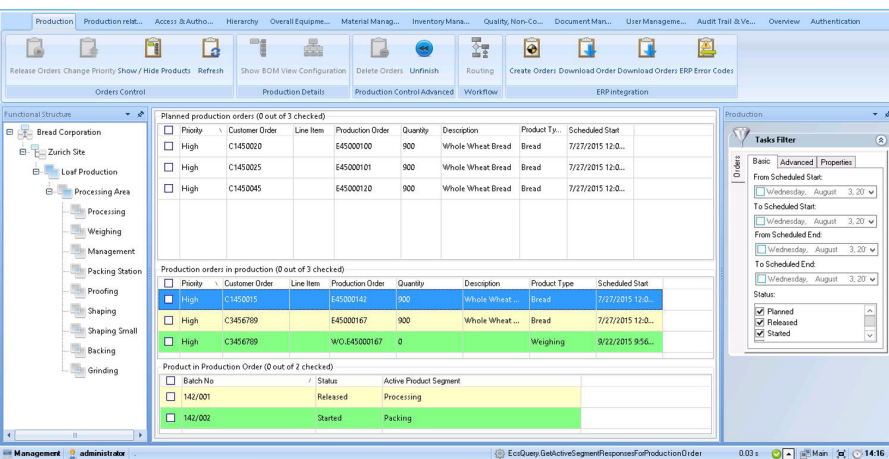


ABB Ability™ Manufacturing Operations Management

Manufacturing Execution System – Production Order Management



Efficient, flexible and reliable production order execution is essential to keep the manufacturing running smoothly. The core of the effective execution is the orchestration of all the operations and the synchronization of the business system with the shop floor and of the different systems, entities and people involved in the end-to-end process.

The ABB Ability™ Manufacturing Operations Management (MOM) Production order management module support different users groups, such as operators, supervisor and production engineers, to perform their responsibilities in an easy and consistent way. Starting from the enterprise resource planning system and extending to the individual production steps of the process and the required manual and automatic interactions, the system guide the users by the underlying workflow / routing.

The solution

The underlying workflow / routing is a core component of the production order management module. The workflow is configured in accordance with the desired manufacturing process and describes how the production order should be executed. This is leading system for the operators, providing on-screen instructions to each step and capturing what is performed. Interactions can be either manual or by the plant equipments and systems. Production order dispatching and execution is relying on receiving the correct and timely information from the ERP

system. Bidirectional integration is established between the ERP system and shop floor process control, creating a strong channel of data exchange throughout the whole production flow. Typical data exchanged include: order details and configuration, product unit details, routing (workflow) information, Bill of Material (BOM), operations confirmation etc. The near real-time capturing of transactions and events enables production order tracking and production progress overview.

Key Benefits

- Production execution based on accurate and timely information
- Streamlined process by workflow capabilities ensuring all specified production steps are completed according to specification
- Manual efforts and errors are reduced
- Bill of Material (BOM) and order configuration are available on a button click
- Real time availability of production progress and status enables timely decision
- Managing exceptions with dynamic responses (e.g. rework)

Integration with ERP system

To use the ERP to its full potential the integration between plant operations and enterprise business applications brings major opportunities to improve productivity, flexibility and quality control. Production order dispatching and execution is relying on receiving the correct and timely information from the ERP system. By integrating the shop floor with the ERP system orders are managed without a manual paper error prone process.

Bidirectional integration is established between various ERP systems and process control, creating a strong channel of data exchange throughout the whole production flow. Typical data exchanged include: order details and configuration, product unit details, routing (workflow) information, Bill of Material (BOM), operations confirmation (progress reporting), quality test result, labor times and instant reporting of material consumed and goods produced.

Download of order data from ERP can be triggered manually or by a periodically running download service, depending on integration mode enabled. After successful download from ERP, production orders are released to production manually or automatically. In case of manual releasing of production orders, authorized personnel defines when and which production orders should be released. For automatic release, the system provides a set of algorithms according to which production orders can be released. The choice of an algorithm used depends on the plant preferences and level of details in routings configured in ERP system.

After successful releasing, the production order is visualized to the operator active at the first step in the workflow. During execution of the order, operations confirmation are send back to ERP at defined steps.

Typical confirmation message contains:

- Operation number
- Quantity for given operation
- Quantity good
- Quantity scrapped
- Operation duration

Flexible and dynamic workflow

An important aspect of the production order management module is workflow management. The MES system supports different methods of workflow mapping from order release to production, dynamic production flow based on a specific product characteristics, run-time production workflow changes for exception management, automatic confirmation to ERP and more.

When a product is completed on a given workstation, it is transferred to the next station for further processing. The workflow can be configured to handle exceptions and reworks by creating branches in the flow charts.

Production order tracking and progress overview

Various built-in production overviews makes the status and progress of orders easily visible. As an example, the progress overview report displays main order details, the percentage of completion, and a detailed overview of the quantities both in progress and finished. The Production Order Brief Info displays information about the product, production order, and work in progress all in one view. In addition, advanced search and filter capabilities are available to manage large quantity of data.

Serialization

Each product or lot tracked in the system is serialized with a unique serial number. Product serialization can be obtained in two ways: Serial number downloaded from ERP, or serial number generated by MOM. Non-serialized production is similar to serialized production in general. The difference is that in non-serialized production the tracking of production process is focused on quantity rather than on single unit.