



Asset Health Manager



Contents

Chapter 1: Overview	1
Overview of the Asset Health Manager Module	2
Assumptions Made in the Asset Health Manager Documentation	2
Access the Asset Health Manager Overview Page	2
Chapter 2: Workflows	5
Basic Workflow	6
Assess Asset Health	7
Manage Health Indicators	10
Manage Health Indicator Sources	13
Chapter 3: Health Summary	16
Overview	17
Health Indicator Statuses	17
Events	23
Risks	27
Policy Instances	29
Chapter 4: Health Indicator Details	31
About the Health Indicator Trend Chart	32
Access Trend and Details for Single Health Indicator	34
Access Trend for Multiple Health Indicators	37
Display Events on the Trend Chart	38
Modify Health Indicator Source Information	41
Chapter 5: Recommendations	43
About Acknowledgments and Recommendations in AHM	44
Access Recommendations in Asset Health Manager	44
Create a Recommendation Based on Health Indicator Status	45
Create a Recommendation Based on an Event	46

Chapter 6: Alert Acknowledgements	47
About Acknowledgments and Recommendations in AHM	48
Acknowledge Alerts and Warnings	48
Access, Modify, or Revoke an Acknowledgment	49
Chapter 7: Admin	51
Event Mapping	52
Health Indicator Source Management	59
Chapter 8: Deployment	63
Deployment and Upgrade	64
Chapter 9: Reference	65
General Reference	66
Family Field Descriptions	75
Catalog Items	79

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Chapter 1

Overview

Topics:

- [Overview of the Asset Health Manager Module](#)
- [Assumptions Made in the Asset Health Manager Documentation](#)
- [Access the Asset Health Manager Overview Page](#)

Overview of the Asset Health Manager Module

The Asset Health Manager module provides tools that help you evaluate the overall health of an asset (i.e., a piece of equipment or a location). Using Asset Health Manager, you can view a graphical summary of an asset's health based on information stored in various records, and then use this information to make decisions about what actions to take in order to mitigate risk.

Asset Health Manager uses health indicators to categorize an asset as having a health status of normal, warning, or alert. The module displays a summary of this information, as well as related events and policy instances, at each level of the Asset Hierarchy. Information is also available about each health indicator and its source records.

In the baseline APM database, health indicators are created automatically to determine health statuses based on the data in the following types of records:

- Measurement Location records and their linked Reading records
- KPI records and their linked KPI Measurement records
- Health Indicator records and their linked Health Indicator Value records

Note: If other record types contain information that indicate an asset's health, an administrative user can configure health indicator mapping records in order for health indicators to be created for those records as well.

Assumptions Made in the Asset Health Manager Documentation

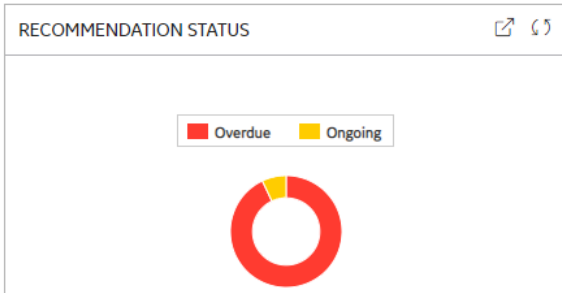
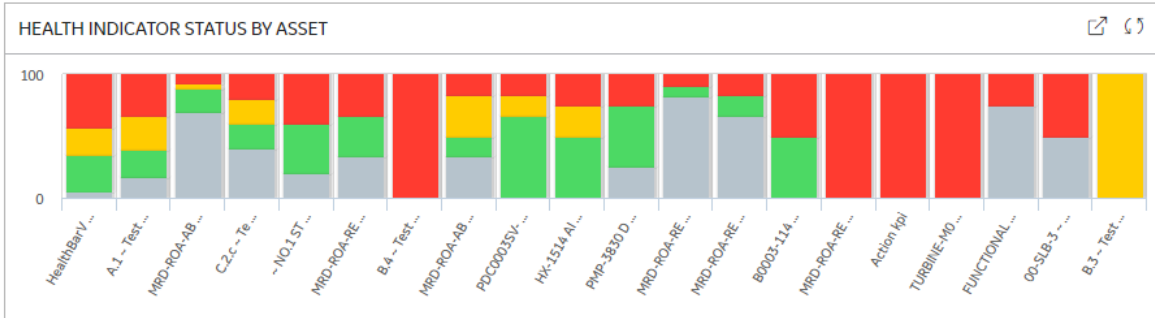
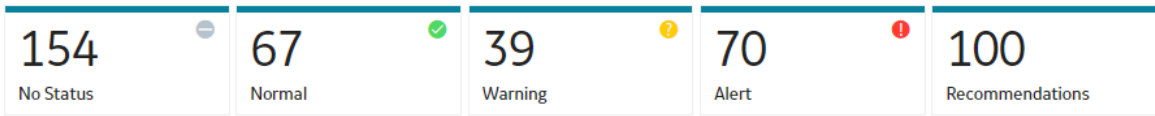
The Asset Health Manager documentation assumes that:

- An Equipment, Functional Location, or similar record already exists to identify the asset whose health you want to evaluate.
- The record families representing assets whose health you want to evaluate are included in the Asset Hierarchy configuration.
- The Asset Health Indicator service is running at all times on the APM Server.
- You will use the [baseline source records](#) for health indicators, and these records already exist.
- The asset record is linked to the associated health indicator source records.

Access the Asset Health Manager Overview Page

Procedure

In the module navigation menu, select **Health > Asset Health Manager**.
The **Asset Health Manager Overview** page appears.





The tabs at the top of the page summarize the [statuses](#) of the health indicators and show related recommendations for the selected asset and its subsidiary assets. You can select a tab to view one of the following lists:

- **No Status** : Health indicators that have no status due to the health indicator source record having no limit values defined or having no associated readings.
- **Normal** : Health indicators that meet the normal status criteria or that have been [acknowledged](#).
Note: If a health indicator has been acknowledged, the actual status of the health indicator is warning or alert, but the status is counted as normal. When this is the case, the **Acknowledged** column of the **Normal** list contains a check mark.
- **Warning** : Health indicators that meet the warning status criteria.
- **Alert** : Health indicators that meet the alert status criteria.
- **Recommendations** : Health-related recommendations (i.e., General Recommendation, AMS Asset Recommendation, Policy Recommendation, and Operator Rounds Recommendation) that are in an open state (i.e., not completed, superseded, or rejected).

The **Asset Health Manager Overview** page also contains the following graphs:

- **Health Indicator Status by Asset** : Displays the top 20 assets and a summary of the health indicator statuses for each.
- **Recommendation Status** : Summarizes the statuses of health-related recommendations (i.e., General Recommendation, AMS Asset Recommendation, Policy Recommendation, and Operator Rounds Recommendation).
- **Alert Acknowledgment** : Compares the number of health indicators with warning or alert statuses that are acknowledged vs. not acknowledged.

You can select  in the upper-left corner of the page to filter the information displayed on the **Asset Health Manager Overview** page to a specific asset. When you filter by an asset, the page displays information for the selected asset and the assets under it in the hierarchy. The Home level includes information not related to an asset or related to an asset not in the Asset Hierarchy.

Note: The **Asset Health Manager Overview** page is not updated automatically when you return to the previously opened tab. You can select  to update the page.

Next Steps

- [View Indicator Status Information](#)
- [View Health Indicator Details](#)

Chapter 2

Workflows

Topics:

- [Basic Workflow](#)
- [Assess Asset Health](#)
- [Manage Health Indicators](#)
- [Manage Health Indicator Sources](#)

Basic Workflow

Asset Health Manager Workflow

The following workflow represents the basic steps that you might use when evaluating a piece of equipment's health using Asset Health Manager. After you have completed this workflow, you will probably find that you need to repeat certain steps at various times depending on your company's specific needs, changing conditions, and your role within the organization.

1. In Asset Health Manager, select an asset whose health you want to evaluate.
2. Evaluate the asset's health using the [health status, event](#), and [policy instance](#) data.
3. As necessary, [create recommendations based on health indicator statuses](#) or other relevant asset health information.
4. [Acknowledge any warning or alert health indicator statuses](#).

APM Health Personas

The workflows for this solution are completed by the following user personas.

Persona	Description	Applicable APM Roles	Notes
Analyst	The Analyst is responsible for prioritizing the areas where efforts should be directed to drive improvements that directly affect productivity and profitability. The Analyst monitors and evaluates historical and condition data. Based on evaluation, the Analyst will make recommendations to take action on current conditions or propose changes to existing strategies.	MI Health User MI Health Power MI Health Admin MI Strategy User MI Strategy Power MI Strategy Admin	None
APM	The APM persona represents automated processes performed by the APM system.	None	None

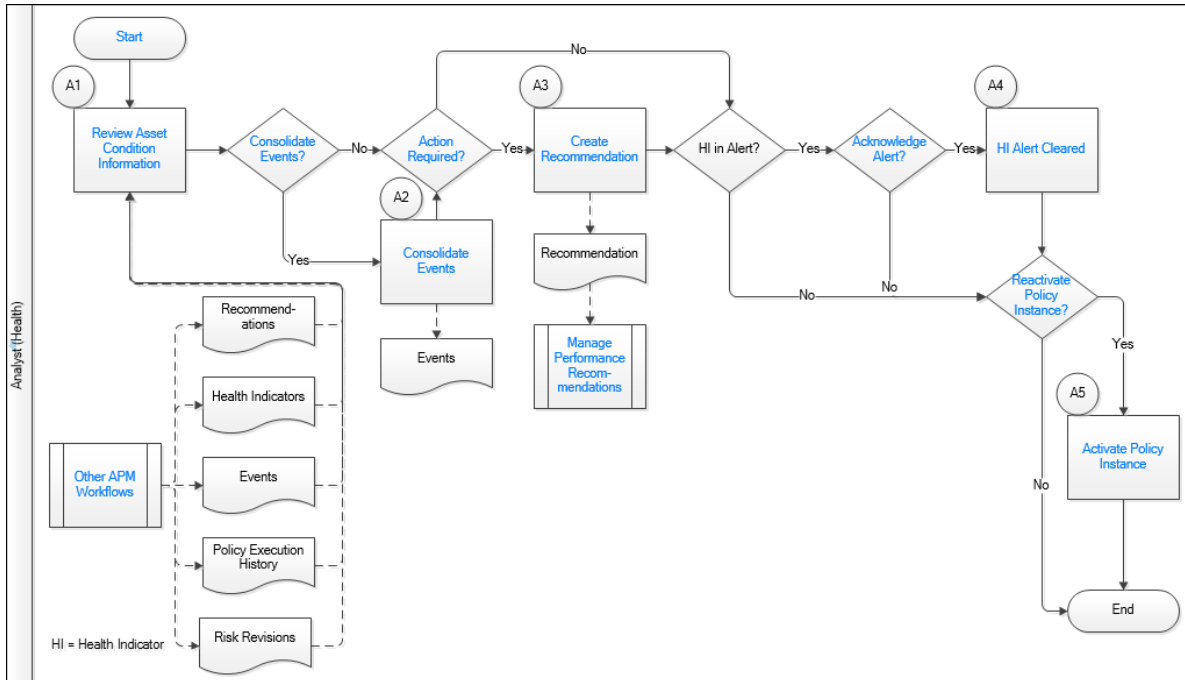
Persona	Description	Applicable APM Roles	Notes
Solution Administrator	The Solution Administrator is responsible for managing advanced features of a APM solution. Some examples are managing health indicators, managing M2M interfaces, and managing SSAS cubes.	MI Health Admin	None
Technician	<p>The Technician is responsible for executing and documenting inspection activities to maintain both asset integrity and compliance with the overall inspection program.</p> <p>The Technician does the following:</p> <ul style="list-style-type: none"> • Performs inspections, calibrations, or proof tests. • Records results. • Initiates recommendations. 	MI Health User	None

Assess Asset Health

Asset Health Manager: Assess Asset Health Workflow

This workflow describes the process for assessing the health of assets managed in APM. Health assessment can be done on a routine basis for key assets; however, most assessments will be driven by health indicator alerts and warnings. As a result of the health assessment, the analyst may create recommendations to address the asset condition, frequently resulting in a work request being sent to the EAM system.

In the following workflow diagram, the blue text in a shape indicates that a corresponding description has been provided in the sections that follow the diagram. For more information, refer to the topic [Interpreting the Workflow Diagrams](#).



1. [Review Asset Condition Information](#) on page 9
2. [Action Required?](#) on page 9
3. [Create Recommendation](#) on page 9
4. [Start](#) on page 8
5. [Other Workflows](#) on page 8
6. [Manage Performance Recommendations](#) on page 10
7. [Acknowledge Alert?](#) on page 10
8. [HI Alert Cleared](#) on page 10
9. [Reactivate Policy Instance?](#) on page 10
10. [Activate Policy Instance](#) on page 10
11. [Consolidate Events?](#) on page 9
12. [Consolidate Events](#) on page 9

Start

Persona: Analyst (Health)

Various factors trigger the need to assess asset health; these may include any of the following:

- Policies
- Conditional alerts
- Review of the **Asset Health Overview** page
- Review of other APM solution overview pages
- Core Analysis outputs such as queries, reports, and dashboards

Other Workflows

Persona: Various

The asset condition information that is brought together in Asset Health Manager is generated by various APM workflows.

- **Health Indicators:** Health Indicators may be generated by a policy execution or related to Measurement Locations, Content Maps, KPIs, or any custom configured health indicator source record. Go to related workflows: Collect Rounds Data, Manage KPIs, and Execute Policy.
- **Events:** Relevant Events can include work history, inspections, calibrations, etc., as well as events generated by M2M data sources. Go to related workflows: Inspection Assessment, Calibration Assessment, Execute Policy, and Integrate with M2M Data Source.
- **Recommendations:** Recommendations can be generated from any other APM process. Go to the Manage Performance Recommendations workflow.
- **Policy Execution History:** Policy execution results often contain information relevant for assessing asset condition. Go to the Execute Policy workflow.
- **Risks:** Includes any risks contained in the relevant Asset Strategy. If a health indicator's source has been identified as a mitigating action for a risk, then the status of that health indicator is evaluated in determining the overall health against the risk. Go to the Asset Strategy Management workflow.

Review Asset Condition Information

Persona: Analyst (Health)

Review the asset condition information brought together in Asset Health Manager to assess the overall health of the asset. This involves viewing the health indicators and associated risks, events, policy execution history, and recommendations related to a particular asset.

Consolidate Events?

Persona: Analyst (Health)

Determine if there are any events related to the same underlying asset condition that you would want to consolidate. For example, you might want to consolidate events representing repeated alarms or excursions due to the same asset condition, such as high vibration, for which you want to create a single recommendation.

You can consolidate events if:

- They are the same type of event
- and-
- Consolidation is allowed for this type of event

Consolidate Events

Persona: Analyst (Health)

Consolidate two or more events related to the same underlying asset condition.

Action Required?

Persona: Analyst (Health)

Determine if any action is needed to maintain, restore, or improve asset performance, particularly for assets with events or health indicators with an alert status.

Create Recommendation

Persona: Analyst (Health)

If action is required, create a new recommendation to implement the action.

Go to the Manage Performance Recommendations workflow.

Manage Performance Recommendations

Persona: Analyst (Health)

The new recommendation is managed for approval and implementation through the Manage Performance Recommendations workflow.

Go to the Manage Performance Recommendations workflow.

Acknowledge Alert?

Persona: Analyst (Health)

If a health indicator is in alert status, determine whether or not it should be acknowledged.

Acknowledging an alert means that you have determined that:

- The current condition is tolerable for the time being
- or-
- Follow-up action is already underway or has been requested through a recommendation.

HI Alert Cleared

Persona: Automated Process

When an alert is acknowledged, the health indicator alert status is cleared until a new reading is added or until a specified date.

Reactivate Policy Instance?

