

ARCHIVED REPORT

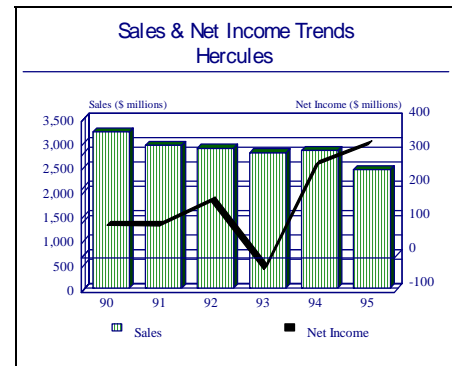
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Hercules - Archived 7/97

Outlook

- In March 1995 Hercules Aerospace was sold to Alliant Techsystems for \$300 million in cash and 3.86 million in Alliant shares
- Following this sale, Hercules has effectively exited the defense business



Headquarters

Hercules Inc
910 Market Street
Wilmington, DE 19899
Telephone (302) 594-5000

Hercules Incorporated is a worldwide supplier of a broad line of natural and synthetic materials, products and related systems. Since its beginning in 1913, its fundamental strength has been technology. The company is the principal producer of most of the products it sells. Through its three world companies — Hercules Specialty Chemicals Company, Hercules Aerospace Company and Hercules Materials Company — the firm serves eight business segments. The company has nearly 100 worldwide production facilities, including subsidiaries and affiliates. About 40 are located in the United States. Hercules' US government contracts are largely for rocket motors and rocket fuels.

In March 1995, Hercules completed the sale of Hercules Aerospace Company to Alliant Techsystems. According to Hercules, the aerospace operation is an excellent business, but an overall awkward fit with Hercules' five franchise chemical operations. Even though Hercules Aerospace is now a part of Alliant Techsystems, Hercules retains a 30 percent ownership in the combined company. Richard Schwartz, former president of Hercules aerospace, is now president and chief executive officer of Alliant Techsystems.

Hercules employed 7,892 at the beginning of 1996. The stock is traded on most US exchanges and on the London and Swiss exchanges, under the trading symbol "HPC." The company auditors are Coopers & Lybrand.

Structure And Personnel

MANAGEMENT EXECUTIVES

Thomas L. Gossage
Chairman of the Board and Chief Executive Officer
R. Keith Elliot
President and Chief Operating Officer

Vincent J. Corbo
Senior Vice President, Technology

Robert J.A. Fraser
 Group Vice President and President Hercules Food &
 Functional Products Company
 C. Doyle Miller
 Group Vice President and President, Hercules
 Chemical Specialties Company
 Michael B. Keehan
 Vice President and General Counsel
 George MacKenzie
 Vice President and Chief Financial Officer
 Vikram Jog
 Controller

Jan M. King
 Treasurer
 Israel J. Floyd
 Secretary and Assistant General Counsel

Product Area

The company currently operates its business through three major groups: Chemicals, Food & Functional Products, and Aerospace. The segments associated with these groups are listed below.

1. Chemical Specialties
 - 1.1 Paper Technology
 - 1.2 Fibers
 - 1.3 Resins
2. Food & Functional Products
 - 2.1 Aqualon
 - 2.2 Food Gums

Aerospace (*sold to Alliant Techsystems 3/95*)

Advanced Materials and Systems Group
 Aerospace Group
 Government Owned, Hercules Operated Plants
 (two plants)
 Composite Products
 Global Environmental Solutions, Inc

Aerospace. The Aerospace business was principally in the design, development and manufacture of high-technology products such as solid rocket motors, electromechanical, electrical equipment and smokeless powders for the defense, recreation and space industries. The company also managed government-owned facilities.

Facilities

The operations units of Hercules Aerospace Company generate the bulk of this firm's aerospace and defense work. The Aerospace Company operates in five markets or product areas: propulsion systems, filament windings, carbon fibers, composite structures and GOCO operations. In some cases a facility or location serves several markets with a variety of related products. These operations are now owned by Alliant Techsystems.

Eastern Region

Hercules Aerospace Co, Allegheny Ballistics Laboratory, PO Box 210, Cumberland, MD 21502. This facility produces tactical motors, gas generators, composite structures, and filament windings, and does testing and hazards analysis.

