C3.ai

C3 AI Process Optimization

Improve Yield, Profitability, and Operational Efficiency

2%
increase in production yield via optimal process operating conditions

30-50%
reduction in off-spec product with AI-recommended control setpoints

95%
reduction in time to detect off-spec product with near real-time visibility to product quality

C3 AI® Process Optimization helps process and production engineers improve yield, profitability, and operational efficiency with dynamic process control recommendations. The application integrates process control and historian systems and applies best-in-class predictive optimization techniques to generate process setpoint recommendations for process engineers and operators in near-real time.

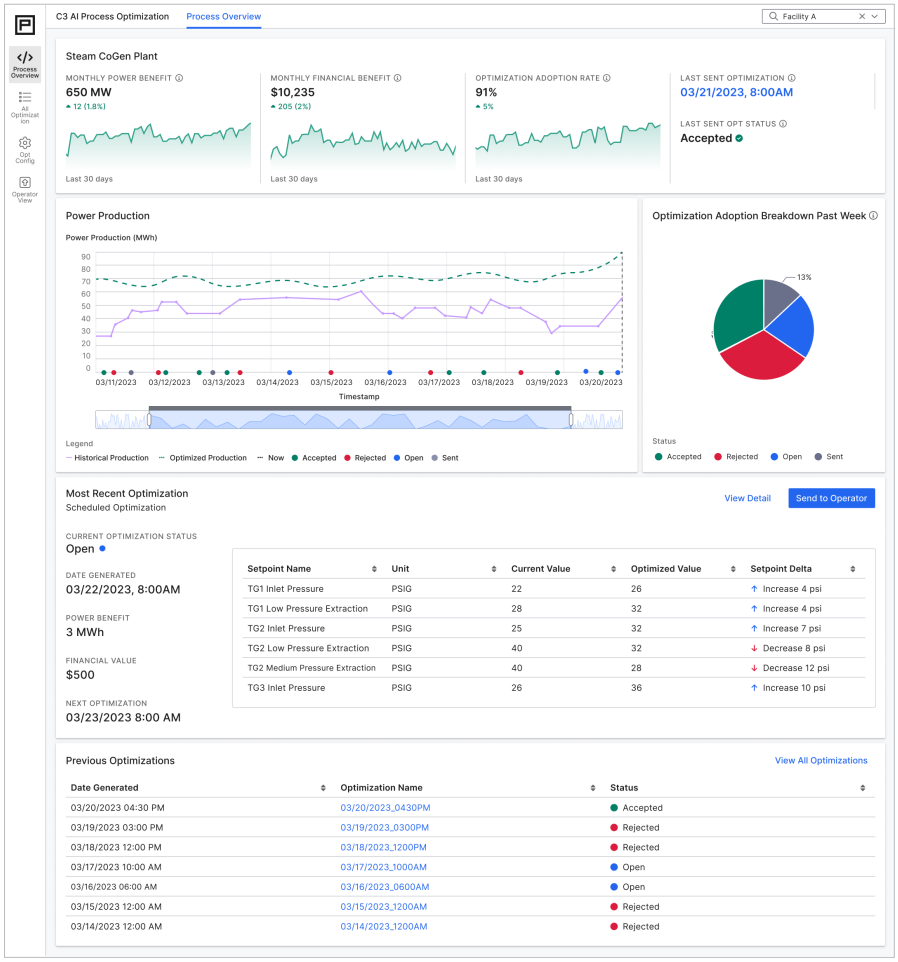

Figure 1. *C3 AI Process Optimization provides insights and real-time setpoint recommendations to process and production engineers.*

Feature Summary

- **Near real-time process monitoring** – Gain visibility of production processes across process lines, equipment, and facilities by unifying data across systems.
- **Optimized control setpoints** – Allow process engineers to configure, run, and manage optimization models to generate recommended setpoint values to achieve production rate, yield, quality, and cost goals.
- **Action-centric prioritization** – Enable streamlined troubleshooting and intervention with AI-driven prioritization, insights, and investigative workflow.
- **Collaborative workflow** – Support communication and collaboration between process and production engineers with an end-to-end workflow to review and align on process recommendations.
- **Ad-hoc analysis** – Enable flexible experimentation and scenario analyses by adjusting process variables, constraints, and objectives to determine optimal operating settings.
- **Unified process modeling** – Leverage comprehensive modeling of processes and integrate process simulators and best-in-class optimization frameworks.

C3 AI Process Optimization applies advanced machine learning and optimization techniques to continuously optimize manufacturing outcomes and recommend process control parameters. The application integrates with advanced process control (APC) systems to serve as an AI-powered advisory layer. Process engineers can flexibly configure of the optimization formulation, where constraints and objectives can be added and adjusted to represent the end use cases, including maximizing production yield from input materials, maintaining high product quality, and optimizing energy efficiency.

