



Industrial Data Diagnostics



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Chapter 1

Overview

Topics:

- [Overview of the Industrial Data Diagnostics Application](#)
- [Access Industrial Data Diagnostics](#)
- [Log Out of Industrial Data Diagnostics](#)

Overview of the Industrial Data Diagnostics Application

Industrial Data Diagnostics is a benchmarking tool that displays data related to reliability and performance of the assets in your company. You can use Industrial Data Diagnostics to view an overall picture of asset performance within your company and to view the performance relative to a specific part of your company (for example, the performance of a single site, the performance of a certain type of equipment). Using Industrial Data Diagnostics, you can compare data from your company with that of similar companies worldwide, or you can compare data between sites within your company. Industrial Data Diagnostics provides you with a variety of visual tools to view and compare data.

You can use the features of Industrial Data Diagnostics to answer the following questions:

- How has my company performed recently? This information can be categorized either by functional location or by equipment taxonomy.
- How is my company doing compared to the competition?
- How can I analyze the health of the assets in my company to identify areas of potential cost savings?
- How can I improve the availability and reliability of my assets?

To answer these questions, Industrial Data Diagnostics determines a benchmark using the average asset performance of peer organizations that have subscribed to Industrial Data Diagnostics. Using this benchmark, you can compare and analyze the asset performance of your company in terms of cost, reliability, and availability. Benchmarking data provides an objective view of the performance of your organization and can help identify the areas that will benefit from improvement efforts. This can help you decrease cost, increase profit, and become more competitive with your peers.

Important: The asset data in Industrial Data Diagnostics is updated once a month.

Features in Industrial Data Diagnostics

- **Industrial Data Diagnostics:** This feature enables the Industrial Data Diagnostics application.
- **Industrial Data Diagnostics API:** This feature allows you to call the backend APIs of the product and is automatically assigned when you select the **Industrial Data Diagnostics** feature.
- **Improvement Tracker:** This feature provides you access to the Improvement Tracker and Cost Analysis functionalities available in the **Asset Level** section when you select the **Bad Actors** tab.
- **Enterprise Benchmarking:** This feature enables the **Enterprise Benchmarking** tab and allows you to access benchmarking functionalities of the product.
- **Data Quality:** This feature enables the **Data Quality** tab and allows you to access data quality information including normalization, metric confidence, issues, and insights.
- **Bad Actors:** This feature enables the **Bad Actors** tab and allows you to perform Bad Actors analysis.
- **Proactive Maintenance Diagnostics:** This feature enables the **Proactive Maintenance Diagnostics** tab and allows you to view Proactive Maintenance Diagnostic analysis and Failure Modes.
- **Metrics:** This feature enables the **Metrics** tab and allows you to view Metrics information grouped by sites and other comparisons with peer values.
- **Export Functionality:** This feature allows you to export data from the grids in the product that support exporting.
- **Manufacturer Comparison:** This feature enables the **Manufacturer Comparison** tab and allows you to perform manufacturer and peer comparison.

Access Industrial Data Diagnostics


Procedure

1. In a web browser that meets the system requirements for Industrial Data Diagnostics, enter the tenant URL for Industrial Data Diagnostics provided to your organization.
The login page for Industrial Data Diagnostics appears.
2. In the **Username** box, enter your user name.
3. In the **Password** box, enter your password.
4. Select **Sign in**.
You are logged in to Industrial Data Diagnostics. The **Data Quality** page appears.

Note: After you are logged in to Industrial Data Diagnostics, if there is no user activity for an hour, you will be logged out of Industrial Data Diagnostics.

Log Out of Industrial Data Diagnostics

Procedure

1. In the page that you are viewing, select .
A menu appears, displaying the following options:
 - **Help**
 - **Logout**
2. Select **Logout**.
You are logged out of Industrial Data Diagnostics.

Chapter 2

Data Quality

Topics:

- [About Data Quality](#)
- [Metric Confidence](#)
- [PRIORITIZED DATA QUALITY ISSUES AND RECOMMENDATIONS](#)
- [Site Comparison](#)
- [Work Orders or Equipment Details](#)
- [Data Quality Insights](#)
- [Access the Metric Confidence Section](#)
- [Access the PRIORITIZED DATA QUALITY ISSUES AND RECOMMENDATIONS Section](#)
- [Access the Insights Section](#)
- [Data Normalization](#)

About Data Quality

The Data Quality module allows you to assess the quality of the equipment data and work orders associated with the Computerized Maintenance Management System (CMMS) of your organization, and its readiness to be used to generate asset performance analytics.

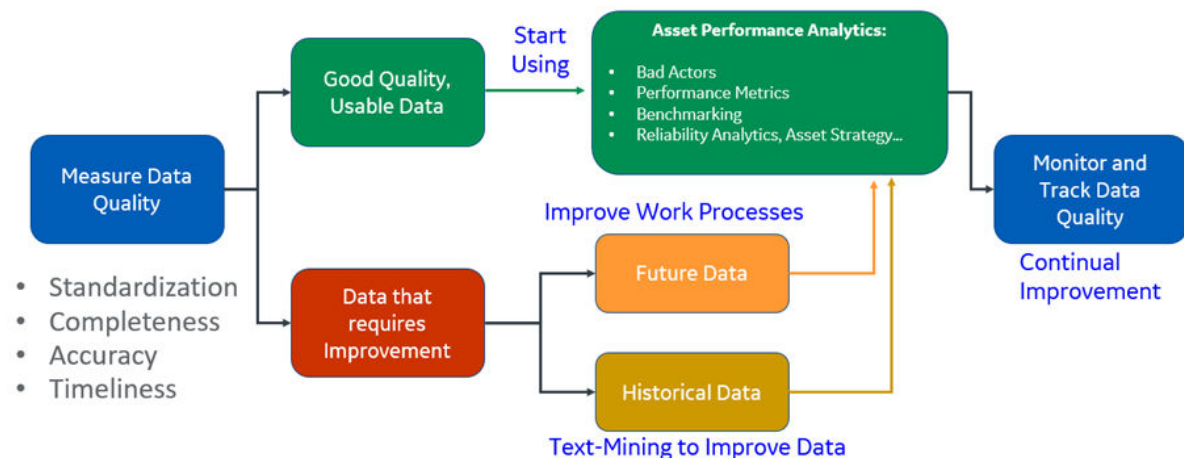
Industrial Data Diagnostics Data Quality module analyzes your CMMS data to assess data completeness, accuracy, and standardization in key data fields needed for asset performance analytics. Industrial Data Diagnostics provides a list of all data quality issues to be addressed, and prioritizes these issues based on their impact on multiple asset performance metrics, effort required, and complexity in resolving these issues, so you can maximize your ROI in deciding what to work on first. Each issue is explained and includes concrete, actionable recommendations on how to improve the data. The impact of these data quality issues is also assessed in terms of ability to calculate reliability and maintenance metrics and asset performance analytics.

You can use this feature to perform the following actions:

- Identify the most important issues for equipment and work order data.
- Analyze different trends in your data to understand if the issue is getting better or worse over time.
- Compare the data quality across the different sites in your organization.
- Rectify data input omissions, inaccuracies, and errors through a set of recommendations for common causes of these issues.
- Understand the impact of data quality issues on the trustworthiness of the reliability metrics and data analytics.

Improving the quality of the CMMS data is a continuous process. The quality of your data can only improve by constant feedback and utilization of data. If the people responsible for entering the data in your system can see how the data is being used, they will make an effort to capture the correct data. By making better asset performance improvement decisions, your organization can focus on the most critical failures and in turn reduce maintenance costs and production losses.

GE recommends the following workflow while assessing and utilizing data for decision-making purposes:



- First step is to measure data quality using several dimensions like data completeness, standardization, accuracy, and timeliness. Industrial Data Diagnostics provides out of the box metrics that measure data quality across these four dimensions.

- Then you identify the areas of good versus bad data. Industrial Data Diagnostics quantifies each metric in terms of a percentage of work orders or equipment that have a particular data quality issue and prioritizes them based on their impact. You can identify the areas of good and bad data using the Issues table in Industrial Data Diagnostics data quality module.
- The good data can be utilized already in solution or in Industrial Data Diagnostics, for asset performance analytics.
- The areas that need improvement, can be improved in two ways:
 - The future data can be improved by implementing best practices for people, processes, and technology of the maintenance organization. Industrial Data Diagnostics provides a set of recommendations, that identify common solutions on how to resolve these issues.
 - The historical data can be mined using natural language processing. For example, the free text fields for work order description can be analyzed to identify how the asset failed.
- The good data from both these sources can then be used for asset performance analytics.
- Finally, to sustain the improvements, you need to monitor and track data quality. Industrial Data Diagnostics provides trends on each data quality issue to help users see if the issue is getting better or worse.

The Data Quality module can be accessed by selecting the **Data Quality** button on the ribbon. It consists of two tabs:

- Metric Confidence
- Issues
- Insights

Metric Confidence

The **Metric Confidence** section helps companies understand how reliable and how much they can trust the reliability metrics calculated in Industrial Data Diagnostics and APM, based on the data quality of the specific fields needed to calculate these metrics.

This screen allows you to compare the metric confidence for the sites in your organization. By default, the top 5 worst quality sites are chosen for display to focus your attention on the most important candidates for improvements.

The left panel shows all the sites in the organization and users can select or deselect specific sites.

The right panel shows the metric confidence score for each selected site. The confidence score for each of 15 reliability metrics offered in Industrial Data Diagnostics is displayed as High, Medium, Low, Very Low or Not Available (no data). This is based on the data quality for the specific fields that are required to calculate the metrics.

Industry Peers Jun 2018 - May 2021 FILTER RESULTS Company / Peers COUNT 1 / 17 SITES 33 / 284 EQUIPMENT 815,487 / 3,333,980 EVENTS 346,589 / 2,541,797

Metric Confidence Issues Insights

Search

Top 5 worst data quality sites selected by default

METRIC	SITE 14	SITE 25	SITE 31	SITE 22	SITE 30
Average Corrective Work Cost	Medium	Medium	Low	Low	Very Low
Corrective Work Cost %	Medium	Medium	Low	Low	Very Low
Proactive Work Cost %	Very Low	Medium	Low	Low	Very Low
Reactive Work Cost %	Medium	Medium	Low	Low	Very Low
Corrective Work Count %	Medium	Medium	Medium	Medium	Low
Proactive Work Count %	Very Low	Medium	Medium	Medium	Low
Reactive Work Count %	Medium	Medium	Medium	Medium	Low
Mean Time Between Repairs (MTBR)	Medium	Medium	Low	Medium	Low
Mean Time Between Failures (MTBF)	Medium	Medium	Medium	Medium	Low
Failure Rate	Medium	Medium	Medium	Medium	Low
Mean Time to Repair (MTTR)	Medium	Medium	Low	Very Low	Very Low

Users can expand each reliability metric to understand which data fields are relevant to each metric confidence score. Understanding the crucial link between data entry and its impact on performance metrics is critical to motivate the team to take data collection seriously.

METRIC	SITE 113	SITE 108	SITE 105	SITE 6	SITE 13
^ Average Corrective Work Cost	Very Low	Very Low	Very Low	Medium	High
ISSUE	% WITH ISSUE	% WITH ISSUE	% WITH ISSUE	% WITH ISSUE	% WITH ISSUE
Maintenance Cost is not captured on closed work orders	100%	100%	100%	35%	18%
Work order types are missing	0%	0%	0%	0%	0%
Work orders written at higher levels of functional location hierarchy	0%	0%	0%	0%	0%
Repair work orders are kept open for a long time	N/A	0%	N/A	0%	0%

For example, the Average corrective cost metric score depends on the following four data quality issues:

- Maintenance cost is not captured on closed work orders.
- Work Order types are missing.
- Work Orders written at higher levels of functional location hierarchy.
- Repair work orders are kept open for a long time.

Each of these issues affects the ability to calculate the Average Corrective Cost metric. For example, without maintenance cost, this metric will be underestimated or, if the repair work orders are kept open for a long time, all the cost elements might not have been captured on the work order yet. Therefore, each of these issues affect the overall metric confidence score.

The reliability metric such as Average Corrective Cost is given a high, medium, low, or very low score based on the issue with the biggest percentage score out of the list of all issues.

For example, in the above screenshot, Maintenance cost not captured on closed work orders was the biggest issue with 100% work orders missing maintenance cost. Hence, the Average Corrective Cost metric has a very low score.

Hyperlinks are shown for issues with a percentage score bigger than 0%. You can select these links to take them to the **Site Comparison** page which is discussed in the **Site Comparison** section.

PRIORITIZED DATA QUALITY ISSUES AND RECOMMENDATIONS

The **PRIORITIZED DATA QUALITY ISSUES AND RECOMMENDATIONS** tab contains a set of data quality metrics that are frequently found when assessing the quality of assets. This page shows the percentage of records with issue across each of these issues for the entire enterprise.

Following columns are displayed in a table on Issues and Recommendations.

- **PRIORITY:** Industrial Data Diagnostics prioritizes the issues based on the following:
 - Impact of the data quality issue on asset performance analytics. For example, missing work order costs lead to underestimated cost metrics, such as Average Corrective Work Cost.
 - Time taken to implement recommended actions to improve data quality. For example, would it take a few months to make improvements or a longer time?
 - Complexity of improvement. For example, a system change might be easier to implement than a cultural change.
- **ISSUE:** This describes the data quality issue.
- **% RECORDS WITH ISSUE WITHIN DATE RANGE:** This field is calculated as following:
 (Number of work orders or equipment with data quality issue) / (Total work orders or equipment)
- **% WOS WITH ISSUE PREVIOUS MONTH:** This field calculates the percentage of work orders written in the last month that had the particular issue.
- **RECOMMENDED ACTION:** This column describes some common actions that you can take to resolve the particular issue and improve data quality.
- **IMPACT OF ISSUE:** This column describes the impact of the issue on specific metrics and data analytics. For example, if work order maintenance cost is missing, the cost metrics like Average Corrective Work Cost are underestimated.

Hyperlinks are shown for issues with a percentage score bigger than 0%. You can select these links to take them to the **Site Comparison** page, discussed in the next section.

The site panel is shown on the left and the default selection is for all sites in the company. You may uncheck certain sites to exclude from the analysis or may clear all and pick a few sites for comparison by checking box for each site.