Radford Army Ammunition Plant, Radford, VA. Telephone 703-639-7631. This is a government-owned, Hercules-operated GOCO plant specializing in the production of rocket motors, propellants, propellant raw materials and explosives.

Hercules Simmonds Precision Products Inc, 150 White Plains Road, Tarrytown, NY 10591. This unit produces aircraft performance measurement systems and instrumentation, fuel gauging and engine instruments, engine ignition systems and instrumentation, flight control systems and related actuators, and conduit hose and related fittings.

Hercules Aerospace Company lists a plant in Kenil, NJ, that is associated with missile and/or ordnance manufacturing.

Hercules Aerospace Co, Missiles, Ordnance and Space Group, Hercules Plaza, Wilmington, DE 19894. Headquarters for the Missiles, Ordnance and Space Group.

Hercules Aerospace Co, Rocket City, West Virginia, is a tactical missile manufacturing plant.

Hercules Defense Electronics Systems, 13133 N 34th St, PO Box 4648, Clearwater, FL 34618. Telephone (813) 572-1900. This operation produces EW systems, missile seekers, sensors, and electro-optic missile warning systems.

Central Region

Sunflower Army Ammunition Plant, Lawrence (Des-oto), Kansas. This is another government-owned, Hercules-operated GOCO plant that produces rocket motors, propellants and nitroguanidine products.

Western Region

Hercules Aerospace Co, Aerospace Division, PO Box 548, McGregor, TX. This facility produces tactical motors, gas generators, ordnance items, energetic chemicals, welded and machined hardware and tooling equipment.

Hercules Aerospace Co, Composite Products Group, PO Box 98, Magna, UT 84044. Also known as the Bacchus Works, this facility makes strategic missile motors, spacecraft motors, carbon fibers, composite structures, filament windings, ordnance items and chemical lasers.

Hercules Aerospace Company has a plant listing at Clearwater, UT. It is probably a supplier to the Magna plant.

Corporate Overview

Following the divestiture of its aerospace business, Hercules will now concentrate on expanding its global presence in Food & Functional Products and Chemical Specialties. In 1994, the company derived about 39 percent of its revenues from Chemical Specialties, 34 percent from Food & Functional Products, and 27 percent of its revenues from Aerospace.

New Products and Services

No major new defense products were announced by Hercules in the past two years.

Plant Expansion/Organization Update

Hercules Reorganizes. In December 1993, as part of reorganization effort, Hercules Materials Company was dissolved. Absorbent & Textile products were transferred to Hercules Chemical Specialties Company; Electronic & Printing Products was transferred to Hercules Food & Functional Products Company; and Composite Products was transferred to Hercules Aerospace Company. Concurrent with this reorganization, Hercules announced that Packing Films and Liquid Molded Resin would be sold.

Settlement Reached on SMRU. In April 1993, the US Government reimbursed Hercules in excess of \$200 million for up-front investments related to development of the USAF's Solid Rocket Motor Upgrade (SMRU). Payment was made through program prime Martin Marietta. Hercules is the main subcontractor on the \$900 million program. Hercules has completed the fifth and final static test of the booster and delivery of a flight ready version was to be expected in 1994.

Global Environmental Solutions Formed. In 1993, Hercules formed an independent Subsidiary, Global Environmental Solutions Inc, to take advantage of demilitarization opportunities. The new company is dedicated to the disposal and environmental cleanup of

energetic materials such as propellants, explosives, and pyrotechnic devices.

Mergers/Acquisitions/Divestitures

Alliant Acquires Hercules Operations. In March 1995, Alliant officially completed its plan to acquire Hercules Aerospace for \$300 million in cash and 3.86 million shares of newly issued Alliant stock. Included in the transaction are the following: Space and Strategic Propulsion, Composite Structures, Tactical Propulsion, Ordnance, Hercules Defense Electronics Inc and Global Environmental Solutions Inc. They employ approximately 5,700 people at facilities in seven states. The combined Alliant and Hercules aerospace operations would have approximately \$1.4 billion in sales and 10,500 employees. Following the issuance of shares, Hercules will hold approximately 30 percent of Alliant's common stock. Alliant said that following the close of the transaction, it will initiate a stock repurchase program aimed at recouping the 3.5 million shares issued as part of the acquisition. As a final part of the agreement, Hercules will hold two of the eight non-employee seats on the Alliant Techsystems board of directors.

