Honeywell

Experion PKS
Gas Operations Suite Configuration Guide

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Disclaimer

Contents

About this guide

This guide is intended to assist engineers and system administrators to plan and configure the Experion system for gas operations.

Revision history

Revision	Date	Description
A	February 2015	Initial release of document.

Prerequisite skills

This guide assumes that you have knowledge of other Experion software and concepts where relevant. This guide also assumes that you are familiar with the Microsoft Windows operating system and the hardware and software that you are using.

Related documents

The following documents complement this guide. They contain additional information that might be useful for reference when planning and configuring Experion for gas operations.

Document	Description
HMIWeb Display Building Guide	Describes how to create custom displays.
Experion HMI – SCADA specification	Includes hardware specifications and supported topologies. The latest specification document is available from the Process Solutions website (http://www.honeywellprocess.com).
Gas Operations Suite User's Guide	Describes how to use the Gas Operations Suite features of Experion to monitor and control your gas transmission pipeline.
Quick Builder User's Guide	Describes how to use Quick Builder to configure equipment.

Overview

Gas Operations Suite is an Experion licensed option that allows organizations in the gas transmission pipeline industry to monitor gas flow, linepack, and compressor performance. It provides the following capabilities:

- Pipeline modeling

  The physical pipeline structure, its connections and equipment can be modeled allowing navigation through the pipeline to view the key operating parameters for pipeline equipment and to provide configuration for Gas Operations Suite applications.
- Gas flow calculations

  AGA calculations and heating value calculations are used to calculate gas volume and energy flow. Results can be compared to those from physical flow meters. The calculations supported by Gas Operations Suite are AGA 3 orifice flow meter, AGA 5 heating value, AGA 7 turbine flow meter, AGA 8 and NX-19 supercompressibility, AGA 9 ultrasonic, and Wobbe Index.
- Linepack calculation

  Linepack is calculated for each segment in the pipeline and summarized for the routes and pipelines in your model. Linepack can be calculated from a combination of field values and manually entered values.
- Leak detection

  If your site is also licensed for Gas Operations Suite leak detection, two leak detection algorithms can be applied to the whole or parts of the pipeline to provide warnings of possible leak conditions. For more information, see “Detecting a leak” in the *Gas Operations Suite User's Guide*.
- Compressor performance monitoring

  Compressor maps can be configured to help review current and historical compressor performance.

> **Attention**
> Pipelines vary widely in size, level and accuracy of instrumentation, flow characteristics, and other factors that can affect the performance and reliability of leak detection. For information about the suitability of the two leak detection algorithms for your pipeline model, see the Gas Operations Suite specification document.

To use the features of the Gas Operations Suite, you must plan, build, and configure your gas transmission pipeline model to reflect your physical pipeline system using the tools available in Configuration Studio and Station.

You can create appropriate schematic displays for pipeline equipment and configure alarms, reports, and other Experion features to extend the capabilities of the Gas Operations Suite. For example, you can create a pipeline schematic display that is a graphical representation of the components in your pipeline system that includes equipment, points, alarms, and links to other displays such as the Linepack Summary. A custom display such as this could be used to drill down into the pipeline model.

This guide describes the planning considerations and the tasks for building and configuring the gas transmission pipeline model.

The configuration procedures described in this guide assume that you have already installed Experion software as described in the *Getting Started with Experion Software Guide*.

This guide does not include descriptions of every property of the equipment templates supplied with Gas Operations Suite. For more information about Gas Operations Suite and the supplied templates, contact your local Honeywell Technical Assistance Center (TAC).

Planning for pipeline model configuration

This guide describes how to model your pipeline in Experion. This involves identifying, building, and configuring the components of your pipeline in Quick Builder. For example, if your pipeline model includes a meter station node and a compressor station node, you can use the appropriate templates to create them in Quick Builder.

The supplied pipeline equipment templates are used to quickly and easily build pipeline equipment and all the associated items that make up that equipment. The templates define the properties for the equipment, as well as the rules to create the associated items such as controllers and points. The associated items, including other equipment, are automatically created. For example, if you build a compressor station node, a compressor will also be created automatically. If the associated items already exist in the asset model, you can modify the templates to avoid creating duplicated items.

The equipment that you can build using the templates supplied with Gas Operations Suite are:

- Pipelines
- Routes
- Nodes (meter station, compressor station, main line valve, reducer, and branch)
- Segments
- Compressors
- Gas chromatographs (manual, physical, and station)
- Flow meters (generic, orifice, turbine, ultrasonic, virtual, and station)

For more information, see “About Gas Operations Suite equipment and templates.”

The equipment in a pipeline model is identified by its distance from the node representing the start of the pipeline. This is known as the equipment’s position on the pipeline route and must be configured for each piece of equipment.