The application provides an integrated end-to-end workflow for process engineers to review and investigate AI-driven recommendations before submitting control setpoint recommendations to production engineers. By providing a single platform for collaboration and communication, C3 AI Process Optimization allows process and production engineers to drive continuous improvements and operate assets at optimal levels.

C3 AI Process Optimization supports discrete, continuous, batch, and semi-batch production processes, delivering benefits across manufacturing, energy, chemicals, food and agriculture, pharmaceuticals, automotive, and other industries.

Feature Summary (cont.)

- **Outcome mapping** – Capture process outcomes over time horizons that span multiple unit shutdowns, revamps, and configuration changes to drive continuous improvement.
- **Configurable KPIs** – Prioritize relevant production and process efficiency performance metrics to track progress against production goals.
- **Codified domain expertise** – Embed process expertise from engineers and subject matter experts into data-driven optimizations.

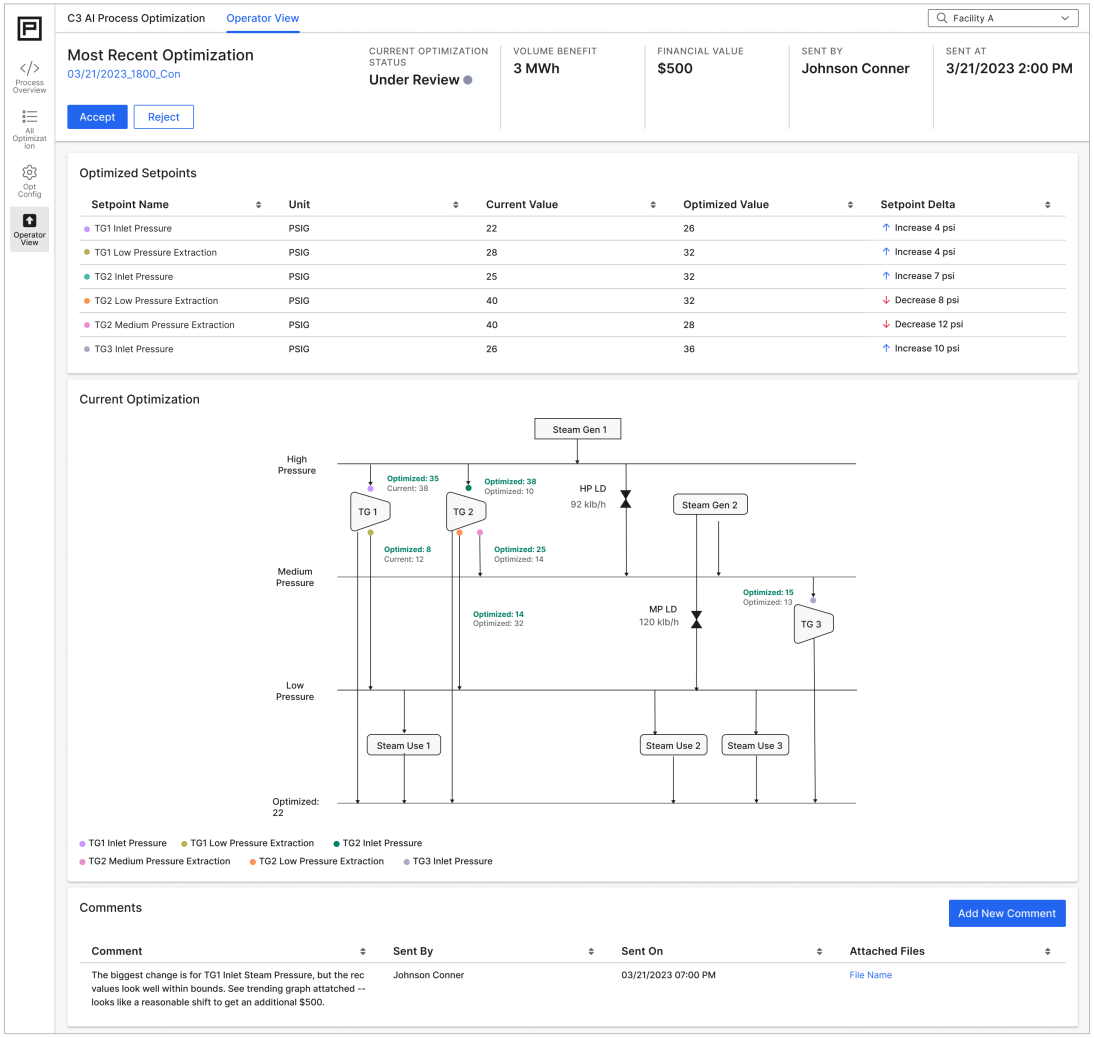

Figure 2. *C3 AI Process Optimization is an application for process and production engineers to collaborate and implement control setpoint recommendations to improve yield, costs, and energy efficiency.*

Proven Results in 6-Month Pilot

Visit C3.ai/get-started