Teaming/Competition/Joint Ventures

BAT International. During 1993, Hercules Composite Products formed a joint venture with BAT International SpA and established a new company in Leoni, Italy, called Tecnologie d'Avanguardia e Materili Avanzati SpA (TAEMA). TAEMA designed and manufactured composites structures for European transportation, construction, and industrial market segments.

Du Pont. In June 1992, Hercules and Du Pont announced that they had teamed to develop, manufacture and market composite parts based on thermoplastic fiber placement technology for aerospace and naval applications.

Fluor. Also in June 1992, Hercules and Fluor teamed to provide weapons disposal services to the US and foreign

governments. Specifically, the joint operation was in charge of disposing of treaty banned, obsolete or defective non-nuclear explosives, chemical and conventional munitions and rocket motors, as well as restoring sites contaminated with energetic materials. Under terms of the Memorandum of Understanding signed between the two companies, the agreement is nonexclusive and was applied on a project-by-project basis.

Rheinmetall. Rheinmetall GmbH of Germany and Hercules signed a cooperative agreement in early 1992 covering the joint development and production of insensitive propelling charges for field artillery. Activities are based on the work already performed by Rheinmetall, with its MTL5 155-mm modular charge systems, and by Hercules on low-sensitivity powders. The new joint charge system was called UNIMOD.

Atlantic Research. The US Air Force in August 1987 awarded the joint venture of Atlantic Research and Hercules a \$22.3 million contract to develop and demonstrate a flight-ready Variable Fuel Flow Ducted Rocket Ramjet engine. (See PROGRAM ACTIVITY section.)

Refractory Technology Aerospace Components. Hercules Incorporated and Rohr Industries formed a joint venture

to research, develop and manufacture aerospace components made from ultra-high temperature materials such as carbon-carbon composites. Activities take place at Magna, UT, and Chula Vista, CA. The Company's name is Refractory Technology Aerospace Components (RTAC) and is equally owned by the firms.

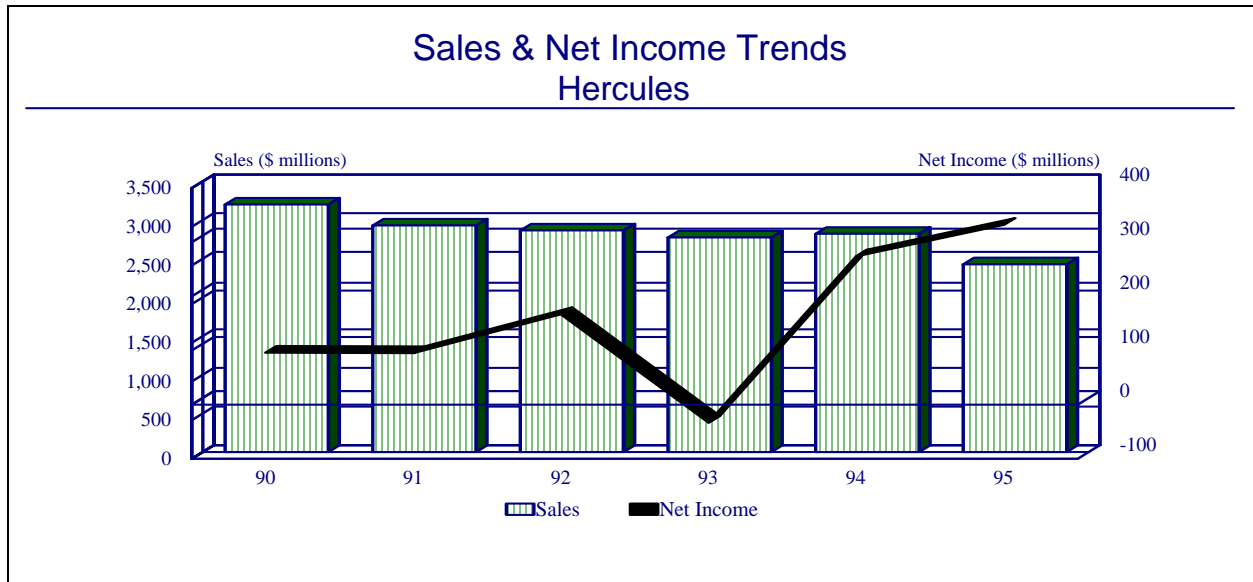
Pegasus. Hercules teamed with Orbital Sciences Corporation for the Pegasus Program. Pegasus is an air-launched vehicle for delivery of space payloads. It was successfully tested in 1989 and is now available for launch services. In 1990, Hercules Aerospace Company, Orbital Sciences Corporation, and Arianespace of Europe announced a preliminary agreement to market the Pegasus air launch booster in Europe. The parties would evaluate other cooperative activities.