If you are planning to build the pipeline model in batches, you should identify the groups of equipment that will be built together before attempting to build the model. For example, you may start by building the mainline route of the pipeline, including segments, nodes, and flow meters, before building other lateral routes.

A set of pipeline equipment templates is supplied for each system of measurement supported by Gas Operations Suite. Choose the set of templates for the system of measurement used at your site. You must use templates from only one system of measurement.

The template files supplied with Gas Operations Suite are located in *<data folder>\Honeywell\Experion PKS \Client\Templates\Samples\<template folder>.*

- Where *<data folder>* is the location where Experion data is stored. For default installations, *<data folder>* is *C:\ProgramData*. The *C:\ProgramData* folder is a system folder, which means that it is only visible if you select the **Show hidden files, folders, and drives** option button in the **Folder Options** dialog box. To change this setting in Windows Explorer, click **Organize** > **Folder and search options**, and then click the **View** tab.
- Where *<template folder>* is a subfolder named after the system of measurement supported by the templates in the folder.

All files in this folder with *typ.xml* or *eqt.xml* extension must be imported into Quick Builder before you can build equipment.

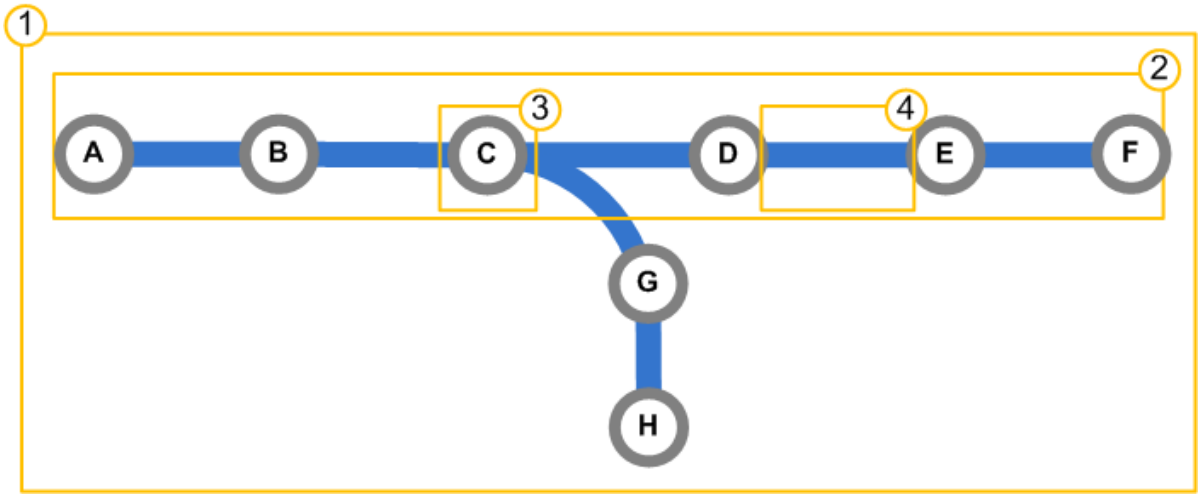

Figure 1: Pipeline structure

Item	Description
1	*Pipeline* A complete pipeline system, consisting of one or more routes, used to report linepack subtotals and define the scope of leak detection. A pipeline can have multiple end points and a pipeline model can have more than one pipeline. When a pipeline is configured, you can view information about the pipeline such as linepack or leak detection. This diagram shows a pipeline that consists of two routes. This pipeline has one inlet node (A) and two outlet nodes (F and H).
2	*Pipeline route* A continuous length of pipe, consisting of one or more segments, used to report linepack subtotals and define the scope of leak detection. A route can have only two ends. Two segments are considered connected (continuous) when it is possible for gas to flow from one to the other. For small pipelines, the whole pipeline may be a single route. Longer transmission lines may have two or more routes. Each route can only belong to a single pipeline and can consist of different pipe characteristics. When a route is configured, you can view information about the route such as linepack or leak detection. In this example, there are two routes. One route is identified by nodes A, B, C, D, E, and F. The second route is identified by nodes C, G, and H only. Nodes A and B are not part of the second route.
3	*Pipeline node* A unique point on the pipeline where one or more pipeline features, such as a physical device or a change in the physical characteristics is located. A node is also the beginning or end of a segment and can contain other equipment such as flow meters, compressors, gas chromatographs, and SCADA points built on controllers. These associated items are used to collect the field data that is used in the Gas Operations Suite calculations. A node can only be associated with up to three segments (inlet, outlet, and branch). Branch nodes are included in multiple routes. In this example, node C is part of both routes. Meter station, meter station branch, compressor station, main line valve, main line valve branch, reducer, and branch are all types of nodes. In this example, node A is the inlet node, nodes H and F are the outlet nodes, and node C is a branch node that has one inlet and two outlets.
4	*Pipeline segment* The smallest building block of a pipeline. A length of transmission pipeline of constant diameter, bounded by two nodes. Each segment can only belong to a single route. When you configure a segment, you can view information about the segment such as linepack.

