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AND
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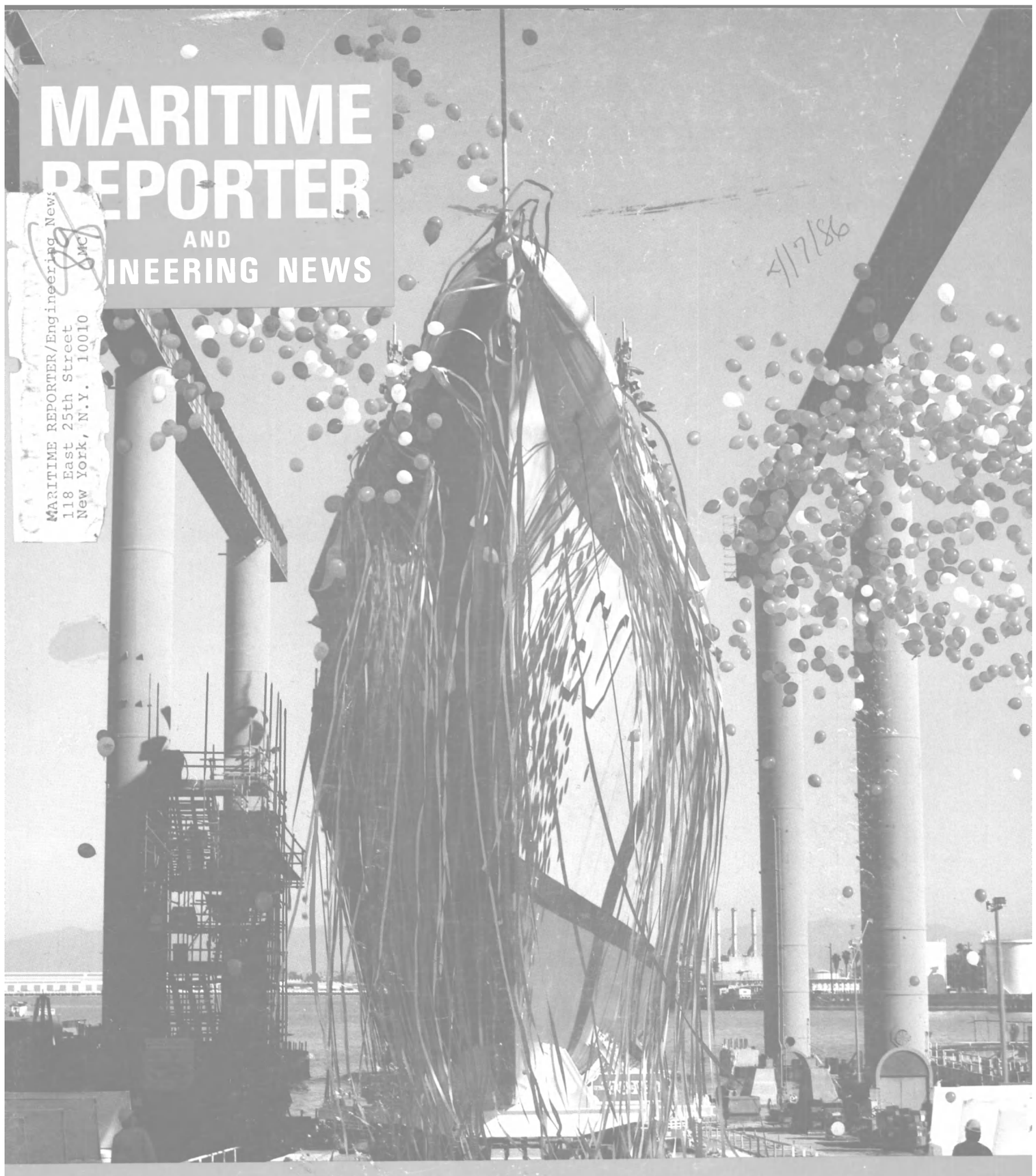


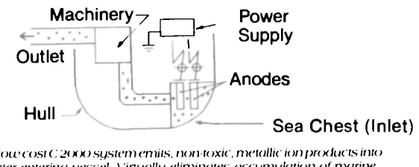
SPECIAL EDITION

NAVAL TECHNOLOGY & SHIPBUILDING

MARCH 1986 ISSUE

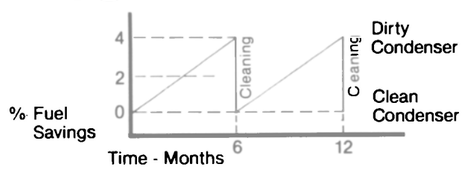
C-2000

Proven in Use. Cuts Fuel and Maintenance Costs. Reduces Power Loss and Damage From Corrosion and Fouling.

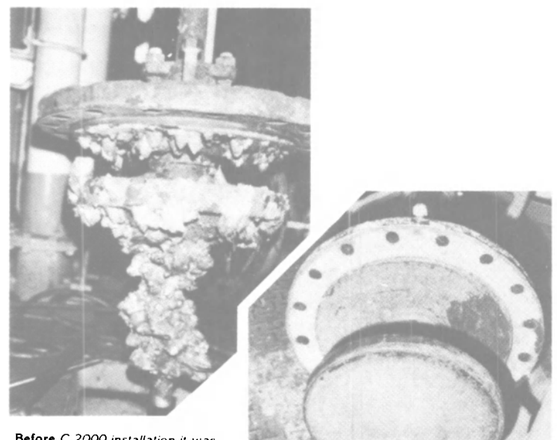


Simple, low cost C 2000 system emits, non-toxic, metallic ion products into sea water entering vessel. Virtually eliminates accumulation of marine growth. . . minimizes corrosion inside piping.

ANTI-FOULING SYSTEM



In steam applications C 2000 saves 2% average in fuel costs and can save up to 5X the systems cost in annual fuel savings.



Before *C 2000 installation it was impossible to close this sea valve.*

After *17 months of C 2000 operation the same sea valve at inspection*

Here's Why 16 Navies Worldwide and Major Oil, Cargo and Cruise Fleets Have Installed C-2000 Systems:

- Reduces fuel consumption of steamships caused by fouling and corrosion build-up in condensers
- Reduces downtime for cleaning heat exchangers and seachests
- Reduces speed loss due to cooling system blockages
- Reduces potential machinery damage caused by overheating
- Reduces potential cargo spoilage caused by refrigeration system failures
- Reduces potential passenger discomfort due to air-conditioning failures
- Reduces seawater piping renewals during dry docking or at sea
- Reduces power loss and overheating of diesels from heat exchanger and charge-air cooler blockages
- Certified by ABS, USCG, DNV, Lloyds Register, Board of Trade, Ministry of Defense UK

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Circle 282 on Reader Service Card

ON THE COVER

House Closes Jones Act Loophole

On January 29, 1986, the House of Representatives approved the Senate-passed version of H.R. 2466, miscellaneous maritime amendments. This legislation contains an important provision that closed a loophole in the Jones Act which currently could permit foreign-flag tugboats to provide ship assist service to foreign-flag vessels in U.S. ports.

The AWO vigorously supports this provision. The Senate passed its version of the bill prior to the Christmas recess.

General Ship Awarded $8-Million Navy Contract For Repairs To Frigate

General Ship Corporation of Boston has been awarded an $8-million U.S. Navy contract for modernization and repairs to the guided-missile frigate USS McInerney. Work is scheduled to begin in May this year and be completed in nine months, extending the yard's work load into 1987.

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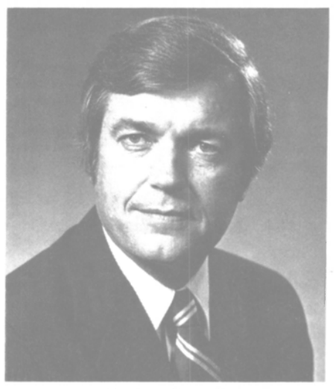
'BUILD AND CHARTER' —A VITAL STEP IN THE RIGHT DIRECTION

By William E. Haggett*



William Haggett

Although funding for Senator **Ted Stevens's** "Build and Charter" program has been appropriated by the Congress, this particular effort to revive commercial shipbuilding in the United States cannot become a reality until the authorization plan makes its way through Congress and the White House.

No one in the shipbuilding industry underestimates the task of winning the rough second lap of this important race. The program, already eyed with caution by some Congressional skeptics, will no doubt receive an even closer look with passage of the Gramm-Rudman deficit-cutting legislation.

In a nutshell, the Stevens plan earmarks $852 million of savings from Navy shipbuilding programs for a "Maritime Fund." Patterned after President **Eisenhower's** mariner program to construct ships for commercial operation, the ships could ultimately be used for military sealift. The Navy would have a voice in the type of vessels to be built, the shipbuilder and the leaser. In the event of a national emergency, the ships would be on call to our government on short notice.

The Shipbuilders Council of America has supported the "build and charter" approach as a good faith attempt to focus Congressional and White House attention on a very serious problem—the severely declining U.S. merchant marine fleet and its implications for defense readiness.

As chairman of the Shipbuilders Council and president of Bath Iron Works, I appeared before the Merchant Marine Subcommittee of the Commerce, Science and Transportation Committee to support the "build and charter" program as the most effective legislative initiative which can contribute to the achievement of the following vital national objectives: 1. Provide needed, militarily-useful ships, operating in a commercial environment; 2. Sustain shipyards, skilled workers and management needed as components of the shipyard mobilization base; 3. Sustain the pool of U.S. citizen seagoing manpower which must always be available; and 4. Provide an opportunity to improve the operation of American shipping companies.

There seems to be no real debate in Congress over the need to maintain an adequate maritime capability to make certain that vital supplies and equipment can be transported in a time of war or international crisis. Likewise, there seems to be general agreement that our merchant marine fleet has been in a steady state of decline for the past several years.

It seems that the only real question in the minds of some of our national leaders is whether the decline in our commercial shipbuilding capabilities has reached a point where national security is a major concern.

Data presented by **M. Lee Rice,** president of the Shipbuilders Council, to the National Strategic Mobility Conference last November demonstrated conclusively that there is a significant problem to be solved if America's shipbuilding and ship repair capability is to be maintained.

Mr. **Rice's** analysis showed that manpower projected to be in place at a time of mobilization will be less than adequate. In reality, a shortfall of at least 25 percent of the required skilled manpower base will occur in the near future. As of today, the shortfall is over 18 percent. In other words, we lack 30,000 skilled production workers who would need to be on the job if mobilization tasks were to be done correctly and on time.

It is certainly not an overstatement that the problem has become a critical one and that national security could easily be impacted.

It is especially distressing to see America's shipbuilding base continuing to erode at a time when the performance of our shipyards is improving. Because of a number of things—technological advances, facility improvements and various cost containment efforts—the cost of building ships in the United States has decreased dramatically. At the same time, quality and schedule adherence are improving. Having reached a point where American shipyards are capable of competing with the best in the world in naval construction, it is particularly sad to see them closing and, in doing so, weakening our national defense capabilities.

Because of the improved performance of U.S. yards, several major Navy shipbuilding programs have been coming in under cost in recent years. As a result, there exists within the Navy's shipbuilding budgets unexpended funds which have been appropriated but not obligated. Senator **Stevens's** approach of using those funds to rekindle militarily-useful commercial shipbuilding in America is sound, fair and, above all, fiscally responsible.

While much-needed progress is being made rebuilding the Navy and attaining an essential 600-ship fleet, Navy construction alone to support combatant fleets will not sustain an adequate shipyard mobilization base. Fewer funds are available to purchase shipyard services when large amounts are required for combat systems in the construction of combatants and auxiliaries. Generally, only 30 percent of the naval shipbuilding budget is spent in our shipyards, compared with nearly 100 percent which flows to the yards when commercial ships are constructed.

David Klinges, vice president of Bethlehem Steel's Marine Construction Group, may have summed up the shipbuilding industry's general feeling about the Stevens's initiative in a recent interview with Baltimore's "The News American."

"This legislative initiative represents the realization that something has to be done about our nation's decreased maritime capability," said Mr. **Klinges.** "We are encouraged to see a move in a direction that would strengthen shipbuilding and our maritime fleet and its personnel.

"We think it makes sense to have a ship being used commercially as a viable maritime asset, rather than attempting to reactivate crewless vessels that may not be well suited to a particular military transportation need," Mr. **Klinges** continued.

The bottom line is that ships constructed under this program would be put to a commercial use and would have high military utility should they ever be needed for that purpose. Other approaches to "build and charter" might work, but the plan awaiting Congressional authorization is workable and offers sound solutions to the various and difficult problems facing the shipbuilding industry. It fills a real void and is not a subsidy.

*Mr. **Haggett** is the chairman of the Shipbuilders Council of America, and the president and chief operating officer of Bath Iron Works Corporation, Bath, Maine.

Navy Adding 13 Ships Costing $206.7 Million To Ready Reserve Force —Four To Be Converted

Thirteen merchant ships were selected for purchase on 17 January 1986 for the Ready Reserve Force of the National Defense Reserve Fleet. The Maritime Administration is processing four contracts totaling $206.7 million with American Automar, Barber Steamship Lines, Lykes Bros. and U.S. Lines at the request of the Chief of Naval Operations for the U.S. Navy's Military Sealift Command.

Rear Adm. **W.T. Piotti Jr.**, Commander, Military Sealift Command, recommended acquisition of the 13 roll-on/roll-off (RO/RO) and heavy lift/barge ships from 91 ships offered in response to a request for proposals. The offerings were followed by an initial survey and evaluation of each ship's material condition by two Navy/MarAd selection committees.

The 13 ships selected are those determined to have the highest military utility at the lowest cost of the ships offered. These ships, combined with the five RO/ROs purchased with Fiscal Year 1985 Supplemental funding, provide the capability to transport more than a mechanized division with the most modern and capable RO/RO and heavy-lift/barge ships at the lowest possible purchase and life cycle cost. When delivered to MarAd, the ships must be within class in accordance with American Bureau of Shipping standards and certified by the U.S. Coast Guard as capable of 180 days of sustained, unrestricted operations. Of the 13 ships selected, nine were built in the U.S. Four foreign-flag RO/ROs will be converted to U.S.-flag in U.S. shipyards prior to delivery.

The Ready Reserve Force currently consists of 72 ships, 46 of which are berthed at the three major sites of the National Defense Reserve fleet—Beaumont, Texas; James River, Va.; and Suisun Bay, Calif. The remaining 26 ships are dispersed in ports throughout the world. The additional 13 ships will be outported within the U.S. at various strategic locations to be determined by competition. All ships in the RRF are kept in a 5, 10 or 20-day readiness status, meaning they can be activated, crewed and ready to sail in 5, 10 or 20 days from call-up by the Chief of Naval Operations.

Although MarAd is the contracting authority for the Federal Government, the ships are being paid for by the Navy. They will be used by the Military Sealift Command for strategic sealift during emergencies, contingencies or exercises to test their readiness.

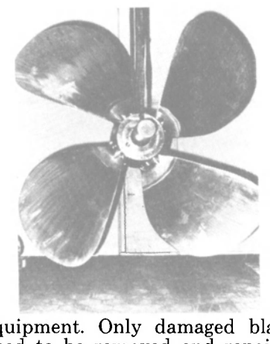
MSC's primary responsibility is to provide the necessary sealift to deploy and sustain military forces overseas, as rapidly and for as long as the military requirement exists. MSC also operates auxiliary ships that will deliver supplies to Navy combatant ships while underway, oceanographic and survey ships, and tankers and dry cargo ships that deliver Defense Department cargo worldwide.

The thirteen ships are:

Company	Year Built	Ship Type	Name	Present Flag
American Automar	1971	RO/RO	Paralla	Sweden
Barber Steamship Lines	1979	RO/RO	Barber Tonsberg	Norway
Barber Steamship Lines	1979	RO/RO	Barber Priam	Norway
Barber Steamship Lines	1979	RO/RO	Barber Taif	Norway
Lykes Bros. Steamship	1976	RO/RO	Lipscomb Lykes	U.S.
Lykes Bros. Steamship	1976	RO/RO	Charles Lykes	U.S.
Lykes Bros. Steamship	1972	Seabee	Doctor Lykes	U.S.
Lykes Bros. Steamship	1972	Seabee	Almeria Lykes	U.S.
Lykes Bros. Steamship	1973	Seabee	Tillie Lykes	U.S.
U.S. Lines	1973	LASH	Delta Mar	U.S.
U.S. Lines	1973	LASH	Delta Sud	U.S.
U.S. Lines	1973	LASH	Delta Norte	U.S.
U.S. Lines	1971	LASH	Delta Caribe	U.S.

Lips Designs Detachable Blade Propellers For Amoco—Literature Available

Amoco's tug Michigan, operating through the winter in Lake Michigan last year, experienced damage to its stainless monobloc propellers necessitating unscheduled drydocking of the vessel twice and the installation of a spare propeller. Lips Propellers was approached as to the feasibility of designing a detachable blade propeller with comparable strength and a hub geometry no larger than the original monobloc propellers. Lips responded with a four-blade design which combined the efficiencies of the original monobloc design with the advantages of a detachable blade propeller.



Spare blades can easily be stored aboard the vessel or easily shipped, even by air, allowing prompt replacement when damage is sustained. The vessel does not need to be drydocked, and the removal and replacement of blades can be accomplished with lighter lifting equipment. Only damaged blades need to be removed and repair of damaged blades can be expedited due to the ease of shipment and handling.

For free literature containing full information on the entire line of Lips Propellers,

Circle 17 on Reader Service Card

ELECTRONICS UPDATE

WATERCOM Telecommunications System To Be Fully Operational This Year

The first phone call through the revolutionary WATERCOM® Automated Maritime Telecommunications System was placed by **Ron VonColln**, program manager at Tracor Applied Sciences, Inc., aboard a boat on the Potomac River in Washington, D.C., to **Rick Baker**, executive vice president of Waterway Communications System, Inc., in his office in Jeffersonville, Ind. The call demonstrated the system hardware and operations control that will form a new communications network to provide voice and customized data services between inland river towboats and their central offices. Full service on the network will be available at mid-1986.

Tracor Applied Sciences, a subsidiary of Tracor, Inc., has a turnkey contract from Waterway Communications covering the design, construction, and installation of the WATERCOM system.

The new system, through a series of 54 shore stations, will provide continuous coverage of approximately 4,000 miles of inland waterways. It will serve the Mississippi River from south of New Orleans to Minneapolis/St. Paul, the Illinois River from the Mississippi to Chicago, and the Ohio River from Cairo to Pittsburgh. On the Gulf Intracoastal Waterway, coverage will extend from Apalachicola, Fla., to Brownsville, Texas, with incidental coverage on the Gulf of Mexico.

WATERCOM will provide service comparable in quality to that of the National Telephone Network, and in fact will connect to NTN lines just like any other telephone network. A barge company operator direct-dials the boat number he wishes to reach and is connected automatically. Operator assistance is available only when requested by the user.

The WATERCOM system consists of three major components: vessel telephones, shore stations, and the Operations and Control Center at the home office in Jeffersonville. Vessel telephones consist of a radio transmitter and receiver, a microprocessor-based phone control unit, and the main telephone handset. An optional extension phone may be added to provide credit card calls from facilities in the crew's quarters.

Each of the 54 shore stations serves compatible equipped vessels within its operating range, thereby providing continuous telephone service. Each station is interconnected with the local area central control office, from which incoming and outgoing calls are routed to and from the vessel.

The Operations Control Center and its mainframe computers are the heart of the WATERCOM system. It provides the principal automatic switching and routing functions for all long-distance calls entering the system. Through full-period leased data lines, the OCC monitors and controls operations at each of the shore stations and acts as a highly sophisticated telephone system, with additional data-processing capabilities.

