

Hexion Deploys FactoryTalk® VantagePoint as Data Platform for Multi-Plant Reporting and Analysis

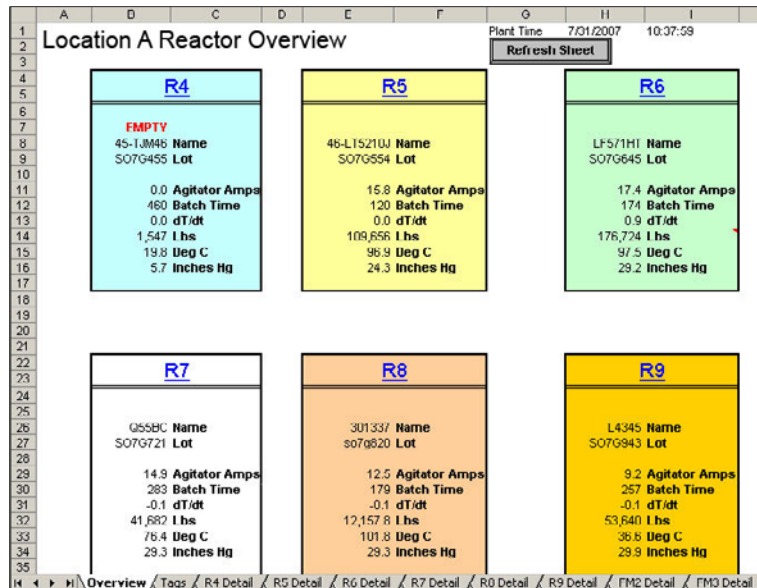
Leading global producer of resins and formaldehyde for building products creates a single access point for data analysis and reporting for divisional plants.

Solutions

FactoryTalk® VantagePoint software serves as the central access point for aggregating data from multiple Hexion production plants in North America, Europe and South America as well as enterprise business applications at the corporate level.

Results

- It allows aggregation of data from all of the company's disparate control and historian systems.
- It allows people to do engineering analysis of that data independently of the underlying control system infrastructure.
- It produces detailed analyses and reports that can be shared in a portal and made accessible to users via web browsers.
- It facilitates the building of a standard set of reports, dashboards and KPIs and usage of them everywhere in the division.
- It provides a growth path to link plant operations to enterprise computing applications so that corporate staffs can make business use of plant data.



Hexion Specialty Chemicals plant overviews now share a common look and feel.

Background

Hexion Specialty Chemicals is the world's largest producer of thermosetting resins and formaldehyde used in bonding, binding and coating applications for a number of industries, including building products. Although the predecessor companies date back to 1899, today's Hexion was formed in 2005 through the merger of Borden Chemical, Resolution Performance Products and Resolution Specialty Materials, and the acquisition of Bakelite AG. As of the end of 2006, Hexion has more than 100 plants and about 7,000 employees. With revenues of more than \$5.2 billion, it is the third-largest North America-based specialty chemicals company.

As the company continues to grow through acquisitions, Hexion has inherited plants that use completely different control systems and historians, including OSIsoft's PI System, the Wonderware IndustrialSQL Server historian, the GE Proficy Historian, Delta V, some legacy Foxboro equipment and even a Honeywell PHD System. Hexion decided to find a single analysis and reporting solution that could integrate all these different systems and that might also allow them to incorporate data collected at smaller plants that were not automated. After considerable research, Hexion selected the FactoryTalk® VantagePoint enterprise manufacturing intelligence (EMI) software developed by Rockwell Automation®.



In 2001 the forest products division management rolled out programs to upgrade plant control systems with historians and analytics software as part of the company's launch of a Six Sigma quality program. Hexion's first process integration project was installed in eastern Canada – and for the first time, the staff overseeing the installation included both the IT staff and the process engineering group. This solved the problem of which applications would take precedence, the IT needs or the production needs. The two had always been viewed as incompatible, primarily for network security reasons, but by having the two teams work together, Hexion was able to eliminate those problems and create a secure set of applications that were available to anyone who needed the information.

Deploying a vendor-neutral solution like FactoryTalk VantagePoint EMI has opened up new possibilities for truly integrating all aspects of operations so that Hexion can eliminate the silos of process information that exist in the division and the company.

Mix of Processing Infrastructure

Hexion Specialty Chemicals forest products operations involve both batch and continuous processes. Hexion produces formaldehyde in a continuous process both for internal use in the manufacture of a wide variety of resins and adhesive systems, as well as for trade sales to other chemical manufacturers. The plants are typically located near major forest products customers and have a similar footprint as a result. For this reason, Hexion deploys much of its IT and engineering resources on a regional basis, allowing support personnel to monitor operations at multiple plants. With no local support, if there were an optimization opportunity or an incident that needed investigation, the regional resources had to travel to the plant site to assist, or the local associates had to enter data in Microsoft® Excel spreadsheets and email them to the regional process engineer. In either case, it was a time-consuming, reiterative manual process, especially since it involved non-standard systems from plant to plant.

