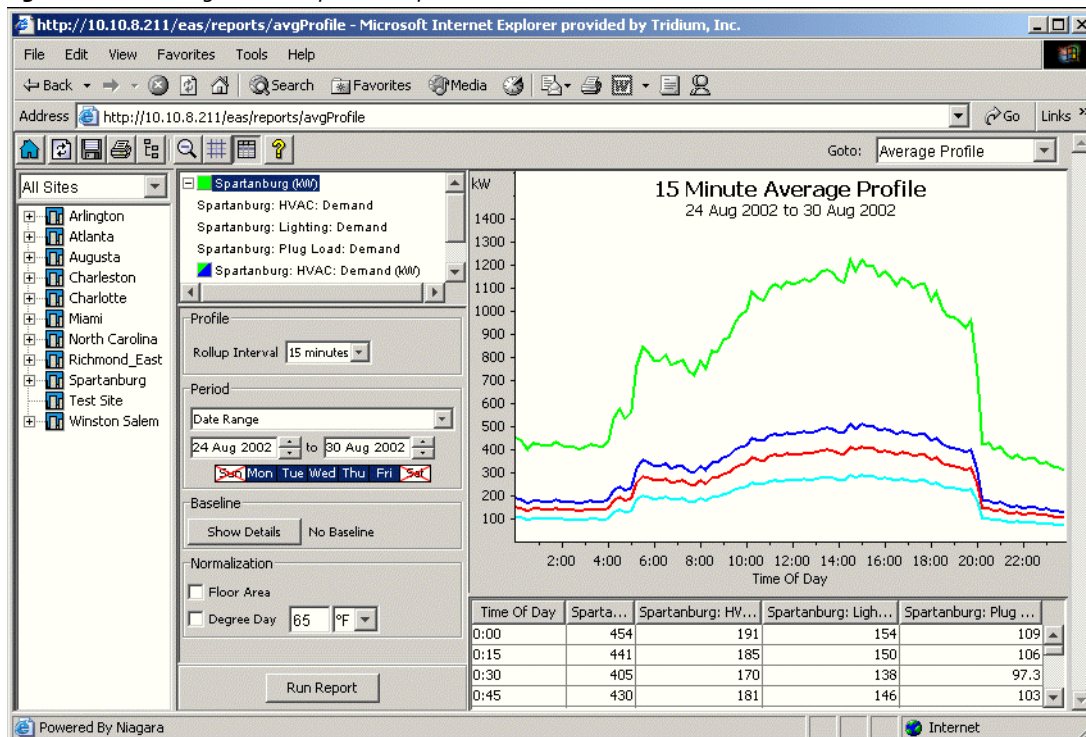
About the Average Daily Profile Report

The Average Daily Profile report shows you the average pattern of a data value over a specified time period. This report is useful when you are negotiating energy contracts. By understanding energy demand patterns, you have the information necessary to negotiate an energy contract tailored to the unique needs of the business. VES gives you the ability to define parameters such as time periods, measurement units, and facilities. Using these parameters, you can identify unfavorable peaks and patterns, adjust behavior, and create an effective energy procurement strategy. Having this information allows you to reduce consumption volatility and to make the energy load more attractive for energy providers - reducing energy purchasing costs.

The Average Profile Report gives you the ability to aggregate and disaggregate points. When viewing an aggregated point, you will be able change the graphical display between a single aggregated curve and multiple disaggregated curves. When in a disaggregated state, the total or aggregated curve will remain in the view along with all the disaggregated points below it.

The following graphic is an example of a disaggregated Average Profile Report:

Figure 4-3 Average Profile Report Example.



This example shows the average 24-hour period for the data points for a week. The average 24-hour period is the mean weekday curve for the week. On the calendar, Saturdays and Sundays are excluded from the report totals. The highest curve on the graph is the aggregate and the underlying curves are the disaggregated record for each point.

Creating an Average Daily Profile Report

Create an Average Daily Profile Report by performing the following tasks

- “Start the average daily profile report”
- “Select the Data Points to Chart”
- “Set Report Parameters”

Start the average daily profile report

- Step 1 Launch VES from your browser using the following URL: <http://hostname/eas> where hostname is the name or IP address of the Web Supervisor.
- Step 2 Enter appropriate login information to gain access to the home page.
- Step 3 From the home page, open Average Daily Profile by clicking on the Average Daily Profile link.
- Step 4 Click on New. You may need to enter security information for the Java Plug-in.

Select the Data Points to Chart

- Step 1 Expand the tree to find the site and data point you wish to chart. Right click on the desired data point and select Add to Report.

The data point displays in the Selection window.

Note: If you select a site or a meter, all applicable data points within that object will be added to the Selection window.

- Step 2 Repeat adding data points or copying and pasting data points until you have all of the points in the report that you want to chart.

Set Report Parameters

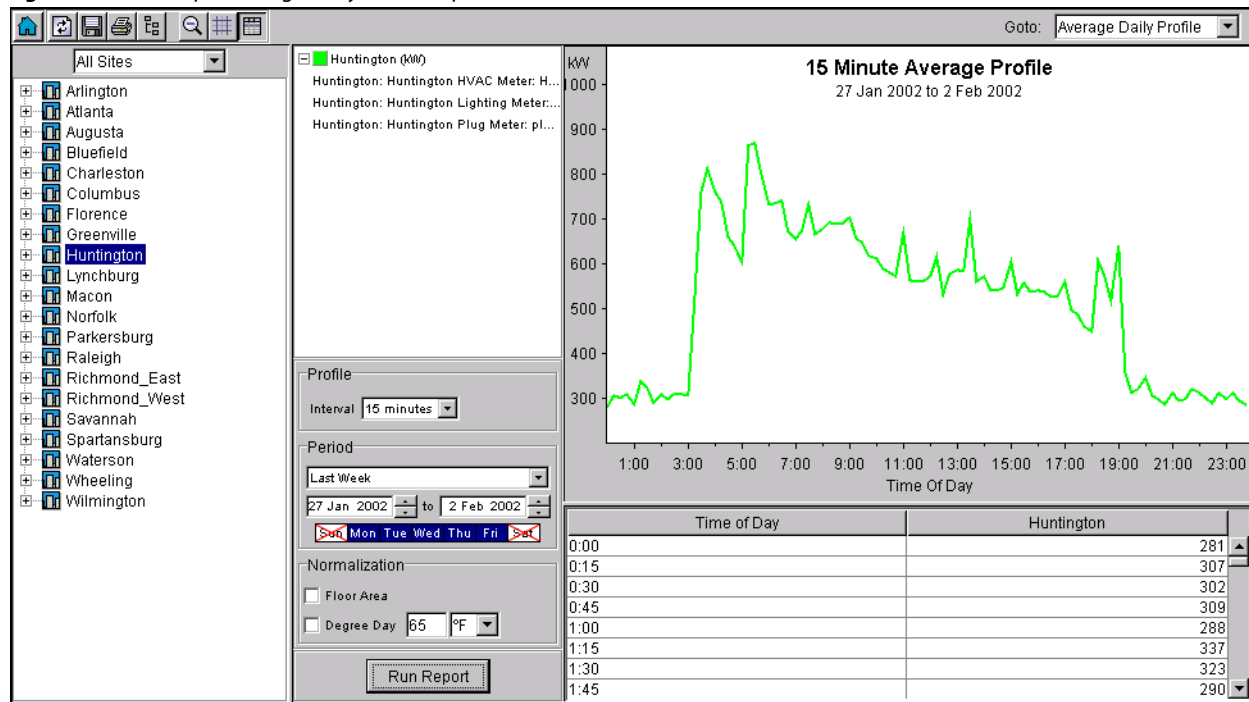
- Step 1 In the Profile frame, set the drop-down box for Rollup Interval. Your choices are 15, 30, and 60 minute blocks of time.

The interval defines a block of time within which the data samples will be reported. Depending on the type of data, the data samples are handled differently. For demand data, the highest value sample, or peak, collected within the interval will be used. For consumption data, all the samples within the interval will be added together. For all other data types, the data samples are averaged together.

Note: If you are viewing this report for only a single day, the actual calculated values as described above will be reported and charted. When reporting on a range of days, the calculated values are averaged together for each time interval and charted as the average for the period of the report.

- Step 2 In the Period frame, select the time period for the data and which days of the week to exclude from the report (if any).
- Last Week is a variable. It will always be the preceding week (Sunday through Saturday) of the date the report is viewed.
 - For a constant date of a particular week, select Date Range. On the day, month, and year, use the arrow keys to set the range for the start and To (end) dates.
- Step 3 If you want to plot a baseline, click the Show Details button and complete the baseline parameters, as described in “Baseline,” page 4-17, below.
- Step 4 In the Normalization frame, set your desired parameters. If you want to normalize for Floor area, weather, or production, see “Types of Normalization,” page 3-35 for details about normalization.
- Step 5 Click on Run Report.
Your report should be similar to that in Figure 4-4.

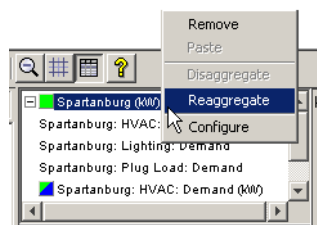
Figure 4-4 Sample Average Daily Profile Report.



- You can right click on a data point in the Selection window and select **disaggregate**. A disaggregated point can be reaggregated the same way.
- Drag across or down to zoom in to a specific section of the chart.

Aggregate and Disaggregate

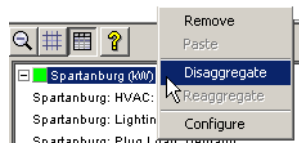
- **Aggregate**
The display of the above exercise of the Average Profile is aggregated. There is one graph line representing the average of the specified time for all of the items selected in each collective. To Disaggregate, right click on the site name and select “Disaggregate.” The graph will display all lines separately.



- **Disaggregate**

When the same collection is Disaggregated, the highest line on the graph is the aggregate of all of the underlying lines.

To Reaggregate, right click on the site name and select “Reaggregate.” The graph will combine all lines and display as a single line.



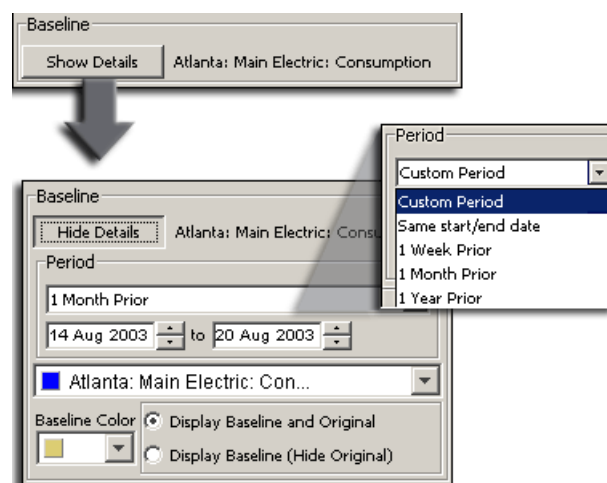
Baseline

Baseline Period is the set of data values, within the trended log, by which all the rest of the data is compared. This allows you to compare a data value against itself at another period of time (i.e., Main kWh for last week vs. Main kWh for the same week in the previous year). You can select a predefined start date from the Period list (Custom Period, Same Start Date, 1 Week Prior, 1 Month Prior, or 1 Year Prior) then select how many days worth of original data are in the baseline period. The software takes that defined number of days and repeats the baseline period for the entire charted time.

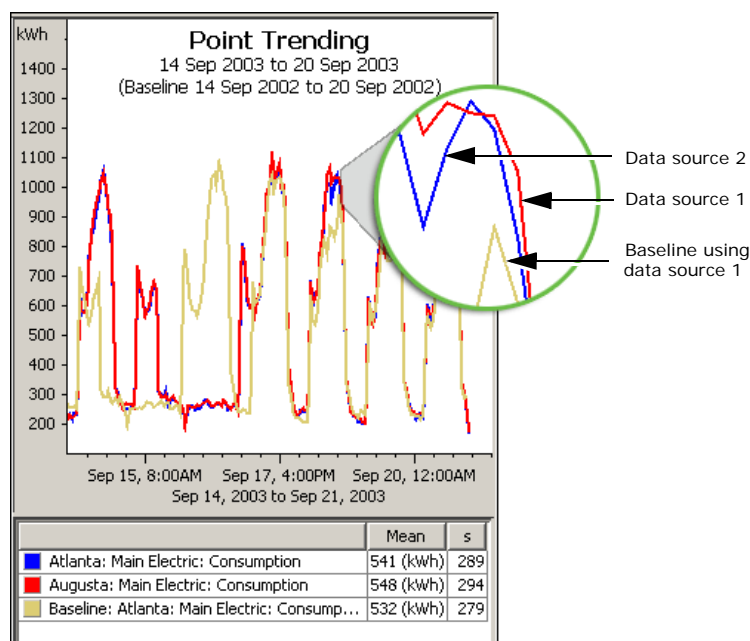
Setting the Baseline Parameters.

The following procedure describes how to set the baseline parameters for reports that allow detailed baseline parameters.

- Step 1 Once you have selected points to be charted, along with a date range, click **Show Details** to define the baseline parameters.
- Step 2 From the data point list, select the point that you wish to use as a baseline.



- Step 3 Define the baseline period by selecting a common period from the **Period** list or by manually defining the baseline period.
- Step 4 Select a color for the baseline trend from the **Baseline Color** list and choose a **Display** option to complete the Baseline Period setup:



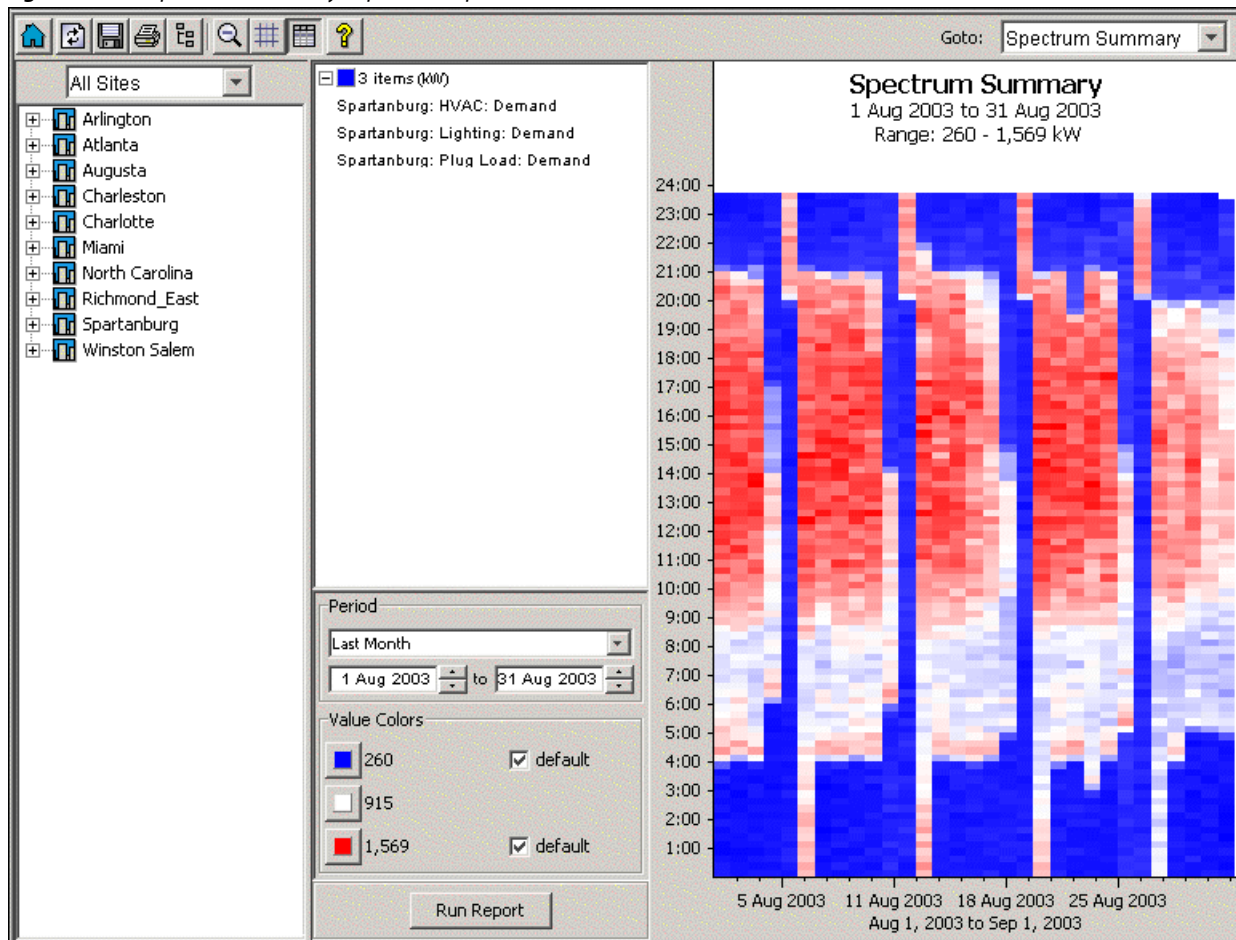
- **Display Baseline and Original** - displays a data plot that represents the data point baseline parameter selections and an additional plot for the full range of your original data point.
- **Display Baseline (Hide Original)** - plots your baseline data only. This data is from the data source that you selected.

Step 5 Click **Run Report** to create the report.

About the Spectrum Summary Report

Using advanced pattern recognition techniques, the Spectrum Summary Report provides a quick view of any point or aggregated point using color coding to identify the reasonableness of the data value. Information in this report is presented in a colorful fashion, making evaluation quick and easy. If all data values are within the proper ranges, the report colors will be in a consistent pattern and the user can move on to other functions. If there are unusual or inconsistent values, the pattern will not be consistent and the user will know with a quick glance that further analysis is required.

Figure 4-5 Spectrum Summary Report Example.



Creating a Spectrum Summary Report.

Create the Spectrum Summary Report by performing the following tasks:

- “Start the Spectrum Summary Report”
- “Set Report Parameters”

Start the Spectrum Summary Report

Step 1 Select the **Spectrum Summary** link on the VES home page or use the Goto Pull-down menu from within the current report.

Note: If you desire, you can click on the **Home** button to take you back to the VES home page. Then you can select the Spectrum Summary link and New to get to the Spectrum Summary Report page. But it would be easier to simply use the Goto Reports Pull-down menu on the upper right to select the Spectrum Summary Report.

Step 2 Once the Spectrum Summary report is open, expand Augusta and then Augusta Main Electric and right click on main electric demand. Select Add To Report. This will place Augusta Main Electric: Main electric demand in the Selection Window.

Set Report Parameters

To set the parameters of the report select the following:

Step 1 In the Period frame, select Last Month in the drop-down box.

Step 2 In the Value Colors frame, retain the default values as selected.

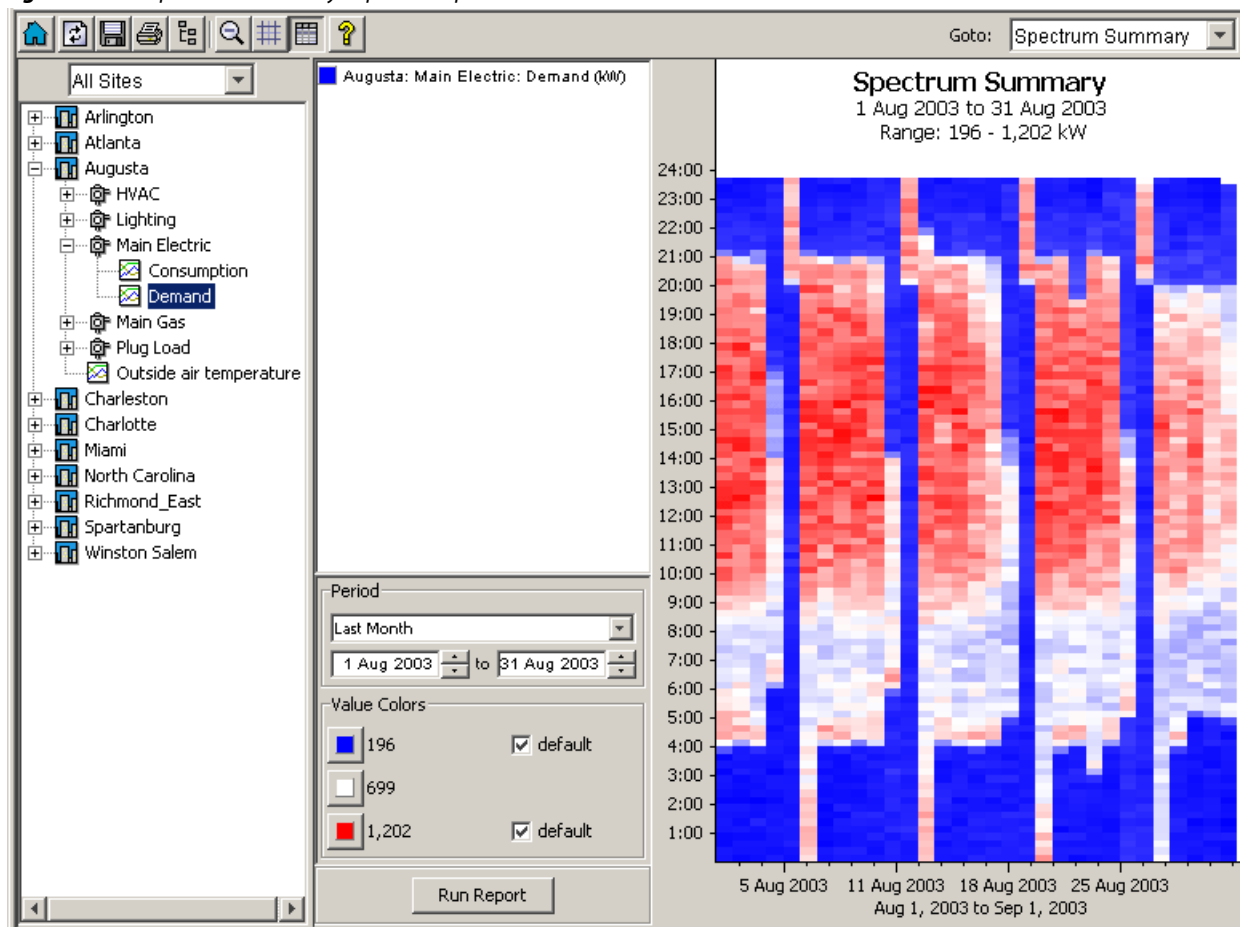
- Value Colors
Value Colors, by default, are blue, white, and red. Blue is the bottom of the displayed range and red is the top of the range. White is the default mean of the plotted values. The default high and low range values are highest and lowest values from the set of data points being displayed. All settings are user definable.



Note: If a Spectrum Summary report shows all blue or all red, then the scale is off (possibly due to some excessive data values). To ignore the excessive values, clear the **default** check box, manually set the suspected excessive parameter, and run the report again.

Step 3 Click Run Report to create the Spectrum Summary Report.

Figure 4-6 Spectrum Summary Report Sample.



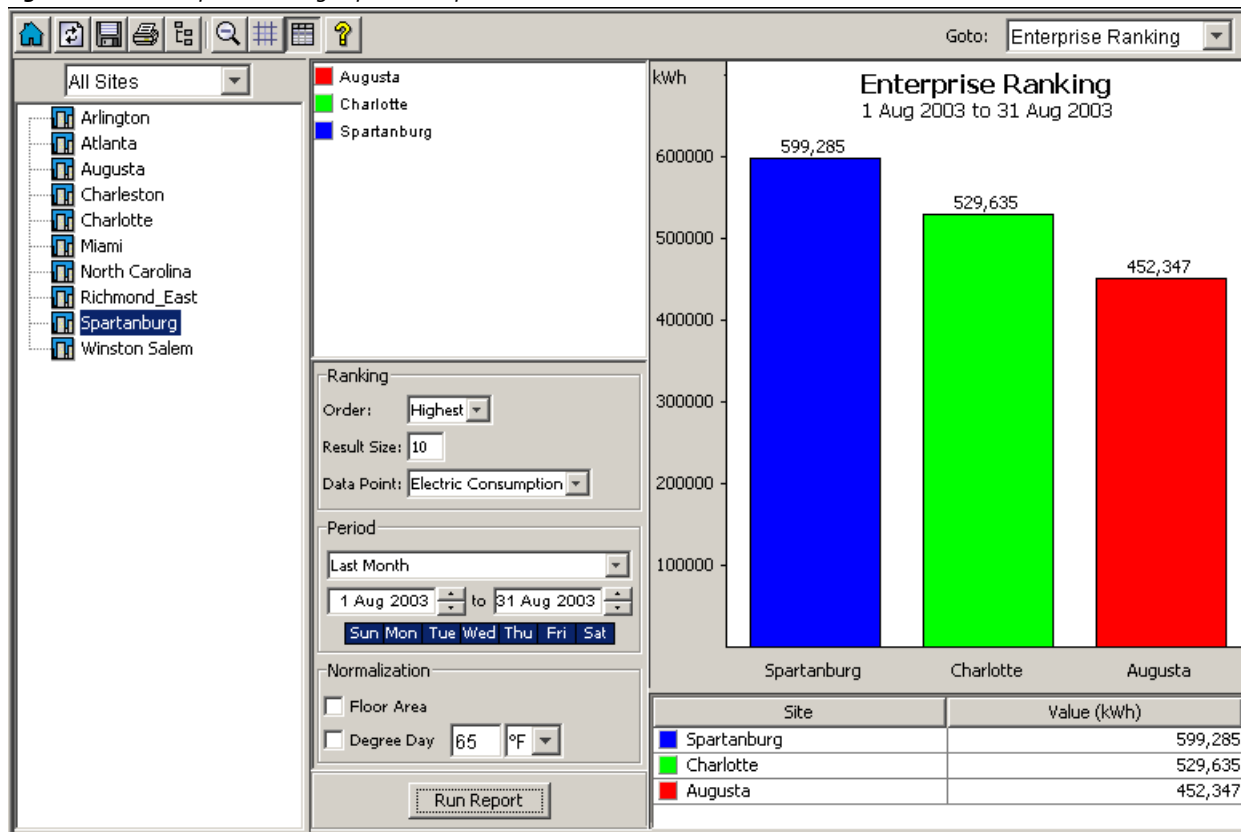
About the Enterprise Ranking Report

With this report, the user can identify the sites in the database that are the most and least efficient, based on utility Demand or Consumption records.