The concept of WATERCOM started in the 1970s when 16 major barging companies joined together to improve inland river telecommunications, a need supported by in-depth research of their industry. In 1981, American Commercial Lines, Inc. acquired WATERCOM from the barging group. That same year the Federal Communications Commission allocated frequencies for automated marine communications systems. WATERCOM applied for license authority, which the FCC granted in 1982. The elements of the system development included marketing research, system design to meet communication needs, and acquisition of properties and construction along the inland waterways. Finally, in the summer of 1985, construction of the Operations and Control Center building in Jeffersonville was completed.

For further information and free literature on the WATERCOM system,

Circle 53 on Reader Service Card

Gary Carlson Joins Midland-Ross Corp. As Group Executive VP

Midland-Ross Corporation, headquartered in Cleveland, Ohio, has announced that Dr. **Gary Carlson** has joined the company as executive vice president, with responsibility for directing the overall efforts of the electronics and electrical businesses.

Reporting to him will be the three electronics division vice president-general managers and the electrical group vice president. His appointment completes the Midland-Ross table of organization with three executive vice presidents, each in charge of a business group—Aerospace, Thermal, and Electronic/Electrical.

Before his move to the Cleveland-based company, Dr. **Carlson** served the General Electric Company for 15 years in various senior managerial and technical capacities. He holds a PhD degree in physical chemistry from the University of Michigan.

$31-Million Development Project Begins At Port Of Miami

A $31-million maritime office/restaurant/retail complex on Dodge Island, Miami, Fla., named "A Seamark at the Port," signals a resurgence of Miami's waterfront development and further expansion of the cruise industry. Development by Miami Seaport Partners, Ltd., a joint venture of Warsham Brothers Company, Inc. and TechniDevelopment Corporation, the 13.8-acre port expansion is the first private undertaking in the Port of Miami's history.

Arquitectonica International Corporation, the innovative Miami-based architectural firm, has designed a reflective silver tile and glass complex combining two new cruise terminals, a 14-story office tower, 19,000 square feet of retail space, 31,000 square feet of warehousing area, 1,158 surface parking spaces, and Dodge Island's first full-service restaurant, with 250 seats.

With groundbreaking scheduled for the first quarter of this year, the first phase of the development will be the two terminals, equipped to service two or three cruise ships by the end of 1986.

The Port of Miami, known in the industry as the cruise capital of the world, last year served more than 2.3 million passengers aboard 20 cruise ships now docking at the port's nine terminals, far exceeding any other U.S. port in passenger load. Due to the phenomenal growth of the cruise industry, several lines are building a total of six new ships. Two of these will be ready to operate by mid-86 and will require space at the Port of Miami.

The entire commercial complex is scheduled for occupancy by the fall of 1987, which will coincide with the opening of a new four-lane, fixed-span bridge linking Dodge Island with the mainland.

Artist's rendering of project called "A Seamark at the Port," first major commercial development at the Port of Miami. Two cruise ship terminals are expected to be in operation by the end of this year, with the office complex slated to open in mid-1987.

To build the new terminals, Metro-Dade County entered into an agreement with Miami Seaport Partners, Ltd. whereby the developers would lease land from the county to build the entire project. The County would then lease back the terminal portion of the project, leaving the remainder of the property to be developed and managed by Miami Seaport Partners. In conjunction with the maritime complex, the developers have also agreed to contribute up to $1.3 million in sitework and port improvements.

B&B Dredging Offers Color Brochure On New Dredge Design

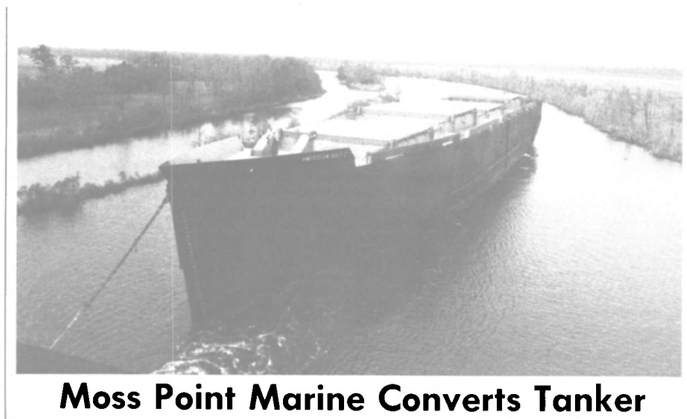
B&B Dredging, Greenbush, Mich., sales representative for W&S Development Inc., has announced the publication of a full-color brochure on their latest dredge design, the Model D-18, submersible-pump cutterhead dredge.

According to the brochure, the Model D-18 offers several features to facilitate dredge portability and productivity. The B&B dredge is equipped with a rugged cutterhead assembly with replaceable teeth; a submersible pump with instant priming; fixed or fold-up pontoons; and windows made of virtually unbreakable Lexan.

In a letter to B&B Dredging, Woodbury & Associates, P.A., consulting engineers, said of the Model D-18, "this dredge configuration provides the ultimate in portability and productive capability. The hull pontoon arrangement, with the continuous hinge connection, allows the width of hull required for good stability while afloat and a simple method of width reduction for over-the-road transport without demounting any part of the structure or machinery."

The color brochure contains several photographs of both the dredge and its equipment accompanied by clear and concise text. For a free copy of the brochure from B&B Dredging on the Model D-18 submersible-pump cutterhead dredge,

Circle 16 on Reader Service Card



Moss Point Marine Converts Tanker Into Oceangoing Grain Barge

Moss Point Marine, Inc. of Escatawpa, Miss., has converted the American Gulf I (shown), a former 520-foot T-2 tanker, into an oceangoing bulk grain barge for American Gulf Shipping of New Orleans.

The extensive modification required the relocation of longitudinal wing walls and the installation of tank tops to make a double-skin barge. The five-hold vessel features grain repose slopes—slanted bulkheads that permit direct pour loading and eliminate the use of costly cargo trimming machinery. The vessel was also modified to transport 60 empty 40-foot containers on her hatch covers.

The American Gulf I was originally a 520-foot World War II tanker built in Seattle in 1945. Her new dimensions are 383 feet in overall length, 68 feet in beam, and 38 feet in depth. Loaded draft is 30.6 feet.

Moss Point Marine president **John Dane III** said the ex-T-2 is the largest vessel his shipyard has worked on to date.

Current contracts at the Moss Point yard include: construction of two 135-foot landing craft (LCU) for the U.S. Navy; conversion of a 171-foot supply boat into an oil spill recovery vessel for Clean Seas Corporation of Santa Barbara, Calif.; construction of twenty-six 110-foot lighters for the Navy; and construction of two 88-foot fireboats for the Port of Long Beach, Calif.

For free literature on Moss Point Marine's shipyard,

Circle 71 on Reader Service Card

Grow Group Announces Merger Of Devoe Prufcoat And Napko Corporation

Grow Group, Inc. has announced the merger of its Devoe Prufcoat Division and Napko Corporation, effective February 1, 1986. The merged entity is Devoe Napko Protective Coatings, a Division of Grow Group. Napko was acquired by Grow Group, Inc. from The O'Brien Corporation on May 3, 1985.

Commenting on the merger, **Russel Banks,** president and chief executive officer of Grow Group, Inc. stated: "This merger will allow for a highly efficient operation for the manufacture of high-performance, advanced technology paints and coatings directed at the petroleum, chemical, power generation, offshore and heavy-duty industrial market segments." According to **Joseph M. Quinn,** Group vice president responsible for Devoe Napko Protective Coatings: "We are especially excited about the opportunities presented by this merger, particularly the introduction of Grow's technology into the existing Napko marketing channels."

Corporate offices for Devoe Napko Protective Coatings will be located in Houston, Texas, and Baton Rouge, La., sales and service personnel are located strategically throughout the United States. Devoe Napko Protective Coatings will also be served by an international licensee network.

Lou Vincent, vice president and general manager of Devoe Napko Protective Coatings, will be located in Houston and can be contacted at 1-800-231-6415. **Andy House,** vice president of marketing, will continue to be located in Baton Rouge at 1-800-535-8076.

Grow Group, Inc. is one of the nation's largest producers of specialty chemical coatings and paints, with subsidiaries located around the world.

For further information,

Circle 81 on Reader Service Card

Bethlehem Yard Completes Repairs To MSC Craneship

Bethlehem Steel Corporation's Sparrows Point shipyard near Baltimore recently completed repairs to the craneship USNS Keystone State (T-ACS-1) under a $550,000 Maritime Administration contract. The 668-foot ship is a former Marine Class vessel built in the early 1950s that was converted last year to a craneship by Bay Shipbuilding under the Military Sealift Command's T-ship program. Formerly the President Harrison, she is the first of 10 auxiliary craneships being procured by the MSC to be held in reserve until needed to unload cargo from commercial containerships and breakbulk freighters in the event of a rapid deployment.

ON THE COVER

Missile Frigate Rodney M. Davis going down the ways during recent launching at Todd's Los Angeles Division San Pedro Shipyard.

Todd's San Pedro Yard Launches Guided Missile Frigate 'Davis'

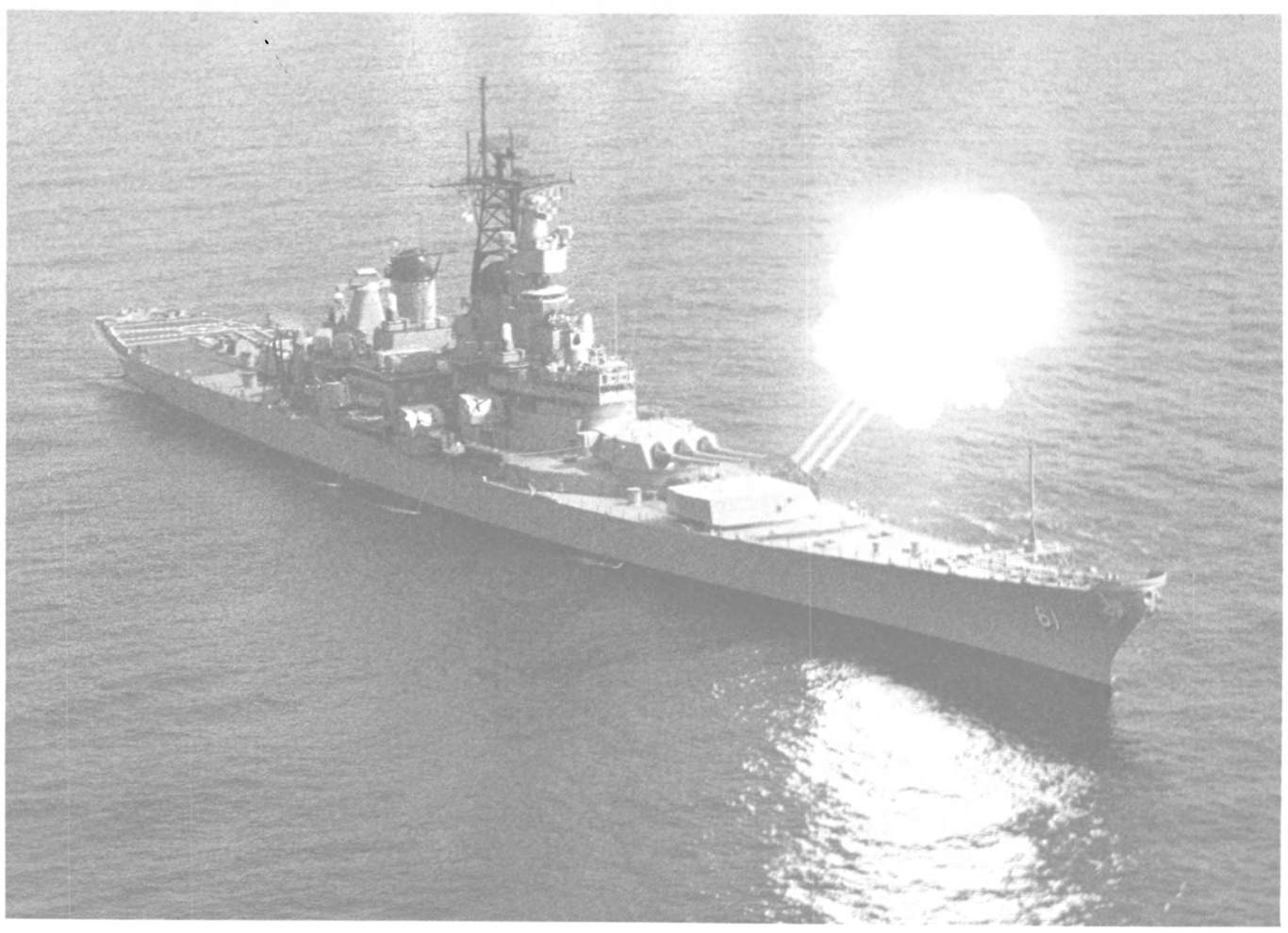
The Los Angeles Division of Todd Pacific Shipyards Corporation recently launched the guided-missile frigate Rodney M. Davis (FFG-60) in ceremonies at the San Pedro shipyard. The vessel is named for Sgt. **Rodney Maxwell Davis,** USMC, who was awarded a posthumous Medal of Honor for exceptional heroism while serving in the Republic of Vietnam on September 6, 1967.

His widow, **Mrs. Judy P. Davis,** was the sponsor of the ship. She was assisted by **Mrs. Ruth Davis,** mother of the ship's namesake, and her daughters, **Nicola A. Davis** and **Samantha J. Davis.** Principal speaker at the event was Major Gen. **Frank E. Peterson Jr.,** USMC, deputy commander, Fleet Marine Force Atlantic.

Also present at the launching ceremonies were Capt. **R. Bruce Woodruff,** USN, guided missile frigate ship acquisition program manager (FFG); Capt. **Robert H. Randall,** USN, supervisor of shipbuilding, conversion and repair, Long Beach; **Hans K. Schaefer,** president of Todd Shipyards Corporation; and **Len M. Thorell,** vice president and general manager, Todd Pacific Shipyards Corporation, Los Angeles Division.

The primary mission of the Rodney M. Davis and the other FFGs is to serve as ocean escort with amphibious task groups, replenishment groups, or convoys. The ship has an overall length of 453 feet, beam of 45 feet, and full-load displacement of 3,900 tons. She is equipped with surface-to-air and surface-to-surface missile systems, torpedoes, and a 76-mm gun. Two manned antisubmarine helicopters extend the ship's attack range and over-the-horizon capability.

Many relatives of the late Sgt. **Davis** attended the launching ceremony. (L to R): **Gordon Davis**, brother; **Nicola Davis,** daughter and maid of honor; **Samantha Davis,** daughter and maid of honor; **Ruth Davis,** mother; **Len M. Thorell,** vice president and general manager of Todd's Los Angeles Division; **Judy Davis,** widow and sponsor; **Robert Davis,** brother; **Howard Davis,** brother; and Maj. Gen. **Frank E. Petersen,** USMC, principal speaker.



LATEST CHANGES IN U.S. NAVY SHIPBUILDING PROGRAM

Quarterly Update On U.S. Navy Ship Procurement February 1986

By James R. McCaul, President
International Maritime Associates, Inc.

IMA provides continuing coverage of the Navy ship procurement market. Each quarter several hundred subscribers receive in-depth, analytical reviews of development affecting Navy business opportunities. This article is an excerpt from IMA's February quarterly report.

FIVE-YEAR SHIPBUILDING PLAN

Navy has proposed a program to build or convert 126 ships over the FY 1987-1991 period. The plan is shown in Exhibit 1.

Navy Lowers Construction Tempo

Budget pressures are affecting Navy ship procurement plans. Fewer ships are proposed to be built or converted over the next five years than in recent plans. Navy last year proposed a five-year plan to build or convert 133 ships. The plan submitted to Congress two years ago (FY 1985) proposed 142 ships.

Exhibit 1—Navy Shipbuilding and Conversion Five-Year Plan

	Number of Ships Budgeted				
	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991
New Construction					
Trident Submarine (SSBN)	1	1	1	1	1
Attack Submarine (SSN-688)	4	3	3	4	1
New Design SSN (SSN-21)	-	-	1	-	2
Aegis Cruiser (CG-47)	2	2	2	2	-
Guided Missile Destroyer (DDG-51)	3	3	3	3	5
Mine Countermeasures Ship (MCM)	-	3	-	-	-
Coastal Minehunter (MSH-1)	4	4	4	-	-
Amphibious Landing Ship Dock (LSD-41CV)	-	1	1	1	1
Amphibious Assault Ship (LHD-1)	-	1	1	-	1
Ocean Surveillance Ship (TAGOS)	3	3	2	2	-
Fleet Oiler (TAO)	2	2	2	2	2
Repair Ship (ARS)	-	-	-	-	1
Ammunition Ship (AE)	-	1	-	2	2
Landing Craft Air Cushion (LCAC)	-	9	9	9	9
Fast Combat Support Ship (AOE)	1	-	1	1	1
Oceanographic Research Ship (AGX/AGOR)	1	-	-	2	3
Conversion/Acquisition					
Amphibious SLEP	-	-	1	3	3
CV SLEP	-	1	-	-	1
Crane Ship (TACS)	2	2	2	-	-
Jumbo Oiler (AO)	1	1	1	2	-
Total (excluding LCAC's)	24	28	25	25	24

Source: Department of the Navy

Three years ago Navy proposed 145 ships over the five-year planning period.

Aegis Program Stretched

Navy now proposes to build a total of five Aegis surface combatants in each of the next five years. Last year's plan called for a total of five Aegis cruisers/destroyers in FY 1987, eight in FY 1988, seven in FY 1989 and five thereafter until an Aegis force of 56 ships is completed. This program stretchout will extend both the CG and DDG programs one year.

Ingalls and Bath are now building Aegis ships and Todd-LA hopes to become involved in the Aegis destroyer program. Reduction in number of DDG's in 1988-90 will be three each year instead of five.

Attack Submarine Program Stretched

An SSN previously scheduled for FY 1988 has been moved to FY 1989. The FY 1988 program will now be three attack submarines instead of four, and three instead of two SSN's are now in the FY 1989 program. Newport News and GD-Electric Boat share in the SSN construction program.

Oceanographic Research Ship Added To Program

The first of a class of oceanographic research ships (AGX/AGOR) is scheduled for FY 1987 funding. Five additional ships are scheduled for FY 1990/1991. This ship had not been included in previous five-year plans.

Other Programs Stretched Or Cut

Support ship and amphibious shipbuilding and conversion plans have been significantly modified:

- the repair ship (AR) program previously scheduled to begin in FY 1990 has been moved to FY 1991
- an ammunition ship (AE) scheduled for FY 1989 has been moved into FY 1990
- the two floating drydocks (AFDM) in the previous five-year plan have been dropped
- a fast combat support ship previously scheduled for FY 1988 has been dropped
- the LSD 41 (cargo variant) program has been stretched—with one instead of two ships scheduled starting FY 1988; Avondale and Lockheed are building LSD 41's
- service life extension of the LPD amphibious transports is now scheduled to start in FY 1989 instead of FY 1988
- the fourth ship in the LHD program has been shifted from FY 1990 to FY 1991; Ingalls is building the lead LHD and other yards are interested in entering this program

Also stretched is the completion of the minecountermeasure (MCM) program. A one-year hiatus has been scheduled in FY 1987, with program completion now planned to be funded in FY 1988. Peterson and Marinette Marine are building MCM's.

Another casualty of the program reduction is the air cushion landing craft (LCAC). No LCAC's are now proposed for FY 1987 and nine instead of 12 LCAC's annually are scheduled in the remaining years in the five-year plan.

More Ocean Surveillance Ships (TAGOS) Planned

Last year's five-year plan called for funding two TAGOS ships in FY 1987 to complete the program. Now 10 TAGOS ships are planned between FY 1987-1990. Presumably these will be SWATH design ships.

