



World's biggest insulin plant relies on ABB technology

Within 24 months of breaking ground, Novo Nordisk wanted a fully functional manufacturing plant for producing high quality insulin. ABB's SattLine batch automation and clean-in-place automation technology helped guarantee their success.

Client: Novo Nordisk Engineering (NNE)

Location: Kalundborg, Denmark

Scope of Work: Automation system

"The construction time for this plant was only 24 months and the plant was so huge and complex that we didn't want to take any chances at all. It just had to be finished on time -- and it was!"

Kasper Malthe Larsen
Project Manager
Novo Nordisk Engineering (NNE)



When NNE built the world's largest Insulin Bulk Plant for Novo Nordisk, they didn't have time for problems. So they chose proven technologies and services: ABB's SattLine automation system, training and engineering services, and clean-in-place expertise. One of the most advanced batch and recipe control concepts on the market, SattLine offers automatic validation, Windows-based operator systems, and graphical object-oriented configuration. SattLine is flexible, stable, and regulatory compliant.

The world consumption of insulin is growing rapidly. As the largest insulin supplier in the world, Novo Nordisk has a big responsibility in ensuring the supply of high quality insulin to diabetes patients all over the world. To meet the increasing demand Novo Nordisk decided early in 2000 to build the bulk plant located in Denmark. The construction of that plant--the largest insulin factory in the world--stands as a major success for Novo Nordisk Engineering (NNE) and all of the companies who participated in the project.

ABB was proud to be chosen to deliver the advanced batch automation system, including 75 SattLine controllers, 120 operator stations, configuration of 25,000 I/O, and networking. In addition, ABB automated the entire clean-in-place (CIP) system, and supplied the main LV cabinet, breakers, and more than 50 drives.

Novo Nordisk decided to build the 32,000-square-meter plant in 2000. As if the size of the project wasn't challenging enough, Novo Nordisk changed the scope mid-way to incorporate facilities for a new product. ABB never missed a step because ABB technologies are designed for both flexibility and stability. Karsten H. Rasmussen, ABB project manager says, "Implementing a huge and complex automation system is always a challenge. You have to push the system

beyond anything ever done before. But SattLine was the perfect match for the task. We never had any real issues with the system so we could concentrate our effort on the significant engineering challenges.”

One reason for SattLine’s flexibility is its modular library. The modules describe control solutions at different levels: for physical objects like valves or motors, for the mathematical algorithms that define analog control, or for special functions, like alarm and event management, history logging, journal handling, report configuration, and I/O configuration. Each module also contains graphics for presentation on the operator station and for interaction with other modules.

This modular structure not only makes the system flexible and scalable, it also expedites validation. Only the application-specific configuration elements have to be tested, because all important functions are carried out by the pre-validated standardized software modules. The batch control functions of SattLine are designed according to ISA standards and Good Manufacturing Practices. The system delivers consistent high-quality performance every time.

According to Leif Poulsen, NNE’s department manager for automation, “The factory’s computer system is designed to coordinate and control the complex production process and automatically generate the necessary batch documentation. This eliminates a lot of the routine work and lets operators concentrate on making sure that production is carried out optimally.”

ABB used the same modular and scalable approach in automating the clean-in-place (CIP) system for the plant.

Benefits

- Automated batch control and CIP system
- Scalability and flexibility needed to accommodate changes
- Faster validation
- Solutions backed by decades of experience in all phases of pharmaceutical plant design

This huge CIP system had to provide flexible, efficient and documented cleaning for more than 300 sections of equipment. There was no way it was possible to program 300 tailor-made CIP programs within the available time-frame. But with the NNE’s modular engineering approach and ABB’s automation expertise and resources, a CIP-system was created that solved this complex task and gave the customer a high-level of flexibility and control in the planning and execution of the CIP operations. Novo Nordisk is so pleased with the result that this advanced CIP concept will be reused on future plants.

In addition to programming, testing and qualification services, ABB provided training courses for operators. With our international perspective, ABB fit right into the project which involved more than 800 on-site workers from several countries, including Denmark, Germany, France, and Sweden.

With Novo Nordisk Engineering as a partner, ABB is helping to push the speed limit for constructing a fully validated pharmaceutical plant.



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