

# Collaborating for success

Innovative Dow/ABB relationship provides mutual benefits for manufacturers in all industries

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According to ARC Advisory Group, some five percent of production in the process industries – worth a staggering \$20 billion a year in revenue – is lost to unscheduled downtime. As part of ABB's ongoing collaboration with The Dow Chemical Company, ABB has introduced a number of features and capabilities that share some of Dow's best practices so other manufacturers can operate their own facilities more safely and productively while minimizing downtime.

The Dow Chemical Company Factbox is a leader in science and technology, providing innovative chemical, plastic and agricultural products and services to many essential consumer markets. Consistency and sustainability have always been key elements of the Dow's operating discipline. As a global company, it is important to be able to operate diverse facilities the same way, every time, to achieve high quality, as well as process reliability and repeatability of best practices [1]. In the 1960s, a number of technology development activities throughout Dow converged to ultimately become a standardized, redeployable process control strategy that supported their goals of overall consistency, productivity improvements, global operating discipline and innovation, all while maintaining high safety performance. In fact it can be said that Dow was striving for true "operational excellence" many years before the term was coined by industry analysts. "Operational excellence includes safety performance, which was and is a key focus for Dow. We're passionate about it. Protecting people, the community and the environment are non-negotiable priorities in our corporate culture. We must operate our plants safely, and in the same way, every time." [1]

At that time, however, a commercially available solution to help Dow realize its operating discipline did not exist. The Dow team then developed several

## Process collaboration

proprietary solutions, including a process control system that came to be known as MOD (Manufacturing Operating Discipline).

**Seeking a new development approach**  
Over the years, the MOD System series delivered tremendous productivity benefits to the company. However, in early 2000, Dow realized it was no longer cost-effective to continue to invest in proprietary hardware and software systems. Instead, the company needed to focus on its core manufacturing business and therefore decided to seek a commercial solution.

The new commercial system had to satisfy essential requirements that addressed their need for sustainability going forward; these criteria included long-term commercial availability, cutting-edge technology, and forward-looking solutions. Dow needed a process control system that would take the company successfully into the future, be deployable on a global scale, leverage commercial standards as they became available, and be on a platform that could be used as a standard at any plant. Additionally, the system needed to be as sustainable as other plant assets which are expected to run for 40-50 years. A commercial system would also be required to meet Dow's increasing need for knowledge management, while remaining true to its process engineering culture [2].

Of a detailed list of 400 requirements, 32 high-level criteria were identified and affectionately coined "The Crown Jewels." A short list of candidates who could help fulfil these requirements was proposed, and ABB was one of them.

"After numerous presentations and discussions, ABB showed us its Industrial<sup>IT</sup> technology – the heart of its Extended Automation System 800xA – and at that point we knew that we had found the commercial solution that would take us forward. The alignment with

ABB's direction and ours meshed nicely. We had found the commercial technology that could accomplish our goals moving forward and meet our "Crown Jewels" criteria. We could use this platform to leverage our experiences and lessons with the MOD System services and take them forward. But while the technology is a necessary ingredient to make conversations happen, much more was needed to take relationships forward." [2]

"Today our relationship is much more than supplier and customer. It is difficult to determine at times who is customer and who is supplier – perhaps the very definition of collaboration." – Dow Chemical Company.

"In subsequent meetings with ABB, we mutually discovered that we had a shared vision of automation – its vision was completely compatible with our ongoing quest to practice our operating discipline. ABB was very open with us on the topic of system strate-

gy and very willing to capture our safety control philosophy and incorporate it into its commercial offering. It also had the dedicated resources for system and technology development that we could not possibly have as manufacturer, as well as centers of excellence for safety, bench strength in systems engineering capability and the willingness to adapt its development program to accommodate our desired capabilities." [3] Together, ABB and Dow laid the foundation for a true collaborative relationship and provided the innovative environment needed to successfully develop the solution.

**Forging a collaborative relationship**  
Beyond the formal development agreement that was signed in 2001, Dow and ABB forged a true collaborative relationship that nurtured ongoing development activities. The relationship consisted of four key elements:

- Shared vision
- Trust in each other
- Open communication
- Willingness to confront each other and use conflict constructively.