Fleet Oiler (AO) Lengthening Moved Up One Year

Navy had planned to begin

(continued)

NAVY SHIPBUILDING PROGRAM

(continued)

lengthening five AO fleet oilers in FY 1988. One ship was scheduled in FY 1988 and two each in FY 1989 and 1990. The first ship is now included in the FY 1987 plan—with an initial funding request of $62 million. Avondale built the five AO's and can be expected to be a major competitor for the lengthening.

FY 1986 PROGRAM WRAP-UP

Congress finally agreed to spending levels for this year's defense program by passing a continuing resolution on 19 December. A total obligational authority of $281 billion was approved. The Administration had asked for $304 billion.

Navy had received obligational authority totaling $95.6 billion—34 percent of the defense dollars.

Changes In This Year's Program

Congress made a number of changes to the FY 1986 Navy ship procurement program. Funds were provided to begin reactivation of the battleship Wisconsin this year, instead of in FY 1987. The MCM program was partially deferred due to technical problems and program slippage. A SWATH design has been approved for the TAGOS program. The Coast Guard has received funding authority to build an ice-breaking tug and 16 patrol boats. And a Mariner Fund to build and subsequently lease cargo ships was tentatively funded—subject to authorizing legislation.

In weapons and systems procurement, Congress denied funding of the rolling airframe missile. Funds were provided to buy 150 MK-60 Captor mines. The funding for seasheds was increased $12 million from the $30 million budget request.

Important changes were made in engineering and design programs. Funds for the SUBACS program were denied due to "severe technical and management problems (which) have significantly increased costs, delayed schedules, and degraded planned system capability." IBM is the prime contractor in the SUBACS program. In place of the $205 million requested by Navy for further SUBACS development, Congress provided $200 million for a new SSN-21 combat system program.

Gramm-Rudman

The Balanced Budget and Emergency Deficit Control Act of 1985 (Gramm-Rudman) signed by the President on 12 December keeps the FY 1986 budget in suspense. Gramm-Rudman imposes a compli-

cated mechanism designed to systematically reduce future government spending deficits. The law sets a deficit target for each of the next six years. Budget cuts are automatically mandated in any year where the deficit target will be exceeded. These cuts will be across the board unless the President and Congress agree to a deficit reduction plan.

Exhibit 4—Budget Authority And Outlay Reductions To Meet Gramm-Rudman Requirements For FY 1986
(millions of $)

	Reduction in Budget Authority			Reduction in FY 1986 Outlays
	Prior Year Programs	FY 1986 Program	Total Reduction	
Shipbuilding and Conversion	$576	$490	$1,066	$67
Weapon Procurement	105	256	361	39
Aircraft Procurement	140	548	688	61
Other Navy Procurement	106	296	402	43
RDT&E	21	493	514	263

Source: Department of the Navy

Exhibit 5—Proposed Navy Procurement And RDT&E Budget
(billions of $)

	Appropriations*		Budget Report	
	FY 1985	FY 1986	FY 1987	FY 1988
Shipbuilding and Conversion	$11.0	$10.8	$11.0	$12.3
Weapon Procurement	4.4	5.2	6.1	7.9
Aircraft Procurement	10.4	11.2	11.3	12.4
Other Navy Procurement	5.1	6.4	6.5	7.8
Research, Devel., Test & Eval.	9.1	10.1	10.6	10.6

*Figures do not reflect effects of Gramm-Rudman sequestrations

Source: Navy Budget Submission

The constitutionality of the Gramm-Rudman law is now being argued in federal court. Meanwhile, cuts (technically called sequestrations) in the FY 1986 budget are programmed to reduce government outlays this year by $11.7 billion.

The projected impact of Gramm-Rudman on Navy procurement and RDT&E programs is shown in Exhibit 4. Figures in the first three columns are the amounts of budget authority to be sequestered from this and prior year appropriations in order to reduce outlays by the amounts shown.

Gramm-Rudman has produced a very complicated situation that is affecting fiscal planning in Navy and other government agencies.

PROPOSED FY 1987 AND 1988 BUDGET

Exhibit 5 summarizes the Navy budget request for procurement and RDT&E programs in FY 1987 and 1988. Figures for FY 1985 and 1986 are given for comparison.

Shipbuilding And Conversion

Navy proposes a two percent increase in shipbuilding and conversion funding in FY 1987 compared to the FY 1986 appropriation. Proposed FY 1988 funding is 11 percent greater than FY 1987—an aggressive funding increase considering the furor over the growing federal deficit. Details for the new budget request are shown in Exhibit 6.

Weapons Procurement

Large increases are proposed in this part of the Navy procurement budget. Next year's proposed budget is an increase of 17 percent over this year. FY 1988 is projected to grow another 29 percent. Most of the growth is duet to production start of the Trident II missile in FY 1987. Lockheed is the prime contractor for this multibillion-dollar program. Production of the advanced lightweight torpedo (a Honeywell contract) and the vertical launch ASROC (a Goodyear contract) are other major programs scheduled to start next year. Details for the proposed weapon procurement budget are shown in Exhibit 7.

Electronics And Other Procurement

The FY 1987 funding request is two percent higher than this year. A 19 percent increase is proposed for FY 1988. Much of the increase is attributable to purchases of electronic equipment—with $577 million budgeted in FY 1987 for communication equipment, $373 million for ASW electronics and $285 million for electronic warfare equipment. Details for the proposed budget for electronics and other procurement are shown in Exhibit 8.

Research, Development, Test and Evaluation

A five percent increase in Navy RDT&E funding is proposed for FY

(continued)

Exhibit 6—Proposed Shipbuilding and Conversion Budget
($ in millions)

	FY 1985		FY 1986		FY 1987		FY 1988	
	Qty	$	Qty	$	Qty	$	Qty	$
New Construction								
Trident Submarine (SSBN)	1	1,503.6	1	1,309.4	1	1,509.1	1	1,516.5
Attack Submarine (SSN-688)	4	2,665.0	4	2,540.9	4	2,332.6	3	2,046.9
New Design SSN (SSN-21)	--	--	--	--	--	454.3	--	160.2
Aegis Cruiser (CG-47)	3	2,752.9	3	2,612.3	2	1,924.3	2	1,902.6
Destroyer (DDG-51)	1	976.0	--	74.0	3	2,527.8	3	2,354.6
Mine Countermeasures Ship (MCM)	4	344.5	2	197.2	--	--	3	272.2
Coastal Minehunter (MSH-1)	--	--	4	184.5	4	196.1	4	181.8
Amphib. Landing Ship Dock (LSD-41)	2	476.6	2	373.4	--	--	--	--
Amphib. Landing Ship Dock (LSD-41/CV)	--	--	--	--	--	--	1	311.2
Amphib. Assault Ship (LHD-1)	--	39.2	1	1,268.3	--	232.0	1	1,046.9
Ocean Surveillance Ship (TAGOS)	2	99.7	2	115.1	3	148.1	3	193.9
Fleet Oiler (TAO)	3	463.0	2	266.3	2	275.5	2	319.9
Ammunition Ship (AE)	--	--	--	--	--	--	1	369.8
Landing Craft Air Cushion (LCAC)	(9)	230.1	(12)	307.0	--	--	(9)	221.3
Survey Ship (TAGS)	2	196.7	--	--	--	--	--	--
Fast Combat Support Ship (AOE)	--	--	--	--	1	612.7	--	--
Oceanographic Research Ship (AGX)	--	--	--	--	1	33.0	--	--
Conversion/Acquisition								
AO Jumbo	--	--	--	--	1	62.3	1	49.5
Acoustic Research Vessel (AG)	--	--	1	57.0	--	--	--	--
Amphibious SLEP	--	--	--	--	--	23.1	--	97.8
Battleship Reactivation	--	--	1	469.0	--	--	--	--
CV-SLEP	1	714.5	--	52.0	--	83.5	1	544.8
Moored Training Ship Demonstration (MTSD)	--	30.0	(1)	175.4	--	--	--	--
Aviation Support Ship (TAVB)	1	35.3	1	26.9	--	--	--	--
Strategic Sealift	--	31.0	--	228.4	--	27.8	--	50.4
Strategic Sealift Enhancement	--	--	--	--	--	20.7	--	18.4
Crane Ship (TACS)	1	30.5	3	82.5	2	61.1	2	59.9
All Other Costs	--	443.8	--	500.8	--	522.2	--	577.3
Total	25	11,032.4	27	10,840.4	24	11,046.2	28	12,295.9

Source: Department of the Navy

Exhibit 7—Proposed Weapons Procurement Budget
($ in millions)

	FY 1985		FY 1986		FY 1987		FY 1988	
	Qty	$	Qty	$	Qty	$	Qty	$
Missiles								
Trident II	-	162.9	-	550.9	21	1,424.4	66	2,283.7
Tomahawk	180	553.3	249	724.8	324	790.5	410	908.1
Phoenix	265	423.7	265	348.8	205	317.7	430	440.9
Sparrow	1,671	290.0	1,948	340.7	1,716	279.4	1,594	271.6
Sidewinder	1,000	68.5	2,120	107.0	627	64.6	488	52.2
Harpoon	354	277.3	370	286.3	94	139.9	204	197.1
HARM	813	278.2	825	224.4	1,110	256.7	1,492	336.6
Standard Missiles	1,384	730.7	1,316	857.9	1,194	730.6	1,250	747.3
Stinger	—	—	—	—	685	51.9	—	—
Mavericks	600	103.0	1,695	191.4	2,219	250.08	1,502	163.3
Other Missiles	438	45.6	1,504	78.2	306	86.1	2,217	196.1
Torpedoes								
MK-48 ADCAP Torpedo	28	105.6	123	395.9	227	508.4	296	552.6
MK-46 Torpedo	1,565	229.7	500	118.9	500	97.9	500	87.7
ALWT	—	—	—	—	84	109.9	204	346.9
MK-60 Captor	300	122.0	150	56.6	—	—	—	—
Vertical Launch ASROC	—	—	—	—	200	74.3	300	73.5
ASUW Torpedo	—	—	—	—	34	17.0	110	30.9
Other								
FLTSATCOM	—	44.3	—	53.1	—	65.1	1	118.3
MK 15 CIWS Phalanx)	49	169.4	39	139.3	27	105.6	9	43.1
Spares & Repair Parts	—	171.3	—	151.5	—	150.7	—	162.1
Other	—	604.9	—	590.4	—	573.9	—	861.5
Total		4,380.4		5,216.1		6,095.4		7,873.5

Source: Department of the Navy

NAVY

(continued)

1987. Additional funding is requested for submarine advanced combat system development (IBM and EG&G have had a lead role) and the ASW stand-off weapon (Boeing is prime contractor). Details for the proposed RDT&E budget are shown in Exhibit 9.

INDUSTRY DEVELOPMENTS

Shipbuilding in this country continues to be dominated by one customer—the Navy.

GE to Buy RCA

Shareholders of RCA approved the $6.3-billion acquisition of the firm by GE. The deal strengthens GE's already strong presence in the Navy market. GE supplies the LM-2500 gas turbine, naval nuclear plants, Trident fire control systems and other ship systems. RCA's long involvement in Aegis gives GE a leading position in surface combatant electronics.

Bath And Ingalls Receive Aegis Cruiser Contracts

In early January Navy awarded Bath a $387-million contract to build two CG-47 class cruisers. Ingalls received a $243-million contract to build one CG cruiser. Bath now has six CG's on order for a total contract value of $1.3 billion. Ingalls has already completed four CG's and has nine more on order.

Newport News To Build Trident Submarines

Extending its policy to use competition to drive prices down, Navy had decided to invite Newport News to bid on future Trident construction. GD-Electric Boat has already received contracts for 12 Trident submarines. Current plans call for eight more Tridents at the rate of one contract per year. As an initial step Newport News will be selected to perform post shakedown work on

(continued)

Exhibit 9—Proposed Research, Development Test and Evaluation Budget
(millions of $)

	FY 1985	FY 1986	FY 1987	FY 1988
Technology Base	$ 791.4	$ 835.6	$ 851.0	$ 918.0
Advanced Technology Development	112.4	118.8	196.3	294.4
Strategic Programs	2,261.9	2,386.0	2,001.0	1,576.9
Tactical Programs	4,748.0	5,375.2	6,035.1	6,191.4
Intelligence and Communications	421.5	580.5	695.0	765.5
Defense Wide Mission Support	735.7	780.8	808.4	857.4
Total	9,070.9	10,076.9	10,586.8	10,603.6

Source: Department of the Navy

Exhibit 8—Proposed Electronics and Other Procurement Budget
(millions of $)

	FY 1985	FY 1986	FY 1987	FY 1988
Ships Support Equipment	$ 743.9	$ 907.5	$1,054.4	$1,159.0
Common. & Elect. Equipment	1,582.6	2,016.1	2,031.4	2,529.9
Aviation Support Equipment	931.9	1,141.4	963.5	1,143.6
Ordnance Support Equipment	1,060.6	1,241.5	1,259.8	1,463.1
Civil Engin. Supp. Equipment	228.8	229.4	267.3	277.5
Supply Support Equipment	87.7	58.9	82.2	138.2
Personnel & Command Supp. Equip.	471.4	526.5	556.3	634.7
Spares and Repair Parts		260.0	323.9	409.4
Total	5,106.8	6,381.3	6,538.8	7,755.4

Source: Department of the Navy

NAVY

(continued)

the Nevada (SSBN-733) later this year.

Todd-LA Given Aegis Cruiser PSA Contracts

In a move similar to above, Todd received a $7.5-million fixed-price contract to perform post shakedown work on two CG cruisers recently delivered by Ingalls. Todd in an announcement to shareholders interprets this as a step toward its Los Angeles yard becoming a builder of Aegis destroyers.

Meanwhile, Navy plans for DDG construction over the next several years have been scaled down from five to three ships per year.

International Maritime Associates, Inc. is a management consulting firm. It specializes in market research and corporate planning. Among its clients are electronics and machinery manufacturers, shipbuilders, and systems integrators. IMA as part of its activities occasionally prepares a special analysis of high visibility markets. The firm has recently prepared in-depth analyses of U.S. Navy ship procurement and Navy ship maintenance and modernization:

- **U.S. Navy Overhaul Market**—175 pages, updated through January 1986
- **U.S. Navy Ship Procurement**—215 pages, updated through February 1986

These reports focus on market opportunities, contracting procedures and points of contact. They provide invaluable information for planning and implementing marketing efforts. Each report is updated every three months, ensuring the data remain current. The reports—including four quarterly updates—are available to subscribers for $480 each from International Maritime Associates, 1800 K Street, N.W., Washington, D.C. 20006, phone (202) 296-4615, telex 643215.

NAVY CONTRACTS

Ship Electronics & Systems

AT&T Technologies Incorporated, Greensboro, N.C., is being awarded a **$9,774,576** modification to a previously awarded fixed-price-incentive contract for oceanographic equipment. Work will be performed in Burlington, N.C., and is expected to be completed January 31, 1989. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-85-C-0082). (Announced 1/29/86)

Johns Hopkins University, Applied Physics Laboratory, Laurel, Md., is being awarded a **$37,115,496** modification to a previously awarded cost-plus-fixed-fee contract for research on tactical/strategic systems, space science, geophysics, biophysics, energy conversion, microelectronics and robotics. Work will be performed in Laurel, and is expected to be completed December 31, 1986. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-5301). (Announced 2/5/86)

EDO Corporation, College Point, N.Y., is being awarded a **$15,213,985** fixed-price-incentive contract for AN/SQR-18A(V)1 Engineering Change (EC) kits, AN/SQS-35(V) EC kits, and AN/SQR-18A(V)2 shipboard electronic systems. Work will be performed in College Point, and is expected to be completed in August 1987. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-6154). (Announced 1/29/86)

Control Data Corporation, Minneapolis, Minn., is being issued a **$4,743,616** firm-fixed-price order to furnish 47 various electronic items to be used as spare parts in support of the AN/UYH-3(v) recorder-reproducer magnetic disk for shipboard use. Work will be performed in Minneapolis, and is expected to be completed in February 1987. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-85-G-0358). (Announced 2/3/86)

Hughes Aircraft Company, Microelectronic Systems Division, Irvine, Calif. is being awarded an **$8,865,628** modification to a previously awarded firm-fixed-price contract for 30 secure voice switches, 500 remote channel selectors and 30 spares for program year 1986 of a multi-year contract. This equipment helps provide secure exterior ships communications. Work will be performed in Irvine, and is expected to be completed April 30, 1988. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-84-C-0145). (Announced 1/30/86)

Canadian Commercial Corporation, Hermes Electronics Limited, Dartmouth, Nova Scotia, Canada, is being awarded a **$22,212,842** firm-fixed-price contract to furnish 58,425 AN/SSQ-53B sonobuoys with LAU-126/A launcher containers and associated data. Work will be performed in Dartmouth, Nova Scotia, Canada, and is expected to be completed in September 1987. Three bids were solicited and three offers were received. The Naval Avionics Center, Indianapolis, Ind., is the contracting activity (N00163-86-C-0008). (Announced 2/10/87)

NAVY

CURRENT NAVY & COAST GUARD VESSELS UNDER CONTRACT AT U.S. YARDS

SHIPYARD / NAVY NUMBER	NAME	APPROX. CONTRACT $	CONTRACT DEL'Y DATE
Atlantic Marine			
MK IV patrol boats (3)	unnamed	4,155,500	NA
Avondale Industries			
T-AO-187	Henry J. Kaiser	123,900,000	9/86
T-AO-188	Joshua Humphreys	117,000,000	12/86
T-AO-189	unnamed	116,000,000	5/87
T-AO-190	unnamed	116,000,000	9/87
T-AO-193	unnamed	116,000,000	8/88
T-AO-195	unnamed	101,000,000	1/89
LSD-44	unnamed	166,000,000	7/88
LSD-45-46	unnamed (2)	306,800,000	88-89
LSD-47-48	unnamed (2)	300,000,000	89-90
Bath Iron Works			
FFG-59	Kauffman	89,300,000	10/86
CG-51	Thomas S. Gates	305,300,000	1/87
CG-58	unnamed	252,800,000	6/88
CG-60-61	unnamed (2)	383,600,000	89
CG-63-64	unnamed (2)	386,600,000	NA
Bell Aerospace			
LCAC-7-17	unnamed (6)	102,000,000	NA
LCAC-13-24	unnamed (12)	197,000,000	NA
Bender Shipbuilding			
LCM-8 type	unnamed (4)	3,000,000[3]	—
Bethlehem-Sparrows Point			
T-AGS-39-40	unnamed (2)	132,000,000	87-88
Boing Marine			
APH	unnamed	6,900,000[1]	6/87
Patrol boats (Thailand-2)	unnamed	112,000,000	—
Bollinger Shipyard			
WPB-1305	Monhegan	5,000,000	86
WPB-1306	Nunivak	5,000,000	86
WPB-1307	Ocracoke	5,000,000	86
WPB-1308	Vashon	5,000,000	86
WPB-1309	Aquidneck	5,000,000	87
WPB-1310	Mustang	5,000,000	87
WPB-1311	Naushon	5,000,000	87
WPB-1312	Sanibel	5,000,000	87
WPB-1313	Ebisto	5,000,000	87
WPB-1314	Sepelo	5,000,000	—
WPB-1315	Matinicus	5,000,000	—
WPB-1316	Nantucket	5,000,000	—