The initial success using FactoryTalk VantagePoint provided Hexion with remote access capabilities so regional specialists could remotely access information needed to monitor processes or respond to incidents. On a routine basis, however, there were also many new consumers of the historical information:

- Production managers had new tools so that production orders were on track.
- Research and development labs could now monitor product quality and test new resin formulations remotely.
- Shipping and inventory could be monitored easily, based simply on tank levels.

- Process engineers could monitor overall equipment efficiency (OEE) and could drill down to resolve problems or optimize batch production phases.
- Site engineers could now track energy consumption.

This initial success in Canada also provided a platform for enforcing standards. If the same tools were available at any location, for any users to connect to any data source, then people will use them. In addition, Hexion was able to move away from high-volume, per-seat licensing of software to server licensing. The first project's success encouraged Hexion to roll out the next system at a much larger facility in the central U.S. At this point, their Six Sigma organization decided the success of these first two installations made this solution a necessary ingredient for the success of their initiatives, so they began including these elements in their project proposals. The first such site was on the Gulf Coast and the installation achieved a savings of about \$300,000 in the first year, so it paid for itself very quickly.

From One-Off to Standard Systems

This was the turning point for Hexion. Seeing how easily they could now access data remotely, they decided this would solve an array of problems faced in coordinating production at all of the forest products facilities in North America.

Hexion received approval for a system in the western U.S., which would be used by process engineers to monitor reactor operations; by the research and development lab for monitoring new product formulations and batch recipes; and by the local plant staff overseeing formaldehyde, resin and wax products manufacture. The west coast plant is fairly typical, with six resin reactors, two formaldehyde plants and a wax emulsion process.

Hexion Specialty Chemicals now had its standard system for use anywhere and they began rolling it out to a dozen or more of their larger, integrated plants across North America. Hexion needed to speed up the rollout process, so they began bundling their project proposals to handle them in waves rather than individually. This allowed Hexion to combine financial proposals and shorten the process for implementation approvals. The first wave of sites in this approach included six of the larger integrated North American facilities. Hexion also installed servers in South America and Finland to support newly acquired plants.

The overriding objective for FactoryTalk VantagePoint EMI is to have one corporate-wide implementation that is accessible in a single portal, that can interact with the Hexion global SAP system and that provides a powerful set of standard analytical tools for process use by staff at local plants. Hexion believes they are on the right path because they are already seeing proof of how well this approach works just through applications that have been created using the systems that are implemented so far.

Formaldehyde Network Status

FORP EAST			
Plant	SAP No.	Resource	Status/Rate
		FM1	N/A
		FM2	N/A
		FM3	97.3%
		FM4	98.1%
		FM5	102.6%
		FM6	102.6%
		FM7	OFF
		FMB	63.9%
		FM9	64.6%

FORP SOUTH			
Plant	SAP No.	Resource	Status/Rate
		FM10	99.4%
		FM11	OFF
		FM12	99.3%
		FM13	87.7%
		FM14	N/A
		FM15	N/A
		FM16	91.7%
		FM17	107.7%
		FM18	98.7%
		FM19	93.3%
		FM20	96.0%

FORP WEST			
Plant	SAP No.	Resource	Status/Rate
		FM21	N/A
		FM22	77.7%
		FM23	OFF
		FM24	99.8%
		FM25	OFF
		FM26	98.2%
		FM27	N/A
		FM28	OFF
		FM29	100.6%
		FM30	83.3%

Network status conveys product availability at a glance.

Formaldehyde Network Status Report

One of the most important applications for Hexion, which was easy to create but has significant cross-functional impact, is the Formaldehyde Network Status Report. Formaldehyde is the building block chemical for everything else they do, so it's important to know at any given time which sites are running and at what rate. The plants run at least 350 days of the year and if there is a problem that shuts down any of them, Hexion needs to know where else in the network to locate product for supply to customers. All that was required was to combine three small pieces of information in one graphical report and Hexion now has what everyone needs to know.

First, Hexion chose a piece of equipment that must be running in order for the plant to be operating. For Hexion, this discrete data comes from the main air blower. Second, they use the methanol flow to derive the rate of production. Finally, they use the tank levels to determine inventory status. Putting these three parameters from three different systems into one portal report tells anyone in the company, at a glance, which plants are running, how much they are producing at current rates and what are the inventory levels of formaldehyde. Hexion produces this network status report on a scheduled basis every two hours, but it can also be generated on-demand by anyone who requires it.

What does this provide Hexion users? Their North American supply chain planning manager used to come in first thing in the morning and begin phoning each of the formaldehyde plants to get current status information. Now he can glance at this report and he knows all plant statuses right away and can more quickly respond to changing supply chain requirements.