Tastemaker. Tastemaker was formed in 1992 as a joint venture partnership combining the Hercules flavor business with that of Fries & Fries, a unit of IM-CERA. Tastemaker's product line ranges from flavors for beverages, sweet goods, savorys, and confectionery to essential oils.

Financial Results/Corporate Statistics

Hercules net sales for 1995 totaled \$2.4 billion, compared to \$2.8 billion in 1994. The company posted net income of \$332.7 million compared to \$274.1 million in 1994. The loss in 1993 was attributed to the adoption of SFAS No. 106 which resulted in a \$238 million charge. The increase in income for 1992 was due to the continuation of the company's cost management programs, which resulted in a decrease in selling, general and administrative, and research and development expenses. The latest full-year statistics are given below. Note that the Alliant transaction occurred in March 1995 and had no effect on 1994's figures. Percent Govt figures reflect roughly three months of Aerospace operations.

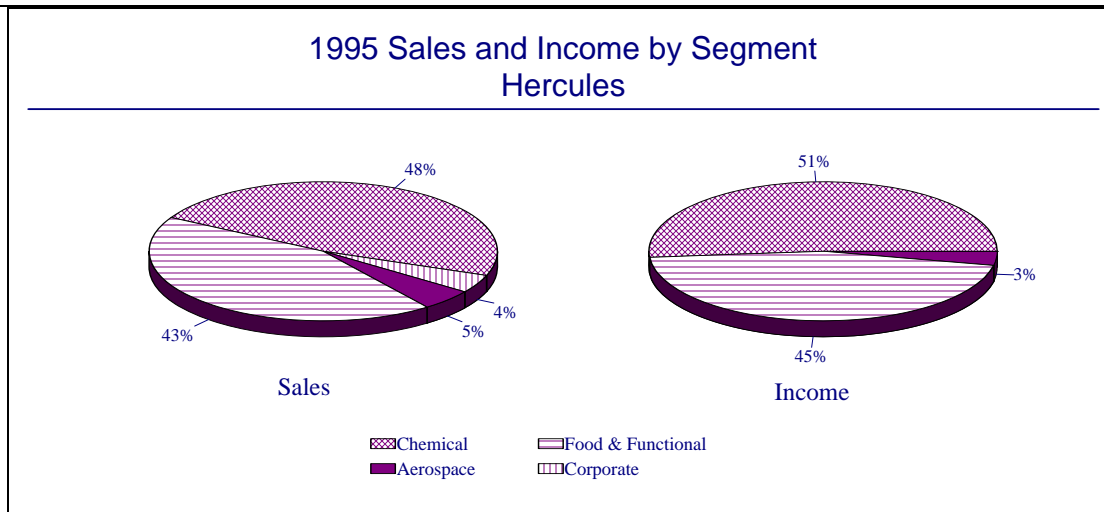
Y/E December 31	1990	1991	1992	1993	1994	1995
(\$ millions)						
Net Sales	3199.9	2928.9	2864.9	2773.4	2821.0	2427.2
Percent Govt(e)	24.0	20.0	24.0	26.0	26.0	5.0
Net Income	96.0	95.0	167.9	-33.4	274.1	332.7
R&D Expenditures	-	-	70.2	76.1	64.8	59.0



Industry Segments

A breakdown of Hercules' sales and operating income by major market segments for the past four years is given below. Aerospace results reflect operation through March 14, 1995.