SHIPYARD / NAVY NUMBER	NAME	APPROX. CONTRACT $	CONTRACT DEL'Y DATE
Robert E. Derecktor			
WMEC-906	Seneca	37,700,000	6/86
WMEC-907	Escanaba	37,700,000	86
WMEC-908	Tahoma	37,700,000	—
WMEC-909	Campbell	30,160,000	—
WMEC-910	Thetis	30,160,000	—
WMEC-911	Forward	30,160,000	—
WMEC-912	Legare	30,160,000	—
WMEC-913	Mohawk	30,160,000	—
General Dynamics/Electric Boat			
SSN-724	unnamed	70,121,000	5/87
SSN-725	unnamed	70,121,000	10/87
SSN-751-2	unnamed (2)	560,200,000	88
SSN-754-5	unnamed (2)	649,000,000	—
SSN-21	unnamed	28,900,000[2]	—
SSBN-733	Nevada	401,000,000	10/87
SSBN-734	unnamed	523,700,000	88
SSBN-735	unnamed	531,600,000	89
SSBN-736	unnamed	500,870,000	90
SSBN-737	unnamed	616,400,000	90
SSBN-738	unnamed	87,100,000[1]	—
Halter Marine			
T-AGOS-13-14	unnamed (2)	28,500,000	88
Litton/Ingalls			
CG-52	Bunker Hill	332,000,000	7/86
CG-53	Mobile Bay	332,000,000	2/87
CG-54-56	unnamed (3)	926,100,000	87-88
CG-57, 59	unnamed (2)	325,500,000	88
CG-62	unnamed	238,600,000	89
CG-65	unnamed	242,600,000	90
LHD-1	Wasp	1,365,700,000	3/89
LHD-2	unnamed	38,877,000[2]	—
Lockheed-Gulfport			
LCAC	unnamed (2)	24,800,000	88
Lockheed-Seattle			
LSD-43	Fort McHenry	271,500,000	6/87
Marinette Marine			
MCM-2	Defender	46,000,000	8/86
MCM-4	Champion	42,000,000	—
TWR	unnamed (5)	13,000,000	86

SHIPYARD NAVY NUMBER	NAME	APPROX. CONTRACT $	CONTRACT DEL'Y DATE
YP Yard Patrol Craft	unnamed (20)	59,700,000	86-87
Moss Point Marine			
LCU	unnamed (2)	8,600,000	9/86
Norfolk Shipbuilding			
Logistic Support	(Army-4)	80,000,000	89
Newport News Shipbuilding			
CVN-71	Theodore Roosevelt	1,300,000,000	9/86
CVN-72	Abraham Lincoln	1,550,000,000	12/89
CVN-63	George Washington	1,550,000,000	12/91
SSN-721	Chicago	225,000,000	6/86
SSN-722	Key West	225,000,000	6/87
SSN-723	Oklahoma City	225,000,000	87
SSN-750	Newport News	278,000,000	87
SSN-753	unnamed	319,000,000	88
SSN-756, 8-9	unnamed (3)	779,500,000	89-90
SSN-760	unnamed	—[2]	—
SSN-21	unnamed	28,900,000[2]	—
Pennsylvania Shipbuilding			
T-AO-191-2	unnamed (2)	222,000,000	89
T-AO-194	unnamed	97,500,000	90

SHIPYARD NAVY NUMBER	NAME	APPROX. CONTRACT $	CONTRACT DEL'Y DATE
Peterson Builders			
ARS-52	Salvor	70,000,000	86
ARS-53	Grapple	33,900,000	87
MCM-1	Avenger	64,400,000	86
MCM-3	Sentry	57,900,000	87
MCM-5	unnamed	57,900,000	88
RMI, Inc.			
SWCM	unnamed	11,250,000	—
Tacoma Boatbuilding			
T-AGOS-9	Assertive	12,500,000	86
T-AGOS-10	Invincible	12,500,000	86
T-AGOS-11	Dauntless	12,500,000	87
T-AGOS-12	Vigorous	12,500,000	87
Missile ships (2-Indonesia)	unnamed	143,000,000	—
Todd Pacific-San Pedro			
FFG-60	R.M. Davis	89,900,000	10/86
FFG-61	unnamed	96,100,000	11/88
Todd Pacific-Seattle			
ARDM	Arco	32,700,000	—

Legend: 1—long-lead procurement; 2—design contract; 3—under subcontract from Twin City Shipyard

CURRENT NAVY, COAST GUARD, & MARAD OVERHAUL, MAINTENANCE & CONVERSION CONTRACTS AT U.S. YARDS

SHIPYARD	OWNER	TYPE OF WORK	$VALUE	COMP.
Alabama Dry Dock	USN	Overhaul USS Butte (AE-27)	9,419,642	4/86
	MSC	Overhaul USNS Saturn (T-AFS-10)	8,800,000	4/86
Bath-Portland	USN	Overhaul DDs Deyo & O'Bannon	44,600,000	86-87
Bath Iron Works	USCG	Overhaul four cutters	117,452,000	—89
Bender Shipbuilding	CofE	Convert dredge to diesel	3,200,000	6/86
Coastal Drydock	USN	Overhaul USS Shreveport (LPD-12)	10,500,000	6/86
	USN	Phased maint. on AE-21,23,27	61,000,000	—
Charleston Naval Shipyard	USN	Overhaul USS Calhoun (SSBN-630)	—	8/86
	USN	Overhaul USS Jackson (SSBN-634)	—	8/87
	USN	Overhaul USS Sturgeon (SSN-637)	—	9/86
Dillingham	MarAd	Convert Pres. Polk to craneship	20,500,000	9/86
Electric Boat	USN	Phased maint. on SSBN-731-3	4,000,000	4/87
General Ship	USN	Maint. on FFs Miller & Valdez	46,475,000	—
	USN	Repairs to USS McInerney (FFG-8)	8,000,000	2/87
Ingalls Shipbuilding	USN	Overhaul USS Simon Lake (AS-33)	15,900,000	7/86
	USN	Overhaul USS Preble (DDG-46)	12,000,000	5/86
Jonathan	USN	Phased maint. USS Saganaw	9,900,000	6/90
Long Beach Naval Shipyard	USN	Overhaul USS Missouri (BB-63)	500,000,000	86
	USN	Overhaul USS Cleveland (LPD-7)	—	1/87
	USN	Overhaul USS Schofield (FFG-3)	—	11/86
Mare Island Navy Yard	USN	Overhaul USS Haddock (SSN-621)	—	5/86
	USN	Overhaul USS Hammerhead (SSN-663)	—	9/86
National Steel	MSC	Convert Rose City & Worth to T-AH	336,200,000	86-87
	USN	Phased maint. of 4 LSTs	3,500,000	—90
	USN	Overhaul USS Tripoli (LPH-10)	12,835,000	5/86
	USN	Overhaul USS Merrill (DD-976)	6,039,000	—
	USN	Overhaul USS Horne (CG-30)	—	—
	USN	Overhaul USS Leahy (CG-16)	—	—
	USN	Maint. on 3 LSTs	5,858,543	—
Norfolk Navy Yard	USN	Overhaul USS Yarnall (CG-17)	—	6/86
	USN	Overhaul USS Nassau (LHA-4)	—	9/86
	USN	Overhaul USS Memphis (SSN-691)	—	9/86
Norfolk Shipbuilding	USN	Phased maint. AO-178, 179, 186	38,900,000	—
	USN	Overhaul USS Caloosahatchee (AO-98)	3,478,000	—
Northwest Marine	USN	Overhaul USS Cushing (DD-985)	12,300,000	7/86
	USN	Overhaul USS Duluth (LPD-6)	12,282,000	6/86
	USCG	Overhaul USCGC Storis (WMEC-38)	4,225,000	6/86
Pearl Harbor Navy Yard	USN	Overhaul USS Skate (SSN-578)	—	6/86
	USN	Overhaul USS Omaha (SSN-692)	—	6/86
Pennsylvania Shipbuilding	USN	Phased maint. on USS Patterson (FF-1061)	5-10 mil/yr	—
Philadelphia Navy Yard	USN	SLEP on Forrestal & Independence	480,000,000	—
Portsmouth Navy Yard	USN	Overhaul USS Bolivar (SSBN-641)	—	12/86
	USN	Overhaul USS Greenling (SSN-614)	—	7/86
	USN	Overhaul USS James K. Polk (SSBN-645)	—	87
Service Engineering	MSC	Overhaul USNS Spica (T-AFS-9)	10,700,000	—
		Phase maint. of AE-29, 32-34	4,154,000	86-89
Southwest Marine	USN	Overhaul USS Dubuque (LPD-8)	10,000,000	—
	USN	Repair USS Kansas (AOR-3) & USS Wichita (AOR-1)	41,600,000	—
	USN	SRN on 4 16/26 class ships	—	—
	USN	Overhaul USS Cayuga (LST-1186), USS Racine (LST-1191) & USS Schenectady (LST-1185)	35,000,000	87-89
Todd-Galveston	MSC	Convert two C-5s to T-AVBs	55,000,000	—
Todd-San Pedro	USN	Maint. on USS Vincennes (CG-49)	3,750,000	—
	USN	Overhaul USS Ingersoll (DD-652)	13,500,000	12/86
Todd-Seattle	USN	Phased maint. of AOEs	6,000,000	86-90
	USN	Overhaul USS Hill (DD-986)	15,000,000	5/86
	USCG	Overhaul 8 cutters	234,903,000	—90
Triple A	USN	Overhaul of USS Kitty Hawk (CV-63)	5,180,848	4/86
USCG Yard-Curtis Bay	USCG	SLEP for 14 buoy tenders	8,500,000	—
	USCG	Major maint. of 16 WMECs	—	—

NEW NAVY BUDGET: OVER $100 BILLION

Changes Create New Supplier Opportunities

The Department of Defense has requested $311.6 billion in new budget authority for the fiscal year (FY 1987) beginning October 1, 1986. Included in the budget request, biggest ever in U.S. peacetime history, is $11 billion allocated for construction of 21 ships and conversion of three others.

The budget also requests $25.7 billion for the Navy's "O&M" account (operations and maintenance, often referred to as the "readiness" account). Of that total, $1.1 billion is allocated for "ship maintenance and modernization" of the Navy's strategic submarine forces (Polaris, Poseidon, and Trident ballistic missile submarines, or SSBNs); another $5.3 billion is set aside for ship maintenance and modernization of the Navy's general purpose ships—the battleships, cruisers, frigates, destroyers, attack submarines, and other combatants and support ships that would do the bulk of the fighting in a "conventional" (non-nuclear) as opposed to a "strategic" (nuclear) conflict.

Projection tables, trend statistics, and other supporting data provided Congress by Secretary of Defense **Caspar Weinberger** in his February 5 "Annual Report to the Congress" also show the following:

• The Department of Defense's five-year defense plan (FYDP) projects additional increases in the budget authority that will be requested in each of the next four fiscal years. The overall five-year plan will take the DOD budget from the $311.6 billion requested for FY 1987 to $332.4 billion in FY 1988 to an eventual $395.5 billion in FY 1991. (It will, that is, if Congress approves the annual DOD requests in toto, and no one in official Washington believes that will happen.)

• The Navy's five-year shipbuilding program will continue on track at about the same pace—20 or so new-construction ships funded each year, and four or five major conversions. There seems to be a reasonable chance that most of that program will be funded, although some specific line items could be delayed or stretched out over a longer time frame. Some others could be accelerated, though.

• The O&M readiness account will also be maintained at about the same level, and in fact will probably be increased somewhat. The official projections on this have not been released (the five-year defense plan and five-year shipbuilding plan are required by law to be submitted to Congress), but the **Weinberger** report and the "posture" statements submitted by Navy Secretary **John F. Lehman Jr.** and Chief of Naval Operations Adm. **James D. Watkins** all say much the same thing: ships now operational will be kept in service longer; there will be greater emphasis on maintaining ships and aircraft now in the active inventory at a higher degree of readiness than there will be on new procurement; and more and better equipment will be turned over to the Naval Reserve, and that equipment also will be maintained at a higher degree of readiness. All of that translates into more rather than less O&M funding.

For the U.S. shipbuilding and shipbuilding support industries the new budget comes as a welcome relief. There have been dire predictions emanating from Capitol Hill that the so-called Gramm-Rudman-Hollings budget-balancing legislation passed late last year would, among many other things, decimate the defense national program in general and create particular havoc with the procurement accounts. House Armed Services Committee Chairman **Les Aspin** (D-Wis.), for example, has said that "G-R-H," as

DEPARTMENT OF THE NAVY
SHIPBUILDING AND CONVERSION, NAVY
(IN MILLIONS OF DOLLARS)

	FY 1985		FY 1986		FY 1987		FY 1988	
	QTY	$	QTY	$	QTY	$	QTY	$
NEW CONSTRUCTION								
TRIDENT SUBMARINE (SSBN)	1	1,503.6	1	1,309.4	1	1,509.1	1	1,516.5
ATTACK SUBMARINE (SSN-688)	4	2,665.0	4	2,540.9	4	2,332.6	3	2,046.9
NEW DESIGN SSN (SSN-21)	–	–	–	–	–	454.3	–	160.2
AEGIS CRUISER (CG-47)	3	2,752.9	3	2,612.3	2	1,924.3	2	1,902.6
DESTROYER (DDG-51)	1	976.0	–	74.0	3	2,527.8	3	2,354.6
MINE COUNTERMEASURES SHIP (MCM)	4	344.5	2	197.2	–	–	3	272.2
COASTAL MINEHUNTER (MSH-1)	–	–	4	184.5	4	196.1	4	181.8
AMPHIBIOUS LANDING SHIP DOCK (LSD-41)	2	476.6	2	373.4	–	–	–	–
AMPHIBIOUS LANDING SHIP DOCK (LSD-41/CV)	–	–	–	–	–	–	1	311.2
AMPHIBIOUS ASSAULT SHIP (LHD-1)	–	39.2	1	1,268.3	–	232.0	1	1,046.9
OCEAN SURVEILLANCE SHIP (TAGOS)	2	99.7	2	115.1	3	148.1	3	193.9
FLEET OILER (TAO)	3	463.0	2	266.3	2	275.5	2	319.9
AMMUNITION SHIP (AE)	–	–	–	–	–	–	1	369.8
LANDING CRAFT AIR CUSHION (LCAC)	(9)	230.1	(12)	307.0	–	–	(9)	221.3
SURVEY SHIP (TAGS)	2	196.7	–	–	–	–	–	–
FAST COMBAT SUPPORT SHIP (AOE)	–	–	–	–	1	612.7	–	–
OCEANOGRAPHIC RESEARCH SHIP (AGX)	–	–	–	–	1	33.0	–	–
CONVERSION/ACQUISITION								
AO JUMBO (C)	–	–	–	–	1	62.3	1	49.5
ACOUSTIC RESEARCH VESSEL (AG)	–	–	1	57.0	–	–	–	–
AMPHIBIOUS SLEP	–	–	–	–	–	23.1	–	97.8
BATTLESHIP REACTIVATION	–	–	1	469.0	–	–	–	–
CV-SLEP	1	714.5	–	52.0	–	83.5	1	544.8
MOORED TRAINING SHIP DEMONSTRATION (MTSD) (C)	–	30.0	(1)	175.4	–	–	–	–
AVIATION SUPPORT SHIP (TAVB) (C)	1	35.3	1	26.9	–	–	–	–
STRATEGIC SEALIFT	–	31.0	–	228.4	–	27.8	–	50.4
STRATEGIC SEALIFT ENHANCEMENT	–	–	–	–	–	20.7	–	18.4
CRANE SHIP (TACS) (C)	1	30.5	3	82.5	2	61.1	2	59.9
ALL OTHER COSTS	–	443.8	–	500.8	–	522.2	–	577.3
TOTAL: SHIPBUILDING AND CONVERSION, NAVY	25	11,032.4	27	10,840.4	24	11,046.2	28	12,295.9

This four-year "snapshot" table showing the Navy's actual fiscal year 1985 and 1986 shipbuilding programs and the funding requested for FY 1987—and expected at this time to be requested for FY 1988—shows, perhaps better than any other single table could, the importance of Navy shipbuilding to the U.S. shipbuilding and shipbuilding support industries. Perhaps the most important single fact to remember about the program is that, because the Navy has five years in which to obligate the funds appropriated—and wants to increase its decision time to seven years—most of the money appropriated in fiscal years 1985 and 1986 is not yet obligated. Moreover, most of the money that *is* obligated has not yet passed the prime contractor level; most subcontractors, systems manufacturers, suppliers, and other second- and third-echelon members of the shipbuilding community still have an excellent opportunity, therefore, to win one or more major contracts for the programs indicated.

it is now being referred to, would force a $40-billion reduction in DOD outlays in fiscal years 1986 and 1987 alone, and an $80-billion cutback in budget authority for the same two years. (Outlays represent the money actually spent in any specific fiscal year. Budget authority represents the money appropriated by Congress in a specific fiscal year and authorized for expenditure; the money authorized and appropriated does not, however, have to be spent in the same fiscal year in which it is appropriated. Funds appropriated, for example, for shipbuilding programs, which require considerable leadtime, typically are not spent until perhaps four or five years later.)

The as-yet unknown impact of G-R-H has thrown all previous budgetary calculations into at least temporary turmoil, however. Named after its three principal sponsors—Republican Senators **Phil Gramm** of Texas and **Warren B. Rudman** of New Hampshire, and Democratic Senator **Ernest F. (Fritz) Hollings** of South Carolina—G-R-H was signed into law in mid-December by President **Reagan** as The Balanced Budget and Emergency Deficit Control Act of 1985 (Public Law 99-177).

The laudable purpose of G-R-H is to force the executive and legislative branches of government to do what they so far have seemed unwilling or unable to do voluntarily: balance the budget. G-R-H does this by setting predetermined but increasingly lower "target deficits"—$171.9 billion for FY 1986; $144 billion for FY 1987; $108 billion for FY 1988, etc. The goal is to reach a zero deficit by FY 1991, and to help Congress and the White House reach cooperative agreement each year there is a provision included in G-R-H that requires mandatory reductions (half from defense, half from domestic programs) if a budget that does not exceed the target deficit is not agreed to by a predetermined date. The "date certain" for the FY 1987 budget is August 20 of this year. That means that Congress must pass, and the President must sign, a G-R-H budget by that date or the automatic reductions go into effect, and the defense-decimating effect predicted by Chairman **Aspin** will become reality.

Complicating the situation further is that a court challenge to G-R-H submitted by several members of Congress has been upheld by a lower federal court and now is headed for the Supreme Court. The lower court held that Congress cannot abdicate to such non-elected officials as the director of the Congressional Budget Office (CBO) and the director of the Office of Management and Budget (OMB)—who jointly determine whether the target deficit mandated by G-R-H will be met—the authority given by the Constitution to Congress only to raise revenues and appropriate and distribute federal funds.

Until the Supreme Court rules (probably not until sometime this summer, most observers agree) on the appeal to the lower court's ruling, though, the executive and legislative branches are bound by the provisions of G-R-H, and must make their plans accordingly. The stage therefore is set for what *Sea Power Magazine*, an official publication of the Navy League of the United States, already has suggested very likely will be "the legislative donnybrook of the decade, and perhaps of the century."

The real problem, of course, is that—no matter what the Supreme Court rules—the White House has for years been asking for, and the Congress has been approving, expenditures which so greatly exceed revenues that the cumulative public debt is now more than $2 trillion, and getting ever larger every year. Even if the G-R-H target deficits are met the national debt will be an estimated $2.6 trillion or so by FY 1991, with annual interest payments alone costing perhaps 10 percent of that, or $260 billion.

All of that means that, with or without G-R-H, Congress and the White House face many long years of budgetary belt-tightening, so it can be assumed that the budget battles are just now beginning. It also can be assumed that every member of Congress will fight tooth and nail to defend the projects and programs of most concern to his or her own constituents, and that many will be quite willing to cut back on spending for national defense if doing so

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will make more money available for other programs.

President **Reagan,** the most overtly pro-defense chief executive of this century, perhaps, will be fighting that understandable Congressional tendency, and he has, fortunately for the national defense program, quite a few weapons in his own arsenal.

