Manufacturing Execution System

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Are you getting everything out of your plant?
How is your production running? Are you satisfied with your supplier’s reliability? Do you have an overview and the control of all operations at all times? Is your plant optimally used to full capacity? Do you exploit your entire potential?

And what about the future? Is your company prepared for new challenges, can you react flexibly and at short notice?

There is often too little time in day-to-day business for questions of this kind, because the increasing pressure of competition in the internationalized markets, the increased requirements of quality and commercial efficiency as well as the rapid pace of development in the technology sector require a large number of quick decisions every day.

Nevertheless, these changes in the market situation make overlapping concepts necessary – solutions which take your company further.

Our solution for you is called: Manufacturing Execution System (MES)

The company in its “entirety”

MES integrates the systems along the entire value chain of your company, starting with the goods inwards, the various production facilities, including Enterprise Resource Planning (ERP), warehouse, laboratory, packaging, shipping or transport into one enclosed, uniform data consistent system.

Continuous Workflow – From goods inwards to shipping

With MES you can describe the operational sequences required for goods transport, ware-housing and production by means of workflow models, and automate and thereby coordinate and monitor them.

You decide on the degree of integration yourself. As a result, you are able to react flexibly, even in exceptional situations. Resource bottlenecks or job collisions are prevented, because you have an overview of the events at all times and can react accordingly.

You know everything about your production

MES collects and archives data from the processes. This is the basis for the product documentation, including tracking and tracing and process optimization.

Your plants become highly available

MES improves the availability of the production systems (assets) by ensuring that unscheduled downtimes are reduced, so that an increase in throughput is possible.
Automated Logistics

The efficiency of incoming and outgoing goods shipment, loading facilities and warehouse systems is considerably improved, including inventory management and operator guidance, being integrated in the automation.

Optimized Production and Planning

MES connects the production facilities to the business systems (ERP), whereby a continuous information flow between logistics, planning and execution takes place.

What you achieve with MES:

- Logistic business processes are automated
- Production orders are transferred and executed online
- Production and planning are optimally tuned to each other
- Your productivity rises
- Quality increases with costs remaining the same
- Lower capital requirement and inventory
- Your maintenance systems are coupled to the automation system

MES from ABB

MES consists of the following four basic components:

- Logistics Management
- Information Management
- Production Management
- Asset Management

In addition, MES include various interfaces for the connection of instruments, logic controllers, batch systems, database applications or SAP. The execution system for MES is based on the 800xA system. MES also includes tools for creating the MES application and a common data basis for all coupled systems.

ABB – Your Partner for MES

MES applications are individual integration projects. Existing and new systems of the customer must be combined in an overall system.

ABB advises you on the selection of the system components and creates the right MES application for your company on the basis of tried-and-tested ABB standard products. Our additional services include:

- Generating detailed specifications on a mutual basis
- Implementation
- Commissioning
- After-sales service

Experience and Know-how

Take advantage of our extensive experience gained in projects in chemicals, pharmaceuticals, foodstuffs and discrete production. Feel free to contact us!
In-time production and shipment need sophisticated logistics concepts for the provision, transport and loading of raw materials and finished products.

**Transport and Loading – In-Time**

With Logistics Management, you automate the business processes required for incoming and outgoing goods shipments, admission into and withdrawal from the warehouse and inventory control. This is applicable for the transport systems of truck, goods train, ship and pipeline.

The equipment required for the loading and transport processes, such as barriers, displays, operating terminals, card readers, scales, measuring systems, pumps, etc., are integrated and controlled in Logistics Management. Blending and liquid movement control are also optional components of Logistics Management.

The logistic processes are configured by graphical means using standardized modules. A large number of different transport and warehouse systems can be incorporated in an MES scenario in a secure, user-friendly and resource-saving manner by means of these instruments.

**Reduction in the costs**

- Extension of the loading time window with unchanging or even reduced resources
- Technical systems such as weighbridges can be used more efficiently
- Integration of the drivers in the operator handling with automated operator guidance (self-loading)
- Elimination of paperwork and manual activities

**Integrated Security**

- Access control with forced security checks for the transport of hazardous goods
- Compliance with the statutory regulations like ADR, IMDG, RID, ADN
- Multilingual interface
- Guarantee of proof for insurance companies or regulatory bodies

**Inventory Control and Warehouse Management**

- Minimization of the stocks
- Reconciliation of the inventory control based upon measurement inaccuracies, leakage, etc.
Greater transparency through more information

Process and company data can be acquired, stored, retrieved, displayed and evaluated by means of information management. From the production to the company management, decision-makers in the office can access the data and use calculation algorithms to process it for further evaluation.

Decision support

The calculation results are the basis for further decisions which concern the system management, maintenance, process optimisation or quality assurance.

Comprehensive data recording

- Enterprise-wide acquisition of measured values, alarms and events from the production systems
- Complete production reports
- Electronic shift book with online connection to the process
- Central standardized storage of data over any required time period

Evaluation and visualization

Information from across the company can be directly selected in familiar Office formats and used for the calculation of performance measures and balances.

- Real time and historical trend data
- Performance indicators (KPI) with trend display
- Mass balances, energy consumption...
- Statistical evaluation of alarms and events from the processes, e.g. for tracking of the causes of message bursts

Improved Plant Management

- Automated shift book entries improve the production documentation of the products and support plant management
- Improved alarm management is essential for optimization of the processes

The in-time acquisition, processing and provision of the correct information can secure decisive competitive advantages: shorter decisions and reaction times.
With improved continuous production flows, producers can react more flexibly and more quickly to market requirements and handle complex work processes more efficiently.

Production and Workflow
The essential requirement for successful production management is completely automated production under the supervision of an overlaid workflow model, starting from the enterprise resource planning system and extending to the individual production systems of the plant.

Production management coordinates and monitors the production through integration of all the systems involved in production.

Extended Resource Management
Human resources and material are also integrated in the resource management.

Reacting Quickly and Flexibly
The design and monitoring of the continuous and consistent workflow model enables both rapid and dependable order processing and flexible reactions to ever-changing customer requirements.

Improved Information Flow
The data from all the systems involved is stored in a common database, whereby the basis for a comprehensive documentation, including batch tracing, is created. Production data is immediately passed on to the sales department or warehouse:

- Production status
- Material production and consumption
- Run times and costs
Asset Management

The availability and efficiency of production systems can be significantly increased through continuous status monitoring and the early detection of "weak points". This is the basis for the best possible Return on Investment.

Maintain your production efficiency

Asset management ensures the availability of the production systems through continuous monitoring of the assets of a production facility and the assessment and optimization of the plant efficiency which result from this.

Assets in the production facility are

- Installations & plant components such as pumps, apparatus, boilers, reactors
- Instruments and devices of the distributed control system such as sensors, actuators, transmitters, field instruments
- Electro technical equipment such as frequency converters, UPS, switchgear
- Network systems such as routers, switches, network cables

Reducing downtimes

Assets monitors’ record system information from field instruments, motors, reactors, etc. and analyze and compare this with reference values. Decreasing performance and imminent failures can be detected and suitable measures taken at an early stage from the thereby prepared reports.

Status-driven maintenance

Initiated by the continuous status monitoring, preventive maintenance measures can be reduced, and the maintenance work processes optimized.

- Transfer of the error reports to the maintenance system, e.g. SAP R/3 module PM
- Initiation of a repair job in system 800xA

Improved work processes – Higher throughput

By means of the results of the status analyses such as the evaluation of remaining lifetimes, performance measures for efficiency, availability or energy consumption,

- Production flows can be planned better and production operating characteristics optimized
- The efficiency of the installations can be increased.