The Elmer A. Sperry Award 2002

FOR ADVANCING THE ART OF TRANSPORTATION

The Elmer A. Sperry Award

The Elmer A. Sperry Award shall be given in recognition of a distinguished engineering contribution which, through application, proved in actual service, has advanced the art of transportation whether by land, sea or air.

In the words of Edmondo Quattrocchi, sculptor of the Elmer A. Sperry Medal:

"This Sperry medal symbolizes the struggle of man's mind against the forces of nature. The horse represents the primitive state of uncontrolled power. This, as suggested by the clouds and celestial fragments, is essentially the same in all the elements. The Gyroscope, superimposed on these, represents the bringing of this power under control for man's purposes."

Presentation of

The Elmer A. Sperry Award for 2002

to

RAYMOND PEARLSON

for the invention, development and worldwide implementation of a new system for lifting ships out of the water for repair and for launching new ship construction. The simplicity of this concept has allowed both large and small nations to benefit by increasing the efficiency and reducing the cost of shipyard operations.

by
The Board of Award under the sponsorship of the:

American Society of Mechanical Engineers
Institute of Electrical and Electronics Engineers
Society of Automotive Engineers
Society of Naval Architects and Marine Engineers
American Institute of Aeronautics and Astronautics
American Society of Civil Engineers

at the
World Maritime Technology Conference
during the
SNAME Annual Meeting in San Francisco, California
at the
International Luncheon
on Saturday, October 18, 2003

Raymond Pearlson

Raymond Pearlson is a native of New York City. During World War II he spent three years in the U. S. Navy. After separation from the Navy, he entered the University of Michigan, from which he graduated in 1949 with a Bachelor of Science degree in naval architecture and marine engineering.

In 1949 he began his professional career with Newport News Shipbuilding and Dry-dock Company. He spent the next five years working in various yard departments gaining practical shipbuilding knowledge.

In 1953 Mr. Pearlson moved to Miami, Florida, and became chief engineer for a small shipyard. One of his assignments was to design and supervise the construction of a 300 ton lifting capacity ship-lift for the shipyard using the technology that was known at that time. His experience building this facility gave Mr. Pearlson the opportunity to develop a unique concept, which overcame the inherent limitations of lifting capacity and size.

In 1957 Mr. Pearlson built the first Syncrolift® with a lifting capacity of 100 tons. This lift is still operating today.

Mr. Pearlson formed his own company in 1959 to further the development of his invention. For the next 20 years he traveled to every corner of the world to introduce the Syncrolift to the marine industry. There are now more than 220 Syncrolifts in 66 countries of the world lifting and launching ships of more than 25,000 tons displacement.

Mr. Pearlson is a member of the American Committee of Lloyds Register of Shipping and of The Society of Naval Architects and Marine Engineers. In 1988 the Society honored him with The William Kennedy Award for outstanding service. Mr. Pearlson was the recipient of the first annual Naval Architecture and Marine Engineering Alumni Society Merit Award of the University of Michigan.

RAYMOND PEARLSON

THE ACHIEVEMENT

The Syncrolift® System is a unique concept that lifts a ship out of the water to make needed repairs to the underwater portion of the ship's hull. Prior to its development, the underwater portion of the ship was exposed by utilizing floating dry docks, graving docks or marine railways, all of which were more expensive to build and operate.

Mr. Pearlson personally designed and produced a very unique, simple system for raising a ship out of the water, moving the ship ashore and then returning the repaired ship to the sea. The system consists of a large elevator, which can be lowered into the water, have a ship positioned over it and then the elevator and the ship can be lifted vertically to the ground level of the shipyard.

There are three principal components: a structural steel platform, a selected number of electrically powered wire rope hoists to raise and lower the platform and a central motor control center to operate the system. The hoists are supported by fixed structures, which are mostly standard marine piling. The Syncrolift is a surprisingly simple concept, which utilizes a rugged electro-mechanical system to hoist the ship out of the water. This easy to install and operate concept has now been employed at over 220 Syncrolifts operating in 66 countries throughout the world.

