Cracking the Nut of Operational Excellence

How we helped Blue Diamond build a facility that uses an integrated ERP-MES to operate more effectively

inflexion point

📞 732-922-6611

✉ info@inflexionpoint.ai

🌐 www.inflexionpoint.ai

FOOD PROCESSING

Plant-Wide Connectivity Drives Efficiency

We helped Blue Diamond Growers implement a Manufacturing Execution System to maximize the efficiency of a new facility.

For over 100 years the California Almond Growers Exchange (now known as Blue Diamond Growers, in recognition of the quality of their almonds) has grown, processed, packaged, and sold almonds and almond-based products.

The Challenge
In 2013, to keep up with demand, the company sought to double capacity by opening a new plant in Turlock, California that could produce more value-added products more efficiently using state of the art technology. And they reached out to us to design and build the systems that would help run the new facility.

Taking Control, Using MES
With the chance to design an optimal system for a facility not yet built, we recommended they implement a Manufacturing Execution System (MES) and integrate it to their Enterprise Resource Planning (ERP) system. By sharing information with the ERP, the MES allows the operations team to monitor and control

functions including work order management, material tracking, quality, compliance, and manufacturing performance, within an enterprise information system.

The MES system is based on Wonderware Operations & Performance MES platform (now part of Aveva), with interface to their SAP ERP system using the Wonderware Enterprise Integrator for master schedule, process order release, consumption transactions and production results. Our team coordinated with the equipment integrator providing the PLC control systems for data collection and equipment interfaces.

An Integrated Process
Process Orders are released by SAP in real time. The change in status of a process order causes a transfer from SAP-PI via web services to the Wonderware Enterprise Integrator. The data package utilizes ISA95 B2MML for modeling the message content. The result is parsed and placed into the MES job schedule.

Challenges
- New facility must double production capacity
- Connection with ERP system to maximize efficiency

Solution
- Plant-wide MES for new green field manufacturing facility
- MES functions included: work order management, material tracking, quality, compliance, and manufacturing performance.
- MES, based on Wonderware Operations & Performance MES Platform
- Interface with ERP via Wonderware Enterprise Integrator and SAP
- Master PLC control systems for data collection and equipment interfaces

Results
- Increased productivity using a unified enterprise information ecosystem
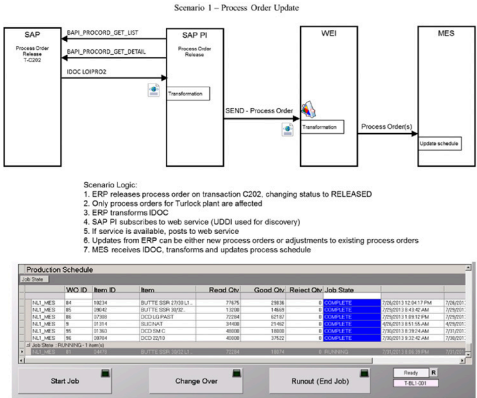- Reduced costs through more efficient materials handling

Materials used to form the BOM are also queried by WEI via this interface to SAP. Additional transactions covered in the interface include material consumption transactions at the point of use and production events (both finished goods and by products).

Users have several interfaces for accessing information from MES. Work orders created from the SAP transfer process become MES jobs that are started and controlled by the operator at an MES display.

KPI Dashboards

A key feature of the MES is the ability to combine consumption data, production data, time and labor to produce a series of metrics that display current system performance. The MES Utilization Display conveys current production status by showing a summary of these metrics. The metrics are also referred to commonly as Key Performance Indicators or KPIs. KPIs are typically represented as a single number like OEE % or Yield % and convey a quick picture of production performance.

Tracking Consumption

The MES Consumption Display is used while running a work order. The user can execute consumption transactions or view consumption records that are sent from SAP. Each consumption record includes the target Bin/Dumper for dispense of the raw material. The Bin/Dumper relay is only enabled after the consumption record is received. The operator can only dispense the material after he or she has scanned in the material and selected the correct dumper.

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