The first and most politically lethal of those weapons is that 1986 is an election year for one third of the Senate and for every member of the House running for reelection. Most members are in fact pro-defense, and even those few who are not will not admit it publicly. In short, there is not one senator or representative who wants to go before his constituents wearing an "anti-defense" label. But that is exactly the label the persuasive Mr. **Reagan** will hang on those members who either vote to cut the defense program or, though inaction, let the G-R-H automatic reductions come into play. (In the latter case all members of Congress can, and undoubtedly will be, justifiably described as "fiscally irresponsible.")

Mr. **Reagan** also will be sure to remind voters that he agreed with the Congress on what is referred to as "zero-three-three," shorthand for a "zero" increase in defense spending accepted by Mr. **Reagan** for FY 1986 in return for a Congressional promise to increase defense funding by three percent "real growth" (i.e., after inflation) in both fiscal year 1987 and fiscal year 1988. The President kept his end of the bargin, and now expects the Congress to keep its promise, also—and he is likely to be very publicly noisy about it if Congress reneges. The American people tolerate many things in their elected representatives, but they instinctively, and correctly, take an instant and abiding dislike of anyone who cheats or welshes on an agreement.

If all that is not enough, the President, Secretary **Weinberger,** and other defense officials undoubtedly will go over the heads of Congress to the American people to make their case that to cut the defense budget any more than it already has been cut (both by Congress, and by G-R-H automatic reductions that already have been ordered into effect for the FY 1986 defense program) will jeopardize national security to an unacceptable degree. This argument is irrefutable—not quite the same as saying it cannot be ignored—and was most recently enunciated by Mr. **Weinberger** as follows in the introduction to his Annual Report: "Wishful thinking . . . cannot meet the growing risk we face from the Soviets' continued and growing military power, nor deter war, nor win the peace. Further cuts in our efforts to regain deterrent military strength will jeopardize our security . . . The pretense of favoring strong defense while being unwilling to support strong defense budgets is unsustainable . . . This choice is ours: We can buy the forces required to serve freedom and peace for ourselves, our allies, and our descendants; or we can meanly conclude it is too great an effort, falter, and thus yield to the forces of totalitarianism and tyranny."

That is the background to the grand budgetary/political scenario now unfolding. Following are additional specifics about the overall federal budget and defense share thereof as well as, in much greater detail, a breakdown by program of the Navy budget and a line-item by line-item report on the new shipbuilding program. (The sources used include but are not limited to: White House, OMB, and DOD budget books and supporting documents; the **Weinberger, Watkins,** and **Lehman** posture statements; and such standard reference works as *Jane's Fighting Ships, The Almanac of Seapower,* and *Combat Fleets of the World.*)

DEPARTMENT OF THE NAVY
SHIPBUILDING AND CONVERSION, NAVY
FIVE-YEAR PLAN

	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991
NEW CONSTRUCTION					
TRIDENT SUBMARINE (SSBN)	1	1	1	1	1
ATTACK SUBMARINE (SSN-688)	4	3	3	4	1
NEW DESIGN SSN (SSN-21)	–	–	1	–	2
AEGIS CRUISER (CG-47)	2	2	2	2	–
GUIDED MISSILE DESTROYER (DDG-51)	3	3	3	3	5
MINE COUNTERMEASURES SHIP (MCM)	–	3	–	–	–
COASTAL MINEHUNTER (MSH-1)	4	4	4	–	–
AMPHIBIOUS LANDING SHIP DOCK (LSD-41/CV)	–	1	1	1	1
AMPHIBIOUS ASSAULT SHIP (LHD-1)	–	1	1	–	1
OCEAN SURVEILLANCE SHIP (TAGOS)	3	3	2	2	–
FLEET OILER (TAO)	2	2	2	2	2
REPAIR SHIP (ARS)	–	–	–	–	1
AMMUNITION SHIP (AE)	–	1	–	2	2
LANDING CRAFT AIR CUSHION (LCAC)	(–)	(9)	(9)	(9)	(9)
FAST COMBAT SUPPORT SHIP (AOE)	1	–	1	1	1
OCEANOGRAPHIC RESEARCH SHIP (AGX/AGOR)	1	–	–	2	3
CONVERSION/ACQUISITION					
AMPHIBIOUS SLEP	–	–	1	3	3
CV SLEP	–	1	–	–	1
CRANE SHIP (TACS) (C)	2	2	2	–	–
JUMBO OILER (AO) (C)	1	1	1	2	–
TOTAL: NUMBER OF SHIPS	24	28	25	25	24

FY 1986-90 SHIPBUILDING PROGRAM

	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1986-90 Five-Year Total
New Construction						
TRIDENT (Ballistic Missile Submarine)	1	1	1	1	1	5
SSN-688 (Attack Submarine)	4	4	4	2	4	18
SSN-21 (Attack Submarine)	–	–	–	1	–	1
CG-47 (Guided Missile Cruiser)	3	3	3	2	–	11
DDG-51 (Guided Missile Destroyer)	–	2	5	5	5	17
LHD-1 (Amphibious Assault Ship)	1	–	1	1	1	4
LSD-41 (Landing Ship Dock)	2	–	–	–	–	2
LSD-41 Follow-on (Landing Dock Ship)	–	–	2	2	2	6
MCM-1 (Mine Countermeasures Ship)	4	1	–	–	–	5
MSH-1 (Minesweeper-Hunter)	4	4	4	4	–	16
AOE-6 (Multipurpose Stores Ship)	–	1	1	1	1	4
AE-36 (Ammunition Ship)	–	–	1	1	1	3
AR (Repair Ship)	–	–	–	–	1	1
TAO-187 (Oiler)	2	2	2	2	2	10
TAGOS (Surveillance Ship)	2	2	–	–	–	4
TOTAL	23	20	24	22	18	107
Conversions/SLEPs/Reactivations						
CV (Aircraft Carrier) SLEP	–	1	–	–	1	2
BB (Battleship) Reactivation	–	1	–	–	–	1
LPD-4 (Landing Platform Dock Ship) SLEP	–	–	1	3	3	7
AO ("Jumbo" Oiler) Conversion	–	–	1	2	2	5
AG (Acoustic Research Vessel) Conversion	1	–	–	–	–	1
TAVB (Aviation Support Ship) Conversion	1	–	–	–	–	1
TACS (Crane Ship) Conversion	3	2	2	–	–	7
TOTAL	5	4	4	5	6	24

These two five-year shipbuilding programs—the one submitted this year for fiscal years 1987 through 1991, and the one submitted last year for fiscal years 1986 through 1990—show that in just one year the plan has gone through several significant changes, but that the long-term buildup to a 600-ship fleet continues unabated—assuming Congress provides the funds requested. The best evidence is the bottom-line numbers for the four fiscal years the five-year plans have in common. Last year, a total of 24 new shipbuildings and conversions were projected for FY 1987. This year, the same total is projected, 24 ships, but some of the specific "line items" have changed. The new-construction/conversion totals for the other three years (with last year's projections indicated in parentheses) are as follows: FY 1988, 28 ships (28 also projected last year); FY 1989, 25 ships (27 projected last year); FY 1990, 25 ships (24 last year). Four-year total, 102 (103 projected last year).

Federal/DOD Budgets

The overall federal budget sub-

mitted by President **Reagan** calls for $850.4 billion in receipts, projects $994 billion in outlays, and allows for a deficit of $143.6 billion—a scant $400 million below the G-R-H target deficit of $144 billion. (The outyear budgets, for FYs 1988-91, also meet the G-R-H targets, or fall close enough to preclude a triggering of the automatic reductions.)

Because the gross national product is expected to grow at an average rate of between 3.5 percent and 4.0 percent annually over the next five years, federal revenues will increase enough, administration officials say, to pay for both the requested increase in defense programs and the higher annual servicing of the national debt. Most non-defense programs will be maintained at about their current (FY 1986) levels, but a number will be cut back substantially, others will be eliminated completely, and still others transferred in whole or in part to the custody of state and local governments, with "private-sector" funding also counted on to pick up part of the tab for welfare and other "entitlement" programs. Thus, although the most damaging effects of G-R-H *can* be avoided— "and will be," Mr. **Weinberger** says, "if Congress acts responsibly"—there will be a major reordering of national priorities, if the President has his way. And, no matter what the final outcome, there seems no way to avoid a long, bitter, and bloody budget fight this year, not only between the President and Congress, but within Congress itself as the several liberal and conservative warring factions joust and tilt with one another over which programs to save, which ones to terminate, and which ones to restructure.

The internal strife within DOD is just as vigorous, but less apparent, because it takes place behind closed doors and the numerous issues in dispute have been at least temporarily reconciled by the time the official DOD budget is submitted to Congress. That budget this year is, as always, sliced, dissected, and distributed several ways, among them the following:

—By Expenditure "Purpose," a catchall term which includes: (a) $142.7 billion in investment funding (for procurement of tangible "things" ranging from beans, bullets, and black oil to electronics and communications systems and subsystems of all types to such major "platforms" as ships, aircraft, and tanks); (b) $43.2 billion to pay for "operations" (training exercises, flight hours, and steaming hours); and (c) $125.7 billion for military pay and such "related" items as PCS (permanent change of station) payments and food and subsistence allowances.

—By "Title"—which allocates the same $311.6 billion as follows: for military personnel (not quite the same, note, as the "pay and related" category just referred to above), $76.8 billion; for O&M, $86.4 billion; for procurment, $95.8 billion; for research, development, test, and evaluation—the "RDT&E" that defines and refines the ships, aircraft, and weapons systems that will be funded in future procurement budgets—$42.0 billion; military construction, $6.8 billion; family housing, $3.4 billion; and "other," $0.5 billion.

—By "Military Function"—Army, $81.5 billion; Navy and Marine Corps, $104.5 billion; Air Force, $105.2 billion; the Defense Agencies, $19.5 billion; and "Defensewide" programs, $0.9 billion.

Navy/Shipbuilding Budgets

The overall Navy/Marine Corps budget also is sliced several different ways, but the most meaningful categories, for budgetary purposes, are as follows (FY 1986 appropriations are included, for comparison purposes, in parentheses): military personnel, $17.5 billion ($15.9 billion); Naval Reserve personnel, $1.5 billion ($1.3 billion); Navy O&M, $25.7 billion ($24.5 billion); Naval Reserve O&M, $975.9 million ($895.0 million); naval aircraft procurement, $11.3 billion ($11.2 billion); naval weapons procurement, $6.1 billion ($5.2 billion); naval shipbuilding and conversion, $11.0 billion ($10.8 billion); "other procurement, Navy," $6.5 billion ($6.4 billion); Navy RDT&E, $10.6 billion

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($10.1 billion); naval military construction, $1.8 billion ($1.7 billion); and Navy and Marine Corps family housing, $784.3 million ($665.1 million).

The important O&M account includes—in addition to the $1.1 billion and $5.3 billion allocated, respectively, to the ship maintenance and modernization of the Navy's strategic forces and general purpose forces—an additional $631.3 million for "airlift and sealift" and $6.9 billion for "central supply and maintenance." Included in the latter account is $2.2 billion for "ship and weapon system maintenance and engineering," and various other large sums for other maintenance programs, some of them undoubtedly requiring at least the partial support of the shipbuilding industrial base.

Two O&M footnotes: (1) The Administration requested—in the numerous "whereases," codicils, and special provisions that often provide the most interesting reading in the DOD authorization and appropriations bills—that $3.4 billion of the O&M total be made available "for the performance of such work in Navy shipyards"; Congress provided $3.65 billion for the work allocated to Navy shipyards in the FY 1986 Defense Appropriations Act. (2) The Administration is seeking elimination of a Congressionally mandated provision that requires that "a test program" be initiated to determine the "direct and indirect costs" of the overhaul and maintenance work conducted by Navy shipyards as compared to the same work done by private-sector shipyards; the latter have been saying, usually through the Shipbuilders Council of America, that the repair and maintenance of the Navy's ships can be done both more cheaply and more effectively by private yards.

There also are several special provisions included in the shipbuilding appropriations account of particular interest to the shipbuilding community as well as certain other factors germane to an understanding of the current and projected program. Among those special provisions of law and "other factors": (a) The Navy wants to take more time to make up its mind on contract awards, and has for that reason asked that the money appropriated in FY 1987 "remain available for obligation until September 30, 1993." Congress set a cut-off date of September 30, 1990 for obligation of funds appropriated for FY 1986; the Navy is in effect, therefore, asking that its decision time be increased from five to seven years. (b) The proposed Appropriations Act includes language stipulating that "none of the funds herein provided . . . shall be expended in foreign shipyards for the construction of major components of the hull or superstructure" of the ships funded by the Act, and that "none of the funds provided . . . shall be used for the construction of any naval vessel in foreign shipyards." The spectre of G-R-H has combined with numerous DOD management initiatives—multi-year contracting, increased use of competition at all contract levels, and "second sourcing" (the distribution of prime contracts to more than one supplier)—to expand the defense industrial base and create business opportunities for numerous companies never previously considered for DOD work. The escalating pressure to cut costs, without sacrificing quality, means that prime contractors are now shaving their own contract bids to the bone, and are in turn seeking lower prices from their own suppliers and subcontractors and/or turning to other sources to satisfy their requirements.

Within that context, the following is a breakdown, not necessarily in order of importance, of the new-construction ships and conversions requested and/or projected for funding in the Navy's FY 1987 and FY 1988 programs. Ship descrip-

tions and missions are taken from DOD budget backup books; FY 1987 and FY 1988 funding details are taken from DOD and Navy budget tables:

AGOR Oceanographic Research Ship—$34.0 million, including $1 million for contract design, is requested for FY 1987 funding. The AGOR is "a new class of oceanographic research vessel capable of operating worldwide in all seasons," and "suitable for use by Navy laboratories, contractors, and academic institutions" for "a broad spectrum of oceanographic requirements." (The Navy also uses the designation "AGX" for this ship.)

AO (Jumbo) Auxiliary Oiler—$64.1 million, including $1.8 million for contract design, is requested in FY 1987 for conversion of one ship; a second will be funded in FY 1988 at an estimated cost of $49.5 million. Both conversions are part of a long-range program to convert or "jumboize" five existing fleet oilers to increase their cargo capacity.

AOE Fast Combat Support Ship—$620.2 million, including $0.8 million for contract design and $6.7 million for RDT&E, is requested for construction of "a twin-screw, 26-knot sustained speed, gas-turbine geared-drive ... ship 755 feet in overall length, 107 feet in beam, and a draft of 39 feet, with a total of 660 accommodations."

CG-47 Aegis Cruiser—$2,066.9 million (including $50.9 million for outfitting, $42 million for post-delivery requirements, $0.8 million for contract design, $38.4 million for RDT&E, and $10.5 million for associated military construction) is requested for two ships in FY 1987; two more ships will be requested in FY 1988, at a cost now estimated at $1,902.6 million. The Ticonderoga-class CG-47 Aegis guided missile cruiser "employs the proven hull and gas turbine propulsion system of the [DD-963] Spruance-class [destroyer]." Its guns, missiles, "and other advanced systems, augmented by passive protection features," make it "a most heavily armed and survivable cruiser."

Carrier Service-Life Extension Program (CV SLEP)—$109.4 million, including $13.3 million for outfitting and $12.6 million for contract design, is requested for FY 1987; an additional $544.8 million will be requested in FY 1988 for the SLEP of one Forrestal-class aircraft carrier, with the work to be carried out at the Philadelphia Naval Shipyard. The SLEPs are intended to extend the service life of carriers now in the active inventory "from a nominal 30 years to 45 years."

DDG-51 Arleigh Burke-Class Aegis Guided Missile Destroyer—$2,646.4 million, including $10.9 million for contract design and $107.7 for RDT&E, is requested (for three ships) in FY 1987, with another $2,354.6 million planned to be requested next year for construction of another three ships. Perhaps the most eagerly awaited ship in the Navy's new-construction program (because of the long-term contract opportunities provided), the DDG-51 will be 466 feet long and displace 8,200 tons. "It will be armed with a Vertical Launching System accommodating 90 missiles ... [and] will carry a 5″/54 rapid-fire gun" and other new state-of-the art weapons and electronic systems. The contract for the lead DDG-51 was awarded in FY 1985 to Bath Iron Works. "The FY 1987 program will be awarded competitively."

LHD-1 Amphibious Assault Ship—$236.1 million, including $3.6 million for outfitting and $0.5 million for contract design, is requested in FY 1987, with another $1,046.9 million projected for FY 1988 funding (for one ship). The LHD-1 is "a twin-screw, 22-knot multipurpose amphibious assault ship, 820 feet in overall length, 106-foot beam, with accommodations for 2,802 personnel, including troops." Ingalls Shipbuilding is building the lead ship under and FY 1984 contract. "Follow ships for FY 1986, 1988, and 1989 will be competed on a three-ship multi-year basis."

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LCAC Landing Craft Air Cushion—Only $11.8 million, including $0.5 million for RDT&E, is requested in FY 1987 funding, but an additional $221.3-million request, for nine LCACs, is projected for FY 1988. An air-cushion vehicle 87 feet 11 inches long and 47 feet wide, the LCAC is designed to operate "over both water and land. It can be carried in the well deck of present and future amphibious ships. It has a payload capability of 120,000 pounds, and can operate at 40 knots with this load. Range capability is 200 nautical miles."

LPD-4-Class Service Life Extension Program—$31.5 million, including $8.4 million for contract design, is requested in FY 1987; another $97.8 million will be requested in FY 1988. The LPD-SLEP, like the CV-SLEP, is designed to extend the life of ships now in the inventory—in this case, the Austin-class amphibious transport docks—"by 10 to 15 years" and to give them the capability "to carry two LCACs and four CH-46 helicopters" or equivalents. The first LPD-4 SLEP is scheduled to begin in FY 1989.

LSD-41/CV Landing Ship Dock Cargo Variant—No funds are requested in FY 1987, but $311.2 million will be request in FY 1988 for the first of four ships projected for future funding (down from six ships projected last year). The FY 1987 budget request does include $21.1 million in follow-on funding to finish LSD-41s previously approved and now under construction at Lockheed Shipbuilding, Seattle, and Avondale Shipyards, New Orleans. The LSD-41s are twin-screw, diesel-propelled amphibious assault ships, 609 feet in overall length, 84 feet at the beam, with 917 accommodations. The "cargo variant" version "will have essentially the same hull and engineering plant . . . [but] will carry more cargo in exchange for fewer LCAC spaces." Construction of the first ship is expected to begin in FY 1988.

MCM Mine Countermeasures Ship—$18.4 million (including $9.6 million for outfitting, $8.5 million for post-delivery, and $0.3 million for contract design) is requested in FY 1987, with another $272.2 million (for three ships) projected for FY 1988 funding. A twin-screw geared-diesel ship approximately 200 feet in overall length and with an approximate beam of 37 feet, the MCM is designed to have accommodations for 80 personnel. Peterson Builders of Sturgeon Bay, Wis., and Marinette Marine of Marinette, Wis., are building MCMs previously funded.

MSH-1 Coastal Minehunter—$206.1 million, including $8.5 million for outfitting and $1.5 million for contract design, is requested for four ships in FY 1987; another four ships will be funded in FY 1988 at a projected cost of $181.8 million. The minesweeper hunter "will be approximately 150 feet in length and displace 470 tons. It will carry a crew of about 40 personnel . . . and will be capable of coastal mine-clearance operations of up to five days' duration without replenishment." Bell Aerospace Textron is building the lead ship; "17 ships of this class are planned, with the last eight ships being recompeted."

