

Welcome to System 1 "Version 23.1"

Document #: 125M6426



Welcome to System 1

Version 23.1 [May 2023]

System 1
Machinery Management

Bently Nevada

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The banner features a dark blue background with a cityscape at night. On the right side, there are three inset images: an offshore oil rig at sunset, an industrial refinery at night, and a wind farm at sunset. The Bently Nevada logo and name are positioned in the bottom left corner of the banner.

Welcome

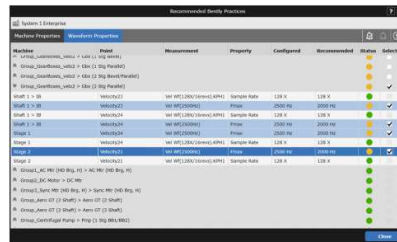
Bently Nevada is pleased to present System 1 version 23.1, with new capabilities (Figure 1) Users upgrading to version 23.1 will benefit from the many capability enhancements to effective outcomes, which are summarized below.

S1 System 1 v23.1 Features

Improved Productivity

Configuration Enhancements

- Recommended Bently Best Practices
 - Review important machine properties and waveform properties
 - Apply Waveform properties
- Export/Import Machine properties
- Support Machine Sub-System
 - Add machine with default sub-systems
 - Ability to add sub systems
- Map OPC & Modbus points via CSV



Bently Performance Enhancements

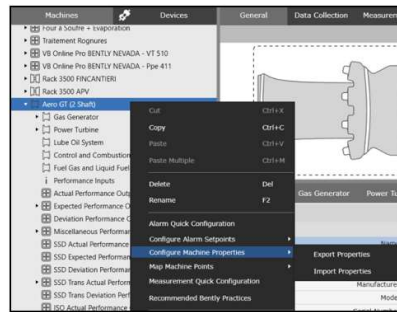
- Update All Manual Input tags
- Copy Bently Performance Template
- Active/Inactive Performance Group

Replication Enhancements

- Tx-Rx Version Compatibility

Quick Alarm Enhancements

- Alarm Quick Configuration tool available on Rx
- Added Constant to Statistical Setpoints Calculation



Edge Devices Monitoring

Orbit60

- Support Recip Piston Rod Channel
- Offline Config Import in System 1
- Advanced security for Orbit 60 in System 1

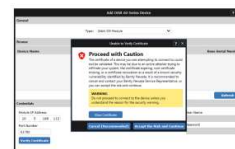
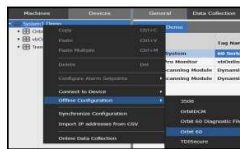
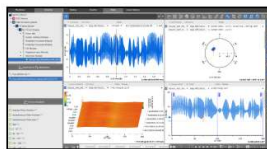


Figure 1 System 1 23.1 Features

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Bently Nevada remains focused on delivering the world's premier plant-wide machinery management software through bi-annual product releases. For a detailed overview of System 1, please visit the [website](#).

Thank you,

A handwritten signature in black ink, appearing to read "Jeffery J. Sipek". The signature is written in a cursive style with a large, stylized initial 'J'.

Jeff Sipek, Product Manager

On behalf of your System 1 Leadership and Development Teams

CONTENTS

1. SYSTEM 1 V23.1 FEATURE OVERVIEW	5
2. VERSION SUPPORT & OPERATING SYSTEM COMPATIBILITY	7
3. IMPROVED PRODUCTIVITY	9
3.1 Configuration Enhancements.....	9
3.1.1 Recommended Bently Practices.....	9
3.1.2 Export/Import Machine properties.....	10
3.1.3 Support Machine Sub-System.....	11
3.1.4 Map Machine Points.....	12
3.2 Replication Enhancements.....	13
3.2.1 Backwards Compatibility.....	13
3.3 Alarm Quick Configuration Enhancements	14
3.3.1 Alarm Quick Configuration tool available on Rx.....	14
3.3.2 Added Constant to Statistical Setpoints Calculation	14
3.4 Bently Performance Enhancements.....	15
3.4.1 Update All Manual Input tags.....	15
3.4.2 Copy Bently Performance Template	15
3.4.3 Active/Inactive Performance Group.....	16
4. DEVICE CONNECTIVITY	17
4.1 Orbit60.....	17
4.1.1 Support Recip Piston Rod Channel.....	17
4.1.2 Offline Config Import in System 1.....	17
4.1.3 Advanced security for Orbit 60 in System 1.....	19

1. SYSTEM 1 V23.1 FEATURE OVERVIEW

Table 1-1: System 1 v23.1 – Improved Productivity

Improved Productivity		
Configuration Enhancements		
Recommended Bently Practices	The new Recommended Bently Practices dialog allows users to review important machine properties and waveform/spectrum configuration and apply recommended settings as per Bently Standards.	3.1.1
Export/Import Machine properties	System 1 now supports export of machine properties to an excel file, configuration of properties in the exported file, and then import into System 1.	3.1.2
Support Machine Sub-System	The System 1 Asset library now displays sub-systems, which can be added under an existing asset. Also, when users add a new asset, its associated default sub-systems are added under it automatically.	3.1.3
Map Machine Points	System 1 now supports export of machine points to a CSV file, mapping OPC and Modbus points in the exported CSV file, and then import of mapped machine points into System 1.	3.1.4
Replication Enhancements		
Tx Rx version Compatibility	System 1 now supports replication of System 1 Database on an Rx server which has a newer System 1 version than its associated Tx server. It is backward compatible for 3 versions.	3.2.1
Alarm Configuration Enhancements		
Alarm Quick Configuration tool available on Rx	Users can run statistical setpoint calculations on the Rx server.	3.3.1
Added Constant to Statistical Setpoints Calculation	Users can add or subtract a constant value from the statistical setpoints calculations.	3.3.2
Bently Performance Enhancements		
Update All Manual Input tags	The Manual Input dialog now supports timestamp update for selected manual input tags.	3.4.1

Copy Bently Performance Template	Users can create a copy of the running Bently Performance spreadsheet using System 1 Bently Performance tool.	3.4.2
Active/Inactive Performance Group	System 1 now allows users to activate or inactivate a Performance group.	3.4.3

Table 1-2 : System 1 v23.1 – Edge Devices Monitoring

Edge Devices Monitoring		
Orbit 60		
Support Recip Piston Rod Channel	Users can now add the Piston Rod channel in System 1, the first Orbit 60 Recip channel supported in version 23.1.	4.1.1
Offline Config Import in System 1	Import Orbit 60 .orb (offline configuration) file in System 1 and perform mapping and other configurations.	4.1.2
Adding Orbit 60 device with invalid or expired security certificate	System 1 now allows users to add Orbit 60 devices with invalid or expired certificates if the security risk is accepted.	4.1.3

2. VERSION SUPPORT & OPERATING SYSTEM COMPATIBILITY

System 1 follows a semi-annual release cadence with targeted releases in May and November of each year. Versions are fully supported for a minimum of two years from the published date of availability (Refer System 1 Datasheet).