PRIORITY	ISSUE	ISSUE RECORDS (DATE RANGE)	ISSUE WOS (LAST MONTH)	RECOMMENDED ACTION	IMPACT OF ISSUE
1	Work orders written at higher levels of functional location hierarchy	4%	0%	Work order should be created against an asset or lowest level of functional location.	Very High Cannot track asset, impeding the ability to analyze asset performance.
2	Work order types are missing	6%	0%	Identify the type of work order, as one of these categories: repair, preventive, predictive (condition based), modification/ More...	Very High Better than count metrics.
3	Maintenance cost outliers for repair, preventive and condition-based work orders	12%	0%	Avoid usage of blanket work order, where maintenance of several assets is grouped on the same work order. Check for accurate More...	High Overestimated Average Corrective Work Cost % and Reactive Cost %
4	Possible date inaccuracy: Downtime greater than 45 days	4%	0%	The date when actual maintenance starts and completes should be captured accurately either automatically from the time stamp More...	Medium Higher than actual
5	Maintenance Cost is not captured on closed work orders	31%	0%	All work order costs including labor, material and contractor costs should be captured. Labor hours can be captured through t More...	High Underestimated Cost % and Reactive Cost %
6	Possible date inaccuracy: Time to repair greater than 90 days	3%	0%	The date when actual maintenance starts and completes should be captured accurately either automatically from the time stamp More...	Low Higher than actual
7	Failure mode is missing for repair work orders	43%	0%	The cause of an asset failure should be tracked on the work order by creating a standard list of common failure modes.	Medium Cannot understand and build data-driven asset failure analysis.
8	Mismatch between time to repair and priority	72%	0%	Work order priority should be captured based on how quickly it is required to be executed. Work orders executed within a week More...	High Lower than actual
9	Breakdown indicator or asset failure data is not captured using a separate field	81%	0%	A repair conducted after an asset fails should be tracked separately from a proactive repair. This can be done by creating a More...	Medium Overestimate actual Failure Rate.
10	Manufacturer is not captured	16%	-	Capture the manufacturer in the CMMS by consulting the documentation or nameplate information on an asset.	Very Low Cannot compare number, to understand n purchase decisions.

Note: The **Equipment Hierarchy** filter allows you to view the issues and metric confidence related to a particular Equipment **Category, Class, or Type**.

Note: The issues in the **Data Quality** module comprising of primary categories: **Completeness, Accuracy, Standardization,** and **Timeliness** are visible in a flat list format by default. You can click the link **Group by data quality categories** to the upper right corner to view them in grouped issues format.

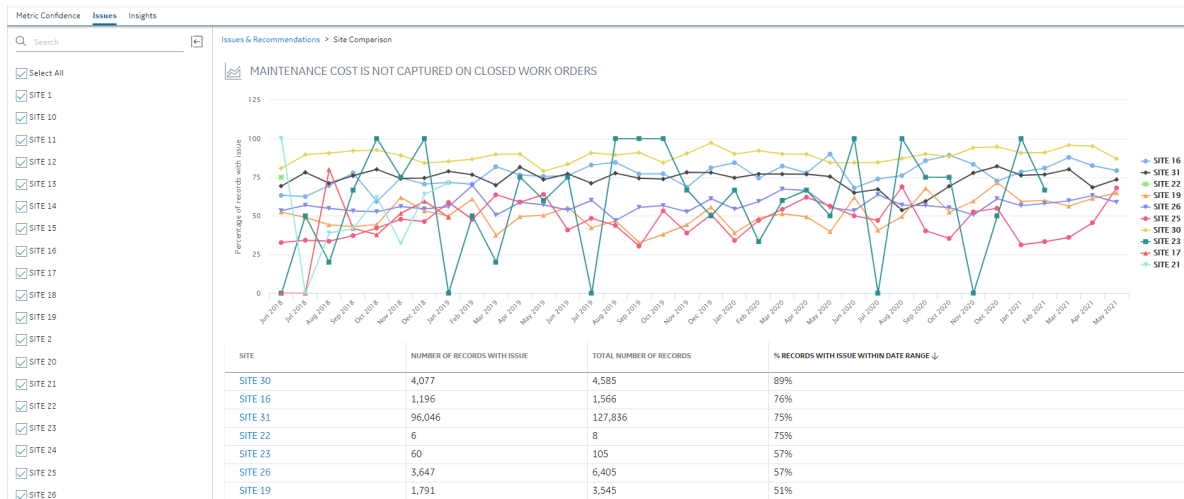
Site Comparison

When you click the hyperlinks available in the **Issues and Recommendations** table, a detailed analysis can be performed by comparing the issue for each site in the organization.

The percentage of work orders or equipment with that particular data quality issue are shown on the Y-axis and the month and year are shown on the x-axis. This trend analysis over time for the selected issue to give an idea of whether the issue has improved or is getting worse.

The percentage with issue column is provided by each in the selected list site at the end of this trend chart in a tabular format.

The site panel is shown on the left and the default selection is for all sites in the company. You may uncheck certain sites to exclude from the analysis or may clear all and pick a few sites for comparison by checking box for each site.




Work Orders or Equipment Details

You may further select a site of interest from the **Site Comparison** screen and come to a table that shows the list of work orders or equipment that have the specific issue. This list has identifier information like work order number, equipment ID and request ID (notification ID for SAP) that can help with the investigation process.

You can go back to your CMMS and start an analysis on specific work orders that have data quality issue and identify the root causes behind missing or inaccurate data. This will help you to identify the issues in your CMMS and implement some of the recommendations suggested in the **Issues and Recommendations** tab.

Metric Confidence [Issues](#) Insights

Issues & Recommendations > Site Comparison > Work Orders

 WORK ORDERS WRITTEN AT HIGHER LEVELS OF FUNCTIONAL LOCATION HIERARCHY / SITE 30 [View functional location distribution](#)

EQUIPMENT ID	WORK ORDER ID	REQUEST ID	EVENT START DATE	WORK ORDER TYPE	WORK ORDER DESCRIPTION	PRIORITY	WORK ORDER COST (\$)	SITE
Equipment Id 1	Work Order Id 1	Request Id 1	N/A	Work Order Type 1	Work Order Description 1	6	\$0	SITE 30
Equipment Id 2	Work Order Id 2	Request Id 2	2021-05-...	Work Order Type 2	Work Order Description 2	3	\$1,580	SITE 30
Equipment Id 3	Work Order Id 3	Request Id 3	N/A	Work Order Type 3	Work Order Description 3	6	\$0	SITE 30
Equipment Id 4	Work Order Id 4	Request Id 4	N/A	Work Order Type 4	Work Order Description 4	6	\$0	SITE 30
Equipment Id 5	Work Order Id 5	Request Id 5	N/A	Work Order Type 5	Work Order Description 5	6	\$0	SITE 30
Equipment Id 6	Work Order Id 6	Request Id 6	N/A	Work Order Type 6	Work Order Description 6	6	\$0	SITE 30
Equipment Id 7	Work Order Id 7	Request Id 7	N/A	Work Order Type 7	Work Order Description 7	6	\$0	SITE 30
Equipment Id 8	Work Order Id 8	Request Id 8	N/A	Work Order Type 8	Work Order Description 8	6	\$0	SITE 30
Equipment Id 9	Work Order Id 9	Request Id 9	N/A	Work Order Type 9	Work Order Description 9	6	\$0	SITE 30
Equipment Id 10	Work Order Id 10	Request Id 10	N/A	Work Order Type 10	Work Order Description 10	6	\$0	SITE 30
Equipment Id 11	Work Order Id 11	Request Id 11	N/A	Work Order Type 11	Work Order Description 11	6	\$0	SITE 30
Equipment Id 12	Work Order Id 12	Request Id 12	N/A	Work Order Type 12	Work Order Description 12	6	\$0	SITE 30
Equipment Id 13	Work Order Id 13	Request Id 13	N/A	Work Order Type 13	Work Order Description 13	6	\$0	SITE 30
Equipment Id 14	Work Order Id 14	Request Id 14	N/A	Work Order Type 14	Work Order Description 14	6	\$0	SITE 30

You can use the **View functional location distribution** link to access the **Data Quality Insights** section that allows you to view the functional location distribution insights to understand how the work orders and equipment are spread throughout different hierarchy levels.

Note: This option appears only when viewing a specific issue, that is, for work orders written at higher levels of functional location hierarchy.

Data Quality Insights

The **Data Quality Insights** section allows you to view the functional location distribution insights to understand how the work orders and equipment are spread throughout different hierarchy levels.

The left panel shows all the sites in the organization. You can select or deselect specific sites. More sites can be added or removed using the left panel.

The right panel lists the top five worst quality sites by default. The top five worst quality sites are chosen for display to focus your attention on the most important candidates for improvements. You can expand each site to view the functional location table that gives insights on hierarchy level, count, and cost of work orders and equipment information.

Metric Confidence Issues Insights

DATA QUALITY INSIGHTS

Top 5 worst data quality sites selected by default

SITE						
SITE 30						
HIERARCHY LEVEL	WORK ORDERS		WORK ORDER COST		EQUIPMENT	
	COUNT	PERCENTAGE %	AMOUNT (USD)	PERCENTAGE %	COUNT	PERCENTAGE %
1	4	80%	\$0	0%	254	32%
3	1	20%	\$9,750,000	100%	532	68%
SITE 22						
SITE 25						
SITE 24						
SITE 19						

Access the Metric Confidence Section

Procedure

1. [Access Industrial Data Diagnostics](#) on page 3.
2. Select the **Data Quality** tab.
The **Metric Confidence** section appears, displaying the reliability metrics confidence score for the top 5 worst data quality sites.

Access the PRIORITIZED DATA QUALITY ISSUES AND RECOMMENDATIONS Section

Procedure

1. [Access Industrial Data Diagnostics](#) on page 3.
2. Select the **Data Quality** tab.
3. Select the **Issues** tab.
The **PRIORITIZED DATA QUALITY ISSUES AND RECOMMENDATIONS** section appears, displaying frequently found data issues, the percentage of asset data having the issues, and the actions recommended by Industrial Data Diagnostics for the corresponding assets.

Data Normalization Metric Confidence **Issues** Insights

Search

SELECT ALL SITE 1 SITE 2 SITE 3 SITE 4 SITE 5 SITE 6 SITE 7 SITE 8 SITE 9 SITE 10 SITE 11 SITE 12 SITE 13 SITE 14 SITE 15 SITE 16

PRIORITIZED DATA QUALITY ISSUES AND RECOMMENDATIONS

PRIORITY	ISSUE	ISSUE RECORDS (DATE RANGE)	ISSUE WOS (LAST MONTH)	RECOMMENDED ACTION	IMPACT OF ISSUE
1	Work orders written at higher levels of functional location hierarchy	4%	0%	Work order should be created against an asset or lowest level of functional location.	Very High Cannot track assets, impacting the ability to track metrics.
2	Work order types are missing	6%	0%	Identify the type of work order, as one of these categories: repair, preventive, predictive (condition based), modification/ More...	Very High Better than count metrics.
3	Maintenance cost outliers for repair, preventive and condition-based work orders	12%	0%	Avoid usage of blanket work order, where maintenance of several assets is grouped on the same work order. Check for accurate More...	High Overestimated Actual % and Reactive Cost %
4	Possible date inaccuracy: Downtime greater than 45 days	4%	0%	The date when actual maintenance starts and completes should be captured accurately either automatically from the time stamp More...	Medium Higher than actual
5	Maintenance Cost is not captured on closed work orders	31%	0%	All work order costs including labor, material and contractor costs should be captured. Labor hours can be captured through t More...	High Underestimated Cost % and Reactive Cost %
6	Possible date inaccuracy: Time to repair greater than 90 days	3%	0%	The date when actual maintenance starts and completes should be captured accurately either automatically from the time stamp More...	Low Higher than actual
7	Failure mode is missing for repair work orders	43%	0%	The cause of an asset failure should be tracked on the work order by creating a standard list of common failure modes.	Medium Cannot understand and build data-driven asset
8	Mismatch between time to repair and priority	72%	0%	Work order priority should be captured based on how quickly it is required to be executed. Work orders executed within a week More...	High Lower than actual
9	Breakdown indicator or asset failure data is not captured using a separate field	81%	0%	A repair conducted after an asset fails should be tracked separately from a proactive repair. This can be done by creating a More...	Medium Overestimate actual Failure Rate.
10	Manufacturer is not captured	16%	-	Capture the manufacturer in the CMMS by consulting the documentation or nameplate information on an asset.	Very Low Cannot compare number, to understand purchase decisions.

Access the Insights Section

Procedure

1. [Access Industrial Data Diagnostics](#) on page 3.
2. Select the **Data Quality** tab.
3. Select the **Insights** tab.

The **DATA QUALITY INSIGHTS** section appears, displaying the top five worst data quality sites. You can expand each site to view the functional location table that shows hierarchy level, count, and cost of work orders and equipment information.

Data Normalization

When the data is imported to the Industrial Data Diagnostics' database, the data is mapped to the Industrial Data Diagnostics' standard fields. Data normalization displays the number of assets and work orders that are imported, the number of assets and work orders that are accepted and the number of assets and work orders that are excluded.

Note: Required fields are checked before the mapping process.

Data normalization is divided into two categories:

- **Equipment Acceptance:** Displays the percentage of equipment accepted, the percentage of equipment excluded and included for Data Quality Analysis, and the percentage of equipment excluded and included for Asset Performance Analysis.
- **Work History Acceptance:** Displays the percentage of work orders accepted, the percentage of work orders excluded and included for Data Quality Analysis, and the percentage of work orders excluded and included for Asset Performance Analysis.

Note: Select a reason to view the records that are excluded.

The following files are generated when you import the data to Industrial Data Diagnostics for the first time:

- **Field Mapping:** The **Download Field Mappings** link opens a spreadsheet that displays the mapping of the data fields to the Industrial Data Diagnostics' standard data fields.
- **Code Mapping:** The **Download Code Mappings** link opens a spreadsheet that displays the mapping of the data to the Industrial Data Diagnostics' standard data.

Chapter 3

Enterprise Benchmarking

Topics:

- [About the Enterprise Benchmarking Page](#)
- [About the OVERALL MAINTENANCE COST Section](#)
- [About the SITE PERFORMANCE Section](#)
- [About the AVERAGE MAINTENANCE WORK COST Section](#)
- [About the AVERAGE MAINTENANCE WORK COUNT Section](#)
- [About the MECHANICAL DOWNTIME Section](#)
- [About Insight Categories](#)
- [About the Gauge Graph](#)
- [About the Trend Graph](#)
- [About Potential Annual Savings/Opportunity Cost](#)
- [Access the Metrics Summary for an Insight Category](#)

About the Enterprise Benchmarking Page

The **Enterprise Benchmarking** page in Industrial Data Diagnostics is a dashboard from which you can drill-down into detailed analyses of the performance of assets in your company. The page contains information that provides insights into the performance of assets from various perspectives.

