

## Batch integration: An enterprising story

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on page 42.

Integration is a popular term in the automation world these days, especially when it comes to standards. In fact, the ISA88 batch standard and the ISA95 enterprise integration standard are standing strong on their integration plans.

"We're working on technical reports about combining ISA88 and ISA95, while ISA95 is revising Parts 1 and 2, so there are some new developments," said Bianca Scholten, a partner at Task 24 (formerly Ordina) in Rosmalen, The Netherlands.

ISA95 Part 2 is especially undergoing transformation. The original Part 2 provided data models you could use for exchange of information about production. "Now we'll make these models more abstract so you can use them for other manufacturing activities, such as quality, inventory, and maintenance, not just production," Scholten said. After working on Parts 1, 2, 3, and 5, the committee had new insights. "We needed to adapt some of the models so they are based on the insight," Scholten said. The new information in Part 1 includes minor changes. But Part 2 is the key since it is not only applicable for production but maintenance as well.

### Integration explanation

In planning to integrate, the ISA88 and ISA95 committee's main objectives were to write a document that would help people who are trying to use both standards together. One of the gaps was the fact the terminology for things that were the same were different. "That's not surprising because ISA95 aimed at all types of manufacturing, and ISA88 was originally written strictly for batch process manufacturing," said Lynn Craig, ISA88 veteran member and president of MAA Inc. in Medford, N.J.

ISA88 is now being used more broadly in other types of process manufacturing, continuous, hybrid, and the like. "So it was good to identify where these overlaps would be complicated by differences in terminology," Craig said. "There were few real conflicts between the two standards

once we recognized the different intents of the two—the batch focused intent of ISA88 and the very broad manufacturing outlook of ISA95," he said.

Understanding and resolving the differences in terminology made it much easier to fit the two together. "In fact, ISA95, which addresses manufacturing operations management, has a very natural link to the ISA88 world," Craig said, "which really deals with implementing physical manufacturing operations."

### On the level

In working with Craig and the ISA88 committee, Scholten understands how "it is especially interesting for people working in a company using both ISA88 and ISA95 to understand how to use them together." Developed for batch processes originally, ISA88

also focuses on lower levels of automation such as Level 2, the process control level.

Levels represent levels of activities, and indicate scope (the higher the level, the larger the scope), said Dennis Brandl, president of BR&L Consulting in Cary, N.C. "Level 4 is typically at an enterprise or division level; Level 3 is typically at a site level and typical response/control cycle times. Level 4 is typically concerned with events that range from a shift to months; Level 3 is typically concerned with minutes to days," he said. Level 4 activities are usually handled by the enterprise resource planning (ERP), and Level 3 activities are usually handled by a manufacturing execution system (MES) or other site-level system, such as laboratory information management systems (LIMS) and asset management.

ISA95 is focusing on Level 3 and inte-

### Interoperability closer to reality

Different definitions for similar processes seem to be the thorn in the proverbial side of quite a few standards. That is why industrial interoperability standards are making a splash, especially when it comes to plant operation systems, such as enterprise resource planning, supply chain management, manufacturing operations management, laboratory information management systems, and supervisory control and data acquisition, to name a few.

The Automation Standards Compliance Institute (ASCI) is helping manufacturers build lean IT systems through common definitions of these data and processes. ASCI called on WBF experts, Charlie Gifford and Dennis Brandl, to develop the business-to-manufacturing markup language (B2MML) compliance program. This program falls under an initiative from the Industrial Interoperability Compliance Institute (IICI), an industry consortium designating ISA interoperability to promote compliant products and systems, and ensuring interoperability between enterprise, supply chain, and plant operations systems.

IICI's main mission is to improve production and supply chain productivity by assuring manufacturing IT applications can interoperate through standard XML schemas and services. The B2MML compliance program should help business and manufacturing systems integrate more easily. It will follow the ISA95 data exchange and transaction definitions using WBF's B2MML data exchange schema standard. The initial focus will be on the B2MML schemas for production (schedules, performance, definition) and for process segment, material information, and equipment information. The services will support B2MML exchanges in a non-transactional mode (ISA95 Part 2) and in a transactional mode (ISA95 Part 5).

A technical advisory board of 10 global manufacturing companies completed the business planning for IICI last spring. IICI expects to complete the operational development of the Institute by first quarter 2009, when it will also begin conformance testing and offer interoperability technical support to the manufacturing marketplace.

gration of Level 4: integration of ERP with MES systems. "When an ERP system sends a production schedule to the production department, production will have to use recipes that could have an ISA88 structure," Scholten said. "The production department is using the system on Level 3 (an MES system). The MES system has to be able to receive this production schedule. So somehow you need to make a translation from the order in Level 4, and you need to link this order to the recipe that has the ISA88 structure," she said.

Now, ISA95 is focusing on the exchange of information from Level 4 to Level 3. "In Level 3, you need to translate the information in ISA95 to the more detailed structure of ISA88," she said.

So the ERP and MES system have to speak the same language. "This is what ISA95 does; it provides standard interfaces so standard terminology (such as a preprinted form you need to fill in) tells you what kind of information you need to fill in on the form."

