

# Stages of a Global Success

Melody – the Industrial<sup>IT</sup> Process Control System



# Use what you have to get what you need

Proven, open, and future-oriented are the most appropriate adjectives to describe Melody, ABB's modern Industrial<sup>IT</sup> process control system. The system structure and the components of Melody are designed in such a way that they meet the requirements of different markets and applications in the best possible way.

Using the comprehensive functionality, it is easy to adapt the process control system to the automation tasks at hand, while the scalable redundancy guarantees maximum reliability. The powerful controllers are distributed hubs of the automation. These are networked via a redundant bus system. In addition, they constitute the links to input/output modules, fieldbus systems, as well as higher-level engineering and operator stations in the control room.

The "Composer" tool, is a multi-user engineering tool offering functions that efficiently support the economical operation of a plant throughout its entire life cycle, that is, from planning and design to commissioning, operation, and maintenance.

## Proven ...

There are already more than 1000 installations of Melody in various markets and fields of application all over the world.

The wide range of Melody references includes power stations, water and sewage processing, pharmaceuticals, petrochemicals, metal and cement industries, sugar manufacturing, and many more. This brochure presents a selection of industry applications showing the impressive performance of Melody.



### ... Open ...

In the field area, Melody gives you freedom of choice between a centralized and a distributed system architecture. Thanks to the fact that it consistently follows fieldbus and device standards, Melody seamlessly integrates intelligent fieldbus stations and devices. These are, for example, PROFIBUS and FDT/DTM.

The control and management level offers powerful operation functions through the integration of the Operate<sup>IT</sup> Process Portal human system interface, the integrated Produce<sup>IT</sup> Batch package for procedural control, and other manufacturing execution systems such as Inform<sup>IT</sup> and Optimize<sup>IT</sup>.

### ... Future-oriented

“Use what you have to get what you need”. Melody has proven its value on numerous occasions, with the result that customers from all sorts of industries trust in automation solutions with Melody. This is particularly the case when dealing with large, distributed plants. Today more and more products of the Industrial IT portfolio are integrated into Melody, and this number is set to grow even further in the future. That's why your current plant is well equipped to adapt to new opportunities and market requirements. Melody perfectly protects your investments.



# Melody – success in numerous industries all over the world

## Germany – spotlight on the largest Profibus installation in the world

Thyssen Krupp Stahl AG/Carbonaria GmbH & Co. KG awarded ABB the contract to provide the entire control system for a new coking plant near Duisburg. The Control IT CMC70 controller module is used for the basic automation of the plant, while the Operate IT Process Portal with 30 operator stations and another 68 screens constitutes the engineering and operator level. The plant's field devices are connected to the control system directly via Profibus DP/PA and are configured and parameterized using Composer with embedded FDT/DTM

technology. This has around 25,000 I/Os, making it the world's largest Profibus installation in the industry.

Thyssen Krupp had particularly stringent requirements related to the design of the control technology. Also in this case, the customer was convinced of ABB's technology because of:

- » The end-to-end networking at all automation levels
- » The seamless dataflow from the manufacturing execution system to the individual sensor



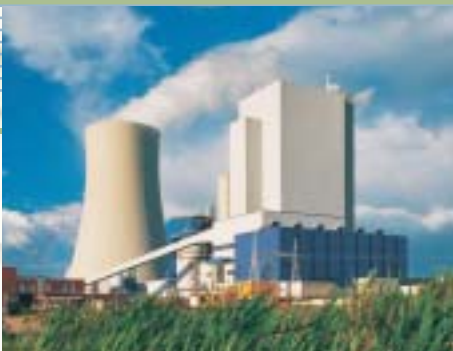
## China – generating and utilizing potential savings

Melody has also demonstrated its advantages as a power station control system at China's largest power station site in Shajiao, located between Canton and Hong Kong. Having installed Melody in the first block as early as 1998, the company has now installed the system also in its third block. In this process, the system fieldbus for connecting the Melody I/O modules was wired to the field in a star-topology, allowing the sensors and actuators to be connected remotely in small on-site cabinets, as is the case for a remote I/O.

It was possible to:

- » Save a considerable amount of money for the cabling
- » Fully utilize the advantages of the Melody I/O modules

In addition, thanks to the user-friendly handling of the Composer engineering tool, the Chinese were able to carry out the majority of the engineering and commissioning tasks themselves.