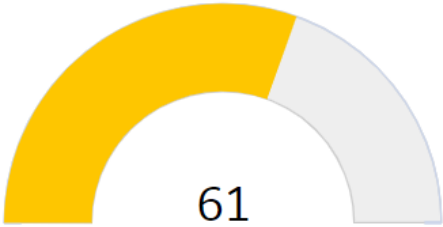
In the **Enterprise Benchmarking** page, the following information appears:

- Overall Maintenance Cost
- Site Performance
- Average Maintenance Work Cost with Cost Insights and Cost Metrics details
- Average Maintenance Work Count with Reliability Insights and Reliability Metrics details
- Mechanical Downtime with Availability Insights and Availability Metrics details

About the OVERALL MAINTENANCE COST Section

The **OVERALL MAINTENANCE COST** section contains a [gauge graph](#) depicting the performance of equipment in your company compared to that of peers. The section also displays the average maintenance cost values per equipment, for your company and your peer, along with the Total Maintenance Cost and the [Potential Annual Savings](#) details.

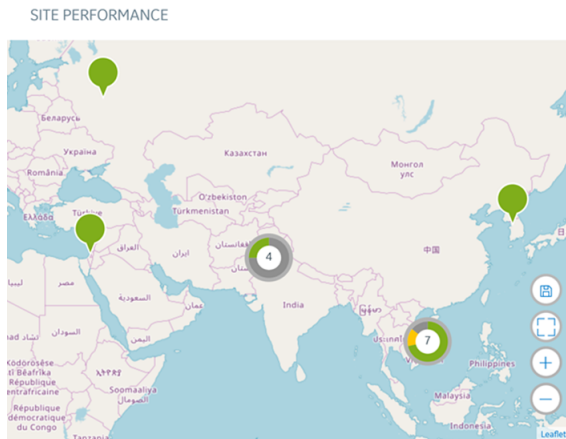
OVERALL MAINTENANCE COST



Company	\$856 /Eq
Peer	\$1,370 /Eq
Total Maintenance Cost	\$1.77B
Potential Annual Savings	\$0

About the SITE PERFORMANCE Section

The **SITE PERFORMANCE** section contains a global map, using which you can navigate to any site in your company and view its performance.





Each marker on the global map represents a site in your organization and appears in one of the following colors based on the percentile of the Overall Maintenance Cost of the assets in the site.

Table 1: Site Color Codes

Color	Percentile of Overall Maintenance Cost
Red	Value is between 0 and 25.
Orange	Value is between 26 and 50.
Yellow	Value is between 51 and 75.
Green	Value is between 76 and 100.
Gray	Value cannot be calculated due to insufficient or missing data for this site.

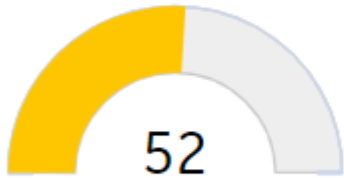
You can perform the following tasks in the map:

- When you select a marker on the map, a tooltip appears, displaying the corrective cost, MTBF, and potential annual savings for the site.
- You can select **+** or **-** to zoom in or zoom out of the map, respectively.
- You can select  to save your zoom level including the longitude and latitude coordinates. When you access the application the next time, you can directly view the map on the zoom level you saved. You can select  to return to the zoom level and coordinates that you saved.

About the AVERAGE MAINTENANCE WORK COST Section

The **AVERAGE MAINTENANCE WORK COST** section is based on [Cost Insights](#) and contains a [gauge graph](#) depicting the maintenance work cost in your company compared to that of peers. The section also displays the average maintenance work cost values per order, for your company and your peer, along with the [Annual Cost Opportunity](#) details.

AVERAGE MAINTENANCE WORK COST



Company **\$1,270** /Order

Peer **\$1,380** /Order

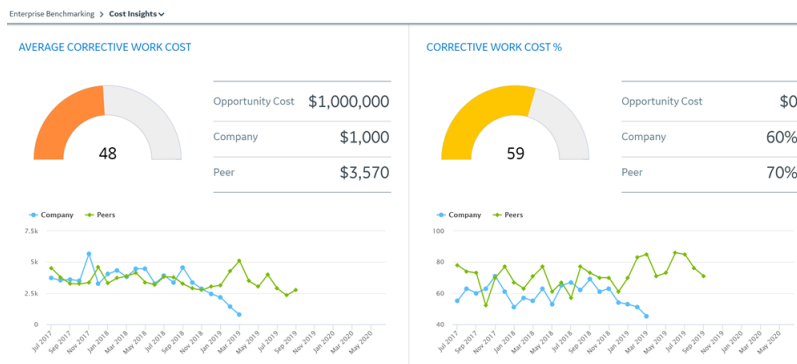
Annual Cost Opportunity **\$0**

[View all Cost Insight details](#) →

You can view the gauge values of the different cost metrics by selecting :

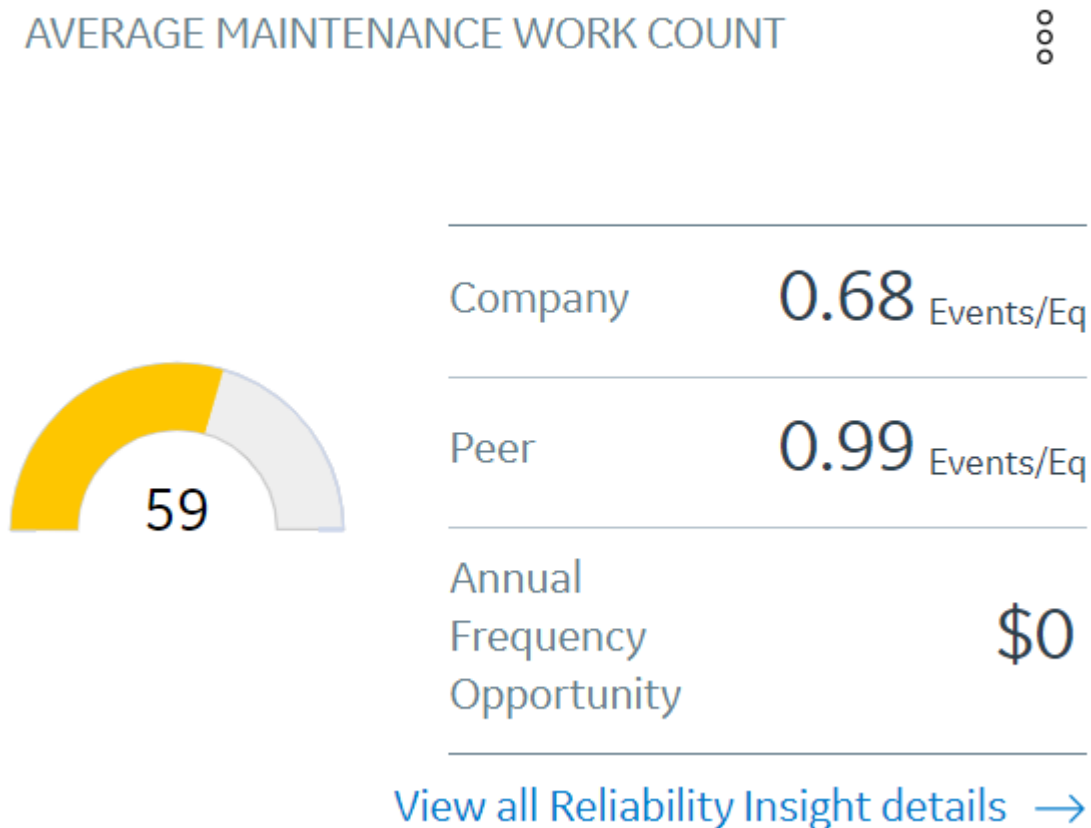
- 85 Average Corrective Work Cost
- 39 Corrective Work Cost %
- 18 Proactive Work Cost %
- 88 Reactive Work Cost %

The **View all Cost Insights details** link provides a comprehensive graphical view of the various costs associated with the assets in the **Cost Insights** section.



About the AVERAGE MAINTENANCE WORK COUNT Section

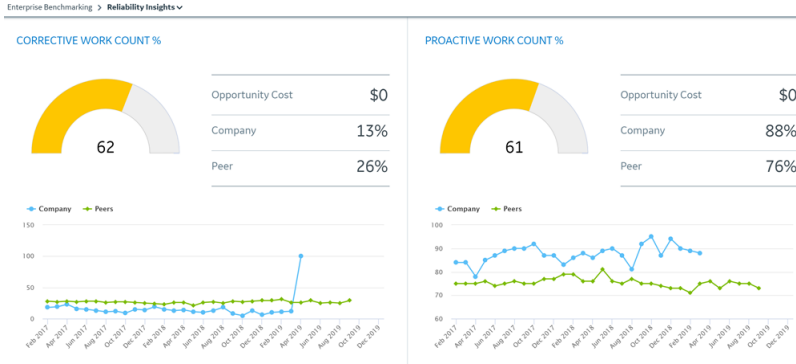
The **AVERAGE MAINTENANCE WORK COUNT** section is based on [Reliability Insights](#) and contains a [gauge graph](#) depicting the number of events in your company compared to that of peers. The section also displays the average number of events per equipment, for your company and your peer, along with the [Annual Frequency Opportunity](#) details.



You can view the gauge values of the different reliability metrics by selecting ↕.

- 51 Corrective Work Count %
- 56 Proactive Work Count %
- 45 Reactive Work Count %
- 84 Mean Time Between Repairs
- 99 Mean Time Between Failures
- 47 Mean Time To Repair
- 99 Failure Rate

The **View all Reliability Insights details** link provides a comprehensive graphical view of the various failure events and the repair time associated with the assets in the **Reliability Insights** section.



About the MECHANICAL DOWNTIME Section

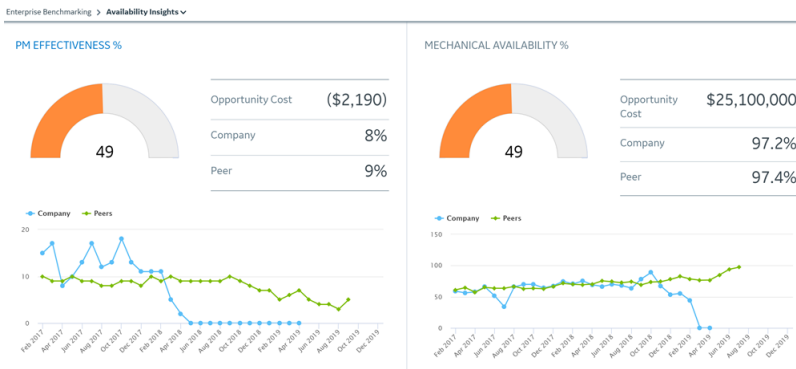
The **MECHANICAL DOWNTIME** section is based on [Availability Insights](#) and contains a [gauge graph](#) depicting the number of days in which there was mechanical downtime in your company compared to that of peers. The section also displays the average number of downtime days per equipment, your company and your peer faced.



You can view the gauge values of the different availability metrics by selecting .

- 76 PM Effectiveness %
- 50 Mechanical Availability %
- 53 Mechanical Downtime
- 50 Mechanical Unavailability %

The **View all Availability Insights details** link provides a comprehensive graphical view of the availability and downtime of your assets in the **Availability Insights** section.



About Insight Categories

Industrial Data Diagnostics categorizes asset performance based on cost, reliability, and availability of assets, known as insight categories, to help you analyze specific aspects of asset performance.

In the **Enterprise Benchmarking** page, the graphs for the insight categories provides visual and numeric data related to asset performance in your organization. The data is based on information related to cost, reliability, and availability of the assets compared to that of peer organizations. You can drill-down each category to view details of asset performance measured by different metrics related to each category.

- **Cost:** Categorizes metrics that analyze the cost associated with the assets, whether the cost is due to corrective, proactive, or reactive maintenance work, and the number of work events associated with each type of work.
- **Reliability:** Categorizes metrics that analyze the frequency of failure events and how long it takes to repair assets after those events occur.
- **Availability:** Categorizes metrics that analyze the availability and downtime of your assets, and the effectiveness of your maintenance strategies.

To measure the performance of an asset based on an insight category, Industrial Data Diagnostics uses a normalized score calculated using the normalized scores for each metric associated with the insight category.

Each of these sections contain the following information:

- Gauge Graph
- Trend Graph
- Opportunity Cost

About the Gauge Graph

In Industrial Data Diagnostics, the performance of assets in your company compared to that of the peers is defined using a ranking value. This ranking value is graphically represented using gauge graphs. Each graph provides a visual representation of the performance of the assets in your company, based on a category, a metric, or overall performance. The data used to generate the graph is filtered based on your selection in the **Select Filters** window.

The graph is scaled to measure a score from zero to 100, where a score of 50 indicates that the performance of your assets is the same as that of your peer organizations. Based on the ranking of your company, the graph is color-coded in red, orange, yellow, and green, where red represents the lowest score, and green the highest. A green graph indicates that your assets are performing better than the peer assets in the category, while a red graph represents that the performance of your assets are lower than that of your peers. The black pointer on the graph points to the score for the assets in your company in the insight category or metric.

About the Trend Graph

A trend graph represents the change in the normalized score for the metric or insight category over the time period selected in the **Select Filters** window. The trend graph appears below the gauge graph that appears for each metric or insight category.

About Potential Annual Savings/Opportunity Cost

Each metric or insight category is associated with a Potential Annual Savings/Opportunity Cost. It is a value that indicates the amount of additional savings and profits your organization could have realized if the performance of your assets in the specific category or metric had been equal to the average score for your peers over the same period. In the **Enterprise Benchmarking** page and in the pages that display details for the metrics, the Opportunity Cost value appears next to the gauge graph for the metric or insight category.

Note: If the score of your company is equal to or greater than that of your peer organizations, the opportunity cost will be \$0. This indicates that for the specific category or metric, your assets are performing better than those of your peer organizations. If enough data is not available to calculate the opportunity cost, a value does not appear in this section.

Access the Metrics Summary for an Insight Category

This topic describes how to access the summary of all metrics associated with an insight category.

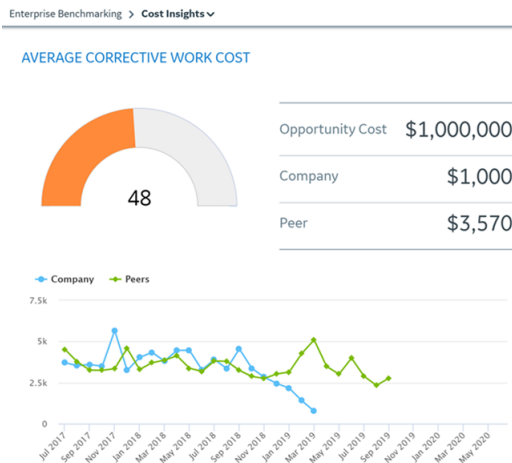
Procedure

1. [Access Industrial Data Diagnostics](#).
2. In the **Enterprise Benchmarking** page, access the section for which you want to view the metrics summary.