By showing where the most, or least, amount of energy is being consumed, this report gives users a quick view of their enterprise and helps identify where to target engineering and project capital. Identifying the most efficient sites can also help define building specifications for future projects.

Note: Only meters that have been defined as “Main Meters” in the Configuration tool can be ranked.

Figure 4-7 Enterprise Ranking Report Example



Creating an Enterprise Ranking Report.

Create an Enterprise Ranking Report by performing the following tasks:

- [Start the Report](#)
- [Select the Sites to Chart](#)
- [Set Report Parameters](#)

Start the Report

- Step 1 Launch VES from your browser using the following URL: `http://hostname/eas` where hostname is the name or IP address of the Web Supervisor.
- Step 2 Enter appropriate login information to gain access to the home page.
- Step 3 From the VES home page, open Enterprise Ranking by clicking on the Enterprise Ranking link.
- Step 4 Click on New. You may need to enter security information for the Java Plug-in.

Note: If you desire, from within an existing report, it is easier to simply use the Goto Reports Pull-down menu on the upper right to select the desired report.

Select the Sites to Chart

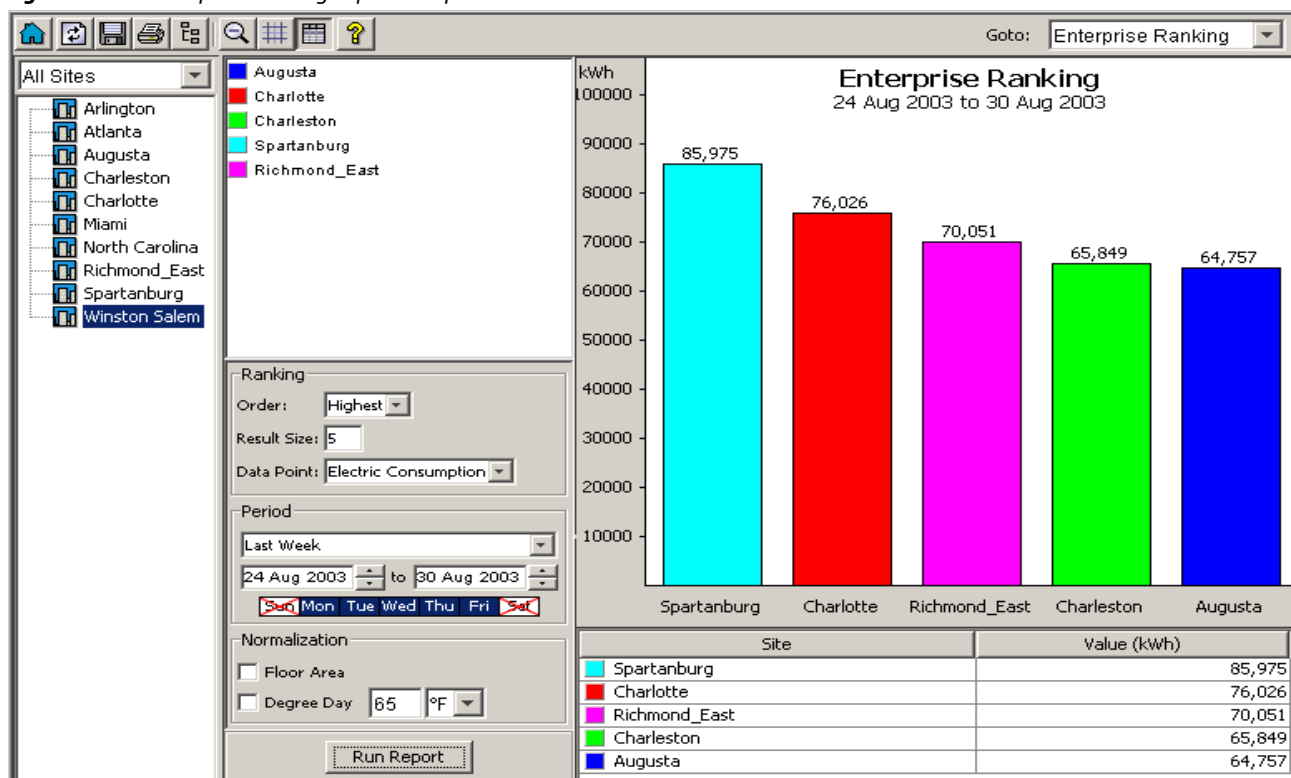
- Step 1 The tree will only list sites for this report. Right click on the site you want to include and select Add to Report. You will see the site in the Selection window.
- Note:** To quickly run a report of the highest or lowest sites in the database, leave the selection window blank. The software will automatically select sites in the database that are the highest or lowest of all the sites.
- Step 2 Repeat adding sites until you have all of the sites in the report that you want to chart.

Set Report Parameters

- Step 1 In the Ranking frame, set Order, Result Size, and Data Point.
 - Order
Can be set to Highest or Lowest to determine how the order by which sites will be ranked.
 - Result Size
This sets the number of sites included in the result window. If you have no sites selected, the software will automatically select this number of sites in the database that are the highest and lowest of all the sites.

- Data Point
This sets the utility data point in the site with which the calculations will be made. This could be either a utility demand or consumption log or a sewer volume or peak flow log.
- Step 2 In the Period frame, select the time period for the data and which days of the week to exclude from the report (if any).
- Step 3 In the Normalization frame, set your desired parameters. If you want to normalize for Floor area, for weather, or production, refer to “Types of Normalization,” page 3-35, for details.
- Step 4 Click on Run Report to create the report.

Figure 4-8 Enterprise Ranking Report Sample Exercise.

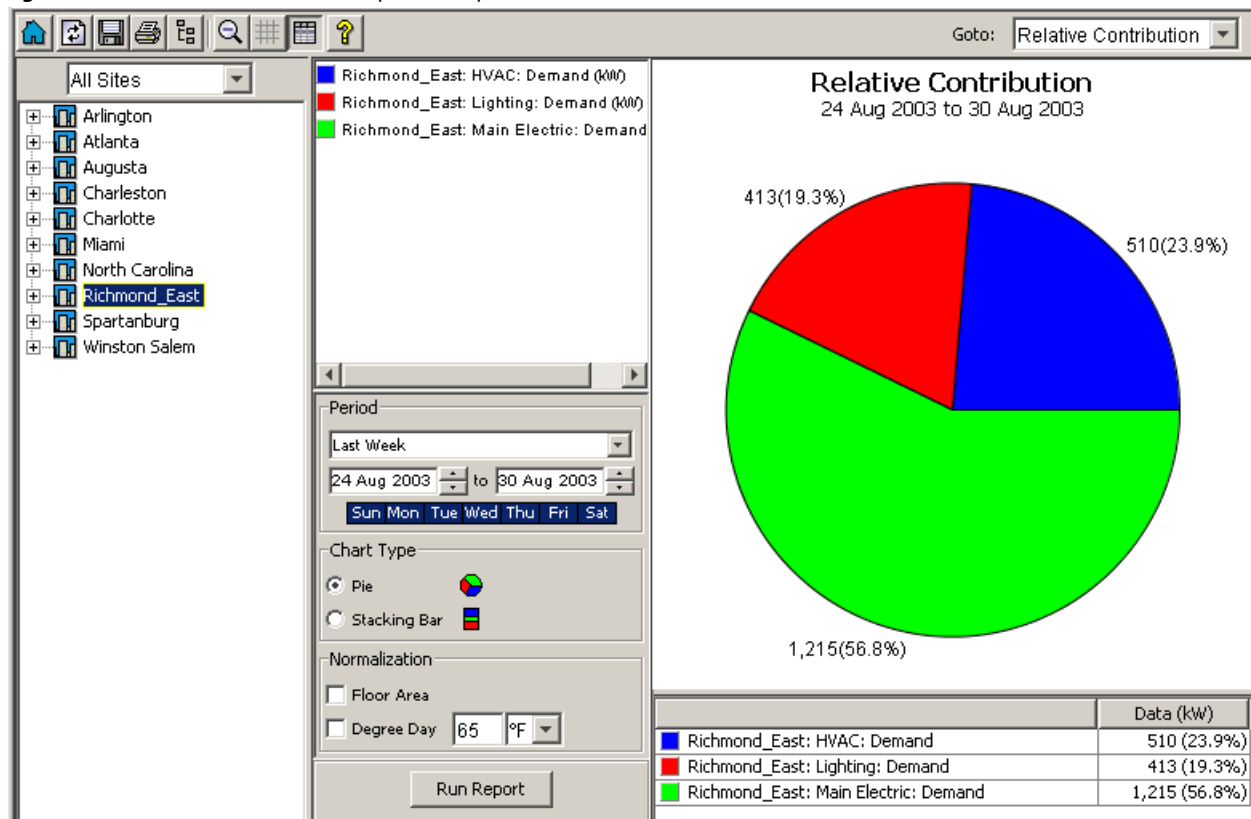


About the Relative Contribution Report

This report gives you the ability to identify how individual points contribute to a total from a site or group or at what specific proportion multiple sites contribute to the total for an organization. You can select a group of points, calculate the aggregate consumption of the group, and report on the individual contribution of each underlying data point. For example, users could identify that HVAC is 48% of the building load; lighting is 42%, or Building 1 accounts for 14% of the total enterprise load and Building 2 contributes 19%.

Data will be displayed both graphically as well as in tabular format. The format of the graphical portion is user definable with options for a pie chart or a stacking bar. This report will allow you to identify inefficiencies and help perform budgeting.

Figure 4-9 Relative Contribution Report Example.



Creating a Relative Contribution Report.

Create an Enterprise Ranking Report by performing the following tasks:

- [Start the Report](#)
- [Select the Data Points to Chart](#)
- [Set Report Parameters](#)

Start the Report

- Step 1 Launch VES from your browser using the following URL: `http://hostname/eas` where hostname is the name or IP address of the Web Supervisor.
- Step 2 Enter appropriate login information to gain access to the home page.
- Step 3 From the home page, open Relative Contribution by clicking on the Relative Contribution link.
- Step 4 Click on New. You may need to enter security information for the Java Plug-in.

Select the Data Points to Chart

- Step 1 Expand the tree to find the site and data point you wish to chart. Right click on the data point and select Add to Report. You will see the data point in the **Selection** window.

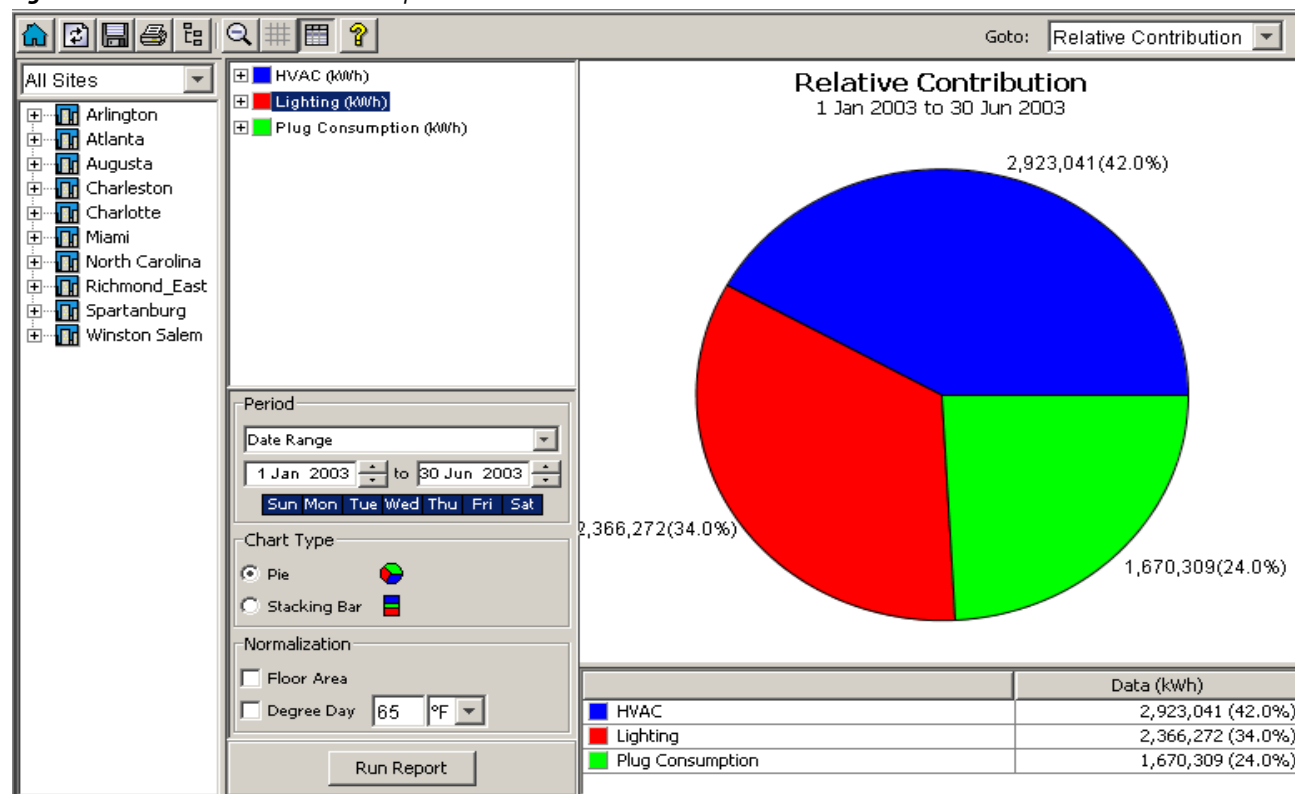
Note: *If you select a site or a meter and do an Add to Report, the software will key off of the first data point in the group, and all data points of that same type, subordinate to that selection, will be added to the Selection window as an aggregated point.*

- Step 2 Repeat adding data points or copying and pasting data points until you have all of the points in the report that you want to chart.

Set Report Parameters

- Step 1 In the Period frame, select the time period for the data and which days of the week to exclude from the report (if any).
- Step 2 Set Chart Type to Pie or Stacking Bar.
- Step 3 In the Normalization frame, set your desired parameters. If you want to normalize for Floor area, for weather, or production, refer to [“Types of Normalization,”](#) page 3-35, for details.
- Step 4 Click Run Report.

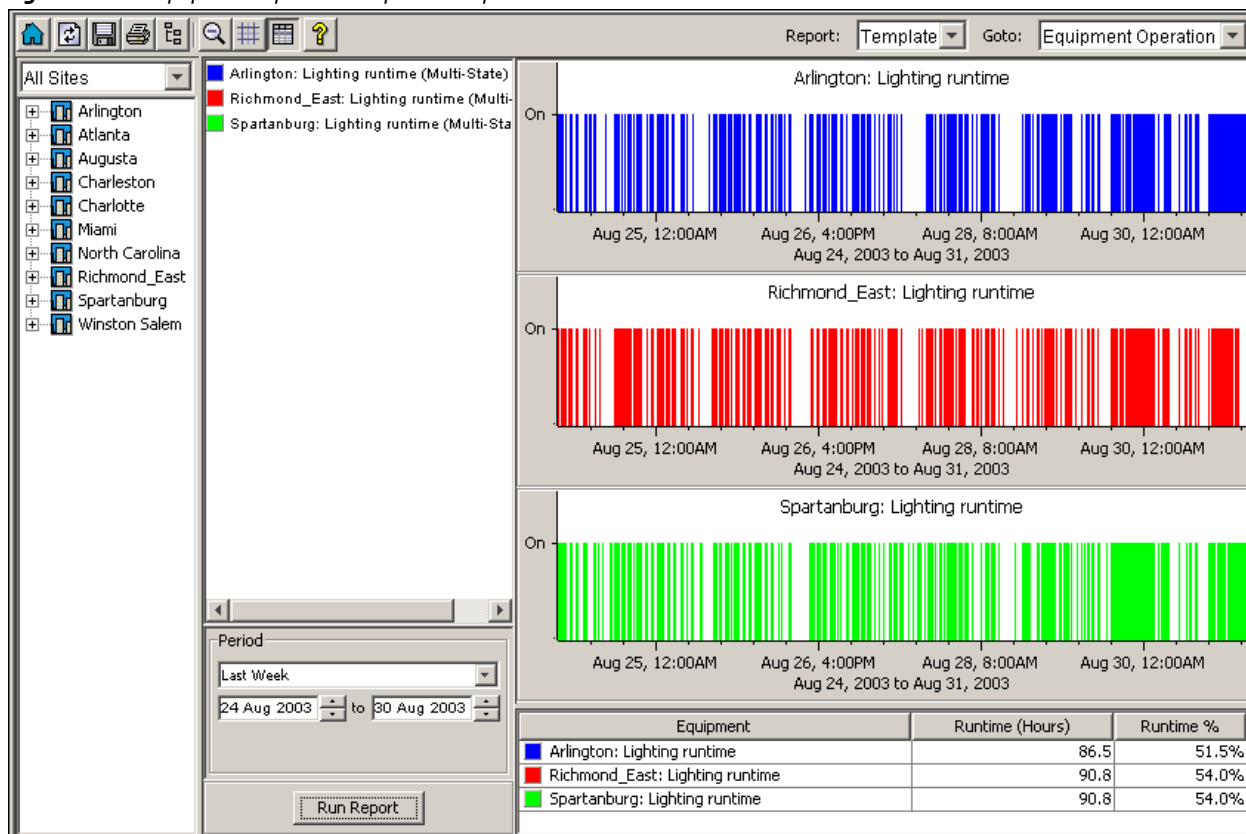
Figure 4-10 Relative Contribution Sample Exercise.



About the Equipment Operation Report

Users have the ability to analyze digital points and identify run times. Comparisons between sites or points can be made and run times can be graphed. For example, comparing lighting or HVAC run hours in a group of stores or comparing HVAC run hours in June for Store 1 versus Store 2. Data is displayed in time and percentage.

Figure 4-11 Equipment Operation Report Example.



Creating an Equipment Operation Report.

To create an Equipment Operation Report, perform the following tasks:

- “Start the Equipment Operation Report”
- “Select the Data Points to Chart”
- “Set Report Parameters”

Start the Equipment Operation Report

- Step 1 Launch from your browser using the following URL: `http://hostname/eas` where hostname is the name or IP address of the Web Supervisor.
- Step 2 Enter appropriate login information to gain access to the home page.
- Step 3 From the home page, open Equipment Operation by clicking on the Equipment Operation link.
- Step 4 Click on New. You may need to enter security information for the Java Plug-in.

Note: If you desire, from within an existing report, it is easier to simply use the Goto Reports Pull-down menu on the upper right to select the desired report.

Select the Data Points to Chart

- Step 1 Expand the tree to find the site and data point you wish to chart.
- Step 2 Right click on the data point and select **Add to Report**.

You will see the data point in the **Selection** window

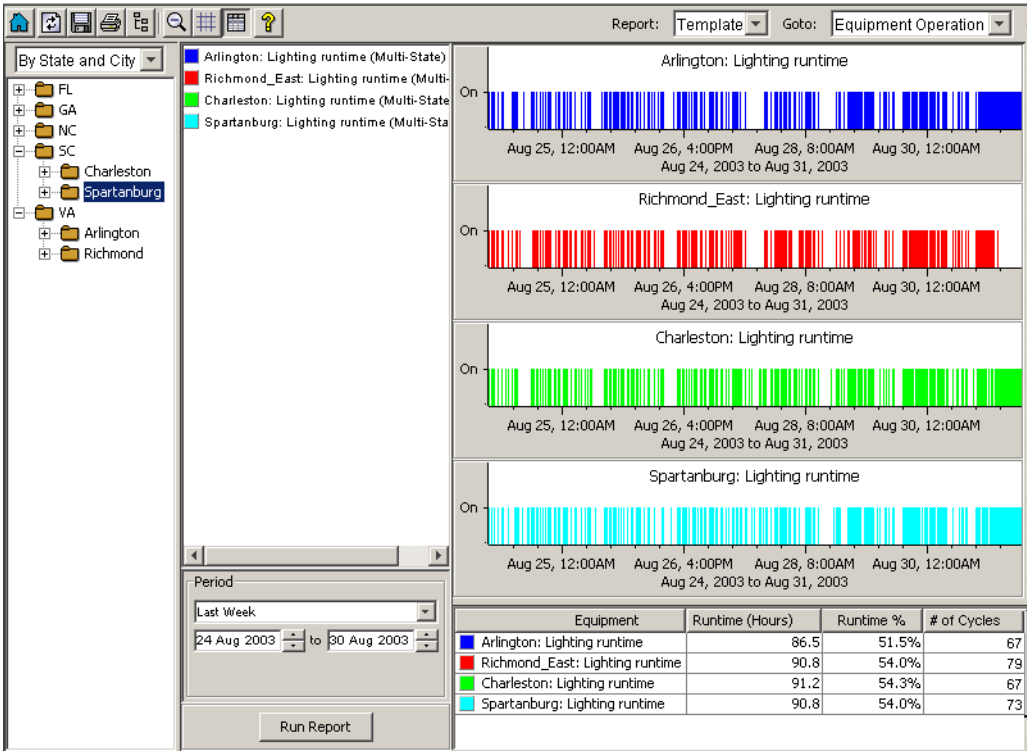
Note: If you select a site or a meter, all multi-state data points within that object will be added to the **Selection** window.

- Step 3 Repeat adding data points or copying and pasting data points until you have all of the points in the report that you want to chart.

Set Report Parameters

- Step 1 In the Period frame, select the time period for the data and which days of the week to exclude from the report (if any).
- Step 2 Click on Run Report.

Figure 4-12 Equipment Operation Report Sample Exercise.



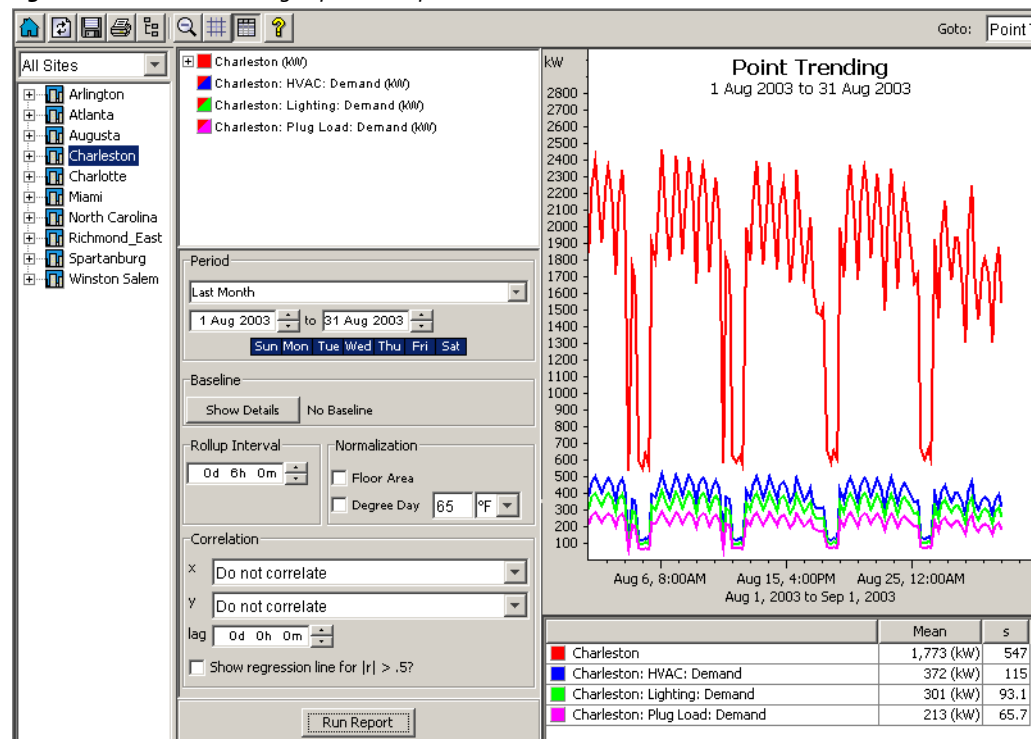
About the Point Trending Report

This report allows the user to choose single or multiple points and trend the values over a specified time period. Either analog or digital points can be trended and multiple variables can be selected to be in the report.

For a visual representation of two point values, you can view the points on a scatter plot. If you would like to perform a statistical analysis identifying correlation coefficient and standard deviation between these two variables, you have the ability to select a single point for the X-axis and another for the Y-axis.

If a point group has been charted, it is presented as a single point value. The Point Trending Report gives users the ability to easily aggregate and disaggregate points. When viewing an aggregated point, the user can right-click on the point to change the graphical display between a single aggregated curve and multiple disaggregated curves. When in a disaggregated state, the total or aggregated curve remains with all underlying points below it.

Figure 4-13 Point Trending Report Example.



