# **Part VIII:** United Technologies and a New Future



Dear Shareowner:

It's time American business did something about annual reports that each year get thicker, more expensive, harder to read or understand, and less helpful to investors.

This year, as an experiment, we've done something. This report does two things: On the opposite page it gives the information people want most, along with a brief description of what our company does. The following pages give solid financial facts and figures, including the detailed data required by the government.

1979 was a good year. Sales and earnings set records. We closed the year with the largest backlog of business we've ever had. With the addition of Carrier Corporation, our company joined the top 20 U.S. manufacturing companies. Late in the year, we acquired Mostek Corporation, a semiconductor company. In the closing days of 1979, we elected Alexander M. Haig, Jr., President and Chief Operating Officer of United Technologies. Mr. Haig retired from the U.S. Army last summer as Supreme Allied Commander

We're working hard to make 1980 a good year, too. We're

aiming for \$20 billion in annual sales by the end of 1985. Thanks to all who have helped us do so well.

Sincerely,

Harry Sthay

Chairman and Chief Executive Officer Harry J. Gray February 4, 1980



# **Part VIII:**

United Technologies and a New Future

From the 1960s into the 1980s, American businesses created a large number of conglomerates in the United States. A conglomerate is a corporation made up of several different, often unrelated businesses. One reason for creating a conglomerate is to reduce the risks of operating in a narrow market. Should one business turn sour, other businesses in more successful markets will help to maintain the parent's bottom line.

Experience came to show that conglomerates could become too diversified and complicated to manage efficiently. After their popularity peaked in the 1980s, many conglomerates reduced the number of businesses they managed through divestitures and spin-offs.

One company that broadened its business portfolio in the 1970s was United Technologies. The historical core of United Technologies was United Aircraft & Transport Corporation, created in 1929 through the merger of the Boeing Airplane Company, Pratt & Whitney, Sikorsky Aircraft and Hamilton Standard. In 1934, United Aircraft & Transport broke up into three independent companies: Boeing; United Airlines; and United Aircraft.

United Aircraft maintained its focus in the aerospace industry into the 1970s. In 1975, United Aircraft changed its name to United Technologies Corporation (UTC). The next year, UTC acquired Otis Elevator, and in 1979, UTC purchased Carrier Corporation and Mostek, a manufacturer of integrated circuits. As a division of Carrier, Elliott became part of UTC.

In 1979, UTC had more than 190,000 employees and 280 plants worldwide. It was the twentieth largest U.S. company, with \$9 billion in sales. UTC's primary businesses and products included Pratt & Whitney aircraft engines; Sikorsky helicopters; Norden military electronics; Otis elevators; equipment for aerospace, automotive, medical, and scientific applications; electrical power transmission controls; rocket propellants and propulsion systems; and its Power Group, which made gas turbines for utilities and compressor drives for oil and gas fields.



# Fitting into UTC

UTC was more interested in Carrier's air conditioning and refrigeration business than the Elliott turbomachinery products. UTC moved Carrier into its Building Systems Group with Otis Elevator, and placed Elliott products in the Power Group.

Frank Fives was succeeded by T. Stephen Melvin as President of Carrier's Elliott Company division. Mr. Melvin had most recently served as Vice President of Operations for UTC's Hamilton Standard division. In August 1981, Carrier created a new entity, Elliott Turbomachinery Company, Inc. In December of that year, Carrier transferred all of the stock in the newly created Elliott Turbomachinery Company to UTC. Elliott replaced Carrier's "Crimson C" with UTC blue, and the "upswept e" symbol was brought out of retirement to be used with a new Elliott theme line, "GO for #1."

Despite weak market conditions, Elliott recorded several noteworthy sales following the UTC acquisition. In 1981, it received orders for three ethylene plants, including six compressors for a large plant in Saudi Arabia that would produce five million tons per annum. Another order that year for a new refinery included three axial compressors for FCC air, five centrifugal compressors, five steam turbines, and a PAP PLUS. Elliott sold more YR turbines in 1981 than in any year since 1971.

The first multi-stage YR steam turbine was introduced at the Turbomachinery Symposium in 1981. The 6-stage MYR turbine was designed to fill a gap in the Elliott turbine line between the single-stage YR frame and the E-line turbine line. Elliott also successfully tested the first D-frame PAP PLUS in the fall of 1981. This was the largest Elliott plant air machine built at that time.