New Versions of System 1 benefit from:

- Compatibility with the latest Microsoft Client & Server Operating Systems
- Client backwards compatibility to previous versions under support (23.1 Client to 21.2 Server DB)
- Database upgrade from previous versions released within last 3 years (20.2→23.1)
- Security patch and update testing for the latest available version
- Bug fixes included in the latest available version.
- Standard technical support with escalation to engineering as required.

Versions no longer supported:

- Standard support is provided for common FAQ type questions, but users are encouraged to update software to the latest version to benefit from new features, OS (Operating System) compatibility, and bug fixes.

System 1 Versions & Support			Windows Server OS				Windows Client OS (64bit)		
Version	Available	End of Support	2022	2019	2016	2012 R2	11*	10**	8.1 U1
23.1	May 2023	May 2025	✓	✓	✓		✓	✓	
22.2	Nov 2022	Nov 2024	✓	✓	✓	✓	✓	✓	✓
22.1	May 2022	May 2024	✓	✓	✓	✓	✓	✓	✓
21.2	Nov 2021	Nov 2023		✓	✓	✓		✓	✓
21.1	May 2021	May 2023		✓	✓	✓		✓	✓
20.2	Nov 2020	Nov 2022		✓	✓	✓		✓	✓

Table 2-1: System 1 Version Support & OS Compatibility Matrix

*Windows 11 version compatibility will track Microsoft’s published release and support model. The latest version of System 1 will be tested and supported on all versions of Windows 11 under support as published on their website based on the System 1 version’s published date of availability.

System 1 v23.1 (Windows 11 Pro/Enterprise 22H2, 21H2)

System 1 v22.2 (Windows 11 Pro/Enterprise 21H2)

System 1 v22.1 (Windows 11 Pro/Enterprise 21H2)

**Windows 10 version compatibility will track Microsoft's published release and support model. The latest version of System 1 will be tested and supported on all versions of Windows 10 under support as published on their website based on the System 1 version's published date of availability.

System 1 v23.1 (Windows 10 Pro/Enterprise 22H2, 21H2)

System 1 v22.2 (Windows 10 Pro/Enterprise 22H2, 21H2, 21H1)

System 1 v22.1 (Windows 10 Pro/Enterprise 21H2, 21H1, 20H2)

System 1 v21.2 (Windows 10 Pro/Enterprise 21H1, 20H2, 2004)

System 1 v21.1 (Windows 10 Pro/Enterprise 20H2, 2004, 1909)

System 1 v20.2 (Windows 10 Pro/Enterprise 2004, 1909, 1903)

3. IMPROVED PRODUCTIVITY

3.1 Configuration Enhancements

Configuration Enhancements video located in Bently Nevada Tech Support Training Library

[Valid M&S Agreement Required](#)

3.1.1 Recommended Bently Practices

System 1 23.1 allows users to review important machine properties and waveform/spectrum configuration in the same dialog, making it quick and easy to validate configurations. In the same dialog, users can apply new waveform/spectrum property values recommended as per Bently Standards. This feature saves time and automatic configuration ensures accuracy.

Machine	Point	Measurement	Property	Configured	Recommended	Status	Select	
Recycle Compressor							●	<input type="checkbox"/>
Gearbox > Shaft 2 > GBX S2 OB	GBHS S2 IB Vert	Disp Wf(500Hz)	Fmax	500 Hz	500 Hz	●	<input type="checkbox"/>	
Gearbox > Shaft 2 > GBX S2 OB	GBHS S2 IB Vert	Disp Wf(128X/16revs)	Sample Rate	128 X	256 X	●	<input checked="" type="checkbox"/>	
Gearbox > Shaft 2 > GBX S2 OB	GBHS S2 IB Horz	Disp Wf(500Hz)	Fmax	500 Hz	500 Hz	●	<input type="checkbox"/>	
Gearbox > Shaft 2 > GBX S2 OB	GBHS S2 IB Horz	Disp Wf(128X/16revs)	Sample Rate	128 X	256 X	●	<input checked="" type="checkbox"/>	
Gearbox > Shaft 2 > GBX S2 IB	GBHS S2 OB Vert	Disp Wf(5000Hz)	Fmax	5000 Hz	500 Hz	●	<input type="checkbox"/>	
Gearbox > Shaft 2 > GBX S2 IB	GBHS S2 OB Vert	Disp Wf(128X/16revs)	Sample Rate	128 X	256 X	●	<input checked="" type="checkbox"/>	
Gearbox > Shaft 2 > GBX S2 IB	GBHS S2 OB Horz	Disp Wf(5000Hz)	Fmax	5000 Hz	500 Hz	●	<input checked="" type="checkbox"/>	
Gearbox > Shaft 2 > GBX S2 IB	GBHS S2 OB Horz	Disp Wf(128X/16revs)	Sample Rate	128 X	256 X	●	<input type="checkbox"/>	
Gearbox > Shaft 1 > GBX S1 OB	GBLS S1 OB Vert	Disp Wf(1000Hz)	Fmax	1000 Hz	500 Hz	●	<input type="checkbox"/>	
Gearbox > Shaft 1 > GBX S1 OB	GBLS S1 OB Vert	Disp Wf(128X/16revs)	Sample Rate	128 X	256 X	●	<input type="checkbox"/>	
Gearbox > Shaft 1 > GBX S1 OB	GBLS S1 OB Horz	Disp Wf(1000Hz)	Fmax	1000 Hz	500 Hz	●	<input type="checkbox"/>	
Gearbox > Shaft 1 > GBX S1 OB	GBLS S1 OB Horz	Disp Wf(128X/16revs)	Sample Rate	128 X	256 X	●	<input type="checkbox"/>	
Gearbox > Shaft 1 > GBX Thrust	GBLS Thrust A	Disp Wf(2000Hz)	Fmax	2000 Hz	500 Hz	●	<input type="checkbox"/>	
Gearbox > Shaft 1 > GBX Thrust	GBLS Thrust A	Disp Wf(128X/16revs)	Sample Rate	128 X	256 X	●	<input type="checkbox"/>	
Gearbox > Shaft 1 > GBX Thrust	GBLS Thrust B	Disp Wf(2000Hz)	Fmax	2000 Hz	500 Hz	●	<input type="checkbox"/>	
Gearbox > Shaft 1 > GBX Thrust	GBLS Thrust B	Disp Wf(128X/16revs)	Sample Rate	128 X	256 X	●	<input type="checkbox"/>	
Gearbox > Shaft 1 > GBX S1 IB	GBLS S1 IB Vert	Disp Wf(1000Hz)	Fmax	1000 Hz	500 Hz	●	<input type="checkbox"/>	
Gearbox > Shaft 1 > GBX S1 IB	GBLS S1 IB Vert	Disp Wf(128X/16revs)	Sample Rate	128 X	256 X	●	<input type="checkbox"/>	