Related topics

“About Gas Operations Suite equipment and templates” on page 14

Configuring the pipeline model

To configure the pipeline model, the equipment and related points must be built, relationships must be defined, and the equipment properties must be configured.

Before pipeline equipment can be built, the pipeline equipment templates must be imported into Quick Builder. The templates contain properties used to create and configure the equipment, as well as rules used to simultaneously create the associated items such as controllers and points.

For information about the templates supplied with Gas Operations Suite and the equipment that the templates create, see “About Gas Operations Suite equipment and templates.” For more information about configuring and importing equipment templates, see the “Building equipment templates" section in the *Quick Builder User's Guide*.

Related topics

“About Gas Operations Suite equipment and templates” on page 14

About Gas Operations Suite equipment and templates

This topic describes the templates supplied with Gas Operations Suite and the equipment that is created by the templates. The templates are located in *<data folder>\Honeywell\Experion PKS\Client\Templates\Samples\<template folder>*.

- Where *<data folder>* is the location where Experion data is stored. For default installations, *<data folder>* is *C:\ProgramData*. The *C:\ProgramData* folder is a system folder, which means that it is only visible if you select the **Show hidden files, folders, and drives** option button in the **Folder Options** dialog box. To change this setting in Windows Explorer, click **Organize** > **Folder and search options**, and then click the **View** tab.
- Where *<template folder>* is a subfolder named after the system of measurement supported by the templates in the folder.

For information about template inheritance, see "Changing templates."

Template	Description
Compressor (*compressor.eqt.xml*)	This template contains the properties that can be used to create and configure a compressor and its associated points. In Gas Operations Suite, a compressor represents a mechanical device that increases the pressure of gas to move it through the pipeline. When a compressor is built in Quick Builder using the compressor template, a set of five compressor maps and the associated points are also created. These are generic compressor maps and must be configured to suit the specific compressors being used. If you want to change the number of compressor maps and associated points that will be created with a compressor, you must update the number of compressor map parameters in the compressor template and import the new template into Quick Builder. The compressor map parameters are located in the **Equipment Properties**, **Associated Items**, **Display Elements**, and **Point References** tabs in Template Builder. The complementary file *compressor.typ.xml* defines the contents that will be shown on the compressor summary table in Station.
Flow Meter – Virtual AGA Base *(flowmeter_agabase.eqt.xml*)	This template contains the base AGA flow meter properties inherited by AGA flow meter templates. This template is provided only for inheritance and is not available in Quick Builder.
Flow Meter – Generic *(flowmeter_generic.eqt.xml)*	This template contains the properties that can be used to create and configure a generic flow meter and an associated EFM meter. In Gas Operations Suite, a generic flow meter represents a physical flow meter in the field, using any mechanism to calculate the flow. The results are not reconciled with a server-calculated flow. If your site is not licensed for EFM, you must update this template to remove the parameters for the EFM meter. The EFM meter parameters are located in the **Equipment Properties** and **Associated Items** tabs in Template Builder. The complementary file *flowmeter.typ.xml* defines the contents that will be shown on the flow meter summary table in Station.
Flow Meter – AGA3 Orifice *(flowmeter_orifice.eqt.xml)*	This template contains the properties that can be used to create and configure a server–based AGA 3 orifice flow meter. In Gas Operations Suite, an orifice flow meter represents a physical flow meter that measures flow using an orifice plate. Experion uses the input measurements from the orifice flow meter instrumentation to calculate the AGA 3 orifice flow. This result can be reconciled against the calculated result from the flow computer in the field. The complementary file *flowmeter.typ.xml* defines the contents that will be shown on the flow meter summary table in Station.

