TrendMiner
A SOFTWARE AG COMPANY

INDUSTRY
Food & Beverage

PROCESS TYPE
Batch
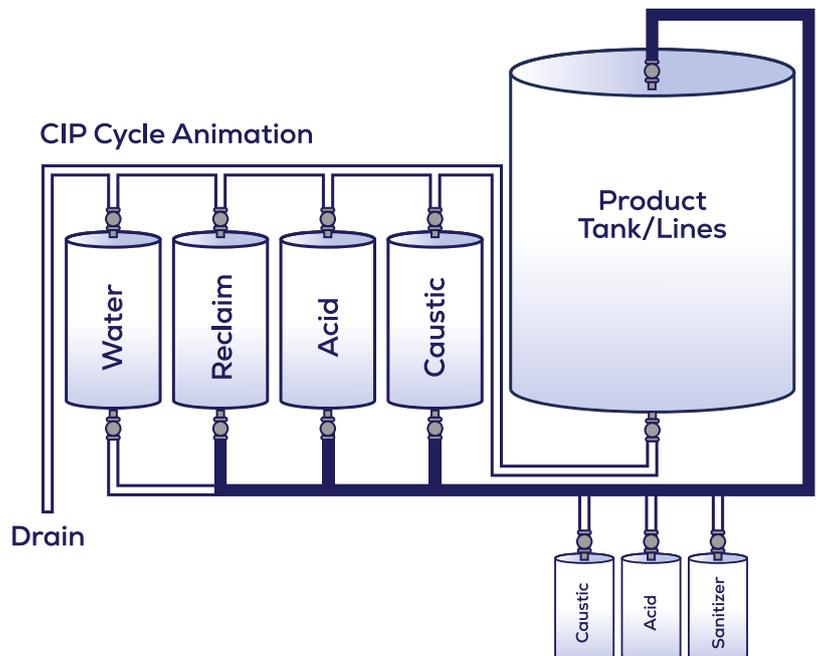
ANALYTICS TYPE
Asset Analysis

KEY OBJECTIVE
Prevent failed CIPs

Performance Optimization of a Clean-in-Place Unit

BACKGROUND

The production of dairy products is heavily regulated and requires a meticulous handling of raw material and final product. Clean-in-Place (CIP) occurs between each production batch. It helps avoid cross-contamination, ensures a quality product that meets specification, and complies with corporate and government safety regulations. In the sterilization process of a filling unit, the unit needs to heat up to 90-degrees Celsius and maintain that temperature to initiate cleaning. When the cycle time of this process step takes too long, it means that the unit did not heat to the correct temperature and the vessels in the unit have not been cleaned correctly.

CIP Cycle Animation

Water | Reclaim | Acid | Caustic

Product Tank/Lines

Drain

Caustic | Acid | Sanitizer

PROBLEM

Engineers noticed that their CIP unit was not reaching the desired temperature. When it failed to clean properly, they had to run the cycle again to ensure that the vessels reached an acceptable level of sterilization. This led to costly interruptions in production and greater use of ultra-pure water used in the process.

GOALS

- Ensure all CIPs are adequately triggered to avoid incomplete cleaning of production vessels
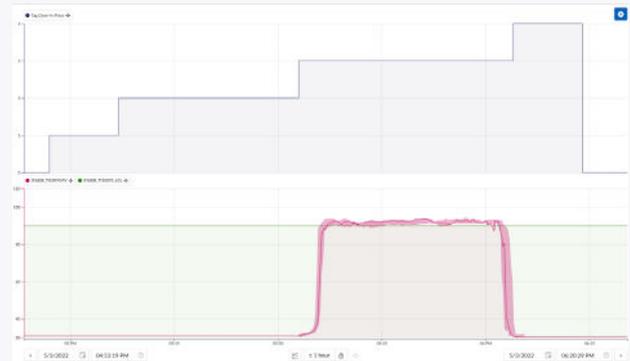- Reduce downtime and water use by avoiding CIP anomalies

Challenges

- To better understand CIP performance, engineers first had to determine which phase is prolonging the process

Approach

- Perform various value-based searches to find the typical run time for all CIPs on a particular asset
- Set up monitors to alert operators when a CIP takes longer than expected
- Compare "failed" CIPs to determine where in which phase the anomalies were occurring
- Perform a correlation analysis to find the root cause for a decrease in vessel temperature during that CIP phase

RESULT

- Using TrendMiner, engineers were able to extend the water wash phase to create longer CIPs
- They also learned that an increase in steam consumption in the spray dryer caused the temperature to drop during a caustic wash
- With the CIP functioning as expected, engineers were able to reduce ultra-pure water usage by 60% during extended CIPs
- Established monitors will give engineers better situational awareness of the CIP unit

TRENDMINER FEATURES USED

f(x) TAG BUILDER

TrendMiner's tag builder allows the creation of time series data using formulas on and aggregations of the tags. The results of these tags can be visualized just like any other tag. The tag builder can also be used for importing time series data via a CSV file.

ALERTS & NOTIFICATIONS

Process experts can use TrendMiner to create batch fingerprints and monitor treatment¬¬¬ processes in relation to these fingerprints. Automatic notifications can be inputted into our software to alert engineers and operators when patterns of interest are detected. TrendMiner supports various notification mechanisms, including embedded inbox and email alerts. These notifications also include suggested courses of action and can be designated to trigger a webhook to fire a workflow in other business applications, such as the maintenance management system.

MONITORS

TrendMiner is like a watchdog; it continuously monitors processes and sends notifications when deviations from predefined fingerprints, process conditions, or operating zones occur. These early warnings improve plant output by allowing the plant to run at optimal energy consumption, and waste reduction and at the same time, to comply with safety, health, and environmental regulations.

VALUE-BASED SEARCH

TrendMiner allows for an easy click and search for tags, just like using Google. While typing, our software auto fills best matching terms to speed up the analysis search. Value Based Search is used to quickly find anomalies in the time series data by analyzing criteria, numerical values, and limits.

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