Pinnacle eBook

How to Eliminate Data Silos to Drive Better Decisions at Your Facility

Quality data is the foundation of a strong reliability program. Today, a lot of data collection, organization, and analysis is human dependent, inefficient, and vulnerable to quality issues. This e-book will discuss the common data challenges that complex process facilities face and how they can approach solving these types of issues.

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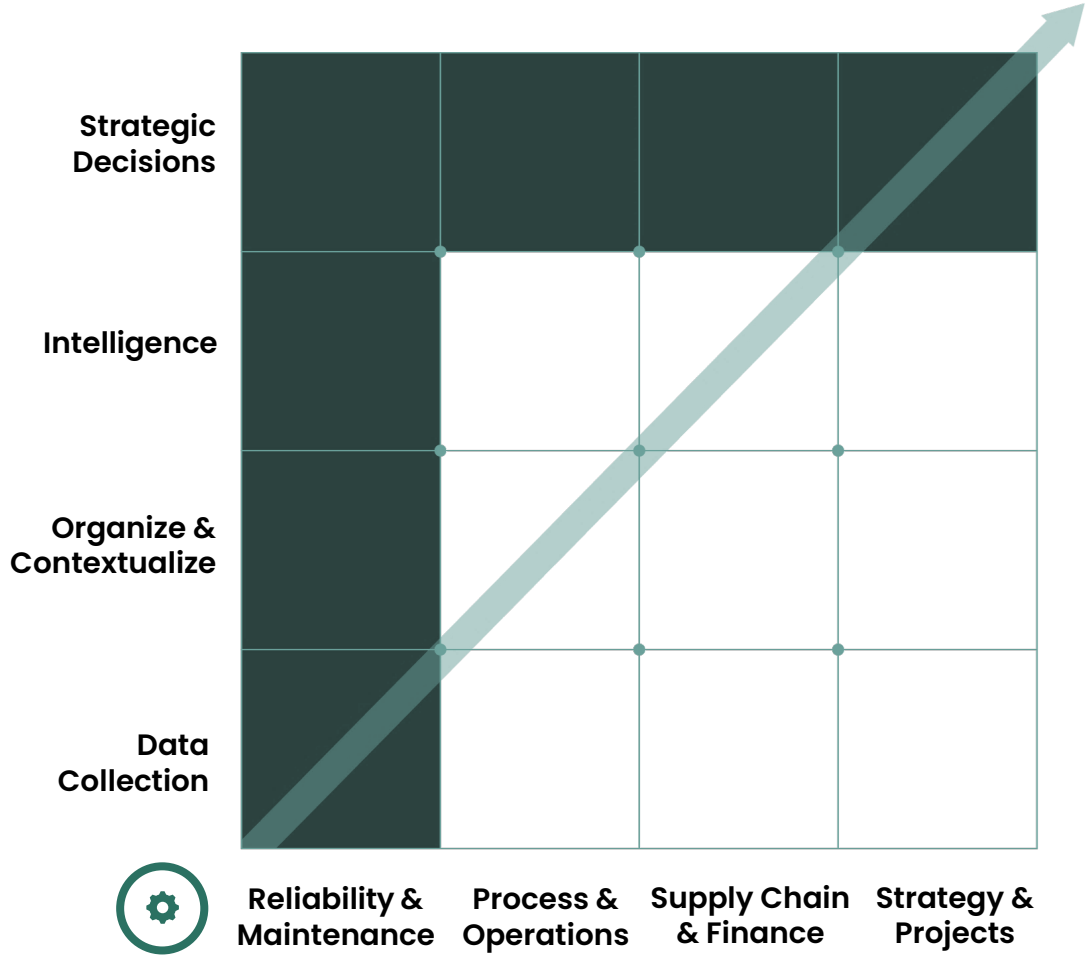
Reliability focuses on the health of a facility's assets and should inform all business strategies. Facilities who maintain reliable operations are in a better position to maximize production, minimize process safety risk, and optimize lifecycle spend.

The average refiner wastes nearly 10% to 25% of its budget on wasted reliability and maintenance activities. For an average facility, this would equate to roughly $50MM annually of bottom-line erosion.