Mr. Pearlson's engineering contribution involved the design of this new type of dock including selecting the appropriate synchronous motors (with suitable controllers) for the specified lifting capacity; design of a lifting platform and all related foundations; and integrating the mechanical, electrical and structural engineering elements into a practical system that has proven itself over nearly half a century.

This achievement nominated for the Sperry Award truly does embrace the award's criterion of advancing the art of transportation, whether by land, sea or air.

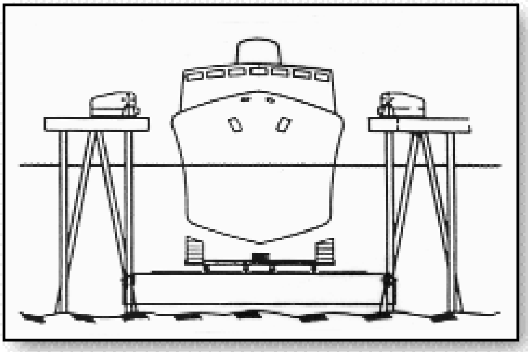
A PARTIAL LIST OF COMPLETED SYNCROLIFT® INSTALLATIONS

	PLATFORM DIMENSIONS	MAXIMUM NET LIFTING CAPACITY	APPROXIMATE VESSEL DEADWEIGHT
Faslane, Scotland	177.00 M. x 25.00 M.	25,600	55,000
Barrow-in-Furness, England	161.80 M. x 21.70 M.	24,000	50,000
Johor Bahru, Malaysia	188.40 M. x 33.8 M.	24,100	60,000
Bandar Abbas, Iran	172.30 M. x 32.00 M.	16,800	40,000
Buenos Aires, Argentina	184.80 M. x 32.00 M.	16,000	45,000
Las Palmas, Canary Islands	171.60 M. x 30.00 M.	12,490	25,000
Sabah, East Malaysia	140.00 M. x 28.00 M.	10,400	15,000
Tulcea, Romania	150.00 M. x 26.00 M.	9,800	14,000
Cartagena, Spain	130.00 M. x 25.00 M.	8,720	11,680
Muscat, Oman	106.00 M. x 18.50 M.	8,580	11,600
Halifax, Canada	413.00 Ft. x 100.00 Ft.	8,000	10,700
Alexandria, Egypt	148.00 M. x 20.00 M.	7,400	10,000
Puerto Cabello, Venezuela	125.00 M. x 27.00 M.	7,370	9,870
Lumut, Malaysia	120.00 M. x 23.00 M.	7,200	10,800
Kaoshiung, Taiwan	440.00 Ft. x 82.00 Ft.	6,900	9,240
Jeddah, Saudi Arabia	106.00 M. x 18.00 M.	6,740	9,030
Jubail, Saudi Arabia	106.00 M. x 18.00 M.	6,740	9,030
Buenos Aires, Argentina	135.00 M. x 32.20 M.	6,600	8,840
Batam Island, Indonesia	104.00 M. x 20.00 M.	5,990	8,000
St. John's, Newfoundland	86.50 M. x 20.00 M.	5,950	7,950
Cartagena, Colombia	117.00 M. x 22.00 M.	5,600	7,500
Adelaide, Australia	80.00 M. x 20.00 M.	5,520	8,000
Seward, Alaska, U.S.A.	300.00 Ft. x 80.00 Ft.	5,400	9,000
Singapore	96.00 M. x 20.00 M.	5,370	8,000
Curtis Bay, Maryland, U.S.A.	334.00 Ft. x 55.00 Ft.	5,310	6,900
Haronomati, Japan	28.00 M. x 22.50 M.	5,180	CAISSON
Launceston, Tasmania, Australia	91.20 M. x 18.00 M.	4,970	6,650
Chinhae, Korea	80.00 M. x 14.00 M.	4,400	6,500
Anacortes, Washington, U.S.A.	250.00 Ft. x 75.00 Ft.	4,260	8,000
Washington, U.S.A.	400.00 Ft. x 104.00 Ft.	4,020	5,380
Salina Cruz, Mexico	102.50 M. x 22.00 M.	4,010	5,370

