Minerals Processing Solutions

Automation
Get the most out of your mineral processing plant
Metso process automation know-how means productivity improvement

PCD – Process Control Diagram
Establish the base, motor control, the right instruments and sensors for your process.

Our process knowledge is the foundation of your automation
Metso is the global leader in minerals processing solutions. Our expertise is based on over a century of experience, and today’s industry-leading solutions embrace the latest technology.

DCS – Distributed control system – centralized information
Design and implementation of the control strategy, where process and technology gets integrated.

“We are experts in automation and minerals processing technology.
And above all, we are experts in integrating automation systems for the mining industry”.

Metso technology is made up of a global pool of highly dedicated people who work closely with all parts of Metso Mining and Construction products and services, giving it a unique position in the industry.

Our long experience in getting the most out of mineral processing plants
The most efficient processing equipment for all steps in the mineral process
Metso is a global leader in the industry - in terms of both knowledge and equipment; we know how to operate mineral processing equipment.

Automation of new and existing plants
We design automation system for processing plants, and offer the modernisation of process control systems in existing plants, with minimum interruption to your production.

is the difference between us and other providers.

Our solutions are always based on your existing equipment and standards.

APC – Advanced Process Control – an autopilot
Advanced control systems based on high level rules aimed at maximizing production performance.

Services – Metso’s life cycle commitment
Production support, to empower your staff to develop and maintain the system.
Our engineers study the process design and operational data. This may require a process audit to assess key parameters and process dynamics.

Motor control (MCC) facilities need to be audited or designed, to ensure motors for conveyors, pumps etc can be started and stopped and which require variable speed drives.

Based on mass balances and other data, the instrumentation required to effectively control your process is chosen. It requires experience to choose the instruments that are fit for purpose as they vary greatly in price and performance. We recommend advanced instruments only where we know it is required for effective process control.

We have supplier agreement with several leading suppliers, allowing us to offer instrumentation at competitive prices.

Automation of crusher plants

Metso is the industry leader for mining crushers, as well as complete crushing plants.

Process control to ensure the choke feeding of crushers, camera and software instruments for particle size measurement of crusher feed and product, power draw measurements, automatic crushing gap monitoring, the detection of screening deficiencies, all contribute to maximizing the plant performance.
Automation of concentrator plant

Milling is normally the highest cost of the entire process and grinding efficiency decides mineral recovery.

Metso has provide some 80% of the bigger mills operating today worldwide. And we know how to best control them, whether they are large Autogenous mills, ball mills or the later generation fine grinding equipment, such as Vertimills and SMD's.

Metso also offers the full range of separation and pumping equipment for concentrators.

Ore and water in mills are controlled for maximum grinding efficiency, followed by grinding size distribution measurements in the classification system. Control logic for a flotation process is implemented, using special instruments such as the Metso Visofroth intelligent camera system.

Supplier independent

Metso is a supplier of specialized advanced control instruments (Audiomill, VisioFroth, VisioRock ect), control system hardware and software (Metso DNA or any other DCS or PLC based control system) as well as the Metso OCS – advanced process control platform.

We also offer to work with all the main standards used in the mining industry, both for instrumentation and control systems. And we will automate the whole plant, not just limited to Metso process equipment.
Distributed Control System

Process data monitored, analyzed and presented where it is needed, for stable operations and improved production.

Control based on your standards
Main Metso process equipment comes with a control system, that controls that production system e.g. a crusher or a mill. All such localized control systems must be integrated to an overall control hierarchy, with control rooms that combine the requirements of centralised control for an overview of process performance, to the need to have some control closer to the equipment. We provide recommendations on control strategy, layouts, redundancy, security levels etc.

You decide on user requirement and hardware and software standards, we do the rest.

With the sensors and motor controls implemented the process can be continuously controlled based on readings from the process instruments.

The process operates stably giving better productivity, less maintenance, and more efficient use of operational staff.

With the automation system controlling every step in the process, the operator is free to look for improvements in operational parameters.