The Challenge: Many Systems Have Siloed Architecture and Data

Many industrial facilities have design, operations, process, asset condition, and risk model data stored in variety of different repositories, creating data silos. Regardless of whether the data is a hardcopy, stored in spreadsheets, or software, the solution is not just to integrate everything into one software. The key to successfully leveraging your data is bringing your data together and properly contextualizing it to feed into the right models to drive better and faster mechanical integrity and reliability decisions.

Systems that have siloed architecture and data often result in:

1. Wasted time from engineering and management trying to retrieve data.
2. Risk due to overlapping or outdated data.
3. Misaligned or overlapping models that require subjective decision making.
4. Disconnected models that are difficult to update.

Data-Driven Reliability Decisions are Critical for Competitive Operations

Data-driven reliability is Pinnacle's unique framework for reliability performance improvement that allows you to connect data to business decisions. Digitizing and organizing your data is the first step. Our framework then leverages models that combine reliability data science and engineering, surfacing better insights and breaking down silos between your systems. Our data-driven reliability framework consists of four elements:

Data Collection:
Efficiently collect and store high-quality data.

Data Organization:
Make data useful by building relationships across all your data elements and systems.

Intelligence:
Use the right models to drive reliability-informed decisions.

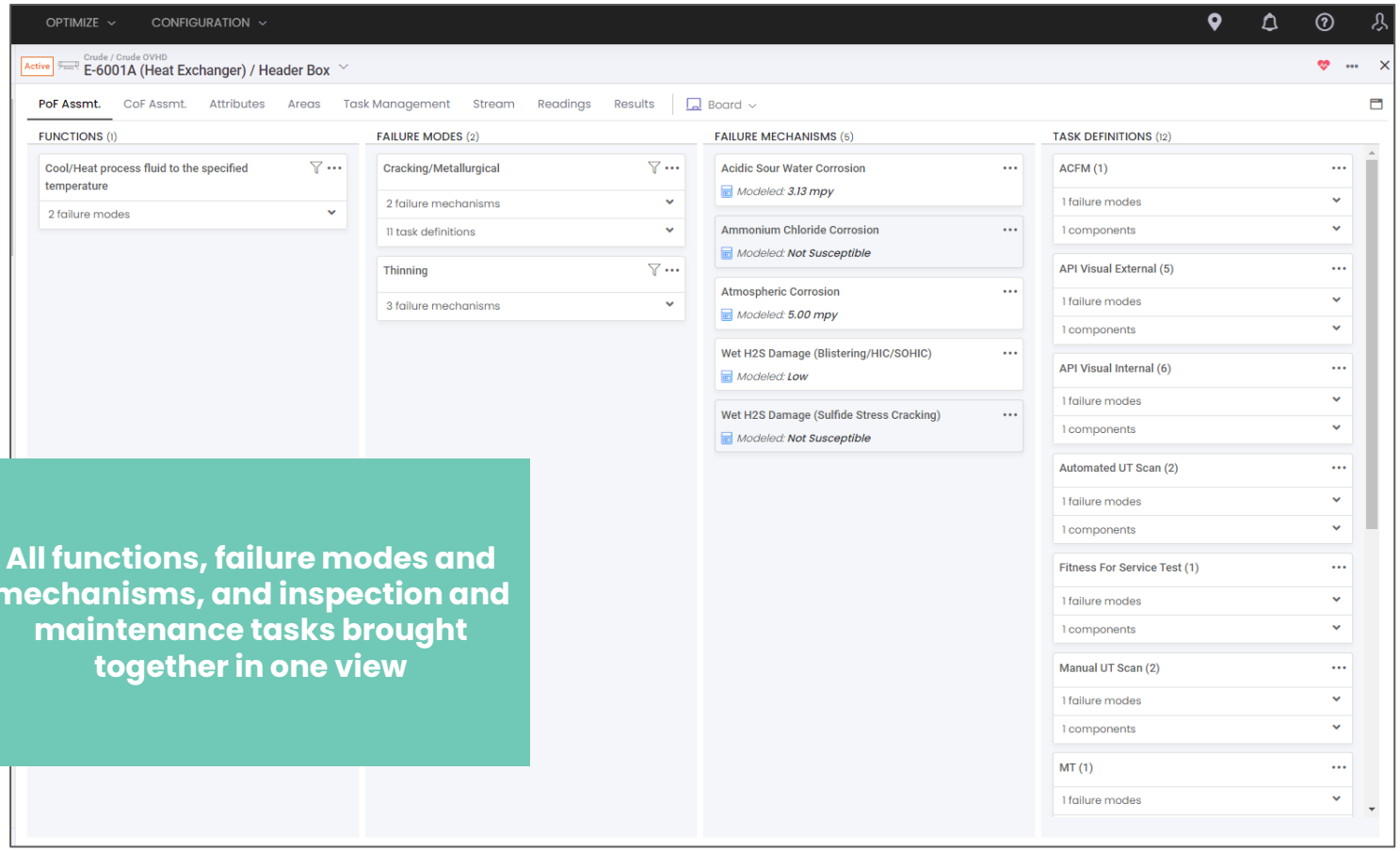
Strategic Decisions:
Prioritize reliability decisions across your facility and understand their impact in real time.