SALES	1991	1992	1993	1994	1995
(\$ millions)					
Chemical Specialties	1016	1023	976	1081	1154
Food & Functional Products	940	865	867	945	1046
Aerospace	795	797	754	743	123
Corporate & Other	178	180	176	52	104
TOTAL	2,929	2,865	2,773	2,821	2,427
OPERATING INCOME	1991	1992	1993	1994	1995
(\$ millions)					
Chemical Specialties	117	162	149	197	211
Food & Functional Products	112	109	113	148	187
Aerospace	-10	52	105	98	13
Corporate & Other	-32	-79	-59	-24	-48
TOTAL	187	244	308	419	363



Strategic Outlook

With the sale of its aerospace business to Alliant Techsystems complete, Hercules has effectively exited the defense business. As such, this report will be dropped from the service and will no longer be up-dated.

Prime Award Summary

Prime awards for the past five years are given below.

Zeros indicate no awards or contracts for less than \$50,000. Dashes indicate data not available. Data for 1995 is detailed in the Alliant Techsystems report.

(\$ millions)	1990	1991	1992	1993	1994
AIR FORCE	122.4	84.6	11.4	42.6	3.4
ARMY	315.9	294.8	203.7	149.8	77.6
ARMY CORP OF ENGINEERS	0.0	0.0	0.0	3.6	1.3
DEF LOGISTICS AGENCY	0.8	0.1	0.0	0.0	0.0
DEF NUCLEAR AGENCY	0.6	0.0	0.0	0.0	0.0
NASA	6.9	3.9	3.4	2.9	4.5
NAVY	40.9	19.4	89.0	49.9	73.5
VETERANS ADMINISTRATION	0.9	0.0	0.0	0.0	0.0
TOTAL	488.4	402.8	307.5	248.8	160.3

EASTERN REGION

Rocket Center, WV

(\$ millions)	1990	1991	1992	1993	1994
ARMY	19.6	1.9	0.8	1.7	0.7
NAVY	0.6	1.1	3.4	17.5	32.3
TOTAL	20.2	3.0	4.2	19.2	33.0

WESTERN REGION

McGregor, TX

(\$ millions)	1990	1991	1992	1993
ARMY	0.0	0.0	0.0	1.0
NAVY	30.7	16.2	52.7	13.3
TOTAL	30.7	16.2	52.7	14.3

Magna, UT

(\$ millions)	1990	1991	1992	1993	1994
AIR FORCE	102.5	75.1	7.2	29.2	1.0
ARMY	0.0	0.5	0.2	-2	0.1
ARMY CORP OF ENGINEERS	0.0	0.0	0.0	3.6	1.3
DEF NUCLEAR AGENCY	0.6	0.0	0.0	0.0	0.0
NASA	6.9	3.9	3.4	2.9	4.5
NAVY	7.6	2.0	8.9	13.7	11.4
TOTAL	117.6	81.5	19.7	49.2	18.3

Clearwater, UT

(\$ millions)	1990	1991	1992	1993	1994
AIR FORCE	10.6	8.2	3.9	13.3	1.9
ARMY	5.3	11.1	8.3	17.2	11.9
NAVY	1.0	0.0	16.7	4.8	18.5
TOTAL	16.9	19.3	28.9	35.3	32.3

Program Activity

Some important aerospace and government programs at Hercules are listed below. The briefs are intended to provide a listing of programs that are of major importance to the company. For detailed information or analysis of specific aerospace and defense programs or equipment, please refer to the appropriate FORECAST INTERNATIONAL binder (for example, AIRCRAFT, MILITARY VEHICLES, WARSHIPS, MISSILES, ELECTRONICS, and GAS TURBINES). The following is an outline of the company's business interests:

- Defense Electronics
- Sensors
- Missiles
- Ordnance Systems
- Space Systems
- Systems Integration

The following programs are now owned by Alliant Techsystems.

Electronic Programs

AAR-47

The AAR-47 Missile Warning Set is an electro-optical missile warning system that utilizes photo-multiplier (PM) tubes to warn of incoming missiles. The missile's emission plume generates radiation or heat that is detected by the PM sensors, triggering audio and visual alarms, either through the pilot display indicator or the APR-39A display. Hercules is the second-source manufacturer.

ALQ-176(V)

This is a pod-mounted radar jammer that can be carried by/on the F-4, F-5, F-16, Learjet 35A, and Canadair CC-144 aircraft. The unit is in production with logistics support ongoing.