Persona: Analyst (Health)

Some policies may be designed such that the executed policy instance is disabled after execution to prevent generation of multiple email messages, events, or recommendations in response to a continuing asset condition.

If a policy instance related to the asset being evaluated was disabled after execution, determine whether the instance should be reactivated to reinstate the automated monitoring process.

Activate Policy Instance

Persona: Analyst (Health)

Activate the related policy instance from Asset Health Manager or Policy Designer.

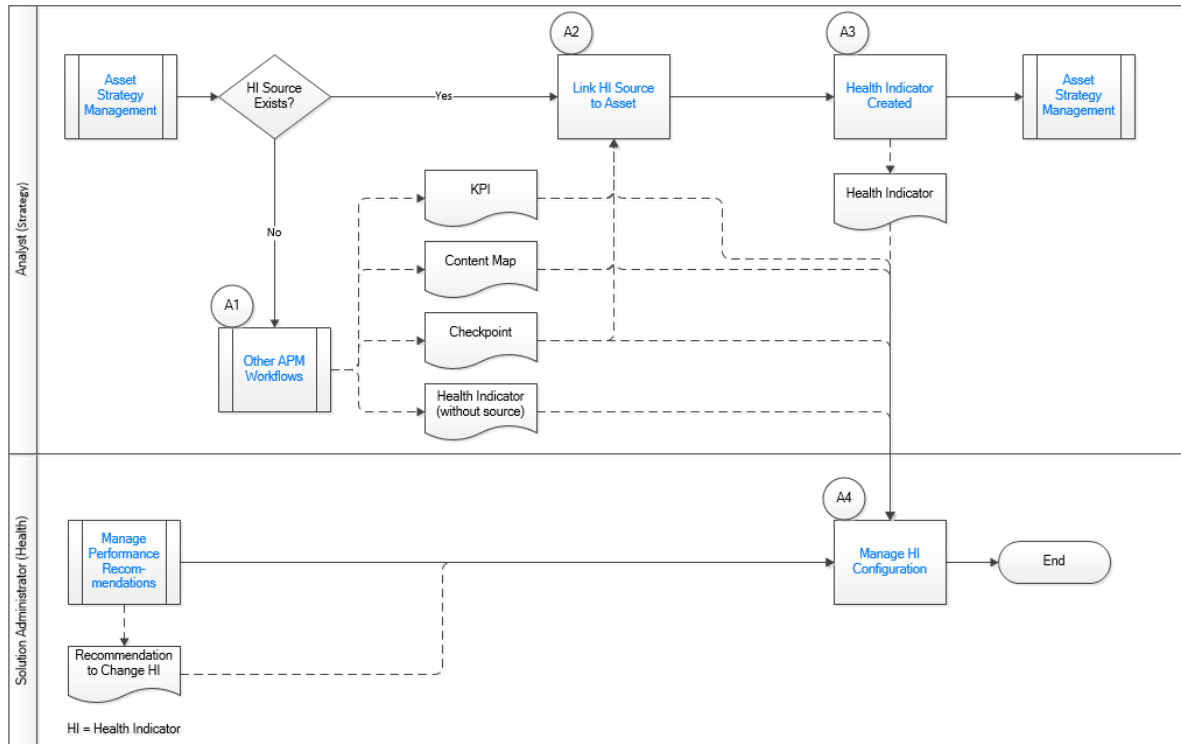
Go to the Design Policy workflow.

Manage Health Indicators

Asset Health Manager: Manage Health Indicators Workflow

This workflow describes the process for implementing checkpoints (i.e., new health indicator sources) and health indicators to implement risk mitigation Actions that have been defined in an Asset Strategy.

In the following workflow diagram, the blue text in a shape indicates that a corresponding description has been provided in the sections that follow the diagram. For more information, refer to the topic Interpreting the Workflow Diagrams.



Asset Strategy Management

Persona: Analyst (Asset Strategy)

Asset Strategy Management defines the health monitoring requirements for an asset, or asset class, based on understanding the underlying failure modes and effects, in combination with the criticality of the asset. This process identifies candidate failure modes where health monitoring offers a significant reduction in risk. This workflow assumes that the Strategy has been approved, an Action has been created for each Risk where a health indicator is the identified mitigation, and the Actions are not yet implemented.

Go to the Asset Strategy Management Workflow.

Other Workflows

Persona: Varies

Health Indicator sources are records that are created in other workflows. Health Indicator sources include:

- Rounds checkpoints, i.e., Measurement Locations and Lubrication Requirements. These represent recurring scheduled tasks typically performed by asset operators, maintenance and lubrication technicians.
Go to related workflows: Manage Rounds Routes and Asset Strategy Management.
- Content Map, such as time series machine data collected from online sensors, which is stored in a process historian.
Go to related workflow: Integrate with M2M Data Source.
- Key Performance Indicators (KPIs), i.e. calculated asset performance parameters such as availability, reliability, etc.
Go to related workflow: Manage KPIs.
- Health indicator without source, i.e. health indicators calculated by Policies.
Go to related workflow: Design Policy.

Implement Action as Rounds

Persona: Analyst (Strategy)

If a new Checkpoint is needed, implement a risk mitigation Action by a Rounds activity (Checkpoint, i.e., Measurement Location or Lubrication Requirement).

Checkpoints can be created from a template or template groups directly within the Asset Strategy implementation workflow.

Note: Checkpoints can also be created in the Manage Rounds Routes workflow. See [Implement Action as HI Source](#).

Implement Action as HI Source

Persona: Analyst (Strategy)

If a new Checkpoint is not needed, implement a risk mitigation Action using existing health indicator sources that are created by other APM workflows.

For example, you might:

- Create health indicators to monitor data from an external data source (e.g., Content Map).
- Use a policy by creating a Health Indicator or an automated decision making process.
- Implement a Checkpoint in Rounds Designer as a source for health indicators. Go to the Manage Rounds Routes workflow for details.

As part of implementing the Action, the health indicator source record is linked to the asset (i.e., equipment or functional location).

Link Health Indicator Source to Asset

Persona: Solution Administrator (Health)

Provided that the system is correctly configured, health indicators will be created automatically when health indicator source records are linked to an asset. Linking source records to assets may be done using Data Loaders, in Record Manager, or within other workflows such as the Manage Rounds Routes workflow.

Go to the Assess Asset Health workflow.

Health Indicator Created

Persona: Automated Process

Once a health indicator source record is linked to a relevant asset (i.e., equipment or functional location), Health Indicator records are created automatically and will be visible for the asset in Asset Health Manager.

Go to the Assess Asset Health workflow.

Persona: Manual Process

Health indicators are created by the User with a User Interface for a particular OT Source Tag and Asset through the OT AHI Connector.

The OT AHI Connector creates the Content Map record that relates the Health Indicator, OT Source Tag, and Asset. This relationship delivers value in readings, subscriptions, and limits. For more information see, [Content Mapping](#).

Asset Strategy Management

Persona: Asset Strategy Analyst

Once the required Health Indicators have been created, the Asset Strategy Management workflow resumes. The Health Indicators can be selected to implement the previously unimplemented Actions.

Note: It is possible to create Rounds checkpoints based on Templates within the Asset Strategy Management workflow. In this case, the checkpoint is created and linked to the asset, and the health indicator is created, in the same step as implementing the Actions.

Go to the Asset Strategy Management Workflow.

Manage Performance Recommendations

Persona: Solution Administrator (Health)

A recommendation created from the Assess Asset Health workflow may request a change to the configuration of a health indicator, such as its limit values.

Go to the Assess Asset Health workflow or the Manage Performance Recommendations workflow.

Manage HI Configuration

Persona: Solution Administrator (Health)

Configure the Health Indicator source records to define health indicator limit values.

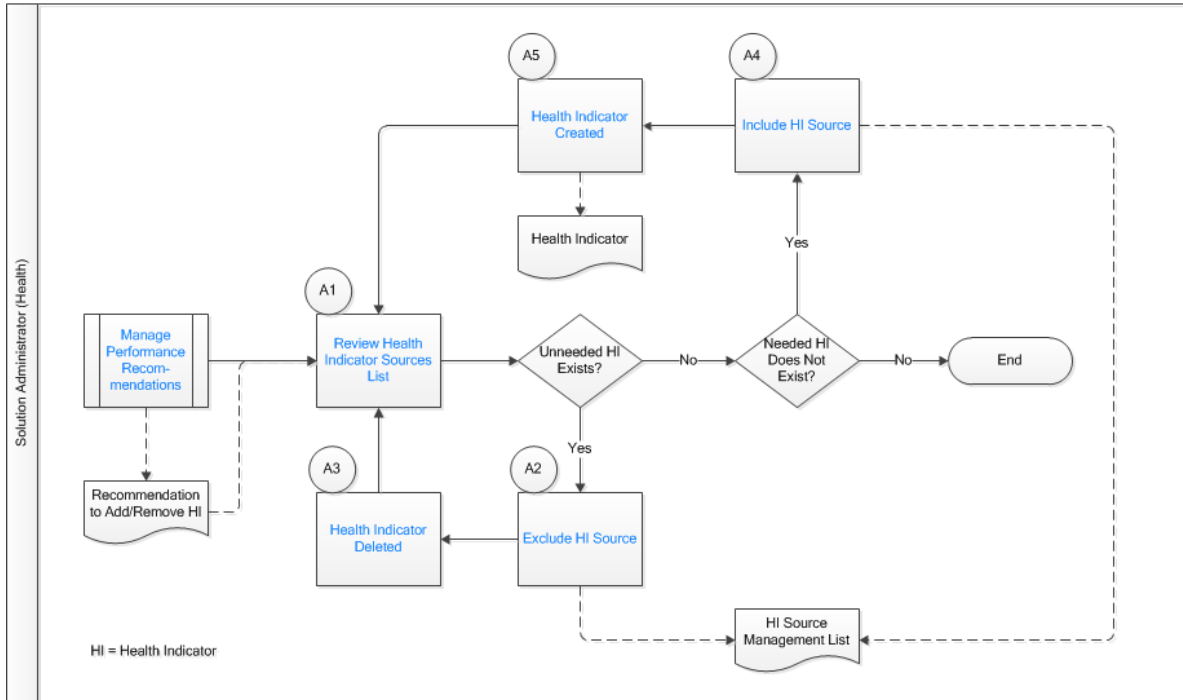
Limit values are stored on the Health Indicator Source record (example, Measurement Location) for automatically created health indicators and on the health indicators for others (example, Content Maps).

Manage Health Indicator Sources

Asset Health Manager: Manage Health Indicator Sources Workflow

By default, when a health indicator source such as a Measurement Location is linked to an asset, a Health Indicator is created; however, the Health Indicator may not always be required. This workflow describes the process for managing the addition or removal of Health Indicators.

In the following workflow diagram, the blue text in a shape indicates that a corresponding description has been provided in the sections that follow the diagram. For more information, refer to the topic [Interpreting the Workflow Diagrams](#).



1. [Manage Performance Recommendations](#) on page 14
2. [Review Health Indicator Sources List](#) on page 14
3. [Health Indicator Deleted](#) on page 14
4. [Exclude HI Source](#) on page 14
5. [Health Indicator Created](#) on page 15
6. [Include HI Source](#) on page 15

Manage Performance Recommendations

Persona: Analyst

A recommendation created from the Assess Asset Health workflow may request that a health indicator for a health source linked to an asset be added or removed. For example, when checkpoints are created in the Rounds module, health indicators are automatically created for all checkpoints that are linked to assets, but some of these will represent inspection tasks that must be completed as part of a Route, but which provide no useful health information.

Go to the Assess Asset Health workflow or the Manage Performance Recommendations workflow.

Review Health Indicator Sources List

Persona: Solution Administrator

Review the status of health indicator sources to ensure that all required health indicators are in place.

Exclude HI Source

Persona: Solution Administrator

If a health indicator that was automatically created when a source record was linked to an asset is not required, exclude the source record so that the related health indicators are removed.

Health Indicator Deleted

Persona: Automated

The APM system removes the existing health indicator record so that the health indicator will no longer appear in Asset Health Manager. This does not affect the limit settings on the source record or remove any related readings.

Include HI Source

Persona: Solution Administrator

If needed health indicators do not exist, include the relevant source records so that related health indicators are created.

Health Indicator Created

Persona: Automated

The APM system creates a health indicator record and sets the health indicator status based on the most recent reading. The health indicator then appears in Asset Health Manager.

Chapter 3

Health Summary

Topics:

- [Overview](#)
- [Health Indicator Statuses](#)
- [Events](#)
- [Risks](#)
- [Policy Instances](#)

Overview

About the Health Summary

The Health Summary provides an overview of information for an asset.

The **Health Summary** page displays the following tabs:

- **Indicators:** Displays the indicators and indicator statuses for the selected asset.
- **Risks:** Displays the risks and health indicator statuses that are associated with an Active Strategy that is associated with the selected asset.
- **Events:** Displays the events that are associated with the selected asset.
- **Policies:** Displays the policy instances associated with the selected asset.

Health Indicator Statuses

About Health Indicator Statuses

The status of a Health Indicator record is based upon values that are stored in the Health Indicator record and the [source records](#) to which the Health Indicator record is linked. Each source record defines the upper and lower limit values that are compared to the most recent reading values in order to determine the status of a corresponding health indicator.

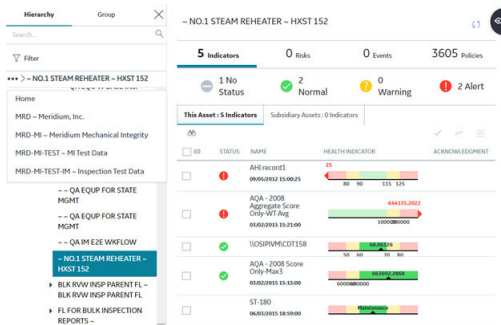
The Asset Health Indicator service automatically updates either the Last Numeric Reading Value or Last Char Reading Value field in Health Indicator records to correspond to the [reading in the most recent reading source record](#). If the Asset Health Indicator service is not running, or if there are many items in the queue to process, a Health Indicator record may not be updated immediately with the reading value from the most recent reading source record. If this issue occurs, the problem may correct itself as the Asset Health Indicator service finishes processing items in the queue. However, if the problem does not correct itself, an administrative user can manually [resync health indicators](#).

Access Health Indicator Status Information for an Asset

Procedure

1. In the [Asset Health Manager Overview](#) page, access the **Health Summary** page using one of the following methods:
 - Select **Open Health Summary**, and then select an asset in the **Asset Hierarchy** pane.
 - In one of the lists of assets (that is, **No Status**, **Normal**, **Warning**, or **Alert**), select an asset name.
 - In the **Health Indicator Status by Asset** graph, select the bar chart for an asset.

The **Health Summary** page appears, displaying the **Indicators** section of the workspace for the selected asset. The number in the **Indicators** tab represents the total number of health indicators for the selected asset and its subsidiary assets. The boxes below the tab summarize the statuses of these health indicators.



2. If it is not already selected, select the **This Asset** tab.

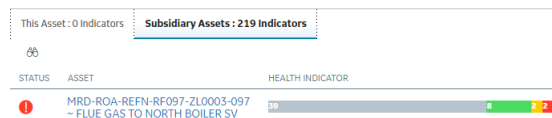
The **This Asset** subsection provides information about the health indicators for the selected asset. The grid in this section contains the following columns:

Column	Description
Status	Contains an icon that represents the current status of the corresponding health indicator .
Name	The name of the health indicator associated with the asset. The date and time of the latest reading also appears in this column.
Health Indicator	Contains a gauge showing where the latest reading value stored in the Health Indicator record falls within the corresponding limit values.
Acknowledgment	If the health indicator status has been acknowledged , this column contains the icon and the status is counted as normal in the cumulative status at the top of the page. If the acknowledgment has an expiration date (i.e., if it is not a one-time acknowledgment), that date also appears in the column.

If the selected asset has no health indicators directly associated with it, this section will be empty.

3. Select the **Subsidiary Assets** tab.

The **Subsidiary Assets** subsection provides a summary of health indicators for each asset under the currently selected asset in the Asset Hierarchy.