Note: You can view the complete summary of associated metrics from the **Average Maintenance Work Cost**, **Average Maintenance Work Count**, and **Mechanical Downtime** sections.

3. Select the insight category link. For example, select **View all Cost Insight details** → to view the Cost Insight metrics.

The page for the selected insight category appears, with different metric values, along with their associated [Gauge Graph](#), [Trend Graph](#), and [Opportunity Cost](#).



Tip: You can access the **BAD ACTOR POPULATIONS** section by selecting the metric name. The company and peer metric values replace the insight category values in the Site category of the **BAD ACTOR POPULATIONS** section. However, this functionality is not available for the following metrics:

- FAILURE RATE

- MECHANICAL AVAILABILITY%
- MECHANICAL UNAVAILABILITY%

Chapter

4

Bad Actors

Topics:

- [About Bad Actors](#)
- [About Favorites Groups](#)
- [About Work Orders](#)
- [Access the BAD ACTOR POPULATIONS Section](#)
- [Access the BAD ACTOR POPULATIONS Section for an Equipment Class, Equipment Type, Site, Area, or Unit](#)
- [Access the ASSET LEVEL Section](#)
- [Filter Data in the Asset Level Section](#)
- [Export Customized Bad Actor Data to an Excel Workbook](#)
- [Access the Cost Analysis Details for a Month](#)
- [Access the Asset Details Section](#)
- [Access the Work Order Visualization Chart](#)
- [Create a Favorite Group](#)
- [Add Assets to an Existing Favorite Group](#)
- [Remove an Asset from a Favorite Group](#)
- [Specify Weightage for Bad Actor Metrics](#)

About Bad Actors

Bad Actors are assets that are associated with frequent failures and high maintenance costs. These assets negatively impact the business and represent opportunities for improvement of asset performance in your organization. Using Industrial Data Diagnostics, you can identify the Bad Actors in your company and create a strategy to improve the performance of these assets. The Bad Actors, filtered based on your filter selections, are listed in the **BAD ACTOR POPULATIONS** section.

The Bad Actors are classified into the following categories:

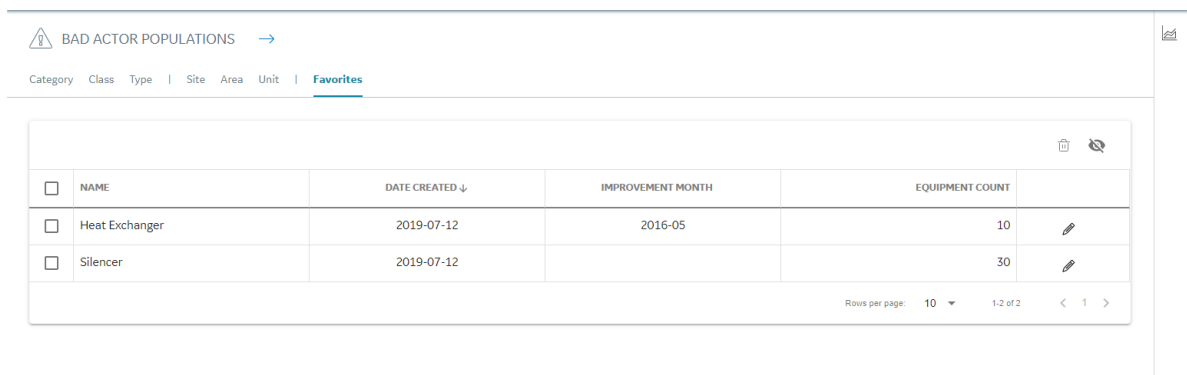
- Equipment Category
- Equipment Class
- Equipment Type
- Site
- Area
- Unit

Based on the relationships between the categories, the Bad Actors are hierarchically classified as follows:

- Equipment Category > Equipment Class > Equipment Type > Asset
- Site > Area > Unit > Asset

About Favorites Groups

A Favorite Group is a collection of assets that have been marked for tracking improvement. The **Favorites** subsection in the **BAD ACTOR POPULATIONS** section contains a list of favorite groups. You can create a favorite group or add assets to an existing favorite group either from the **BAD ACTOR POPULATIONS** section or from the **ASSET LEVEL** section. You can sort the favorite groups from the **Favorites** subsection for easy identification.



The screenshot shows the 'BAD ACTOR POPULATIONS' interface with the 'Favorites' tab selected. The table below contains the following data:

<input type="checkbox"/>	NAME	DATE CREATED ↓	IMPROVEMENT MONTH	EQUIPMENT COUNT	
<input type="checkbox"/>	Heat Exchanger	2019-07-12	2016-05	10	
<input type="checkbox"/>	Silencer	2019-07-12		30	

At the bottom of the table, there is a pagination control: 'Rows per page: 10', '1-2 of 2', and navigation arrows.

You can perform the following tasks in the table:

- Select the columns that appear in the table by selecting
- Delete favorite groups by selecting the check box next to the favorite groups that you want to delete, and then selecting .
- Modify a favorite group by selecting .

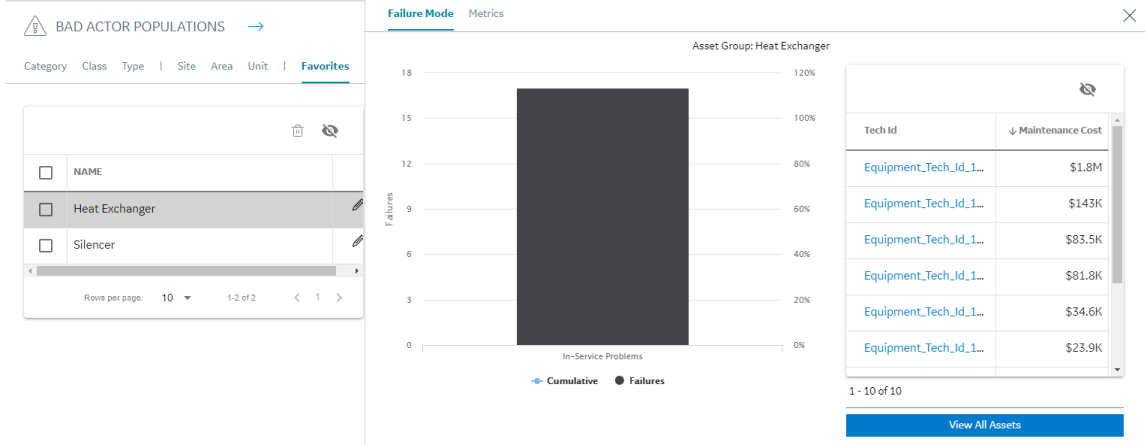
Note: You can modify the values in the following fields:

- Group Name

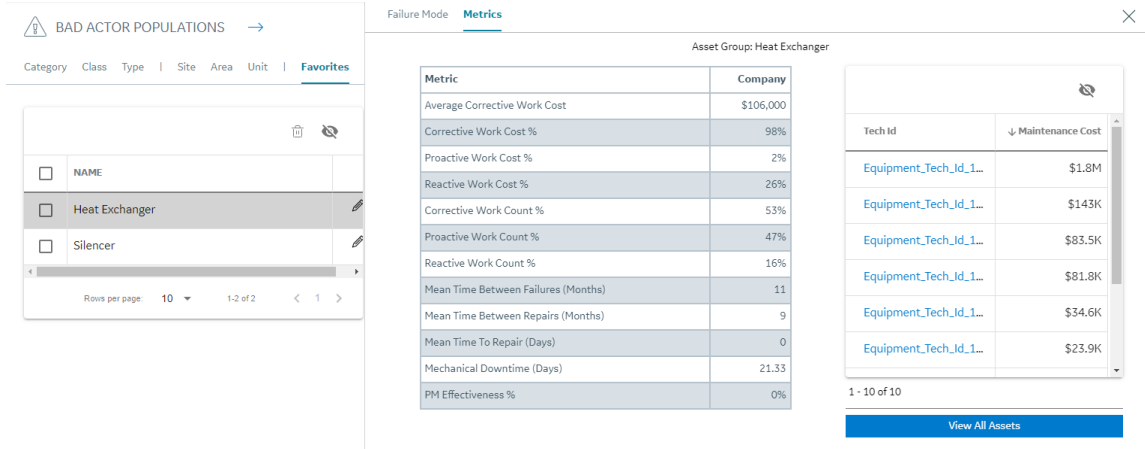
- Improvement Month

In the **Favorites** subsection, when you select a row, a pane containing the following sections appears:

- **Failure Mode:** A chart containing the details of different failure modes.



- **Metrics:** The company values of all the metrics of the selected favorite group.



Note: The pane also contains a list of top 10 assets of the selected favorite group sorted by Maintenance Cost in descending order. To access all the assets of the selected favorite group in the **ASSET LEVEL** section, select the **View All Assets** button.

About Work Orders

A work order is an authorization of maintenance, repair, or breakdown tasks to be completed. Work orders are created to manage the work and related costs for assets. Work orders are essential for tacking maintenance of assets, and assist you in monitoring costs, downtime, and resources.

Using work orders, the asset maintenance process is streamlined as it creates a historical record of the work that is requested and performed. Work order management for repair and preventive maintenance allows you to track requests and monitor the maintenance costs associated with the various events. Proper monitoring of work orders can:

- Improve asset life and enhance productivity.
- Reduce maintenance cost and downtime.

In Industrial Data Diagnostics, a work order event is classified as follows:

- Preventive maintenance event
- Predictive maintenance event
- Repair event
- Miscellaneous event

The **EVENT LOG** subsection in the **Asset Details** section provides you with a visualization tool to view and track your work orders efficiently. You can manage all the work order information through a single dashboard. The information in the dashboard allows you to perform the following:

- Identify assets with frequent problems and with unacceptable amount of downtime.
- Make informed decisions to proactively reduce the amount of downtime.
- Implement solutions such as systematic inspections or preventive maintenance.

Premium account subscribers can download a Microsoft Excel workbook containing information about the work orders associated with the equipment.

Access the BAD ACTOR POPULATIONS Section

About This Task

You can access the **BAD ACTOR POPULATIONS** section to view and analyze how various Bad Actors are performing. You can receive insights on the Cost, Availability, and Reliability metrics of the Bad Actor along with Potential Annual Savings details.

Procedure

1. [Access Industrial Data Diagnostics](#) on page 3.
2. Select the **Bad Actors** tab.

The **BAD ACTOR POPULATIONS** section appears, displaying a table with details of all the Bad Actors. By default, the Bad Actors are classified based on the equipment **Category** and sorted by **INDEX** in ascending order. You can also [access the BAD ACTOR POPULATIONS section for an equipment class, type, site, area, or unit.](#)

BAD ACTOR POPULATIONS →

Category | Class | Type | Site | Area | Unit | Favorites


<input type="checkbox"/>	INDEX	EQUIPMENT CATEGORY	DOMINANT FAILURE MODE	EQUIPMENT COUNT	EVENTS	COST	RELIABILITY	AVAILABILITY	POTENTIAL ANNUAL SAVINGS	POTENTIAL ANNUAL SAVINGS PER ASSET
<input type="checkbox"/>	58	> Electrical	In-Service Pro...	66,083	272,337	55	59	59	\$0	\$0
<input type="checkbox"/>	59	> Fixed	In-Service Pro...	212,859	493,369	51	56	60	\$0	\$0
<input type="checkbox"/>	54	> Instruments	In-Service Pro...	107,557	373,368	54	53	56	\$0	\$0
<input type="checkbox"/>	58	> Rotating	In-Service Pro...	58,460	305,950	48	63	59	\$0	\$0

You can perform the following tasks in the table:


- Select > to drill down the Bad Actor hierarchical classification, to preview the top Bad Actors of each level:
 - From the **Category** column, you can preview the Bad Actors in the Class category. From the **Class** column, you can preview the Bad Actors in the Type category. From the **Type** column, you can drill down to the technical ID level of the asset.

- From the **Site** column, you can preview the Bad Actors in the Area category. From the **Area** column, you can preview the Bad Actors in the Unit category. From the **Unit** column, you can drill down to the technical ID level of the asset.
- Select the TECH ID value in the Asset level to access the **Asset Details** section.







- Select  to access Metrics. This option appears only for **Class** and **Type** rows.



- Select  to access PM Diagnostics. This option appears only for **Class** and **Type** rows.



- Select  to access [Manufacturer Comparison](#). This option appears only for **Class** and **Type** rows.
- Select the **Favorites** tab to create a favorite group or add the Bad Actors to an existing favorite group.
- Select  to specify the weightage for Bad Actor metrics.
- Select  to download a Microsoft Excel workbook containing information about the equipment based on the filters selected in the **Select Filters** window. This functionality is available for Premium account subscribers only.
- Select  to choose the columns that appear in the table.
- Select the column name to sort the table based on a column.
- Drag the column names of the columns to rearrange the columns.

Access the **BAD ACTOR POPULATIONS** Section for an Equipment Class, Equipment Type, Site, Area, or Unit

About This Task

This topic describes how to access the **BAD ACTOR POPULATIONS** section for an equipment class, equipment type, site, area, or unit.

Procedure

1. [Access Industrial Data Diagnostics](#) on page 3.
2. Select the **Bad Actors** tab.
The **BAD ACTOR POPULATIONS** section appears, displaying a table with details of all the Bad Actors. By default, the Bad Actors are sorted based on the Equipment Category.
3. Depending on the category for which you want to access the **BAD ACTOR POPULATIONS** section, in the **Bad Actors** page, select one of the following tabs:
 - **Class**
 - **Type**
 - **Site**
 - **Area**
 - **Unit**

The **BAD ACTOR POPULATIONS** section appears, displaying a table that contains a row for each equipment that belongs to the category you have selected.

Access the ASSET LEVEL Section

This topic describes how to access the **ASSET LEVEL** section for data based on selected filters.

About This Task

You can access the **ASSET LEVEL** section to access and analyze how various assets are performing in different categories of cost and event counts.

Procedure

1. [Access Industrial Data Diagnostics](#) on page 3.
2. Select the **Bad Actors** tab, and then in the **BAD ACTOR POPULATIONS** section, select →.

Tip: You can also select any row in the **BAD ACTOR POPULATIONS** section, and then select the **View All Assets** button.

The **ASSET LEVEL** section appears, displaying a table that contains a row for each piece of equipment that meets the criteria defined by the selected filters.

TECH ID	REPAIR COST	REPAIR EVENT COUNT	MAINTENANCE COST	EVENT TIMELINE
1234	\$1,400	1	\$2,229	Timeline with various event icons
2345	\$1,500	45	\$1,300	Timeline with various event icons
3456	\$2,400	35	\$2,500	Timeline with various event icons
4567	\$3,660	69	\$3,150	Timeline with various event icons
5678	\$3,960	50	\$6,030	Timeline with various event icons

Note: You can filter the data that appears in the **ASSET LEVEL** section.


