

Part VII:

Challenges and Opportunities

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Elliott's success in the 1960s carried over into the 1970s, but the decade brought new challenges and opportunities. Price inflation in the United States accelerated in the 1970s as a consequence of massive government spending on the war in Vietnam and programs such as the war on poverty. A six month oil embargo in 1973-1974 by members of the Organization of Petroleum Exporting Countries (OPEC) caused energy prices to skyrocket to record highs and created shortages. Even after the embargo ended, energy prices stayed high, adding to inflation and eventually leading to rising unemployment.

Rising prices, together with growing unemployment, reduced consumer consumption and curbed business investment. The combination of high inflation and stagnant business activity came to be called "stagflation." With the decline in business spending, the Elliott Company division's sales to important markets such as steel and chemical plants fell sharply by the end of the 1970s. There was also a positive side to the economic situation. The energy shortages and the high energy prices created by the oil embargo sparked a boom in oil exploration and production in the United States and the Middle East. Demand for Elliott's products from these market segments surged.



yr on a truck

Passing the baton

Charlie Fenn left Elliott and returned to Carrier's headquarters in May 1968, six years after he first arrived in Jeannette. His task had been to "reconstitute" Elliott, and he had succeeded admirably. In recognition of his accomplishments, in September he was elected President of Carrier Corporation.

Mr. Fenn's successor as President of the Elliott Company division was Frank M. Fives. Mr. Fives, a graduate of Carnegie Institute of Technology in Pittsburgh, had 15 years of service with Carrier before coming to Elliott in 1959 as compressor sales manager. Despite the change at the top, Carrier's Elliott division never missed a beat.

October 1968 set records for new orders and shipments. Orders for the month included 140 locomotive turbochargers, two steam turbines for nitric acid production at a U.S. Army ordnance plant, three P-line compressors for a sewage plant, and four compressors for repressurizing oil fields in Libya. More than 480 pieces of "standard" apparatus were shipped that month— 138 strainers, 55 ejectors, 102 YR turbines, 27 PAPs, and 159 turbochargers. This latter record was broken the following April when 516 pieces of equipment were shipped.





Selling to the world

Before the Carrier acquisition, the bulk of Elliott's sales were to customers in the United States. In 1950, only four percent, or \$1 million of Elliott's sales were outside of the country. Carrier's international arm, Carrier International Ltd., immediately gave the Elliott division access to new markets for its products. In 1960, Carrier's manufacturing license with Thomassen was amended to include the manufacture of Elliott steam turbines and compressors in Europe. In 1964, the Thomassen license was again revised to cover PAPs. Elliott performed all of the engineering and design work for Thomassen and subsequent manufacturing licensees. Elliott's sales through Carrier International reached \$3 million in 1962.

As international sales of Carrier's own air conditioning and refrigeration products grew, it became more of a burden for Carrier International to sell Elliott's products, as well. In 1967 Carrier created Elliott Overseas Corporation (EOC) to take on this responsibility. EOC bought products and services from the Elliott Company division in the U.S. and resold them overseas.

A second license to manufacture Elliott equipment was granted to Ebara Corporation. Ebara Corporation was founded in Tokyo, Japan in 1920 to make industrial pumps and other machinery. Ebara had manufactured Carrier's air conditioning equipment in Japan since the 1930s. In 1968, Toyo Carrier, Carrier's Japanese affiliate, signed a license agreement with Ebara to manufacture and sell Elliott compressors and steam turbines in Asia. Since 1975, Ebara has built Elliott products in a modern factory in Sodegaura, on the eastern shore of Tokyo Bay.

By 1971, 35 percent of the Elliott division's revenues came from outside the United States. Two years later this figure had increased to 50 percent. International orders in 1970 included four giant 110M compressors and a 60M compressor for a Russian butadiene plant, and two duplicate strings for a Venezuelan natural gas compression plant. More than \$10 million was booked in 1971 for a Russian petrochemical complex and oil production equipment for Saudi Arabia and Norway.

In order to sell products overseas at a competitive price and to avoid import duties, the Elliott Company division began manufacturing its machines in other countries. In 1971, Carrier purchased J. Samuel White & Company, an English shipbuilding company on the Isle of Wight, to build Elliott equipment. Before the White acquisition, Elliott had been unable to bid on many projects in the United Kingdom because it was not a British manufacturer. White's own product line included steam turbines. The White turbine line was dropped, and the plant concentrated on building Elliott equipment. Jeannette supplied components such as compressor barrels, rotors, and seals.