The grid in this section contains the following columns:

Column	Description
Status	<p>Contains an icon that represents the cumulative status of health indicators associated with the selected asset and any subsidiary assets.</p> <p>Note: The cumulative status is determined by the most severe status, ranked in this order: Alert, Warning, No Reading, Normal. In addition, an alert or warning status that has been acknowledged is counted as having a normal status.</p> <p>For example, suppose that an Equipment record is linked to three Health Indicator records: one which meets the normal status criteria, one which meets the warning status criteria, and one which meets the alert status criteria, but has been acknowledged. The cumulative status of health indicators for the piece of equipment is warning.</p>
Asset	The name of a subsidiary asset. You can select the name to reload the Health Summary page in the context of that asset.
Health Indicator	Contains a bar chart that summarizes the health indicator statuses of the corresponding asset and any subsidiary assets.

If you are viewing an asset in the bottom level of the Asset Hierarchy, no content will appear in this section.

Next Steps

- [View Health Indicator Details](#)
- [View Event Information](#)
- [View Policy Information](#)
- [Manage Alerts and Recommendations](#)

About Status Criteria for Numeric Health Indicators

If a source record has numeric readings, the limits define a range of values that correspond to each health indicator status.

Status	Color	Description
Normal	Green	The reading value falls between the lower level 1 limit and the upper level 1 limit.
Warning	Yellow	<p>The reading value is less than or equal to the lower level 1 limit and greater than the lower level 2 limit.</p> <p>-or-</p> <p>The reading value is greater than or equal to the upper level 1 limit and less than the upper level 2 limit.</p>
Alert	Red	<p>The reading value is less than or equal to the lower level 2 limit.</p> <p>-or-</p> <p>The reading value is greater than or equal to the upper level 2 limit.</p>

For example, consider the following Measurement Location limit values:

- Upper Level 3 = 140
- Upper Level 2 = 130
- Upper Level 1 = 120
- Lower Level 1 = 110
- Lower Level 2 = 100
- Lower Level 3 = 90

Given these values:

- Normal = Any reading value greater than 110 and less than 120 (111 - 119)
- Warning = Any reading value greater than or equal to 120 and less than 130 (120 - 129), or less than or equal to 110 and greater than 100 (101 - 110)
- Alert = Any reading value greater than or equal to 130 (130 and above) or less than 100 (100 and below)

Note: Upper and lower level 3 limit values are not used to determine numeric health indicator statuses; instead, these values should represent the highest and lowest reading values that are expected to be recorded.

About Status Criteria for Character Health Indicators

If a source record has character readings, the specific character values defined for each limit correspond to a specific health indicator status.

Status	Color	Description
Normal	Green	The reading value is not defined in a limit value.
Warning	Yellow	The reading value matches the value defined for either of the following limits: <ul style="list-style-type: none"> • Lower Level 1 • Upper Level 1
Alert	Red	The reading value matches the value defined for any of the following limits: <ul style="list-style-type: none"> • Lower Level 2 • Lower Level 3 • Upper Level 2 • Upper Level 3

For example, consider the following Measurement Location limit values:

- Upper Level 3 = Critical
- Upper Level 2 = Poor
- Upper Level 1 = Moderate





Given these values:

- Normal = Any reading value not otherwise specified in a limit level. For example, the reading Good would result in a normal status.
- Warning = Reading value Moderate.
- Alert = Reading value Critical or Poor.

Health Indicator Status Icons

When viewing the **Asset Health Manager** page with an asset record selected in the Asset Hierarchy, a status icon appears next to each health indicator listed in the **This Asset** section and each asset listed in the **Subsidiary Assets** section.

The following icons are used to represent the various statuses of a health indicator.

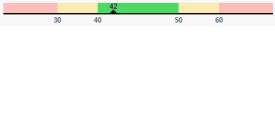
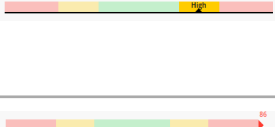
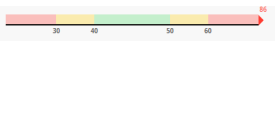

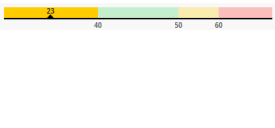
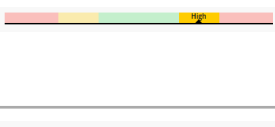
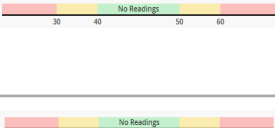
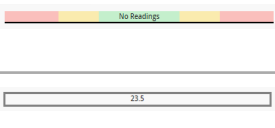
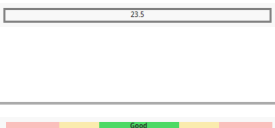

Status	Icon	Description
Normal		Indicates that the corresponding Health Indicator record meets normal status criteria.
Warning		Indicates that the corresponding Health Indicator record meets warning status criteria.
Alert		Indicates that the corresponding Health Indicator record meets alert status criteria.
No Readings		Indicates that the health indicator source record of the corresponding Health Indicator record is not associated with any reading source records. For example, if the source record is a Measurement Location record, the status icon will be gray if the Measurement Location record is not linked to any Reading records.
No limit values	No icon	For numeric health indicators, if limit values are not defined in a health indicator source record, no status will appear for the corresponding health indicator.

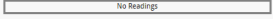
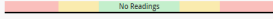

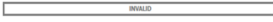
Health Indicator Gauges

When viewing the **Asset Health Manager** page with an asset record selected in the Asset Hierarchy, the **This Asset** section contains gauges showing the latest reading value stored in the Health Indicator record in respect to the corresponding limit values.

Each gauge contains various colored sections that represent the **status criteria** that the Health Indicator record could meet. The latest reading value is displayed on the gauge, along with a black pointer that identifies the status of the reading.

The gauge displays details differently depending on the limit values that are defined, the reading values that exist, and whether the health indicator has character or numeric readings. The following table summarizes these scenarios.

Scenario	Reading Type	Description	Example Gauge
Latest reading falls within defined limits.	Numeric	The latest reading is displayed proportionally to where the reading falls between the limit values.	
	Character	The latest reading is displayed in the center of the corresponding status section.	
Latest reading does not fall within defined limits.	Numeric	The latest reading is displayed with an arrow pointing off the gauge in the direction of the exceeded limit.	
	Character	The latest reading is displayed in the center of the green status section.	
A level 1 or 2 limit value is not defined for the health indicator.	Numeric	The sections in a gauge are displayed based on the limit values that are defined. The latest reading is displayed proportionally in the corresponding section if the limit values provide enough information to determine the relative position of the reading, otherwise, the reading is displayed in the center of the corresponding section.	
	Character	The latest reading is displayed in the center of the corresponding status section.	
The health indicator has no reading values associated with it, but limits have been defined.	Numeric	The text No Readings is displayed in the gauge along with the defined limit values.	
	Character	The text No Readings is displayed in the gauge.	
The health indicator has reading values associated with it, but no limits have been defined.	Numeric	The latest reading is displayed in the gauge, but no limit values are shown.	
	Character	The latest reading is displayed in the center of the green status section.	

Scenario	Reading Type	Description	Example Gauge
The health indicator has no reading values associated with it and no limits have been defined.	Numeric	The text No Readings is displayed in the gauge.	
	Character	The text No Readings is displayed in the gauge.	
Health Indicator with no Source.		The text INVALID is displayed in the gauge.	
Health Indicator with no Mapping.		The text INVALID is displayed in the gauge.	

Events

About Events in Asset Health Manager

An event is an occurrence that takes place concerning an asset, such as an inspection or a repair. The [Events section on the Asset Health Manager page](#) provides a list of events related to the currently selected asset so that you can easily access this information while [reviewing the health indicators](#) for the same asset. You can also [view events on the health indicator trend chart](#).




You can use the event information displayed in Asset Health Manager to monitor the condition of an asset, or to look for trends in the events. For example, if a health indicator has an alert status, you might review the related event information to determine the number of times that piece of equipment has operated outside of normal operating conditions, and for how long each time.

Event Source Records

The event information shown in Asset Health Manager comes from various event source records, such as Work History and Inspection records, that are linked to the selected asset record. Information in event source records is displayed in Asset Health Manager when [event mappings have been defined for the event source family](#).

Event Severities

Events in Asset Health Manager are displayed along with a severity, which is the gravity or seriousness associated with the event. The following table describes the possible event severities.

Severity	Icon	Description
Information		Routine events not affecting asset health. For example, the severity would be information if the event source record represents a routine inspection on an asset.
Warning		Events indicating a low-risk or early warning of asset health issues. For example, the severity would be warning if the event source record represents an activity that indicates that an asset is nearing its end of life.
Alert		Events indicating a high-risk or imminent warning of asset health issues. For example, the severity would be alert if the event source record represents an activity that indicates that an asset is about to fail.

Event Consolidation

You can [consolidate events](#) in Asset Health Manager in order to group duplicate events into a single event, called a master event. Master events appear in the **Health Summary** page instead of the events that you consolidate, and you can manage them as any other event record in AHM.

You can only consolidate events of the same type. When you consolidate events, the Has Consolidated Events relationship links the events that were consolidated to the new master event record that is created during the event consolidation process.

Access Event Information for an Asset

Procedure

1. On the [Asset Health Manager Overview](#) page:
 - Select **Open Health Summary**, and then select an asset in the **Asset Hierarchy** pane.
 - or-
 - In one of the lists of assets (i.e., **No Status**, **Normal**, **Warning**, or **Alert**), select an asset name.

The **Health Summary** page appears.

2. Select the **Events** tab.

The **Events** section appears. The number on the **Events** tab represents the number of [events](#) associated with the selected asset. The boxes below the tab summarize the [severities](#) of these events.

~ NO.1 STEAM REHEATER ~ HXST 152

5 Indicators 0 Risks **21 Events** 3605 Policies

19 Information 1 Warning 1 Alert

SEVERITY	NAME	TYPE	START DATE	END DATE	CONSOLIDATED BY
	Severity 3	GE Tag Event	08/01/2016 15:30:02		
	Severity 2	GE Tag Event	08/01/2016 15:29:02		
	~2015-01-19 10:00:00-EVENT PROC	Production Event	01/19/2015 20:30:00	01/19/2015 21:30:00	
	AQA test	Policy Event	01/06/2015 10:30:00	01/07/2015 10:30:00	
	CAL0000000345 ~	Calibration, Weight Scale	01/01/2015 23:39:53	01/03/2015 23:39:53	
	INSP-24	API 653 Internal Checklist	01/01/2015 10:30:00		
	CAL0000000344 ~	Calibration, Discrete	05/01/2013 22:39:19	05/01/2013 22:39:19	

The grid displays event information that is associated with the selected asset. This information is stored in [event source records](#), and is displayed according to the [event mappings have been defined for the event source families](#).

The grid contains the following columns:

- **Severity** : Contains an icon that represents the [severity](#) of the event.
- **Name** : The name of the event. You can select the event name to open the corresponding event record in Record Manager.
- **Description** : The description of the event.
- **Type** : The family caption of the corresponding event source family.
- **Start Date** : The time that is associated with the beginning of the event.
- **End Date** : The time that is associated with the end of the event.
- **Consolidated Events** : If the event is a master event, the number of [events that were consolidated](#) to create the master event. This column is blank if the event is not a master event.

Note: By default, rows are sorted by the **Start Date** column, with the most recent event at the top.

- Optionally, you can filter the events that are displayed.

To filter by severity, type, or date range:

- Select .

The **Filters** menu appears.

- Specify criteria by which you want to filter the events.

The grid is refreshed and displays events according to your selections.

- Select any area of the page to close the **Filters** menu.

To filter by name or description:

- Select .

A search box appears.

- Enter the values by which you want to filter the events.

The grid is refreshed and displays the events that contain the specified values in either the **Name** or **Description** column.

- Select any area of the page to close the search box.

Consolidate Events


Before You Begin

Ensure that the family in which you want to consolidate events has been [configured to allow event consolidation](#).

Procedure


1. [Access event information for an asset](#).

The **Events** section appears.

2. Select two or more events of the same type (i.e., in the same event family).
3. Select .

The **Consolidate Events** window appears. This window contains a list of the events being consolidated and the details that will be included in the master event. Various fields are populated automatically.

Consolidate Events



Date/Time 

Type

Name

Severity

Description

<input type="checkbox"/>	SEVERITY	NAME	DESCRIPTION	TYPE	START DATE	END DATE	CONSOLIDATED
<input type="checkbox"/>		Severity 5	Active	GE Tag Event	08/01/2016 15:32:01		
<input type="checkbox"/>		Severity 4	Active	GE Tag Event	08/01/2016 15:31:00		

4. Modify the values in any field as necessary.
5. If necessary, adjust the list of events being consolidated.
6. Select **Save**.

The selected events are consolidated into a single, master event of the same event type. In the grid, the **Consolidated Events** column in the row for the master event shows the number of events that were consolidated.

Results

- A new record of the selected type is created in the APM database.
- The event records that were consolidated are linked to the newly created master event record.
- The master event appears in the **Health Summary** page instead of the events that you consolidated.

Risks

Access Risk Information for an Asset

Procedure

1. On the **Asset Health Manager Overview** page,
 - Select **Open Health Summary**, and then select an asset in the **Asset Hierarchy** pane.
 - or-
 - In one of the lists of assets (i.e., **No Status**, **Normal**, **Warning**, or **Alert**), select an asset name.

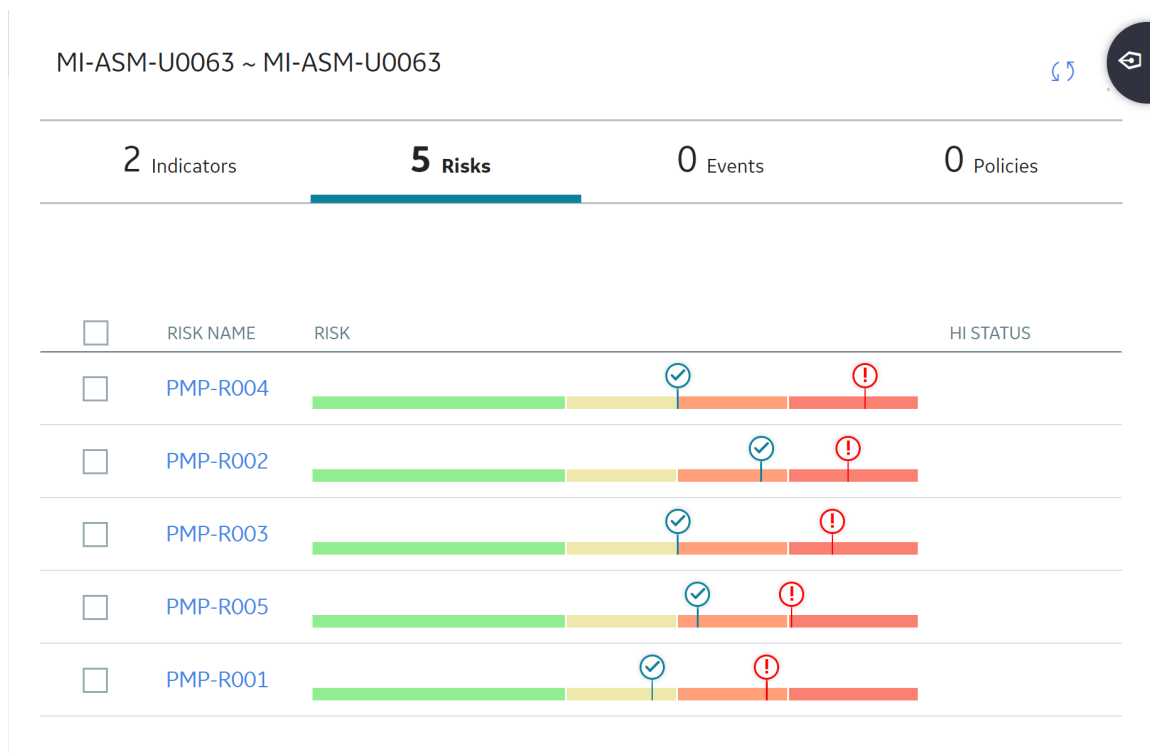
The **Health Summary** page appears

2. Select the **Risks** tab.

Note: The **Risks** tab is available only if the license for Asset Strategy Management is active and you are assigned to one of the following Security Groups, or a Role that includes one of them: MI ASM Analyst, MI ASM Administrator, MI ASM Reviewer, or MI ASM Viewer.