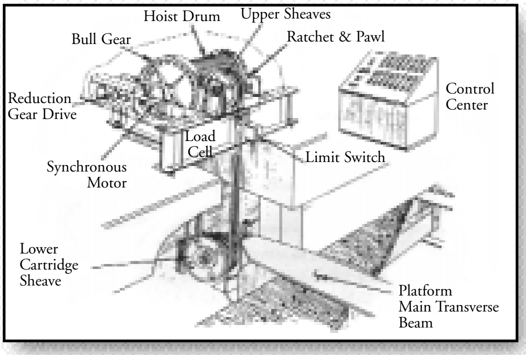
A PARTIAL LIST OF COMPLETED SYNCROLIFT® INSTALLATIONS

	PLATFORM DIMENSIONS	MAXIMUM NET LIFTING CAPACITY	APPROXIMATE VESSEL DEADWEIGHT
Madiera Island, Portugal	86.00 M. x 19.80 M.	3,820	4,500
Dubai, United Arab Emirates	102.00 M. x 24.70 M.	3,790	5,070
Singapore	97.50 M. x 20.00 M.	3,600	4,820
Saudi Arabia	25.35 M. x 18.00 M.	3,560	CAISSON
Simonstown, South Africa	304.00 Ft. x 50.00 Ft.	3,500	4,690
Kuwait, State of Kuwait	102.00 M. x 18.00 M.	3,480	4,660
Walvis Bay, South Africa	260.00 Ft. x 50.00 Ft.	3,460	4,630
Tsing Yi, Hong Kong	90.00 M. x 20.00 M.	3,420	4,600
Durban, South Africa	60.00 M. x 20.00 M.	3,400	4,550
Yanbu, Saudi Arabia	51.00 M. x 17.70 M.	3,390	4,540
Marystown, Newfoundland, Canada	250.00 Ft. x 60.00 Ft.	3,300	4,420
Kuwait, State of Kuwait	90.60 M. x 23.00 M.	3,120	4,280
Bataan, Luzon, Philippines	73.20 M. x 20.00 M.	3,060	4,050
Ensenada, Mexico	75.00 M. x 16.00 M	3,000	4,020
Suez, Egypt	70.00 M. x 20.00 M.	3,000	4,000
Tenerife, Canary Islands	265.00 Ft. x 55.00 Ft.	2,800	3,750
Table Bay, South Africa	210.00 Ft. x 50.00 Ft.	2,700	3,610
Salamis Island, Greece	63.00 M. x 14.00 M.	2,580	3,450
Darwin, N.T., Australia	63.00 M. x 22.20 M.	2,550	3,500
Rosyth, Scotland	63.00 M. x 15.00 M.	2,540	3,400
Kwajalein, Marshall Islands	180.00 Ft. x 74.00 Ft.	2,260	3,000
Illinois, U.S.A.	220.00 Ft. x 55.00 Ft.	2,220	2,970
Chiba, Japan	60.00 M. x 20.50 M.	2,210	2,950
Timsah, Egypt	74.00 M. x 20.00 M.	2,180	2,920
Dakar, Senegal	63.00 M. x 15.00 M.	2,020	2,700

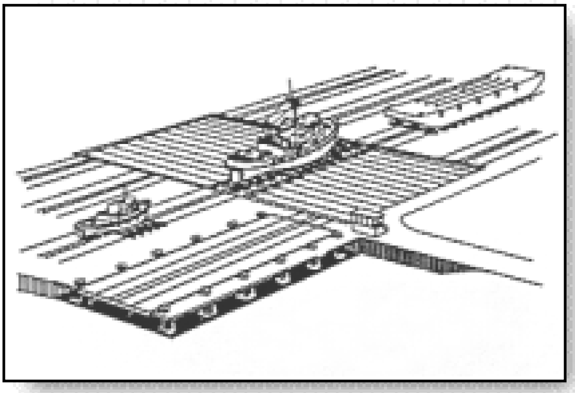
BASIC PRINCIPLES OF THE SYNCROLIFT



The platform, which supports the vessel during the lifting operation, is raised and lowered by electrically controlled hoists and wire rope cables. The hoists are supported by fixed structures consisting mostly of standard marine piling.