The White factory also continued to manufacture White Gill thrusters. The White Gill thruster is a pump jet or water jet that is mounted at the bow or stern of a vessel that needs maximum maneuverability – oil rig supply boats, firefighting boats, research ships, cables ships, ice-breakers, ferries, barges, and many more. The thruster provides full continuous thrust through 360 degrees to move a vessel in any direction.

A large compressor-turbine test facility opened at the Isle of Wight factory in 1975. In 1977, J. Samuel White & Company was renamed Elliott Turbomachinery Limited. On April 20, 1978, Elliott Turbomachinery Ltd. was honored by the presentation of "The Queen's Award for Export Achievement" for its earnings from the export of turbines and compressors. The award was presented personally by Lord Louis Mountbatten, Lord Lieutenant of the Isle of Wight, great-grandson of Queen Victoria and cousin of the present Queen of England.

Carrier acquired additional facilities North and South America to manufacture Elliott products. Elliott do Brasil Equipamentos was established in Rio de Janeiro, Brazil in 1976 to build YRs and larger steam turbines, and an agreement was signed with Beloit Canada in Sorel, Quebec, Canada in 1977 to manufacture YRs and compressors. Elliott supplied rotors and parts from the U.S. Carrier added another manufacturing affiliate, Turbica, in Mexico in 1980 to build YR turbines and compressors.





