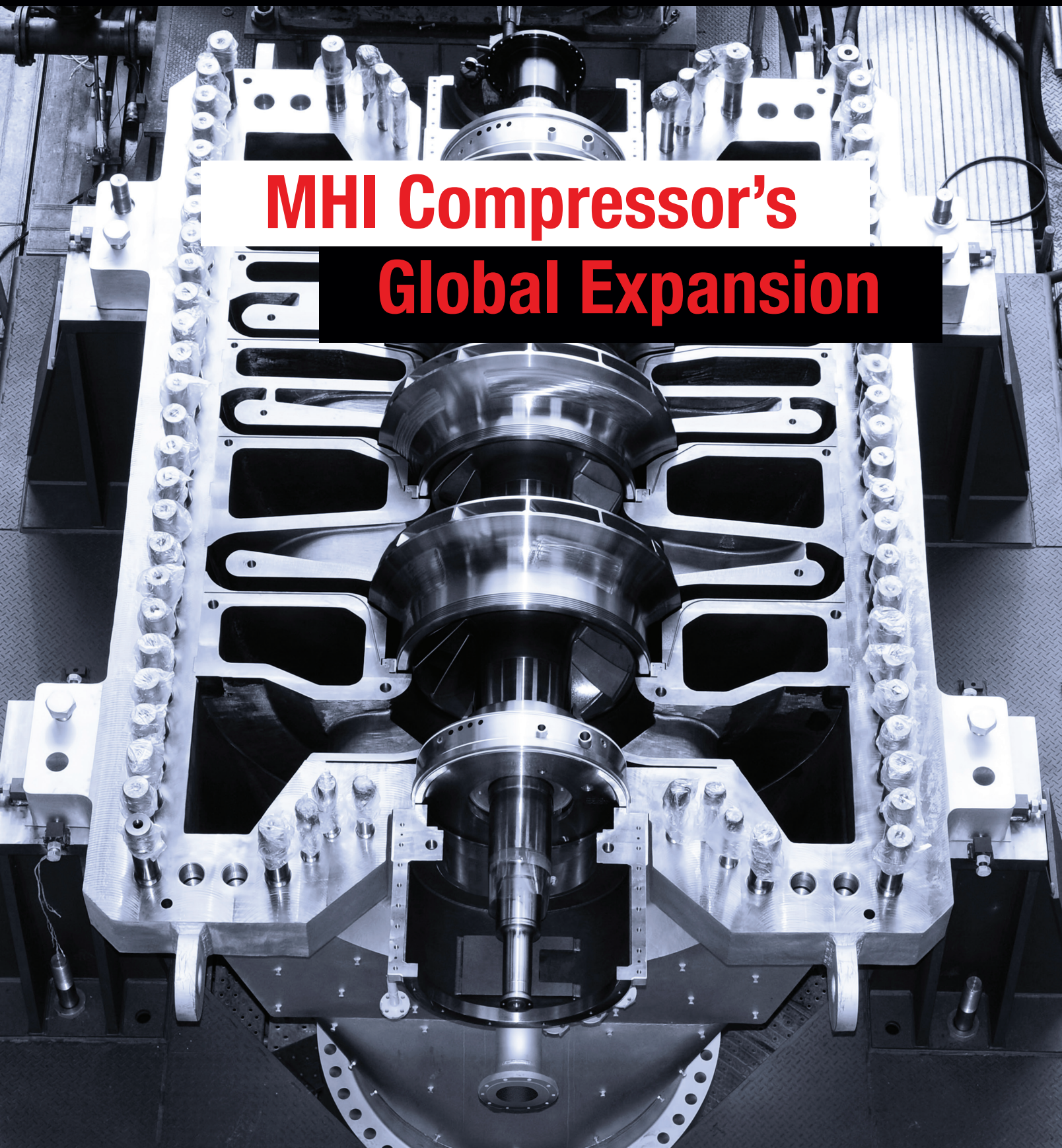