Figure 3.1-1 Recommended Bently Practices

3.1.2 Export/Import Machine properties

System 1 23.1 enables users to export machine properties to a Microsoft Excel file, update the properties in the exported file, and then import it back into System 1. This file-based configuration feature enables users to configure machine properties offline. Ensure the basic components of the machine trains are configured in System 1 before exporting the properties.

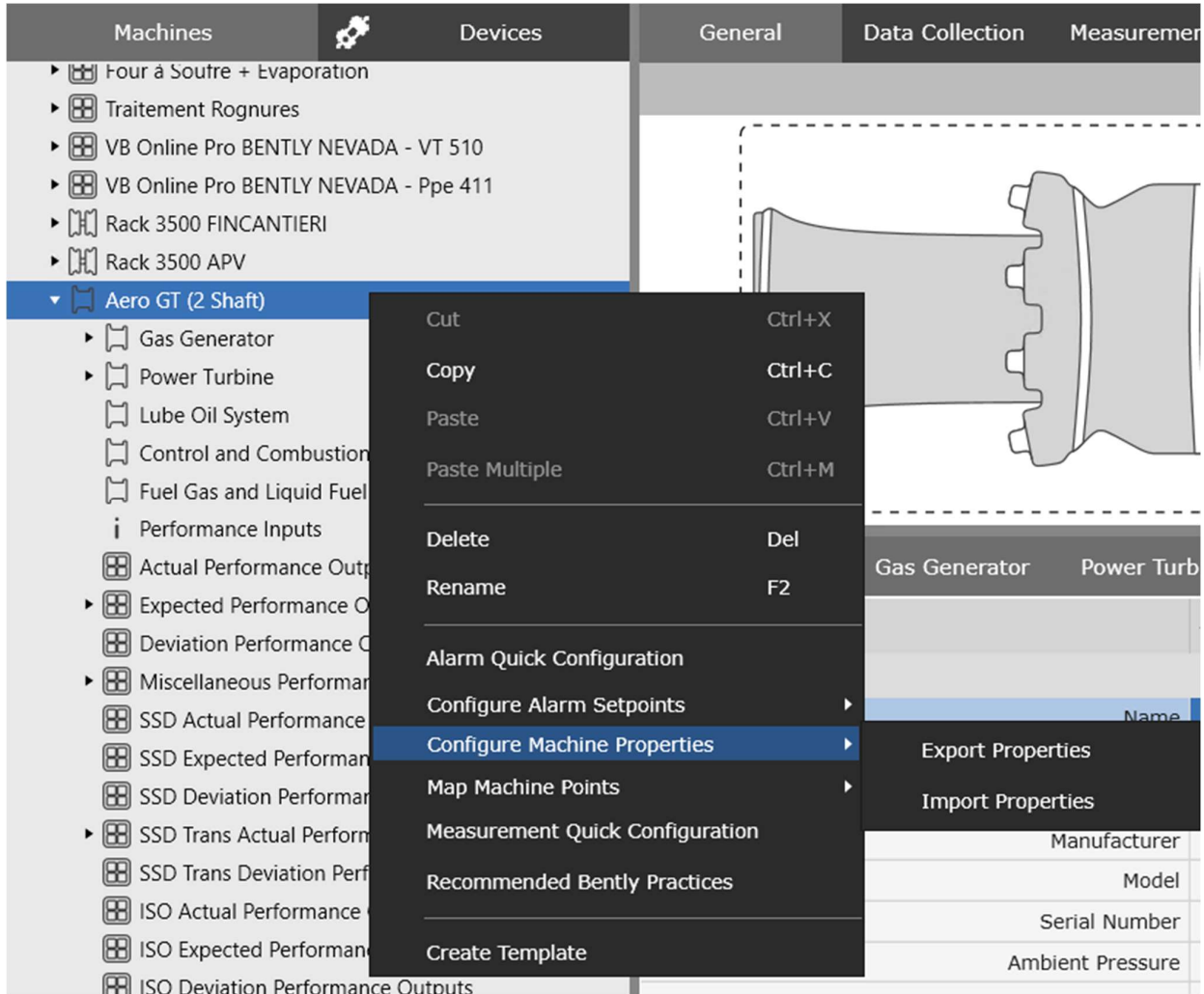


Figure 3.1-2 Export/Import Machine Properties

3.1.3 Support Machine Sub-System

System 1 23.1 now displays Sub-Systems in the Asset Library in Standard Mode in Configure tab. Sub-Systems can be added under an existing asset. Also, when a new asset is added from the library, System 1 automatically adds its associated sub-systems under the asset as shown in Figure 3.1-3.