The **Risks** section appears. The information displayed in this section originates from Asset Strategy Management.

The number on the **Risks** tab represents the number of Risks associated with the selected asset (i.e., the number of Risks associated with an Active Strategy that is associated the asset).



MI-ASM-U0063 ~ MI-ASM-U0063

2 Indicators **5 Risks** 0 Events 0 Policies

<input type="checkbox"/>	RISK NAME	RISK	HI STATUS
<input type="checkbox"/>	PMP-R004		
<input type="checkbox"/>	PMP-R002		
<input type="checkbox"/>	PMP-R003		
<input type="checkbox"/>	PMP-R005		
<input type="checkbox"/>	PMP-R001		

The grid contains the following columns:

- **Risk Name** : The name of the Risk. You can select the Risk name to open the **Risks and Actions** workspace for the corresponding strategy in Asset Strategy Management.
- **Risk**: Contains a bar chart that summarizes the information for each Risk in the Asset Strategy. The colors and thresholds on the bar chart correspond to the Risk Matrix used to assess the Risk and the markers show the Unmitigated Risk Rank (🚨) and the Strategy Mitigated Risk Rank (✅).
- **HI Status**: The cumulative **status** of any health indicators that implement Actions that mitigate the Risk.

Note: The cumulative status is determined by the most severe status, ranked in this order: Alert, Warning, No Reading, Normal. In addition, an alert or warning status that has been **acknowledged** is counted as having a normal status.

For example, suppose that an Equipment record is linked to three Health Indicator records: one which meets the normal status criteria, one which meets the warning status criteria, and one which meets the alert status criteria, but has been acknowledged. The cumulative status of health indicators for the piece of equipment is warning.

You can select the text in this column to display the **Health Indicators for <Risk Name>** window, which contains a grid of the health indicators and their statuses, as shown in the following image.

Health Indicators for Disk/blade joint cracking - RCM FMEA Failure Effect



1 - 2 of 2 record(s)

Name	Health Indicator	HI Status
Low Frequency Vibration Amplitude		
Dye Penetrant Inspection		

OK

Policy Instances



Access Policy Instance Information

Procedure



1. On the **Asset Health Manager Overview** page:
 - Select **Open Health Summary**, and then select an asset in the **Asset Hierarchy** pane.
 - or-
 - In one of the lists of assets (i.e., **No Status**, **Normal**, **Warning**, or **Alert**), select an asset name.
2. Select the **Policies** tab.




Note: The **Policies** tab is available only if the license for Policy Designer is active.













The **Policies** section appears. The number on the **Policies** tab represents the number of policy instances associated with the selected asset. The boxes below the tab summarize whether these policy instances are active or inactive.

PDC0003SV-097 ~ MISCELLANOUS FIXED EQUIPMENT ~ 0000000000010579...  

6 Indicators 0 Risks 0 Events **14 Policies**

 1 Active  13 Inactive

<input type="checkbox"/>	INSTANCE I...	POLICY	LAST EXECUTION
<input type="checkbox"/>	 Instance 2	 BIGfootPolicy	
<input type="checkbox"/>	 Instance 2	 eventRecord	05/26/2016 14:31:58 Created event named Event load for asset PDC0003SV-097 ~ MISCELLANOUS FIXED EQUIPMENT ~ 000000000001057929 .
<input type="checkbox"/>	 Instance 3	 eventRecord	05/26/2016 14:31:58 Created event named Event load for asset PDC0003SV-097 ~ MISCELLANOUS FIXED EQUIPMENT ~ 000000000001057929 .
<input type="checkbox"/>	 Instance 3	 eventRecord1	
<input type="checkbox"/>	 Instance 4	 eventRecord	05/26/2016 14:31:58 Created event named Event load for asset PDC0003SV-097 ~ MISCELLANOUS FIXED EQUIPMENT ~ 000000000001057929 .
<input type="checkbox"/>	 Instance	 eventRecord	05/26/2016 14:31:58 Created event named Event load for asset PDC0003SV-

The grid provides information about each policy instance associated with the selected asset. The grid contains the following columns:

- **Instance ID** : Contains the name of a policy instance and an icon to show whether the instance is active (💡) or inactive (💡).
- **Policy** : Contains the name of the policy that includes the policy instance, and an icon to show whether the policy is active (💡) or inactive (💡). You can select a policy name to open it in Policy Designer.
- **Last Execution** : Contains the date and time of the last time that the policy instance was executed, and a summary of that execution.

Note: By default, rows are sorted by the **Last Execution** column, with the most recent execution at the top.

Next Steps

- [Activate or Deactivate a Policy Instance from AHM](#)

Activate or Deactivate a Policy Instance from Asset Health Manager


About This Task

Procedure


1. In Asset Health Manager, [access the policy instance information](#) for the asset whose related policy instance(s) you want to activate or deactivate.
2. Select the check box in the row for each policy instance that you want to activate or deactivate.

Note: You can select the check box in the grid heading to select all of the policy instances.

3. Above the grid, select  to activate the selected policy instances.

Note: If a policy instance is not fully configured (indicated by the red ), it will not be activated.

-or-

Select  to deactivate the selected policy instances.

Results

- If you activated a policy instance, the instance will be executed according to the policy's execution settings.

Note: The corresponding policy must also be active in order for a policy instance to be executed. You can activate policies from Policy Designer.

- If you deactivated a policy instance, the instance will not be executed.

Chapter 4

Health Indicator Details

Topics:

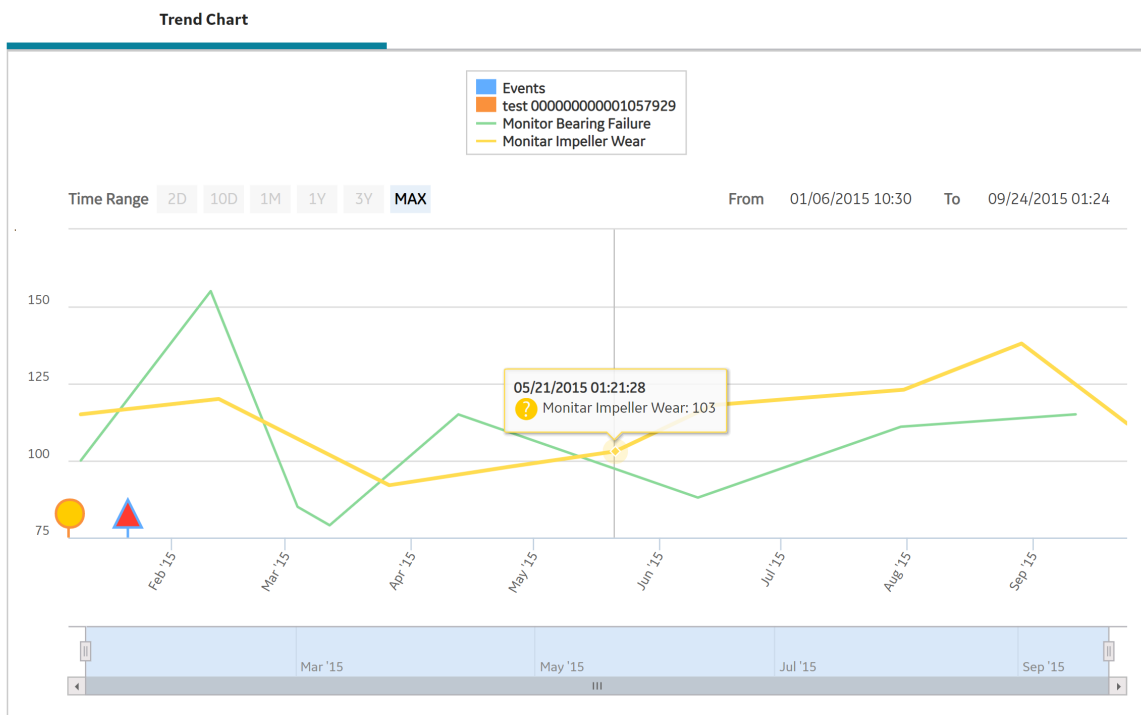
- [About the Health Indicator Trend Chart](#)
- [Access Trend and Details for Single Health Indicator](#)
- [Access Trend for Multiple Health Indicators](#)
- [Display Events on the Trend Chart](#)
- [Modify Health Indicator Source Information](#)

About the Health Indicator Trend Chart

The **Trend Chart** workspace contains a graph that plots the readings values associated with a health indicator source. Specifically:

- If a health indicator source is a record other than a Content Map record, the graph displays a history of reading values that are stored in reading source records.
- If a health indicator source is a Content Map record, the graph displays a history of reading values that were collected by the process historian, assuming the following conditions have been met:
 - A connection to the OT Source is available.
 - The OT Source for the Content Map record provides access to historical data.

The following image shows an example of the graph when accessed for a [multiple health indicators](#).



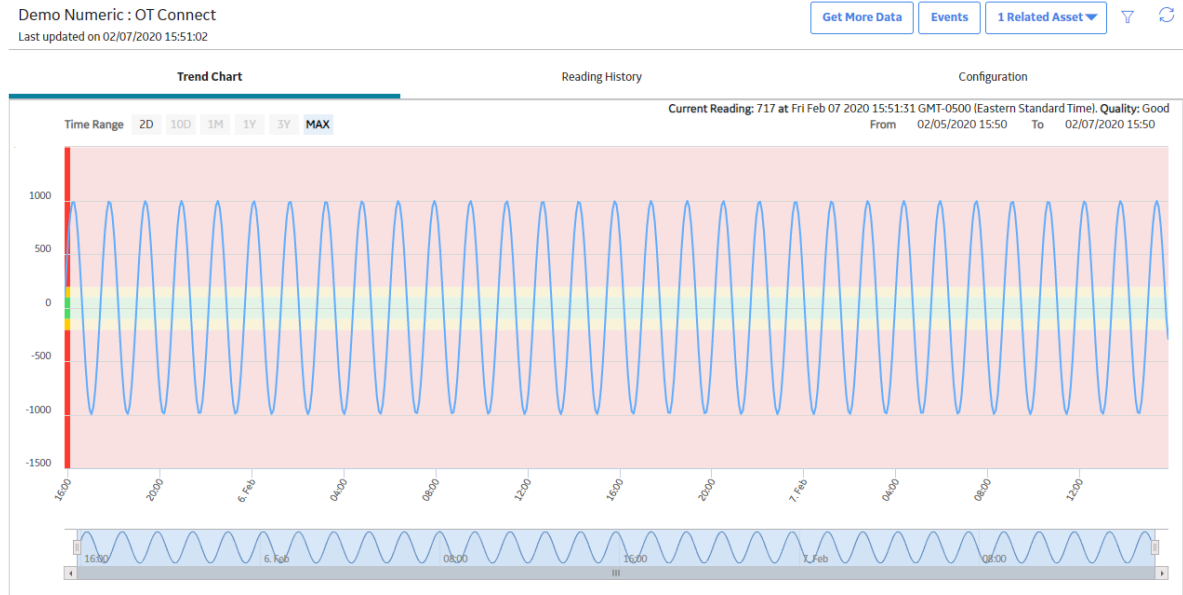
Numeric readings values are plotted on a line graph, while Character readings appear as circle markers along the x-axis. When you point to a line or marker, details of the reading and the related [health indicator status](#) appear, as shown in the preceding image.

The secondary graph below the main graph allows you to change the view of the main graph. You can shrink or expand the view by dragging the left or right border of the shaded area. You can drag the shaded area itself to show a different section of the main graph.

By default, the amount of reading data shown is based on the following criteria:

- If the health indicator source is a record other than a Content Map record, the readings for the previous 12 months will be displayed on the graph, up to a maximum of 10,000 readings. If more than 10,000 readings exist, a message appears indicating that the data has been truncated, and asks whether or not you want to see more data.

- If the health indicator source is a Content Map record, the readings for the previous two days will be displayed on the graph, up to a maximum of 100,000 readings. To view additional data, you can:
 - Select the **Get More Data** button to download additional data in 2-day increments, up to a maximum of 100,000 readings at a time.
 - Specify a specific time range to download additional data, up to a maximum of 100,000 readings.
 - For character health indicators, if a specific time range has more than 10,000 readings you are prompted to confirm if want to get more readings or not. You will not receive the prompt message after the maximum limit of 100,000 readings is reached.



Accessing the Trend Chart for Single vs. Multiple Health Indicator Sources

Depending upon how you access the **Trend Chart** workspace, some additional features are available.

When you [access the Trend Chart workspace for a single health indicator source](#):

- The shaded areas of the graph show the health indicator [limit values and corresponding status colors](#).
- If the health indicator source is a Content Map record, the value, timestamp, and quality of the Current Reading (Last Reading) from the process historian appear above the graph. If Current Reading: Unavailable appears, it may mean that a connection to the process historian could not be established or that the information requested does not exist.

When you [access the Trend Chart workspace for multiple health indicator sources](#), you can select the health indicator name in the graph legend to show or hide individual trend lines.

Viewing Events on the Trend Chart

When you [display events on the trend chart](#), triangle markers showing when each event occurred appear for each event along the x-axis of the graph.



The color of each marker corresponds to the [severity](#) of the event. You can point to a marker to show details of the event.

Access Trend and Details for Single Health Indicator

About This Task

This topic describes how you can access details (i.e., trend chart of health indicator readings, reading history, and health indicator source configuration) for a single health indicator. You can alternately [view a trend chart for multiple health indicators related to the same asset](#).

Procedure

1. On the [Health Summary page](#), in the **This Asset** subsection, select the check box next to a health indicator, and then select .

-or-

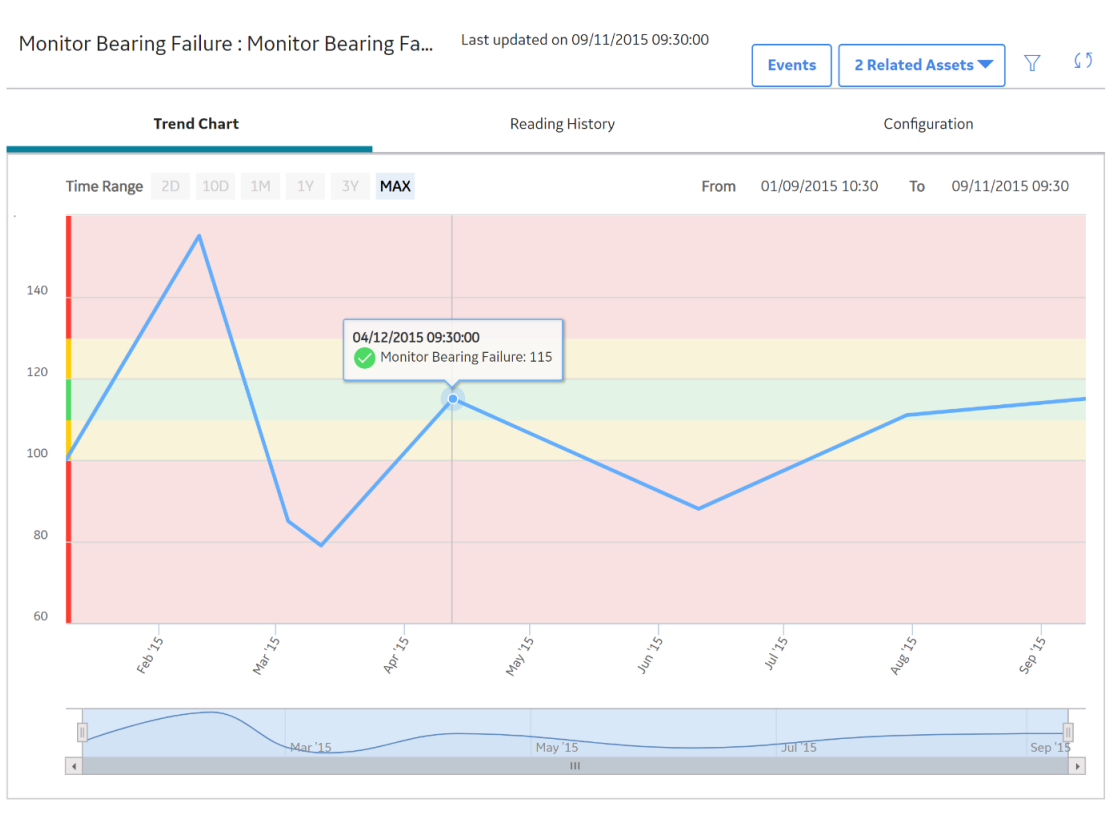
On the [Asset Health Manager Overview page](#), select a health indicator name in one of the overview lists (i.e., No Status, Normal, Warning, or Alert).