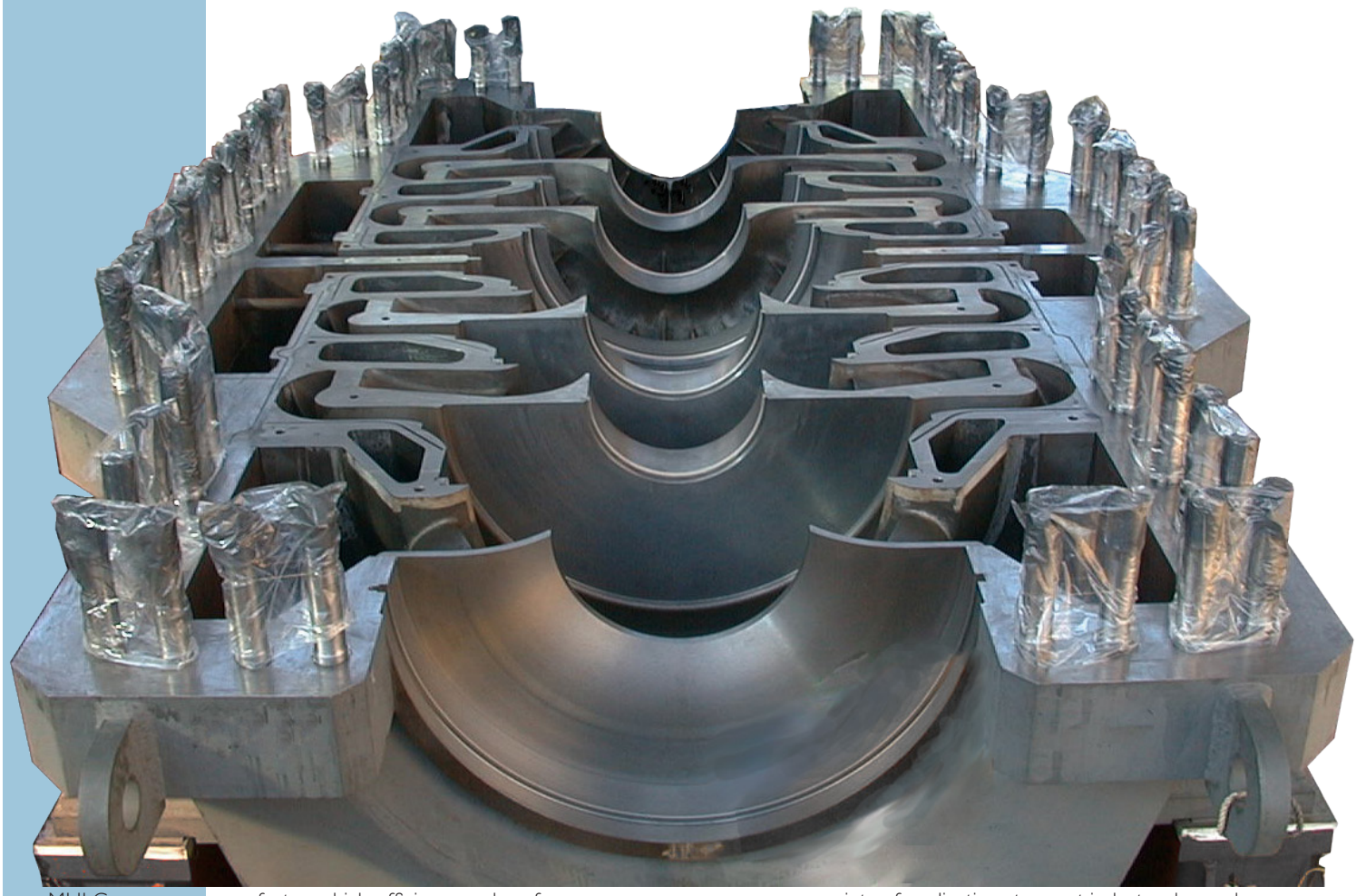
GAS COMPRESSION
magazine