The **EVENT TIMELINE** column in the **ASSET LEVEL** table represents the event timeline. The following elements represent different event types in the timeline:

- A red triangle represents a breakdown repair event.
- An orange diamond represents a repair event.
- A blue circle represents a preventive maintenance (PM) event.
- A purple circle represents a predictive maintenance (PdM) event.
- A gray circle represents a miscellaneous event.
- A green square represents a modification event.

Tip: You can perform the following tasks in the table:


- Filter the assets that appear in the table by selecting ▾.
- To access the cost analysis details for an asset, select the asset, and then select the **Show Cost Analysis** toggle button.
- Select the event types that appear in the timeline by selecting ⚙.
- To export the asset data to an Excel workbook, select 📄.
 - The **Current Page** option allows you to export the data available in the page that you are currently accessing.
 - The **Custom Page** option allows you to configure the preferred number of Bad Actors that you want to export for a specific page and export the Bad Actor data to an Excel workbook. For more information on how to export your preferred number of Bad Actors, refer to [Export Customized Bad Actors Data to an Excel Workbook](#).

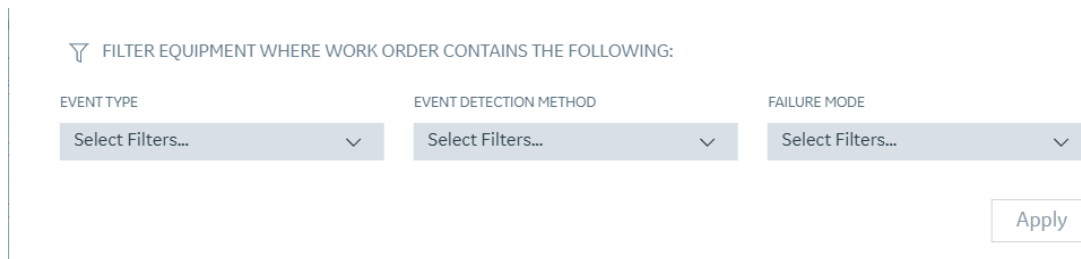
Note: This functionality is available only for the Premium account subscribers.

- Select the columns that appear in the table by selecting .
- Add assets to an existing favorite group by selecting the check box next to the asset TECH ID, and then selecting the **Add to Favorite Group** button. You can create a favorite group from the **Save Asset Group** window.
- Access the **ASSET DETAILS** section by selecting the value in the **TECH ID** column.
- Sort the table based on the values in a column by selecting the column heading.
- Rearrange the columns by dragging the column headings to where you want them.

Filter Data in the Asset Level Section

Procedure

1. Access the **ASSET LEVEL** section.
2. Select  to filter the assets that appear in the **ASSET LEVEL** section. The **FILTER EQUIPMENT WHERE WORK ORDER CONTAINS THE FOLLOWING** pane appears.



▼ FILTER EQUIPMENT WHERE WORK ORDER CONTAINS THE FOLLOWING:

EVENT TYPE	EVENT DETECTION METHOD	FAILURE MODE
Select Filters... ▼	Select Filters... ▼	Select Filters... ▼

Apply

Note: You can filter the data using the following parameters:

- **EVENT TYPE**
- **EVENT DETECTION METHOD**
- **FAILURE MODE**

The options in the drop-down list boxes are populated based on the work history data available in the Industrial Data Diagnostics database.

3. Select the options from the drop-down list boxes based on how you want to filter the data.

Note: In each drop-down list box, you can select more than one value.

4. Select **Apply**.
The data in the **ASSET LEVEL** section is filtered. Only assets that contain at least one work event that meets any one of the filter criteria that you selected appear in the section.

Note: If there is no such equipment, a message appears, stating that there are no results for the current filter criteria.

5. To apply **TECH ID** and **FUNCTIONAL LOCATION** filters, select  in the filter bar.

TECH ID

Search...

FUNCTIONAL LOCATION

Search...

Save As... Clear All Reset Apply

You can search for the **TECH ID** and **FUNCTIONAL LOCATION** you want to select by typing the characters in the search box. It will list all the results which are valid considering all the other selected filters in the filter panel. All the valid results having the search term anywhere in the text will be shown.


Export Customized Bad Actor Data to an Excel Workbook

About This Task

You can access a maximum of 100 Bad Actors per page in the **ASSET LEVEL** section. When accessing a page, if you want to export the Bad Actor data contained in the page, you can use the **Current Page** setting. However, if you want to export more than 100 Bad Actors, you can configure the export settings to export your preferred number of Bad Actors for a specific page. For example, if there are 3000 Bad Actors in the **ASSET LEVEL** section, and you want to export the data of 1000 Bad Actors at a time to an Excel workbook, the data is distributed across three pages. If you increase the number of Bad Actors to be exported per page, the total number of pages containing the corresponding data is reduced. In this scenario, if you want to export the data contained in page number 3, you can configure the export settings in the **Asset Level Export Options** window. When you export the data, the data contained in page number 3 is exported.

This task describes how to export the customized data to an Excel workbook.

Procedure

1. Access the **ASSET LEVEL** section.
2. Select .

The **Asset Level Export Options** window appears.
3. Select the **Custom Page** option.

The total number of Bad Actors available in the **ASSET LEVEL** section and the settings to configure your export preferences appear.
4. In the **NUMBER OF ASSETS IN THE PAGE** drop-down list box, select the number of Bad Actors that you want to export for a specific page.

- In the **PAGE NUMBER** box, specify the number of the page containing the Bad Actors that you want to export.
- Select **Export**.
The Bad Actor data is exported to an Excel workbook and the workbook is downloaded.

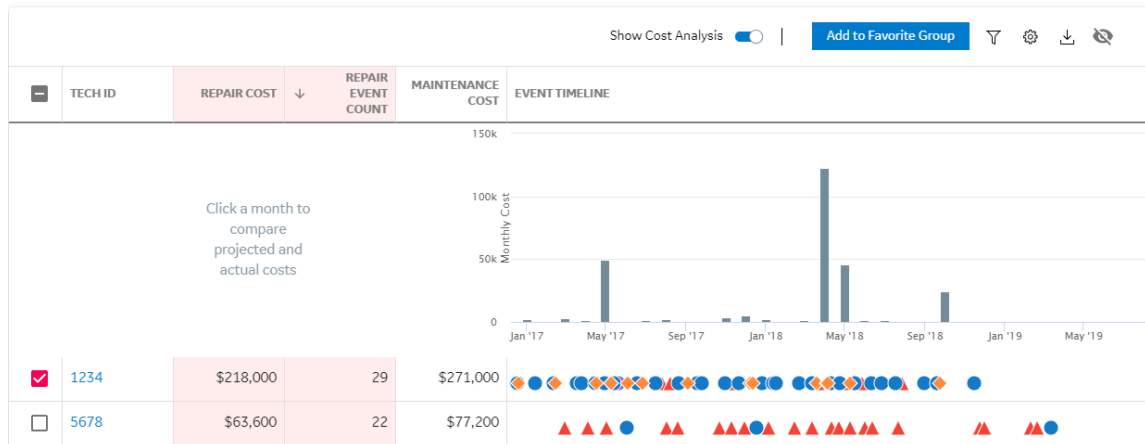
Tip: You can access the Excel workbook with the Bad Actor data in your local drive.

Access the Cost Analysis Details for a Month

Procedure

- Access the **ASSET LEVEL** section.
- Select the asset for which you want to access the cost analysis details.
The **Show Cost Analysis** toggle button appears.
- Select the **Show Cost Analysis** toggle button.
A bar chart appears, displaying the monthly maintenance cost of the selected asset.

 ASSET LEVEL

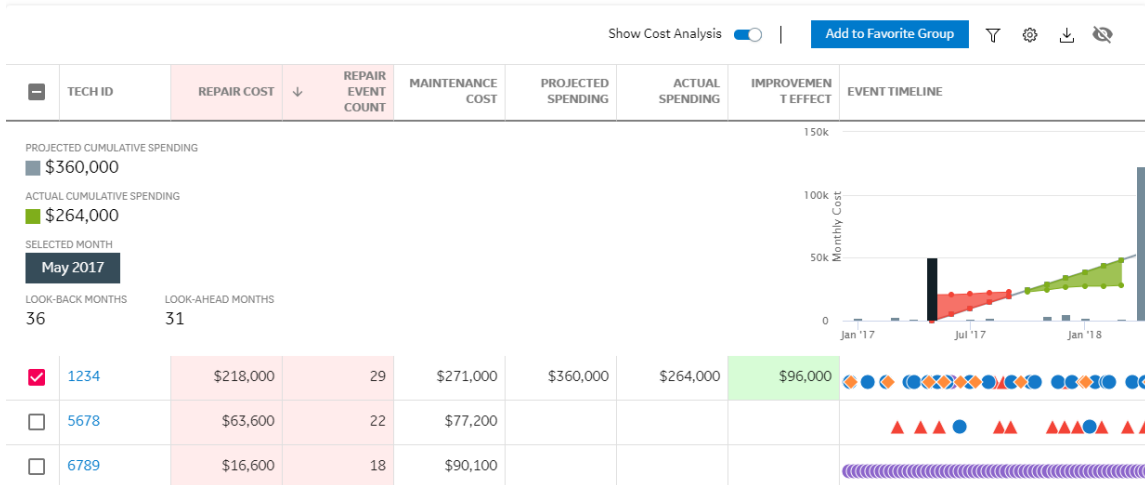


Tip: You can point to the chart to access the following information:

- Projected Maintenance Cost, which is the total cumulative projected maintenance cost.
 - Monthly Maintenance Cost, which is the total maintenance cost.
 - Actual Maintenance Cost, which is the total cumulative maintenance cost.
- Select the bar corresponding to the month for which you want to access the cost analysis details.

Note: To select a different month, select the bar corresponding to that month, or select the month in the **SELECTED MONTH** box.

A bar chart appears, displaying the cost analysis details for the selected month. The chart contains the linear projected cumulative spending and the actual cumulative spending from the selected month through the last month for the selected date range.



Note:

- The projected cumulative spending is plotted by considering the average maintenance cost for the last 36 months, starting from the selected month, and then cumulatively adding the cost for the consecutive months.
- If the actual maintenance cost is more than the projected maintenance cost, the region between the actual cumulative spending curve and the projected cumulative spending curve will be red.
- If the actual maintenance cost is less than or equal to the projected maintenance cost, the region between the actual cumulative spending curve and the projected cumulative spending curve will be green.
- When accessing the assets of a favorite group, if an improvement month is saved for the group, the month will be automatically selected when you access cost analysis, if it lies within the selected date range.
 - You can select the **Set as Improvement Month** button to set the month in the **SELECTED MONTH** box as the improvement month for the favorite group. In addition, you can set a month as an improvement month by selecting the bar corresponding to the month on the chart, and then selecting the **Set as Improvement Month** button for the favorite group.

Access the Asset Details Section

About This Task

You can access the **Asset Details** section to view the details about the piece of equipment, including the associated costs and event logs.



Procedure

1. Access the **ASSET LEVEL** section.
2. In the row containing the equipment whose details you want to view, in the **TECH ID** column, select the link for the technical ID of the equipment.
The **Asset Details** section appears, displaying details regarding the equipment, cost associated with the equipment, and the events logged for the equipment.

Note:

- You can also access the **Asset Details** section using the hierarchical classification in the **Bad Actor Populations** section.
- Select the **Add Manufacturer To Comparison** option to compare the manufacturer of the asset with other manufacturers. This will automatically filter by EQUIPMENT TYPE and display the **MANUFACTURER COMPARISON** page. If the compared manufacturer for the asset is available, it will be selected automatically.
- The **Add Manufacturer to Comparison** button appears only if the value in the Manufacturer field is not Unknown.

Tip: In the **EVENT LOG** subsection, you can perform the following tasks in the table:

- Select  to download a Microsoft Excel workbook containing information about the event logs associated with the equipment. This functionality is available for Premium account subscribers only.
- Select  to choose the columns that appear in the table containing the list of events associated with the equipment.

Access the Work Order Visualization Chart

The work order visualization chart illustrates the different event types and the maintenance costs of an asset. This chart represents the relationship between the various events and their associated costs over a period of time.

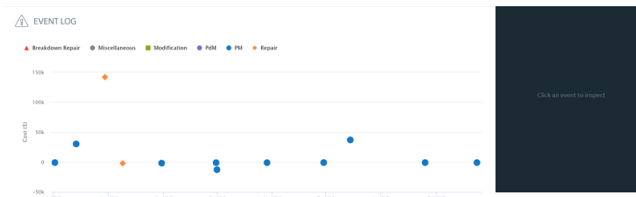
Procedure

1. Access the **Asset Details** section.

2. Access the **EVENT LOG** subsection.

The work order visualization chart appears, displaying the following elements:

- Axes:
 - The horizontal (x) axis represents the event timeline.
 - The vertical (y) axis represents the event costs.
- Event Labels:
 - A red triangle represents a breakdown repair event.
 - An orange diamond represents a repair event.
 - A blue circle represents a preventive maintenance (PM) event.
 - A purple circle represents a predictive maintenance (PdM) event.
 - A gray circle represents a miscellaneous event.
 - A green square represents a modification event.



Note: The labels are plotted based on:

- Event maintenance cost.
- Event date filter configuration (Event Start Date or Maintenance Completion Date).

Tip:

- To access more details about the work order, select an event.



- To zoom in on an area in the chart, drag the pointer over the area. To zoom out, select **Reset Zoom**.

Create a Favorite Group

About This Task

You can create a favorite group in any one of the following sections:

- BAD ACTOR POPULATIONS**
- ASSET LEVEL**

Procedure

- To create a favorite group in the **BAD ACTOR POPULATIONS** section, perform the following steps:
 - Access the **BAD ACTOR POPULATIONS** section.
 - Select the check boxes next to the Bad Actors that you want to add to the favorite group, and then select **Add to Favorite Group**. The **Save Asset Group** window appears.

Save Asset Group

ADD TO EXISTING GROUP

Select ▼

CREATE NEW GROUP

Enter group name

IMPROVEMENT MONTH

Select Improvement Month 📅

Cancel

Save & View Favorites

Save

- In the **CREATE NEW GROUP** box, enter a name for the favorite group.
- Optional:** In the **IMPROVEMENT MONTH** box, select the improvement month.
- Select **Save**. The favorite group consisting of all the assets that belong to the selected Bad Actors is created.

- Note:** Alternatively, you can select **Save & View Favorites** to save the favorite group and then go to the **Favorites** section.
2. To create a favorite group in the **ASSET LEVEL** section, perform the following steps:
 - a) Access the **ASSET LEVEL** section.
 - b) Select the check boxes next to the assets that you want to add to the favorite group, and then select **Add to Favorite Group**.
The **Save Asset Group** window appears.