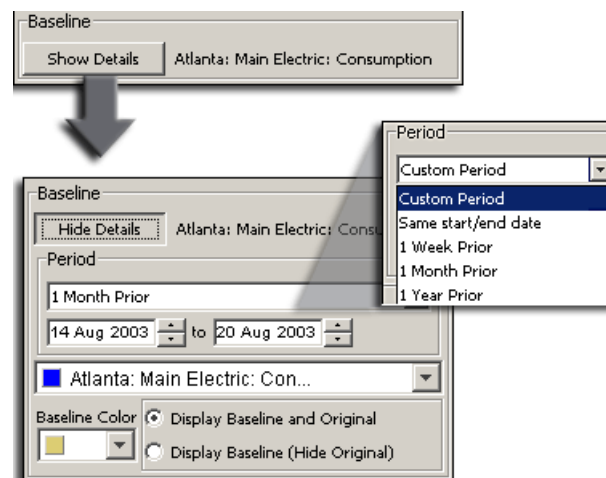
Baseline

Baseline Period is the set of data values, within the trended log, by which all the rest of the data is compared. This allows you to compare a data value against itself at another period of time (i.e., Main kWh for last week vs. Main kWh for the same week in the previous year). You can select a predefined start date from the Period list (Custom Period, Same Start Date, 1 Week Prior, 1 Month Prior, or 1 Year Prior) then select how many days worth of original data are in the baseline period. The software takes that defined number of days and repeats the baseline period for the entire charted time.

The following procedure describes how to set the baseline parameters for reports that allow detailed baseline parameters.

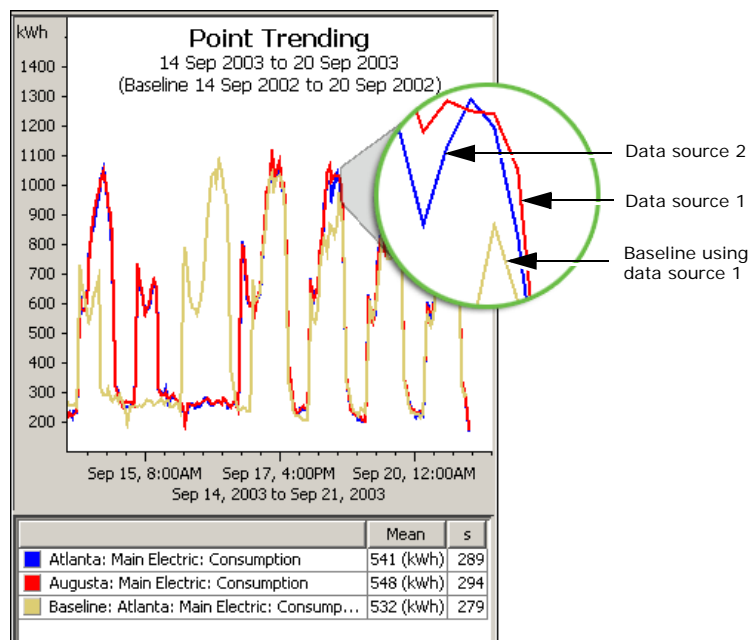
Setting the Baseline Parameters.

- Step 1 Once you have selected points to be charted, along with a date range, click **Show Details** to define the baseline parameters.
- Step 2 From the data point list, select the point that you wish to use as a baseline.



- Step 3 Define the baseline period by selecting a common period from the **Period** list or by manually defining the baseline period.

- Step 4 Select a color for the baseline trend from the **Baseline Color** list and choose a **Display** option to complete the Baseline Period setup:



- Display Baseline and Original
 - displays a data plot that represents the data point baseline parameter selections and an additional plot for the full range of your original data point.
- Display Baseline (Hide Original)
 - plots your baseline data only. This data is from the data source that you selected.

- Step 5 Click **Run Report** to create the report.

Time Lag

Sometimes there is a time lag between cause and effect: it takes some time for the building system to react to a temperature change. In this case we can make dependence more pronounced if we would use temperature measured some time prior to measurement of the consumption value. This time shift is a lag. By varying lag we can get the highest possible correlation between two variables.

Figure 4-14 Plotted values for a 30 minute time lag setting.

Timestamp	3:45PM	4:00PM	4:15PM	4:30PM	4:45PM	5:00PM	5:15PM	5:30PM	5:45PM	6:00PM	6:15PM
Temp.	95	97	99	100	100	100	100	98	97	95	94
KWH	814	821	828	833	839	850	868	890	925	912	902
KWH with minus 30 min. lag	828	833	839	850	868	890	925	912	902	898	891

So you can use the Lag setting to make the software adjust the compared data points by shifting correlated values in degrees of Days, Hours, or Minutes.

Creating a Point Trending Report.

To create a Point Trending Report, do the following:

- “Start the Point Trending Report”
- “Select the Data Points to Chart”
- “Set Report Parameters”

Start the Point Trending Report

- Step 1 Launch VES from your browser using the following URL: <http://hostname/eas> where hostname is the name or IP address of the Web Supervisor.
- Step 2 Enter appropriate login information to gain access to the home page.
- Step 3 From the VES home page, open Point Trending by clicking on the **Point Trending** link.
- Step 4 Click on **New**. You may need to enter security information for the Java plug-in.

Note: If you desire, from within an existing report, it is easier to simply use the *Goto Reports Pull-down menu* on the upper right to select the desired report.

Select the Data Points to Chart

- Step 1 Expand the tree to find the site and data point you wish to chart. Right click on the data point and select Add to Report. You will see the data point in the Selection window.

Note: *If you select a site or a meter and do an Add to Report, the software will aggregate all data points of the same type that are subordinate to that selection.*

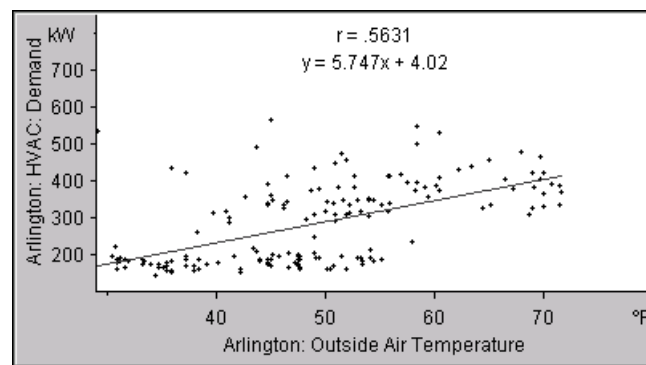
- Step 2 Repeat adding data points or copying and pasting data points until you have all of the points in the report that you want to chart.

Set Report Parameters

- Step 1 In the Period frame, select the time period for the data and which days of the week to exclude from the report (if any).
- Step 2 Set Rollup Interval in days, hours, and minutes.
The interval defines a block of time within which the data samples will be reported. Depending on the type of data, the data samples are handled differently. For demand data, the highest value sample, or peak, collected within the interval will be used. For consumption data, all the samples within the interval will be added together. For all other data types, the data samples are averaged together.
- Step 3 In the Normalization frame, set your desired parameters. If you want to normalize for Floor area, for weather, or production, refer to “Types of Normalization,” page 3-35, for details.
- Step 4 Set the **Correlation** attributes, if desired:

Correlation

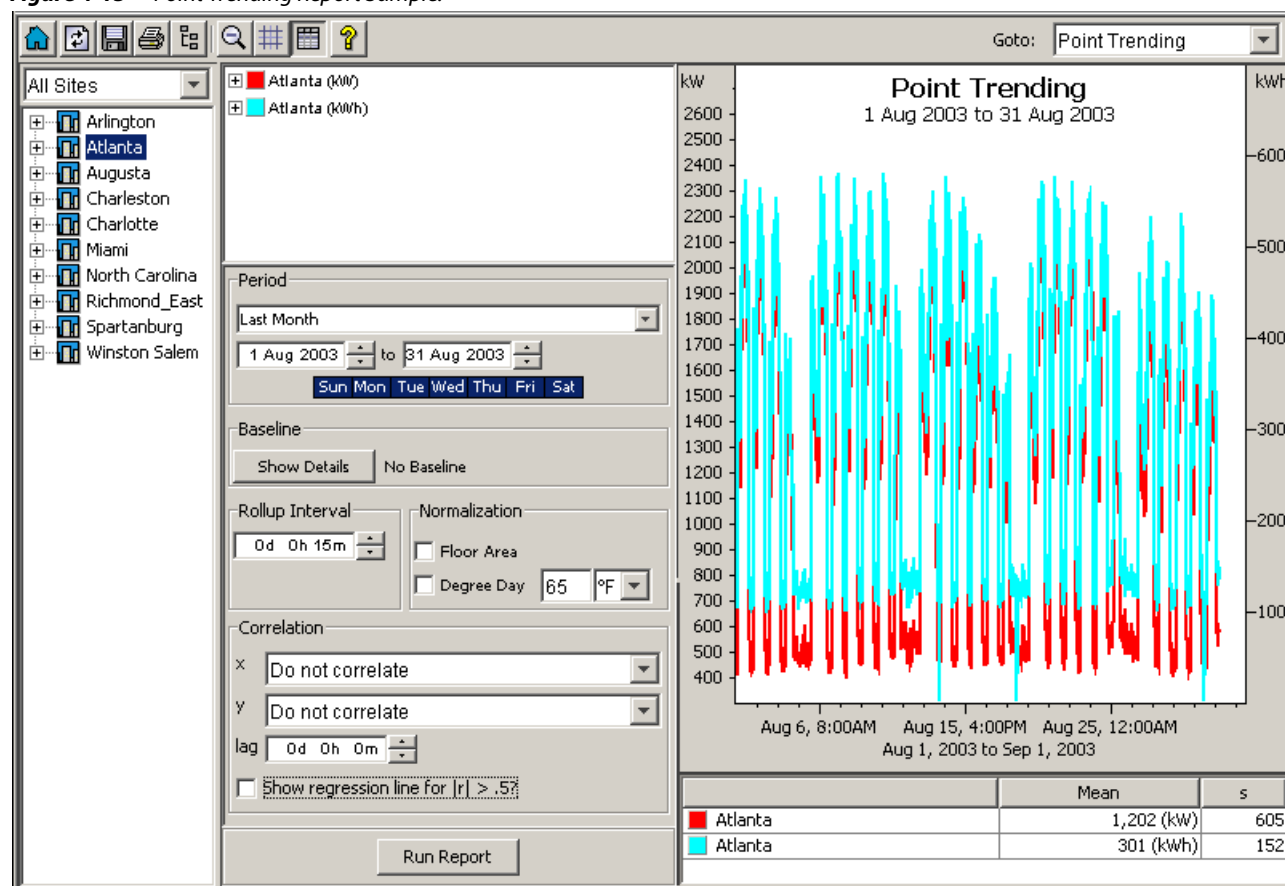
The scatter plot in point trending allows you to see and estimate how two data points depend upon each other. A correlation coefficient (r) can go from 0, meaning no dependency, to 1, meaning a direct correlation and dependence between the two points.



You can define which point is on the X axis and which point is on the Y axis. You can also lag the scatter plot of Y for any period of days, hours, and minutes.

- Step 5 Click on Run Report.
- Step 6 Point Trending Report Sample Exercise

Figure 4-15 Point Trending Report Sample.



About the Exceptions Report

This report is used to identify all data values for a specified period of time that do not fall within a specified range. The date range is user definable, and the benchmark, or baseline, to be compared against is based on historical data within the data point log itself. You can also choose the exceptional limits or let the software determine the acceptable limits for you. You can also display the outside air temperature that was logged for the site on the same value chart. Finally, you can have the software adjust the baseline based on changes to outside air temperature.

This report is used to help you see where data point records have fallen out of a determined set of accepted values and to determine if changes are needed to better control energy demands.

Figure 4-16 Exceptions Report Example.

	# Exceptions
Charlotte: Main Electric: Consumption (kWh)	78
Charlotte: Main Electric: Demand (kW)	79
Charlotte: HVAC: Consumption (kWh)	78
Charlotte: HVAC: Demand (kW)	79
Charlotte: Lighting: Consumption (kWh)	78
Charlotte: Lighting: Demand (kW)	79

Shows the number of exceptions that occurred for each point. Double click on individual rows for corresponding chart.

Allows user to define the baseline period. Not used when user selects "Use Specified Range of Values" in the Comparison Details list.

Provides the ability to normalize for OAT.

Allows users to define the method for determining exceptions.

Defines the threshold for exceptions to the baseline period.

Allows the user to determine if exceptions above and/or below the baseline are displayed.

Allows the user to restrict the report to specific time periods.

Creating an Exceptions Report.

Create an Exceptions Report by doing the following tasks:

- "Start the Exceptions Report"
- "Set Report Parameters"

Start the Exceptions Report

- Step 1 Select the **Exceptions** link on the home page or use the **Goto** list from within the current report.
- Step 2 Once the Exceptions report is open, select **By Group** from the **Site Selector** list.
- Step 3 Right click on EastRegion HVAC Group and select Add to Report. This should put the Arlington, Charlotte, and Richmond_East HVAC Consumption data points into the report.

Set Report Parameters

- Step 1 For **Report Period**, select **Last Month**.
 - Step 2 Select a 1 hour rollup period.
 - Step 3 For the Baseline, choose **1 month prior**.
 - Step 4 In the **Temperature** field, set the color to **none** and do not check the Adjust Baseline option. The Temperature field allows you to plot on the exception report the Main Outside Air Temperature that was collected at the associated site and to select the color of this value will be. You can also decide to have the baseline adjusted for that temperature. For example, if you choose this feature, the software will change the baseline to the value that it calculates it would have been if the temperature at the baseline's date and time had been the same as it is at the plotted value's date and time, thereby removing Outside Air Temperature as a contributing factor in the occurrence of an exception to the expected value.
 - Step 5 For **Comparison Details**, select Use Baseline & Percentage and put in 20 as the Threshold %.
- The three choices of comparison are:

- Use Baseline and Percentage
This choice allows you to determine the percentage of variation from the baseline beyond which a value is considered to be an exception.

- Use Specified Range of Values
This choice allows you to specify the exact upper and lower limits for acceptable values. Anything above or below these limits are shown as exceptions.
- Use Baseline & Statistically Determined Limits
Selecting this options lets the software automatically determine the limits outside of which any value is considered an exception.

All three of these options still allow you to individually select whether or not to display exceptions beyond the upper and lower limits. You can also select any specific day or days of the week to ignore for reporting purposes, and you can define the maximum number of exceptions to report. The exceptions are listed in chronological order.

Step 6 Click on Run Report to create the Exceptions Report. The Exceptions Report is created, as shown in Figure 4-17.

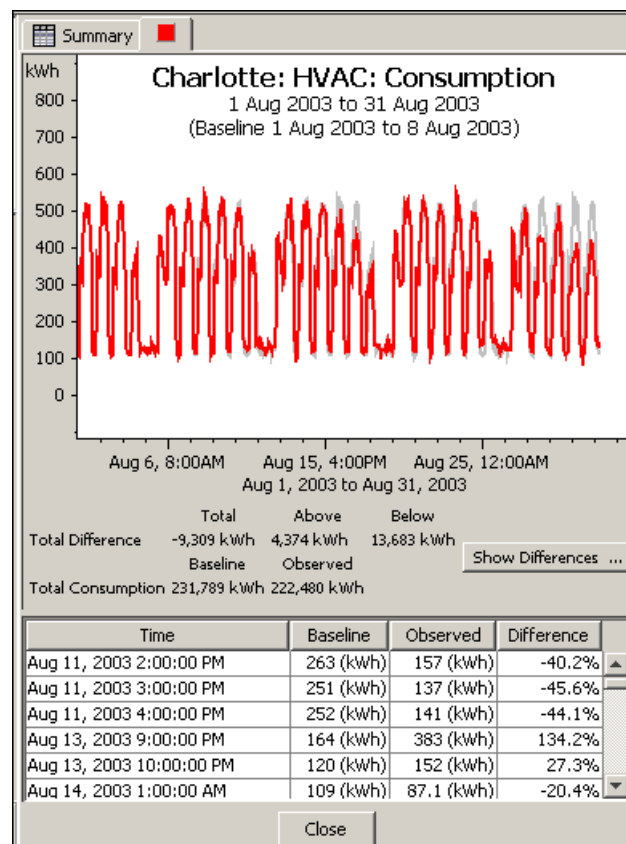
- In the Exceptions Summary Tab, double-click on Charlotte to get the details of exceptions for that data point.

Figure 4-17 Exceptions Report Sample Exercise

The screenshot displays the VES software interface for generating an Exceptions Report. The left sidebar shows a tree view of data groups, with 'East Consumption' selected. The main window is divided into two panes. The top pane shows the 'Summary' tab with a table of exceptions. The bottom pane shows the 'Run Report' button. A blue arrow points to the 'Charlotte: HVAC: Consumption' row in the table, with the text 'DOUBLE-CLICK FOR DETAILS'.

	# Exceptions
Arlington: HVAC: Consumption	336
Charlotte: HVAC: Consumption	372
Richmond_East: HVAC: Consumption	374

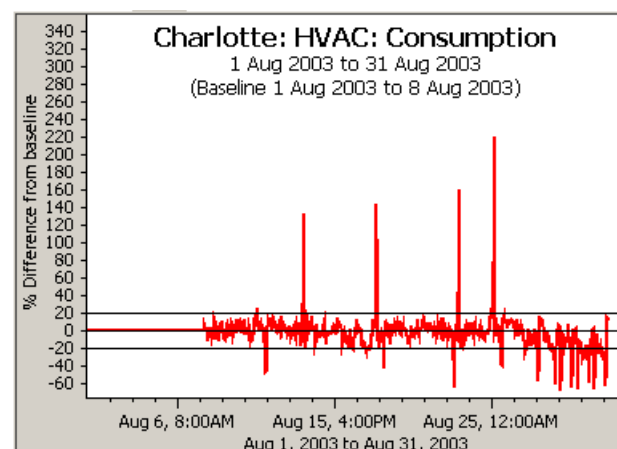
This will bring up the details about the exceptions report for Charlotte.



Step 7 Click on the **Show Differences...** button to view a chart with values plotted against a zero baseline.

- Show Differences...

In this view, zero represents the baseline value. The plot represents the data point's delta from that baseline. Any value outside of the limits is listed as an exception. If you select one of the exceptions in the table below the chart, the chart will show that specific exception with a vertical black line. All exceptions will be either above the Upper Limit or below the Lower Limit – none will fall between these two limits.

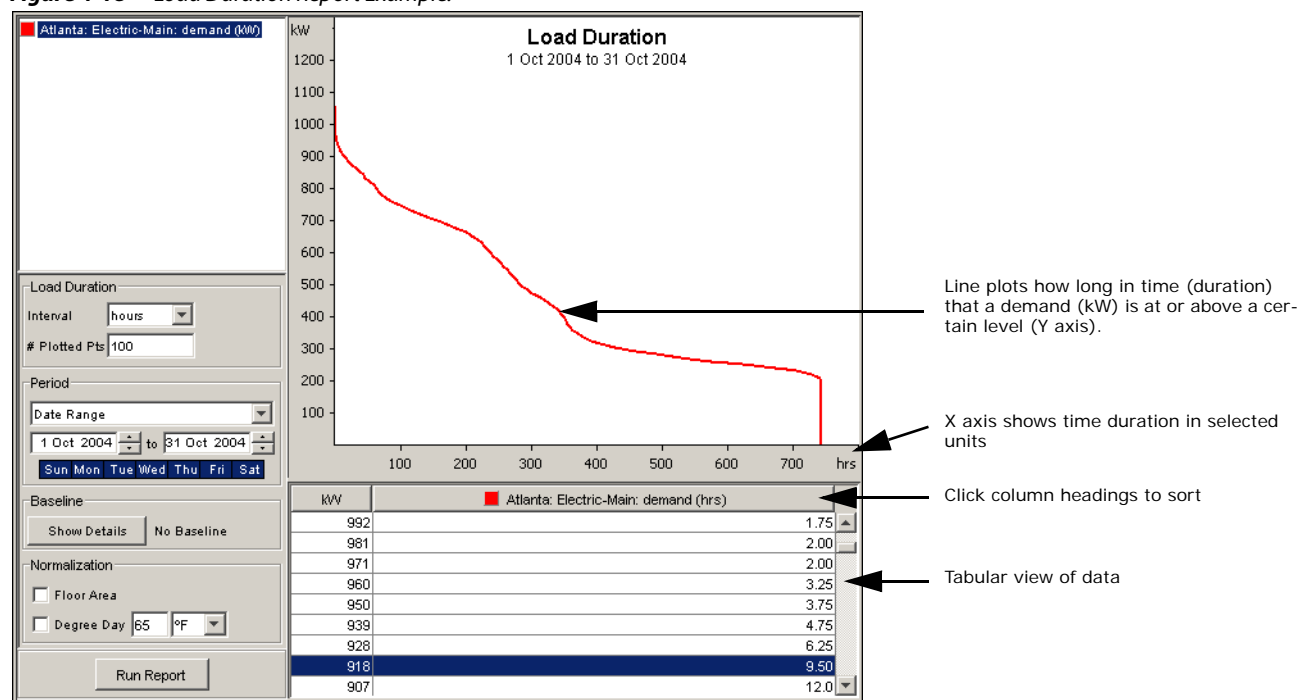


About the Load Duration Report

This report is used to specify how long the demand (or consumption) for a point, aggregate point, or group of points exceeds a specified level. The reason you would use this report would be to see how much time your peak demand levels are maintained. Since demand is a large component of the typical electric rate, you may be able to find significant savings by lowering your peak demand. The date range is user definable, and the benchmark, or baseline, to be compared against is based on historical data within the data point log itself. For comparison purposes, you can also have the software “normalize” the load data based on outside air temperature or based on floor area.

This report, when used with the exception report and the What-If Analyzer, helps to identify return on investment.

Figure 4-18 Load Duration Report Example.



Creating a Load Duration Report.

To create a Load Duration Report, perform the following tasks:

- [“Start the Load Duration Report”](#)
- [“Set Report Parameters”](#)

Start the Load Duration Report

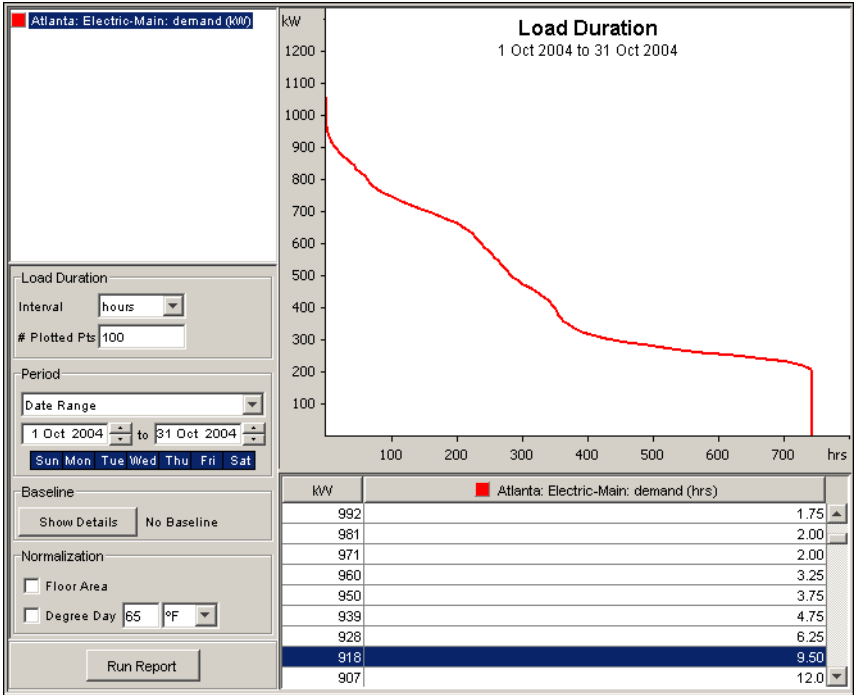
- Step 1 Select the **Load Duration** link on the VES home page or use the **Goto** list from within a current report screen. The Load Duration report opens.
- Step 2 Select **All Sites** from the **Site Selector** list. Click to expand the Atlanta node and click to expand the Electric-Main meter. Consumption and demand nodes are displayed under the Electric-Main meter.
- Step 3 Right-click the “demand” icon and select Add to Report. The Atlanta: Electric-Main meter is added to the report.

Set Report Parameters

- Step 1 Under **Load Duration** field, do the following:
 - for **Interval**, select the **hours** option.
 - for **# Plotted Points**, type in “100”.
- Step 2 For **Period**, select **Last Month**
- Step 3 Do not display a baseline and do not select normalization options.
- Step 4 For the Baseline, choose **1 month prior**.
- Step 5 Click on Run Report to create the Load Duration Report.

The load duration report, [Figure 4-19](#), shows the number of hours in the month (744) along the x-axis. The highlighted row in the table shows that the demand for the month exceeded 918 kW for only 9.5 hours out of 744 total hours. Knowing that the demand charge for this particular meter is \$10.69 (as an example) the energy manager determines that some basic demand limiting sequences that keep demand under 918 kW would reduce peak by 98 kW and save \$1,047.62 per month. Depending on the demand charges in the rate, investment in an on site generator may be justified as a cost savings measure.