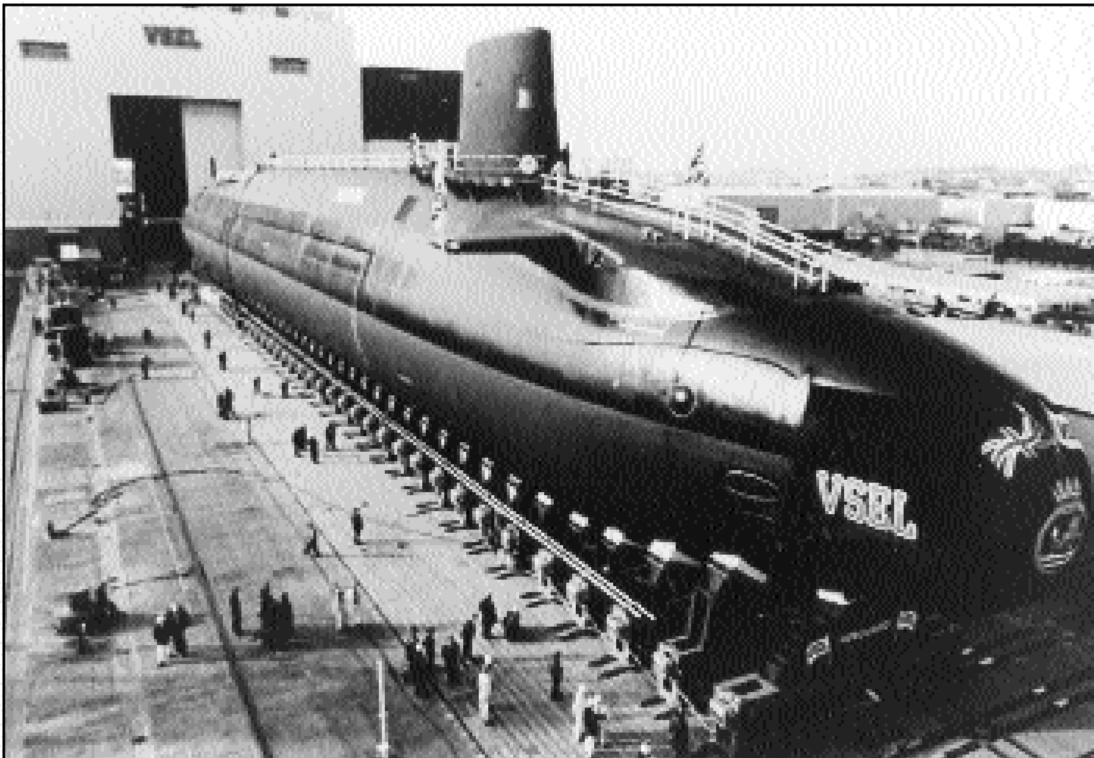


The electrical motors, used to drive the hoist, are designed to operate, up to a maximum required capacity, at a continuous fixed rate of speed regardless of load variations imposed by the distribution of the weight of the vessel. All of the motors are controlled from one central point. In the event of malfunction of any one motor, the entire system is automatically stopped.



A transfer system can be added to a basic SYNCROLIFT® shiplift by providing railroad or crane-type rails on the platform and on the adjacent land area. The rails are arranged so that a transfer cradle, with a ship on it, can be rolled to the land area when the platform is at the yard elevation. The on-shore transfer system can be designed to permit movement in both directions.

U.S.S. ELLIOT, a "Spruance" Class Destroyer, on the Syncrolift® at Todd Pacific Shipyards Corporation, Los Angeles Division
(Note that the vessel has been docked on a special high cradle which allows both the propeller and bow sonar dome to clear the platform during transfer.)
Syncrolift® Platform dimensions: 655ft. x 106ft. (199.6m x 32.3m); maximum lifting capacity: 22,200 long tons.



Vickers Shipbuilding and Engineering Ltd., Barrow-in-Furness, England.
VANGUARD, the first Trident Nuclear Submarine for the Royal Navy
is being launched on the Syncrolift® Platform
which is 161.8m long x 21.7m wide with
a maximum lifting capacity of 24,000 tons.