## South Africa – upgrading to state-of-the-art technology

The Petro SA refinery in South Africa was due to renew its technical systems. In this context, the company teamed up with ABB over the past two years to add Melody controllers to its existing Contronic P system, thus upgrading its technology to the state of the art. At Petro SA, one of the country's largest refineries, the new user interface being used is the Operate IT Process Portal. Consequently, the implementation of Process Portal – together with Melody stations – was also installed in a newly built section of the plant.

Especially for large facilities such as a refinery, which has special requirements related to security and availability, Melody offers particular

advantages:

- » High availability thanks to full redundancy at all levels
- » "Multi-User Engineering" for efficient engineering and commissioning with several users
- » Intrinsically safe I/O modules



## Switzerland – the recipe for reliable recipe processing

Teranol AG, located in the Swiss town of Lalden, produces vitamins, carotins, and other related substances for flavorings. Here, several Melody stations manage the production of up to 10 recipes running in parallel. Melody, with its integrated recipe processing functionality, is especially suited for the complex structures containing up to 8 modes for each basic function. After all, batch-oriented production processes are particularly good examples of an area where you can completely rely on Melody advantages such as:

- » Easy recipe creation with plausibility checking
- » Consistently easy to operate, from recipe to tag
- » Automatic recipe execution
- » Recipe management
- » Flexible plant use
- » Comprehensive documentation options

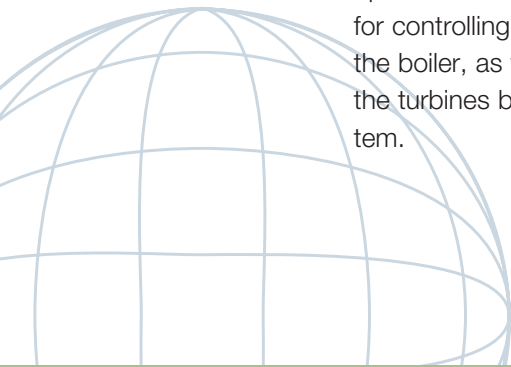


## Denmark – quick revamp for cozy warmth

Melody was also the power station control system chosen to upgrade the boiler automation in the Danish HERNINGSVAERKET power station. One of the requirements here was that the renewal had to be completed within a "non heating" period of just 10 weeks. The primary reason why this could be achieved was due to the fact that interfaces existed between all parts of the system, allowing the plant to be tested "cold". The power station could therefore be started up again particularly quickly and hassle-free. Two operator terminals can now be used in HERNINGSVAERKET to control and monitor the entire operation of the power stations: with functions for controlling the fail-safe burner, protecting the boiler, as well as controlling and protecting the turbines being integrated into just one system.

This makes HERNINGSVAERKET a prime example of how the Melody control system has particular advantages for power stations:

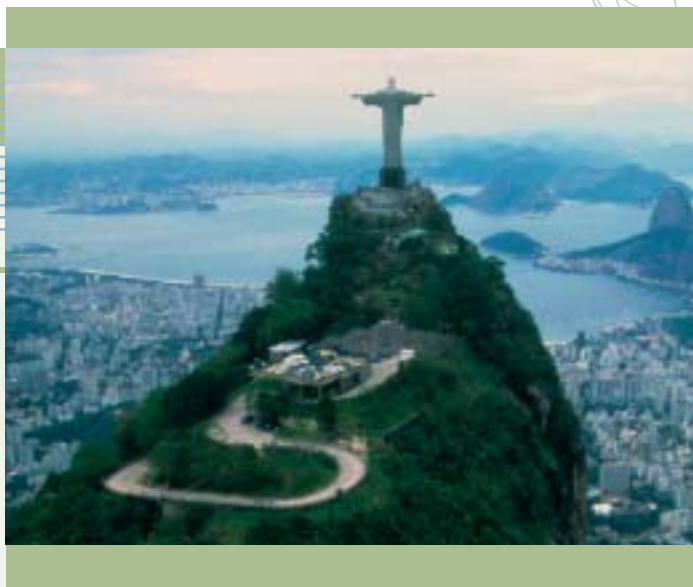
- » High efficiency
- » High availability
- » Built-in security functions



## Brazil – simplified operation of coupled systems

In a fertilizer factory in Brazil, Melody is deployed to couple the signals of approximately 50 on-site systems and create a uniform interface for operating the plant. In this case, the customer's decision to implement the ABB system was primarily based on functions such as the following:

- » Redundancy
- » Straightforward integration of field devices
- » Easy connection to various fieldbuses
- » A central engineering database that also allows partial deliveries



## United Arab Emirates – turning sea water into fresh water

Melody is also used in two large plants in the United Arab Emirates. In the Al Taweelah sea water desalination plant, around 50 km to the north-east of Abu Dhabi, 227,000 cubic meters of clean drinking water is obtained from sea water each day with the help of Melody. The second project involves a power station and a desalination plant in Umm al Nar West, around 15 km to the east of Abu Dhabi, supplying the capital of the United Arab Emirates with both electricity and water. Here, a colossal 465,000 cubic meters of drinking water is processed each day – an amount that would cover the daily drinking water requirements for about 3.5 million people in Germany.