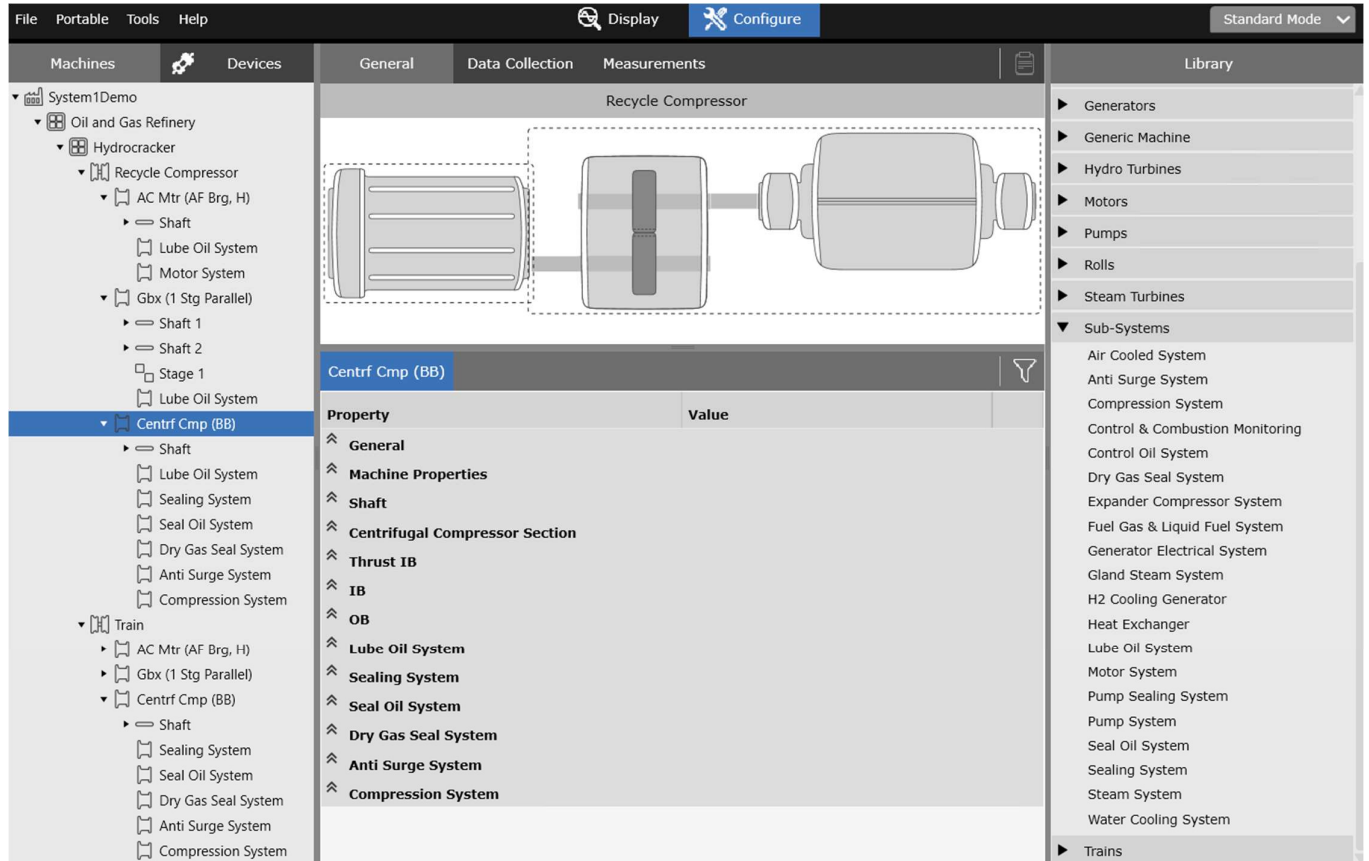


Figure 3.1-4 Sub-Systems

3.1.4 Map Machine Points

System 1 23.1 allows users to export machine points to a CSV file. Users can add OPC and Modbus points using Tag name and Server/IP address in the exported CSV file. After importing the file into System 1, Machine points get mapped with the Device points. This functionality is supported on Database, Group, Machine Train, and Machine nodes in the Machine hierarchy.