The screenshot shows a 'Save Asset Group' dialog box. It has a title 'Save Asset Group' at the top. Below the title are three sections: 'ADD TO EXISTING GROUP' with a dropdown menu showing 'Select', 'CREATE NEW GROUP' with a text input field 'Enter group name', and 'IMPROVEMENT MONTH' with a text input field 'Select Improvement Month' and a calendar icon. At the bottom are three buttons: 'Cancel', 'Save & View Favorites', and 'Save'.

- a) In the **CREATE NEW GROUP** box, enter a name for the favorite group.
- b) **Optional:** In the **IMPROVEMENT MONTH** box, select the improvement month.
- c) Select **Save**.
The favorite group consisting of the selected assets is created.

Note: Alternatively, you can select **Save & View Favorites** to save the favorite group and then go to the **Favorites** section.

Add Assets to an Existing Favorite Group

About This Task

You can add assets to an existing favorite group in any one of the following sections:

- **BAD ACTOR POPULATIONS**
- **ASSET LEVEL**

Procedure

1. To add assets to a favorite group in the **BAD ACTOR POPULATIONS** section, perform the following steps:
 - a) Access the **BAD ACTOR POPULATIONS** section.

- b) Select the check boxes next to the Bad Actors that you want to add to the favorite group, and then select **Add to Favorite Group**.
The **Save Asset Group** window appears.

Save Asset Group

ADD TO EXISTING GROUP

Select

CREATE NEW GROUP

Enter group name

IMPROVEMENT MONTH

Select Improvement Month

Cancel Save & View Favorites Save

- c) In the **ADD TO EXISTING GROUP** drop-down list box, select the group to which you want to add the assets.
- d) **Optional:** In the **IMPROVEMENT MONTH** box, select the improvement month.
- e) Select **Save**.
All the assets that belong to the selected Bad Actors are added to the selected favorite group.
- Note:** Alternatively, you can select **Save & View Favorites** to add the assets to the selected favorite group and then go to the **Favorites** section.
2. To add assets to a favorite group in the **ASSET LEVEL** section, perform the following steps:
- a) [Access the ASSET LEVEL section](#)
- b) Select the check boxes next to the assets that you want to add to the favorite group, and then select **Add to Favorite Group**.
The **Save Asset Group** window appears.

Save Asset Group

ADD TO EXISTING GROUP

Select ▼

CREATE NEW GROUP

Enter group name

IMPROVEMENT MONTH

Select Improvement Month 📅

Cancel

Save & View Favorites

Save

- c) In the **ADD TO EXISTING GROUP** drop-down list box, select the group to which you want to add the assets.
- d) **Optional:** In the **IMPROVEMENT MONTH** box, select the improvement month.
- e) Select **Save**.
The selected assets are added to the selected favorite group.

Note: Alternatively, you can select **Save & View Favorites** to add the assets to the selected favorite group and then go to the **Favorites** section.

Remove an Asset from a Favorite Group


Procedure

1. [Access Industrial Data Diagnostics](#) on page 3.
2. In the **Bad Actors** page, in the **BAD ACTOR POPULATIONS** section, select **Favorites**.
The **Favorites** subsection appears, displaying a table that contains the favorite groups.
3. Select the row that contains the favorite group from which you want to remove an asset.
The analysis pane for the group appears, displaying the **Failure Mode** section.
4. Select **View All Assets**.
The **ASSET LEVEL** section appears, displaying all the assets for the selected favorite group.
5. Select the check box next to the asset that you want to remove from the favorite group, and then select **Remove From <Favorite Group Name>**.
The **Remove Assets** window appears.
6. Select **Yes**.
The selected asset is removed from the favorite group.

Note: If you remove all the assets from a favorite group, the group is deleted and the assets are displayed in the **ASSET LEVEL** section based on the specified filter criteria.

Specify Weightage for Bad Actor Metrics

Procedure

1. [Access Industrial Data Diagnostics](#) on page 3.
2. Select the **Bad Actors** tab, and then in the **BAD ACTOR POPULATIONS** section, select . The **Set Bad Actors Metric Weights** window appears, displaying a list of metrics that are used to calculate the index of Bad Actors, and the weightage for each metric. The list is categorized based on the insight categories (that is, Cost, Reliability, and Availability). By default, the weightage for all the metrics is set to medium, which implies that the weightage of all the metrics is the same.

Set Bad Actors Metric Weights

	EXCLUDE	MEDIUM	HIGH
COST	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Average Corrective Work Cost	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Corrective Work Cost %	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Proactive Work Cost %	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Reactive Work Cost %	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
RELIABILITY	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Corrective Work Count %	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Proactive Work Count %	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Reactive Work Count %	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Mean Time Between Failures	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Mean Time Between Repairs	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Mean Time to Repair	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
AVAILABILITY	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Mechanical Downtime	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Preventative Maintenance Effectiveness %	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

3. If you want to increase the weightage of a metric, in the corresponding row, select the option in the **HIGH** column.
- Tip:** To increase the weightage of all the metrics within a given insight category at once, for the corresponding insight category, select the option in the **HIGH** column.
4. If you want to exclude a metric from the calculation, in the corresponding row, select the option in the **EXCLUDE** column.
- Tip:** To exclude all the metrics within a given insight category at once, for the corresponding insight category, select the option in the **EXCLUDE** column.
5. Select **Apply**.
The weightage is applied to the selected metrics and values in the **BAD ACTOR POPULATIONS** section are recalculated.

Note: If you include only one metric in the **Set Bad Actors Metric Weights** window, the insight category values are replaced by the company value and peer value of the selected metric, in the **BAD ACTOR POPULATIONS** section.

Chapter 5

Metrics

Topics:

- [About Metrics](#)
- [Access Metrics Module](#)

About Metrics

The metrics tab displays the asset performance in terms of 15 reliability and maintenance metrics based on the Society of Maintenance and Reliability Professionals industry standard. Metric comparisons are displayed across different sites in the organization as well as against an industry average peer value.

Note: Industry peers can be a collection of companies in the same vertical, based on the value set in the **Industry** filter.

Metrics enables you to effectively optimize costs, reduce unplanned failures, increase uptime, and lower production losses. You can make the following decisions using this functionality:

- Get an in-depth view of asset performance from different dimensions and understand the areas of good performance against the areas that need improvement. For example, if for a site, the maintenance cost is low, and the mean time between failure is also low, it indicates cheap but frequent failures.
- Focus on a metric where there is a huge difference between the site and the benchmark and ultimately a high annual potential saving.
- Compare performance of assets between the different sites of the organization and incorporate the improvements in performance accordingly. For example, a site that has a low MTBF (and higher frequency of failures) can incorporate the asset strategies from a site with the best MTBF and reduce its failure frequency.
- Benchmark against external peers to understand the opportunity to invest improvement efforts and get the largest value for money. For example, in an internal view, if one site has the best MTBF, but it is below the benchmark's performance, you can focus on the strategies that lower unexpected failures.

Note: To obtain the detailed definitions and calculations of each metric, you can contact your GE representative in sales, customer support, Industrial Data Diagnostics and Customer Success roles.

Access Metrics Module

Procedure

1. [Access Industrial Data Diagnostics](#) on page 3.
2. Select the **Metrics** button on the ribbon.

The metrics module displays a tabular view with 15 metrics as rows and 5 sites as columns.

METRICS		Top 5 sites by greatest potential savings selected by default				
METRIC	SITE 8	SITE 33	SITE 1	SITE 10	SITE 11	PEER
Average Corrective Work Cost	● \$14,200	● \$7,730	● \$22,900	● \$6,310	● \$10,900	\$4,520
Corrective Work Cost %	46%	61%	● 85%	● 97%	● 84%	72%
Corrective Work Count %	22%	16%	25%	● 78%	● 31%	29%
Proactive Work Cost %	99%	● 52%	97%	94%	98%	57%
Proactive Work Count %	100%	89%	99%	89%	100%	80%
Reactive Work Cost %	● 33%	16%	● 77%	● 96%	● 80%	28%
Reactive Work Count %	● 17%	4%	● 20%	● 77%	● 28%	9%
Mean Time Between Failures (Months)	26,164	● 245	10,077	983,983	N/A	322
Mean Time Between Repairs (Months)	245	236	239	● 66	● 97	158
Mean Time to Repair (Days)	16	● 81	9	47	25	79
Mechanical Downtime (Days)	32	32	● 72	● 104	● 41	41
PM Effectiveness %	98%	34%	95%	86%	99%	31%
Failure Rate (FPMH)	0	● 6	0	0	N/A	4
Mechanical Availability %	97.1%	97%	● 93.5%	● 90.5%	96.3%	96.3%
Mechanical Unavailability %	2.9%	3%	● 6.5%	● 9.5%	3.7%	3.7%
Potential Savings	\$101M	\$92.3M	\$74.7M	\$62.6M	\$58.6M	

The top 5 sites with the highest potential savings for performance comparison with the benchmark (average peer value), appear in the columns by default. You can select any other site from left panel.

The potential savings for each site appear at the bottom of each column. This helps determine the overall opportunity to save money by improving the performance to the peer average.

A red dot in front of a value indicates that a particular site's metric performance is lower than the peer value.

Chapter 6

Proactive Maintenance Diagnostics

Topics:

- [About Optimizing Proactive Maintenance](#)
- [Access the Reactive vs. Proactive Maintenance Chart](#)
- [Access the Failure Mode Chart](#)

About Optimizing Proactive Maintenance

Proactive maintenance work comprises routine tasks that include preventative work such as changing the belts on a conveyor at a regular interval and predictive work such as vibration analysis performed at a regular frequency. In some cases, the performance of proactive maintenance causes equipment failures. For example, in instruments such as pressure transmitters, the proactive work of verifying the calibration of the transmitter may cause instrument errors if performed too frequently. If these instrument errors are not corrected frequently, they may result in drift-induced errors. The errors due to proactive work that is performed more frequently than required are called maintenance-induced errors.

In Industrial Data Diagnostics, the **Reactive vs Proactive Maintenance** graph helps you identify equipment that are being over-maintained and under-maintained with respect to proactive maintenance. After identifying such equipment, you can eliminate unnecessary routine maintenance that does not add any value to the performance of assets in your organization. Optimizing the frequency of proactive maintenance results in increased asset reliability and reduced maintenance cost in your organization.

Access the Reactive vs. Proactive Maintenance Chart

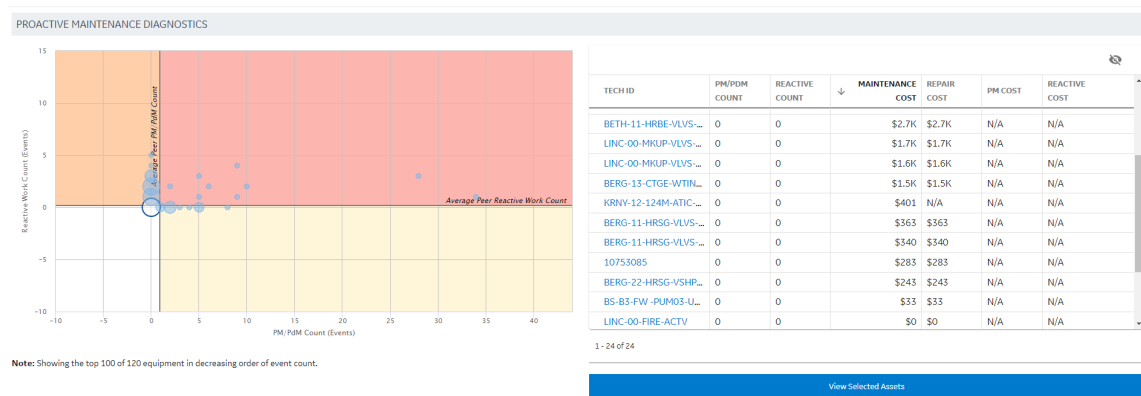
Procedure

1. [Access Industrial Data Diagnostics](#) on page 3.
2. Select the **PM Diagnostics** tab.
The **PM Diagnostics** section appears.

Note: The acronym PM in the **PM Diagnostics** tab name refers to the **Proactive Maintenance Diagnostics** feature, which includes both Preventive Maintenance (time-based) and Predictive Maintenance (condition based) work orders.

3. Select **Modify Equipment filter** and then in the filters pane, select the single equipment type or class for which you want to access the Reactive vs. Proactive Maintenance chart.
The Reactive vs. Proactive Maintenance chart appears for the selected equipment.

Tip: When you select a plotted data point, the technical ID, maintenance cost, PM/PdM count, reactive count, repair cost, PM cost, and reactive cost of the equipment(s) appear in a tabular format. You can also choose to view the asset ID and the site name of the equipment(s) from the column chooser option.



Tip: To access data for the selected assets in the **ASSET LEVELS** section, select **View Selected Assets**.

Access the Failure Mode Chart

About This Task

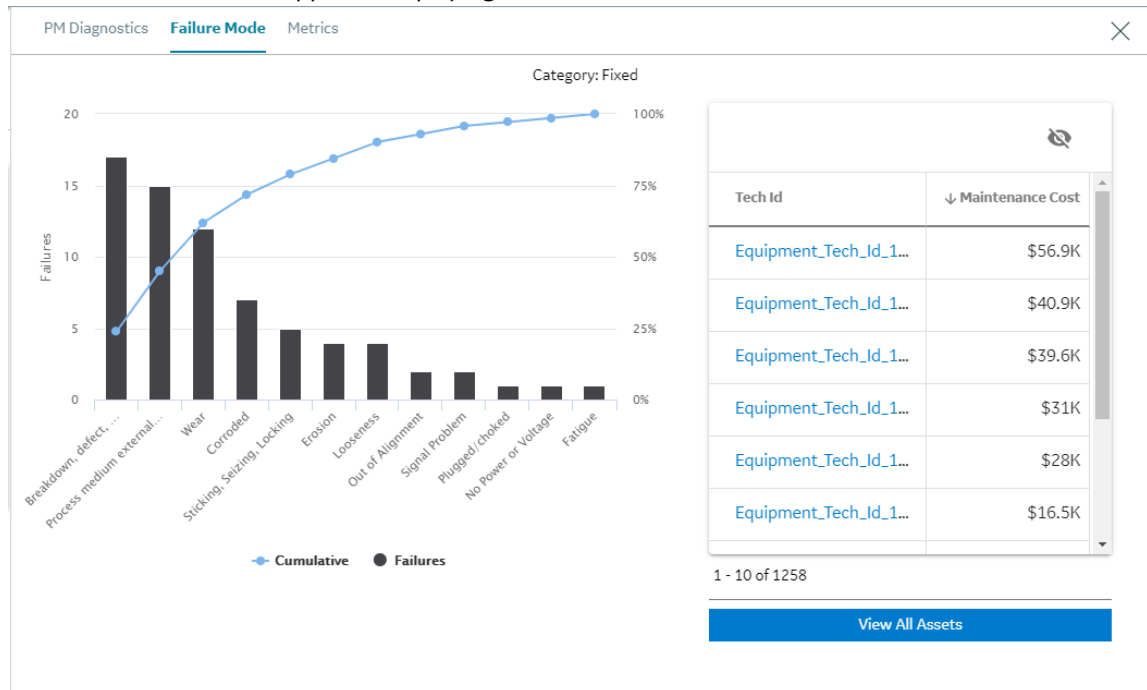
The **Failure Mode** Pareto chart contains a bar chart representing the total number of failure events for each failure mode in descending order, and a line chart representing the cumulative percentage of failure events.

