

CUSTOMIZATION AND GLOBAL SERVICE THE KEY TO ELLIOTT GROUP EXPANSION

Turbomachinery International recently visited Elliott Group for a tour of its facilities. The big takeaways were the fact that the company does more business in service than it does in manufacturing (p. 36), and the degree of customization required in its products. This approach appears to be working as it has expanded from 1,700 workers in 2007 to 2,700 today. "We don't tell people what they need to buy based on a pre-set product line," said retiring Chief Operating Officer (COO) Art Titus. "We build what they need and in downstream oil and gas, that is typically very specific."

He explained that the company's singular purpose is the design, manufacture and service of turbomachinery. It accomplishes this via its Jeannette, PA campus as well as a sister site in Sodegaura, Japan with parallel manufacturing, machining and testing capabilities, and a network of service and sales centers around the globe. The company also manufactures its single-stage YR steam turbines (ST) in China in a joint venture with Ebara Great Pump, and has a lubrication and gas seal system manufacturing plant near Jeannette.

Elliott's core strength is its ability to design and build horizontally and vertically split centrifugal compressors (up to 100,000 HP). They are available in multiple frame sizes with plenty of overlap in between.

"For the downstream oil & gas market, we have to design a machine against very exacting process parameters such as pressure, temperature and flow rate so no two machines are ever exactly the same," said John Rann, Vice President of Engineered Products. Side stream mixing is a particular area of expertise for Elliott's compressor engineers. Refrigeration applications often require the addition of multiple large volume side streams to the primary flow. Optimal compressor performance requires accurate fluid dynamic design to merge the streams for minimum pressure loss and maximum efficiency.

Key markets

This expertise serves Elliott well in key markets such as petrochemicals and LNG. The company estimates that about half the ethylene plants in the world use its turbomachinery. With the recent rise in "on purpose" propylene production, Elliott has also been successful in designing large, high flow compressors for propane dehydrogenation (PDH).

Elliott's strength in LNG is highlighted by the following credentials: It developed the first ever baseload LNG plant and the first GT-driven plant; the first large-scale LNG plant; the first single-mixed refrigerant design; the first mixed refrigerant process LNG plant; the first large propane refrigeration strings; the first dual-shaft GT driven refrigeration strings; and the first dual-mixed refrigerant trains. Its compressors operate today in LNG plants producing in excess of 70 million tons per year (MTPA).

The company has formed an LNG partnership with The Linde Group. With revenues of 17 billion Euros, Linde has 65,500 employees around the globe. Elliott beat out competition from all major turbomachinery suppliers to gain the agreement with Linde's Engineering Division to cooperate in the small-to-mid-scale LNG business. The parties have developed a main refrigerant cycle compression technology for Linde's StarLNG plants ranging from 0.2 MMTPA to 1.3 MMTPA. This enables Linde to increase speed to market.

"With cheap gas available, there is an economic case today for small-scale LNG," said Titus.

Elliott also supplies compressors and steam turbines for refining applications, such as hydrotreating, alkylation, wet gas, and recycle gas compression. Its compressors are used in upstream applications



Sites like the Elliott Group campus in Jeannette, PA dispel the myth that manufacturing is dead in the U.S.



Steam turbine-driven mixed refrigerant compressor trains are produced by Elliott



Large compressor rotors, diaphragms and casings are manufactured, balanced and tested on site



Massive casings like these are cut, machined, welded and finished in the Elliott facility

such as gas lift and gas gathering, gas & oil separation, gas treatment and reinjection.

Many Elliott compressor strings are driven by the company's steam turbines, which produce up to 135,000 HP. Its single-valve YR model STs provide up to 10,000 HP as mechanical drives.

In 1963, Elliott developed the world's first hot gas expander. Today, its power recovery expanders are used in refineries to produce up to 60,000 HP from the thermal energy in the fluid catalytic cracking (FCC) process. Its machines account for about half the FCC power recovery expanders in the world.

Tri-Sen Systems

John Rann commented on the company's partnership with Tri-Sen Systems on controls, which was launched in 2012 in a bid to standardize controls for Elliott products and reduce time consumed on controls engineering. Rann said the deal had achieved that goal.

"To use an analogy, in the past we were trying to install the plumbing after the house was built," he said. "Now our controls conversations begin early, and this has resulted in smoother commissioning and more rapid project completions."

One final area of the Elliott product portfolio deserves a mention. While other OEMs tend to turn lubrication and seal system work over to external suppliers, Elliott has maintained this function in-house. It offers lubrication, seal, and piping systems for rotating equipment from any OEM via an engineering and manufacturing facility near its Jeannette HQ.

Rann and Director of Operations, Engineered Products, Mike Storms, conducted a tour of a vast campus that encompasses 800,000 square feet under roof and 110 acres. It consists of new and old buildings — the company has operated on this site for over 100 years. There are also extensive on-site training facilities — the

company realized that fewer skilled workers have been coming out of the school system. So it embarked upon a program to train its own workforce. This has resulted in about 13 machinists, 30 assemblers, 40 service reps and seven welders recruited and trained in the past two years.

The tour comprised visits to multiple buildings of different purposes. What was evident was heavy investment in technology such as the latest computerized numerical control (CNC) equipment, 5-axis machining and heavy duty cranes. A materials lab moved into a new facility last year, and construction of an R&D lab is underway.

Elliott Group's Global Service (GS) organization recently demonstrated its capabilities during a turnaround at a Middle Eastern refinery and petrochemical complex. The turnaround involved nearly 200 personnel. Elliott's scope of work included the overhaul and rerate of 23 machines, as well as associated lube oil systems, to expand production capacity.

The overhaul was planned years in advance, and the GS team spent two months on site prior to the shutdown to coordinate tools, parts, and logistics. A total of 5,638 parts were manufactured in Elliott facilities and shipped to the site for the mix of Elliott and non-Elliott equipment.

The overhaul included a recycle gas compressor, a wet gas compressor train with a steam turbine driver, a GE refrigeration compressor and refinery compressor, a cracked gas train with MCO turbine drivers and an ethylene heat pump compressor.

Changing of the guard

With Art Titus retiring this month as COO, he is being replaced by current Vice President of GS, Mike Lordi. Mike's position is being taken by Ron Frye. His vacant position of Vice President of Industrial Products will be filled by Scott Wilshire. Long-term CEO Yasuyuki Uruma continues at the helm as CEO of Elliott Group. 