



Packaging

An in-depth look at the ongoing trend of bio-based packaging

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Bioplastics

Which country is shaping up to be Asia's bioplastics hub?

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Converting PLA waste into virgin material

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UNDER CONSTRUCTION

Lanxess Expands Capacities for Baypren Specialty chemicals company Lanxess is investing €17 million in the expansion of its production capacities for polychloroprene solid rubber. The expansion at the Dormagen site is scheduled for completion by the end of 2012 and will increase production by 10 percent to 63,000 metric tons per year. Lanxess produces and markets polychloroprene solid rubber under the brand name Baypren. Uses for this product range include the production of cable sheathing, hoses, belts, seals and air springs. The expansion work will also see the implementation of a new production technology that the company says will enable it to operate more energy and resource efficiently and thus more ecologically.

Linde Builds Large Hydrogen and Synthesis Gas Plant in China The Linde Group has announced it will build and operate a large hydrogen and synthesis gas plant in the Chongqing Chemical Park in Western China in a joint enterprise with Chongqing Chemical & Pharmaceutical Holding Company (CCPHC). The project has a total investment value of around €200 million. Linde holds 60% of the shares in the joint enterprise with CCPHC. In future, the new on-site plant will provide the production facilities of BASF and CCPHC based in Chongqing with carbon monoxide, hydrogen and synthesis gas. The new plant, which will be supplied by Linde's Engineering Division, is expected to come on stream in the third quarter of 2014.

SABIC in Chemicals JV with Japan's Asahi, Mitsubishi SABIC will launch a joint venture firm with Japan's Asahi Kasei Chemicals and Mitsubishi. The new company, Saudi Japanese Acrylonitrile (Shrouq), will build a plant to produce acrylonitrile and sodium cyanide at one of the SABIC affiliates' sites in Jubail. The site was not identified. The facility will have capacity of 200,000 tons annually of the former and 40,000 metric tons annually of the latter, SABIC said. It has announced plans to build an acrylonitrile butadiene styrene (ABS) plant at its fully-owned affiliate Petrokemya. The three companies will start conducting basic engineering design and will take a final investment decision in 2012.

CJ CheilJedang and Arkema to Build Bio-Methionine Plant CJ CheilJedang (CJ Group) and Arkema have signed a memorandum of understanding to build a bio-methionine and thiochemicals platform in South East Asia (Malaysia or Thailand). This project entails the construction of the world's first world-scale methyl mercaptan integrated bio-methionine plant, which will enable CJ to respond to strong demand for methionine, a sulfur amino acid widely used for animal feed in Asia, and Arkema to better serve its Asian customers from a new industrial platform. The project represents overall investments of \$400 million split equally between both partners. The 80,000 ton bio-methionine production plant, which would be unique in the world, and the thiochemicals platform would come on stream at the end of 2013.

Evonik to Build Organic Specialty Surfactants Plant in China Evonik said it is building an integrated production plant for organic specialty surfactants at its site in Shanghai, China. With an investment volume in the upper double-digit million range, the production network is scheduled to begin operation in mid 2013. The various specialty surfactants based on renewable raw materials will be used primarily for cosmetics and laundry care products, as well as for industrial applications. The new integrated production plant will produce ingredients for cosmetics and laundry care products, as well as specialty surfactants for industrial applications. The Chinese cosmetics industry accounts for the lion's share of production.

LDK Solar Makes \$40 Million Entry into LED Business Solar wafer producer LDK Solar will invest about \$40 million to enter into the business of sapphire substrates used to make LEDs, which are likely to see higher demand as power generation costs and greenhouse gas emission concerns rise. Solar companies, including LDK and GT Solar, are diversifying into other businesses to offset potential setbacks in their traditional business because of subsidy cuts in major markets of Europe. LDK plans to build a new plant, with the capacity to supply two million two-inch equivalent pieces of sapphire wafers every year, in the Nanchang city of Jiangxi province in China. Last month, a joint venture led by Samsung Electronics tied up with Sumitomo Chemical for a \$72 million venture to produce the substrates.

Israel Chem to Invest €160 Million in Spanish Unit Fertilizer and specialty chemicals maker Israel Chemicals (ICL) said it would invest €160 million in the first phase of an efficiency plan for its Spanish unit, Iberpotash. The plan calls for an expansion of Iberpotash's mine and processing facility at Cabanas and Suria, near Barcelona, and the phasing out of operations at another Iberpotash mine and processing facility, ICL said. The goal of the efficiency plan is to lower the cost of Iberpotash's mining operations, increase its production of potash and salt products and improve its environmental footprint, ICL said. The first stage is planned to be completed in early 2014.