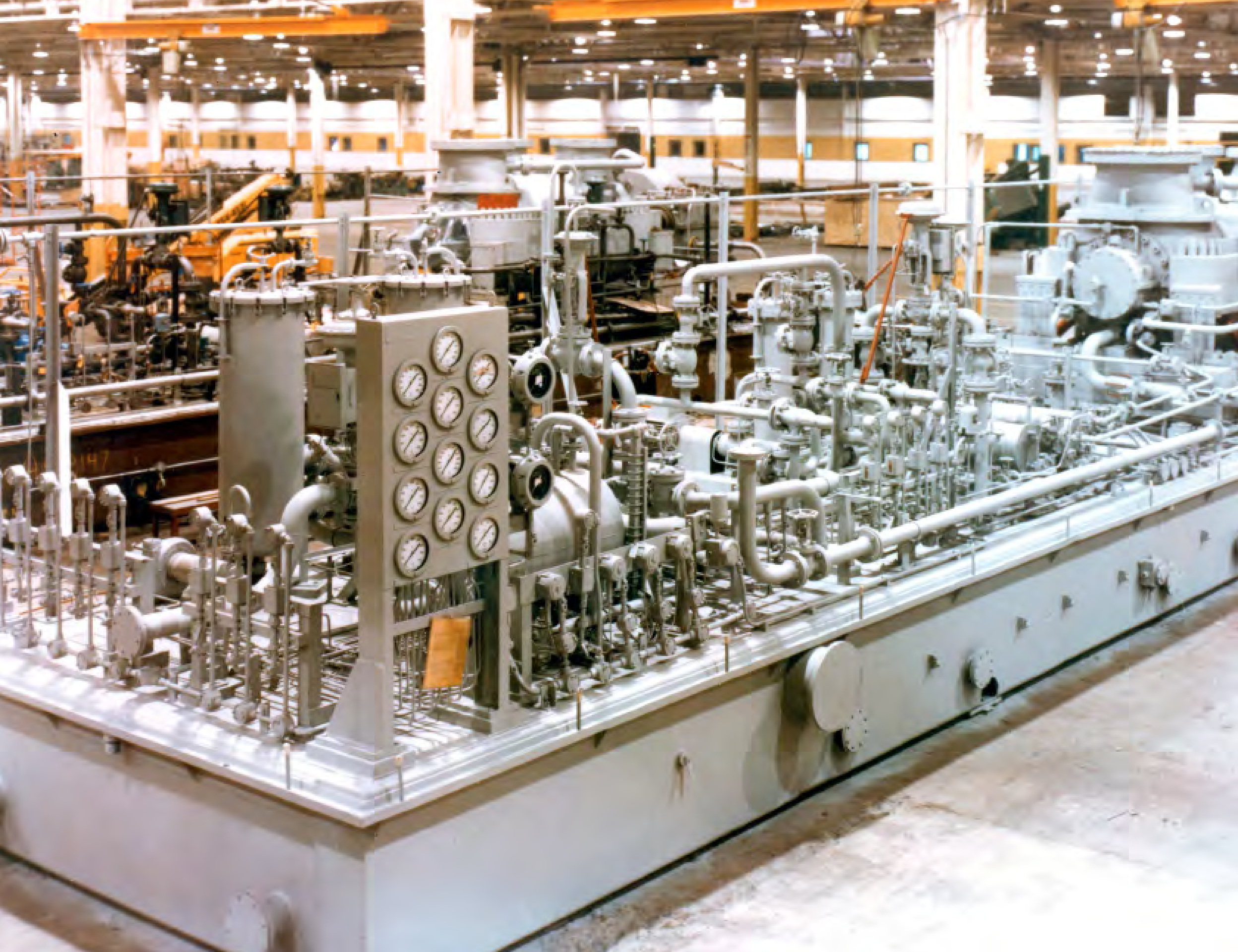
Compressor sales explode

The growth in LNG and the ethylene boom that began in the 1960's continued well into the 1970s and expanded to encompass the production of many different petrochemicals. Large Elliott centrifugal gas compressors were in great demand. Elliott manufactured over 1,300 single- and multi-stage compressors during the 1970's; by 1994 the total exceeded 4,500. Elliott received \$25 million in orders for ethylene compressors and turbines in 1973 alone, as well as an order for 24 compressors for an LNG plant in Africa. In 1975, Elliott received an order from Aramco in Saudi Arabia for a record-setting 90 compressors.

Elliott compressor technology achieved new records for performance. An Elliott gas reinjection compressor installed on an oil production platform in the North Sea Ekofisk field in 1974 produced 9,200 psig, almost three times the pressure capability of previous centrifugal natural gas compressors.

Sales growth continued despite a 10-week strike in 1974. That year, Elliott also shipped its first compressors and turbines for use in ammonia plants. The initial order included 12 compressors and 10 turbines. By the 1980s, Elliott had supplied approximately 80 percent of the compression equipment for the worldwide ethylene market. During the two-year period of 1977 and 1978, the Elliott Company division made major contributions to Carrier's reported profit.





Manufacturing expansion

Carrier's Elliott Company division needed more manufacturing space and tools to produce all of the products it was selling. Carrier approved a new two-year, \$9 million capital plan for Elliott in 1968. The money was used for a large extension to the main machine shop, new machine tools including 14 lathes and four large milling machines, an expansion of the turbocharger building, a new office building – Building 65 – and a new boiler for the engineering lab.

Even with this expansion, the growth in sales stretched Jeannette's manufacturing capacity to its limit. In 1976, some machining and fabrication moved to a large factory in Scranton, Pennsylvania. The Scranton plant produced major weldments and service parts. It also served as the main warehouse and shipping facility for service parts in the Americas.

The Plant Air Package – PAP – that Elliott introduced in 1962 was the first machine to use a centrifugal compressor rather than a reciprocating compressor to produce compressed air for industrial use. After the PAP caught on, Elliott's centrifugal design enjoyed a distinct market advantage for several years, and Elliott sold nearly 1,000 units. By the 1970s, competitors had begun to catch up with their own centrifugal plant air compressors, and the original PAP design was showing its limitations. Elliott introduced the PAP PLUS in 1974. This was a redesigned PAP with a horizontally split gear case and other features. The PAP PLUS was available in a range of frame sizes, a range that expanded over the ensuing years to keep the design competitive in the plant air market.

Elliott also continued to enjoy a dominant share of the U.S. turbocharger market. In 1975 Elliott produced most of the turbochargers sold to engine-builders in the United States except for those made by General Motors for use in its own vehicles. However, the strike at Elliott in 1974 disrupted deliveries, leading General Electric to begin building its own locomotive turbochargers a few years later.