Template	Description
Flow Meter – AGA7 Turbine *(flowmeter_turbine.eqt.xml)*	This template contains the properties that can be used to create and configure a server-based AGA 7 turbine flow meter. In Gas Operations Suite, a turbine flow meter represents a physical flow meter that measures flow using a turbine. Experion uses the input measurements from the turbine flow meter instrumentation to calculate the AGA 7 turbine flow. This result can be reconciled against the calculated result from the flow computer in the field. The complementary file *flowmeter.typ.xml* defines the contents that will be shown on the flow meter summary table in Station.
Flow Meter – AGA9 Ultrasonic *(flowmeter_ultrasonic.eqt.xml)*	This template contains the properties that can be used to create and configure a server-based AGA 9 ultrasonic flow meter. In Gas Operations Suite, an ultrasonic flow meter represents a physical flow meter that measures flow using ultrasonic pulses. Experion uses the input measurements from the ultrasonic flow meter instrumentation to calculate the AGA 9 ultrasonic flow. This result can be reconciled against the calculated result from the flow computer in the field. The complementary file *flowmeter.typ.xml* defines the contents that will be shown on the flow meter summary table in Station.
Flow Meter – Virtual *(flowmeter_virtual.eqt.xml)*	This template contains the properties that can be used to create and configure a virtual flow meter. In Gas Operations Suite, a virtual flow meter does not have a corresponding physical flow meter in the field. Instead, the flow is calculated on the server by adding or subtracting the measured flows from other physical meters. The complementary file *flowmeter.typ.xml* defines the contents that will be shown on the flow meter summary table in Station.
Base Flow Meter Template *(flowmeter.eqt.xml)*	This template contains the base flow meter properties inherited by other flow meter templates. This template is provided only for inheritance and is not available in Quick Builder.
Gas Chromatograph - Manual *(gaschrom_manual.eqt.xml)*	This template contains the properties that can be used to create and configure a manual gas chromatograph. In Gas Operations Suite, a manual gas chromatograph represents a virtual instrument where the values of the various gas components are manually entered instead of using the measurements from a physical gas chromatograph. The complementary file *gaschrom.typ.xml* defines the contents that will be shown on the gas chromatograph summary table in Station.
Gas Chromatograph - Physical *(gaschrom_physical.eqt.xml)*	This template contains the properties that can be used to create and configure a physical gas chromatograph. In Gas Operations Suite, a physical gas chromatograph represents a physical analytical instrument that measures the content of various components in a gas sample. The complementary file *gaschrom.typ.xml* defines the contents that will be shown on the gas chromatograph summary table in Station.
Gas Chromatograph *(gaschrom.eqt.xml)*	This template contains the base gas chromatograph properties inherited by other gas chromatograph templates. This template is provided only for inheritance and is not available in Quick Builder.
Gas Transmission Base *(gastransmission_base.eqt.xml)*	This template contains the base gas transmission properties inherited by all the Gas Operations Suite templates except *pipeline.eqt.xml*, *route.eqt.xml*, and *segment.eqt.xml*. This template is provided only for inheritance and is not available in Quick Builder.

Template	Description
Node *(node.eqt.xml)*	This template contains the properties that can be used to create and configure a node. In Gas Operations Suite, a node represents a unique point on the pipeline where one or more pipeline features, such as a physical device or a change in the physical characteristics, are located. A segment is defined by a node at its beginning and end. Meter station, compressor station, main line valve, reducer, and branch are all types of nodes. The complementary file *node.typ.xml* defines the contents that will be shown on the node summary table in Station.
Node - Branch *(node_branch.eqt.xml)*	This template contains the properties that can be used to create and configure a branch node. In Gas Operations Suite, a branch node is a pipeline node that has three openings – an inlet, an outlet, and a branch with flow measurement at the branch. The complementary file *node.typ.xml* defines the contents that will be shown on the node summary table in Station.
Node - Compressor Station *(node_compressorstation.eqt.xml)*	This template contains the properties that can be used to create and configure a node and an associated compressor. In Gas Operations Suite, a compressor station node represents a pipeline node that contains one or more compressors. The complementary file *node.typ.xml* defines the contents that will be shown on the node summary table in Station.
Node - Main Line Valve *(node_mainlinevalve.eqt.xml)*	This template contains the properties that can be used to create and configure a main line valve node. In Gas Operations Suite, a main line valve node represents a pipeline node that contains a main line valve. The complementary file *node.typ.xml* defines the contents that will be shown on the node summary table in Station.
Node – Main Line Valve Branch *(node_mainlinevalve_branch.eqt.xml)*	This template contains the properties that can be used to create and configure a main line valve branch node. In Gas Operations Suite, a main line valve branch node represents a pipeline node that contains a main line valve and has flow measurement at the branch. The complementary file *node.typ.xml* defines the contents that will be shown on the node summary table in Station.
Node - Meter Station *(node_meterstation.eqt.xml)*	This template contains the properties that can be used to create and configure a meter station node. In Gas Operations Suite, a meter station node represents a pipeline node that contains one or more flow meters. The complementary file *node.typ.xml* defines the contents that will be shown on the node summary table in Station.
Node - Meter Station Branch *(node_meterstation_branch.eqt.xml)*	This template contains the properties that can be used to create and configure a meter station branch node. In Gas Operations Suite, a meter station branch node represents a branched pipeline node that contains flow meters with flow measurements at the inlet and the branch. The complementary file *node.typ.xml* defines the contents that will be shown on the node summary table in Station.
Node - Reducer *(node_reducer.eqt.xml)*	This template contains the properties that can be used to create and configure a gas reducer node. In Gas Operations Suite, a reducer node represents a node that caters for a change in the pipe diameter. The complementary file *node.typ.xml* defines the contents that will be shown on the node summary table in Station.