Hexion benefits from more than just reports. Having remote access to production line information means their regional process engineers can remotely monitor improvement project progress and participate in incident investigations far more easily. Having the ability to overlay trends also helps Hexion drill down into process details to solve production problems. They have created energy analysis applications as well that help them make the most efficient use of equipment while minimizing energy costs.

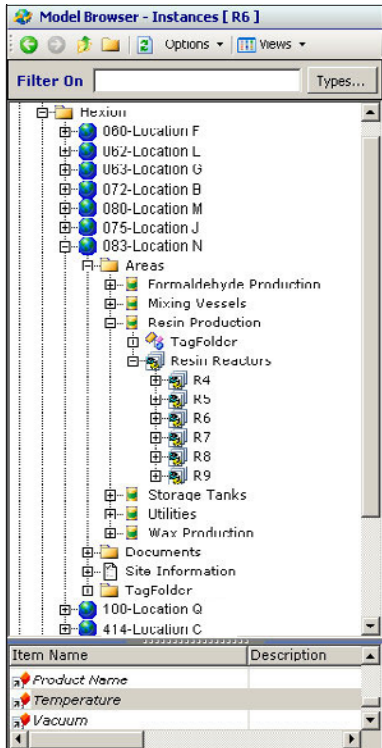
Hexion is also doing more with trend analysis and environmental report compilation. At several sites, Hexion has reports to file with the Department of Environmental Quality (DEQ), and they use FactoryTalk VantagePoint EMI to create those reports in Excel. This tool allows Hexion to report more easily and to verify their compliance.

The X-Y plotting is an exciting tool as well. Using it gives Hexion the ability to look at multiple parameters over time and see relationships among them that wouldn't be discernible otherwise so they can fine tune processes or respond to production problems.

For example, it gives Hexion the ability to look at temperature *versus* pressure, over time, rather than just looking at temperature *and* pressure. Hexion now can see where the temperature-pressure equilibrium curve for a product should lie. They can draw the shape and when they have excursions outside of that curve, they know something has changed in the vacuum pump performance and they can quickly respond to correct any leakage.

UPM is Critical

These are all good results that help Hexion with day-to-day tasks but the biggest benefit of FactoryTalk VantagePoint is its Unified Production Model (UPM). This is a quantum leap from where Hexion Specialty Chemicals



The UPM uses generic terms for key tags in a structured format.

the tag name conventions for the different production areas that can be used at all plant sites, since they all have similar production operations, even if some equipment and processes are different. For example, with the reaction heat exchangers, there are two data points of interest – steam pressure and the bottom temperature out to the absorber – that may have different variables in each plant. If Hexion wants to check the bottom temperature for this device, they no longer have to figure out what the tag name is but can just double-click on that parameter and put it on the screen. This is very important because it lets Hexion serve just about anyone with the precise information they need – from production staff to regional process engineers to corporate supply chain staff, but it all is based on the same data sources. Hexion added an

was in terms of being able to get tags from 15 to 20 sites across the network, especially when no two sites have the same conventions for tag names. It is another of those things that, in theory, you do the same everywhere, but it is never completely consistent. By putting data in the model and abstracting it from the underlying equipment and tag names, Hexion can bring everything together in such a way that anyone can find the information they need to do their jobs better.

Hexion piloted their model at the west coast facility, creating

EMI server at their Columbus (Ohio) headquarters just to support the corporate staff. Once they have servers at every plant, they can put both real-time and historical information right at the operators' fingertips. They can track product from one batch to the next and make sure they are all done the same, which is an improvement that will make everyone's job easier.

Long-Term Vision

There have always been issues between IT and process professionals in manufacturing companies. That is just a fact of manufacturing life. There are usually two silos because of the important security and deterministic concerns from both the business and process perspectives. Historically Hexion has isolated the two so that process PCs could not have access to the business LANs and the other way around. That was a secure approach that made sure no interruption in either area, but there were drawbacks. The biggest negative was that there was no access to process information from outside the plant control rooms.

Hexion has had a good partnership of IT and process people working on the FactoryTalk VantagePoint solution and it has paid dividends. The systems created are a great marriage of IT and process, in a secure fashion that meets the needs of both sides, and as a result, of the business as a whole. The long-term vision for Hexion is to roll everything up to the top so all its people can see whatever they need at any time, with views into the process level as well as the corporate level. They will have the same capabilities over the network, in the control room and in their enterprise systems.

The key is FactoryTalk VantagePoint EMI because it can connect to any data source, including Rockwell Automation systems, IndustrialSQL Server, the PI System, DeltaV, Foxboro UNIX, Honeywell PHD and anything else Hexion may see as they continue to grow. Ultimately, Hexion will implement interfaces to their global SAP system so that people can see and act on anything, from anywhere in the world, over the Hexion secure corporate intranet.

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