Lubrication system sales also increased in the 1970s. Initially, Elliott built lube systems primarily for use with its own rotating equipment. Because of their excellent reputation, customers began to specify Elliott lube systems for use with other manufacturers' turbomachinery. In 1975, Carrier purchased a shuttered U.S. Steel facility in Donora, Pennsylvania, 30 miles south of Jeannette along the Monongahela River. The Donora plant opened in 1976 to assemble Elliott lubrication systems and other auxiliary equipment packages such as seal water systems, seal gas buffer systems, contaminated seal oil drainer packages, and accumulators. In 1977, there were 125 workers in Donora, many of them building lube systems for the 90 compressors Elliott was preparing to ship to Aramco in Saudi Arabia.

The increased demand for gas compressors led Carrier to de-emphasize other Elliott products that contributed little revenue and no longer fit neatly into the product mix. Carrier sold both the air ejector and strainer lines in 1974. Liberty Manufacturing began manufacturing strainers in 1903, when W.S. Elliott first expanded his product line beyond boiler tube cleaners. The ejector line dated back to 1918.

The "modern up-turned 'E'" introduced by Charlie Fenn in 1962 as Elliott's new trademark was also dropped and replaced in 1973 by Carrier's Crimson "C." The change was made because, "The Carrier name is so well known and respected around the world, it only makes sense for each division to begin identifying itself more closely with Carrier. In this way we multiple our future chance to succeed many times over."





Service moves to the forefront

When Charlie Fenn wrote his first newsletter in 1962, he didn't mention service, but he probably should have. The creation that year of a new Service Department laid the foundation for an increasingly important and profitable part of the Elliott Company division's business.

Before the Carrier acquisition, Elliott had a Repair Department to fix its customer's equipment. Repairs were not a central focus for the company, but simply one dimension of doing business as an original equipment manufacturer. The Repair Department supplied customers with parts. Occasionally, customers would return equipment to Elliott for repair. Repairs and the manufacture of parts were handled by Elliott's general manufacturing operations, when they could be fit into the schedule.

Carrier recognized the untapped potential of the service business at Elliott. The Service Department was created to improve customer relations and increase the volume of business. The new department consolidated service into a single operating group separate from manufacturing. A dedicated repair facility and a parts warehouse were set up in Building 47, adjacent to the old Crocker-Wheeler factory in Building 48.

The parts and repair business grew rapidly. By 1970, the Service Operation business – parts, repairs, rebuilds, and time – had grown fourfold and accounted for 40 percent of all orders. Frank Fives commented:

"The Repair Facility has earned an excellent reputation and is unmatched in our industry. Today (1970) the Service Operation includes an engineering activity, parts department, stores section, repair facility, and regional groups in the United States, Canada, Puerto Rico and Zurich – in total 233 people."





Power Services and Elliott service shops

The Elliott division's repair activities grew out of Building 47 and into Building 48 at the Jeannette plant. Elliott also contracted with independent authorized service shops to repair and maintain the machinery it supplied to customers. In August 1972, Carrier signed an authorized service agreement with Power Services, Inc. (PSI). Based in Houston, Texas, Power Services was primarily engaged in on-site maintenance and repair of rotating equipment in refineries, chemical and petrochemical plants. Carrier loaned funds to PSI to construct a shop in Houston for installing, repairing, servicing and maintaining Elliott products. PSI opened the first facility outside of Jeannette dedicated to the repair of Elliott equipment in Houston in April 1976. That same year, Carrier purchased PSI outright.

Houston was the logical place for Carrier to locate the first Elliott service shop. It was arguably the rotating equipment capital of the world, with scores of plants located along the Houston Shipping Channel and in the nearby cities of Port Arthur and Beaumont. All of Elliott's primary competitors were also present. In 1979, the shop moved to its current location in a larger building on the West Beltway. As part of Elliott today, the Houston facility houses not only the service shop, but regional sales, field service, rerate services, application engineering for Engineered Products, and the Latin American operations of Global Service.

PSI established several other Elliott repair shops. The New Orleans, Louisiana shop opened in 1980 and the Jacksonville, Florida shop in 1981. New Orleans was located amidst a heavy concentration of refineries and chemical plants in the Mississippi River delta. A large percentage of Jacksonville's business came from repairs to large gas turbine and steam turbine rotors for the electric utility industry. Also in 1981, the manufacturing of lubrication systems was transferred to Scranton, and the Donora facility began to operate as a repair facility.