Template	Description
Pipeline *(pipeline.eqt.xml)*	This template contains the properties that can be used to create and configure a pipeline. This template does not inherit properties from another template. In Gas Operations Suite, a pipeline represents a complete transmission pipeline system, consisting of one or more routes. The complementary file *pipeline.typ.xml* defines the contents that will be shown on the pipeline summary table in Station.
Route *(route.eqt.xml)*	This template contains the properties that can be used to create and configure a route. This template does not inherit properties from another template. In Gas Operations Suite, a route represents a continuous non-branching length of pipe in a transmission pipeline, consisting of one or more segments. The complementary file *route.typ.xml* defines the contents that will be shown on the route summary table in Station.
Segment *(segment.eqt.xml)*	This template contains the properties that can be used to create and configure a segment. This template does not inherit properties from another template. In Gas Operations Suite, a segment represents a length of transmission pipeline with the same physical characteristics for example, diameter, material, or coating, bounded by two nodes. The complementary file *segment.typ.xml* defines the contents that will be shown on the segment summary table in Station.
Station - Flow Meter *(stationflowmeter.eqt.xml)*	This template contains the properties that can be used to create and configure a station flow meter. In Gas Operations Suite, a station flow meter represents a pair of flow meters that can be configured in serial or parallel. The station flow can be configured by the operator as either flow A, flow B, or flow A + flow B. The complementary file *stationflowmeter.typ.xml* defines the contents that will be shown on the station flow meter summary table in Station.
Station - Gas Chromatograph *(stationgaschrom.eqt.xml)*	This template contains the properties that can be used to create and configure a station gas chromatograph. In Gas Operations Suite, a station gas chromatograph represents a virtual gas chromatograph that allows two physical and one manual gas chromatographs to be configured. The operator can then select which set of gas chromatograph component values should be used for calculations. The complementary file *stationgaschrom.typ.xml* defines the contents that will be shown on the station gas chromatograph summary table in Station.

For more information, see the "Building equipment templates" section in the *Quick Builder User's Guide*.

Related topics

"Planning for pipeline model configuration" on page 9
"Configuring the pipeline model" on page 13
"Changing templates" on page 17

Changing templates

Equipment templates can be modified, however, it is not recommended that you alter the templates supplied with Gas Operations Suite without consulting your Honeywell Technical Assistance Centre (TAC). Some properties in the templates supplied with Gas Operations Suite are used to configure background processing. For example, unit conversion and calculation frequency. If you alter these properties in a template and import it into Quick Builder, background processing may not function as expected.

Some templates supplied with Gas Operations Suite inherit some of their properties from base templates. Some base templates are used only for inheritance and are not available in Quick Builder. However all templates must be imported into Quick Builder. If you alter a base template, the templates that inherit properties from it must also be imported into Quick Builder. *Pipeline.eqt.xml*, *route.eqt.xml*, and *segment.eqt.xml* do not inherit any properties from another template.