Strategic Sealift: Ready Reserve Force (RRF)—$27.8 million is requesed in FY 1987, with an additional $50.4 million projected for FY 1988 and $39.1 million also requested in FY 1987/88 funding for "Strategic Sealift Enhancement." These funds are intended "To provide DOD with contingency shipping capacity which can upon request be activated for service during national emergencies and be made ready for sea through a time-phased program within five and ten days of notification." The ships expected to be used in the program will be "purchased from private owners and . . . placed in the RRF" (a rapid-re-

sponse "subset" of the National Defense Reserve Fleet, or NDRF).

SSN-21 High-Speed Nuclear Attack Submarine New-Design Program—$712 million, including $1.0 million for contract design and $256.7 million for RDT&E, is requested in FY 1987; an additional $160.2 million is projected for FY 1988 funding, with construction of the lead ship in a very long-term program expected to be fully funded in FY 1989. The new design submarine, the Navy says, "will be about 350 feet long, and displace about 9,000 tons. These single-screw submarines will carry a crew of 133 and be equipped with MK 48 torpedoes, Harpoon and Tomahawk missiles, [and] other weapons [and will be] capable of long-endurance submerged patrols."

SSN-688 Los Angeles-Class Nuclear Attack Submarine—$2,423.2 million (including $53.8 million for outfitting, $32.9 million for post-delivery costs, and $3.9 million for RDT&E) is requested in FY 1987 funding (for four ships), with another three ships projected for FY 1988 at a cost of $2,046.9 million. The LA-class SSN is 360 feet long and displaces 6,900 tons. It carries a crew of 102 and "is equipped with MK 48 torpedoes, [and] Harpoon and SUBROC [Submarine Rocket] missiles, and is capable of long-endurance submerged patrols." Newport News Shipbuilding of Newport News, Va., and the Electric Boat Division, Groton, Conn., of General Dynamics are building SSN-688s previously funded.

TACS Auxiliary Crane Ship—$63.5 million, including $2.4 million for post-delivery, is requested for FY 1987 for conversion of two ships for the RRF "by installing cranes to permit offload of general military cargo from all existing ship types where port facilities are inadequate or non-existent." Two more ships will be funded for conversion in the FY 1988 budget, at a cost of $59.9 million. The ships to be modified are "container ships to be selected by the Maritime Administration and Navy."

TAGOS SURTASS Ocean Surveillance Ship—$151.7 million, including $2.7 million for outfitting and $0.9 million for post-delivery, is requested for construction of three ships with FY 1987 funds; an additional three ships (with greater capabilities) will be built for a projected $193.9 million in FY 1988 funds. A twin-screw, 11-knot, geared diesel with auxiliary electric motor, the TAGOS ships "will be approximately 224 feet long and 42 feet wide." Tacoma Boatbuilding, Tacoma, Wash., built the first 12 TAGOS ships funded (between FY 1979 and FY 1982); Halter Marine of New Orleans won the contract for the FY 1985 program.

TAO Fleet Oiler—$292.6 million (including $2.4 million for outfitting, $13.8 million for post-delivery, $0.5 million for contract design, and $0.4 million for RDT&E) is requested for two ships in FY 1987; two more are to be procured in FY 1988 for a projected $319.9 million. A "commercialized" AO-177-class fleet oiler, the TAO has "a 20-knot speed capability and 180,000-barrel capacity," with accommodations for a 106-man Military Sealift Command crew, a Navy C^3 (command, control, and communications) team of 21 men, and "10 transient personnel." Avondale Shipyard of New Orleans and Pennsylvania Shipbuilding of Chester, Pa., are building TAOs previously funded.

AE Ammunition Ship—One ship is planned for FY 1988 procurement at a cost of $369.8 million; no additional information was provided in the DOD and Navy budget documents.

SSBN Trident Ballistic Missile Submarine—$1,708.4 million (including $8.0 million for outfitting, $6.4 million for post-delivery, $51.8 million for RDT&E, and $133.1 million for military construction) is requested in the FY 1987 budget (for one submarine); $1,516.5 million will be requested in FY 1988 for another Trident. The Tridents, equipped with 24 long-range strategic ballistic missiles, are "designed to be highly survivable in a hostile antisubmarine warfare environment" and will have an estimated nine-year operating cycle between overhaul/refueling, "plus an operating life in excess of 20 years." Trident prime contractor is the Electric Boat Division (Groton, Conn.) of General Dynamics.

NAVY CONTRACTS

Ordnance

Vitro Corporation, Silver Spring, Md., is being awarded a **$4,825,000** modification to a previously awarded cost-plus-fixed-fee contract for system integration agent production engineering services for the Tartar MK-74 missile fire control system and MK-26 guided missile launching system program. Work will be performed in Silver Spring, and is expected to be completed February 28, 1987. This contract combines purchases for the U.S. Navy (95%), and for France (1%), and Australia (4%), under the Foreign Military Sales program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-5127). (Announced 2/6/86)

McDonnell Douglas Astronautics Company, St. Louis, Mo., is being awarded a **$4,598,901** cost-plus-fixed-fee contract for sustaining engineering support for Tomahawk cruise missile Operational Flight Software (OFS). Work will be performed in St. Louis. The Joint Cruise Missiles Project Office, Washington, D.C., is the contracting activity (N00032-85-C-5721). (Announced 1/29/86)

RCA Corporation, Missile and Surface Radar Division, Moorestown, N.J., is being awarded a **$20,000,000** firm-fixed-price contract for system design definition for the FY-89 submarine combat control and acoustic system. Work will be performed in Moorestown, and is expected to be completed in December 1987. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-6085). (Announced 1/17/86)

Westinghouse Electric Corporation, Sunnyvale, Calif., is being awarded a **$14,940,597** cost-plus-fixed-fee contract modification for engineering services for the Fleet Ballistic Missile (FBM) program. Work will be performed in Sunnyvale, and is expected to be completed September 30, 1987. The Strategic Systems Program Office, Washington, D.C., is the contracting acitivity (N00030-84-C-0014). (Announced 1/17/86)

Interstate Electronics Corporation, Anaheim, Calif., is being awarded a **$9,937,000** cost-plus-incentive-fee/cost-plus-fixed-fee contract modification for development and production of test instrumentation equipment for the Trident missile program. Work will be performed in Anaheim, and is expected to be completed in October 1989. The Strategic Systems Program Office, Washington, D.C., is the contracting activity (N00030-84-C-0090). (Announced 2/5/86)

General Electric Company, Armament Systems Department, Burlington, Vt., is being awarded a **$15,600,000** modification to exercise an option under a fixed-price contract for 48 25mm gun systems for AV-8B aircraft for FY-86. Work will be performed in Burlington, and is expected to be completed in June 1988. The Naval Air Systems Command, Washington, D.C., is the contracting activity (N00019-84-C-0153). (Announced 2/7/86)

Raytheon Service Company, Burlington, Mass., is being awarded a **$47,464,449** cost-plus-award-fee contract for combat system design engineering for digital computer-based shipboard combat systems. Work will be performed in Arlington, Va., and is expected to be completed in January 1989. Thirty-five bids were solicited and two offers were received. This contract combines purchases for the U.S. Navy (99%), and for Germany (0.2%), Australia (0.2%), Spain (0.2%), Japan (0.2%), and Saudi Arabia (0.2%), under the Foreign Military Sales Program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-5294). (Announced 2/3/86)

Lockheed Missiles and Space Company Incorporated, Sunnyvale, Calif., is being awarded a **$3,669,930** cost-plus-fixed-fee contract for refurbishing of Polaris A-3 missile components for the British naval ballistic missile system. Work will be performed in Sunnyvale, and is expected to be completed August 3, 1987. This contract is in support of a Foreign Military Sale to Great Britain. The Strategic Systems Program Office, Washington, D.C., is the contracting activity (N000-30-86-C-0112). (Announced 2/10/86)

Aircraft

Itek Corporation, Applied Technology Division, Sunnyvale, Calif., is being awarded a **$14,931,248** modification as additional funding under a letter contract for AN/ALR-67 countermeasures warning and control sets for the F/A-18 aircraft. Work will be performed in Sunnyvale, and is expected to be completed in December 1986. The Naval Air Systems Command, Washington, D.C., is the contracting activity (N00019-83-C-0278). (Announced 2/5/86)

LTV Aerospace and Defense Company, Sierra Research Division, Buffalo, N.Y., is being awarded a **$6,849,446** firm-fixed-price contract for 56 ARQ-44 air data link components on the SH-60B aircraft. Work will be performed in Buffalo, and is expected to be completed in June 1987. Three bids were solicited and two offers were received. The Navy Aviation Supply Office, Philadelphia, Pa., is the contracting activity) (N00383-86-C-8009). (Announced 1/29/86)

McDonnell Douglas Corporation, St. Louis, Mo., is being awarded a **$129,000,000** modification as additional funding under an advance acquisition contract for 49 F/A-18A and 35 TF/A-18A aircraft for FY-86. Work will be performed in St. Louis, and is expected to be completed in September 1988. The Naval Air Systems Command, Washington, D.C., is the contracting activity (N00019-84-C-0270). (Announced 1/17/86)

Prospective Computer Analysts Incorporated, Roslyn, N.Y., is being awarded a **$9,807,395** cost-plus-fixed-fee contract for engineering and technical services to assist the Naval Air Engineering Center, Lakehurst, N.J., in the design and development of Automatic Test Equipment (ATE) and Test Program Sets (TPS) utilized in support of McDonnell Douglas and Grumman Aerospace aircraft. Work will be performed in Lakehurst (50%), and Roslyn (50%), and is expected to be completed in January 1989. Eighty-eight bids were solicited and four offers were received. The Naval Regional Contracting Center, Philadelphia, Pa., is the contracting activity (N00140-86-C-9146). (Announced 1/17/86)

Lockheed California Company, Burbank, Calif., is being awarded an **$11,341,228** firm-fixed-price contract to provide 222 structural integrity program support kits for the T-2 aircraft. Work will be performed in Burbank, and is expected to be completed in December 1987. Eighteen bids were solicited and two offers were received. The Navy Aviation Supply Office, Philadelphia, Pa., is the contracting activity (N00383-86-C-1353). (Announced 2/3/86)

McDonnell Douglas Corporation, St. Louis, Mo., is being awarded a **$227,356,184** modification as additional funding under an advance acquisition contract for 49 F/A-18A and 35 TF/A-18A aircraft weapon systems for FY-86. Work will be performed in St. Louis, and is expected to be completed in September 1988. The Naval Air Systems Command, Washington, D.C., is the contracting activity (N00019-84-C-0270). (Announced 2/7/86)

Lockheed Corporation, Lockheed-California Company, Burbank, Calif., is being awarded a **$39,000,000** modification as advance funding under an advance acquisition contract for nine P-3C aircraft for FY-86. Work will be performed in Burbank, and is expected to be completed in March 1988. The Naval Air Systems Command, Washington, D.C., is the contracting activity (N00019-85-C-0016). (Announced 2/7/86)

McDonnell Douglas Corporation, St. Louis, Mo., is being awarded a **$5,000,000** modification to a basic ordering agreement to conduct Forward Looking Infrared Radar/Laser Target Designator/Ranger (FLIR/LTD/R) testing and to accomplish F/A-18 aircraft avionic development tasks prior to flight testing. Work will be performed in St. Louis, and is expected to be completed in December 1986. The Naval Air Systems Command, Washington, D.C., is the contracting activity (N00019-83-G-0412). (Announced 2/7/86)

United Technologies Corpo-

ration, Sikorsky Aircraft Division, Stratford, Conn., is being awarded a **$9,250,000** modification as additional funding under a letter contract to design, develop, test and document the engineering changes required to modify an SH-60B helicopter into an SH-60F aircraft carrier/antisubmarine warfare inner zone helicopter. Work will be performed in Stratford, and is expected to be completed in October 1987. Four bids were received. The Naval Air Systems Command, Washington, D.C., is the contracting activity (N00019-85-C-0148). (Announced 2/7/86)

Grumman Aerospace Corporation, Bethpage, N.Y., is being awarded a **$10,766,000** modification as additional funding to a fixed-price contract for materials and services necessary to integrate the Joint Tactical Information System (JTIDS) into the E-2C aircraft. Work will be performed in Bethpage, and is expected to be completed in December 1990. The Naval Air Systems Command, Washington, D.C., is the contracting activity (N00019-83-C-0337). (Announced 2/7/86)

McDonnell Douglas Corporation, St. Louis, Mo., is being awarded a **$26,325,089** modification to exercise an option under a fixed-price contract for 12 radar system test sets for the F/A-18 aircraft. Work will be performed in St. Louis, and is expected to be completed in July 1988. The Naval Air Systems Command, Washington, D.C., is the contracting activity (N00019-82-C-0501). (Announced 2/7/86)

United Technologies Corporation, Pratt & Whitney Aircraft Group, West Palm Beach, Fla. is being awarded a **$6,300,000** modification as additional funding under a cost-plus-fixed-fee contract for services and materials necessary to conduct component improvement programs for J-52 and TF-30 aircraft engines. Work will be performed in West Palm Beach. The Naval Air Systems Command, Washington, D.C., is the contracting activity (N00019-82-C-0241). (Announced 2/7/86)

Ship Work

RCA Corporation, Missile and Surface Radar Division, Moorestown, N.J., has been awarded a **$3,033,645** modification to a previously awarded cost-plus-fixed-fee Navy contract for ship shock trials for the guided-missile cruiser CG-53. Work will be performed in Moorestown and is expected to be completed in December 1987. Contract funds would not have expired at the end of the current fiscal year. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-79-C-5151). (Announced 1/15/86)

Techmatics, Inc. a professional services firm based in Arlington, Va., has been awarded a three-year, **$1.2-million** Navy contract, including options, to provide reliability, maintainability, and quality engineering support for U.S. Navy ships and combat systems. The Naval Sea Systems Command, Washington, D.C., is the contracting activity. (Announced 2/7/86)

McDermott Marine Construction of Morgan City, La., has been awarded a **$16,308,100** fixed price Navy contract for the construction of offshore training facilities off the Carolina and Georgia coast. Work is expected to be completed in September 1986. Three bids were received. The Naval Facilities Engineering Command, Washington, D.C., is the contracting activity (N62477-83-C-0286). (Announced 1/15/86)

J.A. Jones Construction Company of Charlotte, N.C., has been awarded a **$30,000,000** fixed price Navy contract for the construction of a drydock at the Naval Submarine Support Base, Kings Bay, Ga. Work is expected to be completed in March 1989. Eleven bids were received. The Naval Facilities Engineering Command, Kings Bay, Ga., is the contracting activity (N68248-81-C-3020). (Announced 1/15/86)

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London Broker Sees Move Toward Recovery For Bulk Shipping Fleet

According to London-based broker Eggar Forrester in its latest report, bulk shipping is "starting to move towards recovery." More dry bulk cargo is being shipped, creating employment for ships of more than 40,000 dwt. And steel production is on the rise, which will result in more movement of ore and coal.

Tankers have gained higher rates on the spot market, and Iran is seeking more tonnage to replace ships affected by the war with Iraq, the report states.

Renk Awarded $3-Million Contract By German Navy To Supply Reduction Gears

Renk AG of Augsburg, West Germany, has been awarded a contract by the German Federal Navy valued at about $3 million for the supply of epicyclic gears for the new generation of minelayers and special-purpose vessels. The decisive factor in this award is said to be Renk's ability to meet the high technical requirements regarding low-noise running, weight, and volume of the gears.

Added to this is the confidence placed by the German Navy in Renk's more than 30 years of experience—including supplying gears for the German F 122 frigates—in the design, development, and manufacture of military marine gears. Renk gears are operating successfully worldwide in numerous frigates, corvettes, coast guard and landing boats, as well as in other types of vessels.

For additional information on Renk gears,

Circle 77 on Reader Service Card

PROMAR Offers Latest Model Anritsu Radar —Literature Available

The fifth and latest model of Anritsu Radar features the lowest receiver noise figure in the industry, providing extra long-range capability. Power outputs of 5, 10, and 25 kw provide ranges from one-quarter NM to 120 NM.

The 10-kw Anritsu Color Radar is a high-definition, high-performance radar employing a 14-inch detail resolution CRT bright enough for daylight viewing.

Microcomputers and video memories, versatile functions such as plotting target tracks, off centering, guard zone warning, electronic bearing line, two variable range markers and unique zoom target magnification are standard.

For free details and literature on this latest model of Anritsu Radar,

Circle 80 on Reader Service Card

Teleflex RMVAs Eliminate Corrosion, Misalignment And Binding Problems

Teleflex Inc.'s Remote Actuation Systems Group has simplified remote valve actuation with the development of the Remote Mechanical Valve Actuator (RMVA). The system was designed to eliminate the corrosion, misalignment, and binding problems so often associated with reach rod and flexible shafting methods.

The RMVA operates using a tension-tension, closed-loop actuating system and can replace most existing manual remote valve actuators, as well as hydraulic and pneumatic systems. A helical cable, manufactured by Teleflex for the aerospace and marine industries for more than 40 years, is the heart of the patented system.

The helical cable meshes with cable gears located in the actuator housings that are at each end of the system. Each cable gear has a worm gear with a pitch matching the pitch of the helical wrap of the cable; this allows the meshing of the cable and the gear. The rotary motion from the remote operator is then transmitted through the input shaft to the cable gear in the operator station actuator housing. When this occurs, the cable gear/helical cable interface converts the rotary motion to a linear movement of the cable.

The cable moves linearly in a conduit through the system driving the cable gear in the valve station actuator housing where the motion is converted back to a rotary output via an identical cable gear/helical cable interface. The rotary motion is transmitted through the output shaft to the valve coupling. The helical cable is protected from the environment by a conduit that is both flexible and durable. All Teleflex components have been manufactured using materials that offer superior corrosion resistance.

The system is available with either handwheel-driven remote operators or deck boxes. Rising-stem, nonrising-stem, and rising-handwheel valve couplings can be supplied with or without quick-disconnects. Custom-designed valve couplings are also available to meet specific application requirements.

The RMVA system is designed to provide improved reliability, yield significant cost savings, and eliminate the need for regular maintenance. The flexibility of the conduit simplifies the routing of the system, as no gear boxes or universal joints are required to change directions.

In use on U.S. Navy vessels for more than two years, the RMVA system is proving itself more reliable and cost-effective than current methods of remote valve actuation. It has been approved for use on all U.S. Navy surface vessels and is certified by the American Bureau of Shipping.