The **<Health Indicator Name>:<Description>** page appears.

Note: If you select more than one health indicator, the [Multiple Health Indicators page](#) appears instead.

The date and time that the health indicator was last updated appears under the page heading and a link to open the **Health Summary** page for the related asset(s) appears on the right side of the page.

The **Trend Chart** workspace is displayed, which contains a [trend chart](#) showing how the health indicator readings have fluctuated over time.



2. Select the **Reading History** tab.

The **Reading History** workspace appears, which displays the [status](#), timestamp, and value of each reading for the selected health indicator.

2 Related Assets ▼



Trend Chart		Reading History	Configuration
STATUS	DATE/TIME	VALUE	
✓	09/11/2015 09:30:00	115	
✓	07/30/2015 09:30:00	111	
!	06/10/2015 09:30:00	88	
✓	04/12/2015 09:30:00	115	
!	03/11/2015 17:30:00	79	
!	03/03/2015 19:30:00	85	
!	02/10/2015 10:30:00	155	
!	01/09/2015 10:30:00	100	

Note:

- If the health indicator source is a Content Map record, the reading values displayed in the grid are directly from the process historian.
 - By default, rows are sorted by the **Date/Time** column, with the most recent reading at the top.
3. Select the **Configuration** tab.
 The **Configuration** workspace appears, which displays the name, description, and limit values for the health indicator. [You can optionally modify some of these values.](#)

Health Indicator Name

Description

Datasheet ID:
  **Site:** Global

Identification	Limit Values	Actions	
	Numeric	Character	Message
Upper Level 3	<input type="text" value="140"/>	<input type="text"/>	<input type="text" value="Text input"/>
Upper Level 2	<input type="text" value="130"/>	<input type="text"/>	<input type="text" value="Text input"/>
Upper Level 1	<input type="text" value="120"/>	<input type="text"/>	<input type="text" value="Text input"/>
Lower Level 1	<input type="text" value="110"/>	<input type="text"/>	<input type="text" value="Text input"/>

Next Steps

- [Access or Modify Health Indicator Source Information](#)

Access Trend for Multiple Health Indicators


About This Task

This topic describes how you can view a trend chart showing readings for multiple health indicator sources related to the same asset. To view a table of reading history and the health indicator source configuration for a particular health indicator, you must [access the health indicator details for the single health indicator](#).

Procedure

1. On the **Health Summary** page, in the **This Asset** subsection, select the check boxes next to the health indicators whose readings you want to view on a trend chart.

Note: You cannot view the trends for more than 10 health indicator sources at one time.

2. Above the grid, select .

The **Multiple Health Indicators** page appears.

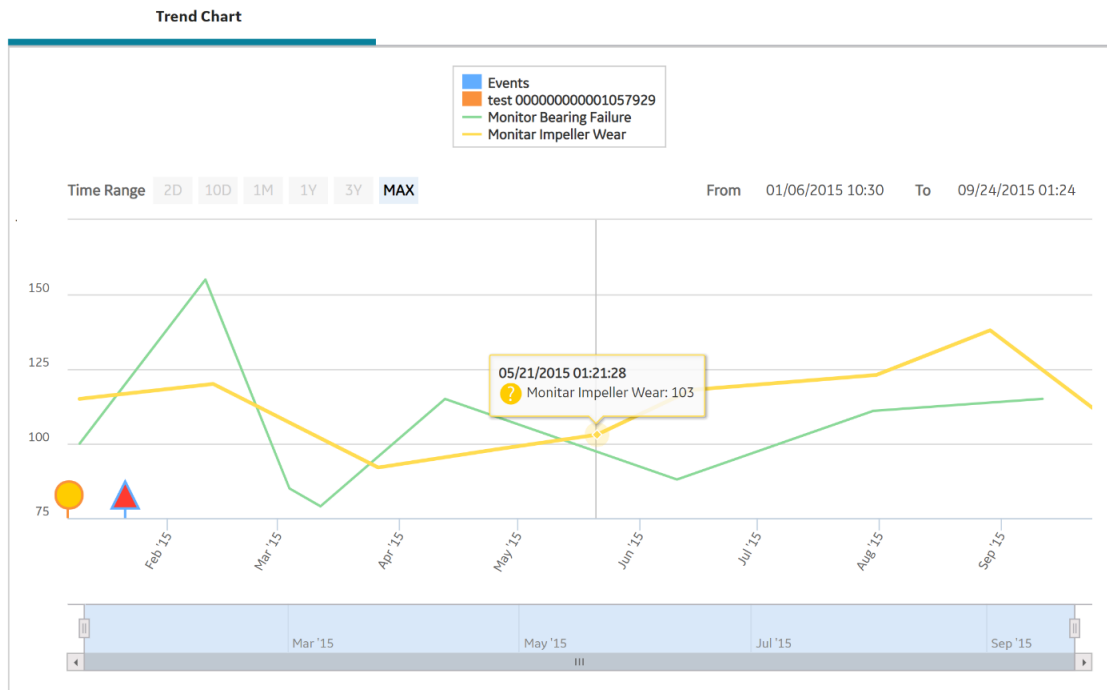
Note: If you select just one health indicator, the **<Health Indicator Name>:<Description>** page appears instead.

This page contains a [trend chart](#) showing how the health indicator readings have fluctuated over time.

Multiple Health Indicators

Events

1 Related Asset



Display Events on the Trend Chart

About This Task

Note: The **Trend Chart** workspace can display a maximum of 500 events.

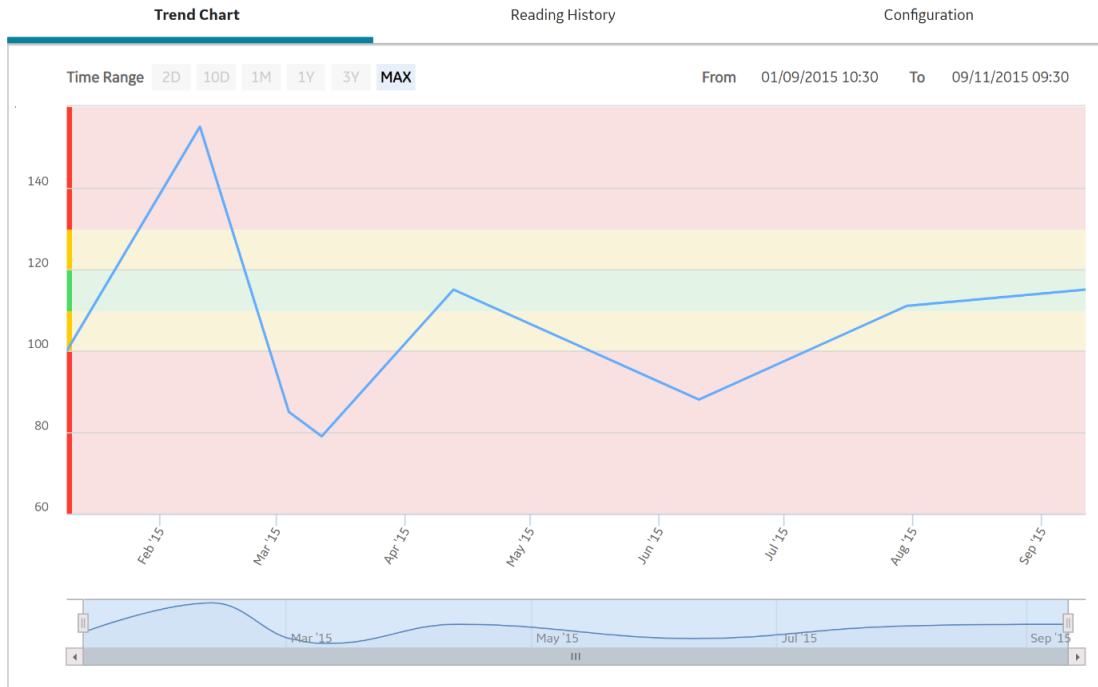
Procedure

1. Access the **Trend Chart** workspace in one of the following ways:
 - [For a single health indicator.](#)
 - [For multiple health indicators.](#)
 - From another area of APM, such as Rounds Designer or OT Connect.

The **Trend Chart** workspace appears.

Events

2 Related Assets



2. Select the **Events** button.

The **Events Displayed on Trend** window appears.

Events Displayed on Trend ✕

Filters

Severity

Alert Warning Information

Event Types Select All


AQA Event
 Calibration
 Event
 Inspection
 Policy Event

3. Select the check boxes for the types and severity of events that you want to see on the graph.
4. Select **OK**.

Triangle markers showing when each event occurred appear for each event along the x-axis of the graph.



The color of each marker corresponds to the severity of the event. You can point to a marker to show the details of the event.

5. Optionally, to modify the date range on the **Trend Chart** workspace, select . The **Filters** menu appears.
6. As necessary, in the **Date Range** section, enter dates in the **From** and **To** boxes, and then select **Apply**.
Events are displayed based on the selected date range.

Modify Health Indicator Source Information

Procedure

1. [Access the health indicator details](#) for the health indicator whose source information you want to view or modify.
2. Select the **Configuration** tab.

The **Configuration** workspace appears. The top of the workspace contains the name and description of the health indicator. The bottom of the workspace contains one of the following:


- For a health indicator with a [source](#), the bottom of the workspace contains the read-only datasheet of the health indicator source record.
- For a health indicator without a [source](#), the bottom of the workspace contains text boxes where you can modify the limit values for the health indicator.

Health Indicator Name

Description

Datasheet ID:
   Site: Global

Identification	Limit Values	Actions	
	Numeric	Character	Message
Upper Level 3	<input type="text" value="140"/>	<input type="text"/>	<input type="text" value="Text input"/>
Upper Level 2	<input type="text" value="130"/>	<input type="text"/>	<input type="text" value="Text input"/>
Upper Level 1	<input type="text" value="120"/>	<input type="text"/>	<input type="text" value="Text input"/>
Lower Level 1	<input type="text" value="110"/>	<input type="text"/>	<input type="text" value="Text input"/>

3. Modify any values that you want to change.
Note: If you want to modify limit values for a health indicator with a source, you must do so by accessing the source record in Record Manager.
4. Select  to save any changes.

Chapter 5

Recommendations

Topics:

- [About Acknowledgments and Recommendations in AHM](#)
- [Access Recommendations in Asset Health Manager](#)
- [Create a Recommendation Based on Health Indicator Status](#)
- [Create a Recommendation Based on an Event](#)

About Acknowledgments and Recommendations in AHM

As you view and analyze health information for an asset, you can use recommendations and acknowledgments to manage health indicators with [warning or alert statuses](#).

Recommendations

While viewing any asset on the **Health Summary** page, you can review existing performance recommendations related to the asset or create a new General Recommendation based on either a health indicator status or on an event.

When you [create a new recommendation based on a warning or alert health indicator status](#), it is linked automatically to the related asset and populated with various information about the health indicator and asset. Likewise, when you [create a new recommendation based on an event](#), it is linked automatically to the related asset and populated with various information about the event and asset.

Note: Recommendations will be linked to the corresponding records only if a relationship definition is defined between the General Recommendation family and the respective asset family.

Acknowledgments

You can [acknowledge a warning or alert status](#) of a health indicator in order to temporarily suppress the negative status indication where cumulative statuses are displayed on the **Health Summary** and **Asset Health Manager Overview** pages. When you acknowledge a health indicator status, the information displayed for the individual health indicator will show the actual warning or alert status, but the status will be counted as normal when a cumulative status or status summary including that health indicator is determined.


By acknowledging alerts and warnings, you can notify other users that the conditions causing the negative status have been reviewed. Typically, you would acknowledge a warning or alert after analyzing the cause and creating a recommendation to address the issue.

You can specify that an acknowledgment is one-time, which will suppress the warning or alert only until a new reading is added to the health indicator, or that it lasts until a certain date. If you specify that it lasts until a certain date, the warning or alert will be suppressed until a new reading is added after the expiration date, regardless of any warning or alert readings that are added in the meantime, or until the health indicator returns to normal status. For example, you could acknowledge an alert status and specify that the acknowledgment is valid until the target completion date for a related recommendation that addresses the underlying cause of the alert condition.

Access Recommendations in Asset Health Manager

About This Task

Procedure

1. [Access the Health Summary page](#).
2. Select the asset whose related performance recommendations you want to view.
3. On the upper-right side of the page, select .

The **Recommendations** pane appears, displaying a list of recommendations related to the selected asset.

4. Select a recommendation in the list to view additional details.


Tip: For information about additional options available when working with the Recommendation records, refer to the Action Management section of the documentation.

Next Steps

- [Create a Recommendation Based on Health Indicator Status](#)
- [Create a Recommendation Based on an Event](#)

Create a Recommendation Based on Health Indicator Status


Procedure

1. Access the [Health Summary](#) page.
2. In the **This Asset** subsection, select the check box next to the health indicator(s) based upon which you want to create a recommendation.
3. Above the grid, select .

The **Recommendations** pane appears, displaying the datasheet for a new General Recommendation with some fields populated automatically.

For each selected health indicator, the following information is populated in the Recommendation Description field: Health Indicator Name> ~ <Alert Status> ~ <Current Reading Date> ~ <Current Reading>.

Note: If you selected multiple health indicators, the recommendation will be populated with information for only those with warning or alert statuses.

4. As necessary, provide additional details to complete the recommendation.
5. Select .

If you created the recommendation for at least one health indicator with an alert or warning status and the status has not already been acknowledged, the **Acknowledge Health Indicator** dialog box appears.

6. If you want to acknowledge the warning or alert status of the health indicator(s) for which you created the recommendation, select **Yes**. The **Acknowledge** window appears, where you can [complete the acknowledgment](#).

Note: The acknowledgment will apply only to the health indicators whose statuses have not already been acknowledged.

-or-

If you do not want to acknowledge the status, select **No**.

7. To close the **Recommendations** pane, select .

Results

A General Recommendation record is added to the APM database and linked to the selected asset.

Next Steps


- [Access, Modify, or Revoke an Acknowledgment](#)

Create a Recommendation Based on an Event

Before You Begin


Ensure that a relationship definition exists between the General Recommendation family and the asset family associated with the event for which you want to create a recommendation.

Procedure

1. Access [the Events section](#) of the **Health Summary** page.
2. Select the check box next to the event for which you want to create a recommendation.
3. Above the grid, select .

The **Recommendations** pane appears, displaying the datasheet for a new General Recommendation record with some fields populated automatically.

The following information is populated in the **Recommendation Description** field: <Event Name> ~ <Event Description> ~ <Severity> ~ <Event Start Date> ~ <Event End Date>.

4. As necessary, provide additional details to complete the recommendation.
 5. Select .
- The recommendation is saved.

6. To close the **Recommendations** pane, select .

Results

A General Recommendation record is added to the APM database and linked to the selected asset.