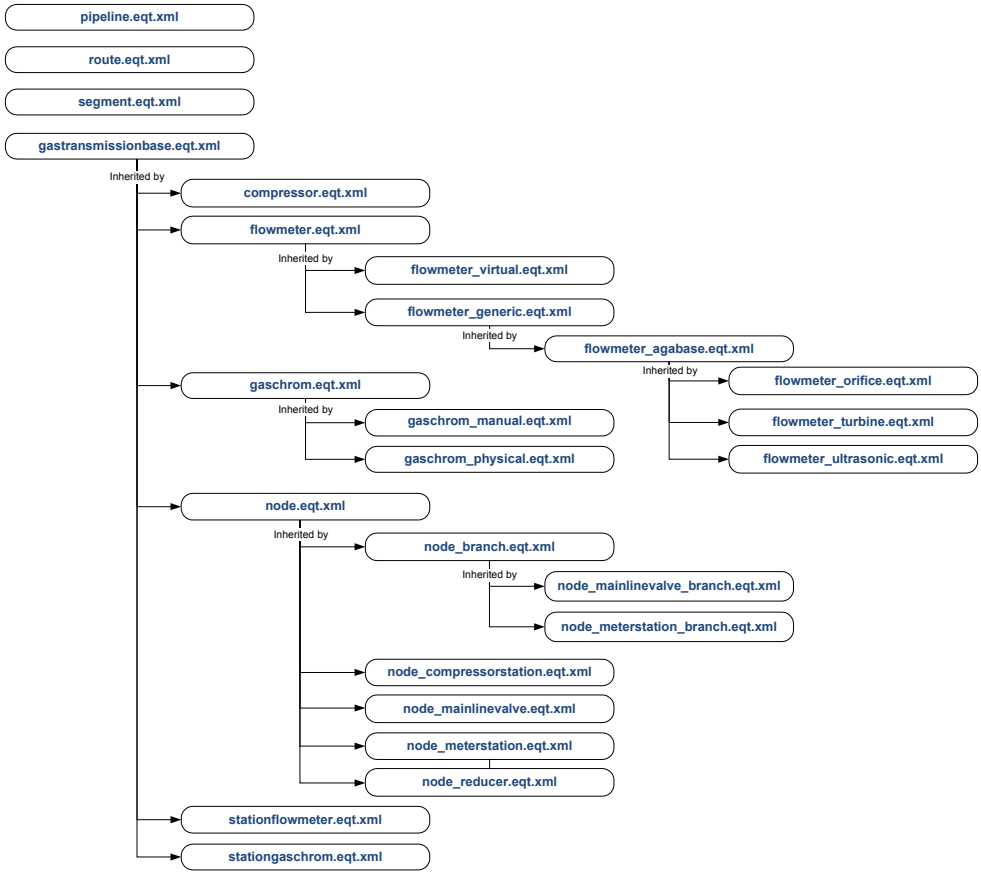

Figure 2: Template inheritance

An altered template must be imported into Quick Builder before you can use it to build equipment. When an altered template is imported again, changes made to the template are propagated to the existing equipment that is based on that template. If you must alter a template, it is advisable that you make a copy of the template first.

Attention

If you do not want template changes to be propagated to all equipment of the same type in Quick Builder, change a copy of the template. Remember to give the new template a different **Name** and **Label**, but do not change the **Equipment Type** as this information is used to group equipment in Station.

For more information, see the ”Configuring equipment templates” and ”Modifying equipment templates” sections in the *Quick Builder User's Guide*.

Example of changing the unit of measurement for a property of an equipment type

A set of pipeline equipment templates is supplied for each system of measurement supported by Gas Operations Suite. While you can only use one system of measurement, you may want to change the unit of measurement for a property of an equipment type.

For example, you may want to change the unit of measurement for the length of a segment from meters to kilometers. To do this, you must open the *segment.eqt.xml* template file in Template Builder. Navigate to **Equipment Properties** and select the **Length** equipment property. You will see the **Units** attribute in the

Advanced category in the Property Details pane. Change the value from *m* to *km*. When changing units of measurement, you should consider whether the **RangeMin** and **RangeMax** attributes should be altered to reflect the new unit of measurement. You can now import the altered template into Quick Builder for these changes to be propagated to every segment in your pipeline model.

Related topics

“About Gas Operations Suite equipment and templates” on page 14

Building the pipeline model

The pipeline model is built by using Quick Builder in Configuration Studio. In Quick Builder, the templates supplied with Gas Operations Suite are located in the Gas transmission section of the template library. These templates facilitate the creation of gas transmission equipment and associated items, such as points, channels, and controllers. Some Gas transmission equipment templates also create child equipment, and placeholder relationships. The equipment, relationships, and associated items must be configured in Quick Builder before the pipeline model is downloaded to the server database. For more information, see "Configuring pipeline equipment."

The template files supplied with Gas Operations Suite are located in *<data folder>\Honeywell\Experion PKS \Client\Templates\Samples\<template folder>.*

- Where *<data folder>* is the location where Experion data is stored. For default installations, *<data folder>* is *C:\ProgramData*. The *C:\ProgramData* folder is a system folder, which means that it is only visible if you select the **Show hidden files, folders, and drives** option button in the **Folder Options** dialog box. To change this setting in Windows Explorer, click **Organize** > **Folder and search options**, and then click the **View** tab.
- Where *<template folder>* is a subfolder named after the system of measurement supported by the templates in the folder.

For more information, see the "Building equipment" section in the *Quick Builder User's Guide*.

Related topics

"Configuring pipeline equipment" on page 21

Configuring pipeline equipment

After a piece of equipment is created in Quick Builder, the equipment properties and relationships must be configured to appropriately represent your pipeline model. The properties that apply to different types of equipment in Quick Builder are determined by the template that is used to create the equipment. This topic describes the equipment properties that must be configured for the applications of Gas Operations Suite.

For more information about how to configure equipment properties, see “Modifying equipment properties" in the *Quick Builder User’s Guide*.

Each item of pipeline equipment must have one or more relationships with other components of the pipeline model. For example, a segment must have relationships configured with its inlet node and its outlet node. When you build the components of your pipeline model using the templates supplied with Gas Operations Suite, placeholder relationships for the equipment in the model are created. To complete the configuration of your pipeline model, these placeholder relationships must be configured in Quick Builder before the model is downloaded to the server.

For information about how to configure equipment relationships, see “Configuring equipment relationships” in the *Quick Builder User’s Guide*.

Configuring the pipeline model

In Quick Builder, ensure that you have built the components of your pipeline model and configured the relationships between the equipment in your model in the **Relationships** tab.

