

Industry 4.0: APC

Industry 4.0 Advanced Process Control – Rendering (Stage 1 Evaluation @ Brooklyn)

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Project description

This project examined whether Industry 4.0 Advanced Process Control (APC) technology could improve stability, yield, and operational consistency in rendering at JBS Brooklyn. CORE machine-learning controllers were installed on dryers and decanters to evaluate whether automated control could outperform manual operation. Early results showed improved combustion-temperature stability and increased decanter throughput; however, performance could not be sustained due to mechanical variability, unstable feedstock, and inconsistent operator adoption. The project ultimately determined that APC requires a stable mechanical and process environment to be effective.

Project content

The project involved installation of CORE hardware, integration with PLC/SCADA systems, operator training, and a multi-phase commissioning period. High-frequency process data—including feed speeds, torque, burner load, and temperature trends—was collected over several months. Haarslev engineers performed commissioning, system tuning, and performance assessments. APC performance was benchmarked against manual control under varying operating conditions.

Project outcomes

Key outcomes included:

- APC demonstrated improved stability during periods of consistent feed and equipment performance.
- Mechanical constraints—air-damper failures, torque spikes, inconsistent dryer airflow—limited sustained APC use.
- Operators reported improved responsiveness and smoother transitions when APC was functioning.
- No verifiable long-term yield or energy benefits were observed due to process instability.

Project outputs included operator manuals, commissioning reports, interim and examination reports, trend graphs, and a detailed set of insights outlining prerequisites for APC adoption in rendering environments.

Benefit for industry

This project clarifies the feasibility and prerequisites for adopting APC in rendering operations. While APC shows promise, it cannot compensate for underlying mechanical or feed variability. Processors now have a validated framework for APC adoption: stabilise equipment, improve instrumentation, reduce feed variability, and ensure operator adherence before implementation. These insights reduce risk, strengthen investment decisions, and support effective modernisation of rendering assets across the industry.