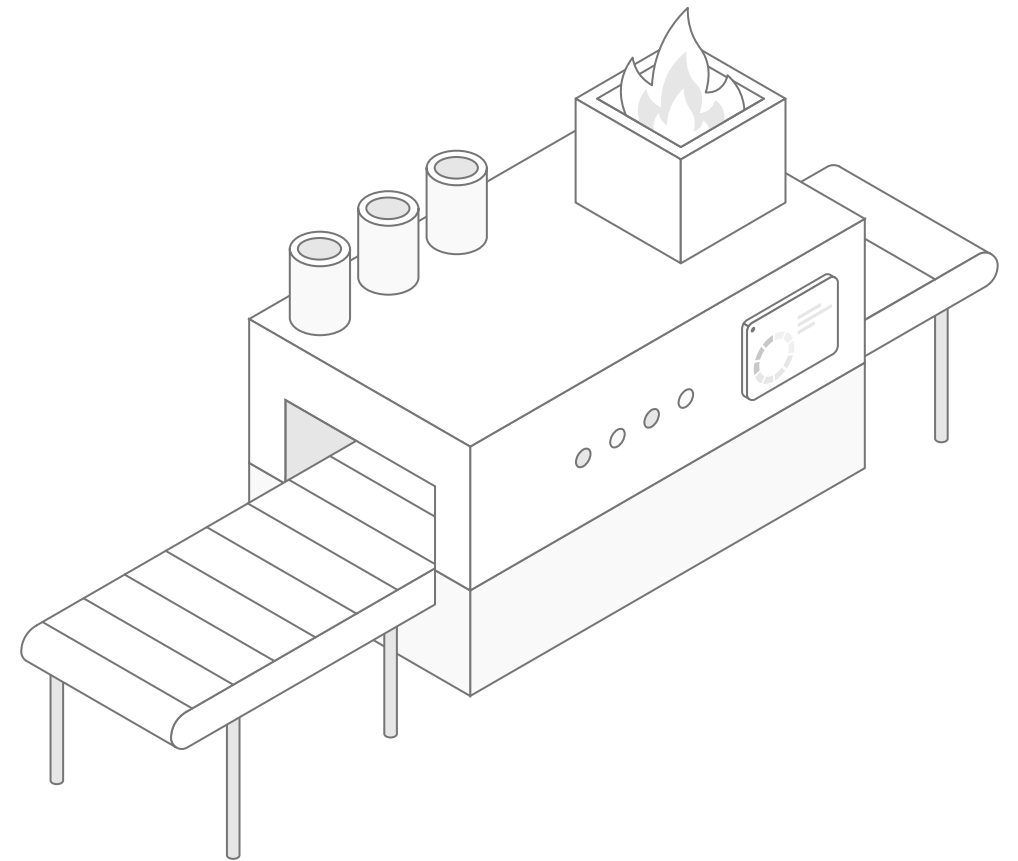


Transforming Furnace Operations with Real-Time Process Intelligence

Customer Profile

A leading stainless steel manufacturer operates a continuous bright annealing furnace where maintaining precise process conditions is critical to producing high-quality stainless steel coils. Operating 24×7, the furnace generates a continuous stream of production data across multiple process parameters, including temperature, gas flow, dew point, line speed, and strip tension. Harnessing this operational data in real time presented an opportunity to improve process visibility, strengthen engineering decisions, and enable proactive maintenance.