Astilleros Canarios, S.A., Las Palmas, Canary Islands
Syncrolift® dimensions: 171.6m long x 30m wide;
capacity: 28,000 DWT

Elmer A. Sperry, 1860-1930

After graduating from the Cortland, N.Y. Normal School in 1880, Sperry had an association with Professor Anthony at Cornell, where he helped wire its first generator. From that experience he conceived his initial invention, an improved electrical generator and arc light. He then opened an electric company in Chicago and continued on to invent major improvements in electric mining equipment, locomotives, streetcars and an electric automobile. He developed gyroscopic stabilizers for ships and aircraft, a successful marine gyro-compass and gyro-controlled steering and fire control systems used on Allied warships during World War I. Sperry also developed an aircraft searchlight and the world's first guided missile. His gyroscopic work resulted in the automatic pilot in 1930. The Elmer A. Sperry Award was established in 1955 to encourage progress in transportation engineering.

The Elmer A. Sperry Award

To commemorate the life and achievements of Elmer Ambrose Sperry, whose genius and perseverance contributed so much to so many types of transportation, the Elmer A. Sperry Award was established by his daughter, Helen (Mrs. Robert Brooke Lea), and his son, Elmer A. Sperry, Jr., in January 1955, the year marking the 25th anniversary of their father's death. Additional gifts from interested individuals and corporations also contribute to the work of the Board.

Elmer Sperry's inventions and his activities in many fields of engineering have benefited tremendously all forms of transportation. Land transportation has profited by his pioneer work with the storage battery, his development of one of the first electric automobiles (on which he introduced 4-wheel brakes and self-centering steering), his electric trolley car of improved design (features of its drive and electric braking system are still in use), and his rail flaw detector (which has added an important factor of safety to modern railroading). Sea transportation has been measurably advanced by his gyrocompass (which has freed man from the uncertainties of the magnetic compass) and by such navigational aids as the course recorder and automatic steering for ships. Air transportation is indebted to him for the airplane gyro-pilot and the other air navigational instruments he and his son, Lawrence, together developed.

The donors of the Elmer A. Sperry Award have stated that its purpose is to encourage progress in the engineering of transportation. Initially, the donors specified that the Award recipient should be chosen by a Board of Award representing the four engineering societies in which Elmer A. Sperry was most active:

American Society of Mechanical Engineers
(of which he was the 48th President);
American Institute of Electrical Engineers
(of which he was a founder member);
Society of Automotive Engineers; and
Society of Naval Architects and Marine Engineers.

In 1960, the participating societies were augmented by the addition of the Institute of Aerospace Sciences. In 1962, upon merging with the Institute of Radio Engineers, the American Institute of Electrical Engineers became known as the Institute of Electrical and Electronics Engineers; and in 1963, the Institute of Aerospace Sciences, upon merger with the American Rocket Society, became the American Institute of Aeronautics and Astronautics. In 1990, the

American Society of Civil Engineers became the sixth society to become a member of the Elmer A. Sperry Board of Award.

Important discoveries and engineering advances are often the work of a group, and the donors have further specified that the Elmer A. Sperry Award honor the distinguished contributions of groups as well as individuals.

Since they are confident that future contributions will pave the way for changes in the art of transportation equal at least to those already achieved, the donors have requested that the Board from time to time review past awards. This will enable the Board in the future to be cognizant of new areas of achievement and to invite participation, if it seems desirable, of additional engineering groups representative of new aspects or modes of transportation.

THE SPERRY SECRETARIAT

The donors have placed the Elmer A. Sperry Award fund in the custody of the American Society of Mechanical Engineers. This organization is empowered to administer the fund, which has been placed in an interest bearing account whose earnings are used to cover the expenses of the board. A Secretariat is administered by the ASME, which has generously donated the time of its staff to assist the Sperry Board in its work.

The Elmer A. Sperry Board of Award welcomes suggestions from the transportation industry and the engineering profession for candidates for consideration for this Award.

PREVIOUS ELMER A. SPERRY AWARDS

1955 To *William Francis Gibbs* and his Associates for design of the S.S. United States.

1956 To *Donald W. Douglas* and his Associates for the DC series of air transport planes.

1957 To *Harold L. Hamilton, Richard M. Dilworth* and *Eugene W. Kettering* and Citation to their Associates for developing the diesel-electric locomotive.