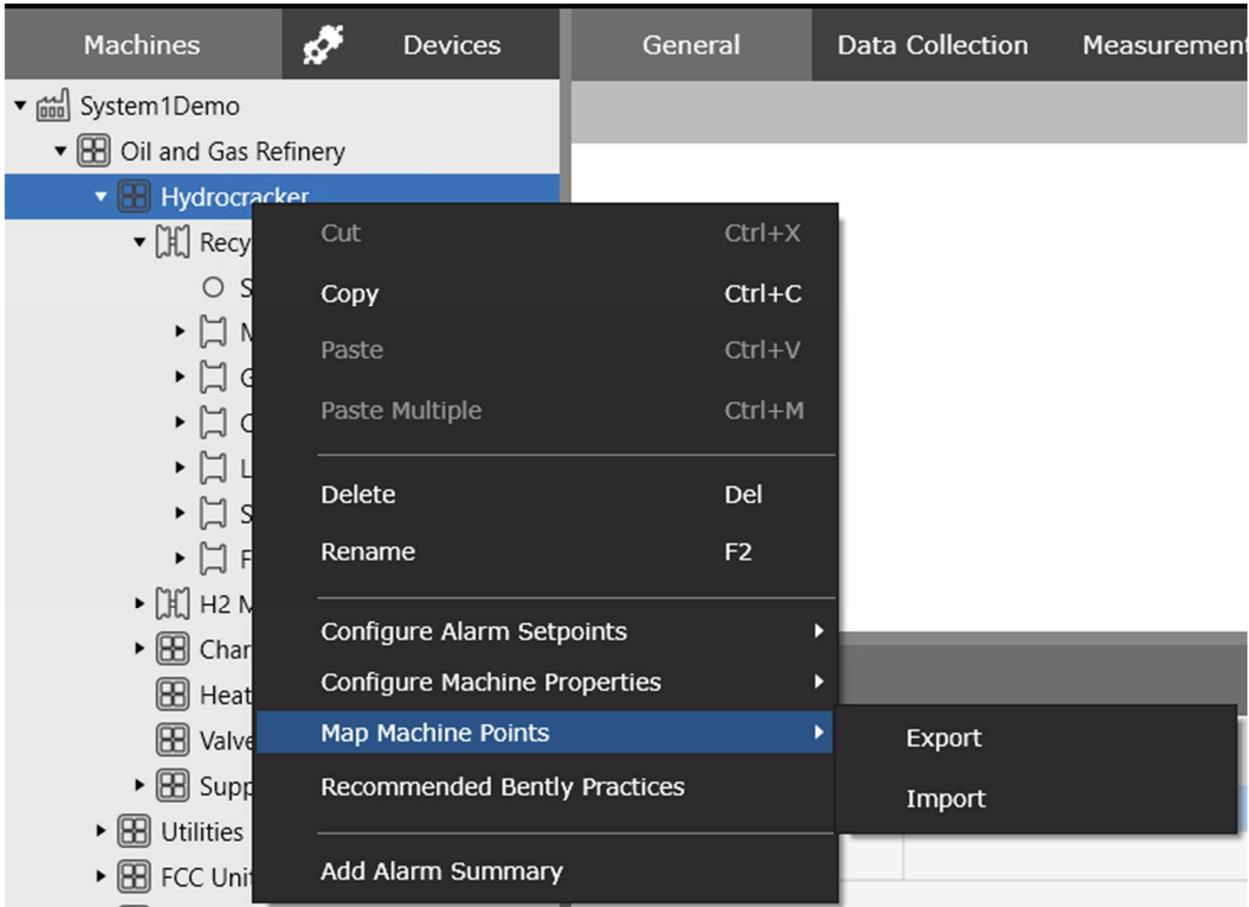


Figure 3.1-5 Map Machine Points

3.2 Replication Enhancements

3.2.1 Backwards Compatibility

System 1 on a Replicated (Rx) server is compatible with databases from prior three System 1 releases, which enables you to upgrade System 1 on the Rx server without the need to upgrade Rx database or interrupt replication. For example, System 1 version 23.1 on a replicated server is compatible with databases from System 1 versions 22.2, 22.1, and 21.2.

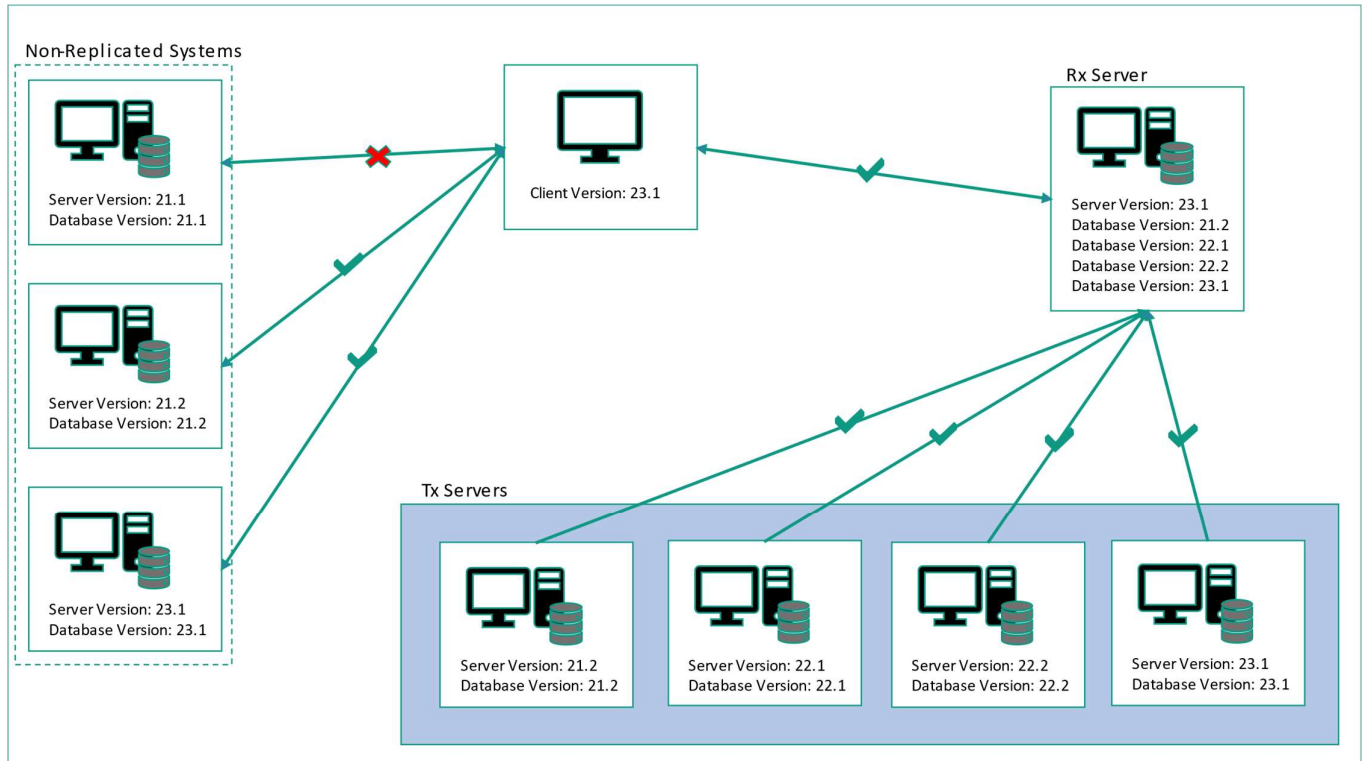


Figure 3.2-1 Client-Server and Tx-Rx version compatibility.

Rx databases can be upgraded only up to the version of their associated Tx database. Therefore, it is recommended to upgrade the Tx database before upgrading the Rx database. Even if Rx databases are "out of sync" with their associated Tx version, data continues to replicate, except for the following items:

- Configuration changes,
- Custom templates, and
- System health events.

These items resume replication after the Rx version is upgraded to match the Tx version.

3.3 Alarm Quick Configuration Enhancements

Alarm Quick Configuration Enhancements video located in Bently Nevada Tech Support Training Library
[Valid M&S Agreement Required](#)

3.3.1 Alarm Quick Configuration tool available on Rx

System 1 23.1 has extended the use of the Alarm Quick Configuration tool to Rx databases. Users can now configure setpoints that are not available on the Tx, and therefore locked for editing, using the Alarm Quick Configuration tool and create Rx setpoints.