What Does Good Data Look Like?

It is important for facilities to understand how their individual assets impact their entire system. Having the ability to look across the entire system and deep dive into the data of a specific asset will help facility leaders make better reliability decisions.

One platform that facilities can use to model how every data point, task, and potential change impacts future facility performance is Newton™. Newton™ connects every facet of reliability and is the only software application in the world that facilitates the Quantitative Reliability Optimization (QRO) methodology.

On the right is an example of an Asset Risk Analysis (ARA). An ARA connects all of the asset's functions, failure modes and mechanisms, and inspection and maintenance tasks into a single location to determine the impact of the completed inspection activity on the overall facility.



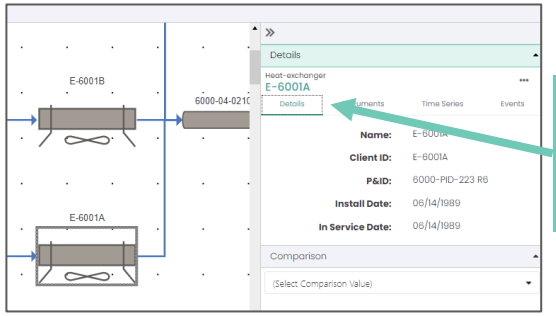
All functions, failure modes and mechanisms, and inspection and maintenance tasks brought together in one view

Dive Further into an Asset

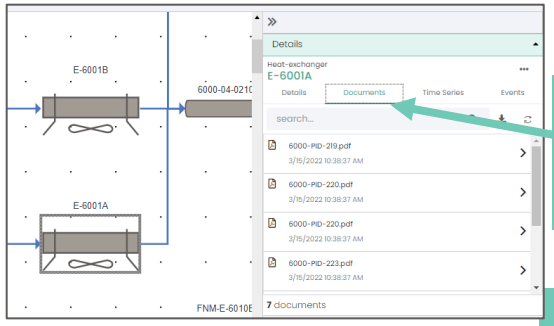
Typically, if there's a problem with an asset, it's usually fueled by data coming from other systems. Instead of using multiple tools and systems of records, a system-level view allows you to look at all of your information holistically and troubleshoot risk and other issues.

When leveraging the ARA to dive further into the specific asset, various information is uploaded, stored, and contextualized. This information provides a picture into the level of risk of an individual asset and rolls it up to the system level.

Details: Includes information from systems such as a Computerized Maintenance Management Systems (CMMS) and Inspection Data Management Systems (IDMS).
Documents: Includes documents from centralized document management systems.
Time Series: Includes times series data such as process and operations data from historians.
Events: Includes information such as events captured in maintenance management systems.