Procedure

1. [Access Industrial Data Diagnostics](#) on page 3.
2. Select the **PM Diagnostics** tab.
The **PM Diagnostics** section appears.

Note: The acronym PM in the **PM Diagnostics** tab name refers to the **Proactive Maintenance Diagnostics** feature, which includes both Preventive Maintenance (time-based) and Predictive Maintenance (condition based) work orders.

3. Select **Modify Equipment filter** and then in the filters pane, select the single equipment type or class for which you want to access the Failure Mode chart.
The **Failure Mode** chart appears, displaying the details of different failure modes.



Note: You can also access the **Failure Modes** chart by selecting the value in the DOMINANT FAILURE MODE field in the **ASSET DETAILS** section.

Chapter 7

Manufacturer Comparison

Topics:

- [About Manufacturer Comparison](#)
- [Access the Manufacturer Comparison Page](#)
- [Compare the Performance of Manufacturers](#)

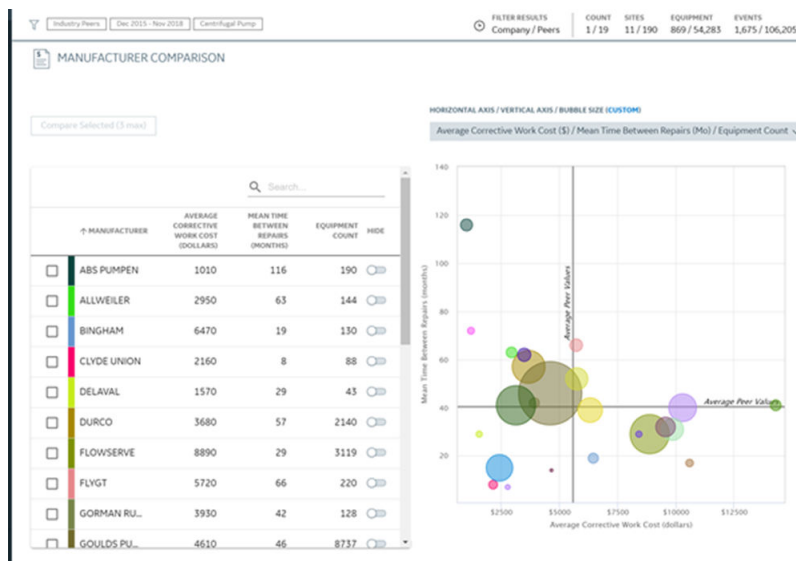
About Manufacturer Comparison

The Manufacturer Comparison feature can be used to identify and evaluate better performing equipment manufacturers. You can compare multiple manufacturers or selected equipment models of a specific manufacturer. The Manufacturer Comparison feature helps you in making better, more informed decisions while purchasing an equipment. Equipment manufacturers are compared based on the performance of the equipment, indicated by the 15 asset performance metrics in Industrial Data Diagnostics. You can analyze the data for peers against that of your company to understand if the asset performance is different for your peers for an equipment from the same manufacturer. Using this analysis, you can identify opportunities for equipment improvements that can result in savings and improved productivity for the company.

Access the Manufacturer Comparison Page

Procedure

1. [Access Industrial Data Diagnostics](#) on page 3.
2. Select the **Manufacturer Comparison** tab.
The **MANUFACTURER COMPARISON** page appears, displaying the bubble chart for the manufacturers and the manufacturer comparison selection table.



Note: To compare manufacturers, you must select a minimum of one equipment type from a single equipment class in the **Select Filters** window. If an equipment type is not selected in the filters, or if multiple equipment classes are selected in the filters, a message appears, stating that you must select equipment types from a single class.

Compare the Performance of Manufacturers

Procedure

1. Access the [Manufacturer Comparison](#) page.

Note:


- In the **Select Filters** pane, you can select the **Other Sites in Company** option to compare the performance of a manufacturer with other sites in the company. If you select the **Industry Peers** option, the sites selected for comparison do not appear in the list of selected filters in the page since the comparison is not applicable in the **Manufacturer Comparison** page. Specify the site for which you want to compare data by selecting the value in the **COMPARE** box, and then specify whether you want to compare with industry peers or with other sites in your company, by selecting the corresponding value in the **WITH** box.
 - To compare manufacturers, you must select a minimum of one equipment type from a single equipment class in the **Select Filters** window. If an equipment type is not selected in the filters, or if multiple equipment classes are selected in the filters, a message appears, stating that you must select equipment types from a single class.
2. If you want to select a combination of metrics from a predefined list, in the **HORIZONTAL AXIS / VERTICAL AXIS / BUBBLE SIZE** drop-down list box, select an option. If, however, you want to select metrics for individual axes:
 - a) Select **CUSTOM**.
The **HORIZONTAL AXIS**, **VERTICAL AXIS**, and **BUBBLE RADIUS** drop-down list boxes appear.
 - b) In the drop-down list box for each axis, select the metric that you want to plot on that axis.
 3. Perform one of the following steps:
 - In the table, select the check box in the row that contains the manufacturer that you want to add for comparison.
Tip: In the search box, you can search for the manufacturer name.
 - In the bubble chart, select the bubble for the manufacturer that you want to add for comparison. In the table, the check box for the manufacturer that you selected is selected.
Tip: You can point to a bubble in the chart to view the tooltip for the bubble. The tooltip contains the values for the horizontal axis, vertical axis, and equipment count. It also contains the rank of the manufacturer with respect to the metric for each value. You can also drag an area of the chart to zoom the area.
 4. Repeat step 3 for each manufacturer that you want to add for comparison.
Note: You can select a maximum of 3 manufacturers for comparison. If you select more than 3 manufacturers, the **Compare Selected (3 max)** button is disabled.
 5. Select **Compare Selected (3 max)**.

The **Peer Comparison** section appears, displaying data related to all the metrics for the selected manufacturers in a table.

PEER COMPARISON

METRIC	ALL MANUFACTURERS	SIMPSON			WEMCO			INGERSOLL RAND		
		COMPANY	PERF.	OPPORTUNITY	COMPANY	PERF.	OPPORTUNITY	COMPANY	PERF.	OPPORTUNITY
Equipment Count	47,587	0	1	-	0	4	-	0	1,413	-
Average Corrective Work Cost	\$5,670	N/A	N/A	N/A	N/A	N/A	N/A	N/A	\$9,900	N/A
Proactive Work Cost %	28%	N/A	N/A	N/A	N/A	N/A	N/A	100%	41%	\$0
Proactive Work Count %	77%	N/A	N/A	N/A	N/A	N/A	N/A	100%	81%	\$0
Corrective Work Cost %	88%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	93%	N/A
Corrective Work Count %	27%	N/A	N/A	N/A	N/A	N/A	N/A	9%	27%	N/A
Reactive Work Cost %	88%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10%	N/A
Reactive Work Count %	9%	N/A	N/A	N/A	N/A	N/A	N/A	9%	6%	N/A
Mean Time Between Repairs (Months)	44	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40	N/A

Tip: In the **Peer Comparison** section, you can perform the following tasks:

- Select  to download a Microsoft Excel workbook containing the results of manufacturer comparison. This functionality is available for Premium account subscribers only.
- Search for and select a specific equipment model of a manufacturer for comparison.

Chapter 8

Filtering Data in Industrial Data Diagnostics

Topics:

- [About Filters](#)
- [Apply Filters on the Data](#)
- [Apply Saved Filters on the Data](#)
- [Saved Filter Actions](#)
- [Create a Set of Predefined Filter Criteria](#)
- [Manage Filters](#)

About Filters

Filters can be applied on the asset performance data to access and analyze information about specific categories of data. Each filter category contains multiple filters. The filters are further classified into various levels of subfilters, which help you to filter data based on more specific details. For example, Equipment is a filter category and it contains multiple subfilters such as, Fixed, Rotating, Electrical, and so on. The Fixed subfilter contains more subfilters such as Air System, Burner, Dryer, Ejector, and so on.


In Industrial Data Diagnostics, you can filter data to view asset information related to a specific location hierarchy level or a specific classification hierarchy level. For example, you can view data about all assets at your Roanoke, Virginia site (that is, by location) or about all rotating pumps (that is, by classification level). You can also view data filtered by both location and classification hierarchy levels. For example, you can view data about all of your rotating pumps at your Roanoke, Virginia site. When you drill down to the most granular level of each hierarchy, you can view data for an individual asset.

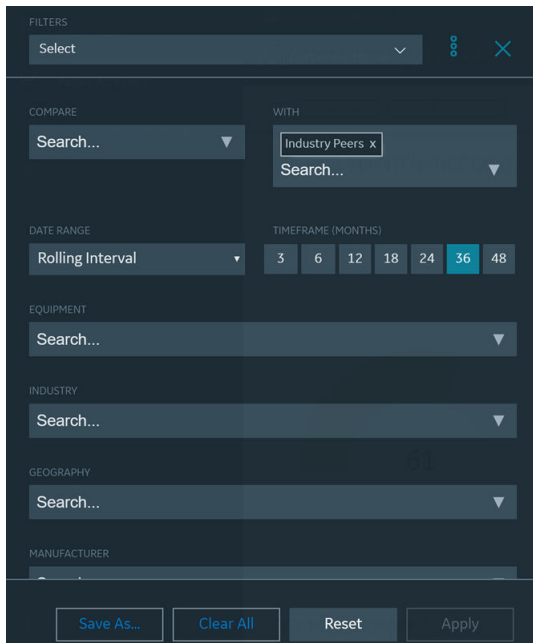
Apply Filters on the Data

About This Task

You can use filters on your data to view information on assets that match the filter criteria.

Procedure

1. [Access Industrial Data Diagnostics](#) on page 3.
2. In the page, select . A window appears, displaying a list of filter categories.



3. Specify the site for which you want to compare data by selecting the value in the **COMPARE** box, and then specify whether you want to compare with industry peers or with other sites in your company, by selecting the corresponding value in the **WITH** box.

- In the **DATE RANGE** box, specify how to filter data based on the maintenance completion date. You can select one of the following values:

Option	Description
Fixed Interval	Select this value if you want to filter data based on a fixed start date and end date.
Rolling Interval	Select this value if you want to filter data of the past few months. By default, this is set to 36 months.

- Select the values in each filter category (Equipment, Industry, Geography, Manufacturer, Unit Type, and Criticality), based on which you want to filter the data, and then select **Apply**.

Tip: In the **Select Filters** window, you can perform the following tasks:

- Search for an item in each filter category by entering the search text in the corresponding box.
- Include all the items in a filter category by selecting the check box at the parent level. Conversely, if you select the check boxes for all the child items, the check box for the parent is automatically selected. If, however, you select only some of the child items, the check box at the parent level appears as . The selected items appear in the text box of the corresponding filter category.
- Remove a selected item by selecting **X** next to the item.
- Clear your selection for a filter category by selecting **Clear All** next to the category. The **Clear All** button appears only if you select more than one item.
- Clear your selection for multiple filter categories together by selecting **Clear All** at the bottom of the window.
- Restore the filter values that were previously selected by selecting **Reset**.
- View the number of assets present in the organization under the classification based on the selected filters by selecting **Equipment** as the filter category. The assets containing at least one work order are considered.
- The page that you are viewing is refreshed to display information based on the selected filters.
- The summary of the filtered results is displayed in the heading of the page.

FILTER RESULTS	COUNT	SITES	EQUIPMENT	EVENTS
Company / Peers	1 / 21	21 / 234	141,039 / 3,243,311	30,154 / 1,746,822

- The items that you select are listed horizontally in the heading of the page. If you select more than one item in a category, only the first item appears in the page; the additional items are indicated only by their number. For example, in the **EQUIPMENT** box, if you select Aviation, Electrical, Fixed, and Rotating, after you apply the filter, it appears as **Aviation + 3** in the heading of the page.
- If you select industry peers for comparison, the total number of sites for which the data is displayed appears in the heading of the page. For example, if you are comparing data with 21 other sites, it appears as **21 Other Sites in Company**.

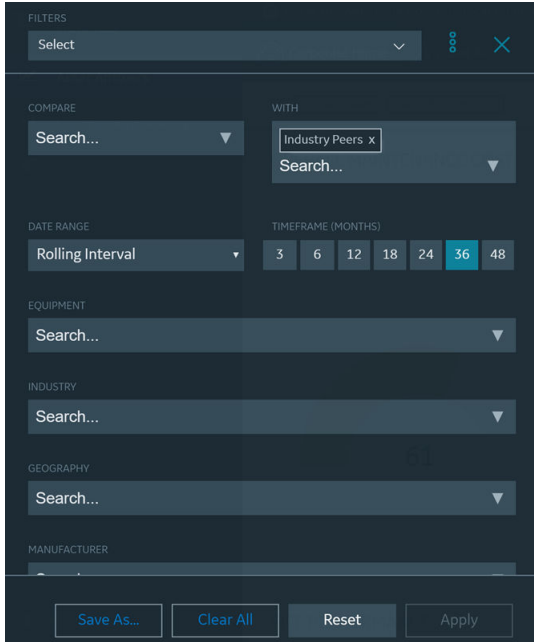
Apply Saved Filters on the Data

About This Task

You can use the filters that you had previously saved to view information on assets that match the filter criteria. Additionally, you can use the filters that are shared by other users in the organization.


Procedure

- [Access Industrial Data Diagnostics](#) on page 3.
- In the page, select . A window appears, displaying a list of filter categories.



3. In the **FILTERS** box, select the filter that you want to use. The assets that match the filter criteria appear.

Saved Filter Actions

If you have selected a value in the **FILTERS** drop-down list box, you can select  to view the actions for the filter. The following table describes the action options that are available for a given filter.


Option	Description
Share Filter	This option is enabled if you have created the selected filter. Select it to share the filter with other users or to revert the change.
Set as Default	Select this option to set the selected filter as the default or to remove the default setting.
Delete Filter	This option is enabled if you have created the selected filter. Select it to delete the current filter.
Manage Filters	This option is enabled if at least one filter exists. Select it to manage all the filters.
Show Shared Filters	This option is enabled if at least one filter exists. Select it to show the filters that are shared by other users, in the Filters drop-down list box.
Rename Filter	This option is enabled if at least one filter exists. Select it to rename a filter set. The option is available only in the Manage Filters window.
Show Equipment Count	Select this option to display the equipment count that appears in the equipment hierarchy in the filter pane.