Both plants have been expanded by using Melody. The formerly used control level has been replaced with a modern engineering and operator system. Melody controllers and I/O devices have been added to the process level. The advantages of such modernization are obvious:

- » More efficient and reliable plant management thanks to the modern operating system
- » A high degree of investment protection through retention of the automation and process level, including the field level



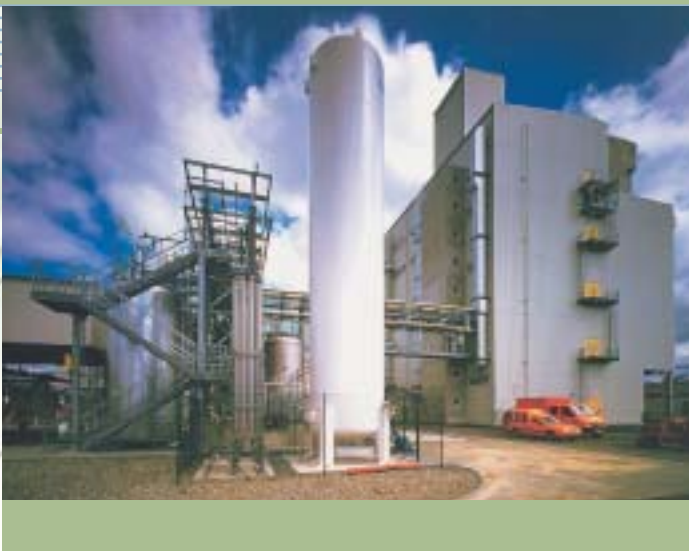
## Germany – flexibility and integrated safety

On the Schwarzheide site in the Lausitz, BASF AG recently opened a production facility for an entirely new crop protection chemical, just 20 months after the construction work began.

The automation for this facility was purchased entirely from ABB, with the project being based on a Melody control system for automating the batch process. The plant contains a total of 19 operator terminals, two of which are located in hazardous areas. Altogether, 14 Melody controllers have been installed and four of these have been designed to be redundant.

In addition to the company's positive experience of working with ABB in the past, the main reasons for choosing the Melody system included:

- » The easy means of coupling 20,000 tags to BASF's customized process information management system (PIMS)
- » The possibility of using the system fieldbus to connect to the fail-safe system of HIMA
- » The possibility of a redundant design
- » The optional Ex-i execution of the process interface modules



## Norway – perfect integration

The gas processing facility of Statoil in the Norwegian town of Kårstø processes natural gas and condensates from off-shore platforms in the North Sea. Ever since it was built in 1983, the plant has been operated using ABB systems and has repeatedly been upgraded to the latest system technologies. In a recent extension, which aimed to double production capacity and integrate an additional production line, the company chose to use Melody as its control system.

At the same time, a central control room had to be built, which was to immediately merge and replace the existing ones.

There were several good reasons to choose Melody for this conversion, for instance:

- » The intrinsic safety while setting up and converting the process plants
- » The minor effect on operations as the changeover was carried out “online”
- » The high degree of investment protection as the system is open for extensions
- » The easy means of asset optimization and the resulting reduction of process costs.



## Germany – the heart of sugar production

Production at Nordzucker AG in the northern German town of Uelzen has recently come to revolve around Melody, with which various, previously autonomous, parts of the plant are interconnected. In addition, this open process control system has been used to interface to 18 different suppliers and integrate them to form one complete system, making all process information available in one central location. In the future, too, Nordzucker will continue to rely on the open features of Melody and that is whenever it needs to connect several silos to the plant.

Melody was chosen here due to the special advantages it has particularly in the area of food industries. These include:

- » The open system concept for the smooth integration of field devices and easy connection to the fieldbus
- » The full redundancy for increased availability
- » The easy way in which production conditions can be adapted, during operation as well as in parallel to operation
- » The fact that it can also be used in validated plants using special functions such as the audit trail
- » The comprehensive library of function blocks



## Melody - the Industrial IT process control system at a glance

### Hierarchical system structure

- » Operator and management level with operator stations and batch processing
- » Control level: Industrial IT Controller CMC70 and AC 870P
- » Input/output units: Melody Rack I/O, PROFIBUS remote I/O S800/S900
- » Melody Composer engineering tool: planning, engineering, commissioning, diagnostics, and maintenance
- » Further Industrial IT components for plant optimization (Optimize IT) and for information management (Inform IT) can also be integrated.

