



BHC3 Process Optimization

Increase Production Process Efficiency with Machine Learning

BHC3™ Process Optimization is an AI application that uses advanced analytic techniques on operational data to improve production yield and process efficiency by proactively identifying emergent process issues. BHC3 Process Optimization supports troubleshooting by providing root cause analyses at various steps of production.

With a holistic view of the production process, BHC3 Process Optimization applies machine learning techniques to continuously monitor and predict product yield, identify quality problems, and optimize process energy utilization and process control parameters. BHC3 Process Optimization is operator-centric and action-oriented, providing contextualized insights for adjusting overall process setpoints based on actual plant operating scenarios to optimize the production process.

BHC3 Process Optimization unifies data from process simulators, operational systems (e.g., DCS, SCADA, Historian), ERP systems (e.g., material movements, operator shift data, lab test results), asset management systems (e.g., equipment data, process step configuration), and environmental systems (e.g., weather). The unified data image builds on the BHC3 Reliability asset hierarchy model, a system of systems approach, to enable a unified view of process and asset operations.

BHC3 Process Optimization supports discrete, batch, semi-batch, and continuous production processes, delivering benefits across industries such as oil & gas, chemicals, discrete manufacturing, mining, and biotechnology.

Feature Summary

- **Near Real-time process optimization** – Allow process engineers to configure, run and manage optimization models to find optimal process operating conditions on a single platform
- **Predict quality and yield** – Maximize yield and minimize supplied materials and energy input in the process
- **Optimize energy utilization** – Reduce production costs by minimizing energy consumption across process steps
- **Optimize setpoint handles** – Apply optimization based on actual plant operations to recommend setpoint handles to achieve production cost, yield, and quality goals
- **High level KPIs** - Provide high-level yield and process efficiency performance metrics and top addressable issues
- **Operator-centric view** – Focus on high priority issues based on AI analysis and deliver prescriptive insights to support intervention
- **Advanced machine learning** - Forecast emergent product yield and process disruption issues at key process steps in advance
- **Unified process modeling** - Leverage comprehensive modeling of discrete and continuous processes and integrate process simulators and best-in-class optimization frameworks
- **Ad-hoc analysis capabilities** - Enable process troubleshooting and root cause analyses across time horizons and plants



Figure 1. BHC3 Process Optimization allows operations to leverage machine learning to gain real-time visibility into manufacturing process.



BHC3 Process Optimization is a foundational application in the Open AI Energy Initiative (OAI), the first open ecosystem of AI-based solutions for the energy industry, and is interoperable with current and future OAI solutions from other members of the OAI such as Shell. Find out more at <https://bakerhughesc3.ai/products/bhc3-oai/>.

Pinpoint Process Risks and Reduce Analysis-to-Action Cycle Time

With BHC3 Process Optimization, process engineers and operators can:

- Identify specific process risk areas by continuously monitoring actual operational parameters
- Quickly identify trouble areas using machine learning and focus operators on the most urgent priorities with human-understandable insights
- Forecast product yields and quality by enabling continual process optimization to reduce waste and maximize production with real-time data integration
- Perform near real-time process optimization by modeling various scenarios, selecting handles, constraints, and goals, to quickly determine optimal operating conditions
- Receive near-real time insights using robust prediction algorithms on streaming data to reduce or eliminate wait times for sample testing
- Create a unified data image by Integrating operational systems (e.g., SCADA, DCS) with enterprise systems (e.g., Asset Management, Labs, and Maintenance) to enable a comprehensive view of operations
- Improve data quality by merging data of various granularity and accuracy with alerts on data issues and advanced data cleansing
- Inform analyses with actual process unit configurations over time by capturing configuration changes over time and input accurate conditions for machine learning algorithm development
- Unify operator and maintenance views by aligning process engineers and operators on the same insights with configured dashboards
- Increase team efficiency by reducing time and effort spent on data aggregation and improve accuracy of optimization analyses
- Maintain a historical archive of process configurations to enable tracking of process risk issues over time horizons that span multiple unit shutdowns, revamps, and configuration change

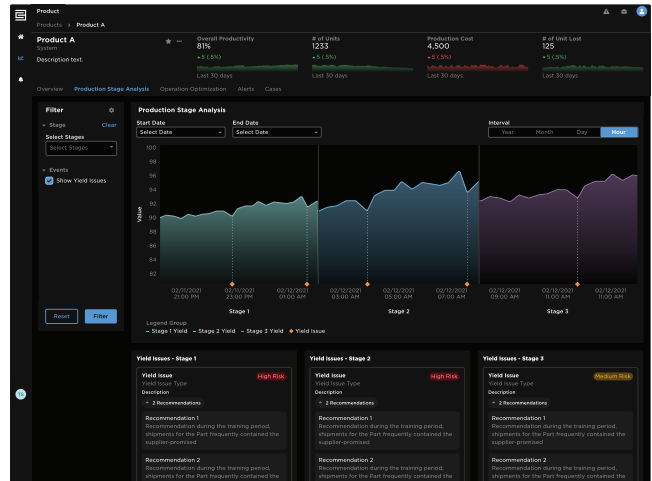


Figure 2. BHC3 Process Optimization reduces time spend on data aggregation and analysis while providing real-time insights into production yield and performance.

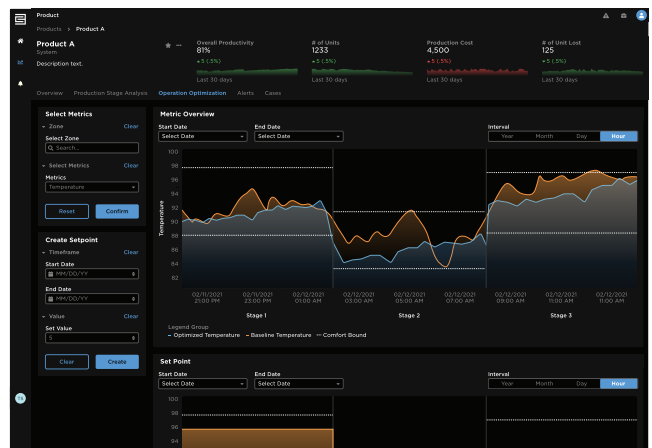


Figure 3. BHC3 Process Optimization provides contextualized insights and real-time setpoint recommendations to operators.

Proven Results in 8-12 Weeks

Visit [BakerHughesC3.ai](https://bakerhughesc3.ai)