OCTOBER 2021



MHI Compressor's Global Expansion



MHI Compressor manufactures high-efficiency and performance compressors across a variety of applications to meet industry demands.

MHI COMPRESSOR'S GLOBAL EXPANSION

FROM HIROSHIMA TO HOUSTON, MHI COMPRESSOR'S GLOBAL EXPANSION TAKES FULL EFFECT AS COMPANY LANDS DEAL WITH KOCH FERTILIZER; BUSINESS REBOUNDS FROM THE PANDEMIC

BY DANIEL FOELBER

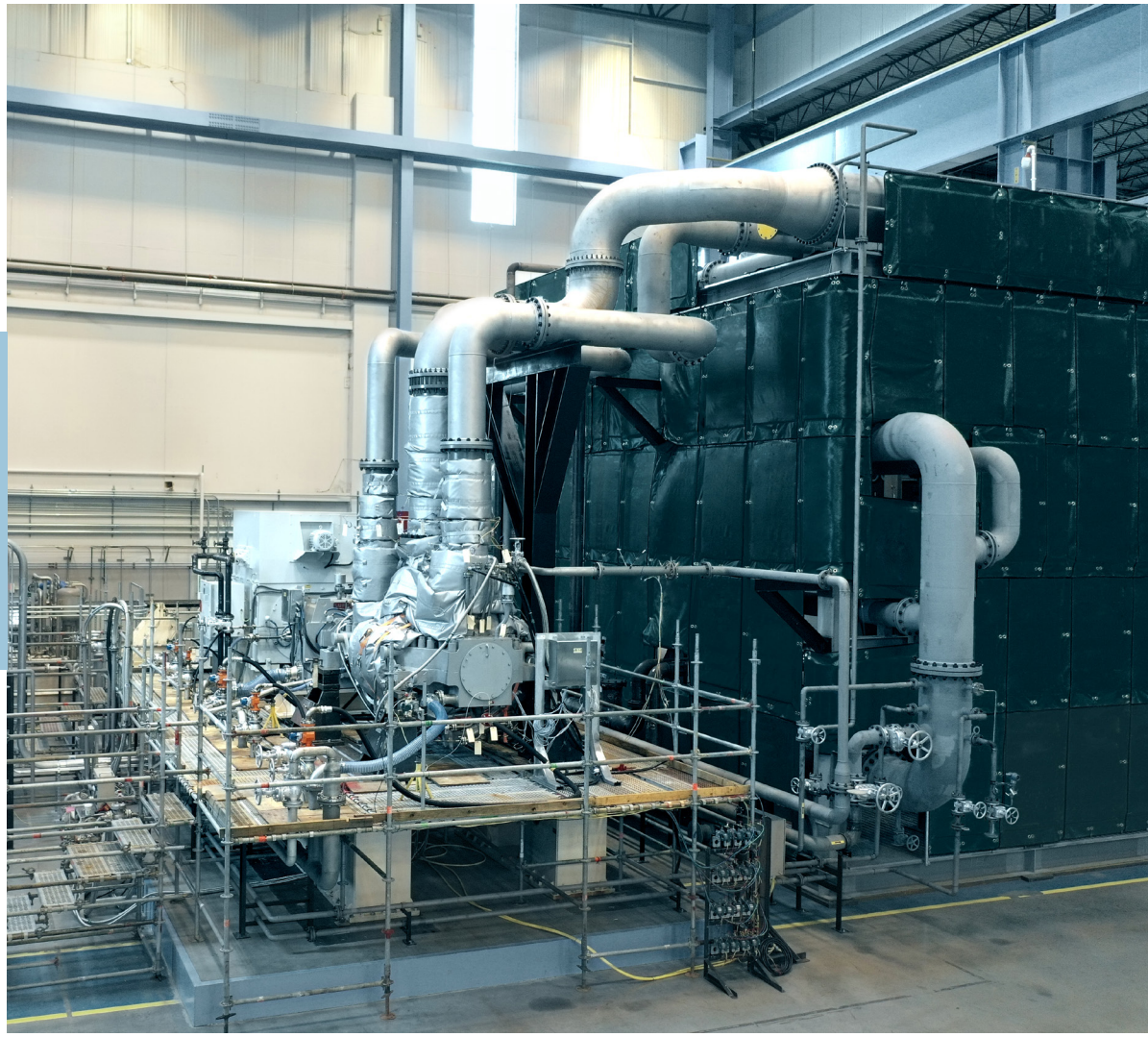
Mitsubishi Heavy Industries Compressor International (MHI Compressor), a subsidiary of Mitsubishi Heavy Industries Group (MHI), will supply several compressors and steam turbines during a revamp and expansion of Koch Fertilizer's ammonia production facility in Fort Dodge, Iowa. MHI Compressor is a designer and manufacturer of compressors, drive steam turbines, gear boxes, and control systems.