For more information on the Teleflex RMVA system,

Circle 12 on Reader Service Card

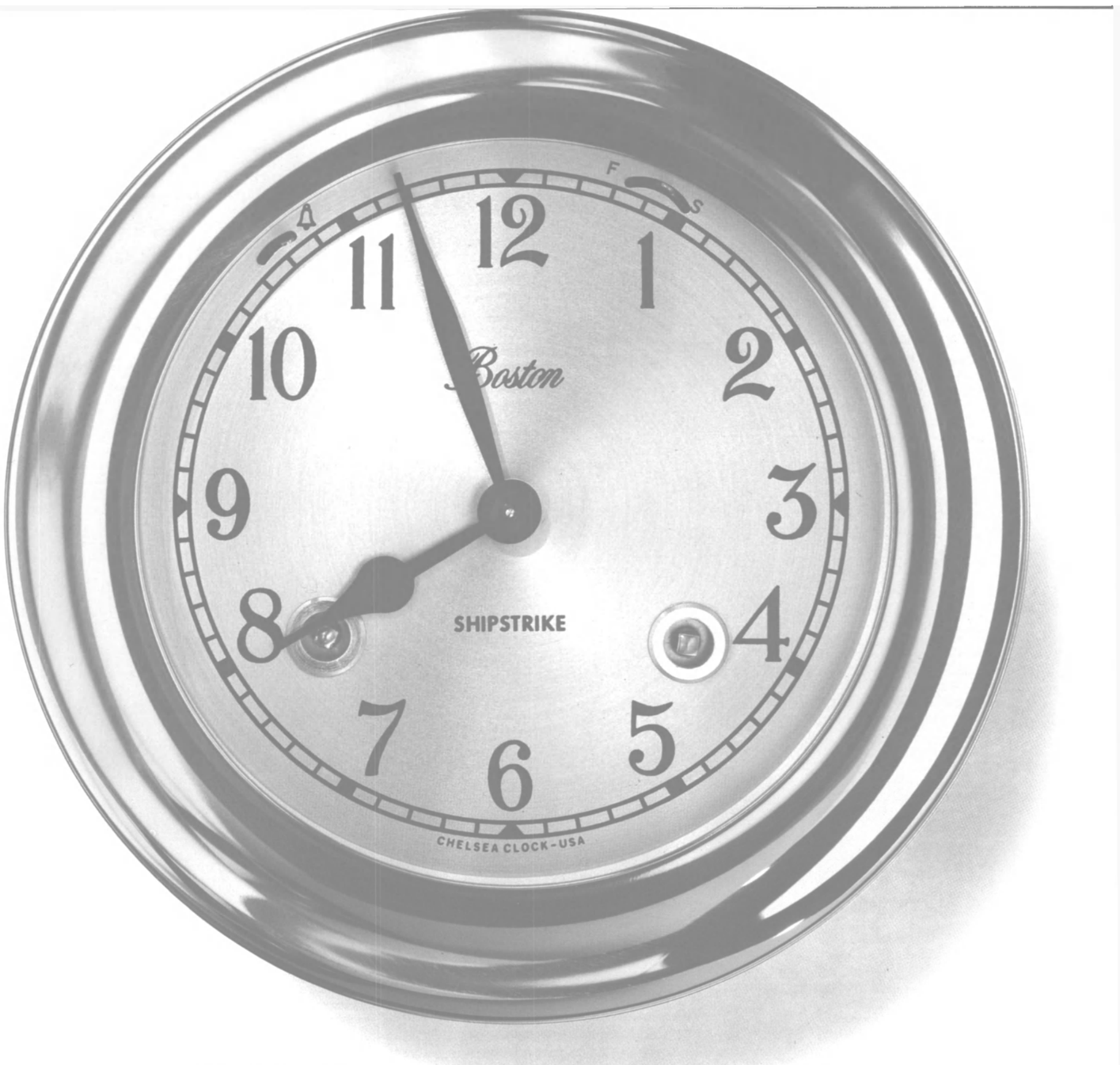
USCG Awards Aquafacs Inspection, Maintenance And Repair Contract

Aquafacs Marine Technical Services of Boston, Mass., and Los Angeles, Calif., has been awarded the in-water inspection and maintenance repair contract for the U.S. Coast Guard District 1, covering Maine, Massachusetts, New Hampshire, and Rhode Island. The contract provides for video inspections, hull cleaning, propeller polishing, and hull repair work on the Coast Guard's cutters, buoy tenders, and patrol boats within the district.

Aquafacs offers a variety of in-water maintenance and repair services to shipowners and operators, including drydock extension surveys, in-tank inspections for special survey, hull cleaning, and propeller polishing using the 3M Scotchbrite conditioning discs. Aquafacs presently provides these services at ports throughout the continental U.S. and the Caribbean.

For further information on Aquafacs services,

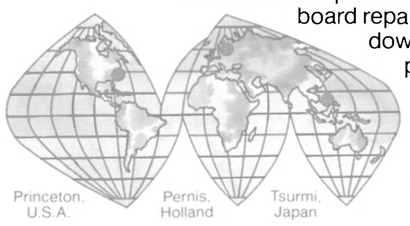
Circle 97 on Reader Service Card



Watch after watch after watch after watch the engines keep working.

Your marine engines and machinery are the heart of the multimillion dollar investment you have in your fleet. They deserve maximum protection against costly breakdowns and damage, and Mobil can provide it.

Because no shipowner can afford onboard repair costs, costly downtime and expensive overhauls, Mobil has developed PFA, Progressive Fast Analysis ... the ultimate in used oil analysis ... the ultimate in protecting your investment.



Three totally modern, automated PFA laboratories operating in different parts of the world can ensure that your oils are performing to peak standards. All three provide Wear Metals Analysis that identifies the type and percentage content of metal contaminants in order to give you a diagnostic measurement of equipment condition. And those labs work fast—turnaround from receipt of samples at a PFA laboratory to transmission of results is only two working days because computers process all

The Mobil® PFA program will keep an unbroken watch on their condition around the world.

collected data.

One reason PFA does an outstanding job in protecting shipowners is that it is progressive in nature. In addition to communicating current oil and equipment conditions, PFA generates a progress report that allows you to identify immediately potentially critical trends in wear or contamination. Because of this, you can take action before they reach a danger point.

The Unbroken Watch of the Mobil Progressive Fast Analysis transforms used oil analysis into an efficient, cost-saving system. Wherever in the world your ships sail, that system is ready and able to help you extend the life of your equipment ... reduce your maintenance and repair costs ... cut downtime ... and increase the intervals between overhauls.

For further information on the PFA program, call the Mobil Information Center toll-free: 1-800-634-3100.
Or write: Mobil Oil Corporation, Marine Division, 670 White Plains Road, Scarsdale, NY 10583.

Mobil

If we can't save you money, we don't deserve your business.

Marine Corps League's 6th Annual Exhibition Set For July 22-24 In D.C.

Managers of the Marine Corps League-sponsored "Modern Day Marine—Force in Readiness Military Exposition" have announced that over 80 percent of the 95,000 square feet of exhibit space in the Sheraton Washington Hotel has been committed for their scheduled July 22-24, 1986, military exposition.

Nearly all of the 115 defense contractors who participated in the 1985 exposition have contracted for space for the July event and many other companies are entering for the first time.

The theme for this year's exhibition is "Power Projection—From The Sea."

This annual defense industry trade show is conducted at the Sheraton Washington Hotel in Washington, D.C. The hotel's 95,000 square feet of indoor exhibit space, along with its convenient location, make it an ideal site for this activity.

Between 6,000 and 7,000 visitors are expected to tour the exhibits during the three-day exposition and to participate in related functions which will include industry technical seminars, an enlisted awards luncheon and a formal banquet. Visitors in 1985 included members of Congress and their staffs, Department of Defense officials, senior executives of some of the nation's largest businesses, and more than 3,000 Marines and fellow service members from East Coast bases. An especially large number of "Gator Navy" and representatives of foreign governments also were in attendance.

The exposition is international in scope with participating companies from the United States, Belgium, Canada, France, Germany, Israel, Italy, Switzerland, Singapore and the United Kingdom.

The purpose of the annual show is to provide an opportunity for present and potential defense, supply and service contractors to display and promote their products, and to provide an opportunity for the free exchange of ideas between suppliers and users.

This unique marketing opportunity also provides three days of intense visibility to high-level decision makers; facilitates the development of contacts; provides media exposure within the international defense community; influences name recognition and has special appeal to firms interested in enhancing their reputations as major defense suppliers in U.S. and international markets.

In addition to the exposition, a formal reception and Grand Banquet will be conducted on Wednesday, July 23, 1986.

Industry technical briefings, a new feature of the 1986 exposition, will be scheduled during the show. Industry officials are encouraged to take advantage of these briefing opportunities. Managers of the exposition will aid in the development of special invitation lists designed to attract an audience with special interest in the subjects being presented.

A USMC Enlisted Awards Luncheon will be held on Tuesday during the exposition and will honor four enlisted Marines and one Fleet Marine Force Navy medical or dental corpsman for distinguished contributions to combat readiness in the Fleet Marine Force.

As a result of the successful experiences in the 1984 and 1985 shows, officials of the Marine Corps League are again encouraging the concept of pavilions. These pavilions are intended to permit countries or industry groups to assemble their defense products as a single entity, complete with nationalistic or industry theme and decor. For example, a special pavilion designed to accommodate electronics manufacturers is also being considered. The pavilion concept is designed to permit military and other decision makers an opportunity to view the capabilities of each nation and manufacturing group as a single potential resource group, rather than through separate displays throughout the vast exhibit facilities.

For further information regarding participation in the exposition, contact **Becky Lower** or Col. **Jim Bracken,** USMC (ret.), Capitol Convention and Exhibit Co., 25 S. Quaker Lane, Suite 24, Alexandria, Va. 22314. Telephone: (703) 823-2333.

1986

VALVE EQUIPMENT GUIDE

MARITIME REPORTER AND ENGINEERING NEWS

118 EAST 25th STREET
NEW YORK, N.Y. 10010
(212) 477-6700

1986

VALVE EQUIPMENT GUIDE

Valves, valve actuators, and other accessories are vital components in any ship's piping systems for cargo, fuel, ballast, steam, seawater, and many other applications. Valve manufacturers offer a wide variety of valve types, variations, and materials, including ball, butterfly, check, swing, gate, globe, diaphragm, and other designs. They are produced in many materials, including bronze, stainless and carbon steels, cast iron, aluminum, ductile iron, and in special materials for exotic requirements.

The editors of MR/EN asked the manufacturers of shipboard valves and accessories to tell us about their latest products and marketing plans. The following review is based on the replies we had received at press time.

FOR MORE INFORMATION

If you wish to receive additional information on any of the products described in this review, circle the appropriate reader service number under each company's name, using the postage-paid card bound near the back of this issue.

AMERICAN PIPING

Circle 30 on Reader Service Card

The forged steel line blinds manufactured by American Piping Products, Inc. of New Hyde Park, N.Y., are said to be the most positive dead-tight shutoffs ever devised. These blinds feature "O" ring seals in dove-tailed grooves, spectacle plates to indicate open or closed position, and lubricated jack bolts to automatically spread flanges apart. American line blinds are available butt weld or flanged, for all pressures and body materials.

CLA-VAL

Circle 31 on Reader Service Card

Cla-Val Company of Newport Beach, Calif., manufactures a complete line of fluid-actuated, automatic fire protection equipment, from main valves down to the sprinklers. All components are designed to work together as a system for compatibility; they are also rugged and reliable. Designers of U.S. Navy ships have specified Cla-Val valves for more than 40 years. The company is said to be the Navy's largest supplier of automatic control valves for fire protection systems today.

The Cla-Val magazine sprinkler valve has simple, dependable diaphragm actuation, and features a test fitting and a double "O" ring stem. The manual pilot valve control changes valve position quickly; it is used for magazine sprinkler valves and void filling valves. Cla-Val's dual solenoid pilot control valve is used to activate magazine sprinkler and foam systems, or anywhere a relatively large capacity solenoid valve is needed. This valve stays in either position until the opposing solenoid is energized.

CRAWFORD

Circle 32 on Reader Service Card

Crawford Fitting Company of Solon, Ohio, manufactures Swagelok® tube fittings whose unique swaging action provides a seal between ferrule and body at a point different from where the heavy work is performed. It supports the tube ahead of the seal to resist vibration, does not create torque or leave residual strain on the tubing, and does not significantly reduce flow area.

Interaction of precision parts—body, front ferrule, back ferrule, and nut—produces a leak-free seal with a simple 1¼-turn pull-up. The Swagelok works on thick or thin wall tubing, and seals consistently over a wide range of pressures, temperatures, and temperature cycling.

Crawford also offers a complete line of valves and fittings. Shut-off, regulating, check, or relief valves are available in a variety of end connections and ratings to 10,000 psi and 1,200 F. All valves are 100 percent tested. Crawford fittings in fractional, metric, and ISO sizes with straight and tapered threads are available in aluminum, brass, carbon steel, Hastelloy C, Inconel 600, Monel, 316 Stainless steel, titanium, and other machineable metals and plastics.

HAYWARD

Circle 33 on Reader Service Card

The Hayward Marine Division of Hayward Industrial Products, Inc., Elizabeth, N.J., manufactures a broad range of valves, strainers, and fittings for all types of vessels and applications.

Hayward's engineered marine products are backed by technical and field assistance worldwide. The company's line of liquid cargo handling products includes angle valves, PVR valves, and inverted vent checks, as well as simplex, duplex, fabricated, and "Y" strainers, and Cu/Ni strainers.

JAMESBURY

Circle 34 on Reader Service Card

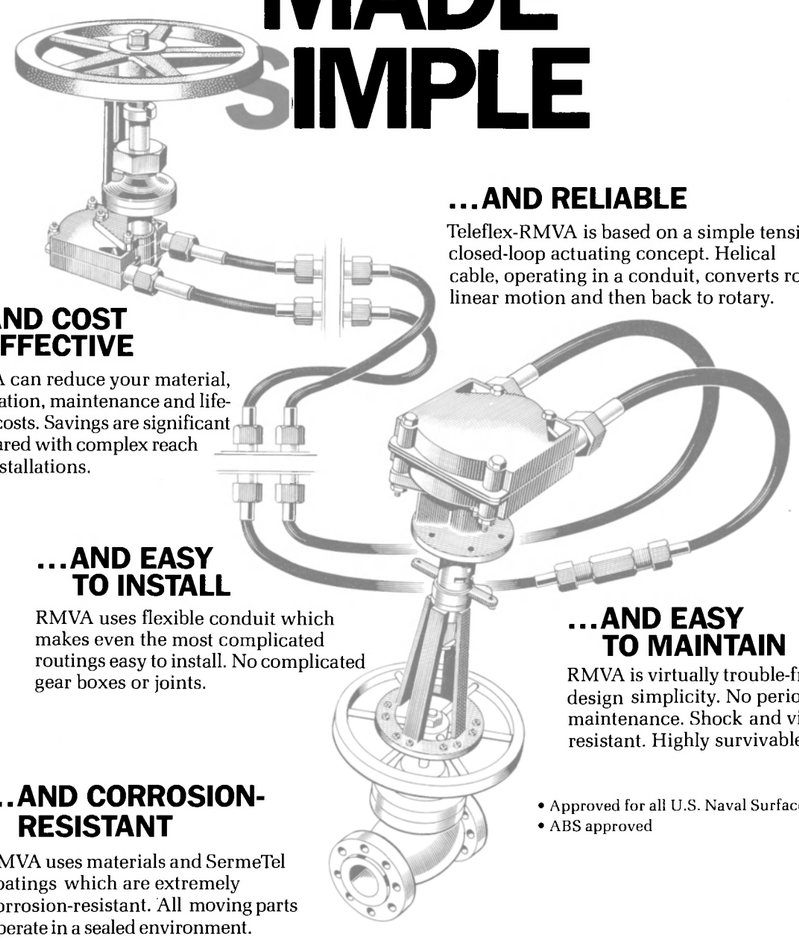
Jamesbury Corporation of Worcester, Mass., manufactures the Wafer-Sphere® high-performance valves that are suitable for 2½-inch and larger valve requirements.

These valves feature a flexible-lip TFE seat that provides tight shutoff to 1,480 psi in temperatures ranging from cryogenic up to 500 F. They are compact, light, and easy to install, and are said to offer corrosion resistance, long life, and easy, low-cost maintenance.

Jamesbury also manufactures a complete line of ball and butterfly valves, valve actuators, and control devices. The company offers a unique Actuator Selection Slide as a

(continued)

REMOTE VALVE ACTUATION MADE SIMPLE



...AND RELIABLE

Teleflex-RMVA is based on a simple tension-tension, closed-loop actuating concept. Helical cable, operating in a conduit, converts rotary to linear motion and then back to rotary.

...AND COST EFFECTIVE

RMVA can reduce your material, installation, maintenance and life-cycle costs. Savings are significant compared with complex reach rod installations.

...AND EASY TO INSTALL

RMVA uses flexible conduit which makes even the most complicated routings easy to install. No complicated gear boxes or joints.

...AND EASY TO MAINTAIN

RMVA is virtually trouble-free, due to design simplicity. No periodic maintenance. Shock and vibration resistant. Highly survivable.

- Approved for all U.S. Naval Surface Ships
- ABS approved

...AND CORROSION-RESISTANT

RMVA uses materials and SermeTel coatings which are extremely corrosion-resistant. All moving parts operate in a sealed environment.

The Teleflex Remote Mechanical Valve Actuator (RMVA) has proven its dependability in cruel environments aboard naval vessels.

Specify RMVA by Teleflex. It's simple. It works. It's proven. Call or write for your complete RMVA Design Manual.

Teleflex INCORPORATED
remote actuation systems

771 First Avenue • King of Prussia, PA 19406–1401
(215) 265-0556 • Telex 90-2528 • TWX: 710-670-1122

Circle 305 on Reader Service Card

user aid in matching actuator to valve. With this chart, the user selects the type of Jamesbury valve (threaded end ball, flanged ball, or high-performance butterfly), sets the Valve Torque Guide to the maximum differential pressure of the planned application, and matches this to a Jamesbury actuator best suited for the application.

KEYSTONE

Circle 35 on Reader Service Card

The K-LOK extended service butterfly valves manufactured by Keystone Valve USA of Houston, a division of Keystone International, Inc., are included on the Qualified Products List per Military Specification MIL-V-24624(SH), Amendment 1, Types I, II, III, and IV. The K-LOK is rated to 285 psi and is fire-tested in accordance with API-607. Both wafer and lug style K-LOK valves have met or exceeded all test requirements in sizes 14 inches and under.

The K-LOK has been approved for a variety of marine applications, including JP-5 fuel-handling systems, as well as for diesel oil and lubricating oil handling systems. K-LOKs are also being used in saltwater handling systems such as fire mains and in cooling water and chilled freshwater systems.

LIMITORQUE

Circle 36 on Reader Service Card

Limitorque Corporation of Lynchburg, Va., has just introduced a comprehensive line of pneumatic valve actuators, the HR Series, that meets virtually any service condition required. Ranging in torque outputs from 70 to 250,000 inch-pounds, on supply pressures varying from 40 to 120 psi, the new line features a slim profile design for easy installation and maintenance, and an all-cast-iron construction to meet harsh environmental requirements. Standard features include built-in adjustable stroke stops with adjustments ranging from 80 to 100 degree travel, and double scotch yoke mechanisms for improved balance.

Limitorque also offers the T Series worm gear operator for manual and motorized control of any valve or mechanism requiring 90-degree rotation. These new operators are available in two series: a commercial series for general industry applications, utilizing ductile iron worm gears; and an AWWA series meeting AWWA C504-80 specifications and incorporating bronze worm gears. All components in both series feature rugged, high-strength cast iron enclosures, self-locking worm gears with minimum gear backlash, full O-ring sealed construction, and external mechanical stops to provide plus or minus travel adjustability.

MUELLER

Circle 37 on Reader Service Card

A complete line of butterfly valves, check valves, and needle valves is manufactured by Mueller Steam Specialty of Lumberton, N.C., and distributed through Marine Piping Products of New Hyde Park, N.Y.

All types of body trim material are offered in a wide range of sizes, pressure ratings, and end connections. Each valve is hydrostatically tested before shipment. Test reports and physical certifications on all products are available from Mueller.

NEWMAN'S

Circle 38 on Reader Service Card

Newman's Inc., headquartered in Tulsa, Okla., markets a full line of marine valves under the brand name NEWCO. They are available in stock in a size range from 2 to 24 inches, in classes 150# through 2,500#. They come in gate, globe, angle, and check types.

These marine valves are bronze trimmed with stainless steel, Stellite, Monel, and other special trims upon specification. They are used in saltwater applications such as tankers and cargo ships, barges, drydocks, and pipelines. All meet MSS, ASTM, and ASME specifications, and are American Bureau of Shipping inspected.

NEWCO marine valves are stocked in depth at local distributors to facilitate customer accessibility. They may also be ordered directly from the manufacturer's seven strategically located warehouses in Tulsa; Houston; East Brunswick, N.J.; Milwaukie, Ore., Chicago; and in Edmonton and Barrie, Canada.