Figure 4-19 Load Duration Report Sample Exercise

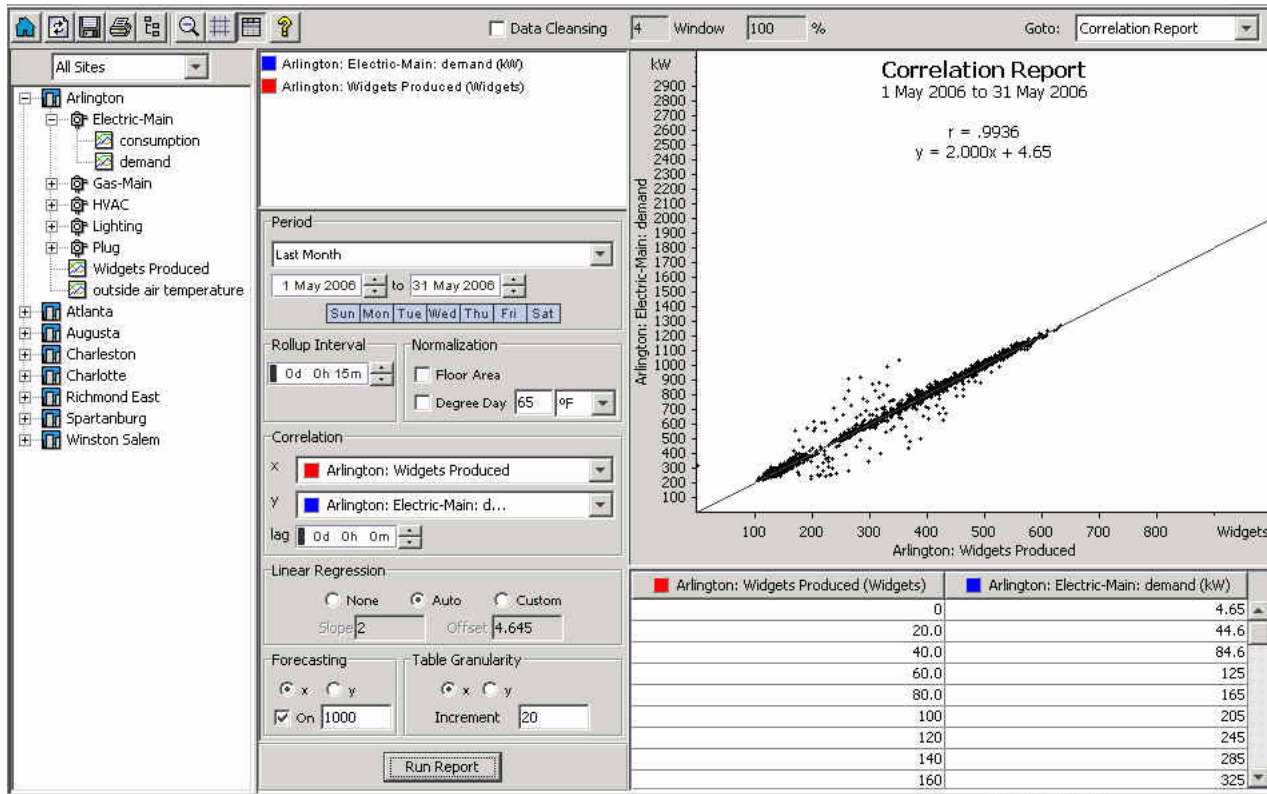


About the Correlation Report

The Correlation Report allows you to correlate two logs of data over a user defined period of time. This can be useful for determining the relationship between any two data points. It allows the user to select the data points to use for the x and y axis of a correlation chart (scatter plot), and then use the configuration parameters to enable a linear regression trend line (automatic or custom), set up linear regression forecasting, and tweak the tabular results. The Correlation Report also leverages from the other common features available to all E2 Profiler reports.

The Correlation report can be useful for determining a relationship between energy data logs and times-tamped unit production logs. This can allow you to forecast energy usage based on predicted production units.

Figure 4-20 Correlation Report Example.



This example shows a correlation run for the electric demand of a site, and its corresponding units of production (widgets) over a month time period. You will notice that there is a strong correlation between the two data points (i.e. the correlation coefficient, r , is close to 1). The forecasting features allow the linear regression trend line to be extended in order to predict electric demand based on its historical association to widgets produced. The table below the chart gives a breakdown of the linear regression (the table granularity is also user-definable).

Creating a Correlation Report.

To create a Correlation Report, perform the following tasks:

- “Start the Correlation Report”
- “Select the Data Points to Correlate”
- “Set Report parameters”

Start the Correlation Report

- Step 1 Launch VES from your browser using the following URL: <http://hostname/eas> where hostname is the name or IP address of the Web Supervisor.
- Step 2 Enter appropriate login information to gain access to the home page.
- Step 3 From the home page, click on the **Correlation Report** link to open the Correlation Report.

Select the Data Points to Correlate

- Step 1 Expand the tree to find the site and data point(s) you wish to chart. Right click on a data point and select **Add to Report**.

The data point appears in the **Selection** window.

Note: If you select a site or a meter and do an Add to Report, the software will aggregate all data points of the same type that are subordinate to that selection.

- Step 2 Repeat adding a data point or copying and pasting data points until you have at least two data points in the report that you want to correlate.

Set Report parameters

Figure 4-21 Correlation Report parameters

- Step 1 In the **Period** frame, select the time period for the data and select the days of the week to exclude from the report (if any).
- Step 2 Set **Rollup Interval** in days, hours, and minutes.
The interval defines a block of time within which the data samples will be reported. Depending on the type of data, the data samples are handled differently. For demand data, the highest value sample, or peak, collected within the interval will be used. For consumption data, all the samples within the interval will be added together. For all other data types, the data samples are averaged together.
- Step 3 In the **Normalization** frame, set your desired parameters.
If you want to normalize for Floor area, for weather, or production, refer to “Types of Normalization,” page 3-35, for details.
- Step 4 Adjust the following parameters, as desired:
- **Correlation**
The scatter plot chart allows you to see and estimate how two data points depend upon each other. A correlation coefficient (r) can go from 0, meaning no dependency, to 1, meaning a direct correlation and dependence between the two points. You can define which point is on the X axis and which point is on the Y axis (these selections will automatically be populated when the first two data points are added to the report, but you are free to change as needed). You can also lag the scatter plot of Y for any period of days, hours, and minutes.
 - **Lag**
Sometimes there is a time lag between cause and effect: for example, it takes some time for the building system to react to a temperature change. In this case we can make dependence more pronounced if we would use temperature measured some time prior to measurement of the consumption value. This time shift is a lag. By varying lag we can get the highest possible correlation between two variables.

Figure 4-22 Plotted values for a 30 minute time lag setting

Timestamp	3:45PM	4:00PM	4:15PM	4:30PM	4:45PM	5:00PM	5:15PM	5:30PM	5:45PM	6:00PM	6:15PM
Temp.	95	97	99	100	100	100	100	98	97	95	94
KWH	814	821	828	833	839	850	868	890	925	912	902
KWH with minus 30 min. lag		828	833	839	850	868	890	925	912	902	898

So you can use the Lag setting to make the software adjust the compared data points by shifting correlated values in degrees of Days, Hours, or Minutes.

- **Linear Regression**

You can use the linear regression feature to draw a trend line with your data. This is useful for forecasting. The default selection is "auto" which means that the linear regression (best fit) will automatically be calculated for the data. You can optionally disable the linear regression feature ("none" selection) or enter your own custom linear regression ("custom" selection). If you enter your own "custom" linear regression line, you can use the Slope and Offset fields to enter the parameters for the trend line. In "auto" mode, the slope and offset will automatically be calculated for the line of best fit.

- Forecasting

Sometimes there is a time lag between cause and effect: for example, it takes some time for the building system to react to a temperature change. In this case we can make dependence more pronounced if we would use temperature measured some time prior to measurement of the consumption value. This time shift is a lag. By varying lag we can get the highest possible correlation between two variables.

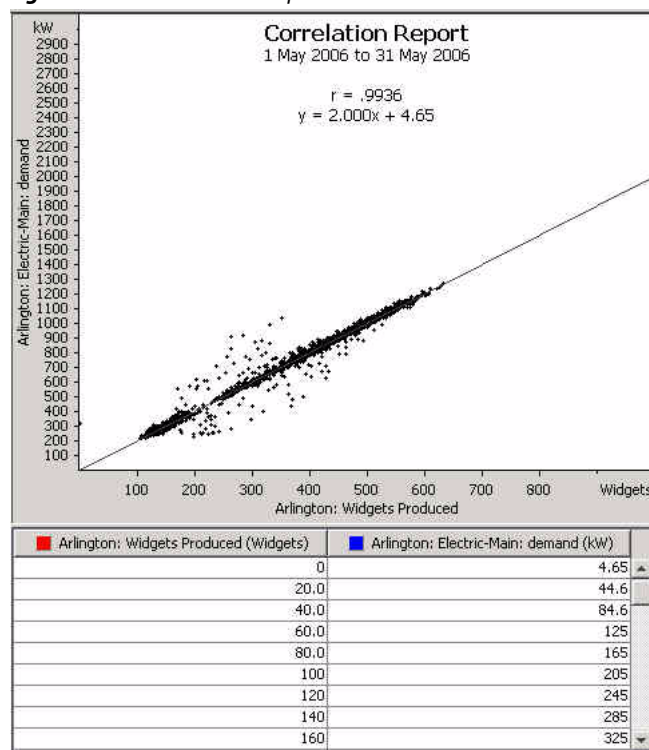
- Table Granularity

If you have the linear regression feature enabled (i.e. either "auto" or "custom" mode), you can use the forecasting feature to extend the linear regression, thus allowing forecasting. You can select to forecast either the x or y axis, and then you can enable forecasting by selecting the "On" checkbox and entering the forecast value. When the report is run, the linear regression will be extended to the forecasted value for either the x or y axis, depending on your selection.

Step 5 Click on **Run Report** to create the Correlation Report.

The Correlation Report is displayed, as shown in [Figure 4-23](#).

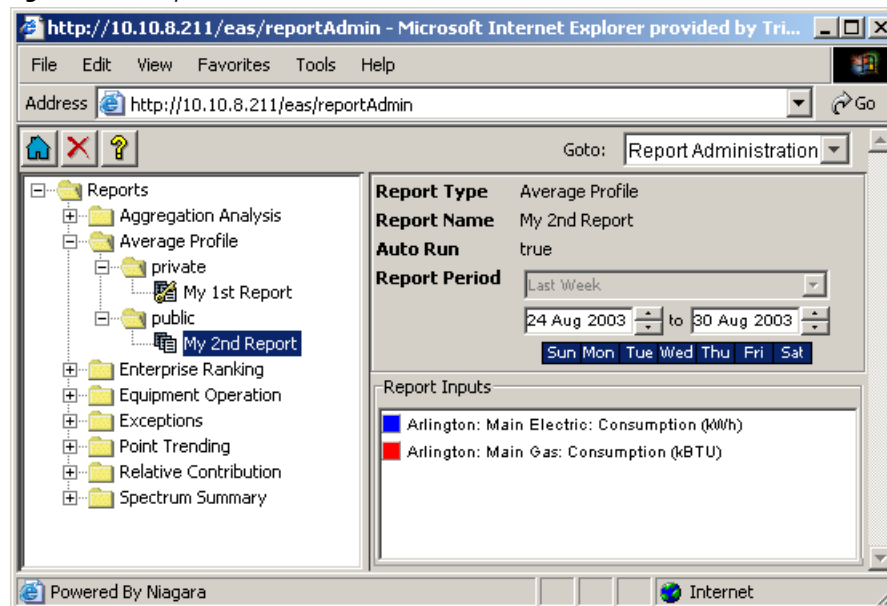
Figure 4-23 Correlation Report



Report Administration

The Report Administration tool gives you a tree view of all the saved reports that you can access. From this tool, you can view the common attributes of any saved report and you can delete any privately saved reports. If you have an admin level password, you may also delete public reports.

Figure 4-24 Report Administration.



Using Cost Profiler Reports

For an overview of the Cost Profiler reports, refer to “[Types of Cost Profiler Reports](#),” page 1-16. Descriptions about how to use the Cost Profiler reports are included in the following sections:

- “[About the Cost Ranking Report](#)”
- “[About the Cost Contribution Report](#)”
- “[About the Bill Reconciliation Report](#)”
- “[About the Rate Comparison Report](#)”
- “[About the Budget Report](#)”
- “[About the What-If Analyzer](#)”

About the Cost Ranking Report

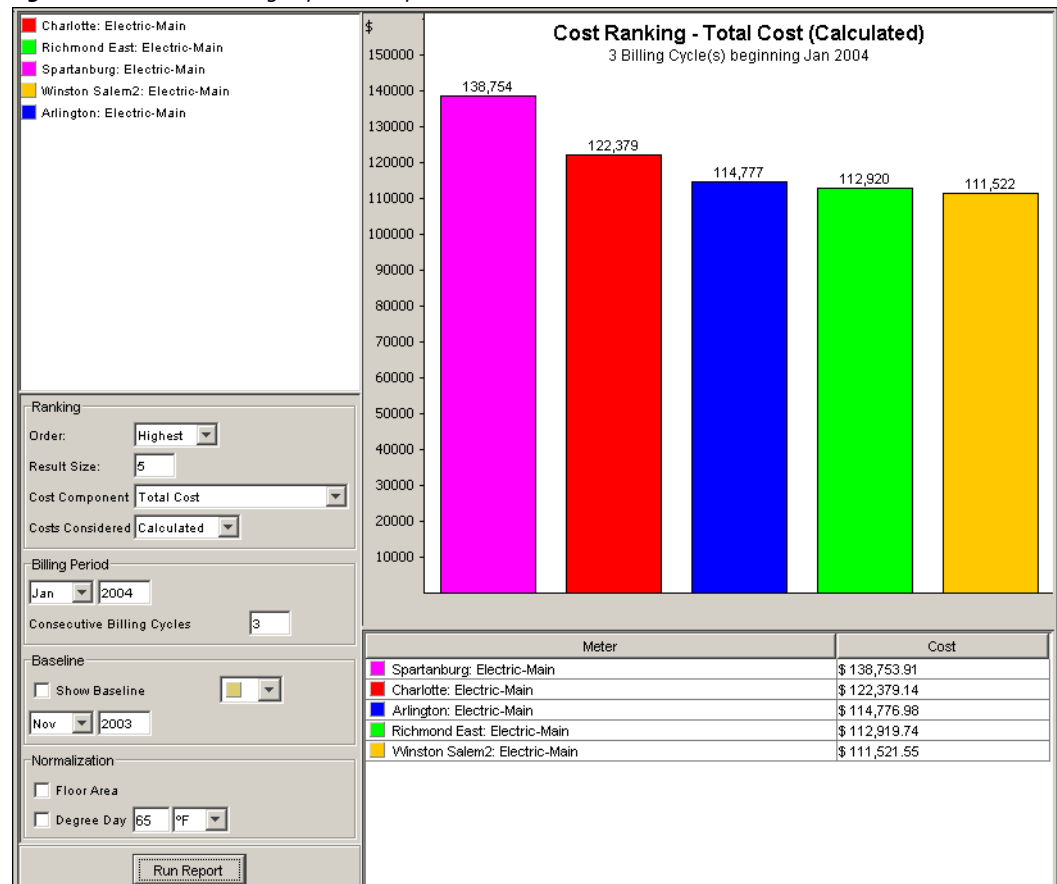
This report is similar to the Enterprise Ranking Report in the E² Profiler module (see “[About the Enterprise Ranking Report](#),” page 4-10). You select meters and manually rank costs for applicable cost components or leave the legend empty and define the sample size of the analysis. By selecting sites or commodities, you may identify the least and most expensive sites or meters and cost components in the enterprise. You can compare any point or aggregated point, which allows you to rank the sites with the highest overall energy bill, not just the highest individual electric or gas costs.

You may also rank costs of sub-metered equipment such as lighting and HVAC as well as ranking cost components such as demand charges, transmission charges, generation charges, and so on.

Users can report on a single billing cycle or multiple billing cycles. If a user wishes to view costs for Q1, they would select January as the reporting period, then define “3” in the Consecutive Billing Cycles entry field. In this case, the costs would be computed for individual meters for individual months.

Users can compare costs in this report to historical costs for the same meter using baselining. For example, if a user runs a report for three sites for Q1 2004 and would like to see how the total costs compare to the previous year, they compare the two side-by-side.

Figure 4-25 Cost Ranking Report Example.



Creating a Cost Ranking Report.

Create an Cost Ranking Report by performing the following tasks:

- [Start the Report](#)
- [Select the Meters or Sub-meters to Chart](#)
- [Set Report Parameters](#)

Start the Report

- Step 1 Launch VES from your browser using the following URL: `http://hostname/eas` where hostname is the name or IP address of the Web Supervisor.
- Step 2 Enter appropriate login information to gain access to the home page.

Note: From within an existing report, it is easier to simply use the *Goto: menu* on the upper right to select the desired report, as an alternative to the following step.
- Step 3 From the VES home page, open Cost Ranking by clicking on the Cost Ranking link. The Cost Ranking report template displays.

Select the Meters or Sub-meters to Chart

- Step 1 The tree displays sites and points as filtered by the Site Filter drop down list. In the site tree, right click on the site or point that you want to include and select Add to Report from the popup menu. The point is added in the Selection window.

Note: To quickly run a report of the highest or lowest cost points in the database, leave the selection window blank. The software will automatically select points in the database that are the highest or lowest.

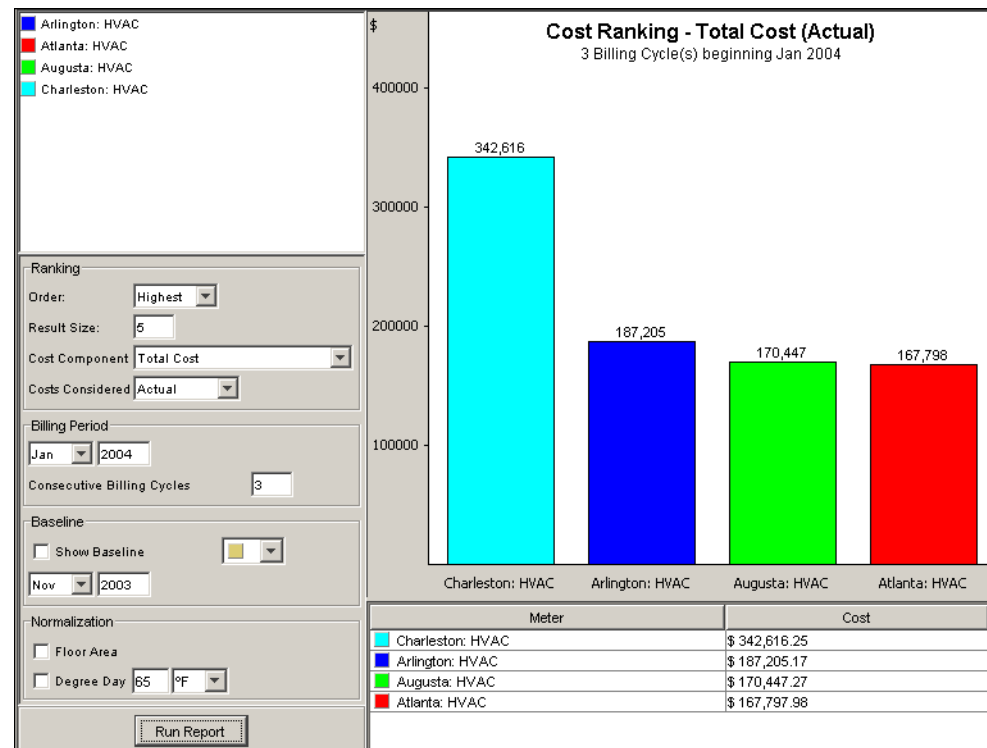
 - At any time after adding a point to the Selection window, you may view the point's attached rates by right-clicking the point and selecting "View Attached Rates" from the shortcut menu, as shown below.
- Step 2 Repeat adding points until you have all of points in the report that you want to chart.

Set Report Parameters

- Step 1 In the Ranking frame, set Order, Result Size, Cost Component, and Cost Considered.

- Order
Can be set to Highest or Lowest to determine the order by which sites will be ranked.
 - Result Size
This sets the number of points included in the result window. If you have no sites selected, the software will automatically select the highest or lowest cost points – up to a maximum equal to the “result size”.
 - Cost Component
This sets the type of costs used in the calculation. This could be a total of all costs or one of several preset or user-defined component costs.
 - Cost Considered
This allows for selection of one of the following options: “Actual Costs” or “Calculated Costs”.
- Step 2 In the Billing Period group, select the starting billing period for the data and enter the number of subsequent billing cycles to include.
- Step 3 In the **Baseline** group, clear the “Show Baseline” option. Use this option and set a date when you want to compare costs to a previous billing period.
- Step 4 In the Normalization frame, set your desired parameters. If you want to normalize for Floor area, for weather, or production, refer to “Types of Normalization,” page 3-35, for details.
- Step 5 Click on Run Report to create the report. Figure 4-26 is an example of a Cost Ranking report using sample data.

Figure 4-26 Cost Ranking Report Sample Exercise.



About the Cost Contribution Report

This report provides a way to perform a comparison of rate cost components across a variety of rates. Rate categories, as defined in Create A Rate (for details, refer to “About Create A Rate,” page 3-9) are used to group the components into general categories. For example, a rate may have several components, such as: On Peak Demand, Off peak Demand, Partial Peak Demand, and Historical Ratchet. Each of these four components can be grouped into a “demand” category and compared to sites that have rates that may only have a single constant demand component.

You can aggregate meters to get regional, divisional, or other grouped sites in the same stacked bar. When meters are aggregated in Cost Contribution, the costs for each meter are computed individually using applicable tariff rate and billing cycles for each – then aggregated. The individual rate categories are totaled to provide aggregated costs broken down by demand, consumption, other, UDE, and total.

This is important for two reasons:

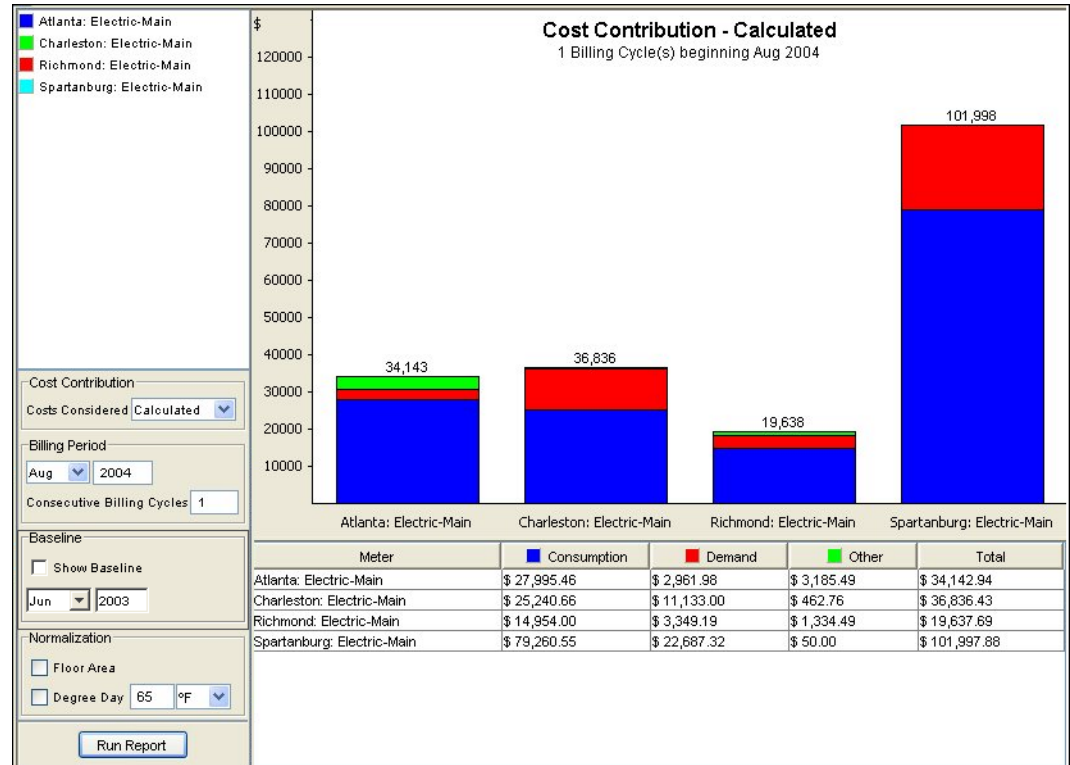
- users will often aggregate meters that have different rates
- aggregated loads applied to a rate will have characteristics that are different from a single rate and may generate false positives for ratchets, rebates, and other rate components.

For example, if Site A Main-Electric and Site B Main-Electric are aggregated and applied to a rate that is designed for a single facility, the peak and total consumption for the aggregate point is excessive and the report displays invalid cost information.

You can report on a single billing cycle or multiple billing cycles. If you want to view costs for Q1, select January as the reporting period, then define “3” in the Consecutive Billing Cycles entry field. In this case, the costs are computed for individual meters for individual months.

You can compare costs to historical costs for the same meter using baselining. For example, if you run a report for three sites for Q1 2004 and would like to see how the total costs compare to the previous year, compare the two side-by-side by selecting the Baseline option.

Figure 4-27 Cost Contribution Report Example.



Creating a Cost Contribution Report.

Create an Cost Ranking Report by performing the following tasks:

- [Start the Report](#)
- [Select the Data Points to Chart](#)
- [Set Report Parameters](#)

Start the Report

Step 1 Launch VES from your browser using the following URL: `http://hostname/eas` where hostname is the name or IP address of the Web Supervisor.

Step 2 Enter appropriate login information to gain access to the home page.

Note: From within an existing report, it is easier to simply use the Goto: menu on the upper right to select the desired report, as an alternative to the following step.

Step 3 From the home page, open Cost Contribution by clicking on the Cost Contribution link. The Cost Contribution report template displays.

Note: If you desire, from within an existing report, it is easier to simply use the Goto Reports Pull-down menu on the upper right to select the desired report.

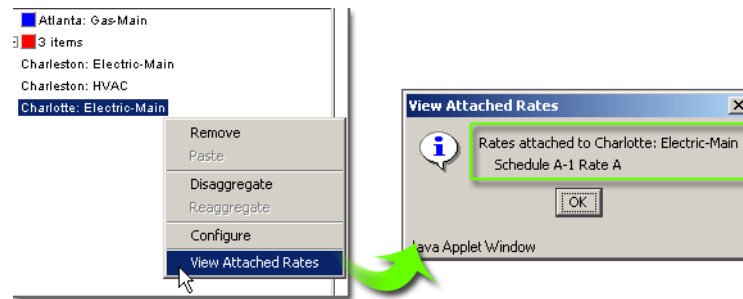
Select the Data Points to Chart

- Step 1 The tree displays sites and points as filtered by the Site Filter drop down list. In the site tree, right click on the data point or meter and select Add to Report. The data point or meter is added to the **Selection** window.

