CHEMICAL INDUSTRY TRENDS

Emerson discusses trends, outlook and innovations across the chemical sector.
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Q Tell me about the current state of the chemical sector in terms of trends, economic outlook, and innovations?

Don Fregelette (DF): In 2020 Covid had a mixed impact on the Chemical Industry. Segments dependent on O&G, Automobile sales and housing saw a decline, while other segments driven by consumer goods, personal protection devices and cleaners saw healthy growth.

A rebound is occurring in 2021 and the general expectation for growth has been reported by many analysts to be at a global average around 3.5 percent. Regionally there are variations as China and India have expectations above five percent and Europe and the Middle East have more modest expectations.

Those areas that saw growth during Covid such as chemicals used in cleaning supplies, personal protection devices and consumer goods are expected to continue to grow, but at a lower degree, while many other areas are expecting a much larger increase driven by the rebound across the global economy and hence demand.

With the increased demand, the industry in general is seeing lower inventories than normal. This is reflected in increased commodity pricing for many products on the market today.

Three major trends are driving spend in the industry today. Safety, which continues to be critical to this industry.

Sustainability initiatives driven by both environmental regulations around emissions and decarbonisation,

and the desire to be better stewards of the environment with initiatives around energy efficiency, shift to green feedstocks, and focus on the circular economy.

A good example of this is recycled plastics. Today the number of pilot plants and projects focused on the conversion of recycled plastics back to either their base polymers or monomers are quickly increasing.

The third is digitalisation, an area that many in the chemical industry are just beginning to explore. Here the industry is focused in a few key areas including more effective ways of improving data flow and analysis to speed up innovation from pilot to production, improving the management of their plants, using more data and predictive analysis to

enable real time response to adjust to market changes faster, streamline their operations, maximise asset performance and minimise rework and streamlining the interactions with customers and suppliers.

Q What pain points are your customers facing and how are you helping them address those pain points?

Pete Sharpe (PS): The pandemic has been good to some industries and bad to others. Housing, construction, auto and durable goods took a hit, which dropped demand for some polymers and PVC's.

But the packaging industry took off as people moved to take-out and in-home dining, as did demand for cleaning, disinfecting and sanitation products.

As a result, global demand for organic and inorganic chemicals dropped 10-12% (ref. IHSMarkit) in 2020, but demand for certain segments of the industry skyrocketed. In every case, whether your plant was sold out or cut back, you had to do everything with less people on-site.

One of the best ways to improve personnel productivity is automation. This could mean installing wireless sensors for local measurements that used to require a person with a clipboard or a handheld device.

Or it could be using an augmented reality headset, camera and wifi infrastructure that allow a subject matter expert to help an operator inspect a plant situation without leaving home.

Equipment still fails, so sensors and analytics that can help identify impending problems can give maintenance staff advance warning to plan for outages rather than running to failure and scrambling to get back online.

For sold out plants, there are a number of advanced control technologies that can increase production and lower your energy footprints. These are the kinds of Emerson technologies that our chemical customers are finding valuable in this post pandemic environment.

Q What advancements or innovations are we seeing around plant optimisation, predictive

maintenance, etc, and what advice would you give in terms of best practice?

PS: The major innovations regarding predictive maintenance would be in the area of wireless sensors and data analytics.

Things are getting smaller and more functional. Emerson's new vibration sensor provides 3-dimensional vibration readings and a temperature in one small wireless device that you can glue on to a motor, pump or gearbox.

Our next-generation AMS Asset Monitor performs analytics in an edge device that can automatically detect 10 common failure points including balance, alignment, looseness, gear mesh, bearing, lubrication and motor issues.

We see more chemical customers moving data to cloud-based systems which can accommodate data from a large number of different sources and perform analytics on a broader scale across multiple assets, plants and continents.

Optimisation applications are moving from local unit optimisation to broader plantwide optimisers that consider the

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interactions between units and plants. In terms of best practice, start small and grow.

Pick a use case that will have some financial impact. Get the right parts of the organisation involved and establish a solid project team with IT, OT and end-users represented.

Q Do you expect to see an increase in investments around digitalisation across the chemicals sector due to Covid-19?
PS: Yes, we expect to see continued increase in investment and attention to digitalisation, which is really a continuation of an upward trend that started a few years ago – COVID just accelerated it.

Many multinational chemical companies are starting to callout digitalization programs as a key strategy in their annual reports.

There is no doubt spending in this area is increasing and the requirement during the peak of the pandemic to operate plants with half your people at home makes digital technologies even more compelling.

Companies are finding that it is possible to achieve efficient production with less people in the plant if you provide the infrastructure, tools and technology that can support remote operations.

Prashasta Kumar (PK): Covid has caused major hazard installation regulations, social density measures

at plants and 'lone' worker safety scenarios at plants that have resulted in increased emphasis on Emerson's Plantweb Insight Location Awareness solutions.

These have been further accelerated by government co-funding and boost to the Smart Plant and Industrial Safety worker related Digitalisation programs, like the Singapore government sponsored Open Innovation Platform.

Q What are your customers saying regarding Covid's impact, investment priorities, etc?
DF: Covid-19 has increased the sensitivity and focus on digitalisation in the market in a number of ways. Two of these we believe will clearly result in more focus on digitalisation and pervasive sensing. Speed of response to market changes and a refreshed view of remote work in the plant.

Both of these require a different view on the amount of data and how that data is collected, viewed and assessed in a more streamlined manner.

There are many examples, however, one that is clear is around being able to manage a plant with fewer resources. During the height of Covid, the impact on the number of people allowed on site was significant.

Many activities that you see in the plant such as operator rounds to collect data became more difficult.

However, adoption of today's wireless technologies bring the ability to put more measurements in the plant at a lower cost per point and at the same time significantly reduce the number of people and time spent collecting data while at the same time improving the overall safety of the plant.

PK: Covid has also put additional pressure on plants to increase their throughput to meet the increased market demand for products dependent on the chemicals industry.

Here, Emerson customers are increasingly utilising advanced analytics and machine learning to better manage the performance of assets and predict failures in advance to avoid unplanned shutdowns.

There is also an increased emphasis on Sustainability and Energy Efficiency initiatives in the post Covid world, chemical plants are saddled with high energy consumption and need for optimisation.

Investments are increasingly being made on capabilities to pinpoint the root cause of the energy overconsumption across all energy consumers and generators. Further developments in architecting reliable EMIS systems that are able to model and optimize process behavior, operating modes, assets availability trends. Ⓔ