Automation on a Small Scale

Increasing Efficiency in Continuous and Batch Manufacturing

New Solutions – As a manufacturer of particle board resins, Dynea Benelux participates in a competitive commodity market and thus establishing a cost-leadership position is crucial. In 2004, although its cost structure was competitive, the business was experiencing more demanding requirements on customer service and flexibility, product quality and business planning and controlling and reporting. In order to meet these requirements, management elected to implement state-of-the-art automation solutions.

Goals And Objectives

At the start of the effort, production processes were semi-automated, with the operator controlling the batch from the DCS but still required to complete some activities manually. Administrative systems were stand-alone. The objective of the program was to simplify and increase the level of automation of all business processes, including manufacturing, administration and business planning, control and reporting. By doing so, safety and product quality consistency would be improved, raw material consumption reduced and data capturing, handling and reporting would be faster and more accurate.

It was determined initially to select open, standard software packages from leading suppliers that were designed to meet the specific demands of a small and not too complex process industry site employing both batch and continuous processes. Systems would be configured with a strong focus on process and cost efficiency according to the ISA S88 industry standard. Furthermore, standard tools and set-ups from other Dynea sites and suppliers would be adopted where possible and interfaces between systems would be included in order to eliminate double input and work.

Project Initiation

The project was initiated from the bottom to the top, keeping later phases and the totality of the systems in mind from the start. Increasing process efficiency and automation was followed by increasing the level of automation and integration of manufacturing support systems and ultimately business systems.

To get the most value out of the project, the processes themselves were evaluated to identify opportunities for improvement of efficiency and productivity to make the operations leaner as well as automated.

The Emerson DeltaV system was chosen because it offers an integrated solution that follows the ISA-88 Batch standard. It is a DCS with multi-unit recipe control and integrated batch automation. In addition, all of its components are designed to use a single configuration database, and the DeltaV Batch History module is included. Furthermore, using the standard modules and tools available from the Emerson Project Builder Library, design and implementation time were significantly reduced.

Implementation

At the time of project implementation, the existing system was not designed for recipe handling and batch automation, was not easy to config-



Challenges

Throughout implementation of the automation system, the biggest challenge was getting the operators to adjust to the changes. Most feared losing their jobs once efficiency was improved. Dynea, however, retrained the operators for expanded responsibilities so that they now do multiple tasks in addition to performing their operator duties. Commitment by management helped overcome this problem.

The openness of the DeltaV software, while a great benefit, also presented a challenge as well. People experienced in programming the DCS system are required to maximize its use. Therefore it was necessary to find production people looking for the opportunity to learn this skill and expand further their responsibilities. Fortunately, some people volunteered and have been trained.

Conclusions

The results at Dynea Benelux demonstrate that it is not necessary to be big to benefit from being lean and automated. When making such significant operational changes, however, it is very important to proceed at the right speed and consider employee concerns. People still have to operate the automated systems and must accept the changes, or the investment will not bring the proper return.

Finally, the introduction of automated systems has been successful and we are thus considering other opportunities including more automated production scheduling, integration of the DeltaV and Oracle ERP systems for plant maintenance operations and more integration on the Dynea Europe level for activities such as supply chain planning.

ure and it was getting difficult to obtain good support and spare parts. Paper documentation for batch and production data, material consumption, formulations, quality control, production scheduling and other activities was required, and only basic process controls were automated using a PLC-based system.

The first step, therefore, was to increase automation of processes

which historically came from different companies (Neste Chemicals, Dyno), utilized different systems. With adoption of the company-wide ERP system, data from the DeltaV DCS at Dynea Benelux (raw material consumption, production figures, analytical data and shipment numbers) are exported to the ERP system, and the Benelux business has rapid access to necessary ad-



Dynea Benelux's automating of its operations has led to improved product quality and reliability.

including better automated equipment (e.g. valves) and monitoring systems (flow, weight, etc.). Most importantly, controls were installed for automated batch sequence.

The DeltaV software also includes the ability to control specific actions at various levels, build recipes and manage campaigns, and provides one operator interface, making it easy to monitor the system. Batch-based analysis tools have helped dramatically with early identification and resolution of operational problems. Web-based access enables easy interaction with the program and provides flexibility in scheduling batches. Dynea's intranet is protected with a firewall and a gateway to the Internet.

Integration at the top level did not take place until Dynea adopted a corporate-wide ERP system in 2008. Until this time, different sites,

administrative and other corporate level information.

Results

Automating operations has led to improved product quality and reliability. Operations are more efficient due to improved production planning. Business activities (logistics, financial) are also more efficient due to ready access to production, sales, shipping and order information. Reduced resource consumption (raw materials, paper, energy) and waste generation help with cost reduction and environmental compliance. The DeltaV system also provides good plant benchmarking possibilities. The performance of each plant and how individual plants are performing in relation to each other can be evaluated, resulting in improved operational insight.

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