3.3.2 Added Constant to Statistical Setpoints Calculation

System 1 23.1 has introduced a new Constant (C) value to the statistical calculation used by the Alarm Quick Configuration tool. The constant C has been added to the end of the calculator for both Over and Under setpoints. For Over and Under setpoints, Constant value is added and subtracted respectively. To add or subtract Constant value from Over and Under setpoints conversely, enter a negative Constant value.

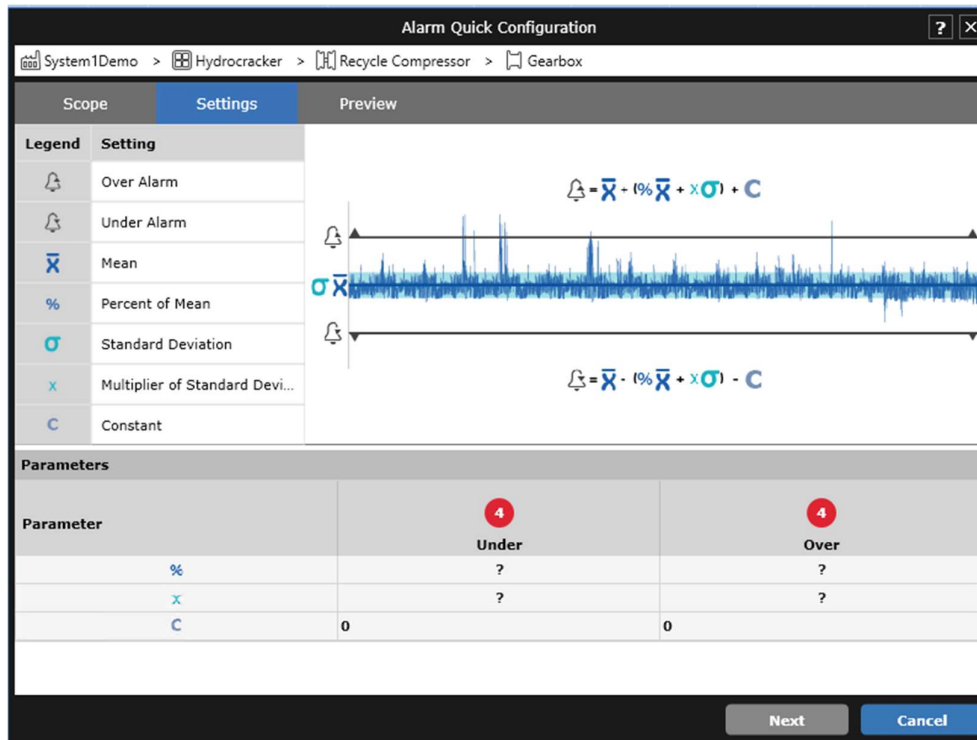


Figure 3.3-2 Constant C added to Settings tab calculations.

3.4 Bentley Performance Enhancements

Bentley Performance Enhancements video located in Bentley Nevada Tech Support Training Library

[Valid M&S Agreement Required](#)

3.4.1 Update All Manual Input tags

In System 1 23.1, the Manual Input dialog allows users to update Manual Input tag timestamps even if its value is not modified. Users can select checkboxes next to particular or all Manual Input tags to update their timestamps.

<input checked="" type="checkbox"/>	Group	Point Name	Description	Value	Unit Group	Unit
<input checked="" type="checkbox"/>	Compressor	n-Heptane - C7H16	0.060	0.060	Percentage	%
<input checked="" type="checkbox"/>	Compressor	Hydrogen Sulfide - H2S	0.060	0.060	Percentage	%
<input checked="" type="checkbox"/>	Compressor	Oxygen - O2	0.080	0.080	Percentage	%
<input checked="" type="checkbox"/>	Compressor	i-Pentane - C5H12	0.100	0.100	Percentage	%
<input checked="" type="checkbox"/>	Compressor	n-Hexane - C6H14	0.170	0.170	Percentage	%
<input checked="" type="checkbox"/>	Compressor	Water - H2O	0.170	0.170	Percentage	%
<input checked="" type="checkbox"/>	Compressor	i-Butane - C4H10	0.620	0.620	Percentage	%
<input checked="" type="checkbox"/>	Compressor	Propane - C3H8	0.790	0.790	Percentage	%
<input checked="" type="checkbox"/>	Compressor	Carbon Dioxide - CO2	0.880	0.880	Percentage	%
<input checked="" type="checkbox"/>	Compressor	Carbon Monoxide - CO	1.090	1.090	Percentage	%
<input checked="" type="checkbox"/>	Compressor	Propylene - C3H6	2.950	2.950	Percentage	%
<input checked="" type="checkbox"/>	Compressor	Nitrogen - N2	4.820	4.820	Percentage	%
<input checked="" type="checkbox"/>	Compressor	Ethylene - C2H4	13.20	13.20	Percentage	%
<input checked="" type="checkbox"/>	Compressor	Ethane - C2H6	17.34	17.34	Percentage	%
<input checked="" type="checkbox"/>	Compressor	Hydrogen - H2	19.08	19.08	Percentage	%
<input checked="" type="checkbox"/>	Compressor	Methane - CH4	38.59	38.59	Percentage	%
<input checked="" type="checkbox"/>	Compressor	Ambient Pressure	1.013	1.013	Pressure - Absolute	bar (a)

Figure 3.4-1 Manual Input Dialog with checkbox

3.4.2 Copy Bentley Performance Template

Bentley Performance 23.1 tool enables user to create a copy of workbook when System 1 Bentley Performance Service is in running mode. This copied workbook has the last updated value in Inputs and outputs.

