



## DOW Chemical Case Study

One of the leaders implementing Manufacturing Intelligence is the Dow Chemical Company. They presented two papers recently on their implementation of Manufacturing Intelligence:

- In January, 2013 one paper was presented at IFPAC (International Foundation Process Analytical Chemistry) in Baltimore.
- Dow was also a Manufacturing Intelligence guest presenter at the ARC World Industry Forum in February, 2013 in Orlando.

In October 2012, Dow Chemical implemented NWA Focus EMI software into their Hydrocarbons Division, which accounts for over 25% of the company's revenue. Dow collects a wide variety of data using many automation tools and feeding a number of separate databases.

### Objective

The goal of the NWA Focus EMI<sup>®</sup> solution was to view all of the data in a context that helped to optimize plant efficiency, issue identification, and problem resolution. Their then current systems did not provide a unified picture of all of the important information in a clear context, and to all of the key stake holders.

### Challenge

Although data is constantly being collected through automated on-line systems, they had situations when problems occurred and some of the important variables had not been captured or looked at for a period of time. This caused large delays, as the team assembled to resolve the issues found they did not have access to all the information they needed. As Lloyd Colegrove, Statistical and Modeling Services Director, commented, *"I see no point in collecting the data if you are not going to look at it."*

### Solution

NWA Focus EMI triggers alarms in real time for operators, plant management, and corporate chemists when issues begin to appear. Operators can no longer rely on or shift expertise, tribal knowledge, or obsolete company practices that may no longer be endorsed. Many companies that run multiple shifts find they have different procedures being followed on each shift, and Dow was no different.

Alarms can be triggered off Rule, SPC, and/or Specification violations, but Dow does not turn on alarming for all of these, and does not treat each variable the same. Certain alarms are only set up to trigger off a Specification, while others may use SPC and/or Rule violations. When alarms trigger, the system will email and/or SMS the notification to specific individuals. Each person can chose any level of notification from none to any specific tags they would like. Dow has been fine tuning the notification service so that people are not barraged with constant alarms, but are aware when appropriate.



## Results

Prior to installing NWA Focus EMI, Dow gathered a group of experts to meet and discuss the most important tags to track. Although they measure thousands of variables, they chose to limit the dashboard to the most important 50 that could have the largest impact on plant efficiency. The experts had tough discussions, but arrived at a unified informed conclusion, that let everyone know what they should be focusing on. In the words of one of the chemists on the team, *“Just narrowing this to the top 50, has had a big impact on the operation, as the most important tags are not getting lost in the noise of all the data.”*

They also created two dashboards that measure the same variables, but with different context. One dashboard shows hourly data for the last seven days, while the second dashboard shows daily averages for the past many months. By doing this they are able to use two different contexts for decision making, and the second dashboard is showing their overall process improvement over time.

Dow has grouped the tags into specific categories so that the main dashboard only shows ten variables. These ten may be grouped by operating unit, location, or by a specific metric such as “pressure drops.” When an alarm triggers, the user can drill down to the specific variable with a single click of the mouse, and drill further to see charts and other details. They have also developed a decision protocol that references the standard course of action for each situation.

When operators respond to the alarm notifications, the data are automatically stored in an Assignable Cause/Corrective Action (AC/CA or CAPA) database. As this database grows, the knowledge for resolving issues grows – not just within a single plant, but across the entire enterprise. Best Practices can be analyzed and promoted, while ineffective ones are identified and eliminated. Although correlations are frequently identified for problems, determining causation is much more difficult. Dow is using NWA Focus EMI software to reduce inefficiencies, problems and waste in the manufacturing process.

The NWA Focus system immediately identified problem areas and started paying dividends. When the system was first being installed, a meeting was called to show managers the new dashboard capability. In the meeting one of the managers pointed to a certain metric that was showing a red alarm, and asked if this was live or just simulated data. The data was live from the factory floor. He commented that this metric is important, but sometimes ignored by operators.

They quickly addressed the problem, and the manager later said, *“That dashboard did just what it was supposed to. First it caught that there were changes in the plant. Then, right away the plant people and research people were able to use the dashboard statistical plots to easily investigate what was happening. This provided the information required for quick resolution. A problem that used to take days to weeks to identify and resolve, was fixed in a couple hours.”*