Engine Programs

VFDR (Variable Fuel Flow Ducted Rocket Ramjet Engine)

The US Air Force in August 1987 awarded a joint venture of Atlantic Research and Hercules a \$22.3 million contract to develop and demonstrate a flight-ready Variable Fuel Flow Ducted Rocket Ramjet engine. The objective of the program is to demonstrate an integrated propulsion system in ground test facilities. This system consists of inlets, fuel-rich solid-gas generator, fuel throttle, ram-burner, integral rocket booster, fin, fin actuators, fairings and arm-fire devices. Tests are conducted over a wide

range of simulated supersonic speeds and altitudes. Full-scale development began in the early 1990s.

Missile Programs

Propulsion Systems

Hercules has produced propulsion systems for NASA and all branches of DoD services for 50 years. Some of the programs that used, or are using, Hercules propulsion systems and fuels are the following: Minuteman, Polaris, Poseidon, Trident, Pershing, Peacekeeper, Scout, Nike, Shrike, Sparrow, Phoenix, Honest John, Sidewinder, Pioneer, Telstar, Explorer, Vanguard, Tiros, Alto, Echo and the Shuttle. In addition to propellant fuels and solid rocket engines, Hercules was a pioneer in the development of materials and structures for large strategic rocket motors. Reportedly, Hercules has over nine acres under one roof dedicated to the winding and finishing of rocket motor structures requiring filament windings, carbon fibers and other composites. The company's components, products and systems are used on almost all major weapon and space propulsion systems in use today. Hercules Aerospace Company (along with Thiokol, UTC Chemical Systems, Pratt & Whitney, Rocketdyne and Aerojet) provides most of the aerospace and defense industries' needs for rocket propulsion.

Hercules produces rocket motors and rocket motor components for the following tactical missiles:

ADATS (canceled)
 AGM-88A/B/C HARM
 AGM-114 HELLFIRE
 AGM-122 SIDEARM
 AIM-7 Sparrow
 AIM-9 Sidewinder
 AIM-54A/C/C+ Phoenix
 AIM-120A AMRAAM
 BGM-71 TOW
 FGM-77 DRAGON
 MIM-72 Chaparral
 MIM-104 Patriot
 Predator
 RIM-66/67 Standard

Hercules has the following tactical missile rocket motor and rocket motor components programs under development:

AAWS-M/Javelin
 Advanced Air-to-Air Missile (canceled)
 AGM-131A SRAM II (canceled)
 Sea Lance (canceled)

Hercules is also involved in the manufacture of motors for the following strategic missile programs:

LGM-30F/LGM-30G Minuteman

Hercules built the Minuteman third stage. The program is no longer in production.

MGM-118A Peacekeeper

Hercules builds the Peacekeeper third-stage solid-fuel rocket motor and second-stage cases. Procurement has been concluded, although production of previously awarded units continues.

UGM-133A Trident II

The D5 propulsion is the company's largest single propulsion system effort and involves the manufacturing of two stages of the US Navy's Trident II missile. The program is currently in production to fulfill requirements for the US and UK Navies. The program is expected to conclude in the mid-1990s with total production of approximately 950 missiles.

Ordnance Programs

Military requirements call for munitions that will not detonate accidentally or as a result of enemy fire. These are called Insensitive Munitions (IM), and Hercules makes a range of products and devices for IM utilization. Laser arm/safe devices and composite case mixes are some of the products manufactured by Hercules. The company is a leader in warhead loading, using slurry-cast Plastic Bonded Explosives (PBX). Over 100,000 pounds have been produced and 1,000 war-head units delivered. Orders and revenues will probably decline in the future but will still remain at significant levels.

Hercules has been providing All Up Rounds assembly for over 20 years, ranging from the Condor to today's HARM missiles. Again, this is a business that might decline due to changing worldwide defense postures, but will still represent sizable sales numbers.

Gas generators are produced for defense and space applications. They provide energy for launch startups, turbopumps and control devices for artillery shells.