The Fort Dodge facility was built more than 50 years ago and consists of three main compressor trains that are used in the ammonia process. "The heart of the ammonia production system is really the SynGas [synthesis gas] compressor train," said Steven Lucchesi, account executive for centrifugal com-

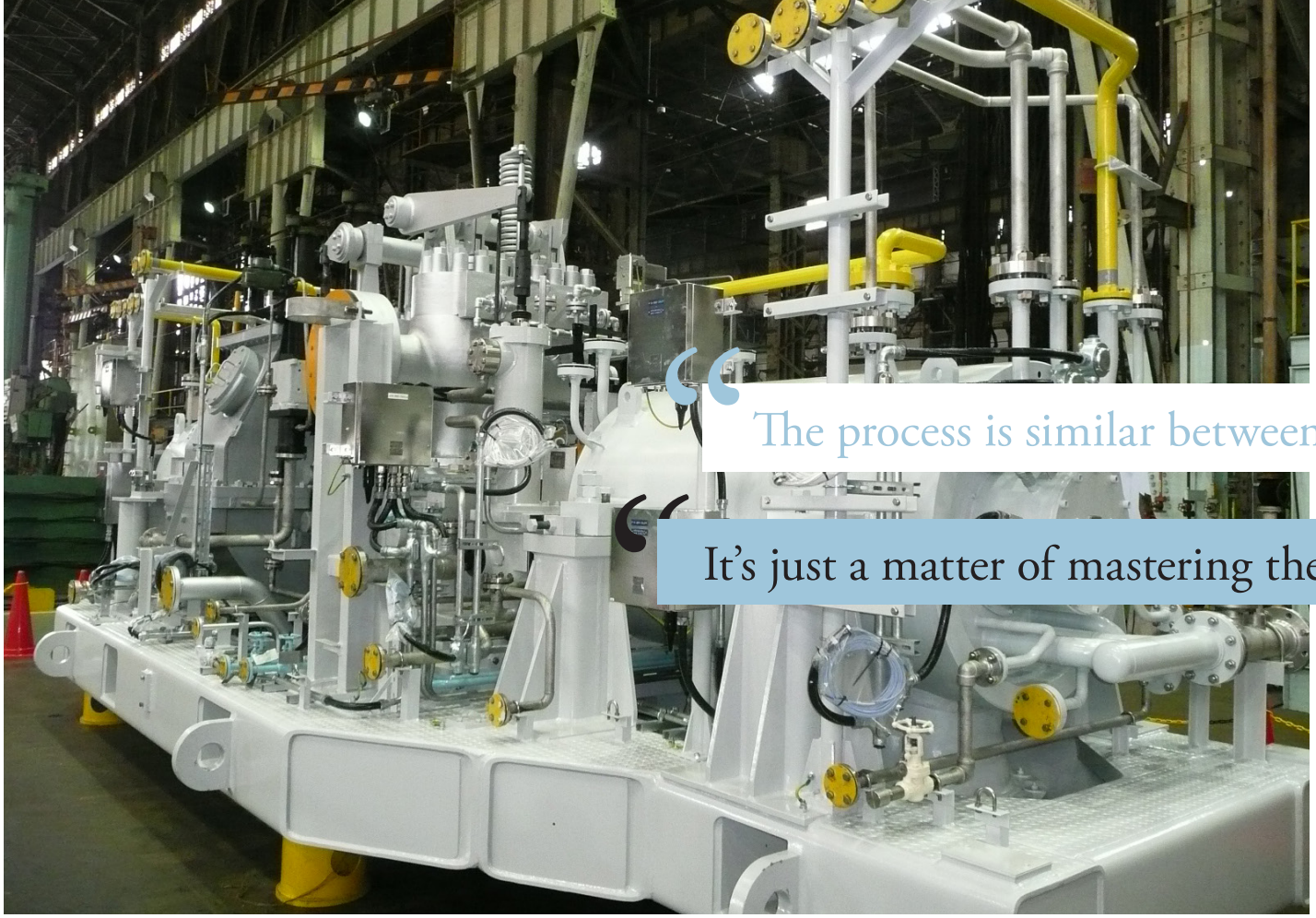
pressors and steam turbines at MHI Compressor. "Ancillary to the SynGas compressor train, you typically see ammonia refrigeration compressors and process air compressors for which MHI also has comprehensive solutions. We work very closely with ammonia/fertilizer customers to ensure we are providing all their turbomachinery needs throughout the facility."

Koch Fertilizer manufactures and distributes approximately 10 million tons (9.1 million tonnes) of fertilizer products annually. The company recently announced a US$140 million investment to increase ammonia production capacity by 85,000 tons (77,111 tonnes) per year at its Fort Dodge plant. To help meet these increased production goals, MHI Compressor will supply turbomachinery including one SynGas compressor train and one process air compressor (PAC) train. The trains will be installed as "footprint replacements" for the non-MHI SynGas and PAC trains currently onsite in order to minimize the impact to the existing facility's infrastructure. The equipment will be jointly manufactured and tested between MHI Compressor's Hiroshima and Houston facilities. MHI Compressor has extensive experience supplying and installing turbomachinery replacements. All machines will be delivered in the second quarter of 2022.