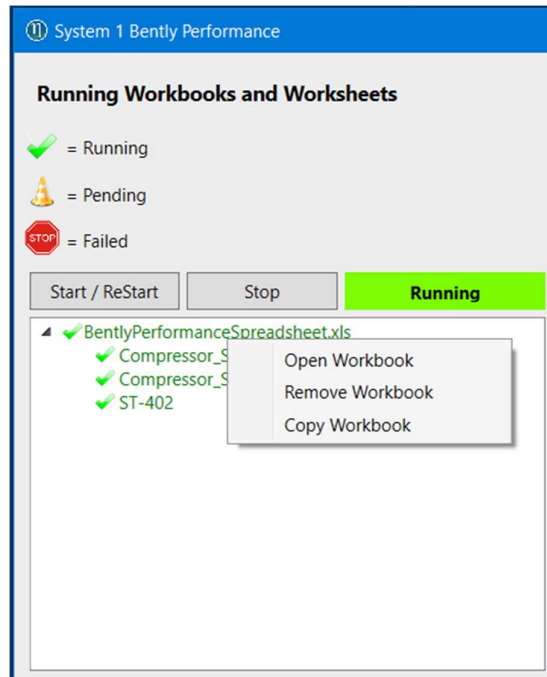


Figure 3.4-2 Copy Workbook option in Bently Performance tool

3.4.3 Active/Inactive Performance Group

System 1 now allows users to activate or deactivate a performance group by selecting or clearing the Active checkbox in the property grid. When a performance group is deactivated, it is not shown in the Display. However, the mapped points of the performance group remain intact. When the group is active again, all the mapped points are restored in machine hierarchy in Config and Display.

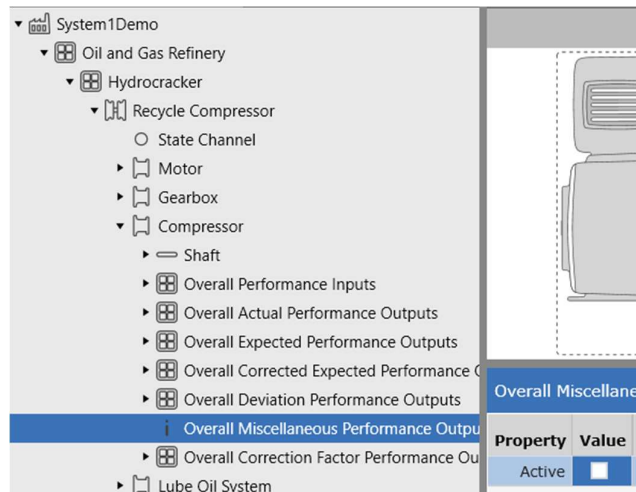


Figure 3.4-3 Active property for Performance Group

4.DEVICE CONNECTIVITY

4.1 Orbit60

Orbit60 Enhancements video located in Bently Nevada Tech Support Training Library
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4.1.1 Support Recip Piston Rod Channel

System 1 23.1 now supports Piston Rod channel configured in Orbit 60 device. System 1 receives the default Sync and Async waveforms from the device when connected to the device for the first time. Users can add new waveforms or delete existing waveforms from System 1 and then send the configuration to the Condition Monitoring Module (CMM). All the existing features available for 3500's Rod drop/Rod Position channel is also supported for Orbit 60's Piston Rod channel. Users can view Piston Rod data in Rod Position plot in Display workspace.

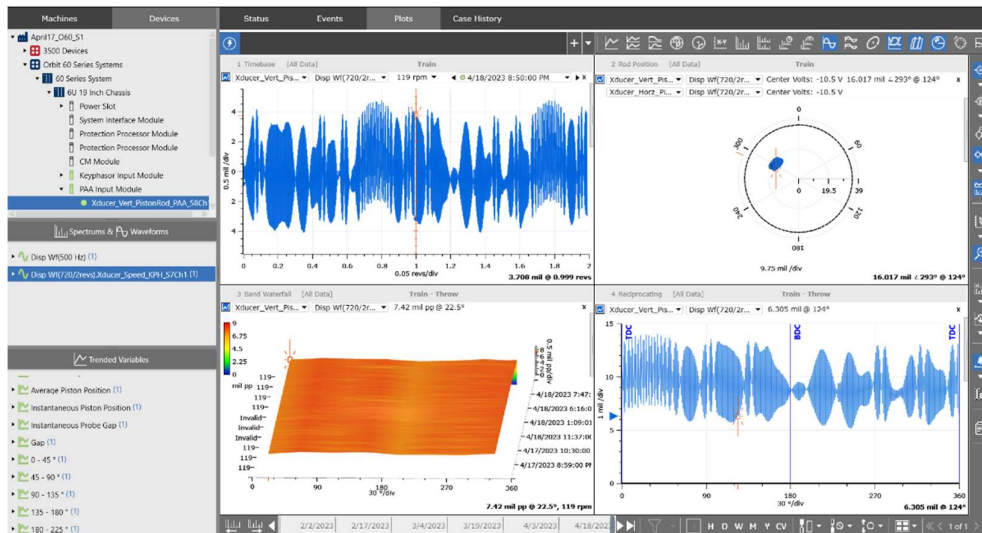


Figure 4.1-1 Recip Plot

4.1.2 Offline Config Import in System 1

In the previous release, users could add a device in System 1 either by connecting to it or by importing an offline diagnostic file (.odf). In this release, System 1 supports import of offline configuration file (.orb). The .orb file can be created using Orbit Studio version 23.1 or higher and imported into System 1. After importing the file, users can map device points to asset points, add waveforms and trended measurements, configure data collection parameters for the collection groups, add System 1 states, and so on. After establishing connection with Condition Monitoring Module (CMM), the configuration

can be sent to the device. Users can update the protection configuration in System 1 by reimporting the .orb file before synchronizing with the device.