Government Owned Contractor Operated (GOCO) Facilities Prior to World War II, the government recognized three important factors. First, private industry could not realistically support the massive production capabilities needed for potential armed conflict. Second, facilities built for consumer and industrial products could not, for the most part, be transitioned into ammunition plants. And third, the expertise to operate and manage high-production plants resided in the private sector. The answer in 1940 was GOCO, in which government plants were designed, constructed and operated with American

industry providing the expertise and operating capabilities. Since that time, GOCO plants were supposed to alternate between production and standby, depending upon national needs. Most GOCO plants are installations under the US Army Armament, Munitions and Chemical Command, or Department of Energy (DoE) nuclear fuel plants. Today, GOCO plants are competitive enterprises. They can enter into direct contracts with domestic and foreign military services and with approved contractors. The products produced at GOCO facilities establish stability and provide offsets to plant maintenance costs through rental fees. Entrenched GOCO operators usually win follow-on service contracts of three- to five-year durations, unless a major catastrophe occurs. The Company Operator (CO) profits are incentive-related, ranging between five percent to perhaps 10 percent for outstanding results, such as meeting schedules, maintaining quality and improving safety records. Hercules has had plant accidents, but on balance, the safety record is good, considering the products involved. There is no indication that the company's GOCO programs are at risk.

Hercules currently has contracts for two GOCO facilities: Army Sunflower Ammunition Plant, DeSoto, Kansas and Radford Army Ammunition Plant, Radford, Virginia.

Space System Programs

Delta II Launch Vehicle

The Delta II is a medium-lift expendable launch vehicle designed to carry medium-size payloads up to 5,039 kilograms into low-Earth orbit, and up to 1,819 kilograms into geosynchronous transfer orbit. Hercules provides the nine stretched GEM solid-rocket boosters that power the Delta II model 7925 during the initial stages of flight. Delta II production is expected to average approximately eight units annually through the remainder of the decade.

Titan IV

The Titan IV is a heavy-lift expendable launch vehicle capable of placing Space Shuttle-sized payloads into Earth orbit. Hercules was selected in 1987 by prime contractor Martin Marietta to develop the solid motor propulsion system for the Titan IV expendable launch vehicle program. The program is moving ahead with the US Air Force intending to launch 60-70 Titan IVs over the next 20 years. Following the explosion of a Titan IV SRMU in April 1991, Hercules successfully tested the motor on June 12, 1992.

Pegasus Winged Launch Vehicle

Jointly produced by Orbital Sciences Corp (OSC) and Hercules, Pegasus is a winged space booster designed for launch from any large transport aircraft. Pegasus's structural development includes Hercules Aerospace,

which developed the two-piece composite payload fairing. In designing the aluminum saddle that attaches the wing to the booster body, Hercules borrowed the design used for the SRAM II short-range attack missile. Pegasus is in production; OSC holds 20 firm orders for Pegasus launches and 54 options. The first Pegasus launch took place in April 1990.

Taurus

Taurus is a four-stage, solid propellant expendable launch vehicle. Taurus is a hybrid booster, combining the new Thiokol Castor 120 solid rocket first stage with the three

stages of the OSC Pegasus air-launched winged booster produced by Hercules Aerospace.

Other

Graphite Fiber Production

Graphite fiber is experiencing growing aerospace use; it is currently used on Boeing 757 and 767 aircraft and the McDonnell Douglas DC-9. It is also used on AV-8B, B-1, F-16, F-18, S-76 and UTTAS military aircraft, and on MX, Pershing and Trident missiles. The company currently dominates the graphite fiber market with a 67-percent market share.

US Contract Awards

Below is a listing of major contracts awarded to Hercules from the United States Government in the past year (contracts as of press date).

<u>Date</u>	<u>Award (\$ millions)</u>	<u>Contract #</u>	<u>Description</u>
1995			
1/12/95	\$7.4	N00019-94-E-0277	Rehabilitation pro-jects at the naval weapons industrial reserve plant in McGregor, TX.
1/26/95	\$6.7	DAAA09-91-Z-0001	O&M of GOCO facility, Radford Army Ammunition Plant.
1/27/95	\$6.9	N00030-95-C-0037	Intermediate nuclear forces services for fleet ballistic missile submarine program.
3/30/95	\$12.4	DAAA09-91-Z-0001	O&M of GOCO facility, Radford Army Ammunition Plant.

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