### Integration applications

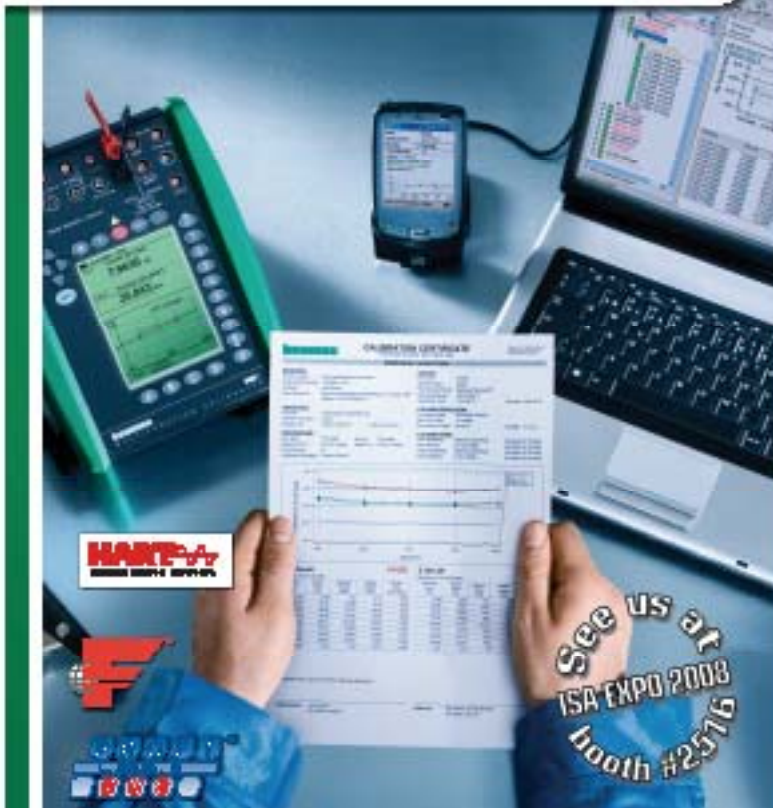
In an industry of software suppliers and end-user manufacturers, suppliers are trying to translate their vendor-specific language to ISA95 data models. The larger end-user companies especially are using the ISA95 and ISA88 languages. "They are interested in purchasing one system they can use for all their factories," Scholten said. "So they are trying to make an MES template, and they are comparing the user requirements in different countries in order to purchase and use the same system in all the factories."

Pharmaceutical companies, as well as food and beverage industries, have a common structure and common terminology, so this makes communication between people easier. "If you use the word 'unit' or 'unit procedure,' people understand what you mean, so it takes less time to explain," Scholten said. "For exchange of information between automation systems, it's easier because if you have to make an interface between sys-

tems, you need to map information from one system to another. If the information has the same structure, if it's already in the same language, it's less time-consuming. And ultimately that means less cost for development of interfaces between systems, and less cost for maintenance.

Pharmaceutical companies have years of experience using ISA88, so their employees speak in ISA88 language, sometimes without even knowing it, "so it becomes the internal language of the company," Scholten said. "The nice thing about the new batch control system is it uses the same terminology so there's less effort to train operators," she said. Often, when they get a new batch system, the common batch control systems you can purchase in the market are based on the ISA88 standard. "The same will be true in the future for MES systems. Many MES providers are already changing their data models and application to the ISA95 language."

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Since the ISA88 standard is expanded, it is not only applicable for batch but also for discrete processes such as packaging. The same is true for ISA95; “we’re not going to use it only for production but for warehouse management systems, LIMS, and for maintenance systems,” Scholten said.

The integrated ISA88 and ISA95 technical report has been submitted to ISA for Board review and publication. However, people are using the two together already, Craig said. “I don’t know why this

wouldn’t fit anywhere in process manufacturing with some interpretation. The only problem we couldn’t do anything about is the fact ISA88 was unabashedly focused on batch process manufacturing. We have yet to come to grips with writing a document that clearly explains in every detail the application of ISA88 to continuous process manufacturing even though many people are using it in that application.”

Part 1 of ISA88, Models and Terminology, is now being revised. It defines most

of the basic concepts. “There’s no overt intent to make anything other than a batch standard, but it’s being done with a recognition that it’s frequently used in other types of manufacturing,” Craig said. Other more recent parts of the ISA88 standard include Part 3, a focus on general recipes, Part 4, focused on batch records and closely associated with ISA95, and Part 5, which is implementation oriented.

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**Alarm management draft close to ballot**

Industry experts in alarm management submitted a record 760 review comments to the ISA18 standards committee on instrument signals and alarms, adding to the total of more than 2,500 comments from end users, vendors, and other industry professionals in the last year. The committee plans one final review cycle before submitting the draft ISA-18.00.02 for committee ballot by the end of 2008.

Why the huge interest? When the standard is complete, it will address alarms for all systems presented to the operator,

including annunciator panels, safety instrumented systems, fire and gas systems, and emergency response systems said committee co-chair Nick Sands of DuPont. “The principles and processes covered are intended for use in the lifecycle management of alarm systems based on programmable electronic controller and computer-based human machine interface technology,” he said.

The committee is meeting again at ISA EXPO 2008 in Houston, 13 October (www.isa.org/expo).

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