Deliverables DCS - Distributed Control system

Control strategy and system layout

Delivery of instruments and PLC’s
Metso DNA process control system. The best possible payback from automation

Metso DNA is a single automation system for all functions – process, machine, drive and quality controls. It also covers information management and mechanical and field device condition monitoring. The single system architecture saves on both costs and effort, at the same time ensuring open growth for your future challenges.

The intuitive and straightforward Metso DNA user interface enables quick problem solving and efficient decision-making.

Finding the cause of process disturbances at plants is often challenging. Often information is scattered when you need to be able to compare it on the same screen. By bringing different data into one interface we can create tools that provide a comprehensive overview at a glance, making problem solving and decision making easier.
Advanced Process Control is essentially a mature technology and is installed in many plants around the world. Metso’s Optimizing Control System (OCS©) software is a leader in the field.

OCS© is built around a core of artificial intelligence. The rule set is specific to each application and it effectively takes over most of the set point decision making from the operator, freeing him or her up to focus on higher level tasks – the system runs the plant and normally these systems have an availability of 99%.

Metso APC differs in our extensive use of model-based control, which has historically meant using population balance models that are automatically calibrated to the plant using advanced statistical methods. In this way a virtual model is available which can be used with optimization algorithms to compute the best operating point for the plant.

Of course, these targets are filtered by the expert system prior to implementation in the plant control system. It is this powerful combination of Artificial Intelligence and deep process expertise in the form of mathematical models that makes Metso the leader in Model-Based Expert Control.

Deliverables APC - Advanced Process Control

Production analysis, design of operations philosophy and assess process constraints.

Programming high level operations rules, commissioning and evaluation.
maximize production and product quality

Installed on top of DCS and PLC-based controls
The OCS© is installed on top of the DCS. Basic logic for control flows, densities, motor speed, tank and bin levels etc. are maintained by the rules programmed into the PLC’s that makes up the DCS.

However, more advanced control strategies that well trained operators with good process knowledge implement, are too complex to be programmed in the software used in PLC’s.

The OCS© software system was designed to allow for such complex analysis, e.g. using process data on-line with statistical models, linear programming with constraints, neural networks, fuzzy logic, soft sensor algorithms.

Small investment with immediate payback
The OCS© will typically result in several percentage points of improvement in productivity. The system comprises a computer into which the operational strategy is programmed.

The OCS© is a relatively small additional investment when compared to the development of a modern DCS.

Using the DCS infrastructure the OCS maximizes the use of the asset, resulting in an immediate payback.

Training of staff on how to use the system for continued learning and process optimization.
Our experienced field service team provides on-site support for your operation. As a global service provider, we understand how to provide you with better process performance, improved productivity, maximum plant availability, reliable equipment performance, effective preventive maintenance and improved safety.

Our competence and expertise are at your service full time. Count on Metso's certified customer service team to assist you in getting the best from your operation.

Control from a distance…
Metso can monitor your process from a distance. With this service we can detect potential problems early as well as recommend service and maintenance.

…and local presence
Our local presence is important for our customers. Not just because we can quickly be in place, but also because we know the local conditions, regulations and other requirements.

Continuous improvement
An automation system, especially an optimizing control system, can always be refined and used better. For Metso, it is
important that we are always available as a resource, for continuous improvement and continued economic viability.

**Plant diagnostics and upgrades**

Metso conducts tests and simulations on plant and materials, thus providing the most efficient and economical method of processing a specific material. Testing allows us to match equipment precisely to the material being processed for new or existing installations.

**Operation and maintenance contracts**

Metso Life Cycle Services are far more than a simple service offering. They incorporate our global knowledge in products and processes to provide solutions that best fit your needs.

Metso services can help you in implementing the industry best practice at each step of your operation and achieving the optimum performance from your assets on a sustainable basis throughout the whole lifecycle.
Automation project to the world’s leading mining companies

Metso delivers success. We have more than 100 reference cases around the world. Cases, based on both innovative as well as proven solutions.

A proof of this success is that we constantly get new assignments from our customers. Assignments, giving our partners strong competitive advantages and an optimized production.

Examples from case studies:

$200$ Million US$ total benefits
$51$ days payback time
$15\%$ energy cost savings
$21\text{-}32\%$ increase in crushing plant productivity

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