When configuring the properties of equipment, the **Associated Items** tab lists the Quick Builder items that were automatically built when the equipment was built. These items were specified in the template that was used to build the equipment and must also be configured. You can locate them in the **List View** after selecting the item type in the **Navigation pane**.

The **Point References** tab lists the points that can be referenced as parameters for the piece of equipment.

To configure your pipeline model, you must configure the properties of all the configuration categories for the equipment in your model. For example, the **Configuration - Point** category on the **Details** tab.

Configuring linepack calculation

To configure linepack calculation in Quick Builder, you must configure the properties in the **Configuration - Linepack** categories on the **Details** tab of the pipeline, routes, and segments in your pipeline model.

Configuring leak detection

To configure leak detection in Quick Builder, you must configure the properties in the **Configuration - Mass balance** and **Configuration -Pressure-derived flow** categories on the **Details** tab of the routes and segments in your pipeline model.

You can configure alarms to trigger when the calculated leak exceeds a configured limit for both Mass Balance and Pressure Derived leak detection. For each segment in your pipeline model, an associated analog point was created for each leak detection type, upon which alarms can be configured. For example, analog points PIPE001-MBLK and PIPE001-PDFLK would have been created with segment PIPE001. The PV Source Address of these analog points must be configured with the segment parameters, MBLeakPercent and PdFLeak respectively. Adjust the sensitivity of Mass Balance leak detection by changing the alarm limits on PIPE001-MBLK. The alarming logic of PdF Leak Detection is implemented inside server calculations, so its sensitivity cannot be changed.

If your site includes branched meter station nodes, mainline valve nodes, or branched mainline valve nodes, virtual flow meters were created automatically with these nodes. When virtual flow meters are built, associated SCADA points are also created automatically and the Algo 20 equation must be configured for these SCADA points. For more information, see “PV Algo 20: Advanced Arithmetic” in the *Quick Builder User’s Guide*.

Tip

For a mainline valve node, the associated virtual flow meter and SCADA point were created automatically with the node. The Algo 20 **equation** for this SCADA point is typically configured as **`(QS1.PV + QS3.PV)/2`**, where QS1 is the SCADA point associated with the closest upstream flow meter and QS3 is the SCADA point associated with the closest downstream flow meter.

For a branched mainline valve node, the associated inlet virtual flow meter, outlet virtual flow meter, and SCADA points were created automatically with the node.

- For the SCADA point associated with the inlet flow meter, the Algo 20 **equation** is typically configured as **`QS2.PV + QS3.PV`**, where QS2 is the SCADA point associated with the closest downstream flow meter and QS3 is the SCADA point associated with the branch flow meter of the node.
- For the SCADA point associated with the outlet flow meter, the Algo 20 **equation** is typically configured as **`QS1.PV – QS3.PV`**, where QS1 is the SCADA point associated with the closest upstream flow meter and QS3 is the SCADA point associated with the branch flow meter of the node.

For a branched meter station node, the associated virtual flow meter and SCADA point were created automatically with the node. The Algo 20 **equation** for this SCADA point is typically configured as **`QS1.PV – QS3.PV`**, where QS1 is the SCADA point associated with the inlet flow meter of the node and QS3 is the SCADA point associated with the branch flow meter of the node.

Configuring compressor performance monitoring

To configure compressor performance monitoring in Quick Builder, you must configure the properties in the **Configuration - Transmitter point reference** category on the **Details** tab of the compressors in your pipeline model.

Configuring gas quality reconciliation

To configure gas quality reconciliation in Quick Builder, you must configure the properties in the configuration categories on the **Details** tab of the physical and manual gas chromatographs in your pipeline model.

Configuring flow meter reconciliation

To configure flow meter reconciliation in Quick Builder, you must configure the properties in the configuration categories on the **Details** tab of the flow meters in your pipeline model.

When you build orifice, turbine, or ultrasonic flow meters, the SCADA points associated with these flow meters are automatically created. The Algo 15 properties must be configured for these SCADA points. For more information, see “PV Algo 15: Integration” in the *Quick Builder User’s Guide*.

Tip

When configuring Algo 15 for a SCADA point, you must use **Scale Factor** to convert the SCADA point's PV to a "per second" flow rate. For example, if the unit of measurement for the SCADA point’s PV is a volume **`per minute`**, you must use the **Scale Factor** to convert the PV to a volume **`per second`**. This means you must configure the **Scale Factor** as **`0.0166667`** (1/60) to divide the PV by sixty. When the scale factor has a repeating decimal, for example 1/60, it should include sufficient number of decimal places such that the effect of rounding is negligible.

Related topics

“Building the pipeline model” on page 20

Validating the pipeline model

In Quick Builder, your pipeline model will be validated when it is downloaded to the server. During pipeline model validation, equipment relationships are checked to ensure that the model adheres to the structure required. Any validation warnings will be reported in a text file. You can choose to ignore the warnings and continue the download or cancel the download to correct the problems.