The Challenge

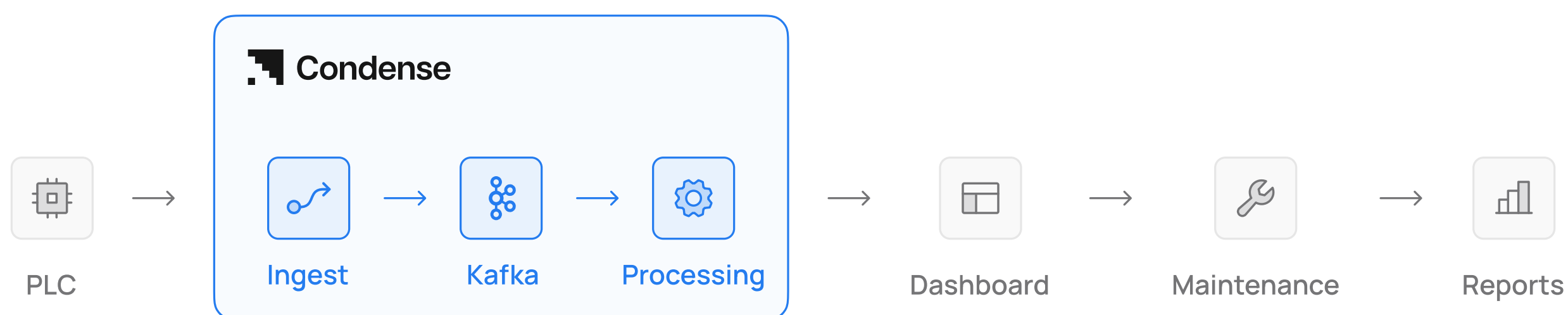
Although production systems continuously captured operational data, converting that information into timely operational decisions remained a significant challenge. Production, engineering, and maintenance teams required more than access to process readings; they needed a unified operational view capable of continuously monitoring furnace performance, identifying process deviations before they impacted product quality, validating operating conditions against engineering specifications, and accelerating root cause investigations whenever abnormal events occurred.

The goal was to build a real-time operational intelligence platform that could transform production data into actionable insights while relying exclusively on actual plant data. Every alert, engineering analysis, maintenance workflow, and operational decision needed to be driven by live production events, providing teams with a single source of truth for monitoring and decision-making.

The Solution

Working closely with the customer's Operations and Maintenance teams, Zeliot designed and implemented a Real-Time Furnace Intelligence Platform powered by Condense, its real-time application platform for building event-driven industrial solutions.

By combining the customer's deep operational expertise with Zeliot's experience in real-time data streaming and industrial application development, the solution was designed to mirror actual furnace operations and engineering workflows. Together, the teams identified critical process parameters, defined engineering rules, established maintenance triggers, and built applications that continuously transform production events into actionable operational intelligence.



Condense serves as the foundation of the platform, providing continuous data ingestion, event streaming, pipeline orchestration, stream processing, custom application development, business logic execution, and seamless integration with downstream systems. Using Condense built-in development framework and IDE, Zeliot developed custom applications for Statistical Process Control (SPC), Engineering Process Control (EPC), Overall Equipment Effectiveness (OEE), maintenance automation, Root Cause Analysis (RCA), operational reporting, and real-time notifications.

As production data flows through the platform, every event is processed in real time, validated against engineering specifications, enriched with operational context, and delivered through dashboards, APIs, maintenance workflows, and reporting services. This unified event-driven architecture ensures that production, engineering, and maintenance teams operate from the same continuously updated view of furnace performance, enabling faster decisions and more proactive operations.