As a division of Carrier, Elliott's sales had peaked in 1978. They fell 10 percent in 1979 and another 7 percent in 1980. After his arrival at Elliott in 1979, Mr. Melvin commented:

"The present, and hopefully brief, business slowdown gives us needed time to make strategic midcourse corrections... Synergism between Elliott and UTC – similar technology in aerodynamics, thermodynamics, metallurgy and controls – will help us 'leap frog' competition. We expect that our service business will give us the immediate financial strength we'll need to operate until our improved product innovations, procedures and manufacturing techniques have us in 'high gear'... There is no doubt that we face real problems today."

Some of the issues affecting the Elliott division's business were internal, others a consequence of upheavals in the world. The Jeannette plant was struggling to reduce lead times and costs, and to ship on time. At the same time, world markets were shaken by events in the Middle East. An Islamic revolution in Iran in 1979 ousted the ruling Shah and raised doubts about the future of Iran's oil production. Then the following year, Iraq, also a major oil producer, invaded neighboring Iran, sparking a war that dragged on for eight years. Oil prices soared to record highs. The high prices led to a reduction in demand and gave momentum to energy conservation trends. Oil prices soon began an extended decline. Exploration and production became less economical, leading to the shutdown of many refineries. The number of U.S. refineries fell by one-third over a period of five years. The decline led to reduced revenues for Elliott and resulted in operating losses from 1981 through 1987.

Stephen Melvin returned to UTC in 1982, and Gordon A. Titcomb was named as his replacement. Mr. Titcomb left Elliott after only a few months and was replaced by Terry D. Stinson, who had been president of UTC's International Support Systems Group.







# Service comes together

UTC's acquisition of Carrier eventually resulted in the creation of a new Elliott service operation. Several transactions occurred as different service operations were consolidated under the new Elliott Turbomachinery Company, Inc.

Responsibility for Elliott field service activities and service parts shifted in 1979 from ETSCO to a new Carrier subsidiary, Elliott Service Company, and in 1981 Elliott Service Company was transferred to Elliott Turbomachinery Company. Power Services and its U.S. service shops in Houston, New Orleans, Jacksonville and Donora were also transferred in 1982 to Elliott Turbomachinery Company. Elliott Turbomachinery Company created a new service division, Elliott Support Services (ESS), in 1983 with responsibility for all service-related activity – parts, field service and repair shops.

In 1980, Carrier's Elliott division negotiated a Total Service Program with the U.S. Navy to repair Elliott equipment supplied to the Navy – blowers, superchargers, PAPs and auxiliary turbines. This was part of a Navy program to obtain higher quality repair services with more dependable delivery than it was getting from Navy shipyards and independent repair shops. Elliott's first repair delivery in 1981 was four horizontal blowers for the USS Shreveport, an amphibious assault landing ship. The Navy had installed 80 of these blowers on 15 ships. The Navy was delighted when Elliott inspected, repaired and shipped these first units only four months after receipt, and they were reinstalled and started up without any major problems. The USS Shreveport was able to leave the shipyard ahead of schedule.

Elliott Turbomachinery Ltd. opened a new service shop in the United Kingdom in 1982. As a result of the decline in new equipment orders, the J. Samuel White plant on the Isle of Wight closed in 1981. The weakening business environment also resulted in the closure of Elliott's factory in Brazil that same year and contributed to the eventual bankruptcy of Beloit, Elliott's manufacturing licensee in Canada. After the White plant shut down, the spare parts and business operations moved to the town of Basingstoke, about 50 miles southwest of London. Almost from the beginning, there was a small repair business in Basingstoke. Limited space for expansion and continued growth in the Europe, Middle East and Africa service region led to a move to the current large shop on the west side of Basingstoke in 1987. The next year, Basingstoke became the first Elliott service facility to be certified to the new ISO 9000 Quality Assurance System.

In North America, a new full-service shop was set up in Los Angeles, California in 1983; the shop closed in 1992. A second California shop opened in Benicia in 1987 to service equipment in the oil refineries and chemical plants around San Francisco Bay. Another new shop opened in Burlington, Ontario, Canada in 1988, replacing the Elliott Industrial Equipment Canada office in Brampton, Ontario. Burlington borders on Hamilton at the western end of Lake Ontario, a 30 minute drive from Toronto. The shop location was convenient to support the eastern Canadian steel industry and surrounding refineries, including Shell, Petro-Canada and Imperial Oil.







## Management buyout

Elliott's business shrank significantly in the mid-1980s. Revenues in 1984 were nearly 20 percent less than when UTC acquired Carrier in 1979. The next year they declined to their lowest level in ten years. The tool business in Ohio was also suffering. The Springfield plant was closed in 1987 and operations were consolidated in Dayton at the former Wiedeke plant.