Chapter 6

Alert Acknowledgements

Topics:

- [About Acknowledgments and Recommendations in AHM](#)
- [Acknowledge Alerts and Warnings](#)
- [Access, Modify, or Revoke an Acknowledgment](#)

About Acknowledgments and Recommendations in AHM

As you view and analyze health information for an asset, you can use recommendations and acknowledgments to manage health indicators with [warning or alert statuses](#).

Recommendations

While viewing any asset on the **Health Summary** page, you can review existing performance recommendations related to the asset or create a new General Recommendation based on either a health indicator status or on an event.

When you [create a new recommendation based on a warning or alert health indicator status](#), it is linked automatically to the related asset and populated with various information about the health indicator and asset. Likewise, when you [create a new recommendation based on an event](#), it is linked automatically to the related asset and populated with various information about the event and asset.

Note: Recommendations will be linked to the corresponding records only if a relationship definition is defined between the General Recommendation family and the respective asset family.

Acknowledgments

You can [acknowledge a warning or alert status](#) of a health indicator in order to temporarily suppress the negative status indication where cumulative statuses are displayed on the **Health Summary** and **Asset Health Manager Overview** pages. When you acknowledge a health indicator status, the information displayed for the individual health indicator will show the actual warning or alert status, but the status will be counted as normal when a cumulative status or status summary including that health indicator is determined.

By acknowledging alerts and warnings, you can notify other users that the conditions causing the negative status have been reviewed. Typically, you would acknowledge a warning or alert after analyzing the cause and creating a recommendation to address the issue.


You can specify that an acknowledgment is one-time, which will suppress the warning or alert only until a new reading is added to the health indicator, or that it lasts until a certain date. If you specify that it lasts until a certain date, the warning or alert will be suppressed until a new reading is added after the expiration date, regardless of any warning or alert readings that are added in the meantime, or until the health indicator returns to normal status. For example, you could acknowledge an alert status and specify that the acknowledgment is valid until the target completion date for a related recommendation that addresses the underlying cause of the alert condition.

Acknowledge Alerts and Warnings

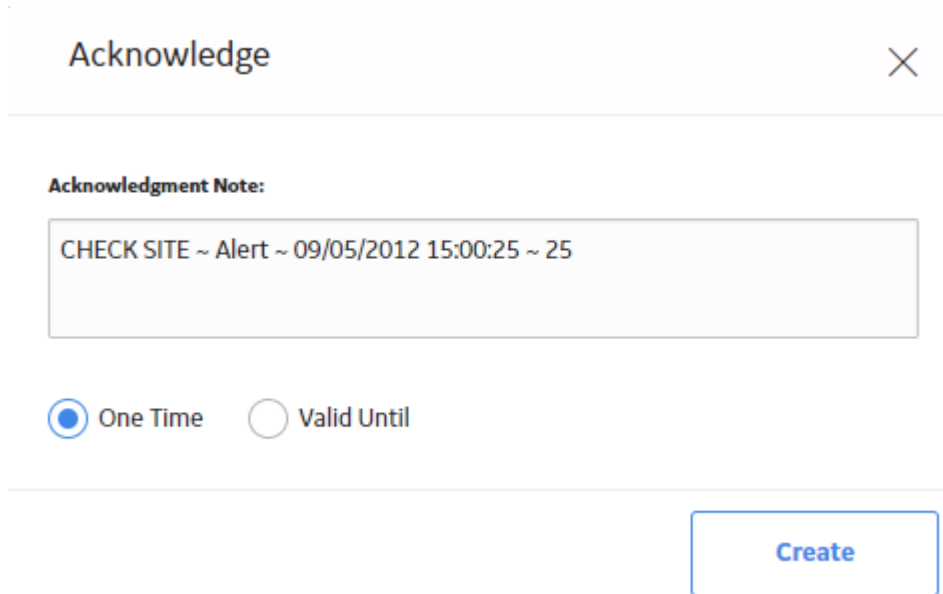
Procedure

1. [Access the Health Summary page](#).
2. In the **This Asset** subsection, select the check box next to each health indicator whose status you want to acknowledge.

Note: If you select health indicators with no readings, with a normal status, or whose status has already been acknowledged, only the health indicators with warning or alert statuses will be acknowledged.

3. Above the grid, select .

The **Acknowledge** window appears.



4. Optionally, in the **Acknowledgment Note** box, enter comments.
5. If you want the acknowledgment to remain valid only until a new reading is added, select the **One Time** check box.

-or-

If you want to set an expiration date for the acknowledgment, select the **Valid Until** check box, and then select an expiration date from the calendar.

6. Select **Create**.

Results

The ✓ icon is added to the **Acknowledgment** column to indicate that the status of the health indicator will count as normal until a new reading is added or until the acknowledgment expires, depending on your selection.

Note: The [status icon and the gauge](#) displayed for the individual health indicator will still show the actual warning or alert status.

Next Steps

- [Access, Modify, or Revoke an Acknowledgment](#)

Access, Modify, or Revoke an Acknowledgment

Procedure

1. [Access the Health Summary page](#) that includes the health indicator whose acknowledgment you want to view, modify, or revoke.
2. In the **This Asset** subsection, select the check box next to the acknowledged health indicator.
3. Select ✓.

The **Acknowledge** window appears.

Acknowledge ×

Acknowledgment Note:

Recommendation REC-34421 created for special inspection.

One Time Valid Until

Revoke **Update**

4. If you want to revoke the acknowledgment, select **Revoke**. In the confirmation box that appears, select **OK**.

-or-

If you want to modify the values, make any changes, and then select **Update**.

Results

If you revoked the acknowledgment, the ✓ icon is removed from the **Acknowledgment** column and the actual warning or alert status of the health indicator is once again counted in any cumulative status calculations.

Chapter 7

Admin

Topics:

- [Event Mapping](#)
- [Health Indicator Source Management](#)

Event Mapping

About Event Mapping

Event Mapping enables you to configure the information that is displayed in the **Events** section in Asset Health Manager, as well as whether event records can be consolidated. For more information about events, see the [end user documentation for Asset Health Manager](#).

Access the Event Mapping Workspace

About This Task

Super Users and members of the MI AHM Administrator Security Group can use the **Event Mapping** workspace to customize the information that is displayed in the **Events** section in Asset Health Manager, as well as whether event records can be consolidated. For more information about events, see the [end user documentation for Asset Health Manager](#).

Procedure

In the module navigation menu, select **Admin > Application Settings > Asset Health Manager**. The **AHM Admin** page appears, displaying the **Event Mapping** workspace.

The screenshot shows the 'Event Mapping' workspace in the 'AHM Admin' application. The page title is 'Event Mapping' with a subtitle 'Configure the event information displayed in Asset Health Manager' and an 'Add Mapping' button. The 'Mapped Family' is set to 'AMS Asset Alert' with 'Save' and 'Delete' buttons. The 'Allow event consolidation?' section has 'Yes' selected. The 'Event Fields' section contains several dropdown menus: '*Event Relationship' (Has Tag Alert), '*Start Time Field' (Date/Time), 'End Time Field' (Date/Time), 'Name Field' (AMS Asset ID), 'Description Field' (Description), 'Has Duration Field' (Active?), 'Severity Field' (Severity), and '*Default Severity' (Information). At the bottom, 'Event Severities' shows 'Alert' mapped to 'Communication Failure'.

The family selected in the **Mapped Family** box indicates the family that is being mapped as a source event family.

The **Allow event consolidation?** selection specifies whether or not you want to allow events for this family to be [consolidated](#).

Note: In order for events to be consolidated, the Has Consolidated Events relationship must also be configured for this family.

The **Event Fields** section contains the following boxes:

- **Event Relationship:** Specifies the relationship that links the asset to the source event record.
- **Start Time Field, End Time Field, Name Field, Description Field, and Severity Field:** Specifies fields in the source event record whose values are displayed in the **Events** section of [Asset Health Manager](#).

- **Has Duration Field:** Specifies the field in the source event record that indicates whether the event has a duration.
- **Default Severity:** Specifies the severity that is associated with the source event record if the value in the specified **Severity Field** does not contain a specifically defined **Mapped Severity Code**.



The **Event Severities** section specifies the severity that is associated with specific values in the specified **Severity Field** of the source event family. The severity is shown as an icon representing Information, Warning, or Alert in the **Events** section in Asset Health Manager.

Event Severity

For example, based on the event severity mappings shown in the preceding image, when the Severity field in a Policy Event record contains the value WRN, the Warning icon is displayed in the **Events** section of Asset Health Manager. If the Severity field in a Policy Event record contains a value other than INF, WRN, or ALT, the default severity will be used (i.e., Information).

Modify Event Mappings

Procedure

1. Access the [Event Mapping workspace](#).
2. In the **Mapped Family** box, select the family whose event mappings you want to modify.
3. Modify the values as necessary.
4. If you want to add or delete an event severity, use  or  respectively.
5. Select **Save**.

Results

Events are displayed in the [Events section of Asset Health Manager](#) according to the values you specified.

Create a New Event Mapping

About This Task

Super Users and members of the MI AHM Administrator Security Group can use the [Event Mapping workspace](#) to customize the information that is displayed in the **Events** section in Asset Health Manager. For more information about events, see the [end user documentation for Asset Health Manager](#).

Procedure

1. Access the [Event Mapping workspace](#).
2. Select **Add Mapping**.
Boxes that you can use to specify a new event mapping appear.
3. In the **Mapped Family** box, select the family whose event information you want to appear in Asset Health Manager.


Note: The family that you select must:

- Have a relationship to a family in the asset hierarchy.
 - Contain a date/time field that can be mapped to the **Start Time Field**.
4. In the **Allow event consolidation?** section, specify whether or not you want to allow events for this family to be [consolidated](#).

Note: In order for events to be consolidated, the Has Consolidated Events relationship must also be configured for this family. Also, Asset Health Manager users who will perform event consolidation must belong to a Security Group that includes Insert and Update privileges on the family.

5. In the **Event Relationship** box, select the relationship family that links the asset to the source event record.
6. In the following boxes, select the field in the source event record whose values you want to display in the **Events** section of Asset Health Manager:
 - **Start Time Field**
 - **End Time Field**
 - **Name Field**
 - **Description Field**
 - **Severity Field**

Note: For performance reasons, you cannot map long text fields to these fields.

7. In the **Default Severity** box, select the severity that should be associated with the source event record if the value in the specified **Severity Field** does not contain a specifically defined **Mapped Severity Code**.
8. Define event severities for specific values as necessary. To do so:
 - a) In **Event Severities** heading, select .
 - Boxes that you can use to specify a severity appear.
 - b) In the **Select Severity code...** box, select the type of severity you want to define.
 - c) In the **Mapped Severity Code** box, enter the value that corresponds to the selected severity.
9. Select **Save**.

Delete an Event Mapping

Procedure

1. Access the **Event Mapping** workspace.
2. In the **Mapped Family** box, select the family whose event mappings you want to delete.
3. Select **Delete**.

About the Baseline Event Mappings

The baseline APM database contains Event Mapping records to define event mappings for the following event source families:

- AMS Asset Alert
- AMS Asset Event
- Calibration subfamilies
- GE Tag Event
- Inspection family and the following Inspection subfamilies
 - Bundle Inspection
 - Full Inspection
 - General Inspection
 - Pressure Test Inspection
- Checklists subfamilies
 - API 510 External Checklist
 - API 510 Internal Exchanger

- API 510 Internal Exchanger Checklist
- API 570 External Checklist
- API 653 External Checklist
- API 653 Internal Checklist
- External PRD Checklist
- Policy Event
- Production Event
- Work History

The tables in this topic list the baseline event mappings for each of these families.

Note:

- The tables list the field captions of the mapped fields, some of which may differ from the datasheet captions for these fields.
- The **Default Severity** is information for all baseline event mappings.

AMS Asset Alert

Allow Event Consolidation? section

Yes is selected.

Event Fields section

Box in Event Fields section	Mapped Calibration subfamily field
Event Relationship	Has Tag Alert
Start Time Field	Date/Time
End Time Field	None
Name Field	ID
Description Field	Description
Has Duration Field	None
Severity Field	Severity Note: The following specific severity codes are also defined: <ul style="list-style-type: none"> • Advisory = Warning • Abnormal = Warning • Failed = Alert • Communication Failure = Alert

AMS Asset Event

Allow Event Consolidation? section

Yes is selected.

Event Fields section

Box in Event Fields section	Mapped Calibration subfamily field
Event Relationship	Has Tag Event
Start Time Field	Date/Time
End Time Field	None
Name Field	ID
Description Field	Description
Has Duration Field	None
Severity Field	Severity Note: The following specific severity codes are also defined: <ul style="list-style-type: none"> • Advisory = Warning • Abnormal = Warning • Failed = Alert • Communication Failure = Alert

Calibration Subfamilies

Allow Event Consolidation? section

No is selected.

Event Fields section

Box in Event Fields section	Mapped Calibration subfamily field
Event Relationship	Has Calibration
Start Time Field	Event Start Date
End Time Field	Event End Date
Name Field	None
Description Field	Calibration Type
Has Duration Field	None
Severity Field	None

GE Tag Event

Allow Event Consolidation? section

Yes is selected.

Event Fields section

Box in Event Fields section	Mapped GE Tag Event field
Event Relationship	Has Tag Event
Start Time Field	Start Time
End Time Field	End Time
Name Field	ID
Description Field	Type
Has Duration Field	None
Severity Field	Severity Level Note: The following specific severity codes are also defined: <ul style="list-style-type: none"> • 1 = Warning • 2 = Warning • 3 = Alert • 4 = Alert

Inspection Family and subfamilies

Allow Event Consolidation? section

No is selected.

Event Fields section

Box in Event Fields section	Mapped Inspection family and subfamilies field
Event Relationship	Has Inspections
Start Time Field	Commencement Date
End Time Field	Completion Date
Name Field	Inspection Reference
Description Field	Inspection Headline
Has Duration Field	None
Severity Field	None

Checklists Subfamilies

Allow Event Consolidation? section

No is selected.

Event Fields section

Box in Event Fields section	Mapped Checklists subfamilies field
Event Relationship	Has Inspections
Start Time Field	Completion Date
End Time Field	None
Name Field	Inspection Reference
Description Field	Inspection Reference
Has Duration Field	None
Severity Field	None

Policy Event

Allow Event Consolidation? section

Yes is selected.

Event Fields section

Box in Event Fields section	Mapped Policy Event field
Event Relationship	Has Event
Start Time Field	Start Time
End Time Field	End Time
Name Field	Name
Description Field	Short Description
Has Duration Field	Has Duration
Severity Field	Severity Note: The following specific severity codes are also defined: <ul style="list-style-type: none"> • ALT= Alert • WRN = Warning • INF = Information

Production Event

Allow Event Consolidation? section

No is selected.

Event Fields section

Box in Event Fields section	Mapped Production Event field
Event Relationship	Has Production Event
Start Time Field	Start Date
End Time Field	End Date
Name Field	Event ID
Description Field	Headline
Had Duration Field	None
Severity Field	None

Work History

Allow Event Consolidation? section

No is selected.

Event Fields section

Box in Event Fields section	Mapped Work History field
Event Relationship	Has Work History
Start Time Field	Event Start Date
End Time Field	Maintenance Completion Date
Name Field	Request Type Description
Description Field	Event Short Description
Has Duration Field	None
Severity Field	Event Type Note: The following specific severity code is also defined: Repair = Alert

Health Indicator Source Management

About Health Indicator Source Management

In Health Indicator Source Management, you can indicate which health indicator source records should be monitored by Asset Health Manager. If a source record is excluded, AHM will ignore data related to that source when processing health information for an asset.