Note: If you select a site or a meter and do an Add to Report, the software will key off of the first data point in the group, and all data points of that same type, subordinate to that selection, will be added to the Selection window as an aggregated point.

Note: At any time after adding a point to the Selection window, you may view the point's attached rates by right-clicking the point and selecting "View Attached Rates" from the shortcut menu, as shown in [Figure 4-28](#).

Figure 4-28 Viewing Attached Rates from the Cost Contribution Report Selection Window.

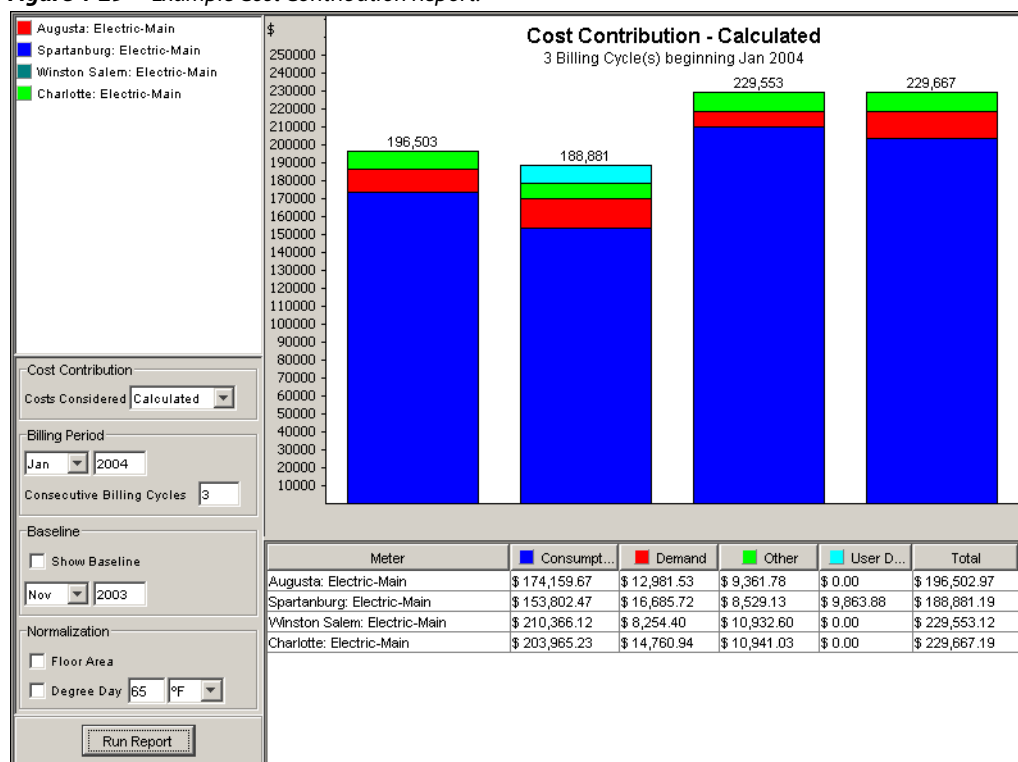


- Step 2 Repeat adding data points or copying and pasting data points until you have all of the points in the report that you want to chart.

Set Report Parameters

- Step 1 In the Cost Contribution frame, set the **Cost Considered** option to use one of the following options: "Actual Costs" or "Calculated Costs".
- Step 2 In the Billing Period group, select the starting billing period for the data and enter the number of subsequent billing cycles to include.
- Step 3 In the **Baseline** group, clear the "Show Baseline" option. Use this option and set a date when you want to compare cost contributions to a previous billing period.
- Step 4 In the Normalization frame, set your desired parameters. If you want to normalize for Floor area, for weather, or production, refer to "[Types of Normalization](#)," page 3-35, for details.
- Step 5 Click on Run Report to create the report. [Figure 4-29](#) is an example of a Cost Ranking report using sample data.

Figure 4-29 Example Cost Contribution Report.



About the Bill Reconciliation Report

This report allows you to validate invoices that you receive from utility companies. Once you get an invoice, you build a report in Cost Profiler using the same meters, billing cycle, and rate as used on the invoice. If you have been billed correctly, and your records are correct, the Bill Reconciliation Report in Cost Profiler should match that on the invoice, thereby allowing you to “reconcile” the invoice from a utility.

The bill reconciliation report provides information for a single account over a specific billing period.

If there is a one-time anomaly that does not get associated with any single rate component, the user can fill in the difference in the “Miscellaneous Actual Cost” entry field. This provides the ability to profile actual costs in other reports, as well.

Figure 4-30 Example Bill Reconciliation Report.

About the Bill Reconciliation Report Display

The Bill Reconciliation Report shows important details about the account and gives all the necessary utility account and contact information. Following are the primary display panes in the Bill Reconciliation Report:

Figure 4-31 Bill Reconciliation Report Display Areas.

- **Site Tree Window**
This window works like all other site tree windows. See “[Site Tree Window](#),” page 3-28, for details.
- **Cost**
Once a report is run, “Calculated Cost” and “Actual Cost” columns are populated. If discrepancies are found, the user can manually enter the valid value for each rate component in the “Actual Cost” column and click Save Changes. These changes are saved as an XML file in the relational database

and provide the ability for the user to profile these “actual” costs throughout the Cost Profiler application.

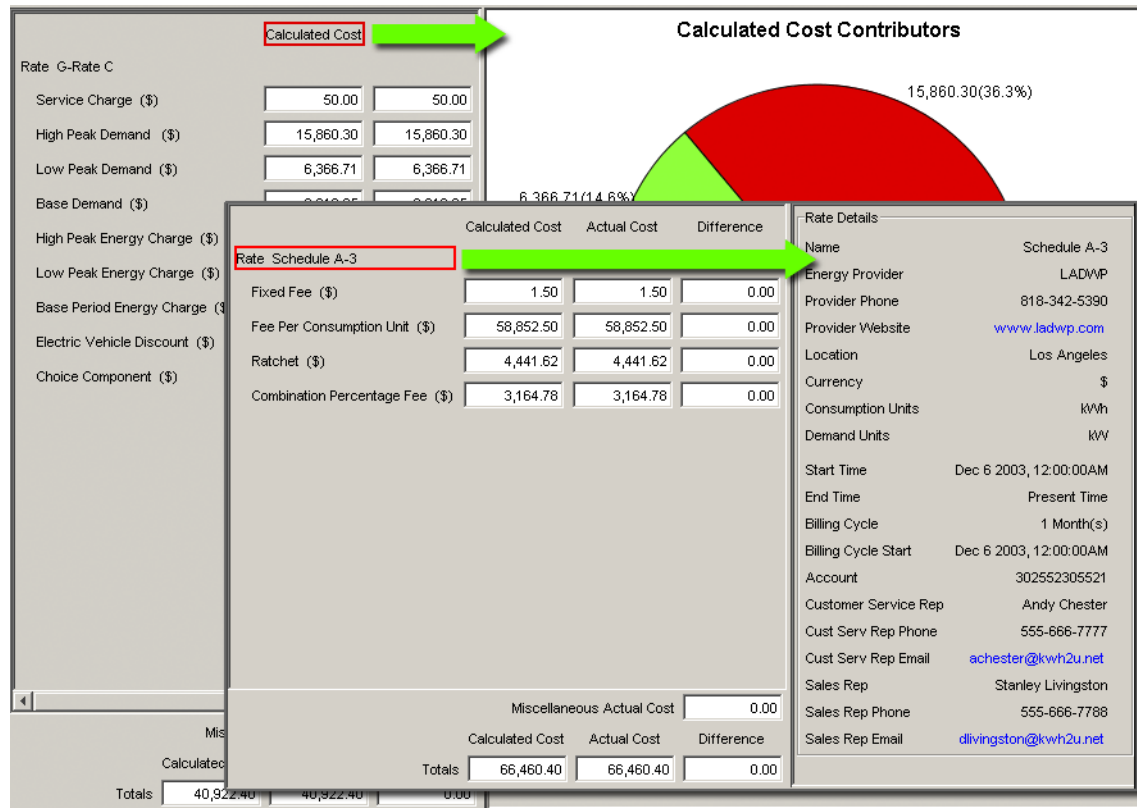
- Details

After running a reconciliation report, you can click on any individual rate component to see the rate component details in the pane on the right. For example, if you click on the rate component called “High Peak Energy Charge”, you see total units for the component, the fee associated with the component, the total, and the fee schedule.

Click the column headers to display a pie chart and table for each of the rate components, as shown in Figure 4-32. The data in the table can be exported to a spreadsheet for further manipulation.

Clicking on the column header in the table re-sorts the data based on ascending or descending values.

Figure 4-32 Calculated Cost Contributors and Rate Details.



- Billing Period

Select the billing period for the invoice you wish to reconcile, based on month and year. The billing cycle for the rate (or rates) attached to the selected meter automatically appears with the start date, end date, and time, as was defined by the administrator in Attach A Rate (refer to “About Attach A Rate,” page 3-20).

Note: If the Start and End days are not correct, adjust them and save the changes. The billing cycle fields are originally set when you attach a rate to a meter.

This report will always default to a billing cycle, not calendar month, making it important to have accurate billing cycle information when attaching a rate to a meter.

- Billing Period Notes

The Bill Reconciliation report has a Notes feature that you can use by clicking the “Notes...”


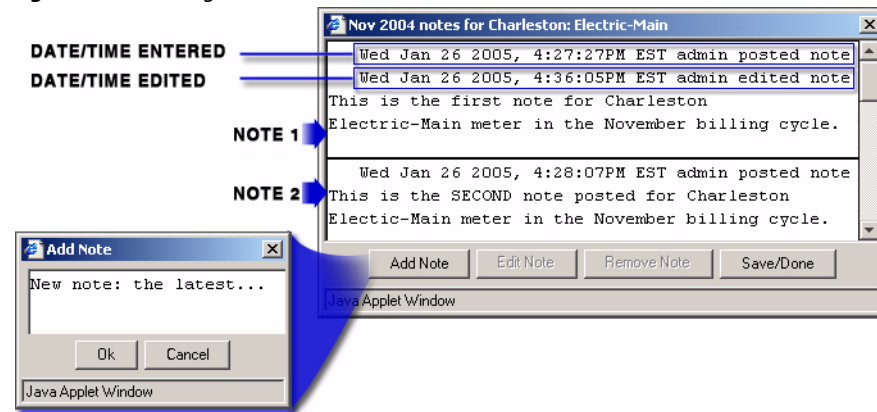
 button. This feature allows you to enter text information about the data that is associated with a particular meter for a particular billing cycle. For example, you may enter a note to describe what changes were made for a reconciliation report and why they were made. The note is saved and may be edited or removed by someone with administrative privileges, or by the original author.

Figure 4-33 Billing Period Notes.



To add, remove, or edit a note from the Billing Period Notes dialog box, select the note that you want to edit and use the Add Note, Edit Note or Remove Note button, to perform the desired function.

- Rate Component Details dialog box.

The Rate Component Details dialog box is provided to allow you to open several Rate Component Detail panes at once and resize them as necessary, as shown in Figure 4-34.


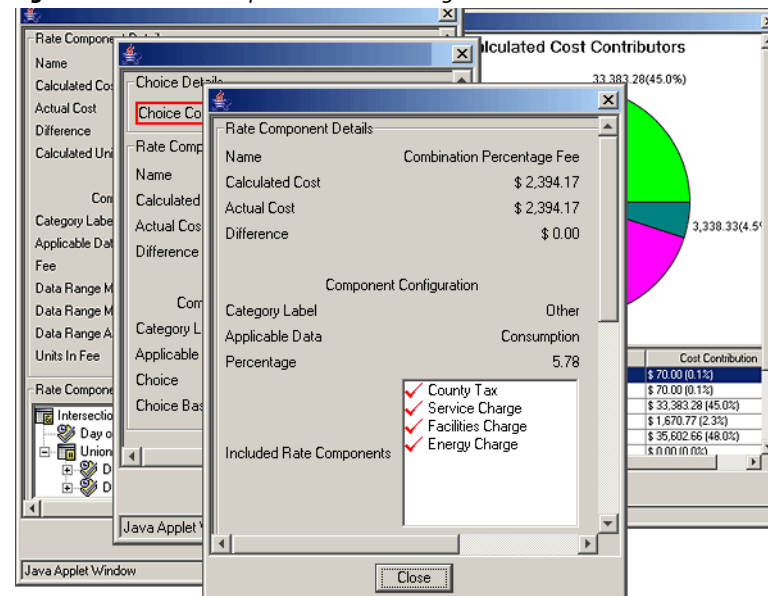
Use the Popup Details button  to open the Rate Component Details pane into a separate dialog box for viewing. These detailed views will remain open even if you move to another meter, run another report, and open another detailed dialog box. Click the Close button to close individual detail dialog boxes or close them all at once by selecting a report other than the Bill Reconciliation report.

Figure 4-34 Rate Component Details dialog box.



Creating a Bill Reconciliation Report

To create a Bill Reconciliation Report, perform the following tasks:

- “Start the Bill Reconciliation Report”
- “Set Report Parameters”

Start the Bill Reconciliation Report

Step 1 Launch VES from your browser using the following URL: <http://hostname/eas> where hostname is the name or IP address of the Web Supervisor.

Step 2 Enter appropriate login information to gain access to the home page.

Note: From within an existing report, it is easier to simply use the Goto: menu on the upper right to select the desired report, as an alternative to the following step.

- Step 3 From the home page, open Bill Reconciliation by clicking on the Bill Reconciliation link. The Bill Reconciliation report template displays.

Note: *If you desire, from within an existing report, it is easier to simply use the Goto Reports Pull-down menu on the upper right to select the desired report.*

Set Report Parameters

- Step 1 The tree displays sites and points as filtered by the Site Filter drop down list. In the site tree, click on the meter that represents the account that you want to reconcile. The Cost area displays the cost table, with empty (\$0.00) fields.

Note: *Only meters that have rates attached are valid for reconciliation.*

- Step 2 In the Billing Period group, select the month option and type in the year for the desired billing period. By default, the regular account billing period is loaded into the rate Start and End fields.

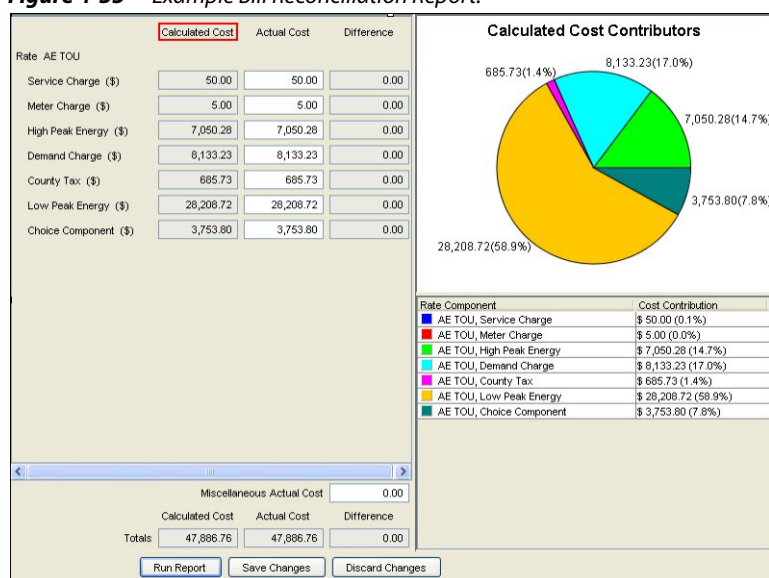
Billing Period
Oct 2004

Schedule A-3
Start 6 Oct 2004 00:00
End 6 Nov 2004 00:00

Note: *If the Start and End days are not correct, adjust them and save the changes. The billing cycle fields are originally set when you attach a rate to a meter (refer to "About Attach A Rate," page 3-20).*

- Step 3 Click on Run Report to create the report. Figure 4-26 is an example of a Cost Ranking report using sample data.

Figure 4-35 Example Bill Reconciliation Report.



About the Rate Comparison Report

This report lets you make predictions about what your costs would be if you were to change your energy rate plan. This helps you decide whether or not you could save money simply by changing energy providers or tariff rates. The Rate Comparison report allows you to select a meter with attached rates (or aggregate meters by holding down the CTRL key and selecting multiple meters), and then apply an alternate rate to see what the calculated costs would have been if you had used the alternate rate instead of the one attached to the meter(s).

Aggregating meters

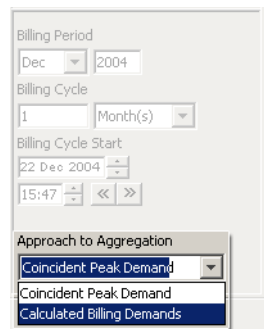
To aggregate meters in this report, select multiple meters by holding down the CTRL key. Click on the desired meters to select them. Alternatively, select an entire site to aggregate all meters for that site. Once the left side of the report window is defined (with default rates assigned using Attach A Rate) select a single alternate rate to apply to the aggregate.

Note: This method of aggregating meters is used in the What-If Analyzer, Rate Comparison report, and the Budget report. In all other reports, aggregation is performed with a Copy and Paste function, as described in “About Aggregating Data Points,” page 3-44.

Aggregation Approach

You have the ability to select how aggregation works when you run the Rate Comparison report. The “Approach to Aggregation” option list, shown in Figure 4-36, is located in the bottom right corner of the report display and provides the following two options:

Figure 4-36 Aggregation Approach Options.

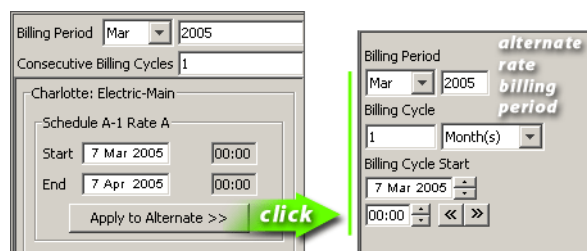


- **Coincident Peak Demand**
This is the default option. When the report is run using this option, the selected meters are aggregated (demand data points are coincided by each timestamp) and then the alternate rate is applied to the aggregated data (fixed fees are consolidated).
- **Calculated Billing Demands**
This option does the opposite of the Coincident Peak Demand method. It specifies that the alternate rate is applied to each meter first (revealing multiple demand charges to be summed) and then the total costs are aggregated (fixed fees are summed).

Synchronizing billing cycles

When you select a single meter or aggregate meters, the individual billing cycles for each meter are displayed in the bottom left corner of the display. You can apply any *one* of the Billing Periods to the alternate rate Billing Period by clicking the “Apply to Alternate” button for that billing period.

Figure 4-37 Synchronizing Billing Cycles with the Apply to Alternate Button.



Sample Report

The example in Figure 4-38 shows a comparison of two rates. Based on this report, it appears that you would have saved \$3,262.14 if you had used the alternative rate, a savings of 9.3%.

Figure 4-38 Rate Comparison Report Example.

Attached Rate Details		Alternate Rate Details	
Calculated Cost		Calculated Cost	
Atlanta: Electric-Main		Rate Schedule A-1 Rate D	
Rate Schedule A-1 Rate A		Rate Schedule A-1 Rate D	
Consumption	28,752.24	Consumption	25,794.07
Demand	2,979.51	Demand	2,979.51
Other	3,265.05	Other	2,961.08
Grand Total	34,996.80	Grand Total	31,734.66
Difference		Difference	
Grand Total Difference	3,262.14 (90.7%)	Consumption Difference	2,958.17 (89.7%)
Demand Difference	0.00 (100.0%)	Other Difference	303.97 (90.7%)

Creating a Rate Comparison Report.

Create an Cost Ranking Report by performing the following tasks:

- [Start the Report](#)
- [Select the Meter or Meters that you want to use](#)
- [Set the Billing Period](#)

Start the Report

- Step 1 Launch VES from your browser using the following URL: `http://hostname/eas` where hostname is the name or IP address of the Web Supervisor.
- Step 2 Enter appropriate login information to gain access to the home page.
- Note:** From within an existing report, it is easier to simply use the Goto: menu on the upper right to select the desired report, as an alternative to the following step.
- Step 3 From the VES home page, open Rate Comparison by clicking on the Rate Comparison link. The Rate Comparison report template displays.

Select the Meter or Meters that you want to use

- Step 1 The site tree displays sites and meters. In the site tree, click on the site or meter that you want to compare rates on.
- Note:** The meter(s) you select must have a rate attached to it. Refer to [“About Attach A Rate,”](#) page 3-20 for details about attaching a rate.
- Step 2 Aggregate meters, if desired, using the CTRL-click method to select multiple meters. You may also select an entire site, which aggregates all meters for that site.

Set the Billing Period

- Step 1 In the Billing Period group, adjust the billing period fields to the desired dates, if necessary, and type in the number of Consecutive Billing Cycles that you want to include in your report. Default billing dates appear for a single meter or for multiple meters (when you aggregate meters or select a site).
- Step 2 In the Billing Period group, click the “Apply to Alternate” button for the billing period that you want to use for the alternate. This button synchronizes the alternate rate’s billing cycle to use the selected meter’s Billing Period and Consecutive Billing Cycles.
- Step 3 In the Select Alternate Rate window, select the alternate rate that you want to use for comparison. The billing period for the alternate rate should match your selected meter billing period.
- Step 4 Click on Run Report to create the report. The report displays the results and allows you to compare the meter’s current rate (on the left) with the alternate rate (on the right). [Figure 4-39](#) is an example of a Rate Comparison report using sample data.
- Step 5 To see cost component details, click the 'Show Details' button in the toolbar (see [Figure 4-40](#)). To conserve screen space, click the 'Toggle Tree' button in the toolbar.

Figure 4-39 Rate Comparison Sample report.

Figure 4-40 Using the Details Button.

About the Budget Report

The Budget report allows you to compare your budgeted costs to your actual costs (or for the current, partial billing cycle projected costs). This report provides a way to view and edit your yearly budgets at the monthly level. Before you can create a Budget report, you must actually have budget data available for comparison.

The Budget report interface allows you to choose a starting billing period, in terms of year and month and then specify how many subsequent billing cycles to look at. You may also choose to “project” (estimate) costs for the current partial billing cycle.

Using the budget report for a meter requires that you have a monthly budget for each month that you are interested in. After you have entered budget data, you can define the report parameters, run the report and assess the data that it presents.

Entering a budget

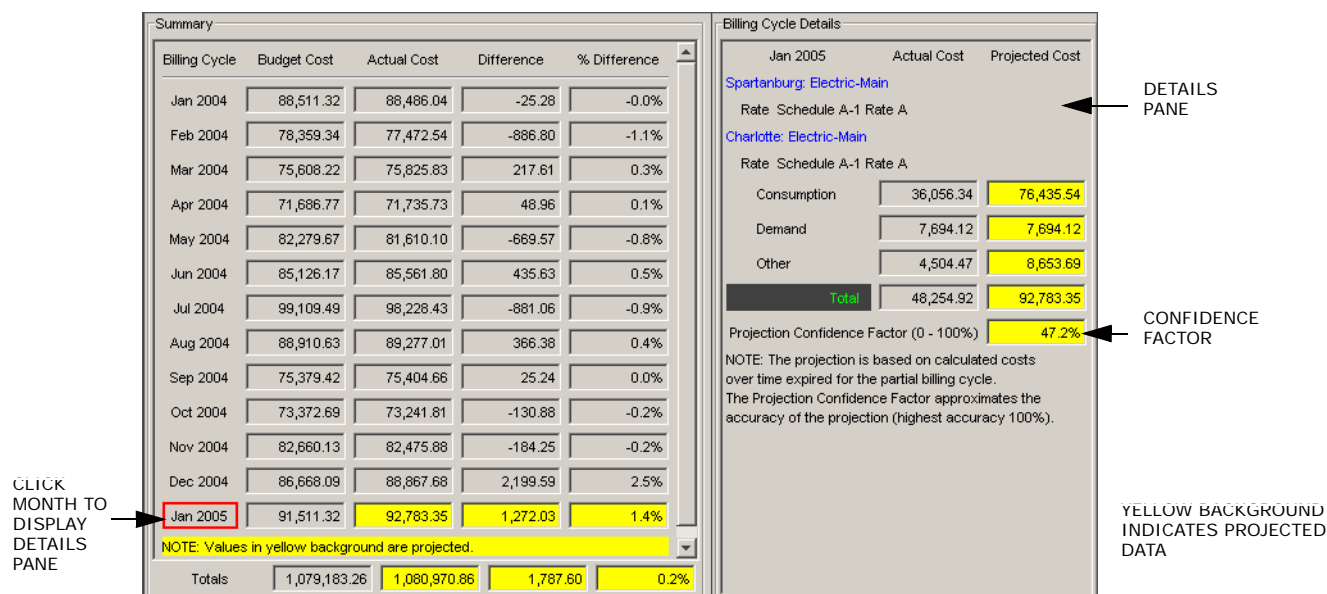
The budget entry view is the screen that provides fields for entering a budget for a meter. There are two ways to access the budget entry view:

- use the 'Enter Budget' tab on the Configuration view
- click the 'Enter Budget' button at the bottom of the Budget report screen, to bring up the entry view.

Note: Only administrators can enter a budget. If you are logged in as a user without admin write access, you will not be allowed to get to the Enter Budget view (just like Create-A-Rate, etc.).

Figure 4-41 is an example of a Budget report.

Figure 4-41 Budget Report Example.