"The motivation behind this project was to improve plant reliability while increasing capacity," said Lucchesi. "We were approached by Koch and its selected EPC [engineering, procurement, and construction] partner to evaluate some options to replace non-MHI machines while minimizing disruption to the surrounding infrastructure of the equipment, such as piping, auxiliaries, foundation, etc. We were able to offer a unique and competitive solution that has the ability to be installed within their turnaround window while incorporating the latest steam turbine and compressor technology."



MHI Compressor's new Houston-based test stand for API 617 centrifugal compressors is the only test stand in the Gulf Coast region capable of performing PTC 10 Type 2 testing.



A complete SynGas compressor package ready for project execution for a fertilizer facility in Indonesia.

NORTH AMERICAN EXPANSION

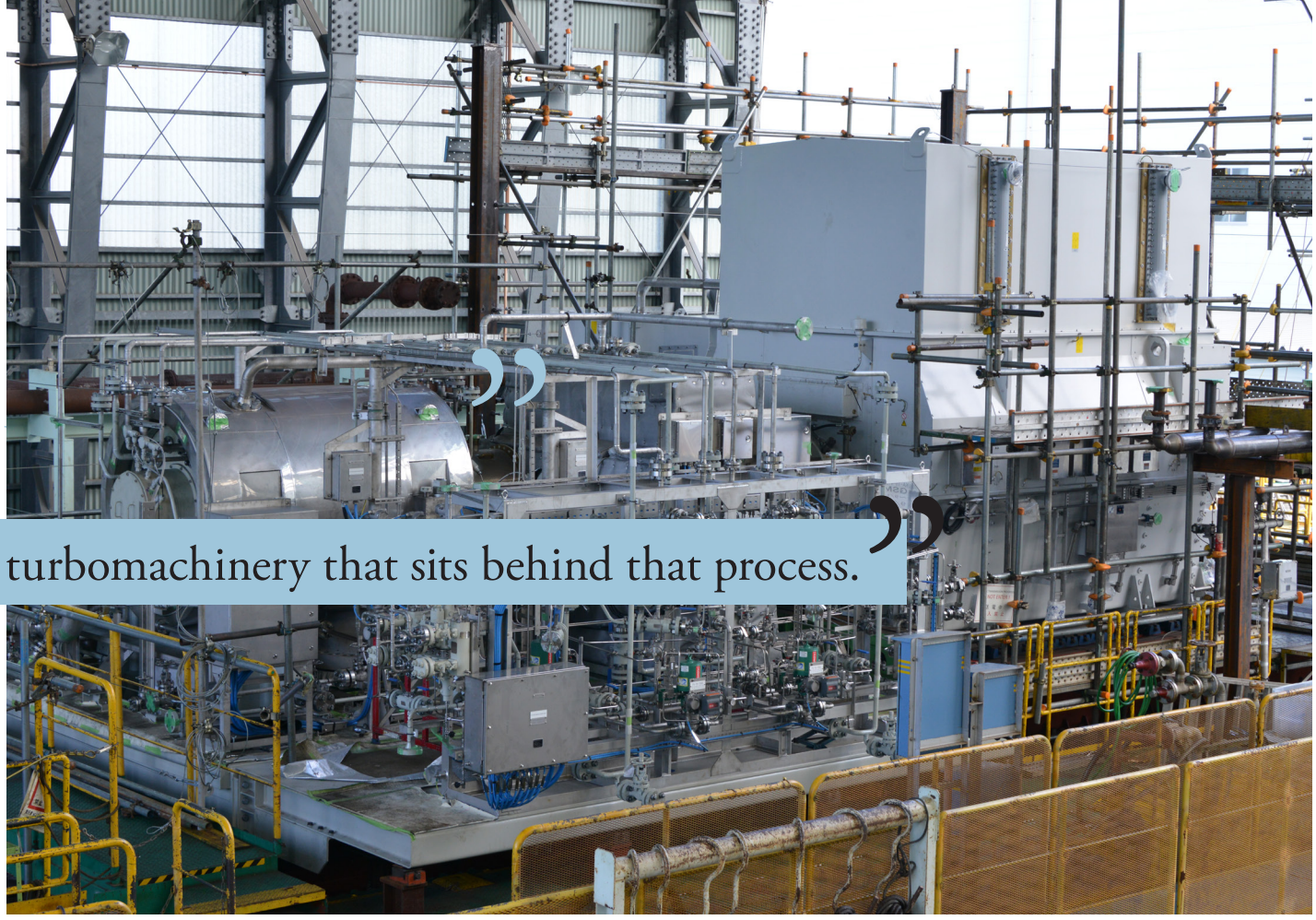
As of March 2020, 54% of MHI’s US$36.7 billion in consolidated sales were generated outside Japan, and 18% of total MHI subsidiaries consolidated sales came from North America. MHI’s North American businesses are playing a key role in the company’s global growth, sporting more than 100 offices and factories and 10,000 employees. Texas is home to roughly 1500 MHI employees. Houston serves as the headquarters (HQ) of Mitsubishi Heavy Industries America (MHIA), including the investment and business development, the engineered system division, and the oil and gas division HQ. Mitsubishi Caterpillar Forklift (renamed Logisnext) and MHI Compressor International both have manufacturing and service facilities within the greater Houston area. MHI Compressor was established in the United States in September 2012 as a group company of MHI and is a wholly owned subsidiary of MHI in Hiroshima, Japan — which holds a 70% stake with Mitsubishi Corporation (Americas) as a 30% joint venture partner.