Paul R. Smiy replaced Terry Stinson as President of Elliott Turbomachinery Company in July 1986. Mr. Smiy had begun his career at the original Elliott Company as a messenger in the mailroom shortly after graduating from Jeannette High School in 1941. Aside from three years in the U.S. Army during World War II, he had worked no where else. When he returned from the war, he rejoined the company as a scheduling clerk, a union position. After moving into the salaried ranks as Equipment Process Engineer, he advanced over the years through a number of positions, primarily in manufacturing. Mr. Smiy was Vice President of Operations when tapped to succeed Terry Stinson as President of Elliott Turbomachinery Company.

Shortly after assuming his new role as President, Mr. Smiy learned that UTC had determined that Elliott did not fit into the company's future plans and would be sold. UTC already had a potential buyer whose primary interest was in Elliott's service business. Mr. Smiy persuaded UTC to allow him and his management team to make an offer for the company. UTC agreed and even helped the Elliott executives to arrange financing with Citicorp, a New York bank, for a leveraged buyout. In November 1987, this investment group completed the purchase of Elliott Turbomachinery Company from United Technologies. Shares in the company were divided among the Elliott management, Citicorp, and MAN-GHH. MAN-GHH was a German turbomachinery company and a subsidiary of the MAN Group, a \$10 billion German industrial firm. Paul Smiy was the Chairman, President and Chief Executive Officer.

Two years later, Citicorp announced that it had decided to sell its interest in Elliott. The Elliott management team again had to put together an offer quickly. The management group succeeded in arranging new financing and bought out Citicorp. MAN-GHH provided new investment capital, as did a new investor, Ebara Corporation. Elliott's relationship with Ebara extended back to 1968 when Ebara obtained a license to build Elliott equipment in Japan. The two companies had worked closely together for more than twenty years. When the new capitalization plan was completed, Elliott management owned 55 percent, and Ebara and MAN-GHH owned 22.5 percent each. The Elliott managers used some of their shares to create an employee stock ownership plan. This plan gave all employees the opportunity to own shares in Elliott.

The buyout in 1987 required a drastic restructuring of the company. Employment at Elliott fell from 1,800 in 1986, before the management buyout, to 1,400 afterward. It wasn't long before many of those jobs returned.





#### A promising new start

There could hardly have been a better time for Elliott to emerge as an independent company. As Elliott's management completed the buyout from UTC, an unanticipated ethylene boom gathered steam in many parts of the world and resulted in substantial new orders. Paul Smiy described 1990 as, "a great year. We exceeded the plan for bookings and shipments. There have been very encouraging changes lately, which are returning this company to financial stability."

Elliott took advantage of this good fortune to consolidate operations and to make needed investments in the Jeannette factory. Production operations in Jeannette were grouped into new manufacturing cells, and more than \$1 million was spent on new machine tools. The Scranton plant was closed, and a new fabrication shop was constructed in Jeannette to handle the work previously done there. Service Parts manufacturing and its warehouse also moved from Scranton to Jeannette, and Oil Systems moved back to Donora. All PAP operations – marketing, engineering and manufacturing – were consolidated into a new factory in Buildings 34 and 45. Elliott's Board of Directors more than doubled the 1991 capital budget \$11.3 million.

Ronald D.V. Turner was promoted in 1991 from Chief Financial Officer to President and Chief Operating Officer. Paul Smiy remained Chairman of the Board and Chief Executive Officer.





#### Moving forward in a tough market

Revenues reached an all-time high in 1992, but it became apparent that the ethylene bubble of the late 1980s had collapsed. Bookings fell significantly short of plan in 1993.

The Ohio operation, now called the Industrial Tool Division, was hit hard by the growing economic downturn. To build market share, in 1992 the Tool Division purchased the Tubemaster line of boiler tube maintenance tools. Elliott rented these tools to customers in hopes of subsequently selling its traditional products. Also that year, the Tool Division acquired Harris Tube Service of Salt Lake City. The Dayton plant, founded by Gustav Wiedeke in 1892, celebrated its 100th anniversary. The manufacturing operations of the Tool Division relocated in 1994 to a new facility in Columbus, Ohio, although administrative and support functions remained in Dayton. But business remained soft, and in November 1996, Elliott sold the Industrial Tool Division to the division's managers. This had been the original Elliott product line, built upon William Swan Elliott's patents from 100 years earlier.

Affairs in Jeannette were not quite so dire. The market was weaker, but Elliott was still winning major orders. Contracts came from Reliance Industries in India for an ethylene plant, as well as from Saudi Arabia Petrochemical Company and Liao Yang Petrofiber in China. Elliott shipped the first centrifugal compressor in the U.S. with magnetic bearings and dry gas seals to an oil refinery. An existing Elliott compressor at the same refinery was also retrofitted with magnetic bearings and dry gas seals.