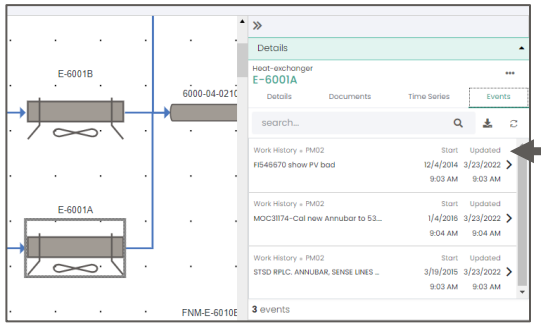


Data from Exchanger contextualized from CMMS or IDMS



Documents contextualized from Documentation Management System

Time Series Data contextualized from process historian and condition monitoring systems

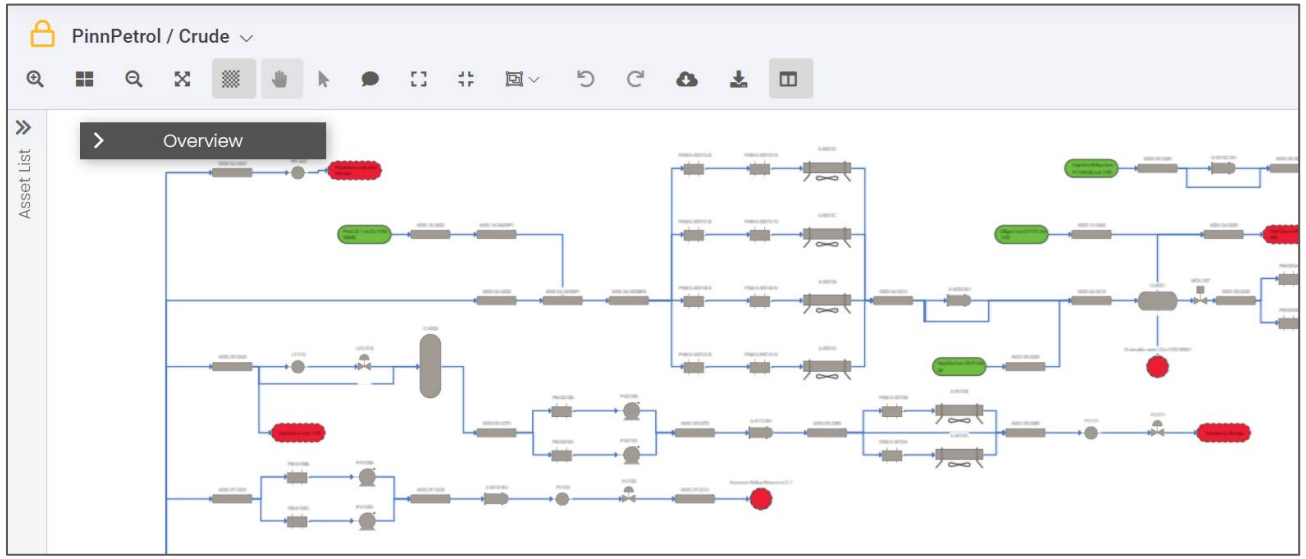


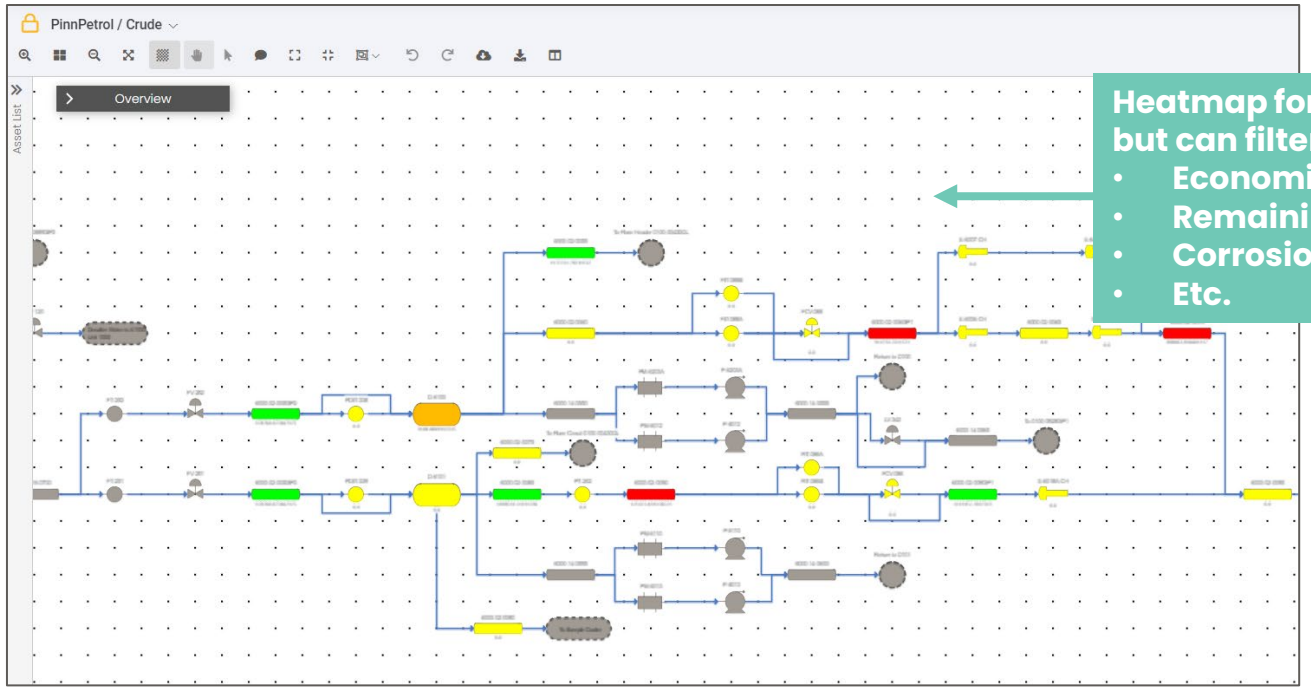
Events Contextualized from CMMS

System View

Leveraging the contextualized information at the asset level, Newton™ is then able to zoom out to the system level. This system view allows facilities to see the asset in context with the other assets. With the simple click of a button, facility leadership can drill down into a specific asset while also viewing how it relates to other assets within the system.

When you have the ability to evaluate multiple assets at the same time, you can make decisions based on reliability data and risks. In order to make accurate decisions based on what is actually occurring in your facility, the risk analysis needs to be continuously updated as information is brought in. Newton™ dynamically updates the risk over time as new data becomes available. As a result, you can create and prioritize actions based on the assets that will have the greatest impact on the facility's availability.