MHI Compressor International’s latest deal with Koch adds to the company’s reputation as a leader in North America’s fertilizer industry. “The fertilizer business is one of our core competencies, not only in North America, but globally,” said Clayton Jurica, director of MHI Compressor’s new equipment business in Houston. “If you looked at the North American market in the last eight years, the vast majority of the new grassroots fertilizer plants utilize MHI equipment. The Koch deal plays right into one of our key strengths as an organization.”

DEEP IN THE HEART OF TEXAS

The linchpin that supports MHI Compressor’s North American growth is its Pearland Works facility. The campus houses MHI Compressor’s first facility in the Americas dedicated to the packaging, service, and storage of Mitsubishi and other original equipment manufacturer (OEM) API turbomachinery backed by local sales, engineering, and operation experts. MHI Compressor hopes that by investing in Houston, its customers will benefit from shorter lead times and quicker responses, through domestic project management and engineering teams. According to MHI Compressor, the company is the only OEM that has an API 617 centrifugal compressor test stand in the Gulf Coast region capable of performing ASME PTC 10 Type 2 performance testing. Being strategically located in the Gulf Coast region provides many of the company’s clients “ease of access” to its factory in order to follow their respective new equipment and service projects.

MHI Compressor will use the Pearland Works facility to deliver the machines needed to support the project. A significant portion of US ammonia plants are located in the American Midwest to supply fertilizer to the country’s main agricultural region. Given the scale of MHI’s global manufacturing reach, it makes sense that Pearland Works would serve as the company’s focal point of its North American operations.



turbomachinery that sits behind that process.”

MHI Compressor's technical expertise comes from its headquarter facility in Hiroshima, Japan, which houses 19 compressor test stands, similar to the one pictured here.

“If you look at Pearland Works, we're approximately 150 employees encompassing engineering, project management, skilled machinists, field services, spare parts, and sales both from a new equipment and aftermarket services perspective,” said Jurica. “We have a large contingent of personnel dedicated to the manufacturing and packaging of turbomachinery, but another key focus is supporting our fleet of machinery out in the field in order to keep our customer's plants running reliably and safely.”

MHI Compressor is specifically dedicated to manufacturing and servicing centrifugal compressors and mechanical drive steam turbines primarily in the oil and gas industry. Since its inception, MHI Compressor has produced some of the world's largest compressor and steam turbine packages. According to the company, it has earned an international reputation for reliable API turbomachinery. As of August 2020, MHI Compressor has more than 20 test stands at its Hiroshima facility, as well as its Houston facility.

THE COILED SPRING

Like the rest of the gas compression industry, MHI Compressor faced a slew of challenges during the COVID-19 pandemic. “In 2020, the world completely shut down and the development of many projects were placed in a holding pattern” said Jurica. “Any owner/operator that was looking to develop a plant had to take a step back and look at what was the most financially feasible and safe option for its employees. As a result, the turbomachinery market — new equipment-wise — slowed down significantly.”