Elliott organized operations into strategic business units in 1992 to better coordinate marketing, sales and production – Engineered Products for compressors and turbines; Industrial Products for YR turbines and turbochargers; Oil Systems; and Service Parts. Engineered Products received certification to ISO 9001 Quality System Standards in December 1992; Industrial Products and Oil Systems were similarly certified two months later.

Ebara and Elliott began a series of semi-annual technical meetings to exchange information on current projects and research and development programs. The spring meetings were held in Tokyo, the autumn meetings in Jeannette. In 1993, the two companies marked the twenty-fifth anniversary of Ebara's license to manufacture and sell Elliott products and celebrated 25 years of friendship and cooperation at a ceremony in Haneda, Japan.

In the mid-1990s, Engineered Products launched the EDGE project to improve the performance of its multi-stage centrifugal compressor line with the latest in aerodynamic technologies, while reducing costs and lead-time. At the outset, Elliott's typical cycle times were ten to twelve months. The new EDGE technology allowed Elliott to supply a machine in six months. The EDGE project not only cut manufacturing cycle times, but also improved aerodynamic performance, reduced power consumption, increased process flexibility and reduced capital cost. This new technology received wide acclaim within the industry and was featured in CompressorTech magazine. The first EDGE compressors were built for Shell in 1998. Today, Elliott's scalable compressor designs are based upon EDGE technology.

PAP sales set a record in 1996 with nearly 200 units sold. The strong sales were the result of a redesign of four of the five frame sizes so that they were more efficient and cheaper to build. More than 50% of these units were shipped to customers overseas.

Elliott booked its largest order in many years in 1995, with a \$65 million contract for a project in Qatar in the Persian Gulf. The order was for a refrigeration train of two strings of large compressors for the Ras Laffan LNG Project. The contract required a full-load test in Jeannette of both strings using their gas turbine drivers. The contract also included an option for a second, duplicate train, with the prospect of additional trains in the future. Over the next several years Elliott won orders for five trains of equipment for what came to be called RASGAS.



#### New tools and new test stands

The Board of Directors of Elliott Turbomachinery Company approved an \$8 million expansion of the Jeannette test floor in 1993. The new facility was 120 feet long and included five new test stands over a 34-foot deep pit. In 1994, the Board approved an additional \$60 million, six year capital budget. The capital improvement program, which came to be called Factory 2000, was a demonstration of the ownership group's commitment to the long-term future of the company.

The next major purchase was an \$8 million Ingersoll Masterhead Machining Center for installation in the Jeannette factory. Weighing more than 435 tons, this was the largest machine tool ever purchased by Elliott. Its 255 interchangeable cutting tools would be used to layout, mill, drill and bore M-line compressor and steam turbine casings. A year later, Elliott spent \$4 million dollarS to buy a large Ravensburg lathe for drilling, grinding, turning and milling operations on rotors. These sophisticated tools reduced production times and improved productivity. Major upgrades and overhauls were also made to several other machine tools in the plant.

The pending full-load performance test of the Ras Laffan LNG strings required an additional \$5.2 million expansion of the test floor in 1996. To support operation of the gas turbine drivers Elliott installed a two-mile long, high-pressure gas line, switchgear and a 25 kV electrical line to power the 10,000 HP starter motors, and upgrades to the cooling tower and cooling water system to handle the heat load from the 90,000 HP test. Over five years, Elliott spent \$13 million to upgrade the test floor in Jeannette. The first full-load gas turbine string test was completed successfully in July 1997.

Another major new machine tool was added in 1998 with the installation of a \$7.5 million Ingersoll Mill-Turn Machining Center, the first of its kind in the U.S. The machine performed multiple milling and turning operations on diaphragms and endwalls with a single set-up. A three-pallet shuttle system allowed additional set-ups to be made while parts were being machined. Also in 1998, a new YR factory brought together manufacturing and office personnel in Building 48. A new high-speed rotor balancing facility opened in Jeannette in 1999. Equipped with a large vacuum bunker, the facility was used to balance compressor and turbine rotors at speeds up to 30,000 rpm.





# Turbocharger service

Elliott changed its approach to the turbocharger market in the 1990s. As the industry matured, sales to original equipment manufacturers peaked, and foreign manufacturers entered the U.S. market. Elliott looked to service and repairs to offset declining new equipment sales. Turbochargers are subjected to tremendous punishment. They operate on hot, dirty diesel exhaust gas. If an engine throws a valve or bolt, it generally goes right through the turbocharger.