### Redundant bus network

Reliable communications network for all automation areas, such as the operator level, controller, process interface, and fieldbus components.

### Scalable redundancy, full system support

Integrated redundancy concept in power supply, communication, functional units, and process interface, as well as high availability with no additional configuration effort

### Powerful Industrial IT controller

Comprehensive scope of common and customized, industry-specific process functions, redundant, integrated interfaces to Melody Rack I/O, redundant, integrated PROFIBUS interfaces to fieldbus stations and devices, and automatic redundancy handling. Two different designs for flexible installation: AC 870P for rail mounting, CMC70 for rack mounting.

### Intelligent process interface

Broad range of I/O modules with an optionally integrated Ex-i interface and a power supply to the sensors. Functions with 1 ms time stamp, integrated HART interfaces, assembly of the I/O modules optionally in the cabinet or junction box on site, reliable bus connection using redundant fiber-optic cables.



**PROFIBUS and PROFIBUS I/O stations  
(Industrial IT S800, S900) for Ex-i and non-Ex  
applications**

Two redundant PROFIBUS DP lines for each CMC70 or AC 870P controller, optionally copper and/or fiber-optic connection with the I/O stations and Profibus devices; possibility of simultaneous connection of Profibus DP and PA devices via DP/PA couplers, on-site assembly of Industrial IT I/O stations (S800, S900) for non-Ex and Ex-i applications, including installation in zone 1 hazardous areas.

**Melody Composer: a comprehensive engineering tool**

Efficient multi-user engineering tool for planning, engineering, commissioning, diagnostics, and maintenance; parallel engineering of planning and operating phases, function-chart-oriented user interface, seamlessly integrated field device planning and configuration for PROFIBUS and HART, field device configuration with FDT/DTM.



**Modern human system interface**

Scalable operation system, with the data for all process areas being accessed directly using objects and the associated aspects. Uniform operating concept, integration of live videos from the plant, security, and overview thanks to intelligent window management.

**Produce IT Batch: flexible recipe processing**

Optimized additional package for recipe processing, scheduling, and batch production, automatic execution of recipes, recipe management, configurable redundancy, deployment of the NAMUR and ISA S88 standards.



## Melody – the success factors at a glance

### » Success factor: high availability

Melody: The modular process station offers a wide scope of process functions for various industries. The redundancy concept – including controllers, I/O modules, and fieldbuses – ensures high availability of the whole plant.

### » Success factor: increasing efficiency

Composer: this efficient engineering tool supports users throughout the entire life cycle of a plant, providing functions for planning, configuration, commissioning, diagnostics, and for maintenance. The field devices are configured in a highly efficient manner using the FDT/DTM concept.

### » Success factor: built-in safety

Operation system: the modern and scalable operation and visualization system that allows even complex plants to be controlled reliably.

### » Success factor: enhanced quality

Produce IT Batch: the tool that allows you to create and manage recipes in a simple and verifiable manner. Thanks to the fact that the tool is consistently user-friendly at all levels – from the recipe to the tag – you can enjoy enhanced quality and optimized use of your plant.

## Do you still have questions?

If you desire further information, please do not hesitate to contact us. We will be happy to answer any questions you may have about the Melody Industrial IT system. Just use the address below to get in touch with us.



### Automation Technologies

Mannheim, Germany  
Tel.: +49 (0) 1805 266776  
Fax: +49 (0) 1805 776329  
[www.abb.de/controlsystems](http://www.abb.de/controlsystems)  
E-mail: [Marketing.Control-Products@de.abb.com](mailto:Marketing.Control-Products@de.abb.com)

### Automation Technologies

Västerås, Sweden  
Phone: +46 (0) 21 34 20 00  
Fax: +46 (0) 21 13 78 45  
[www.abb.com/controlsystems](http://www.abb.com/controlsystems)  
e-mail: [processautomation@se.abb.com](mailto:processautomation@se.abb.com)

### Automation Technologies

Wickliffe, Ohio, USA  
Phone: +1 440 585 8500  
Fax: +1 440 585 8756  
[www.abb.com/controlsystems](http://www.abb.com/controlsystems)  
email: [industrialitsolutions@us.abb.com](mailto:industrialitsolutions@us.abb.com)