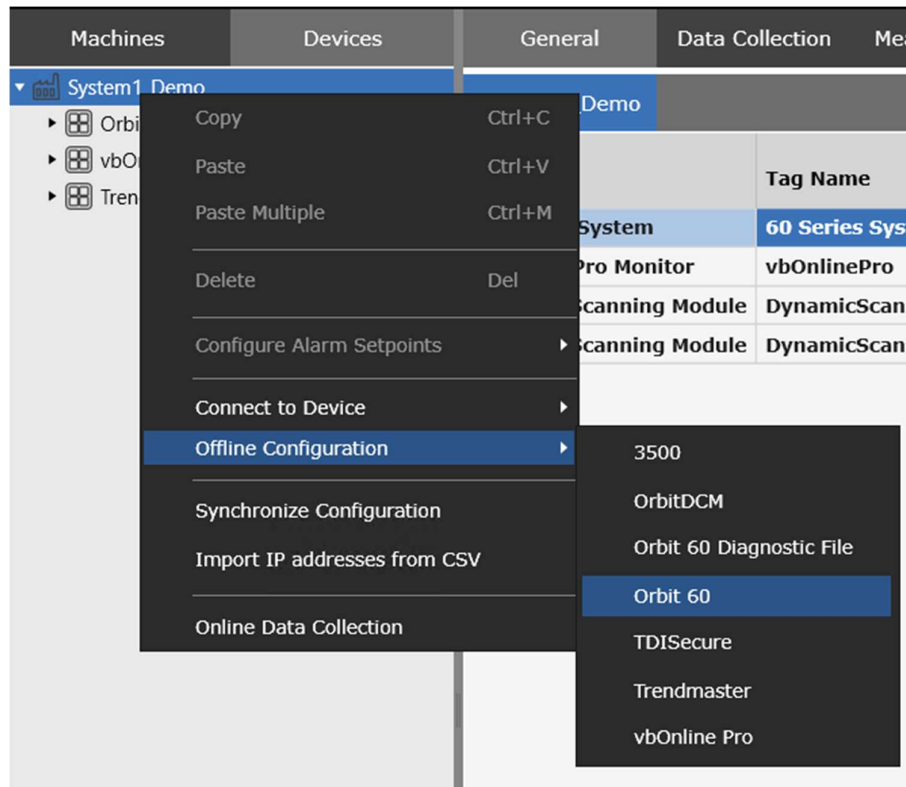


Figure 4.1-2 Offline Config Import in System 1

4.1.3 Advanced security for Orbit 60 in System 1

In previous release, users could only add an Orbit 60 device with valid security certificate. Devices with invalid or expired security certificate could not be added.

System 1 now displays a warning when user adds an Orbit 60 devices with an expired or invalid certificate. After user accepts the risk, System 1 adds the device and log a system health event notifying about the certificate expiry or invalidity.

If the Orbit 60 Security certificate expires, System 1 will continue to collect and visualize data.

System 1 also notifies and logs system health events when the certificate is about to expire within 30, 60, or 90 days. Security certificate is validated for Orbit 60 devices added by importing .orb or .odf file when the device is online for data collection.

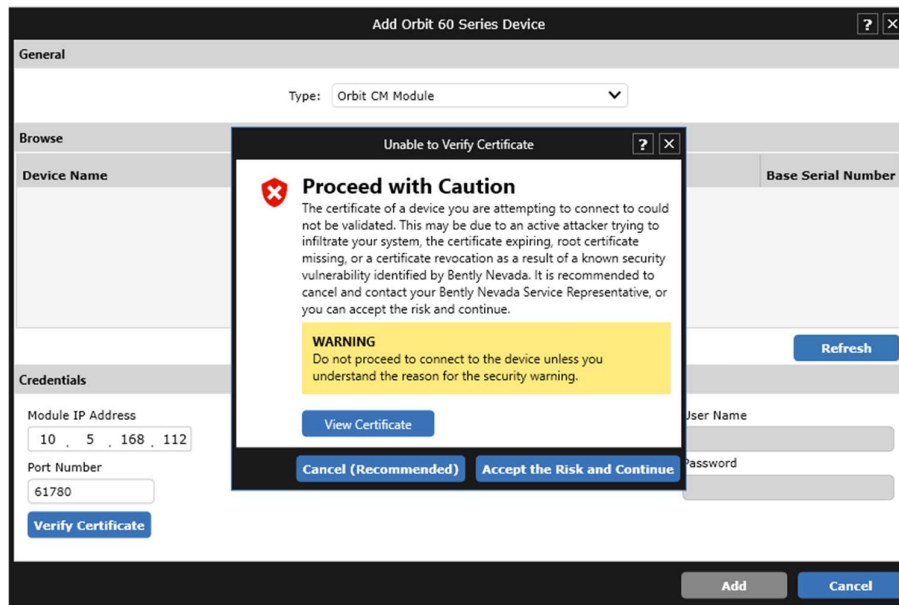


Figure 4.1-3 Advanced security for Orbit 60 in System 1

DECISION SUPPORT IS NOW AVAILABLE TO DOWNLOAD

[Valid M&S Agreement Required](#)

Starting with System 1 version 23.1, Decision Support Developer will be included with all new orders of System 1. Decision Support and System 1 both remain as separate products. However, they will be delivered through the same download folder in Flexera. Decision Support is now part of the System 1 package, and therefore does not require a separate license for installation. This excludes the Decision Support Analytics (formerly known as InsightPaks) and the DS Analytics library, which also remains as a separate commercial product. For more information on this change, contact your sales manager.

ONLY APPLICABLE WHEN UPGRADING FROM VERSIONS PRIOR TO 22.1

! License Changes !

If you upgrade from System 1 21.2 or prior, the existing licenses are not visible in the Licenses tab because of the Publisher Name change to "Baker Hughes". Therefore, **before you install the latest System 1 version**, return your existing licenses to the Licensing Portal. **After the upgrade**, register the License Server again using your existing activation code and relicense System 1. For more details, refer to the System 1 Licensing User Guide.

! Postgres version upgrade !

System 1 version 22.1 onwards supports Postgres 14 as the historian. Databases on Postgres 11 need to be upgraded to Postgres 14.

While upgrading to Postgres 14, it is recommended to create a backup before installing the latest System 1 version.

When you upgrade to PostgreSQL14 on System 1 22.1 or later, rollback installation to earlier System 1 versions is not allowed. Rollback is only possible by restoring VSS/Acronis backup.

To upgrade the historian from Postgres 11 database to Postgres 14, launch the Database Manager tool and click "Upgrade PostgreSQL Database".

! Proficiency Obsolescence !

Proficiency is no longer supported as historian. Users need to migrate their database from Proficiency to Postgres.

Users must migrate Proficiency databases to PostgreSQL to upgrade to System 1 22.1 or later.

This is applicable for customers who have an older System 1 version with Proficiency databases. This does not impact customers who already have PostgreSQL databases as historians.

For more details, please refer to System 1 Help.

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