In 1993, Elliott bought Turbine Specialties Inc. (TSI) of Salina, Kansas. TSI repaired and overhauled turbochargers for large bore diesel engines at its shops in Salina and in Harvey, Louisiana. Another repair company, American Diesel Engineering of Yorktown, Virginia, was acquired in 1994. TSI added repair shops in Guatemala in 1997 and Pompano Beach, Florida in 1999. The service operations were combined in 1998 into a new entity, Elliott Turbocharger Group, Inc., headquartered in Salina. The Salina facility celebrated its 20,000th turbocharger repair job in November of that year. Revenues for the group peaked in 1999.





#### Service expansion

The 1990s saw a major expansion of Elliott's service network. The Swiss service office moved in 1989 from Zurich to Altendorf, a small town on the southern shore of Lake Zurich. The office supported Elliott's Field Service and Service Sales operations for more than 60 countries in the EMA region.

In the United States, a dedicated on-site services group was created in the early 1990s to manage maintenance, repairs and installations at customer sites. One of the group's first major projects involved the disassembly of a power station at a geo-thermal plant in California, including two large Elliott turbine generators. Several Elliott shops reconditioned the equipment before the entire plant was shipped to New Zealand and re-assembled there by the Elliott team. In 1996, Donora became the base for field service operations covering the Americas and Asia.

New repair shops opened in Europe, Asia, Canada, and Central America, as well as in the U.S. The expansion resulted in a true global service network, capable of supporting customers in the major industrial regions where Elliott equipment was concentrated and unique among turbomachinery manufacturers. The Elliott shops were equipped to repair virtually any type and make of rotating equipment, including steam and gas turbines, centrifugal and axial compressors, turbochargers, blowers, and fans.

A new shop opened near Chicago, Illinois in 1990, serving the many industrial customers around Lake Michigan. The Elliott shop in Donora, Pennsylvania had previously supported this region, but distance – 500 miles – was an obstacle to winning many jobs. The Chicago shop was busy from the very beginning. By 2000, it had outgrown its space and relocated to its present site in Crown Point, Indiana, 35 miles southeast of Chicago. Approximately 60% of the shop's business today is the repair of Elliott equipment; the balance of the work is on non-Elliott machines.

A second European shop opened in 1992 in La Spezia, Italy, located on the northwest coast midway between Genoa and Pisa. La Spezia offered convenient access by sea, land and air for customers' equipment from throughout the Mediterranean and the Middle East. The new shop received ISO 9002 certification in 1993, only five months after opening.

The shop in Burlington, Ontario, Canada received ISO 9002 accreditation in 1994, the first North American shop to achieve the certification. In the next few years, all Elliott service shops became ISO-certified. A second Louisiana shop opened in 1993 in Baton Rouge, the capital and second-largest city of the state. The new shop was located adjacent to the Dow Chemical plant in Plaquemine, Louisiana, one of the largest chemical plants in the United States. The Baton Rouge shop included a large, climate-controlled rotor storage facility.

Ebara and Elliott joined forces in 1994 to open a full-service repair shop in Taichung, Taiwan called Ebara-Elliott Service (Taiwan) Company. Much of the shop's work was weld repairs, as well as overhauls and replacement of impellers, buckets and seals. At first, jobs came primarily from the domestic market, but in time, customers were drawn from throughout Southeast Asia and as far away as the Middle East.

Elliott acquired a second Canadian shop in Edmonton, Alberta in 1999, replacing a contract shop in Calgary. Edmonton was centrally located to Elliott's customers in the Alberta oil fields. The shop building, located in Edmonton's "refinery row," was previously the home of the Edmonton Soccer Association. Elliott renovated the building and outfitted it with all of the equipment required of a modern repair shop, including one of the largest lathes in Western Canada.



## The end of an era

Paul Smiy's long career at Elliott came to a close in 1998. Mr. Smiy had started at the original Elliott Company fifty-seven years earlier. He had seen Elliott's ownership transition several times. The company that hired him in 1941 was controlled by the Elliott family. In 1957, Carrier Corporation acquired Elliott Company, and in 1979 Carrier in turn was acquired by United Technologies Corporation. In 1978 Mr. Smiy engineered the buyout of Elliott Turbomachinery Company from UTC with the financial backing of Ebara Corporation and MAN-GHH, taking the company private. He worked under nine presidents before obtaining that title himself.

Paul Smiy's retirement coincided with another change in ownership. In 1998, Ebara Corporation and MAN-GHH exercised their options to buy out the shares of the management investors and the 1,600 other employee shareholders. When Mr. Smiy departed as Chairman Emeritus, the Japanese and German corporations each owned 50 percent of Elliott Turbomachinery Company, Inc.