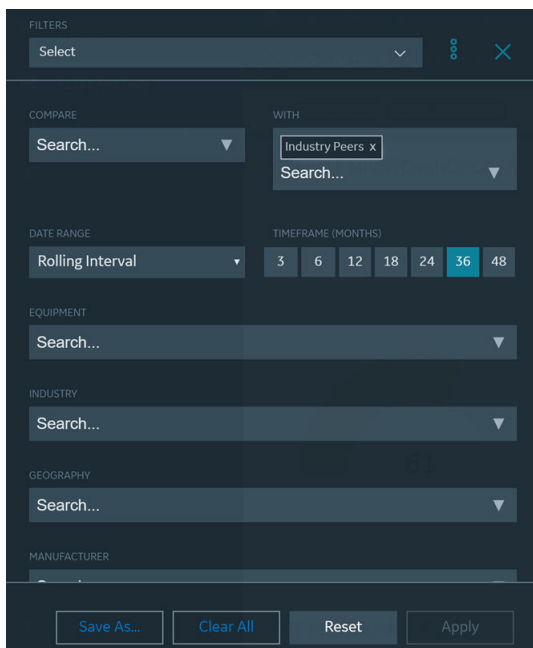
Create a Set of Predefined Filter Criteria

About This Task

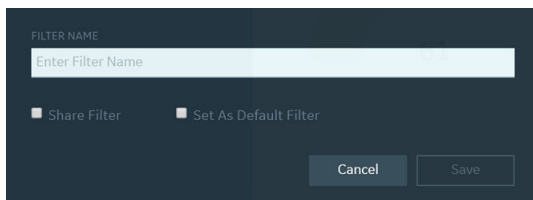
You can define a set of filter criteria and save the criteria to quickly filter the data based on the specified filter criteria. You can also share the filter criteria that you saved with other security users.

Procedure

1. [Access Industrial Data Diagnostics](#) on page 3.
2. Select .
A window appears, displaying a list of filter categories.



3. Specify the filter criteria that you want to save, and then select **Save As...**
A section appears, displaying the **FILTER NAME** box.



4. In the **FILTER NAME** box, enter the name of the filter.

Important:

The name of the filter must conform to the following restrictions:

- It must be unique within your organization.
- It must not start with a special character.

Note: The name can include the following special characters: , ' . _ () & : -

Tip:

- If you want to share the filter with other security users who use Industrial Data Diagnostics, select the **Share Filter** check box.
 - If you want to make the filter as your default filter to filter data, select the **Set As Default Filter** check box.
5. Select **Save**.
The filter is saved and the data is filtered based on the saved filter criteria.

Note:

- The filter that you saved appears in the **FILTERS** drop-down list box of the window that appears when you select ▼.
- To edit a saved filter set, select the filter set from the **FILTERS** drop-down list, modify the filter criteria, and then select **Save As** to save it as a new filter set.

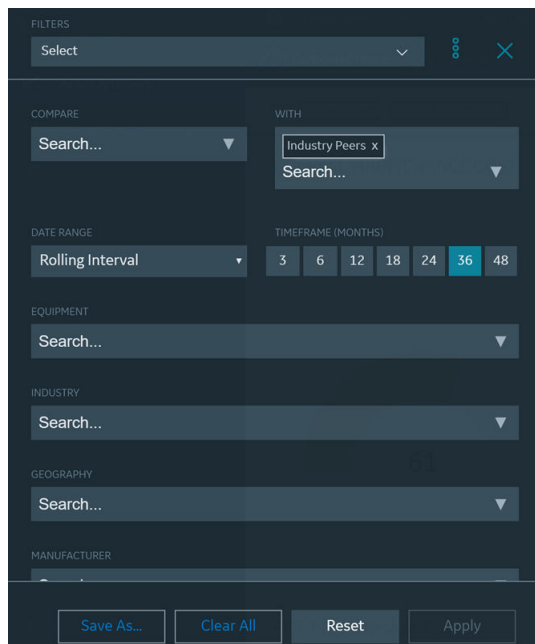
Manage Filters


About This Task



You can manage the existing Industrial Data Diagnostics filters from the **Manage Filters** window.


Procedure

1. [Access Industrial Data Diagnostics](#) on page 3.
2. In the page, select ▼.
A window appears, displaying a list of filter categories.



3. Select , and then select **Manage Filters**.
The **Manage Filters** window appears.

Manage Filters	
Search Filters 	36M -PUMP 
36M - Pipe Not Shared AIC AIC	Compare My Performance With Industry peers
Internal Comparison Not Shared AIC AIC	Date Sep 2016 - Aug 2019
2 sites with internal comparison Shared AIC AIC	Corporation ALL
36M -Pump Not Shared AIC AIC	Equipment Pump
	Industry ALL
	Geography ALL
	Manufacturer ALL
	Unit Type ALL
	Criticality ALL
Close	

4. Select a filter that you want to manage.
The details of the selected filter appears in the <Filter Name> section of the **Manage Filters** window.
Note: You can also search for the filter that you want to manage from the **Search Filters** box.
5. Select , and then select any one of the following actions that you want to perform.
 - Share Filter
 - Set as Default
 - Delete Filter
 - Rename Filter
6. Select **Close**.

Chapter 9

Release Notes

Topics:

- [Second Quarter of 2022](#)
- [Third Quarter of 2021](#)
- [Second Quarter of 2021](#)
- [First Quarter of 2021](#)
- [Third Quarter of 2020](#)
- [First Quarter of 2020](#)
- [Fourth Quarter of 2019](#)
- [Third Quarter of 2019](#)

Second Quarter of 2022

V4.0

This topic provides a list of product changes released for this module on April 8, 2022.

Table 2: Enhancements and New Features

The following enhancements and new features have been added.

Description	Tracking ID
The product name for Asset Answers is now changed to Industrial Data Diagnostics. The new name reflects the expanded capabilities around data quality improvements and recommendations, and positions Industrial Data Diagnostics as an integral part of GE Digital's APM product suite.	US525644
To enhance usability, Filter, Sort, and Export functionalities have been added to the Work Orders or Equipment Details page in PRIORITIZED DATA QUALITY ISSUES AND RECOMMENDATIONS section.	US524212
To enhance usability, Filter, Sort, and Export functionalities have been added to the Rejected Records page in Data Normalization.	US524211
To improve usability, in the Work Orders and Equipment page, you can now view the issue records in a paginated table and select the page number to view more issues.	US521238
You can now view the Metrics and PM Diagnostics sections in different pages. To facilitate this enhancement, new tabs, Metrics and PM Diagnostics , have been added in the product. Now, you cannot click the rows in the BAD ACTOR POPULATIONS section to view the PM Diagnostics, Metrics, and Failure Mode details as earlier.	US521232
You can now view the Reactive vs Proactive maintenance chart and Failure Mode chart both in one page for the selected equipment hierarchy, which allows you to evaluate the charts in the same page. To facilitate this enhancement, a new tab, PM Diagnostics , has been added in the product.	US521230
You can now view the standard fifteen metrics grouped by Sites with additional metrics, Potential Savings and Comparison with Peer . To facilitate this enhancement, a new module, Metrics , has been added in the product.	US521224

Third Quarter of 2021

V3.8

This topic provides a list of product changes released for this module on September 29, 2021.

Table 3: Enhancements and New Features

The following enhancements and new features have been added.

Description	Tracking ID
You can now find the record details which were excluded from data quality and asset performance analysis. To facilitate this enhancement, you can now find the Data Normalization tab in the Data Quality workspace.	US503540
3 new metrics - Failure Rate , Mechanical Availability % , and Mechanical Unavailability % are now added to the list of Bad Actors metrics. You can view them on opening Metrics tab by clicking on a selected row.	US502603
You can now view issues grouped by category. To facilitate this enhancement, a link Group by data quality categories is added in the PRIORITIZED DATA QUALITY ISSUES AND RECOMMENDATIONS tab in the Data Quality module.	US502389
The Impact of Issue column within the Issues tab in the Data Quality module now displays a badge indicating the impact level for the issue in various color schemes in accordance to the metric confidence table.	US502356
To enhance usability, Equipment Hierarchy filter is enabled for the Data Quality module. You can now view issues and metric confidence related to a particular Equipment Category, Class, or Type.	US498912

Second Quarter of 2021

V3.7

This topic provides a list of product changes released for this module on June 29, 2021.

Table 4: Enhancements and New Features

The following enhancements and new features have been added.

Description	Tracking ID
To enhance usability, following changes have been made to the Data Quality tab: <ul style="list-style-type: none"> A new section, Insights, has been added that allows you to view the functional location distribution insights to understand how the work orders and equipment are spread throughout different hierarchy levels. In the PRIORITIZED DATA QUALITY ISSUES AND RECOMMENDATIONS tab, five additional data quality issues have been added. 	<ul style="list-style-type: none"> US489125 US489113

First Quarter of 2021

V3.6

This topic provides a list of product changes released for this module on March 26, 2021.

Table 5: Enhancements and New Features

The following enhancements and new features have been added.

Description	Tracking ID
<p>To enhance usability, following changes have been made to the Data Quality tab:</p> <ul style="list-style-type: none"> In the Issues section, the Impact of Issue column has been added to describe the impact of the issue on specific metrics and data analytics. This correlation will be useful to encourage change management to improve the relevant data fields. A new section, Metric Confidence, has been added to display the metric confidence score (High, Medium, Low, Very Low or Not Available (no data)) for each site. This section helps companies to understand reliability of the metrics calculated in Industrial Data Diagnostics and GE Digital APM. In the PRIORITIZED DATA QUALITY ISSUES AND RECOMMENDATIONS tab, six additional data quality issues have been added. When viewing the work orders for a particular site, you can now choose to view additional columns from the column chooser. 	<ul style="list-style-type: none"> US476064 US469140 US468207 US467331

Third Quarter of 2020

V3.5

This topic provides a list of product changes released for this module on August 14, 2020.

Table 6: Enhancements and New Features

The following enhancements and new features have been added.

Description	Tracking ID
To enhance usability, the Corporate Home page has been renamed Enterprise Benchmarking .	F55188
<p>In the ASSET LEVEL section, when you select the Download Bad Actors Data button (↓), a new window, Asset Level Export Options now appears, displaying the following options to export the asset data:</p> <ul style="list-style-type: none"> Current Page: Allows you to export the asset data appearing in the current page to an Excel workbook. Custom Page: Allows you to configure the preferred number of Bad Actors that you want to export for a specific page and export the Bad Actor data to an Excel workbook. 	F52972
A new module, Data Quality, has replaced the Reports module. This module allows you to assess the quality of the asset data and work orders associated with the Computerized Maintenance Management System (CMMS) and provides recommended actions to address the quality issues that are found frequently.	F52971

First Quarter of 2020

Industrial Data Diagnostics

This topic provides a list of product changes released on February 28, 2020.

Version: 3.4

Table 7: Enhancements and New Features

The following enhancements and new features have been added.

Description	Tracking ID
The Show Cost Analysis toggle button now appears even when you do not select an asset in the ASSET LEVEL section.	US392708
You can now search for Tech IDs and Functional Locations in the Asset List page. To facilitate this enhancement, Tech ID and Functional Location filters now appear in the global filter list. This enables you to search for the Tech IDs and Functional locations by typing the characters in the search box.	US389063
The metric calculations associated with Mechanical Downtime and Mean Time to Repair are now refined.	<ul style="list-style-type: none">• US389053• US389055
A version number has now been added to the Industrial Data Diagnostics application.	US389044
You can now use Apple Safari and Mozilla Firefox browsers to access the Industrial Data Diagnostics application.	US388553
You can now identify good performing manufacturers based on selected metrics on the Manufacturer Comparison page. To facilitate this enhancement, quadrants are colored green for good performing manufacturers and red for bad performing manufacturers for selected metrics combination.	US243648
The query performance is now improved due to the enhancements made to the BAD ACTOR POPULATIONS section.	DE83304

Table 8: Known Issues and Limitations

The following known issues and limitations exist.

Description	Tracking ID
If you access or refresh Industrial Data Diagnostics using Firefox, Safari, or Chrome v80 or a higher version, the application intermittently takes longer than expected to load.	NA

Fourth Quarter of 2019

Industrial Data Diagnostics

This topic provides a list of product changes released for this application on the dates listed below.

Release Date: November 22, 2019

Table 9: Enhancements and New Features

The following enhancements and new features have been added.

Description	Tracking ID
You can now access the cost analysis details for individual assets. To facilitate this enhancement, the Show Cost Analysis toggle button now appears only when you select an asset in the ASSET LEVEL section.	US381384
In the filter pane, you can now view the number of Equipment in each sub category. In addition, you can view all the assets in a sub category before selecting the required asset.	US372342
You can now save the selected filters for future use. In addition, you can use the saved filters for subsequent login sessions and share the filters with other users.	US368842
The performance of the Bad Actor Population page has been improved. To facilitate this enhancement, the following changes have been made: <ul style="list-style-type: none">• The selective sort option has been introduced.• Opportunity Cost has been made the default sort. As a result, you can now quickly find sub categories of Taxonomy and Functional Location that have a scope for improvement based on the Opportunity Cost.	US366612
You can now access the Manufacturer Comparison page by selecting the Add Manufacturer To Comparison button on the Asset Detail page. From the Manufacturer Comparison page, you can set the Equipment type of the Asset in Taxonomy hierarchy and select the manufacturer for comparison.	US362243
For a particular bad actors population, you can select the bubble on the PM Diagnostic chart and select the View Selected Assets button to view the asset level view of those assets.	US358967

Table 10: Resolved Issues

The following issues, which existed in one or more previous versions, have been resolved.

Description	Tracking ID
Previously, in the Bad Actor page, if the search value started with a numeric value, you could not use the Functional Location and Tech ID filters. This issue has been resolved.	DE117549

Third Quarter of 2019

Industrial Data Diagnostics

This topic provides a list of product changes released for this application on the dates listed below.

Release Date: August 7, 2019

Table 11: Enhancements and New Features

The following enhancements and new features have been added.

Description	Tracking ID
<p>Industrial Data Diagnostics is now available on the Predix platform. The following key features are available in this release:</p> <ul style="list-style-type: none">• A new intuitive user interface built on a new technology framework• A new data storage schema and an improved datastore• A new hybrid deployment architecture• Multi-tenancy support• SSO integration support• Improved internal site comparison functionality• Better Bad Actor detection and classification capabilities using the hybrid architecture• Enhanced work order visualization• A new event timeline infographic for each asset• Faster metric calculations• Improvement tracker functionality	US360128