For more information, see “Downloading a project" in the *Quick Builder User’s Guide*.

Creating displays for gas operations

Displays such as custom displays and compressor maps can be created for use in equipment detail displays. For information about how to create custom displays for equipment, see the “About equipment displays and templates" section in the *HMIWeb Display Building Guide*. For information about how to configure compressor maps, see “Configuring compressor maps.”

Related topics

“Configuring a compressor map” on page 26

Configuring a compressor map

When a compressor is built in Quick Builder, a set of compressor maps and associated points are also created. A compressor map consists of a background image overlaid with a graphical representation of the compressor's performance. To use a compressor map, the compressor map background image and the associated points must be configured. The background image is usually sourced from the compressor manufacturer and consists of compressor performance curves or indicators that show the expected performance at given operating conditions. Sample background images are supplied with Gas Operations Suite. They are located in *<data folder>* \Honeywell\Experion PKS\Client\Templates\Samples\, where *<data folder>* is the location where Experion data is stored. For default installations, *<data folder>* is *C:\ProgramData*. The associated points must be configured to reflect the parameters of the graphical information. The graphical information on a compressor map is shown over the time period and interval that are selected when the compressor map is used.

Prerequisites

- You have the background image to be used for the compressor map.
- You have built the compressor in Quick Builder.

To prepare the background image

1 Create or obtain a copy of the manufacturer's performance curves or indicators in SVG format.

> **Tip**
> If necessary, this can be done by scanning and converting the image into bitmap format and importing it into Microsoft Visio. In Visio, you can trace the bitmap on to a Visio drawing before removing the bitmap. To minimize distortion of the background image due to scaling, the dimensions of the Visio drawing should approximately reflect the aspect ratio of the monitors it will be viewed on. You may wish to add other elements to the Visio drawing, such as text and a white border to improve the usability of the compressor map. Contact your local Technical Assistance Centre (TAC) for assistance if required.

2 Take note of the minimum and maximum extent of the X and Y values in the background image. These values are used to configure the position and scale of the background image in the compressor map.

3 If the background image SVG file was created using Visio:

   a Open the SVG file with a text editor.

   b Move any class attribute on the root svg element to the first `g` element.

   c Replace headers and the root element with *<svg xmlns="http://www.w3.org/2000/svg" xml:space="preserve" color-interpolation-filters="sRGB">*

   d Remove all `v:` elements and attributes.

   This can be accomplished in a text editor that supports regular expressions by replacing the following with blanks:

   - `<v:*/>`
   - `<*v:custProps*>`
   - `<*v:userDefs*>`
   - `<*v:documentProperties*>`
   - `<v:*^p*/>`
   - `<v:*="*">`
   - `<title>*</title>`

   e Save the edited SVG file.

4 Load the SVG file in Internet Explorer and confirm that it displays correctly.

5 Copy the SVG file to *<data folder>*\Honeywell\Experion PKS\Server\data\CompressorMaps\, where *<data folder>* is the location where Experion data is stored. For default installations, *<data folder>* is *C:\ProgramData* on the Experion Server. Create the folder if it does not already exist.

To configure a compressor map

1. Prepare the compressor map's background image.
2. Start Quick Builder. For more information, see "Starting Quick Builder" in the *Quick Builder User's Guide*.
3. On the **Details** tab in the **Property pane**, enter values for the properties in the **Point configuration** category for the compressor map that you are configuring.
4. In the **Navigation Pane**, click **Points**.
5. In the **List view**, select the point that you entered as the **Point reference for compressor configuration map** in the compressor's **Point Configuration**. For example, if you are configuring compressor map 01, select the point ID entered as the value for **Point reference for compressor configuration map 01**.
6. In the **Property Pane**, on the **User Defined** tab, enter the values for the compressor map you are configuring, including the minimum and maximum X and Y values from the SVG file.

   Tip
   The minimum X and Y values are from the bottom left of the background image. Similarly, the maximum X and Y values are from the right and top of the background image. These are the values noted when the background image was prepared.

7. In the **List view**, select the point that you entered as the **Point reference for compressor configuration map X** in the compressor's **Point Configuration**. For example, if you are configuring compressor map 01, select the point ID entered as the value for **Point reference for compressor configuration map 01 X**.
8. In the **Property Pane**, on the **Main** tab, enter the **PV Source Address** to be used as the X-axis of the compressor map you are configuring.
9. In the **List view**, select the point that you entered as the **Point reference for compressor configuration map Y** in the compressor's **Point Configuration**. For example, if you are configuring compressor map 01, select the point ID entered as the value for **Point reference for compressor configuration map 01 Y**.
10. In the **Property Pane**, on the **Main** tab, enter the **PV Source Address** to be used as the Y-axis of the compressor map you are configuring.

Related topics

"Creating displays for gas operations" on page 25

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Index