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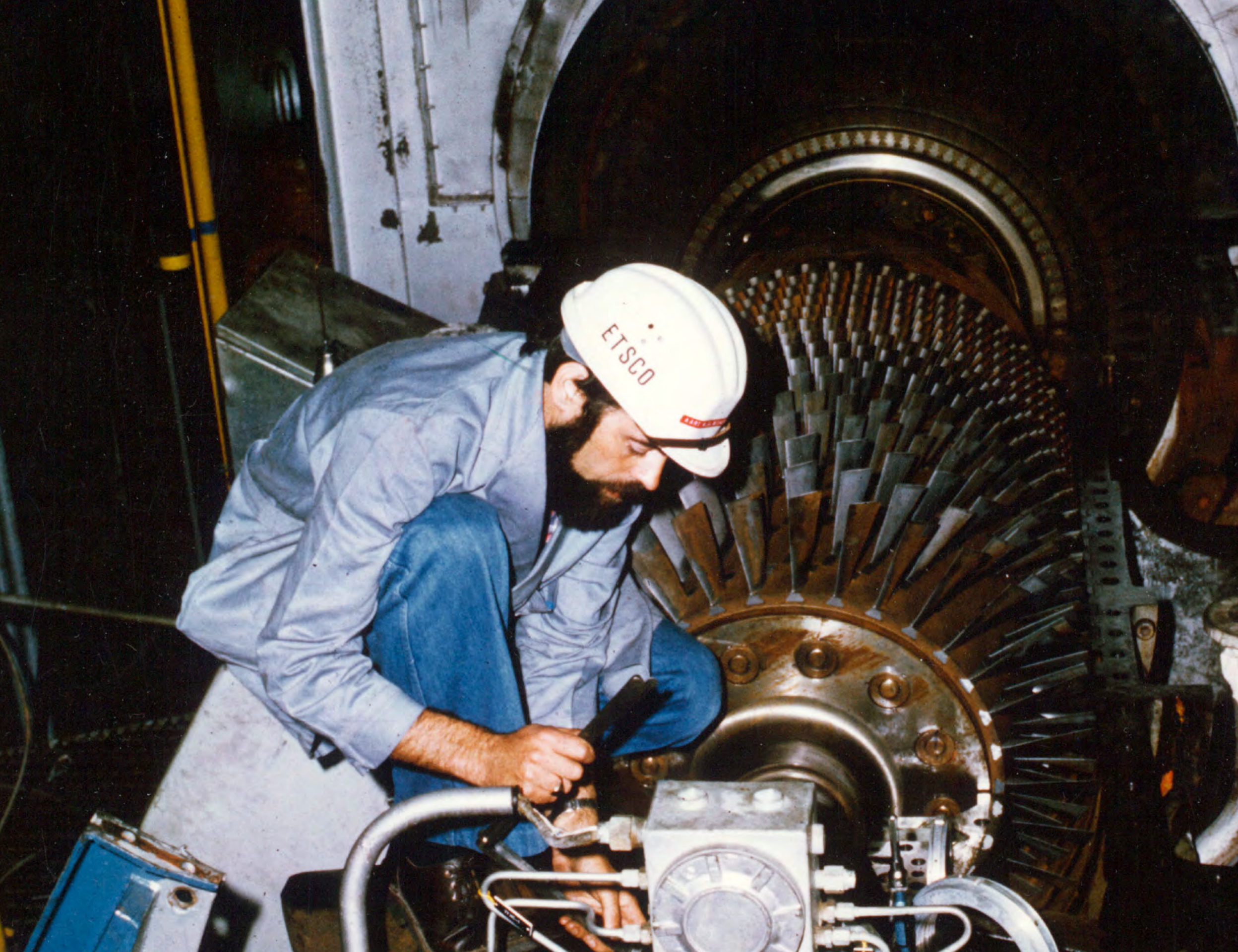
Field Service and overseas expansion

Carrier established the first Elliott service operation outside of the U.S. in Zurich, Switzerland in 1968. Switzerland was centrally located amidst the rapidly growing fleet of Elliott machines in Europe and the Middle East, and it also offered an excellent transportation network and a well-educated, technically skilled, multi-lingual work force.

The Zurich office supported field service engineers who engaged in the installation, start-up and repair of Elliott equipment. A major development in the growth of the field service business in Europe came in 1977 with a contract from Imperial Chemical for the overhaul of all of the turbomachinery at its No. 4 olefin plant in England. An Elliott crew completed the turnaround of five compressors, three turbines and two gears in only ten days, well within the promised service period. This was an excellent demonstration of Elliott's service capabilities.