About Automatic Creation of Health Indicators

After you start the Asset Health Indicator service, whenever an entity or a relationship record is created in the APM database, Health Indicator records are created automatically if the following conditions are met:

- A valid health indicator source record exists (i.e., a record belonging to a family that with a fully configured [Health Indicator Mapping record](#)).
- The health indicator source record is linked to an asset record (that is, a record in a family that is included in the Asset Hierarchy definition) and the Has Health Indicators relationship definition exists for that asset family.
- A Health Indicator record does not already exist for the health indicator source record and the asset record.
- The health indicator source record is included in the **Health Indicator Source Management** workspace.
- For Measurement Location health indicator source records, the **Include as Health Indicator Source** check box on the data sheet is selected.

Records may exist in your database that belong to a health indicator source family, but for which you do not want health indicators to be created. You can use the **Health Indicator Source Management** workspace to [manage whether health indicators are created for each potential source record](#).

When Health Indicator records are created:

- The asset record will be linked to the newly created Health Indicator record(s) through the Has Health Indicators relationship.
- The Health Indicator record(s) will be linked to the corresponding health indicator source and Health Indicator Mapping records [according to the AHM data model](#).
- If reading data (from [health indicator reading source records](#)) is available, the initial status of the health indicator will be set accordingly.

Once Health Indicator records exist in the APM database, you can [view the related health information in Asset Health Manager](#).

If a health indicator source record is deleted or if it is unlinked from an asset record to which it was linked through the relationship defined in the relevant Health Indicator Mapping record, the corresponding Health Indicator records are deleted automatically.

Health Indicators and Site Filtering

When a health indicator source record is linked to an asset, both the health indicator source record and the newly created Health Indicator record inherit the Site Reference Key of the asset.

Tip: For more information, refer to the Site Filtering section of the documentation.

In certain scenarios, you may be working with a health indicator source that measures some values that are shared across sites. For example, you may have a Measurement Location that measures flow or pressure in a pipe that crosses a site boundary. In this case, the health indicator source (e.g., Measurement Location record) should be designated as a global record (that is, not assigned to any specific site). Because health indicator source records automatically inherit the Site Reference Key of the asset, after linking the source to the asset, a Super User must use the **Site** control to adjust the site assignment of the source records to designate them as **Global**.

Important: It is not supported for a health indicator source and an asset to be assigned to different sites.

Include or Exclude Sources from Automatic Health Indicator Creation

About This Task



Administrative users can use the **Health Indicator Source Management** workspace to specify whether health indicators are [created automatically](#) for each potential health indicator source record (that is, a record belonging to a family that has a fully configured [Health Indicator Mapping record](#)).

Important: When you include or exclude a source record linked to multiple assets, your changes affect the health indicators based on that source for all linked assets. Also, when you exclude a source record, no health indicators are created for that source when you link it to additional assets.

Procedure

1. In the module navigation menu, select **Admin > Application Settings > Asset Health Manager**.
2. Select the **Health Indicator Source Management** tab.
The **Health Indicator Source Management** workspace appears, displaying a table with one row for each health indicator source record.

Tip:

- You can select  to search for a source record matching a keyword in any column. If you search in the **Included** column, you must specify true or false.
 - You can select  to filter the grid to show only the source records in specific families.
3. Depending on whether you want to include or exclude a health indicator source, choose one of the following:
 - Select the check box next to a source for which you want to create Health Indicator records, and then select **Include Selected**.
 - Select the check box next to a source for which you do not want Health Indicator records to be created, and then select **Exclude Selected**.

A window appears, asking you to confirm whether you want to include or exclude the specified sources.

4. If you want to proceed, select **OK**.

If you included a source, a check mark appears in the **Included** column for the row containing the selected source record. This indicates that the source is no longer excluded and that the corresponding Health Indicator records were created.

Alternatively, if you excluded a source, the check mark is cleared from the **Included** column for the row containing the selected source record. This indicates that Health Indicator records will not be created based on the source record for any asset and that existing Health Indicator records based on the source were deleted.

View the Time Stamp of the Last Health Indicator Update

In the **AHM Admin** page, you can determine whether your Health Service is running by viewing the time stamp of the most recently updated health indicator source. If the date and time displayed seem older than you expect, you may need to take further steps to confirm whether your Health Service is functioning as expected.

Procedure

1. In the module navigation menu, select **Admin > Application Settings > Asset Health Manager**.
2. Select the **General Settings** tab.
The **Health Administration General Settings** section appears.
3. Select **Check Last Health Indicator Update**.
A window appears, displaying the date and time of the most recent health indicator update.

Resync Health Indicators

If the list of health indicator sources in the **AHM Admin** page becomes out of sync with the actual list of available health indicators, an admin may need to resync your health indicators.

About This Task

Typically, the health indicator sources remain in sync with the list of available health indicators. However, if the Asset Health Indicator service was down, or if an admin reset the health indicator service, the list of health indicator sources in the **AHM Admin** page may become out of sync with the list of available health indicators. In this scenario, complete the following procedure to resync health indicators.

Procedure

1. In the module navigation menu, select **Admin > Application Settings > Asset Health Manager**.
2. Select **Health Indicator Source Management**.
The **Health Indicator Source Management** workspace appears, displaying a list of potential health indicator sources as well as the date when the list was last resynced.
3. Select **Resync Health Indicators**.
A window appears, asking you to confirm whether you want to proceed.
4. Select **Yes**.
A sync job begins. When the job is completed, the Last Resynced date is updated, and the health indicators are resynced.

Chapter 8

Deployment

Topics:

- [Deployment and Upgrade](#)

Deployment and Upgrade

Deployment and Upgrade content for various APM modules has been consolidated into a single document. For more information, refer to the module-specific information in the APM Module Deployment and Upgrade document.

Chapter 9

Reference

Topics:

- [General Reference](#)
- [Family Field Descriptions](#)
- [Catalog Items](#)

General Reference

About Site Filtering in AHM

In Asset Health Manager, users will see only the health information related to assets assigned to their site(s) or that are global records.

Tip: For more information, refer to the Site Filtering section of the documentation.

In most cases, the asset, health indicator source, and health indicator will all be associated with the same site, though it is possible for a health indicator source record to contain global data. For information on configuring this scenario, refer to the AHM Administration section of the help.

Consider an organization that has three sites, Site X, Site Y, and Site Z. Measurement Location A is a global record and is linked to the following two equipment records:

- Equipment 1: Assigned to Site X
- Equipment 2: Assigned to Site Y

Two Health Indicator records exist for the Measurement Location, one for each piece of equipment.

Scenario 1: User assigned to only Site X

When this user views the **Health Summary** page, he or she can view Equipment 1, Measurement Location A, and the health indicator associated with Equipment 1. Equipment 2 and the associated health indicator are not visible.

Scenario 2: User assigned to both Site X and Site Y

When this user views the **Health Summary** page, he or she can view Equipment 1 and 2, Measurement Location A, and the health indicators associated with both Equipment 1 and 2.

Scenario 3: Super User

When this user views the **Health Summary** page, he or she can view Equipment 1 and 2, Measurement Location A, and the health indicators associated with both Equipment 1 and 2. If any records are assigned to Site Z, he or she would be able to see the related data for those records as well.

About Health Indicator Sources

Health Indicator records are associated with health indicator source and reading source records that contain the limit values and reading values, respectively, that are compared to determine the [status of the health indicator](#). One health indicator may exist for each health indicator source record associated with a piece of equipment. Reading source records are then used to provide the most recent reading value to the health indicator.

The following table summarizes the records that are configured as sources in the baseline APM database.

Health indicator source record	Corresponding reading source
GE Tag	GE Tag Event records
Measurement Location	Reading records
Content Map	The most recent reading available from the OT Source.
KPI	KPI Measurement records
None (e.g., health indicators created via Policy Designer)	Health Indicator Value records

The following table summarizes the fields that define health indicator limit values for each of the baseline health indicator source records.

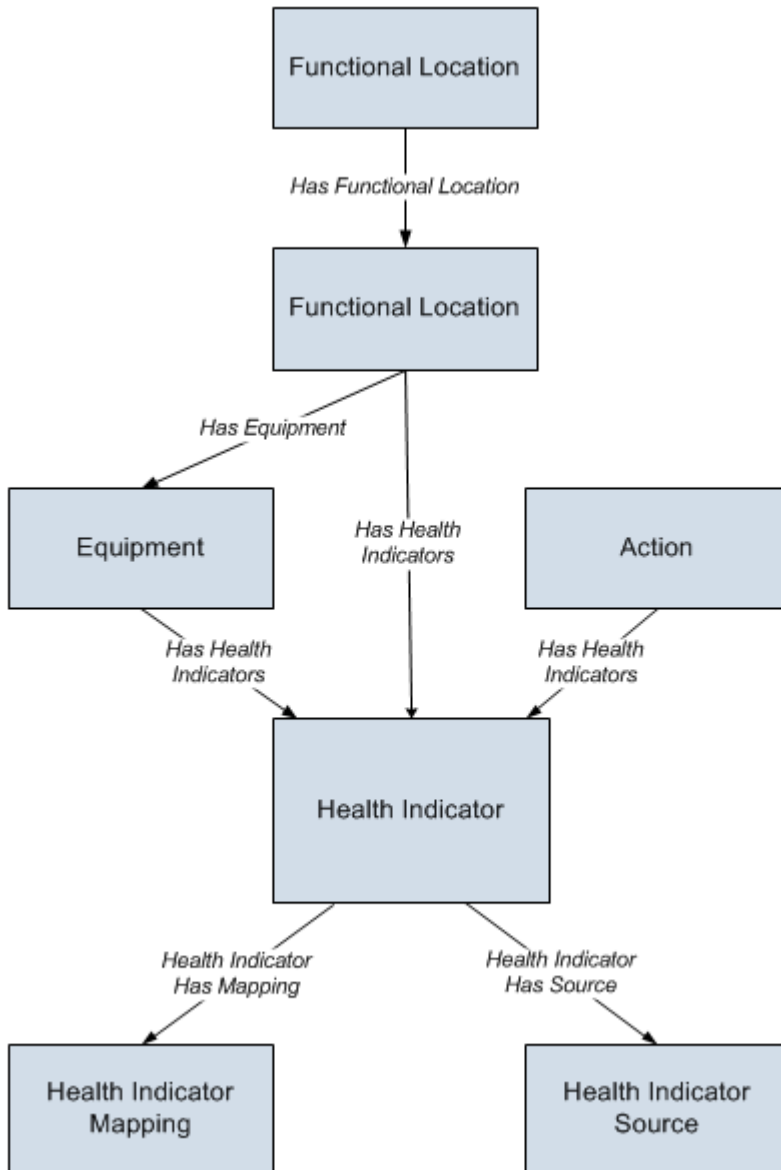
Health indicator source record	Fields Containing Limit Values
GE Tag	Upper and lower level limit fields in the GE Tag record.
Measurement Location	Upper and lower level limit fields in the Measurement Location record.
Content Map	Upper and lower level limit fields in the Content Map record.
KPI	<p>Target and Critical fields in the KPI Measurement record associated with the KPI record.</p> <ul style="list-style-type: none"> In KPI records where a low value is good, the Target value represents the upper level 1 limit and the Critical value represents the upper level 2 limit. In KPI record where a high value is good, the Target value represents the lower level 1 limit and the Critical value represents the lower level 2 limit.
None	Upper and lower level limit fields in the Health Indicator record.

The following table summarizes the fields in each reading source record that contain the latest reading value, which the Asset Health Indicator service copies into either the Last Numeric Reading Value or Last Char Reading Value field in corresponding Health Indicator records.

Reading source	Field Containing Reading Value
GE Tag Event record	Type
Reading record	Reading Value Character Reading Value Numeric
Reading from the OT Source	N/A
KPI Measurement record	Actual
Health Indicator Value record	Value (Numeric)

AHM Data Model

The following diagram shows how the families used in Asset Health Manager are related to one another.



Note: In the diagram, boxes represent entity families and arrows represent relationship families that are configured in the baseline database. You can determine the direction of each relationship definition from the direction of the arrow head: the box from which the arrow originates is the predecessor, and the box to which the arrow head points is the successor.

Note that the Health Indicator Source box in this image does not represent a family with the caption Health Indicator Source. Instead, it represents a family containing a record that will be linked to a Health Indicator record. In the APM baseline database, Health Indicator records can be linked to the following types of records through the Health Indicator Has Source relationship:

- Measurement Location
- Content Map
- KPI
- Health Indicator

If desired, you can configure this relationship definition to include other families as successors to the Health Indicator family.

Each Health Indicator record is also associated with readings linked to these health indicator source records. Refer to the topic [About Health Indicator Sources](#) for details.

AHM Security Groups

The following table lists the baseline Security Groups available for users within this module, the baseline Roles to which those Security Groups are assigned, and the OT Connect groups that are assigned to the Health Roles to support the Health and OT Connect integration.

Note: For more information on the privileges related to OT Connect families and the workflows that Health users must have access to, refer to the OT Connect documentation.

Important: Assigning a Security User to a Role grants that user the privileges associated with all of the Security Groups that are assigned to that Role. To avoid granting a Security User unintended privileges, before assigning a Security User to a Role, be sure to review all of the privileges associated with the Security Groups assigned to that Role. Also, be aware that additional Roles, as well as Security Groups assigned to existing Roles, can be added via Security Manager.

Security Group	Roles
MI AHI Administrator	MI Health Admin MI Strategy Admin MI Strategy Power
MI AHI User	MI Health Power MI Health User MI Strategy Admin MI Strategy Power MI Strategy User
MI AHI Viewer	None
MI OT Connect Administrator MI OT Connect User	MI Health Admin
MI OT Connect Viewer MI Content Template Viewer	MI Health Power MI Health User

The baseline family-level privileges that exist for these AHM Security Groups are summarized in the following table.

Family	MI AHI Administrator	MI AHI User	MI AHI Viewer
Entity Families			
Checkpoint Task	View, Update, Insert	View, Update, Insert	View
Event Mapping	View, Update, Insert, Delete	View	View
Health Indicator	View, Update, Insert, Delete	View, Update	View
Health Indicator Mapping	View, Update, Insert, Delete	View	View

Family	MI AHI Administrator	MI AHI User	MI AHI Viewer
Health Indicator Value	View, Update, Insert, Delete	View	View
KPI	View	View	View
KPI Measurement	View	View	View
Measurement Location	View	View	View
Measurement Location Template	View	View	View
OPC Reading Note: This family is obsolete from V4.4.0.0.0.	View	View	View
OPC System Note: This family is obsolete from V4.4.0.0.0.	View	View	View
OPC Tag Note: This family is obsolete from V4.4.0.0.0.	View	View	View
Operator Rounds Allowable Values	View	View	View
Policy	View	View	View
Policy Event	View, Update, Insert, Delete	View, Update, Insert, Delete	View
Policy Instance	View	View	View
Reading	View	View	View
Recommendation	View, Update, Insert, Delete	View, Update, Insert, Delete	View
Timestamped Value	View, Update, Insert, Delete	View	View
Relationship Families			
Has Checkpoint	View	View	View
Has Child Hierarchy Item (Deprecated)	View, Update, Insert, Delete	View	View
Has Consolidated Events	View, Update, Insert, Delete	View, Update, Insert, Delete	View
Has Health Indicators	View, Update, Insert, Delete	View	View
Has OPC Reading Note: This family is obsolete from V4.4.0.0.0.	View	View	View
Has OPC Tag Note: This family is obsolete from V4.4.0.0.0.	View	View	View
Has Readings	View	View	View

Family	MI AHI Administrator	MI AHI User	MI AHI Viewer
Has Recommendations	View, Update, Insert, Delete	View, Update, Insert, Delete	View
Has Timestamped Value	View, Update, Insert, Delete	View	View
Health Indicator Has Mapping	View, Update, Insert, Delete	View	View
Health Indicator Has Source	View, Update, Insert, Delete	View	View

AHM URLs

There is one URL route associated with Asset Health Manager: **health**. The following table describes the various paths that build on the route, and the elements that you can specify for each.

Tip: For more information, refer to the URLs section of the documentation.

