

# Solutions for the Chemical Operations Executive

The rapid expansion of the chemical industry in recent years has created new challenges for chemical plants. In order to adapt to the demand of the growing chemical market, industry executives must utilize new technologies, resources, and solutions to remain competitive. In response to this growth, Yokogawa has identified four key trends transforming the chemical industry and offers solutions for companies to achieve success in this evolving market.



Massive Growth in the Market



Rising Project Costs



Aging Workforce



Increased Risk of Cyber Attacks



# Rising Trends Transforming the Chemical Industry

The world's leading chemical companies partner with Yokogawa as a full scope automation partner to achieve operational excellence, reliability, and safe operations. Yokogawa is committed to delivering solutions across the entire plant lifecycle that meet the evolving needs of the market.

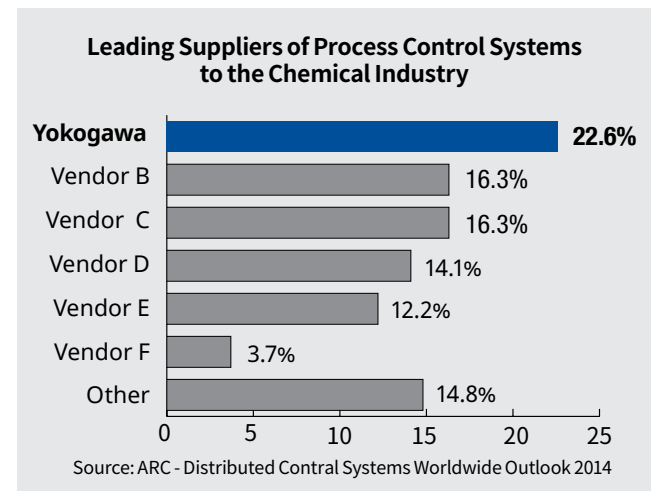
As a part of our dedication to helping executives maneuver the ever-changing chemicals market, Yokogawa has identified the following four trends as the most critical factors transforming the industry.

## Low Shale Gas Prices are Driving Massive Growth

**Industry Challenge:** Driven by China's key role in the consumption of chemicals, consumer spending, and continued urbanization, capital in the chemicals market has more than doubled. As a result, the need for chemicals will continue to grow and evolve.

**Solutions:** Yokogawa is the leading pure-play automation and controls solution provider to the chemical industry, offering Main Automation Contractor (MAC) project delivery services and other solutions to help chemical plants increase throughput and meet market demands.

Chemical plants rely on Yokogawa for providing stable control systems with a 99.99999% real-world availability service record that prevents unexpected shutdowns, while accommodating online formula and procedural adjustments.

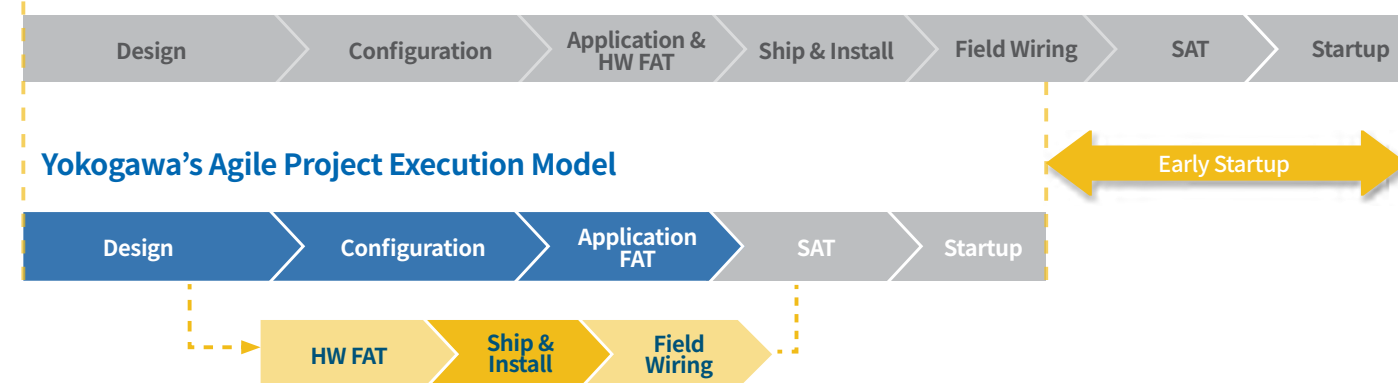


Yokogawa's extensive product portfolio and experienced control systems engineers combined with an extensive global sales and service network gives chemical executives peace of mind while keeping up with growth.

## Chemical Project Costs are Rising

**Industry Challenge:** Chemical projects have traditionally been cost-effective, but with the increase in the number of projects overall, the demand for qualified talent is also increasing. Independent Project Analysis (IPA) found that in the last 10 years, engineering error rates have increased by 50% and the average engineering slip is over 30%. A diminishing qualified workforce results in increased pressure on project schedules with an average of two out of three projects missing execution targets.

### Typical Project Execution Model



**Solutions:** Yokogawa is proud to be a trusted partner and low risk MAC with a proven track record of delivering projects on time without shutdowns to existing operations. Yokogawa developed the Agile Project Execution (APEX) methodology to allow commissioning and startup of systems within a few days of construction completion, providing significant savings. Involving Yokogawa as a team member in the Front End Engineering Design (FEED) stage yields additional and important benefits to project quality in subsequent phases, while also providing specialized automation expertise throughout the plant lifecycle.

*15 of the 15 largest chemical companies rely on Yokogawa for control and automation solutions*

Yokogawa's Total Cost of Ownership (TCO) is the lowest in the industry, driving value with tailored Lifecycle Support Services specific to your needs.