"The relationship has become stronger with the passage of time. When we began, each company had their own and separate view of the world of automation. The Dow MOD 5 with its FORTRAN-like language and ABB with its object-oriented programming – it was the collision of two different automation suppliers' philosophies. This collision began the long process of actually integrating the ABB System 800xA product in a standardized way into the Dow Chemical Company – this required a high degree of trust and collaboration. Trust and collaboration evolved as each company learned more of the capabilities of the other and thus began the process of listening and acknowledging the possibilities of the others ideas. Today our relationship is much more than supplier and customer. It is difficult to determine at times who is customer and who is supplier – perhaps the very definition of collaboration." [4]





### The fruit of their labor

The latest version of ABB's Industrial IT Extended Automation System 800xA was launched in November 2006. Version 5.0 of System 800xA is equipped with new engineering functions that let customers make application changes without interrupting production and without incurring downtime – a common and costly occurrence whenever system modifications are made. These new engineering functions include Multi-User and Distributed Engineering as well as tools such as Load-Evaluate-GO. According to ARC, most unscheduled downtime could be readily avoided through improved automation capabilities such as these [5].

Load-Evaluate-GO was developed in collaboration with Dow. It lets customers add programs, modify configurations and implement software upgrades while production is running, and then simulates and evaluates the impact these changes will have on the production process. Once the application changes have been evaluated, the customer can choose to execute, modify or discard them. This capability significantly reduces the risks associated with making application changes in the running process, and improves overall efficiency by avoiding production stops, missed or delayed product deliveries, and costly downtime.

Dow specifically identified this capability as one of the high-level criteria that was essential when they decided

to make the shift from their MOD 5 Basic Process Control system to a commercially available one.

Andre Schepens, Control System Architect, Engineering Solutions, Dow Benelux BV, explains the value case for this capability: "LEG (Load, Evaluate and GO) allows for online modifications to a plant control system and doing a last-minute integrity check against the running version of the control application. Because the system warns about any abrupt change that can have an impact on field devices at the moment of activating the new version of the control application, this will detect any hidden problems that surface only at the split second of the transition of the old version to the new version of the control application. Even the best dynamic process simulation cannot provide the exact data of the dynamics of a transition between old and new versions of a control program. Because the 'Evaluate' feature flags this while the output is in a passive status (not controlling the field device), the user has the ability to either back out or make a last-minute correction to resolve the delta prior to activating. The added value is translated into less risk (equipment damage, production loss...) and faster turn-around and payback of application changes."

Load-Evaluate-GO complements other jointly developed elements of System 800xA, including the innovative System 800xA High Integrity combined

control and safety option. With embedded safety and control within the same flexible architecture, it offers customers the option of combining control and safety functions within the same controller or keeping control and safety functions separate within the same system. This improves process availability while reducing risk to the overall plant operation by providing a common high integrity system environment for production control, safety supervision, and production monitoring.

As the collaborative development relationship between ABB and Dow continues to move forward, process industries stand to benefit from the commercial availability of even more capabilities. Key elements of Dow's operating discipline have been "productized" and are available to other process manufacturers so they can operate their own facilities more safely and productively. This innovative relationship and collaborative business and development effort provides a win-win scenario not only for Dow and ABB, but also customers in all process industries.

This article contains references to the Dow/ABB article series as published in Control magazine. The entire series of articles can be found at [www.controlglobal.com](http://www.controlglobal.com)

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- [5] ARCwire Industry News, November 10, 2006.
- [6] [www.dow.com](http://www.dow.com) (May 2007).

### Factbox The Dow Chemical Company

The Dow Chemical Company is a diversified chemical company founded in 1897 in Midland, Michigan (USA) to manufacture and sell bleach commercially. The company has annual sales of \$49 billion and employs 43,000 people worldwide. It operates under a „Vision of Zero“: zero incidents, injuries, illnesses, accidents and zero environmental harm. Dow offers a broad range of products and services to customers in more than 175 countries, helping them to provide everything from fresh water, food and pharmaceuticals to paints, packaging and personal care products [6].