About projected costs

Projected costs are costs that are calculated when the current partial billing cycle is included in the Budget report billing period. Projected cost is based on calculated values for time expired in the current billing cycle. For example, a projected consumption value is determined by dividing the total billing cycle time by the time that has expired in the billing cycle. That quotient is multiplied by the actual consumption values (to-date) to arrive at the projected cost, as illustrated in the following equation.

$$\text{Projected Consumption Cost} = \left(\frac{\text{total billing cycle time}}{\text{time expired in billing cycle}} \right) \times \text{Current Consumption Value}$$

Demand costs are simply the peak demand found to date, so a computation based on time expired does not affect demand cost projection.

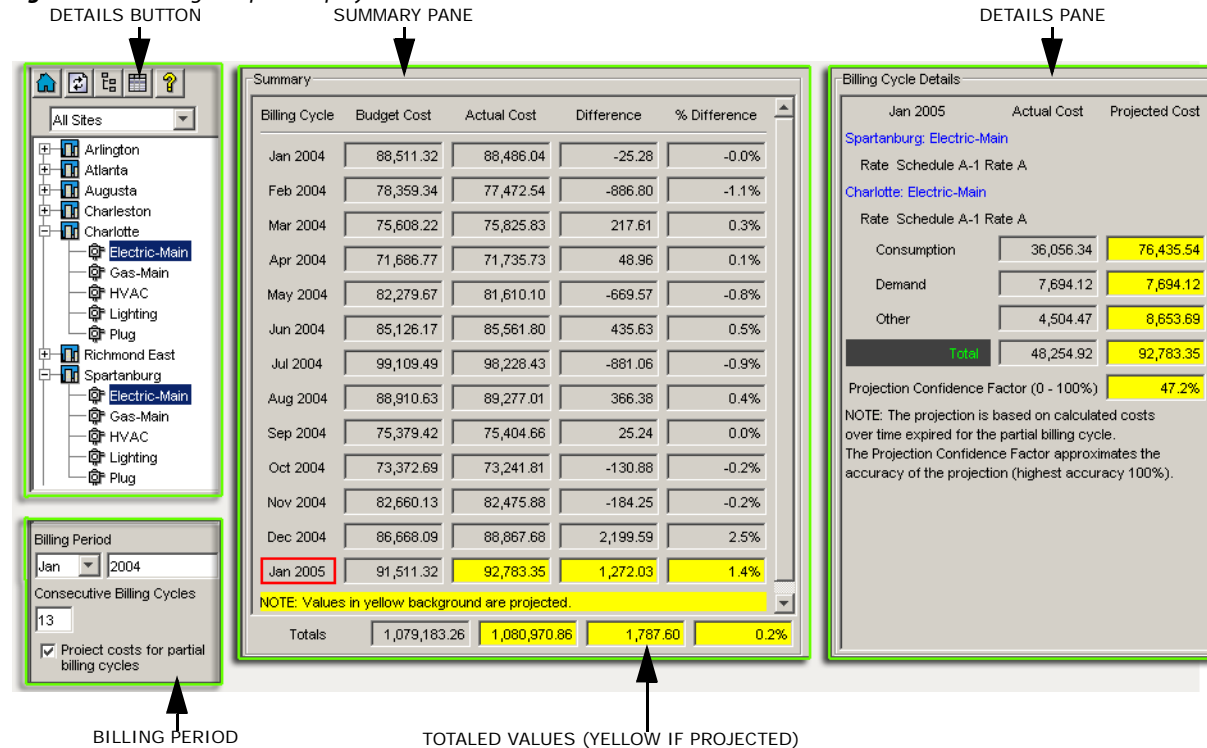
- **Confidence Factor**
Since the projected costs are estimated, a “confidence factor” is calculated to help you judge the reliability of the projection. Basically, the confidence factor is inversely proportional to how much time is *remaining* in the billing cycle. The confidence factor is displayed in terms of percentage, with a higher percentage being a higher confidence factor, reflecting less possibility for changes in the projection.

About the Budget Report Display

The Budget report shows how actual costs compare to budgeted costs by presenting this data side by side in parallel columns for as many billing cycles as you specify. The actual difference as well as the percentage difference between budget and actual costs is displayed as well. Details are also provided for each billing cycle.

Following are the primary display panes in the Budget Report:

Figure 4-42 Budget Report Display Areas.



- **Site Tree Window**
This window works like all other site tree windows. See “[Site Tree Window](#),” page 3-28, for details.
- **Billing Period**
Select the desired billing period start date (month and year) and enter the number of consecutive billing cycles to include for the budget report. You may choose to project costs for the current incomplete billing cycle (refer to “[About projected costs](#),” page 4-42) by selecting the “Project costs for partial billing cycles” check box.
- **Summary Pane**
Once a report is run, the Summary pane displays four columns of data, as described below, with column totals at the bottom:
 - **Budgeted Cost**
Shows the budgeted values for each month.
 - **Actual Cost**
Shows the actual values for each month.
 - **Difference**
Shows the Actual Cost minus the Budgeted Cost for each month.
 - **% Difference.**
Shows percent over or under budget (to the nearest tenth of a percentage point).
- **Details Pane**
After running a Budget report, you can click on any individual billing cycle (by month) in the summary pane to see the details for that month in the Details Pane on the right. The details pane shows a breakdown of the costs that went into the total for the billing cycle.


Click the “Show Details” button  to see additional details (as shown in [Figure 4-43](#)) for the month that is currently selected in the details pane. Details remain available, even when you select a different month, as long as the “Show Details” button is toggled on.

Figure 4-43 Billing Cycle Details.

Billing Cycle Details		
Jan 2005	Actual Cost	Projected Cost
Spartanburg: Electric-Main		
Rate: Schedule A-1 Rate A		
County Tax (\$)	988.13	1,900.85
Service Charge (\$)	4.00	4.00
Facilities Charge (\$)	4,069.58	4,069.58
Energy Charge (\$)	19,176.58	40,652.29
Combination Percentage Fee (\$)	1,400.97	2,695.02
Spartanburg: Electric-Main Total	25,639.27	49,321.74
Charlotte: Electric-Main		
Rate: Schedule A-1 Rate A		
County Tax (\$)	871.60	1,675.00
Service Charge (\$)	4.00	4.00
Facilities Charge (\$)	3,624.54	3,624.54
Energy Charge (\$)	16,879.75	35,783.25
Combination Percentage Fee (\$)	1,235.76	2,374.82
Charlotte: Electric-Main Total	22,615.65	43,461.61
Total	48,254.92	92,783.35
Projection Confidence Factor (0 - 100%)		47.2%
NOTE: The projection is based on calculated costs over time expired for the partial billing cycle. The Projection Confidence Factor approximates the accuracy of the projection (highest accuracy 100%).		

Creating a Budget Report.

Create an Cost Ranking Report by performing the following tasks:

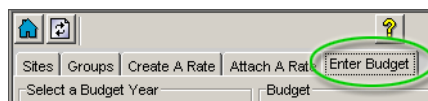
- [Start the Report](#)
- [Enter a Budget](#)
- [Set Report Parameters](#)

Start the Report

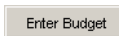
- Step 1 Launch VES from your browser using the following URL: `http://hostname/eas` where hostname is the name or IP address of the Web Supervisor.
- Step 2 Enter appropriate login information to gain access to the home page.
- Note:** From within an existing report, it is easier to simply use the *Goto:* menu on the upper right to select the desired report, as an alternative to the following step.
- Step 3 From the VES home page, open Budget Report by clicking on the **Budget Report** link. The Budget Report template displays.

Enter a Budget

- Step 1 To enter a budget for a meter, do one of the following:
- From the Configuration page, click the Enter Budget tab. The budget entry page appears as one of



the tabbed option displays.

- From the Budget report page, click the Enter Budget button. 
- The Enter Budget dialog box appears in a popup window.

Note: It does not matter how you access the budget entry display. The fields and information in the popup dialog box are identical to those in the configuration page tabbed display.

Figure 4-44 Enter Budget Display

- Step 2 In the “Select a Budget Year” field, type in a year for the budget information that you are editing.
- Step 3 In the Sites tree, select the meter that you want to edit budget costs for. The fields in the Budget area are now editable.
- Step 4 Enter budget cost information for each individual month that is displayed by typing the data into each Budget Cost field, for all 12 months, **OR** do step 5, below:
- Step 5 Apply historical values to Budget Cost fields by using the following controls:
- In the Historical Year field, type in the year of the data that you want to retrieve.
 - From the Use Historical option list, select one of the following options to specify which historical costs to use:
 - Actual Cost
 - Budget Cost
 - Calculated Cost
 - Select or clear the **Normalization** option. If you want to normalize the historical data for weather, select this option, type in a degree day temperature, and choose desired units (C, K, or F). Refer to [“Types of Normalization”](#) on page 3-35 for more information about normalizing data.
- Step 6 Select or clear the Data Cleansing option, as desired, to filter historical data used. [“About Data Cleansing,”](#) page 3-45 for details about data cleansing. If you select Data Cleansing, enter an integer in the Window parameter field and a percentage in percent field.
- Step 7 Click the Apply Historical Values button. Historical data will populate the Budget Cost fields.
- Note:** *If no values fill the Budget Cost fields after clicking the Apply Historical Values button, then there is probably no historical data available. Try selecting different historical value parameters or enter the data manually.*
- Step 8 All nodes in the site tree are dimmed (not editable) until the report changes are saved, discarded, or the report is deleted. Click one of the following buttons:
- **Save Changes** – to save the budget data in the currently displayed budget.
 - **Save/Continue** – to save the budget data in the currently displayed report and increment the year number in “Select a Budget Year” and “Historical Year” fields
- Note:** *It is possible to unintentionally delete budget data. Before discarding or deleting data be sure to check the Budget Year field so that you are fully aware of the time range of the data you are discarding or deleting.*
- **Discard Changes** – to delete current budget data changes and revert to the previously saved budget information for the currently displayed budget.
 - **Delete a Budget** – to delete the currently displayed budget.

Set Report Parameters

- Step 1 In the site tree, click on the desired site or meter. You may aggregate meters (refer to [“Aggregating meters,”](#) page 4-38 for details on aggregating). You may also select a site to run a report on all meters under the site.
- Note:** *Default data for Budget Cost fields is \$0.00. Make sure that all “aggregated” meters (or meters under sites that are targeted for Budget reports) have individual budget cost data for each meter or the Budget report may not produce usable information.*
- Step 2 Select a month and year for the Starting Billing period fields.
- Step 3 Enter the desired number of billing cycles to include in the report.
- Step 4 Select or clear the “Project costs for partial billing cycles” option, as desired. When this option is selected, the current partial billing cycle will have projected costs calculated, if appropriate. Projected values are always displayed with a yellow background in both the Summary and Details pane of the Budget report.
- Step 5 Click on Run Report to create the report. [Figure 4-45](#) is an example of a Budget report using sample data.

Figure 4-45 Budget Report Sample.

Summary					Billing Cycle Details	
Billing Cycle	Budget Cost	Actual Cost	Difference	% Difference	Jan 2004	Actual Cost
Jan 2004	47,000.00	46,974.71	-25.29	-0.1%	Spartanburg Electric-Main	
Feb 2004	42,000.00	41,113.20	-886.80	-2.1%	Rate Schedule A-1 Rate A	
Mar 2004	40,000.00	40,217.61	217.61	0.5%	Consumption	38,704.26
Apr 2004	38,000.00	38,048.96	48.96	0.1%	Demand	3,889.28
May 2004	44,000.00	43,330.43	-669.57	-1.5%	Other	4,381.17
Jun 2004	45,000.00	45,435.62	435.62	1.0%	Total	46,974.71
Jul 2004	53,000.00	52,118.94	-881.06	-1.7%		
Aug 2004	47,000.00	47,366.38	366.38	0.8%		
Sep 2004	40,000.00	40,025.24	25.24	0.1%		
Oct 2004	39,000.00	38,869.13	-130.87	-0.3%		
Nov 2004	44,000.00	43,815.75	-184.25	-0.4%		
Dec 2004	45,000.00	47,199.59	2,199.59	4.9%		
Jan 2005	50,000.00	49,527.44	-472.56	-0.9%		
NOTE: Values in yellow background are projected.						
Totals	574,000.00	574,042.99	42.99	0.0%		

About the What-If Analyzer

The What-If Analyzer provides the ability to manipulate such things as consumption and demand levels to determine how much money is saved if energy consumption and/or demand is reduced. It also allows you to manipulate associated unit fees for each component. For example, you may offer energy services, where you implement efficiency projects for the end user. You may wish to consider whether or not a lighting retrofit, chiller optimization routine, or simple scheduling and setpoint changes, significantly improve your energy efficiency.

With the What-If Analyzer, you can set up different scenarios to consider variable demand, variable consumption, and variable fees.

Figure 4-46 What-If Analyzer Report Example.

Summary of Billing Cycles			Billing Cycle Details			
Billing Cycle	Calculated Cost	Adjusted Cost	Feb 2004			
Jan 2004	46,974.71	46,967.92	Calculated Units	Fee (per Unit)	Calculated Cost	Adjusted Cost
Feb 2004	41,113.20	41,099.61	Spartanburg: Electric-Main, Rate Schedule A-1 Rate A			
Mar 2004	40,217.61	40,217.61	County Tax (\$)	N.A.	1,584.49	1,584.49
Apr 2004	38,048.96	38,048.96	Service Charge (\$)	N.A.	4.00	4.00
May 2004	43,330.43	43,330.43	Facilities Charge (\$ / kW)	1,728.57	2.25	3,889.28
Jun 2004	45,435.62	45,435.62	Energy Charge (\$ / kWh)	491,247.29	0.06794	33,388.93
Jul 2004	52,118.94	52,118.94	Combination Percentage Fee (\$)	N.A.	2,246.50	2,246.50
Aug 2004	47,366.38	47,366.38				
Sep 2004	40,025.24	40,025.24				
Oct 2004	38,869.13	38,869.13				
Nov 2004	43,815.75	43,815.75				
Dec 2004	47,199.59	47,199.59				
Grand Total	524,515.55	524,495.17	Feb 2004 Total	41,113.20	41,099.61	
Savings		20.38	Feb 2004 Savings		13.59	
Reset All			Reset Feb 2004			
Run Report						

About the What-If Analyzer Display

The What-If Analyzer report shows important details about each billing cycle that is displayed in the report. [Figure 4-47](#) shows the primary display panes in the What-If Analyzer report, which are also described below:

Figure 4-47 What-If Analyzer Display Areas.

Diagram illustrating the What-If Analyzer Display Areas:

- SITE TREE**: A tree view showing the hierarchy of sites and equipment. The "Atlanta" site is selected, and "Electric-Main" is highlighted under it. Other sites listed include Arlington, Augusta, Charleston, Charlotte, Richmond East, Spartanburg, and Winston Salem.
- BILLING CYCLES SUMMARY PANE**: A table showing the summary of billing cycles. The "May 2004" cycle is highlighted. The table includes columns for Billing Cycle, Calculated Cost, and Adjusted Cost. The Grand Total is 267,216.01, and Savings is 0.00. A "Reset All" button is at the bottom.
- BILLING CYCLES DETAILS PANE**: A table showing the details for the selected billing cycle (May 2004). It includes columns for Calculated Units, Fee (per Unit), Calculated Cost, and Adjusted Cost. The details for "Atlanta: Electric-Main, Rate Schedule A-1 Rate A" are shown, including County Tax, Service Charge, Facilities Charge, Energy Charge, and Combination Percentage Fee. The May 2004 Total is 33,601.31, and May 2004 Savings is 0.00. A "Reset May 2004" button is at the bottom.
- BILLING PERIOD**: A section for selecting the billing period. It includes a "Billing Period" dropdown set to "May" and "2004", and a "Consecutive Billing Cycles" input field set to "8".
- RESET ALL BUTTON**: A button located at the bottom of the Billing Cycles Summary Pane.
- RESET BUTTON**: A button located at the bottom of the Billing Cycles Details Pane.
- Run Report**: A button located at the bottom center of the display.

- **Site Tree Window**
This window works like all other site tree windows. See ["Site Tree Window,"](#) page 3-28, for details.
- **Billing Period**
Select the desired billing period start date (month and year) and enter the number of consecutive billing cycles to include.
- **Billing Cycles Summary Pane**
Once a report is run, the Billing Cycles Summary pane displays two columns of data, as described below, with column totals at the bottom:
 - **Calculated Cost**
Shows the total calculated cost values for each billing cycle. These numbers will not change when you make adjustments in the Billing Cycle Details pane.
 - **Adjusted Cost**

Total adjusted cost values are calculated using the adjustments that you make in the Billing Cycle Details pane. These numbers will change as you make changes to the editable fields in the Billing Cycle Details pane.

- **Grand Total**
This row shows the total costs of all billing cycles in the report. The Grand Total of the Calculated Costs does not change with adjustments. The Grand Total of the Adjusted Cost changes with each adjustment you make in the Billing Cycle Details pane to show the cumulative total of all changed billing periods.
- **Savings**
The savings field displays the difference between the Adjusted Cost and the Calculated Cost and updates each time you make an adjustment in the Billing Cycle Details pane.
- **Reset All button**
Click this button to clear all adjustments made in **all** billing cycles since the last save.
- **Billing Cycle Details Pane**
Once a report is run, the Billing Cycle Details pane displays four columns of data, as described below, with column totals at the bottom:
 - **Calculated Units**
This editable column allows you to adjust the units calculated for the rate component and used in its cost calculation. Changes to these fields change the calculations that display in the Adjusted Cost column and are reflected in the billing cycle's "Total" and "Savings" fields.
 - **Fee (per Unit)**
This column includes editable fields that allow you to adjust fees for rate components. Changes to these fields change the calculations that display in the Adjusted Cost column and are reflected in the billing cycle's "Total" and "Savings" fields.
 - **Calculated Cost**
This non-editable column contains the cost data that is calculated when the report is run. Changing the editable columns in other fields will not change these fields.
 - **Adjusted Cost**
this non-editable column contains the cost data that is calculated as a result of adjustments that you make in the editable fields of the Billing Cycle Details pane.
 - **"Billing Cycle" Total**
This row shows the total costs for the displayed billing cycle. The "Billing Cycle" Total of the Calculated Costs does not change with adjustments. The "Billing Cycle" Total of the Adjusted Cost changes with each adjustment you make in the editable fields of the Billing Cycle Details pane. This shows the total of all changes for the currently displayed billing period.
 - **"Billing Cycle" Savings**
The savings field displays the difference between the Adjusted Cost and the Calculated Cost and updates each time you make an adjustment in the Billing Cycle Details pane.

Using the What If Analyzer

To create a What If Analyzer Report, perform the following tasks:

- [Start the Report](#)
- [Set Report Parameters](#)

Start the Report

- Step 1 Launch VES from your browser using the following URL: `http://hostname/eas` where hostname is the name or IP address of the Web Supervisor.
- Step 2 Enter appropriate login information to gain access to the home page.
- Note:** *From within an existing report, it is easier to simply use the Goto: menu on the upper right to select the desired report, as an alternative to the following step.*
- Step 3 From the VES home page, open What-If Analyzer by clicking on the What-If Analyzer link. The What-If Analyzer report template displays. To open a saved report, select the report by name from under the What-If Analyzer link or by selecting the report from the report option list.

Set Report Parameters

- Step 1 The site tree displays sites and meters. In the site tree, click on the site or meters that you want to compare rates on.
- Note:** *The meter(s) you select must have a rate attached to it. Refer to ["About Attach A Rate,"](#) page 3-20 for details about attaching a rate.*
- Aggregate meters, if desired, using the CTRL-click method to select multiple meters (refer to ["Aggregating meters,"](#) page 4-38). When you select a site, all meters for that site are aggregated.



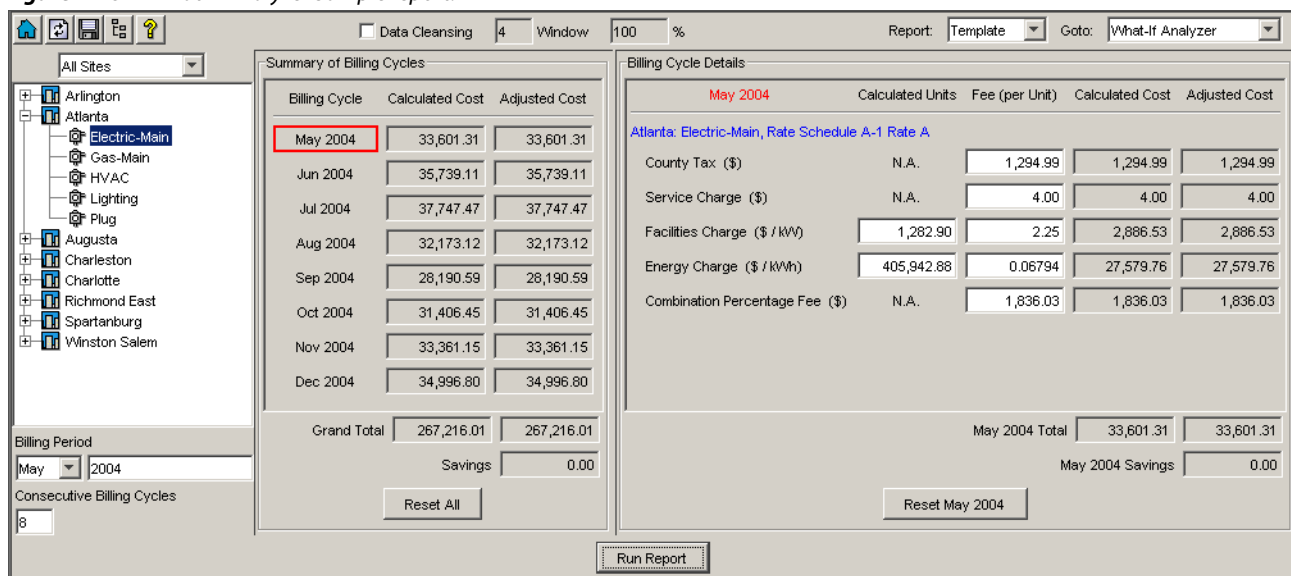
- Step 2 In the Billing Period group, select a starting billing cycle and number of consecutive billing cycles to consider
- Step 3 Click on Run Report to create the report. The report displays the results for each billing cycle in a Summary pane (middle pane) and a Details pane (right pane).
- Step 4 To see details for a particular billing cycle: in the Summary pane click the billing cycle month in the first column of the Summary pane. The details for that billing cycle appear in the Details pane. Any editable field in the “Calculated Units” and “Fee (per Unit)” columns appears with a white background.
- Step 5 Edit the data in the “Calculated Units” or “Fee (per Unit)” columns. Changes appear in the “Adjusted Cost” column. The “Calculated Cost” column does not change.
- Step 6 Click the **Reset** button  to clear any adjustments that appear in the “Adjusted Cost” column for the displayed billing cycle. The adjustments are removed.
- Step 7 Click the **Reset All** button  to clear any adjustments that appear in the “Adjusted Cost” column for all billing cycles in the current report. The adjustments are removed.
- Step 8 Click the **Save** button in the toolbar to save the report. Type in a name for the report and select the “Public” option, if desired.

Figure 4-48 What-If Analyzer Sample report.



Summary of Billing Cycles

Billing Cycle	Calculated Cost	Adjusted Cost
May 2004	33,601.31	33,601.31
Jun 2004	35,739.11	35,739.11
Jul 2004	37,747.47	37,747.47
Aug 2004	32,173.12	32,173.12
Sep 2004	28,190.59	28,190.59
Oct 2004	31,406.45	31,406.45
Nov 2004	33,361.15	33,361.15
Dec 2004	34,996.80	34,996.80
Grand Total	267,216.01	267,216.01
Savings	0.00	

Billing Cycle Details

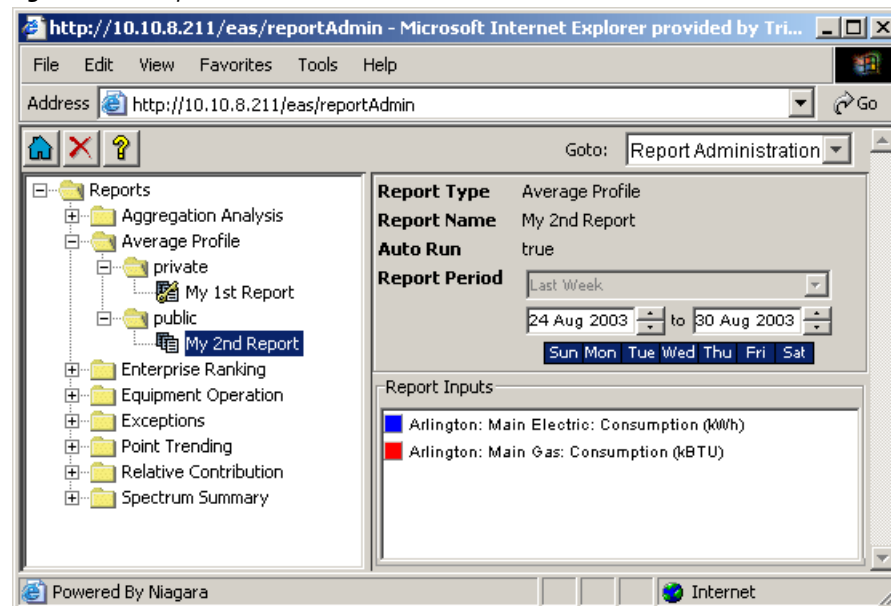
May 2004

	Calculated Units	Fee (per Unit)	Calculated Cost	Adjusted Cost
County Tax (\$)	N.A.	1,294.99	1,294.99	1,294.99
Service Charge (\$)	N.A.	4.00	4.00	4.00
Facilities Charge (\$ / kW)	1,282.90	2.25	2,886.53	2,886.53
Energy Charge (\$ / kWh)	405,942.88	0.06794	27,579.76	27,579.76
Combination Percentage Fee (\$)	N.A.	1,836.03	1,836.03	1,836.03
May 2004 Total			33,601.31	33,601.31
May 2004 Savings				0.00

Report Administration

The Report Administration tool gives you a tree view of all the saved reports that you can access. From this tool, you can view the common attributes of any saved report and you can delete any privately saved reports. If you have an admin level password, you may also delete public reports.