1958 To *Ferdinand Porsche* (in memoriam) and *Heinz Nordhoff* and Citation to their Associates for development of the Volkswagen automobile.

1959 To *Sir Geoffrey de Havilland, Major Frank B. Halford* (in memoriam) and *Charles C. Walker* and Citation to their Associates for the first jet-powered passenger aircraft and engines.

1960 To *Frederick Darcy Braddon* and Citation to the Engineering Department of the Marine Division of the *Sperry Gyroscope Company*, for the three-axis gyroscopic navigational reference.

1961 To *Robert Gilmore LeTourneau* and Citation to the Research and Development Division, *Firestone Tire and Rubber Company*, for high speed, large capacity, earth moving equipment and giant size tires.

1962 To *Lloyd J. Hibbard* for applying the ignitron rectifier to railroad motive power.

1963 To *Earl A. Thompson* and Citation to his Associates for design and development of the first notably successful automatic automobile transmission.

1964 To *Igor Sikorsky* and *Michael E. Gluhareff* and Citation to the Engineering Department of the Sikorsky Aircraft Division, *United Aircraft Corporation*, for the invention and development of the high-lift helicopter leading to the Skycrane.

1965 To *Maynard L. Pennell, Richard L. Rouzie, John E. Steiner, William H. Cook* and *Richard L. Loesch, Jr.* and Citation to the Commercial Airplane Division, *The Boeing Company,* for the concept, design, development, production and practical application of the family of jet transports exemplified by the 707, 720 and 727.

1966 To *Hideo Shima, Matsutaro Fuji* and *Shigenari Oishi* and Citation to the *Japanese National Railways* for the design, development and construction of the New Tokaido Line with its many important advances in railroad transportation.

1967 To *Edward R. Dye* (in memoriam), *Hugh DeHaven*, and *Robert A. Wolf* for their contribution to automotive occupant safety and Citation to the research engineers of *Cornell Aeronautical Laboratory* and the staff of the Crash Injury Research projects of the *Cornell University Medical College*.

1968 To *Christopher S. Cockerell* and *Richard Stanton-Jones* and Citation to the men and women of the *British Hovercraft Corporation* for the design, construction and application of a family of commercially useful Hovercraft.

1969 To *Douglas C. MacMillan, M. Nielsen* and *Edward L. Teale, Jr.* and Citations to *Wilbert C. Gumprich* and the organizations of *George G. Sharp, Inc.*, *Babcock and Wilcox Company*, and the *New York Shipbuilding Corporation* for the design and construction of the N.S. Savannah, the first nuclear ship with reactor, to be operated for commercial purposes.

1970 To *Charles Stark Draper* and Citations to the personnel of the *MIT Instrumentation Laboratories,* Delco Electronics Division, *General Motors Corporation*, and Aero Products Division, *Litton Systems*, for the successful application of inertial guidance systems to commercial air navigation.

1971 To *Sedgwick N. Wight* (in memoriam) and *George W. Baughman* and Citations to *William D. Hailes, Lloyd V. Lewis, Clarence S. Snavely, Herbert A. Wallace*, and the employees of *General Railway Signal Company*, and the Signal & Communications Division, *Westinghouse Air Brake Company*, for development of Centralized Traffic Control on railways.

1972 To *Leonard S. Hobbs* and *Perry W. Pratt* and the dedicated engineers of the Pratt & Whitney Aircraft Division of *United Aircraft Corporation* for the design and development of the JT-3 turbo jet engine.

1975 To *Jerome L. Goldman, Frank A. Nemec* and *James J. Henry* and Citations to the naval architects and marine engineers of *Friede and Goldman, Inc.* and *Alfred W. Schwendtner* for revolutionizing marine cargo transport through the design and development of barge carrying cargo vessels.

1977 To *Clifford L. Eastburg* and *Harley J. Urbach* and Citations to the Railroad Engineering Department of *The Timken Company* for the development, subsequent improvement, manufacture and application of tapered roller bearings for railroad and industrial uses.