One big exception to this slowdown was MHI Compressor's deal with Air Products and Gulf Coast Ammonia (GCA). In late August 2020, MHI Compressor landed a strategic contract for its new test stand at Pearland Works. The company is working to supply multiple compressor trains for GCA's new ammonia production facility in Texas City, Texas. The equipment includes a SynGas compressor train and an ammonia refrigerant compressor train. Each train consists of two compressors and supporting auxiliary systems. The compressors are being jointly built and tested at MHI's Hiroshima factory and at MHI Compressor's Houston facility. All trains are to be packaged in Houston. The US$1 billion plant will have a production capacity of approximately 1.3 million tons (1.18 million tonnes) of ammonia per year and will purchase hydrogen and nitrogen gases as feedstock. Air Products will build and operate the facility (see “MHI Compressor International Corporation Opens New Gulf Coast Test Stand,” October 2020 *Gas Compression Magazine*, p. 40).

So far this year, MHI Compressor is experiencing the raw power of the coiled spring that is America's industrial economic rebound. “As 2021 came into effect, there was a lot of pent-up demand because there was not much happening in 2020,” said Jurica. “The first six months of 2021, at least for

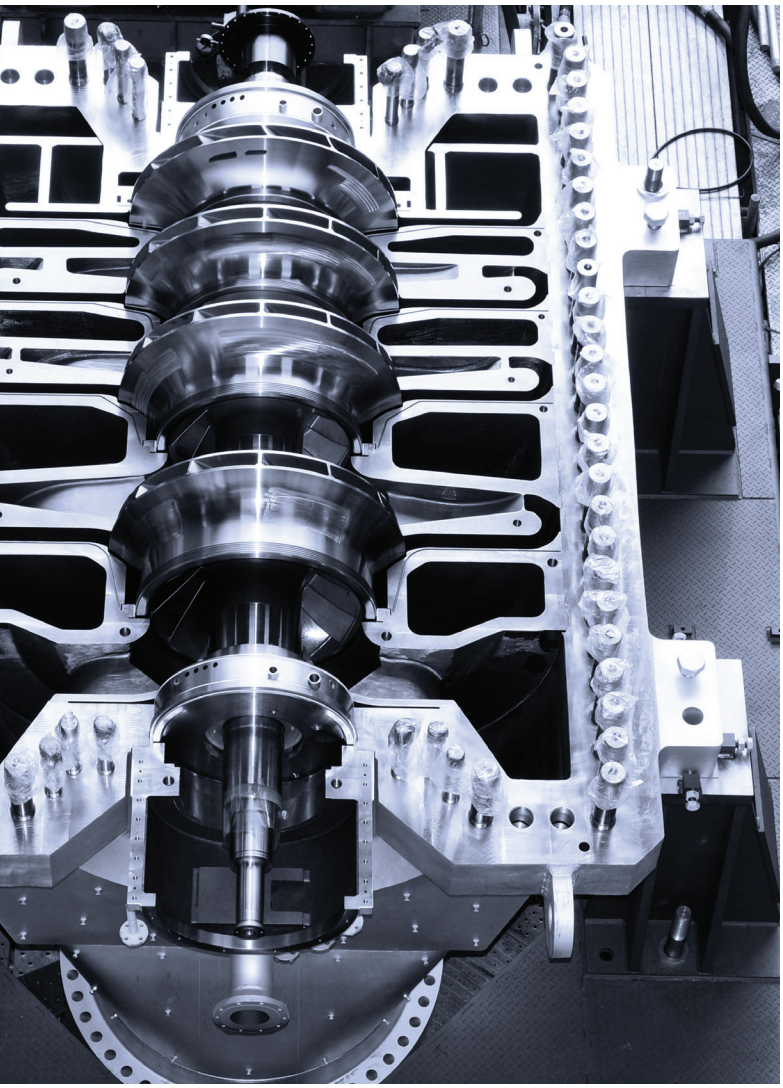
A custom MHI Compressor ammonia SynGas train for an international customer in Uzbekistan.

MHI, have been extremely busy. We've picked up a significant amount of new equipment orders here in North America. Not only are these orders in ammonia and fertilizer and urea-type facilities, but we're also picking up orders from traditional petrochemical, olefin-type facilities, and refineries as well. In addition, we picked up a revitalization project for power generation. There's a lot of demand for projects that probably should have happened in 2020. Now, we'd like to think that our customers are back on track expanding their businesses."