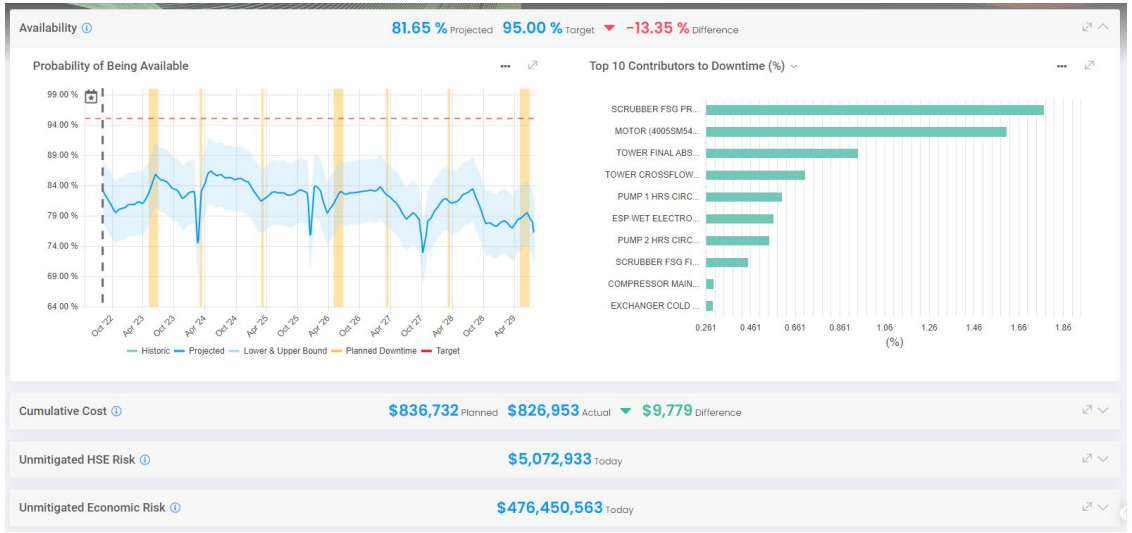




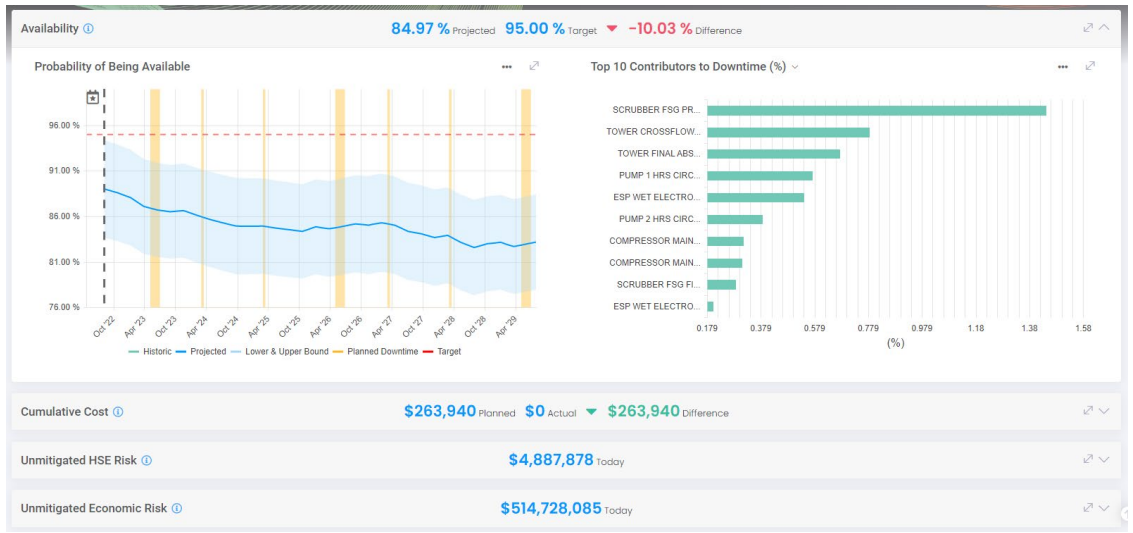
Heatmap for HSE risk, but can filter for:

- **Economic risk**
- **Remaining life**
- **Corrosion rate**
- **Etc.**

Impact of System View on Availability



This is an example of the system view based on a facility's current tasks. The facility is currently on track to achieve 81.65% availability based on the current tasks. Additionally, this view is able to identify the top 10 contributors to downtime, with the scrubber and motor ranking as the top two contributing factors to downtime.



Because all the facility's data is stored in a single location and platform that allows the facility to connect each of its assets, the facility is able to see the potential impact that various inspection and maintenance tasks have on future availability. In this example, we see the facility's projected availability increases to 84.97% based on modified tasks. Additionally, we see that its unmitigated HSE risk decreases as well. As a result, the facility is able to determine the predicted impact of specific tasks before performing the tasks.

Conclusion and Takeaways

Facilities often face a myriad of challenges with their data. Many facilities have data that is siloed between systems or not organized around proper asset hierarchies, resulting in disconnected reliability models. These disconnected systems offer poor support for business decisions and can create gaps between engineer models and data science frameworks, impairing technical insights.

A data-driven approach to reliability ensures that facilities have the right data fuel the right intelligence, helping you to make confident, strategic decisions.

Major Takeaways:

- Quality data is the foundation of a strong reliability program
  - Today, a lot of data collection, organization, and analysis is human dependent, inefficient, and vulnerable to quality issues.
- A data-driven approach to reliability will help break down data silos.
  - Facilities can leverage Quantitative Reliability Optimization (QRO) for a more data-driven approach to reliability.
- Connecting individual asset data in a centralized location will help facilities determine the impact of a specific asset on its entire facility.
  - This system-level view can be achieved through Newton™, an application that facilitates the QRO methodology.