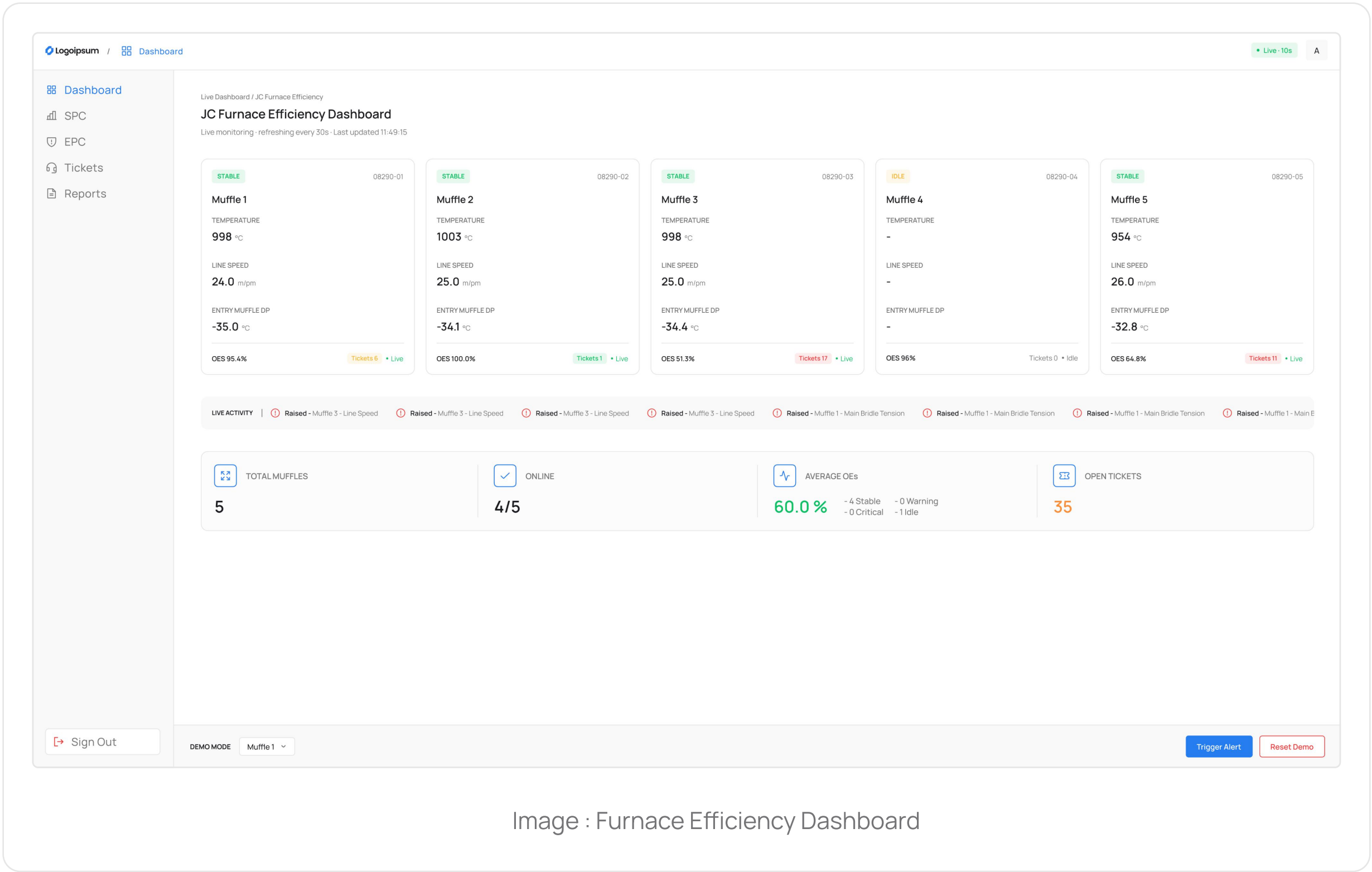
Business Impact

The implementation established a unified operational intelligence platform that connects production, engineering, and maintenance teams through a common real-time data foundation. By continuously processing live production events and automating engineering analysis, the solution enables earlier detection of process deviations, streamlined maintenance workflows, faster root cause investigations, and improved operational visibility across the furnace.

Beyond delivering a modern Furnace Intelligence solution, the project demonstrates how Condense enables industrial organizations to rapidly build scalable, event-driven applications that transform continuous operational data into actionable business intelligence.

Operational Intelligence in Action

See how the platform translates live production data into actionable operational intelligence through real-time process monitoring, equipment health analytics, maintenance insights, and engineering dashboards. Together, these applications provide a unified view of furnace performance for faster, data-driven decision-making.



From real-time process intelligence to predictive maintenance, the solution demonstrates how industrial data can be transformed into measurable business value, laying the foundation for a smarter, more connected **Industry 4.0 enterprise**.