STAYING FLEXIBLE

MHI Compressor finds itself in a similar position to other companies whose businesses are booming. To justify capital-intensive expansions, companies need to make sure that growth will continue for years into the future. Put another way, it's simply too early to tell how much of this year's rebound is attributed to catch up from last year, and how much is pure organic growth. The question for MHI Compressor, and likely its competitors, is determining what 2022 will look like. Will businesses overbuy this year and then slow down next year? Or will the industry experience a multiyear upswing in the business cycle? Forecasts, even during steady times, tend to be riddled with inaccuracies. The unprecedented magnitude of the COVID-19 pandemic is throwing a wrench in the already difficult challenge of predicting what's going to happen in the short- to mid-term future.

To navigate this uncertainty, MHI Compressor is taking a flexible approach to its North American expansion. "The Pearland Works facility was designed and built six years ago with the intent to continuously expand," said Jurica. "Our most recent capital expenditure project within the facility was the test stand, which was a multi-million-dollar investment. As business picks up and we see a wave of continued projects in the next two to three years, it will give us continued opportunities to grow our capabilities here at Pearland Works."



THE FUTURE OF THE AMERICAN AMMONIA INDUSTRY

Once operational, GCA's facility will be the largest ammonia plant in the world at 3970 tons (3600 tonnes) of ammonia production per day. With the target capacity of greenfield ammonia facilities continuously increasing and their locations becoming more coastal, one could speculate that the users who are building these facilities are anticipating non-traditional uses for ammonia. Fuel for the purpose of transporting hydrogen, instead of fertilizer targeting agricultural clientele, could become an increasingly popular use case for these newer ammonia facilities. "Regardless of plant size, MHI Compressor has the ability to meet the demands of a variety of processes and applications," said Clayton.

"I think it's important to note that ammonia production has traditionally been on the smaller end of capacities, similar to what you see at the Koch Fertilizer facilities," said Lucchesi. "Just like the petrochemical industry, the owners of these facilities are looking at how to produce lower cost product over time. They've done so by expanding the capacity of these facilities as they operate them. If you were to look at a plot of newly built fertilizer plants and their nameplate capacities over time, you would see linear growth across the globe. MHI Compressor has experience in smaller plants, and we're gaining experience in the larger plants too. The scale of the GCA facility establishes Mitsubishi as an expert in supplying turbomachinery to large ammonia facilities. The process is similar between varying production sizes. It's just a matter of mastering the turbomachinery that sits behind that process."

The Pearland Works facility is a 26-acre (10.5-ha) campus dedicated to the manufacturing, packaging, service, and storage of Mitsubishi and other original equipment manufacturer turbomachinery.

DOUBLING DOWN ON AMERICA

MHI Compressor's strong position in the North American ammonia industry is just one of the many reasons why the company is ramping up spending and doubling down on its US expansion. "Despite the global pandemic, MHI continues to invest in factory upgrades such as our compressor test stand and boots on the ground here in North America," said Jurica. "We're increasing our capabilities in the Lower 48 as an OEM and a third-party manufacturer, with respect to API turbomachinery. We remain extremely bullish on the business environment that is forecasted here in the region and want to be prepared to serve our customers. We've taken an expansion approach to the market whereas some of our peers have decided to transition their capabilities overseas. MHI, as a global company, is very committed to this region. This commitment can be seen through MHI Compressor, but also through their power organization, Mitsubishi Power Americas. Mitsubishi Power Americas established its Savannah, Georgia, factory in 2010 and has since significantly grown its gas turbine market share in the western hemisphere. We're looking to replicate what the power division has accomplished and position ourselves to be long-term strategic partners with our customer base. The MHI group is definitely putting a significant amount of interest and equity into North America."

"We're investing in growing our fabrication and manufacturing capabilities here in the United States," said Lucchesi. "One stigma we see is folks will say, 'yeah, but all their knowledge base is back in Japan.' That's not true. As we grow our manufacturing fabrication capabilities, we are also growing our personnel and engineering capabilities along with that."

A parallel can be drawn between MHI Compressor and another famous Japanese company, Toyota. This year marks the 50th anniversary of American-made Toyota parts. Similar to Toyota, Mitsubishi is creating American jobs and strengthening the US economy. "We've got a lot of machinery experts who are homegrown MHI folks, as well as folks that bring knowledge from their previous lives with other OEMs, EPCs, and end users," said Lucchesi. "The local talent pool has allowed us to grow our knowledge base here in the United States, which adds immediate value to our American clientele as they look to develop projects maybe three or four years out. Here in America, we can help them develop the solution while it's still an idea on the back of a napkin." GCM

Reprinted from the October 2021 issue of *Gas Compression Magazine*.
www.gascompressionmagazine.com