Figure 4-49 Report Administration.



CHAPTER 5

Working with Data in VES

The following topics are included in this chapter:

- [“Working with Energy Data,”](#) page 5-1
This section describes some of the possible conditions that may require you to edit data values or delete records. This topic includes information about handling corrupt data, working with data spikes, and how to edit history data.
- [“Importing data files,”](#) page 5-2
This section describes how to import a CSV file as a NiagaraAX history so that you can use it in VES.
- [“Importing Sql databases,”](#) page 5-5
This section describes how to import a Sql database files as a NiagaraAX history so that you can use them in VES.
- [“Exporting history files,”](#) page 5-8
This section describes how to export history tables in various formats, including Microsoft® Excel® CSV file format.
- [“NiagaraAX drivers,”](#) page 5-9
This section an overview of several NiagaraAX drivers that support collecting meter data.
- [“About VES Demo Data,”](#) page 5-15
This section describes “demo data” and includes procedures for generating Demo Data and generating and purging Yearly Templates.

Working with Energy Data

Data may be corrupt, invalid, or unusable for various reasons and require that you edit it or replace it. The following sections describe some of the common problems related to working with energy data.

Data Spikes and Corrupt Data

Occasionally there may be extremely large increases or decreases in the logged data coming from NiagaraAX, which in turn shows up on VES reports as large spikes. The root source of this problem could be an incorrectly configured meter or unreadable incoming data (problematic pulse counts). If there are occasional large negative spikes occurring after nearly equal time periods, there may be a problem with the meter's energy capacity. For example, if a delta log is taking consumption values at 15-minute intervals and the meter resets its energy count at a certain limit, say 5000 pulses or kilowatt-hours, it will go back to zero during an interval, resulting in a large negative delta value. To illustrate, assume a consumption meter has a total reading of 4990 kWh with a reset function at 5000kWh. If the meter increases by more than 10 kWh, there will be a large negative value recorded to the 15-minute delta log (delta logs take the difference in value from one 15-minute period to the next). Assume there is 50 kWh used in that 15-minute interval. Instead of a value of 50 in the delta log, there will be a value of around -4950 kWh (10 kWh before the reset, a change of -5000 kWh after the reset, and then 40 is consumed after the reset to yield -4950kWh). Again, this problem arises only if the meter is programmed to reset or clear after a certain threshold has been reached, and is usually meter-dependent.

Regardless of the underlying reason, the VES reports can be fixed using one of the following methods:

- **Edit history data**
This method involves actually editing the bad data values in the logs using the History Editor or Database Maintenance views. These views are described in the *NiagaraAX User Guide*.
- **Using Data Cleansing**
This method involves leaving the bad data in the logs, but *masking* them in the VES reports so that they do not show up. If you do not want to change any of the records and only want to have the VES

reports not display the bad values, the Data Cleansing function can be used. The only things that change with this feature are the reports themselves, not the actual data values. Data Cleansing is described in “About Data Cleansing,” page 3-64.

Editing History data

Sometimes you may have unwanted records rather than just bad values. If there is unwanted or corrupt data records that you need to delete, you can delete them using the History Editor or Database Maintenance views in the NiagaraAX workbench.

These views are described in the *NiagaraAX User Guide* and mentioned in summary, below:

- Refer to the History Editor view (see Figure 5-1) for editing individual record data
- Use the Database Maintenance view (see Figure 5-2) for deleting large numbers of sequential records or for deleting complete history files from the history database.

Figure 5-1 History Editor view

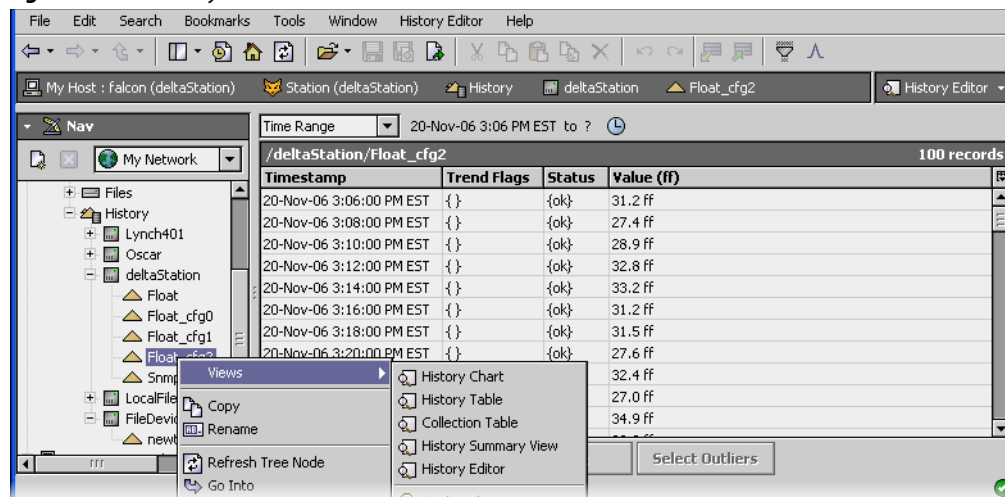
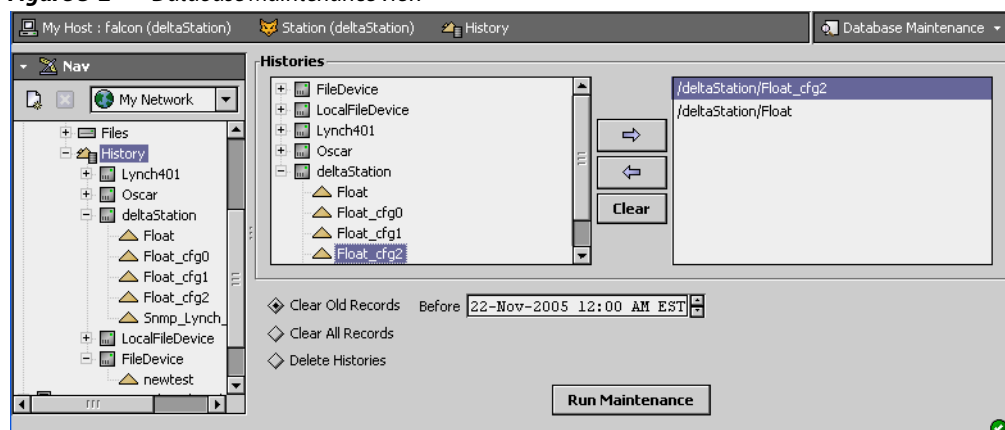




Figure 5-2 Database Maintenance view



Importing data files

You can use the ExcelCsvFileImport component  or the Delimited File Import component  to import data to create a NiagaraAX history based upon data in any (local) comma-separated-values (CSV) text file created by Microsoft Excel. These history file import descriptors reside under the HistoryNetworkExt (**Histories** extension) of a FileDevice in a FileNetwork. You use the DelimitedFileImport-Manager view of the Histories extension to add history file import descriptors.

Note: This import *ExcelCsvFileImport* descriptor is similar to the *DelimitedFileImport* descriptor, but assumes CSV data specifically created by Microsoft Excel (it lacks the “Delimiter” property). This allows complex CSV-delimited data to be successfully imported, using the special rules of Excel CSV generated files. For any other type of delimited data (for example, tab-delimited or “pipe-delimited”), use the *DelimitedFileImport* descriptor instead of the Excel CSV descriptor.

This import descriptor has properties “common” among all history import descriptors, such as Name, History Id, and so on. See “Properties of history file import descriptors” in the NiagaraAX User Guide for other configuration properties.

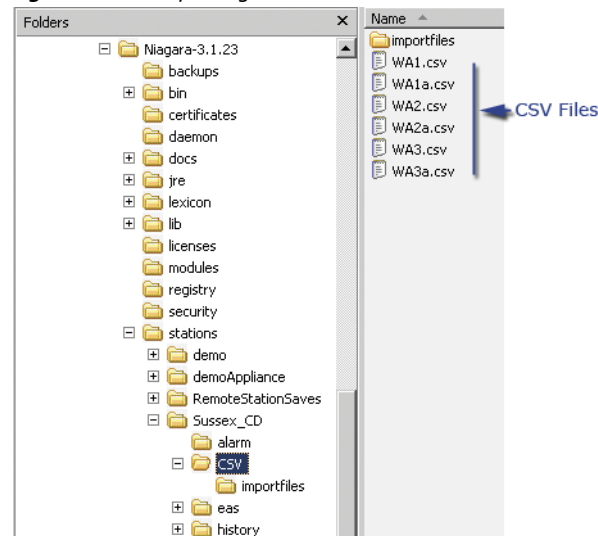
Import a data delimited file

Note: Files that you want to import must be on the local server. You cannot remotely import excel CSV files.

Histories can be imported from Microsoft® Excel® files or non-Excel produced files using the *FileDevice* driver. These files can be placed on the a NiagaraAX workstation server and imported from the location where they reside. The import driver requires that the timestamps are consistent and clean or an import fault will occur which may cause the file not to append to an existing history.

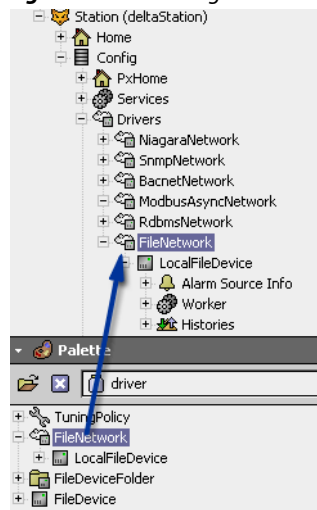
- Step 1 Place the CSV files on the server in an appropriate folder under your station, as shown in Figure 5-3.

Figure 5-3 Importing an Excel CSV file




- Step 2 In the NiagaraAX Workbench nav tree, under your station database (Config node), click on the Drivers node to display the network devices (if any).
- Step 3 In NiagaraAX Workbench, open the palette side bar.
- Step 4 In the palette side bar, open the driver palette and copy and paste the *FileNetwork* component under the Drivers node in the nav tree, as shown in Figure 5-4.

Figure 5-4 Adding the FileNetwork driver to the drivers node

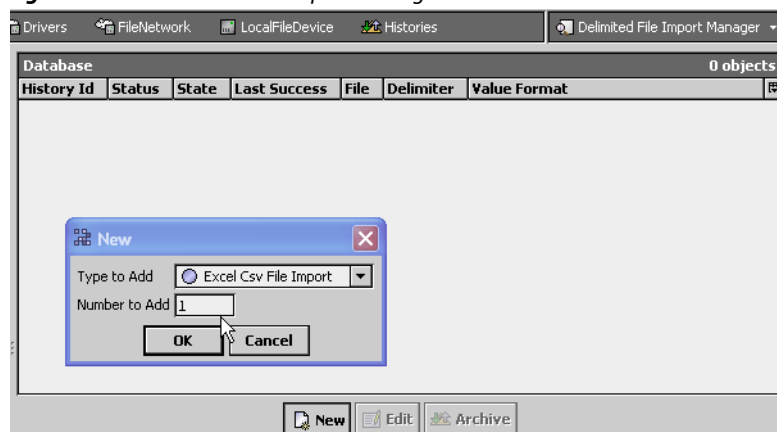


Note: The FileNetwork driver includes a Local File Device. Often, a FileNetwork contains only a single FileDevice. Unlike in true “field bus” networks, the standard NiagaraAX driver architecture (network: device: device extensions) the File Device provides no “real hardware” equivalency, this is simply a modeling “convention.”

Step 5 In the NiagaraAX nav tree, under the FileNetwork node expand the FileDevice node and double-click on the File History device extension .

The Delimited File Import Manager view displays, as shown in Figure 5-5.

Figure 5-5 Delimited File Import Manager view



Step 6 In the Delimited File Import Manager view, click the **New** button.

The New dialog box displays.

Step 7 In the New dialog box, from the Type to Add drop-down list, choose the type of file that you are importing, and click the **Ok** button.

The New File Import dialog box displays with fields of data that need to be reviewed and edited as necessary. The following fields are of particular importance:

- **Name**
The text in this field displays as the name of the import descriptor in the nav tree as well as in the descriptor’s property sheet.
- **History ID**
The text in this field defines the name and location of the history file that you create when importing the file.
- **Value Facets**
Use this field to set the value facets (units) *before* importing the data. This defines the units that VES will use to analyze the data.
- **File**
This field allows you to browse to the location of the file that you want to import.
- **Time Zone**

- Set this field to the appropriate time zone for the data.
 - Timestamp and Value Column index
Set these fields to correspond to the appropriate fields in the file that you are importing. Column A and Row 1 in a CSV file are both considered zero.
 - Timestamp
Choose the format to match your data. Refer to the following website for an explanation of the timestamp format symbols:
<http://java.sun.com/j2se/1.4.2/docs/api/java/text/SimpleDateFormat.html>
- Step 8 In the New File Import dialog box, click the **Ok** button.
The Delimited File Import Manager view displays with the new Excel CSV File Import descriptor or the DelimitedFileImport descriptor listed in the database table. Also, the descriptors display in the nav tree view under the LocalFileDevice > Histories node.
- Step 9 In the Delimited File Import Manager view, right-click the new descriptor and select **Execute** from the menu to complete the import.
- Note:** *An imported history with the exact same name can be appended to a real time log in Niagara.*

Importing Sql databases

You can use the Rdbms History Import component to import SQL data in order to create a NiagaraAX history based on remote SQL data. This history file import descriptor resides under the Sql Server History Device Extension of a SqlServerDatabase “device” on a RdbmsNetwork. You use the Rdbms History Import Manager view to Discover and Add import descriptors.

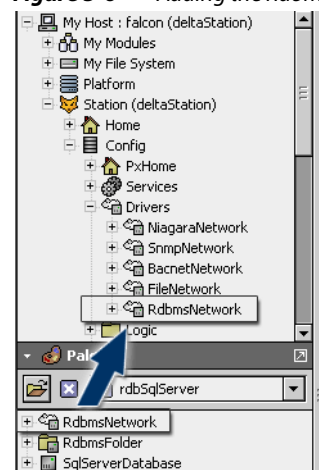
This import descriptor has properties “common” among all history import descriptors, such as Name, History Id, and so on. See “History Import properties” on page 141. See “Properties of history file import descriptors” in the *NiagaraAX User Guide* for other configuration properties.

Import Sql data

You must have administrative access to the SQL database (username and password) and the hosting server before you can complete the following procedure.

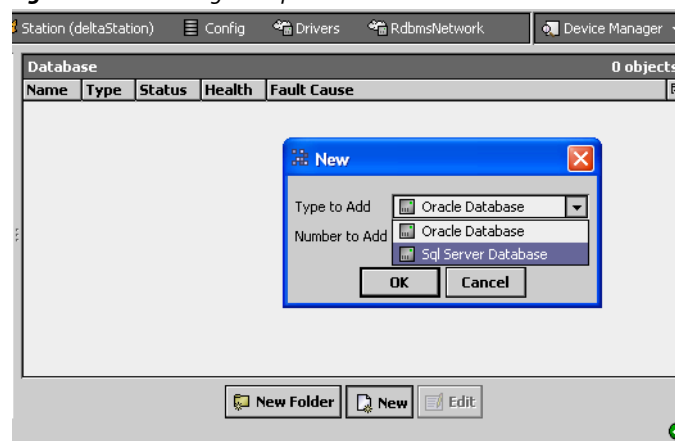
- Step 1 In the NiagaraAX Workbench nav tree, under your station database (Config node), click on the Drivers node to display the network devices (if any).
- Step 2 In NiagaraAX Workbench palette side bar, open the rdbSqlServer palette and copy and paste the RdbmsNetwork component under the Drivers node in the nav tree, as shown in Figure 5-6.

Figure 5-6 Adding the Rdbms Network driver



- Step 3 In NiagaraAX Workbench nav bar, double-click on the RdbmsNetwork node.
The Device Manager view displays.
- Step 4 In the Device Manager view, click the **New** button at the bottom of the view.
The New dialog box displays.

Figure 5-7 Adding the Sql Server device



Step 5 In the New dialog box, from the Type to Add drop-down list, choose Sql Server Database. and click the **Ok** button.

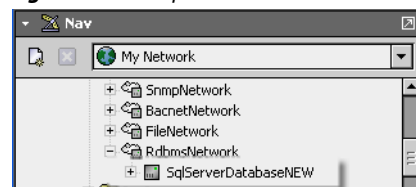
The New Sql Database Import dialog box displays.

Step 6 In the New Sql dialog box, edit the following properties and click the **Ok** button when complete.

- Name
Type in a name to identify the database in NiagaraAX.
- Type
Make sure that the correct database type is selected in this field.
- Enabled
Select true.

The SqlServerDatabase appears in the Device Manager view and in the Workbench nav tree.

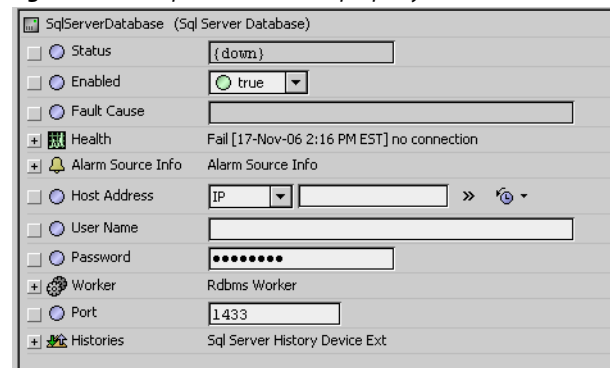
Figure 5-8 SqlServerDatabase in the nav tree



Step 7 In the NiagaraAX Workbench nav tree, under the RdbmsNetwork node, double-click on the SqlServerDatabase device node.

The SqlServerDatabase property sheet view displays, as shown in Figure 5-9.

Figure 5-9 SqlServerDatabase property sheet view



Step 8 In the SqlServerDatabase property sheet view, set all the fields according to the host server and database that you are targeting and click the **Save** button.

Step 9 In the nav tree, right-click on the Sql Server History Device Ext and select Views > Rdbms History Import Manager from the popup menu.
The Rdbms History Import Manager displays.

Step 10 In the Rdbms History Import Manager view, click the **Discover** button.

A discovery job runs and displays discovered database points in the top half of the view, as shown in Figure 5-10.

Figure 5-10 Discovered points

The screenshot shows a window titled "Rdbms Discover Tables" with a "Success" status. It contains two main sections: "Discovered" and "Database".

Discovered Section: Shows 129 objects. The table has columns: Table Name, Catalog Name, and Schema Name. The data is as follows:

Table Name	Catalog Name	Schema Name
ACTUAL_COSTS	demo	dbo
BILLING_CYCLES	demo	dbo
BUDGET_COSTS	demo	dbo
DATA_POINT	demo	dbo
DEMO_CHARLESTONMAINELECTRICC	master	dbo
GROUP_PROP	demo	dbo
GROUPS	demo	dbo
METER	demo	dbo

Database Section: Shows 0 objects. The table has columns: History Id, Status, State, Last Success, Rdb Table Name, Rdb Catalog Name, and Rdb Schema Name. It is currently empty.

At the bottom, there are buttons: New, Edit, Discover, Add, Match, and Archive.

Step 11 In the Rdbms History Import Manager view, select the desired database table to import and click the **Add** button at the bottom of the view.

Note: You can add multiple tables by selecting more than one entry in the Discovered (top) pane and then clicking the **Add** button.

The Add dialog box displays, as shown in Figure 5-11, with fields of data that need to be reviewed and edited as necessary. The following fields are of particular importance:

- **Name**
The text in this field displays as the name of the import descriptor in the nav tree as well as in the descriptor's property sheet.
- **History ID**
The text in this field defines the name and location of the history file that you create when importing the file.
- **Execution Time**
This field allows you to specify when imports are performed.
- **Value Facets**
Use this field to set the value facets (units) *before* importing the data. This defines the units that VES will use to analyze the data.
- **Time Zone**
Set this field to the appropriate time zone for the data.
- **Timestamp Column, Value Column, and Index Column**
IMPORTANT! These columns allow you to map the database tables columns to the corresponding history columns. These drop-down lists are automatically populated if you use the Discover process to create the import descriptor.

Figure 5-11 Rdbms Add dialog box

- Step 12 In the Rdbms Add dialog box, click the **Ok** button.
The Rdbms History Import Manager view displays with the new Table Import descriptor listed in the database pane. Also, the descriptor displays in the nav tree view under the `SqlServerDatabase > Histories` node.
- Step 13 In the Rdbms File Import Manager view database pane, right-click the new descriptor and select **Execute** from the popup menu to complete the import.
- Note:** An imported history with the exact same name can be appended to a real time log in Niagara.

Exporting history files

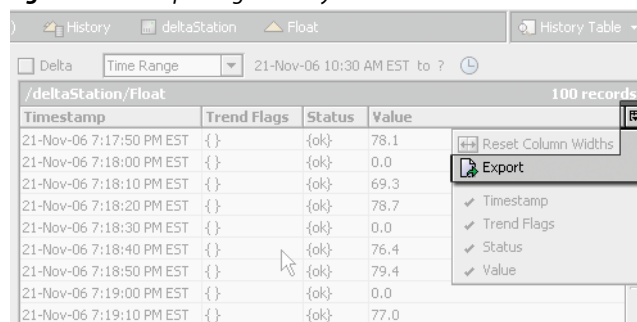
In NiagaraAX Workbench you can export history files to several different formats, including: Excel CSV, oBIX, PDF, and text files.

Export a history file

In order to export a history file you must display the file in any of the following tabular history views: History Table, Collection Table or History Editor views.

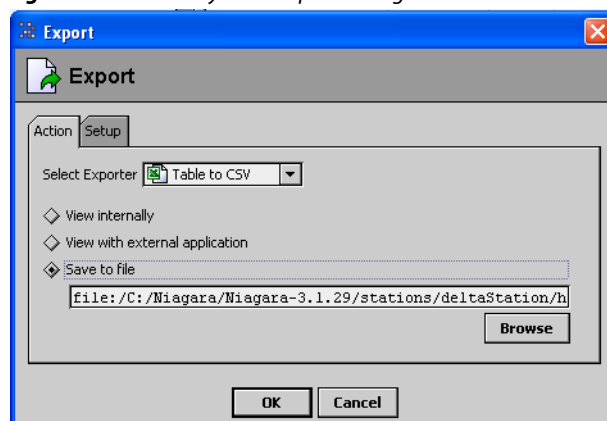
- Step 1 In NiagaraAX Workbench right-click on the history file that you want to export and select a History Table (or any tabular view) from the popup menu.
The history file displays in the tabular view
- Step 2 Set the data parameters to filter the history data (if desired) and select **Export** from the table options drop-down menu, as shown in Figure 5-12.

Figure 5-12 Exporting a history file to Excel CSV format



The Export dialog box displays, as shown in Figure 5-13

Figure 5-13 History table export dialog box



- Step 3 On the Action tab of the Export dialog box, select the desired export format option from the Select Exporter drop-down list and choose one of the following three options for handling the export file:
- View internally - to view the exported data in Workbench Text Editor view
 - View with external application - to view the exported data in an application (such as Microsoft® Excel®).
 - Save to file - to save the data to a file location that you designate using the **Browse** button.
- Step 4 After choosing a display option or file name and location, click the Ok button to complete the export. The file is saved or displayed, as directed.

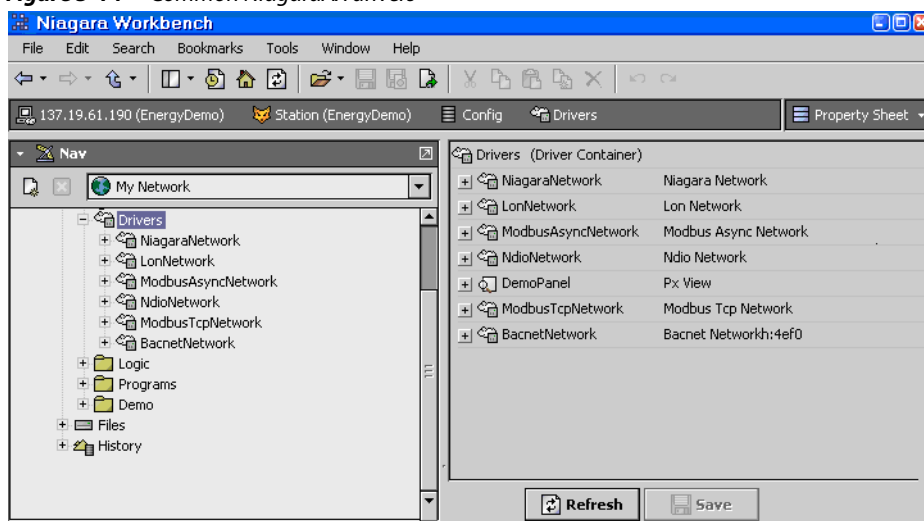
NiagaraAX drivers

NiagaraAX is a powerful way to bring data in directly from meters. Typical meters include Modbus, Lon or Pulse from I/O which can be accessed via the appropriate Niagara Drivers. Refer to the following sections for a general description of these drivers may be used in NiagaraAX to log history data for use in VES reports:

- Modbus driver
- Pulse metering
- Lonworks driver
- Modbus driver

Most meter drivers can be found under a running station after expanding on the Config folder and opening the driver folder as shown in the figure below.

Figure 5-14 Common NiagaraAX drivers



- If the correct driver is not available it should be added according the *Niagara AX User Guide*.
- Modbus
A modbus point can be addressed and configured using the "Modbus Client Point Manager" as shown in Figure 5-15 or the "Modbus TCP Device manager and shown in Figure 5-16.