Element	Description	Accepted Value(s)	Notes
health : Opens the Health Summary page displaying health indicators at the Home level of the hierarchy.			
health/overview : Opens the Asset Health Manager Overview page.			
health/asset/<EntityKey>/<SectionName> : Opens the Health Summary page.			
<EntityKey>	Specifies the level of the asset hierarchy for which you want to view health information.	Any Entity Key that corresponds to an asset in the asset hierarchy.	N/A
		0	Displays the Home level of the asset hierarchy.
<SectionName>	Specifies the type of health information you want to view.	indicator	Displays the Indicators section.
		event	Displays the Events section.
		policy	Displays the Policies section.
		risk	Displays the Risks section.
health/indicator/<IndicatorEntityKey>/<WorkspaceName> : Opens the Health Indicator page.			
<IndicatorEntityKey>	Specifies the health indicator whose details you want to view.	Any Entity Key that corresponds to a health indicator in the asset hierarchy.	N/A
<WorkspaceName>	Specifies the type of health indicator information you want to view.	trend	Displays the Trend Chart workspace.
		readings	Displays the Reading History workspace.
		configuration	Displays the Configuration workspace.

Example URLs

Example URL	Destination
#health -or- #health/asset/0/indicator	The Indicators section of the Health Summary page for the Home level of the Asset Hierarchy.
#health/asset/6425187457/policy	The Policies section of the Health Summary page for the specified asset.
#health/indicator/64253092336/trend	The Health Indicator page, displaying a graph of readings associated with the specified health indicator.
#health/indicator/64253092336/configuration	The Health Indicator page, displaying source information for the specified health indicator.

AHM System Code Tables

The following table lists the System Code Tables that are used by Asset Health Manager.

Table ID	Table Description	Function
MI AHM STATUS	Health Indicator Status	Populates the Alert Level field in Health Indicator records.
MI AHM TIME	AHM Search Time Range	Populates the Time Range list in the filter for the Asset Health Manager Overview page.
MI HIER ITM GROUP	Hierarchy Item Groups	This table is no longer used.

Access Health Indicator Details

Procedure

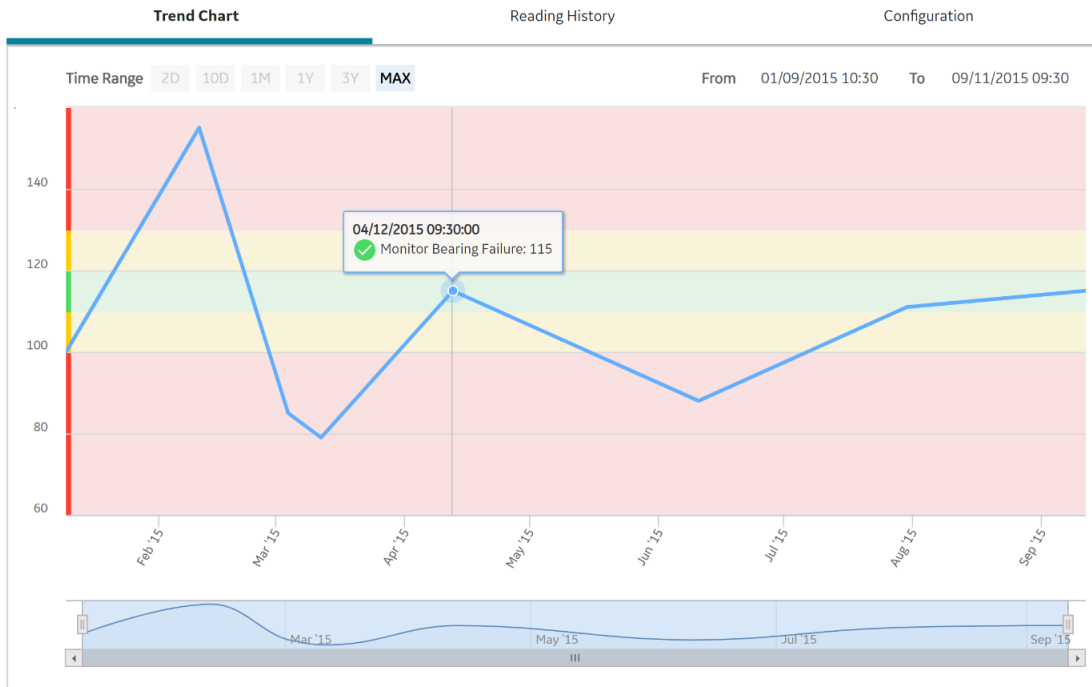
1. On the **Health Summary** page, in the **This Asset** subsection, select the check box next to a health indicator, and then select .

-or-

On the **Health Overview** page, select a health indicator name in one of the overview lists (i.e., No Status, Normal, Warning, or Alert).

The **<Health Indicator Name>:<Description>** page appears. The date and time that the health indicator was last updated appears under the page heading.

If the health indicator has numeric readings, the **Trend Chart** workspace appears, which contains a **trend chart** showing how the health indicator readings have fluctuated over time. If the health indicator has character readings, the **Reading History** workspace appears instead. See Step 2.



2. Select the **Reading History** tab.

The **Reading History** workspace appears, which displays the **status**, timestamp, and value of each reading for the selected health indicator.

STATUS	DATE/TIME	VALUE
✓	09/11/2015 09:30:00	115
✓	07/30/2015 09:30:00	111
!	06/10/2015 09:30:00	88
✓	04/12/2015 09:30:00	115
!	03/11/2015 17:30:00	79
!	03/03/2015 19:30:00	85
!	02/10/2015 10:30:00	155
!	01/09/2015 10:30:00	100

Note:

- If the health indicator source is a Content Map record, the reading values displayed are directly from the process historian.

- By default, rows are sorted by the **Date/Time** column, with the most recent reading at the top.
3. Select the **Configuration** tab.

The **Configuration** workspace appears, which displays the name, description, and limit values for the health indicator. [You can optionally modify some of these values.](#)

Monitor Bearing Failure : Monitor Bearing ... Last updated on 09/11/2015 09:30:00

2 Related Assets

Trend Chart Reading History **Configuration**

Health Indicator Name
Monitor Bearing Failure

Description
Monitor Bearing Failure

Datasheet ID:
Measurement Location

Site: Global

Identification	Limit Values	Actions
	Numeric	Character
Upper Level 3	140	Text input
Upper Level 2	130	Text input
Upper Level 1	120	Text input
Lower Level 1	110	Text input

Next Steps


- [Access or Modify Health Indicator Source Information](#)

Acknowledge Alerts and Warnings

Procedure

1. Access the **Health Summary** page.
2. In the **This Asset** subsection, select the check box next to each health indicator whose status you want to acknowledge.

Note: If you select health indicators with no readings, with a normal status, or whose status has already been acknowledged, only the health indicators with warning or alert statuses will be acknowledged.

3. Above the grid, select .

The **Acknowledge** window appears.

Acknowledge



Acknowledgment Note:

CHECK SITE ~ Alert ~ 09/05/2012 15:00:25 ~ 25

One Time Valid Until

Create


4. Optionally, in the **Acknowledgment Note** box, enter comments.
5. If you want the acknowledgment to remain valid only until a new reading is added, select the **One Time** check box.

-or-

If you want to set an expiration date for the acknowledgment, select the **Valid Until** check box, and then select an expiration date from the calendar.

6. Select **Create**.

Results

The  icon is added to the **Acknowledgment** column to indicate that the status of the health indicator will count as normal until a new reading is added or until the acknowledgment expires, depending on your selection.

Note: The [status icon](#) and the [gauge](#) displayed for the individual health indicator will still show the actual warning or alert status.

Next Steps

- [Access, Modify, or Revoke an Acknowledgment](#)

Family Field Descriptions

Health Indicator Records

This topic provides an alphabetical list and description of the fields that exist for the Health Indicator family, whose records store information that is used to determine the health of assets. The information in the table reflects the baseline state and behavior of these fields. This list is not comprehensive.

This family is enabled for site filtering, which means that records in this family can be assigned to a specific site, and will only be accessible to users who are assigned to the same site and have the appropriate license and family privileges. For more information, refer to the Sites section of the documentation.

Field	Data Type	Description	Behavior and Usage
Acknowledged	Logical	Indicates whether or not the status of the Health Indicator has been acknowledged .	When this field is set to: <ul style="list-style-type: none"> • True, the status of the Health Indicator record has been acknowledged. • False, the status of the Health Indicator record has not been acknowledged.
Alert Level	Number	Indicates the status of the Health Indicator record.	If the Meridium.AHI.Service.exe.config file has been configured properly, this value is populated automatically by the Asset Health Indicator service with one of the following values: <ul style="list-style-type: none"> • 0 (zero): Indicates that the Health Indicator record meets the Normal status criteria. • 1: Indicates that the Health Indicator record meets the Warning status criteria. • 2: Indicates that the Health Indicator record meets the Alert status criteria. • 3: Indicates that no readings have yet been processed by the Asset Health Indicator service. This field is populated by the MI_AHM_STATUS system code table and is not displayed on the baseline Health Indicator datasheet.
Description	Character	A description of the Health Indicator record.	N/A
Last Numeric Reading Value	Numeric	The most recent reading value associated with the health indicator.	The Asset Health Indicator service populates this field with the reading value from the most recent reading source record . This field is used only for numeric health indicators.

Field	Data Type	Description	Behavior and Usage
Last Char Reading Value	Character	The most recent reading value associated with the health indicator.	The Asset Health Indicator service populates this field with the reading value from the most recent reading source record . This field is used only for character health indicators.
Lower Level 1 Alert Lower Level 2 Alert Lower Level 3 Alert	Character	For health indicators without a source, determines the status of readings that are associated with this Health Indicator record.	These fields are used only for health indicators without a source (e.g., health indicators created via Policy Designer). For health indicators with a source (e.g., a Measurement Location record), the limit values defined in the source record are used instead.
ML Type	Character	For Health Indicator records whose primary source records are Measurement Location records, indicates the type of data stored in the associated secondary source records (Reading records).	On the datasheet, this field appears as a list that contains the values Character and Numeric.
Name	Character	The health indicator name.	N/A
Upper Level 1 Alert Upper Level 2 Alert Upper Level 3 Alert	Character	For health indicators without a source, determines the status of readings that are associated with this Health Indicator record.	These fields are used only for health indicators without a source (e.g., health indicators created via Policy Designer). For health indicators with a source (e.g., a Measurement Location record), the limit values defined in the source record are used instead.

Health Indicator Mapping Records

This topic provides an alphabetical list and description of the fields that exist for the Health Indicator Mapping family, whose records are used to determine how values will be mapped from health indicator source records to the Health Indicator records that they are used to create. The information in the table reflects the baseline state and behavior of these fields. This list is not comprehensive.

This family is not enabled for site filtering, which means that records in this family can be accessed by any user with the appropriate license and family privileges. For more information, refer to the Sites section of the documentation.

Field	Data Type	Description	Behavior and Usage
Asset to Source Relationship Family ID	Character	The relationship family used to link the Equipment record to the health indicator source record.	The list in this field contains all Relationship families delivered in the baseline database. This field is required.
Description	Character	The purpose of the Health Indicator Mapping record.	This value is not used when mapping data from health indicator source records to Health Indicator records.
Family ID	Character	The family caption of the health indicator source family.	The list in this field contains all families that are successors to the Health Indicator family through the Health Indicator Has Source relationship.
Include as Health Indicator Source Field	Character	Identifies a Boolean field in the health indicator source family that is used to determine whether a specified health indicator source is used to create health indicators.	This field is optional. The list in this field contains fields that are stored in health indicator source records. If the source does not contain a field that specifies inclusion or exclusion as a health indicator source, inclusion or exclusion of that source is tracked by Asset Health Manager.
List of Values Field	Character	The field in the health indicator source family that specifies the values that are valid to be entered into reading source records. For example, Measurement Location records (health indicator source records) can accept either numeric or character values. If they are configured to accept character values, the Allowable Values field in the Measurement Location record stores values that are valid to be entered in the Reading records (reading source records) to which it is linked.	The list in this field contains fields that are stored in health indicator source records.
Mapping Type	Character	The type of data that will be evaluated in the health indicator source record to determine the status of the Health Indicator record .	The list in this field contains the values Character and Numeric.
Reading Date Field	Character	The field in the reading source family that contains the date associated with a reading.	The list in this field contains fields that are stored in reading source records.
Reading Family ID	Character	The reading source family that contains the value that the APM rule logic will use to determine the status of the Health Indicator record.	The list in this field contains all families that are successors to the health indicator source family through any relationship.
Reading UOM Field	Character	The unit of measure that is associated with the reading source record.	The list in this field contains fields that are stored in reading source records.

Field	Data Type	Description	Behavior and Usage
Reading Value Field	Character	The field in the reading source family that contains the reading value that the APM rule logic will use to determine the status of the Health Indicator record.	The list in this field contains fields that are stored in reading source records.
Source Name Field	Character	The field in the health indicator source family whose value will be mapped to the Name field in the Health Indicator record that is created.	The list in this field contains fields that are stored in health indicator source records.
Target Field	Character	This field is not currently used.	N/A
Type Field	Character	The field in the health indicator source family that indicates the type of reading that is associated with a health indicator source record.	When a new entity or relationship record is added to the database, the Asset Health Indicator service compares the contents of the specified Type Field to the value in the Type Value field. If the values match, a Health Indicator record is created automatically using this Health Indicator Mapping record. If the Type Field and Type Value fields are not specified, a Health Indicator record will be created for each Health Indicator Mapping record that is configured for the health indicator source family.
Type Value	Character	The value that the specified Type Field must contain in order for this Health Indicator Mapping record to be used.	See Type Field.

Catalog Items

AHI Folder

The Catalog folder \\Public\Meridium\Modules\AHI contains the following items.

Item Name	Type	Behavior and Usage
Health Overview	Dashboard	Displays the Health Overview page.
Health Overview - Alert Acknowledgment	Graph	Compares the number of health indicators with warning or alert statuses that are acknowledged vs. not acknowledged. This graph can be filtered by asset. This graph is based on the query Health Overview - Alert Acknowledgment and is displayed on the Health Overview page.

Item Name	Type	Behavior and Usage
Health Overview - Recommendation Status	Graph	Summarizes the statuses of health-related recommendations (i.e., General Recommendation, AMS Asset Recommendation, Policy Recommendation, and Operator Rounds Recommendation). This graph can be filtered by asset. This graph is based on the query Health Overview- Recommendation Status and is displayed on the Health Overview page.
Health Overview - Status by Asset	Graph	Displays the top 20 assets and a summary of the health indicator statuses for each. This graph can be filtered by asset. This graph is based on the query Health Overview- Status by Asset and is displayed on the Health Overview page.

Queries Folder

The Catalog folder \\Public\Meridium\Module\AHI\Queries contains the following items.

Query	Behavior and Usage
Health Overview- Alert Acknowledgement	Compares the number of health indicators with warning or alert statuses that are acknowledged vs. not acknowledged. This query can be filtered by asset. The results of this query are used by the Health Overview- Alert Acknowledgement graph which is displayed on the Health Overview page.
Health Overview- Parameters	Contains the asset context parameter used in the page-level filter of the Health Overview page. This parameter is passed to the other queries used on the page.
Health Overview- Recommendation Status	Summarizes the statuses of health-related recommendations (i.e., General Recommendation, AMS Asset Recommendation, Policy Recommendation, and Operator Rounds Recommendation). This query can be filtered by asset. The results of this query are used by the Health Overview- Recommendation Status graph which is displayed on the Health Overview page.
Health Overview - Recommendations Tile	Returns the list of recommendations that is displayed in the Recommendations list on the Asset Health Manager Overview page.

Query	Behavior and Usage
Health Overview- Status by Asset	<p>Returns the top 20 assets and a summary of the health indicator statuses for each. This query can be filtered by asset.</p> <p>The results of this query are used by the Health Overview - Status by Asset graph which is displayed on the Health Overview page.</p>
Health Overview- Tiles	<p>Returns the lists of assets that are displayed on the Health Overview page (i.e., No Status, Normal, Warning, or Alert).</p>