Service considerations figured into Carrier's acquisition of J. Samuel White & Company in 1971. The factory in Cowes, Isle of Wight, England also served as an Elliott repair facility to support Elliott equipment in Europe and the Middle East. The Elliott parts operation shifted in 1976 from Zurich to the Isle of Wight, where the parts inventory was located.

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ETSCO

Carrier formed a service company joint venture in 1975 with Thomassen, its manufacturing licensee in Europe. The new company was named Elliott-Thomassen Service Company – ETSCO. ETSCO's activities were devoted to service parts and field service; service shop activities were not involved. One reason ETSCO was created was to eliminate confusion among customers as to which supplier would service their equipment. Thomassen built and sold Elliott branded products in Europe under its license to Carrier. The huge contract from Aramco for 90 Elliott compressors, for example, included compressors built both in Jeannette and in Holland.

ETSCO provided service for all Elliott and Thomassen equipment throughout the world, regardless of where the equipment was made. In the mid-1970s, Elliott products were manufactured in the United States, Brazil, Canada, England, Holland and Japan. ETSCO offered customers an expanded range of services. Thomassen had 64 employees in its service organization in Holland. The Elliott service operations were four times larger and separate from production operations, unlike Thomassen's.

ETSCO was headquartered in Greensburg, Pennsylvania, not far from the Jeannette plant.

Also located there was a 30-member technical services group that supported service operations globally. ETSCO's field service and parts operations represented an important platform for the Elliott division's future growth. As Frank Fives put it in 1978:

"You can't continue to sell new apparatus, year after year, without guaranteeing proper service after the sale. It's very simple. Elliott needs ETSCO, and ETSCO needs Elliott."





Farewell to Fives

Frank Fives served as President of the Elliott Company division for 11 years. During his tenure, Elliott was remarkably successful. Nonetheless, during the 1970s Mr. Fives had to wrestle with issues that his predecessors had never faced. One challenge was a difficult economic environment characterized by raging inflation. In 1975, he reported that, “prices on casings and forgings are 145 percent of a year ago; electricity, 157 percent. Price inflation is always coupled with material shortages – material delivery lead times are twice as long as year ago.” Inflation and the energy crisis in the 1970s also affected the cost of energy for factories and offices. Carrier spent over \$200,000 to drill two natural gas wells at the Jeannette site in 1977. These wells provided two-thirds of the factory’s energy needs during peak-use periods.

By the late 1970s, Carrier’s Elliott Company division was competing throughout the world against aggressive global and regional competitors. Elliott relied heavily upon international sales. Mr. Fives described the challenges Elliott faced in 1979:

“At the present time the global turbomachinery market is as competitive as I’ve ever seen it. As little as four or five years ago, we very seldom had to worry about competing with foreign compressor or turbine manufacturers in our specialty fields – particularly right here in America. This is no longer true. The Japanese, Germans, Swiss and Italians are vigorously competing with us at every turn. And when you add our tough American competitors to this list, you may begin to appreciate what a ‘no holds barred’ selling situation we face at the present time. As we enter 1979, Elliott Company finds itself in a brand new competitive contest.”

Frank Fives retired as President of the Elliott Company division of Carrier Corporation in 1979. He had worked in Jeannette for 20 years. Looking back on his years as President, he noted the company’s many accomplishments. Bookings and revenue had quadrupled, employment had increased 60 percent to 3,800, and Elliott produced over 16 percent return on sales for Carrier. Manufacturing space in Jeannette had increased by 1.5 million square feet (140,000 square meters). Elliott was a leader in high-pressure barrel compressors and the world’s leading supplier of large, high-pressure refrigeration compressors used in ethylene and LNG plants. Elliott equipment was in service in 90 countries. Elliott had pioneered single- and multi-stage power recovery expanders and was a major supplier of these machines in FCC service. The tools operation in Springfield was healthy and had booked its largest order ever in 1977. Nonetheless, he cautioned that, “Our new apparatus sales are not nearly what we’d expected them to be in 1978. Global inflation and lack of a clear national energy policy are just some of the many causes.”

Mr. Fives’ concerns would soon become major issues for Elliott’s new owner. In 1979, United Technologies Corporation – UTC – acquired Carrier Corporation.