1978 To *Robert Puiseux* and Citations to the employees of the *Manufacture Française des Pneumatiques Michelin* for the development of the radial tire.

1979 To *Leslie J. Clark* for his contributions to the conceptualization and initial development of the sea transport of liquefied natural gas.

1980 To *William M. Allen, Malcolm T. Stamper, Joseph F. Sutter* and *Everette L. Webb* and Citations to the employees of *Boeing Commercial Airplane Company* for their leadership in the development, successful introduction and acceptance of wide-body jet aircraft for commercial service.

1981 To *Edward J. Wasp* for his contributions toward the development and application of long distance pipeline slurry transport of coal and other finely divided solid materials.

1982 To *Jörg Brenneisen, Ehrhard Futterlieb, Joachim Körber, Edmund Müller, G. Reiner Nill, Manfred Schulz, Herbert Stemmler* and *Werner Teich* for their contributions to the development and application of solid state adjustable frequency induction motor transmission to diesel and electric motor locomotives in heavy freight and passenger service.

1983 To *Sir George Edwards, OM, CBE, FRS; General Henri Ziegler, CBE, CVO, LM, CG; Sir Stanley Hooker, CBE, FRS* (in memoriam); *Sir Archibald Russell, CBE, FRS;* and *M. André Turcat, L d'H, CG*; commemorating their outstanding international contributions to the successful introduction and subsequent safe service of commercial supersonic aircraft exemplified by the Concorde.

1984 To *Frederick Aronowitz, Joseph E. Killpatrick, Warren M. Macek* and *Theodore J. Podgorski* for the conception of the principles and development of a ring laser gyroscopic system incorporated in a new series of commercial jet liners and other vehicles.

1985 To *Richard K. Quinn, Carlton E. Tripp*, and *George H. Plude* for the inclusion of numerous innovative design concepts and an unusual method of construction of the first 1,000-foot self-unloading Great Lakes vessel, the M/V Stewart J. Cort.

1986 To *George W. Jeffs, Dr. William R. Lucas, Dr. George E. Mueller, George F. Page, Robert F. Thompson* and *John F. Yardley* for significant personal and technical contributions to the concept and achievement of a reusable Space Transportation System.

1987 To *Harry R. Wetenkamp* for his contributions toward the development and application of curved plate railroad wheel designs.

1988 To *J. A. Pierce* for his pioneering work and technical achievements that led to the establishment of the OMEGA Navigation System, the world's first ground-based global navigation system.

1989 To *Harold E. Froehlich, Charles B. Momsen, Jr.*, and *Allyn C. Vine* for the invention, development and deployment of the deep-diving submarine, Alvin.

1990 To *Claud M. Davis, Richard B. Hanrahan, John F. Keeley*, and *James H. Mollenauer* for the conception, design, development and delivery of the Federal Aviation Administration enroute air traffic control system.

1991 To *Malcom Purcell McLean* for his pioneering work in revolutionizing cargo transportation through the introduction of intermodal containerization.

1992 To *Daniel K. Ludwig* (in memoriam) for the design, development and construction of the modern supertanker.

1993 To *Heinz Leiber, Wolf-Dieter Jonner* and *Hans Jürgen Gerstenmeier* and Citations to their colleagues in *Robert Bosch GmbH* for their conception, design and development of the Anti-lock Braking System for application in motor vehicles.

1994 To *Russell G. Altherr* for the conception, design and development of a slackfree connector for articulated railroad freight cars.

1996 To *Thomas G. Butler* (in memoriam) and *Richard H. MacNeal* for the development and mechanization of NASA Structural Analysis (NASTRAN) for widespread utilization as a working tool for finite element computation.

1998 To *Bradford W. Parkinson* for leading the concept development and early implementation of the Global Positioning System (GPS) as a breakthrough technology for the precise navigation and position determination of transportation vehicles.

2000 To those individuals who, working at the *French National Railroad (SNCF)* and *ALSTOM* between 1965 and 1981, played leading roles in conceiving and creating the initial TGV High Speed Rail System, which opened a new era in passenger rail transportation in France and beyond.

The 2002 Elmer A. Sperry Board of Award

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