## Risk of Cyber Attacks is Increasing

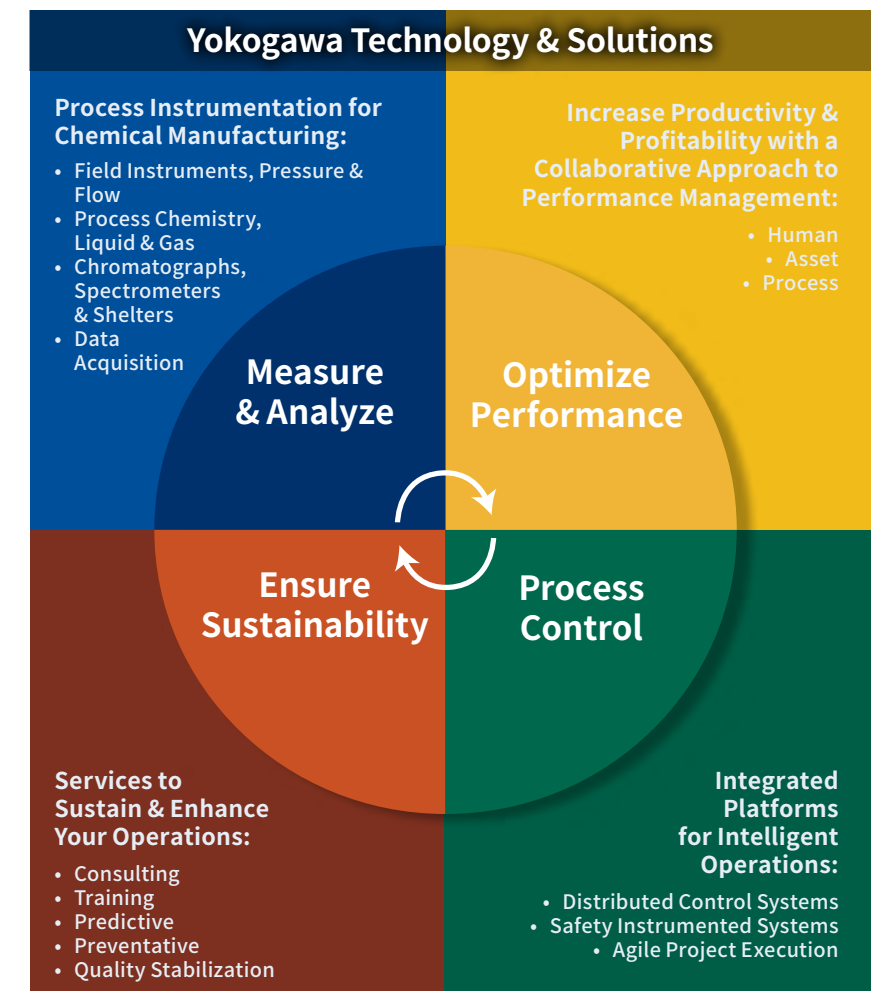
**Industry Challenge:** Industrial producers around the world face cyber threats in this increasingly connected world, which pose a pervasive threat to safety and system availability. Without a perpetually strong cyber security solution, plants and corporate networks are targets for hackers.

**Solutions:** Yokogawa, in partnership with Cisco, provides industry leading SecurePlant™ cyber security services to the chemical industry. These cyber security services help customers implement proper security solutions for their plants to ensure safe operations and reduce risks. This end-to-end cyber security approach provides effective measures that also deliver increased business agility and risk awareness, decreased operational costs, and reduced downtime.

## An Aging Workforce is Affecting Operations

**Industry Challenge:** The effects of an aging workforce are beginning to show in plant operations. One major chemical company analyzed their demographics and found that they would soon lose 75% of their operating staff due to retirement.

**Solutions:** Yokogawa offers Modular Procedural Automation (MPA), Operator Training Simulators (OTS), and other operational support solutions. As experienced operators begin to retire, some procedures with manual intervention are at risk of being lost. Implementing modular automation and providing training solutions to reshape a new workforce is critical to mitigating risks. Yokogawa solutions reproduce actual plant behaviors that provide realistic operations training. Virtual plant training gives customers the knowledge of how to best respond to various emergency situations, which contributes to reductions in time and cost, while improving control strategy, productivity, and efficiency.



*Yokogawa control solutions are deployed at **over 7300** chemical facilities around the world*

“Yokogawa’s CENTUM Batch is used to automate a wide range of Reichhold’s batch processes and multiproduct/multipath processes, thereby demonstrating ease of use, outstanding reliability, and sophisticated functionality. Using the CENTUM Batch package, Reichhold has reduced lifecycle engineering costs, shortened time to market, improved plant performance, and kept unexpected control failures to a minimum. Reichhold has now standardized all of its process control systems in the U.S. with Yokogawa’s CENTUM system because of its high reliability. Yokogawa hardware is very reliable. The availability of more than 99.99% is really amazing.”

“Lucite International formerly relied on a Honeywell PlantScape Batch control system that ran on Windows NT4 servers. Due to the difficulties of maintaining this legacy system, Lucite opted for its replacement and decided on a Yokogawa CENTUM VP solution. The CENTUM VP Batch package can handle everything from recipe management to batch report handling and unit management. Its capabilities are superior to those of the system that it replaced, and it is much easier for the Lucite engineers to use, ensuring error-free batch operations. Lucite is very happy with the high reliability, availability, and flexibility of the CENTUM VP system, and has experienced no major system failures since this system was started up.”

“Making use of Yokogawa’s different control platforms having unique specifications but the same well known ‘look and feel’ operator interfaces allows [Safripol] to avoid extensive operator training, yet provides both the right control philosophy on the plant floor and makes use of the existing management information software tools. The changeover was virtually bumpless.”



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