Figure 5-15 Modbus Client Point Manager

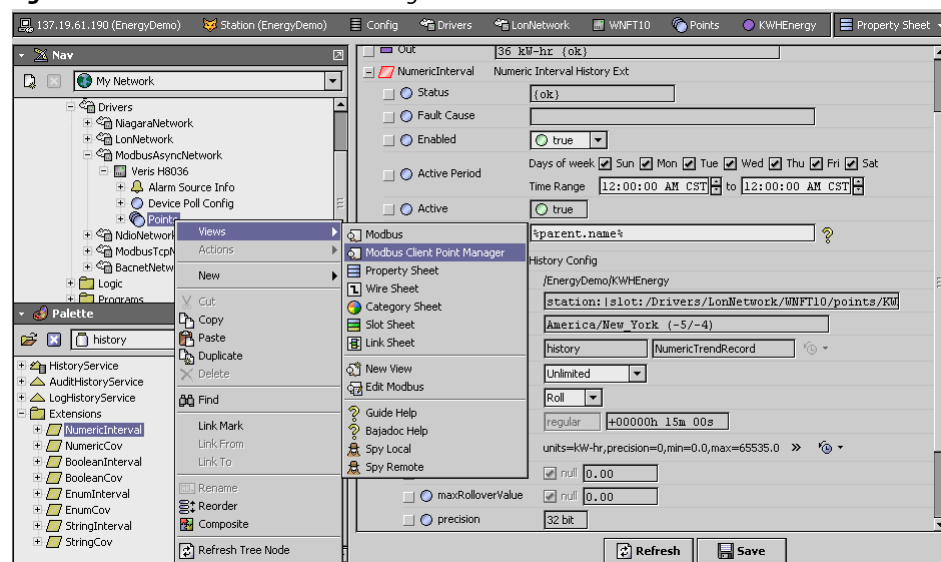
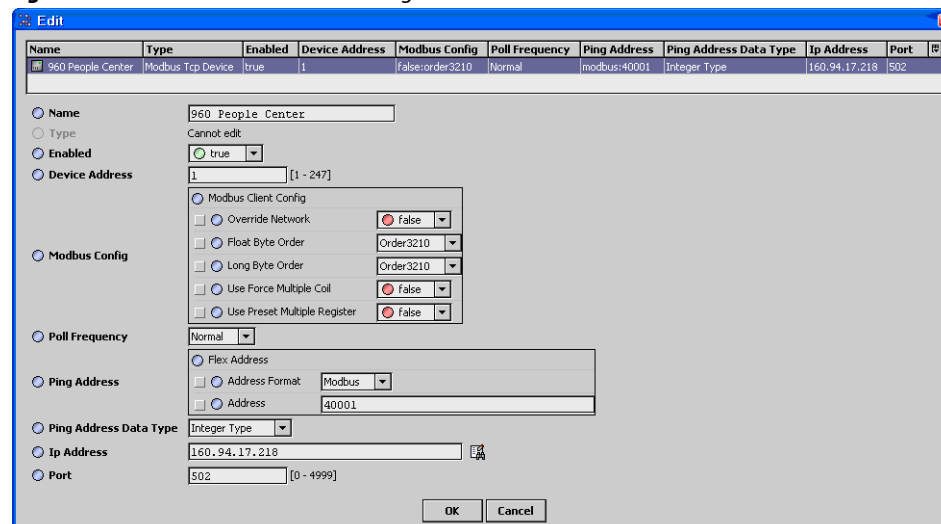
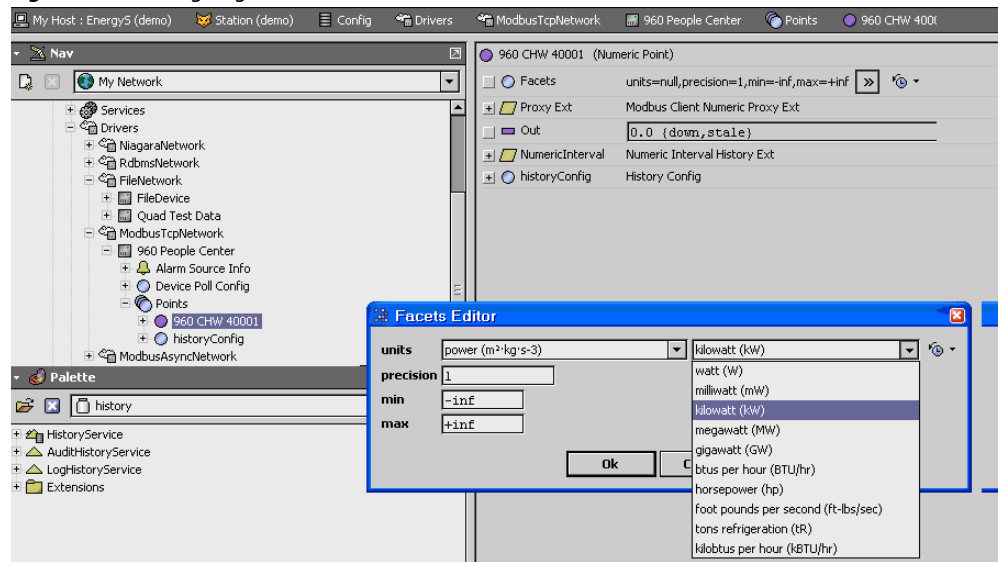


Figure 5-16 Modbus TCP Device Manager



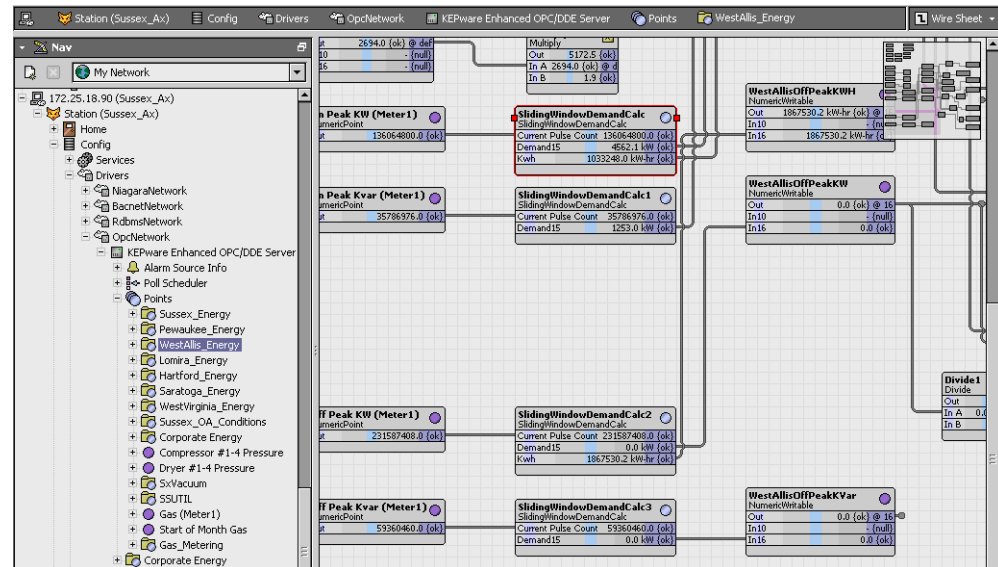
Important inputs in the Device Manager view include the five digit address that will often begin with the number 4. The IP address can also be entered so that the meter can be addressed over the Internet. Once the information has been entered, the "enabled" drop down box should be set to true. The meter should include documentation to determine what meter addresses correspond to what values. Once the meter point has been set up, an action can be taken to ping the meter in order to bring in values. When the point has been established, the facets should be assigned as shown in Figure 5-17. Careful attention should be given to the Modbus address and the actual value that is assigned through value facets.

Figure 5-17 Assigning Facets for Modbus



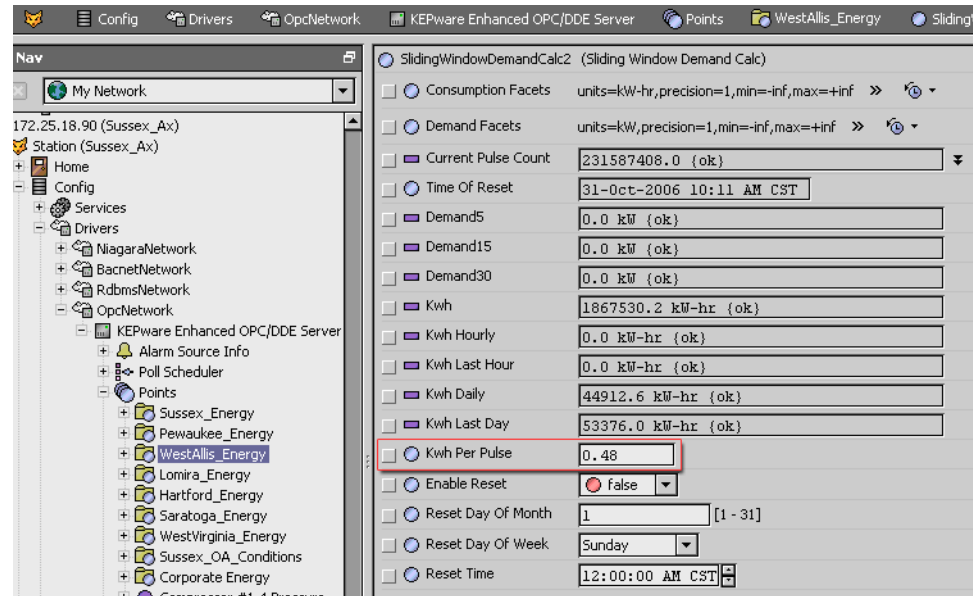
- Pulse metering
Pulse metering can be brought into NiagaraAX a number of ways, including: NDIO, OPC, and BAC-net. A pulse is often provided from a utility through an isolation relay that is physically separated from the meter. A pulse meter is made available from the utility so that the end customer may have access to the same meter values as the utility without having to get data by directly connecting to the meter. The customer must work with the utility to understand the relationship between a pulse value and the commodity produced. For electricity, this value will often be expressed as kwh produced. NiagaraAX includes a program object called a "slidingwindowdemandcalc" object that can allow a user to convert from pulses to rates of usage and consumption values. A sliding window demand calc object is shown in a wiresheet view in Figure 5-18.

Figure 5-18 Wiresheet using sliding window object



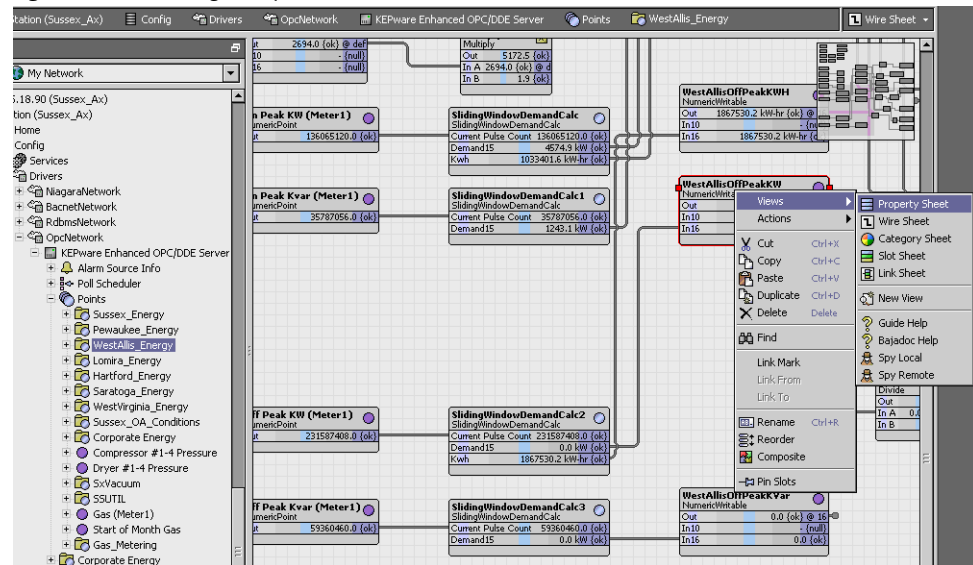
The relationship of the pulse value can be entered in the properties section of the sliding window demand calc program object in the category called "kwh per pulse". In the example shown in Figure 5-19, a 0.48 value has been entered, meaning that each pulse represents .48 kwh.

Figure 5-19 Logging pulse values with numeric point extension



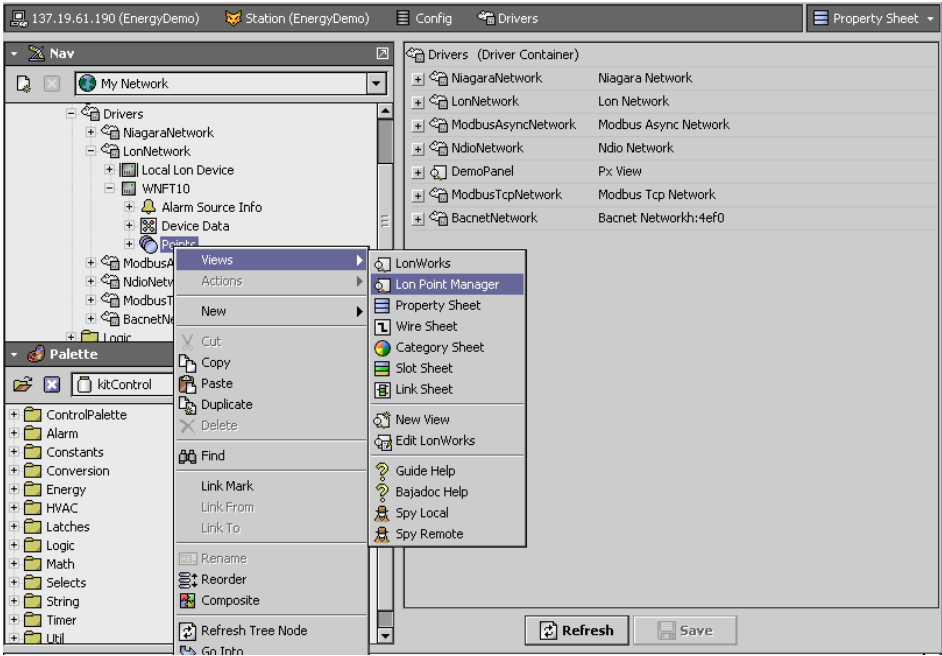
The sliding window program object will output rates of usage, including 5 minute demands, 15 minute demands, and 30 minute demands, as well as totalized consumption values. A numeric point extension should be used to log these values and should be set up for the correct time period as shown in the wiresheet view in Figure 5-20.

Figure 5-20 Setting time period in the wiresheet



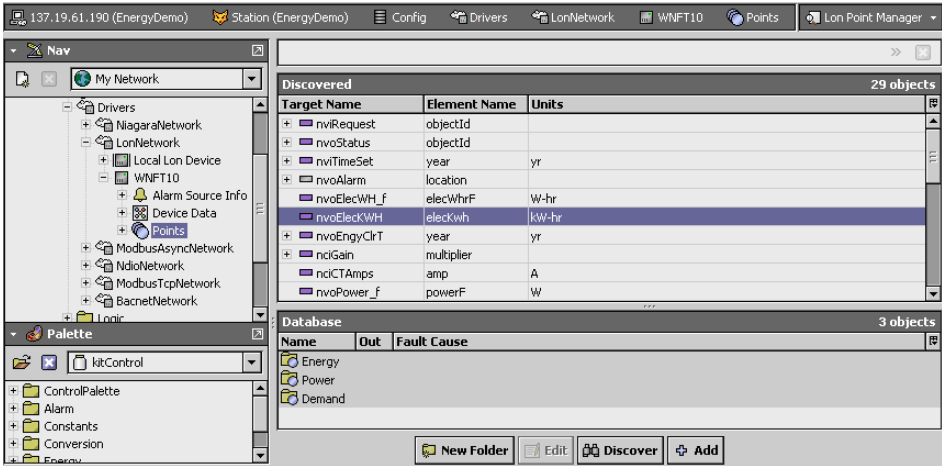
- Lonworks driver
Lon meters are also popular with customers. As with other Lon devices, NiagaraAX can discover the categories available to bring in by using the Discover function. Setup for this is available under the Lon Point Manager view as shown in Figure 5-21.

Figure 5-21 Setting up Lonworks



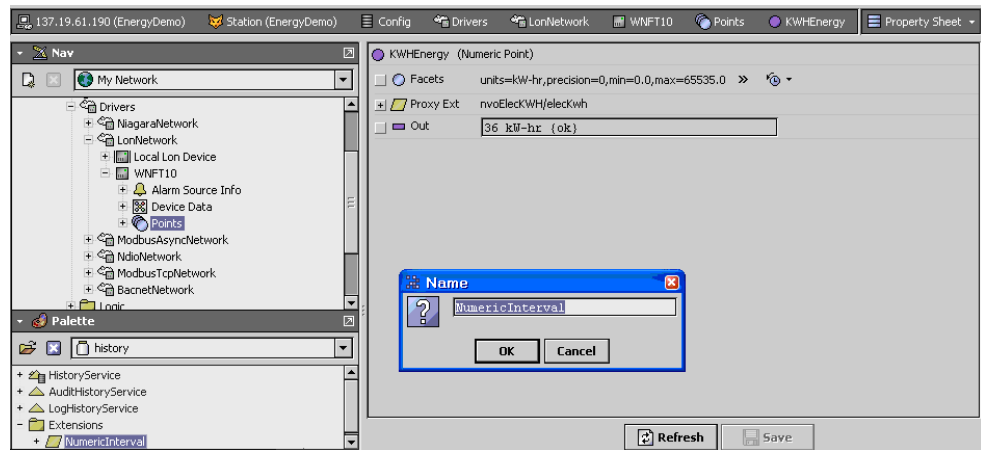
Performing a Discover function on a lon metering device will bring in a variety of points that are available and logged for use in VES. An example of a discovery of points available is shown in Figure 5-22. Careful attention should be taken to set up the points properly in NiagaraAX. Refer to the meter user guide for details.

Figure 5-22 Lon Point Manager view



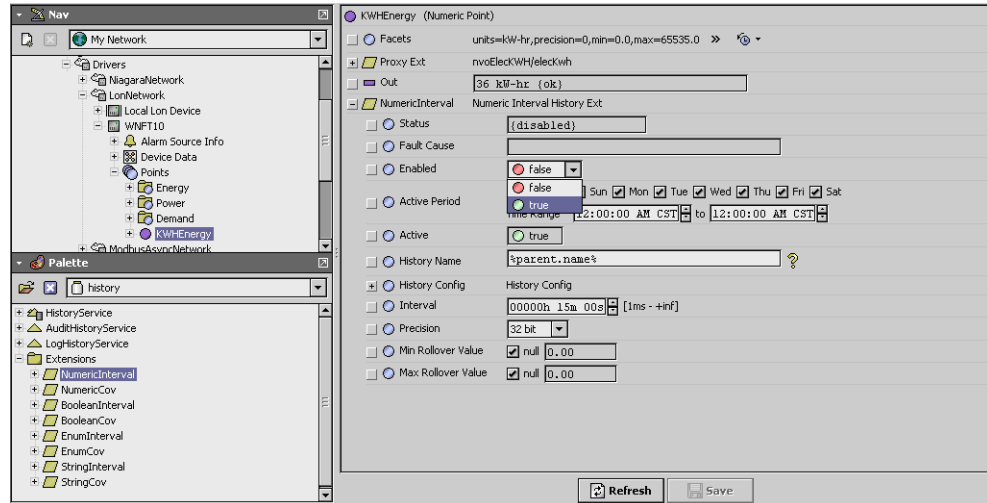
Once the point category is understood, the value facets can be assigned in the properties of the point using the Facets Editor dialog box. Double-click on the point then click the **Facets >>** button (in the Add/Edit dialog box) to open the Facets Editor dialog box. Add a Numeric Interval point extension to the point from the property sheet view so the point can create history logs as shown in Figure 5-23.

Figure 5-23 Adding a Numeric Interval point extension



The Numeric Interval extension can then be defined as shown in Figure 5-24. Once the interval size is defined, the point should then be enabled.

Figure 5-24 Setting up history logging using a Numeric Interval point extension



About VES Demo Data

Demo data is data that is generated by the *demo data generator*. You can use the demo data with a demo license for evaluation and training purposes. This means that you need the “eas” feature included in your license file, as described in “About the license.properties file,” page 2-3. The “eas” feature is also required for the fully licensed version of VES - whether you are running in demo mode or not, so you can always use demo data if you have it. If you do not have any demo data you can generate it by using the demo data generator as described in “Generate demo database,” page 5-21.

The following topics describe tasks related to installation and setup of demo data:

- Install the demo data generator service
- Generate demo database
- Generate a year template
- Purge the year templates

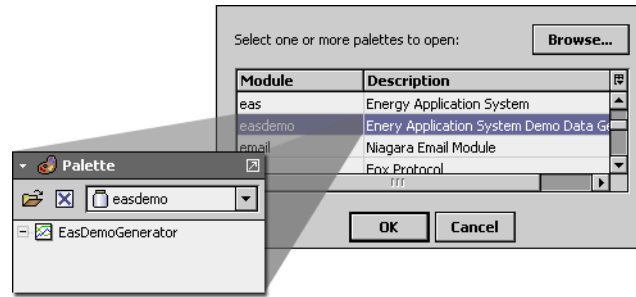
Install the demo data generator service

The `easdemo.jar` file must be installed (copied to the NiagaraAX modules directory) before you can install it in your services directory. Installation of this module is described along with the eas module installation procedure. Refer to “Install the eas module,” page 2-7, for details about installing the `easdemo.jar` file.

Note: After installing the `easdemo.jar` file, the station (or workbench instance) must be restarted in order to see it in the station.

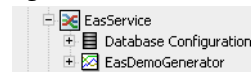
- Step 1 Using the workbench interface, open the **easdemo** palette.
The **EasDemoGenerator** appears as the only component in the palette (see Figure 5-25).

Figure 5-25 Opening the easdemo palette.



- Step 2 Drag and drop the **EasDemoGenerator** module onto the **EasServices** node in the workbench nav tree. The **EasDemoGenerator** is installed and appears as a child node under the **Services** node, as shown in Figure 5-26.

Figure 5-26 EasDemoGenerator service.



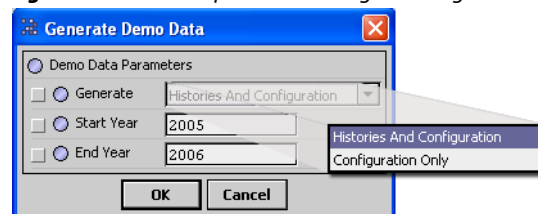
Generate demo database

The **EasService** must be up and running and connected to the relational database before you can create demo data.

Note: If you want to monitor the progress of the demo data generation, you need to use the 'trace' level debugging for the "easdemo" log. Set this by going to the 'Remote Spy' pages, and navigating to the 'logSetup' page. Switch the "easdemo" setting to 'trace'. This will allow you to monitor the progress in the standard output of the station.

- Step 1 In the workbench nav tree, expand the **Services** node and double-click on the **EasServices** node. The **EasService** property sheet displays.
- Step 2 Right-click on the **Eas Demo Generator** property and select **Actions > Generate Demo Data** from the popup menu. This action triggers the demo data generation process. It prompts you for some optional parameters (see Figure 5-27).

Figure 5-27 Select parameters for generating demo data.



- Step 3 Choose to generate both the histories and set up the SQL configuration tables, or choose to set up just the SQL configuration tables. You can also specify the start and end years to use for generating the histories.
- Note:** Once you click the **OK** button the demo generator will use these parameters to create the demo data. For 2 years worth of data, it could take 40 minutes or so, depending on your computer speed. During this time you will not be able to use VES and your pc may be sluggish. Once complete, you will have the 8 sites worth of VES demo data stored in NiagaraAX histories.
- Step 4 Click the **OK** button to generate the data.

Generate a year template

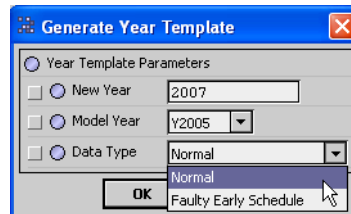
A year template is a .csv file that contains the model data to use for generating the VES demo data. The "Generate Year Template" action places any year templates that the user generates under the station's directory in a folder called 'easDemoYearTemplates'.

- Step 1 In the workbench nav tree, expand the **Services** node and double-click on the **EasServices** node.

The EasService property sheet displays.

- Step 2 Right-click on the **Eas Demo Generator** property and select **Actions > Generate Year Template** from the popup menu.
- This action triggers the Year Template generation process. It prompts you for some optional parameters (see Figure 5-28).

Figure 5-28 Select parameters for year template.



- Step 3 Choose or set the following parameter
- **New Year**
Type in the year that you want to generate.
 - **Model Year**
Select the model year to use for generating the year.
 - **Data Type**
Choose to generate either Normal data or Faulty Early Schedule data. The type defaults to Normal data. The "Faulty Early Schedule" option generates data that is offset by a few hours to give the effect of an early schedule. The "Faulty Early Schedule" option can be useful for demonstrating the effects of bad or fixed results.

- Step 4 Click the OK button to generate the template.
- The template is generated and stored in a "easDemoYearTemplates" folder.

Note: Now that a template is created, the next time you generate demo data, it will use the year template that you generated.

Purge the year templates

This action deletes any Year templates that have been generated. It removes all of the .csv files that are in the easDemoYearTemplates under the station directory.

- Step 1 In the workbench nav tree, expand the Services node and double-click on the EasServices node.
- The EasService property sheet displays.
- Step 2 Right-click on the **Eas Demo Generator** property and select **Actions > Purge Generated Year Templates** from the popup menu.
- A confirmation dialog box appears, asking if you are sure you want to purge the Year Template files..
- Step 3 Click the **OK** button to delete all Generated Year Template files.
- The Generated Year Template files are deleted.