NORRIS

Circle 39 on Reader Service Card

The O-ring butterfly valves manufactured by Norris Flow Products, a division of Dover Resources, Inc., Tulsa, Okla., are backed by 25 years of experience serving the marine industry. The valves are offered in sizes 2 through 36 inches, and in various types such as wafer span, double rib, full lug, and long neck.

The elastomer-lines R-Series has a temperature range of −35 to +250 F, depending on seat and seal material and media handled. The valve body is isolated from the flow stream by a resilient elastomer seat and O-ring seals. Angle-disc construction gives 360-degree uninterrupted contact of disc with seat. This series meets various commercial and military specifications for shipboard use as ballast, cargo-handling, cooling water, and machinery valves.

The metal-lined M-Series has a temperature range of −40 to +550 F, depending on seal material and media handled. It features field-replaceable metal seat and shaft O-ring seals that isolate the valve body from the flow stream, thereby eliminating the need for premium body material. This series is said to be ideally suited for more severe applications that ordinarily cause swelling of the elastomer.

Norris also manufactures ANSI 150 valves rated 285 psi, designed for positive shutoff in severe service. These also come in elastomer-lined and metal-lined series, in sizes 2 through 36 inches. The company also offers air cylinder assemblies for operating its valves in 2- to 24-inch sizes.

PITTSBURGH BRASS

Circle 40 on Reader Service Card

Pittsburgh Brass Manufacturing Company (PBM) of Irwin, Pa., has extended its product line by offering a complete range of actuated ball valves the company calls "Performance Packages." Highly efficient, power-driven actuators are mated to PBM's Adjust-O-Seal ball valves in all styles, all metals, and all sizes.

Depending upon specific requirements, actuators may be either electric or pneumatic, and if pneumatic may be of vane or piston type, and if electric may be reversible type.

A full complement of accessories is available, including solenoid valves, limit switch boxes, regulator systems, positioner systems, motor brakes, auxiliary switches, heaters, and thermostats.

PBM markets a complete range of two-way bronze valves in a choice of alloys with any type trim, including Monel. These valves feature silbraze ends, Navy flanges, detenting handles, and blowout-proof stems.

Manufactured to U.S. Navy and Coast Guard specifications, the PBM line of ball valves has been shock and vibration tested. These valves are available in ¼- to 4-inch sizes, pressures to 700 psig, and temperatures to 450 F.

(continued)

Rugged Reliable -the Cla-Val Factor

For Marine Service no one makes it better.

- Void Filling
- Foam Proportioning
- Magazine Sprinkling
- Pressure Relief Valves
- Ballasting Valves
- Pressure Reducing Valves
- Lube Oil Unloading
- Aircraft Fueling
- Solenoid Valves

For the past fifty years, marine engineers have factored in CLA-VAL Valves to insure dependable long life for the rough seas of marine service.

CLA-VAL offers a full line of valves for fluid applications, from salt-water to lube oil. For further information, contact the Marine Division:

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P.O. Box 1325,
Newport Beach, CA 92663
(714) 548-2201
Telex: 67-8429
FAX: 1-714-548-5441

Eastern Division
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THE FIRST FIFTY YEARS 50 1936–1986

CLA-VAL CO.

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SKINNER

Circle 41 on Reader Service Card

Introduced in 1984 by Skinner Engine Company's Power Division, Erie, Pa., the first hydraulically actuated governor valve control for controlling steam turbine speed has performed better than initial expectations. The company reports that data gathered from dozens of installations reveal a record of unsurpassed economy, adaptability, and dependability.

The Skinner SPR™ System, powered by the Woodward TG-13 constant-speed governor, requires fewer adjustments following initial start-up than comparable governor valve controls because it is a closed system with no mechanical wear points. It instantly corrects variations in preset turbine speed without the "hunting" for correct speed found in standard mechanical linkage controls.

The SPR system is free from the shock loads and backlashes that can cause the levers, arms, and pins of mechanical systems to weaken or break prematurely. The system's elimination of speed correction turbulence also helps extend the life of the governor valve, cage, and stem, and the absence of any mechanical linkage reduces maintenance costs.

At slight underspeed or overspeed conditions, the movement of a rotary actuator in the SPR system initiates a chain of events in the hydraulic system that opens or closes the steam inlet to provide immediate response to speed variations. The SPR also produces a substantial increase in the power available at the governor valve.

The system is a retrofit package made for all popular types of single-stage steam turbines. It is available in configurations for Coppus, Elliott, and Terry turbines, with others available upon application.

STACEY FETTEROLF

Circle 42 on Reader Service Card

Stacey Fetterolf Corporation of Skippack, Pa., manufactures a complete range of butt welded or flanged end line blinds for absolutely tight shutoff. Standard sizes and materials are in stock ready for shipment. Computer-aided design is available for special needs and custom requirements. The Stacey line blind can be changed quickly and reliably by one man in minutes versus two men in hours, providing quick downstream protection with less maintenance. The blinds are made in all sizes, pressures, materials, and codes.

STAUFF

Circle 43 on Reader Service Card

Stauff Corporation, headquartered in Waldwick, N.J., manufactures 2-, 3-, and 4-way valves in port sizes from ⅛-inch to 2-inches NPT and SAE. These valves offer positive sealing and easy operation for a wide range of high-pressure applications. They are available in carbon steel and stainless, with a choice of seat and seal combinations.

For superior sealing in hydraulic operations, Stauff ball valves manufactured with high-strength Delrin® seals handle the highest pressures with ease and safety. These valves have a patented stem seal and ball connection for the ultimate in ¼-turn operation. Constant contact pressure provides a long-lasting seal even in such demanding conditions as high pulsation. A wide variety of valve designs are available to suit every application.

STOCKHAM

Circle 44 on Reader Service Card

Stockham Valves & Fittings of Birmingham, Ala., manufactures an exceptionally broad range of valves of all types and materials. With this wide selection, Stockham can handle most any request, whether it is for gates, globes, angles, or checks, in bronze, iron, carbon steel and stainless steel, or quarter-turn valves such as ball, butterfly, or Wedgeplug. In addition, a complete line of cast iron, malleable iron, and ductile iron pipe fittings, along with grooved couplings and fittings, is also available. All Stockham products are manufactured to meet strict engineering standards.

Stockham's extensive distributor network is backed by the company's own factory sales representatives and eight strategically located Service Centers that contain large inventories.

STOW

Circle 45 on Reader Service Card

Stow Manufacturing Company of Binghamton, N.Y., offers a 39-page catalog titled "Flexible Shafts and Flexible Couplings." The publication gives technical data on solving problems of transmitting rotary motion through angles by use of flexible shafting in place of gears and pulleys, and it provides readers with pictorial and dimensional information for complete freedom of design.

Included in the catalog are sections on standard, short lead time, low-cost units, as well as a section on custom designs and special-material components.

TATE ANDALE

Circle 46 on Reader Service Card

Tate Andale, Inc. of Baltimore (formerly Tate Temco) offers angle valves, cross valves, pressure vacuum relief valves, and vent check valves, as well as pipeline strainers, hull drainage fittings, deck sounding tube fittings, duplex strainers, simplex strainers, and other specialty marine equipment.

The company provides specialty as well as stock items.

TELEFLEX

Circle 47 on Reader Service Card

The Remote Mechanical Valve Actuator (RMVA) developed by the Remote Actuation System Group of Teleflex, Inc., King of Prussia, Pa., eliminates problems associated with current methods of remote valve actuation.

The Teleflex RMVA system is based on a simple tension-tension, closed-loop actuating concept. Helical cable, operating in a conduit, converts rotary to linear motion and then back to rotary. The flexibility of the conduit allows the system to make bends without the use of expensive gear boxes. It also eliminates the need for costly universal joints by allowing the system to be routed without concern for critical alignments.

This simplistic design eliminates the need for regular maintenance and provides a significant cost savings compared with the complex reach rod and flexible shafting applications.

Designed to survive the harshest environments, RMVA uses materials and SermeTel coatings that are extremely corrosion-resistant. The system has been approved for use on all U.S. Navy surface vessels, and is certified by the American Bureau of Shipping. The system has been in use on Navy ships for more than two years and continues to perform reliably.

UNION FLONETICS

Circle 48 on Reader Service Card

The product line of Union Flonetics of West Clinton, Pa., includes the R-10 Series of relief valves designed to prevent overpressurization of shipboard piping systems. Built to MIL-V-24332 Specifications, these valves are available in sizes up to 8 inches in bronze or steel.

Special attention to the spring design insures that the "set point" repeatability is maintained throughout the life of the valves. The R-10 relief valves have been tested and meet the vibration requirements of MIL-S-901.

WAGER

Circle 49 on Reader Service Card

The Robert L. Wager Company of Chatham, N.J., supplies vent valves from 1 to 12 inches in size. These valves are available in cast iron, bronze, or steel with copper or Monel trim, with or without covers. They are said to meet or exceed every marine specification.

Wager also supplies a line of deck drains made of galvanized steel with removable strainer plates of bronze. Six deck drain sizes are available to accommodate pipe from 1½ to 6 inches.

S.S. WHITE

Circle 50 on Reader Service Card

Flexible reach rods for operation of hard-to-reach valves are manufactured by S.S White Industrial Products of Piscataway, N.J. These rods are used for safe remote control of valves in hazardous or inaccessible areas. Once installed, valves can be operated smoothly from distances up to 40 feet away.

The flexible rods may be routed around curves and obstacles. They require no additional operating gear such as universal joints or right-angle gear boxes. The rods absorb shock and vibration, and stand up to abrasion, abuse, and corrosion. They are prelubricated and the only maintenance required is once-a-month operation.

White heavy-duty, flexible reach rods are available in standard lengths from three to 36 feet, and in three sizes to fit valves from ¾-inch to 16 inches in diameter.

WHITEY

Circle 51 on Reader Service Card

A line of steam service ball valves manufactured by Whitey Company of Highland Heights, Ohio, provides continuous on-off operation at high temperatures and pressures. These quarter-turn valves, the S60 Series, are said to offer maximum protection against leakage.

Flanged seals are made of reinforced Grafoil, and the flange bolts and body are made of the same 316 stainless steel so that expansion and contraction occur at the same rate. Maximum service ratings are 2,500 psi cold working pressure, 1,050 psi at 550 F saturated steam, and 200 psi at 600 F superheated steam.

The three-piece stem packing consists of Grafoil sandwiched between supports made of Whitey Pac material that is resistant to breakdown when used with high temperature water. Both are spring-loaded to compensate for wear and changes in system conditions.

Air actuators provide remote control operations in normally open, normally closed, and double-acting modes. For manually operated valves, bar handles are standard. Extended trip proof and bar handles for systems requiring insulation are optional.

WILLIAMS

Circle 52 on Reader Service Card

William E. Williams Valve Corporation of Long Island City, N.Y., offers a complete line of gate, globe, angle, and swing check valves for commercial and military applications. Said to be of superior design and engineering, Williams valves are in use aboard U.S. Navy vessels.

IF THE SUPPLEMENT HAS BEEN REMOVED FROM THE MARCH 1986 ISSUE AND THERE IS NO READER SERVICE CARD, PLEASE CONTACT MARITIME REPORTER FOR DISTRIBUTOR INFORMATION.

THE NEW NRD-525

YOU'LL FIND THE DIFFERENCE THE MORE YOU USE IT.

RECEIVER NRD–525 SPECIFICATIONS

Receiving frequency range: 0.09— 34 MHz
34— 60 MHz (option)
114—174 MHz (option)
423—456 MHz (option)

Receiving Modes: RTTY, CW, SSB (USB, LSB), AM, FM, FAX

Receiving System: Double superheterodyne
First IF: 70.45399-70.453 MHz
2nd IF: 455 kHz

Sensitivity :

Band	RTTY/FAX CW/SSB	AM	FM
0.09 — 1.6 MHz	5.0 μV	15. μV	—
1.6 — 34 MHz	0.5 μV	2.0 μV	0.7 μV
34 — 60 MHz (option)	1.0 μV	3.0 μV	1.5 μV
114 — 174 MHz (option)	1.0 μV	3.0 μV	1.5 μV
425 — 445 MHz (option)	1.0 μV	3.0 μV	1.5 μV

Dimensions (mm): Width: 330, Height: 130, Depth: 280

Frequency stability: +/– 3 ppm

Image rejection ratio: 70 dB or more

IF rejection ratio: 70 dB or more

AF Outputs:
Speaker: 0.5W or more (4 ohms load, 10% distortion)
Line: 1 mW or more (600 ohm load. 10% distortion)

Function Features: Noise blanker, S-meter, Side tone input, Mute input, TX Monitor, Squelch, Dimmer, Tone control, RF Gain, Clock, Timer, Scanning receive, Sweeping receive.

Memory: 200 Channels

Accessories: Instruction manual, AC power supply cable
DC power supply cable 6ZCJD00127

Options: Converter: CHE-85, CGA-118
RTTY Demodulator with external indicator CMH-532,
RS-232C Interface with connector CMH-532,
Headphone ST-3, External Speaker NVA-88,
Filter: YF455DE 1 kHz, YF455FM 0.3 kHz

FOR THE PROFESSIONAL

NRD-92 Digitally-Synthesized Receiver

NRD-93 Digitally-Synthesized Receiver

For more information please contact:

JRC *Japan Radio Co., Ltd.*
Since 1916

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Phone: Tokyo (03) 584-8836, Facsimile: Tokyo (03) 584-2482
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Circle [57] on Reader Service Card

Japan Radio Offers New Literature On Products—GSC-80 ODARS And JLR-4000 GPS Navigator

Japan Radio Company, Ltd. (JRC) recently introduced two new products—the JLR-4000 Global Positioning System (GPS) Navigator and the GSC-80 On-Board Data Automatic Recording System (ODARS).

The GPS NAVSTAR system with timing and ranging is a completely new system that will eventually use 18 satellites to pinpoint a ship's position and speed anywhere in the world with great accuracy. The system can now use seven satellites now in orbit, allowing measurement of positions for about three to five hours a day. Twenty-four-hour service will be available in about 1987.

The JLR-4000 navigator is said to be one of the most compact and lightweight units in the world, with a unique time-sharing feature. As the GPS navigator receives signals from four satellites to measure a position, four or five receiving channels would normally be required. However, the time-sharing system developed by JRC permits the receiver to receive the signals from all four satellites on a single channel for instant position fixing. The GPS receiver determines not only latitude, longitude, speed, and bearing—the basic functions—but it can also indicate such navigational data in memory as destination, bearing and distance to destination, required time to it, off-course alarm, etc.

Many optional units, such as a color plotter for color track display, a hard-copy printer for printouts of various data, and a remote display unit for displaying navigational data in a second location can be connected to the GPS navigator.

The GSC-80 ODARS has been developed to meet demands for automated data communications through the INMARSAT from ship to shore. It is an automatic data reporting system to collect various types of onboard information and to automatically transmit the newest data to the shipowner's office ashore via the INMARSAT telex link.

The system consists of a multi-data interface and a telex channel interface that are connected to an existing or new INMARSAT ship earth station. The GSC-80 can transmit data to shore using three modes—fully automatic, semiautomatic, and manual. The onboard data received at the shore office is analyzed and processed to send a relevant sailing plan back to the ship.

For free literature describing both new products,

Circle 75 on Reader Service Card

Fincantieri Awarded Orders For Seven Ships

The Italian State shipbuilder Fincantieri recently garnered three contracts for a total of seven sophisticated vessels. These high-value ships account for the greater part of a shipbuilding package awarded to the company since Christmas valued at some $600 million.

Fincantieri's Monfalcone and Venice yards will build two 1,500-1,800 passenger cruise ships for Sitmar Line of Monte Carlo. They will be used in the Caribbean area. Delivery is scheduled by the end of 1988.

Two large passenger/cargo ferries were ordered by the Grimaldi Group of Genoa. Each will have a capacity of 2,400 European-sized cars, or a combination of up to 800 trucks or containers. To be built at the Naples yard, the 593.8-foot vessels will be powered by GMT/Sulzer diesel engines and have a service speed of 18 knots.

The third contract was for three highly automated 137,000-dwt colliers to be operated by Grimaldi and two other Italian owners—Bulkitalia and Ferruzzi of Ravenna—under long-term charter to the Italian State electric power company, ENEL. The first is scheduled for delivery in early 1987, and the second and third at the beginning and end of 1988.

Bonner Elected Chairman, Solley Vice Chairman Of VMA

Ed Bonner, president and CEO of Leslie Co., is the 1986 chairman of the Valve Manufacturers Association of America (VMA). **Larry Solley,** group vice president and worldwide product director-Final Control Systems, Fisher Controls International, Inc., is the new vice chairman. Both were elected at the association's annual meeting held October 13-16 in Santa Barbara, Calif. Their one-year terms began January 1, 1986.

Mr. **Bonner** joined Leslie Co., Parsippany, N.J., in April 1973 as executive vice president and was elected president and chief operating officer in April 1974. Previously, he worked 15 years for Nichols Engineering and Research Corp., New York City. Before joining Leslie, Mr. **Bonner** served as vice president-sales at Nichols.

Mr. **Bonner** has been a member of the board of directors since 1982 and was formerly VMA's chairman of product/industry committees.

Mr. **Solley** joined Fisher Controls, Marshalltown, Iowa, in 1977 as vice president-planning and in 1979 was appointed vice president-marketing. Before being promoted to his present position, he served as vice president-Control Valves and Regulators Division. Prior to joining Fisher, he held various engineering and marketing positions with Monsanto Co. Mr. **Solley,** currently chairman of VMA's finance committee, has served on the board of directors since 1981.

James R. Burke, vice president-corporate development of Cameron Iron Works, Inc., Houston, will remain on the board as immediate past chairman having held that position in 1984 and 1985.

Newly elected to three-year terms are: **R.R.J. Baker,** president and general manager-Valves & Fittings Division, Crane Co., Elmsford, N.Y., and **Gerald E. Hoffmeister,** president-Flow Control Division, Rockwell International Corp., Pittsburgh. Elected to a two-year term is **Thomas Bruns,** president and CEO, Xomox Corp., Cincinnati.

Directors reelected to three-year terms are: **James H. Elder Jr.,** chairman, president and CEO, Anderson, Greenwood & Co., Bellaire, Texas, and **Bill Henry,** chairman of the board of directors, MUESCO, Inc., Houston. Reelected to two-year terms are: **Ralph H. Clemons Jr.,** president, Daniel Industries, Inc., Houston, and **Daniel L. DeSantis,** president, Jamesbury Corp., Worcester, Mass.

Present board members serving continuing terms are: **William E. Bendix,** group vice president, Mark Controls Corp., Evanston, Ill.; **Lynn Elliott,** president, EIM Valve Controls, Inc., Missouri City, Texas; **Charles L. Harper,** general manager, W-K-M Division, Joy Manufacturing Co., Houston; **George Raftis,** president, Red Valve Co., Inc., Carnegie, Pa.; and **Kenneth P. Stegemiller,** division president, The Duriron Co., Inc., Cookeville, Tenn.

Founded in 1938, the Valve Manufacturers Association of America today represents 76 domestic valve manufacturers who together account for approximately 85 percent of the total U.S. industrial valve production. The American valve industry supplies 40 percent of the worldwide valve demand.

Six NATO Nations Will Collaborate On Research In Surface Effect Ship Design

Canada, France, Germany, Spain, the U.K. and the U.S. have signed a memorandum of understanding involving a joint effort in the research and development of a surface effect ship (SES) design. Under the program, each country will conduct a series of tests to determine the military applications of the SES, which is a hybrid of hovercraft and catamaran.

The tests will be carried out using the SES-200 experimental vessel supplied by the U.S. This craft, completed by Bell Halter in 1982, has a maximum speed of 28 knots and displacement of 200 tons.

A U.S. Navy team of 18 men will conduct the tests in each country, under the surveillance of each national trials director. In addition to the joint effort, each nation will use the data obtained from the tests in support of its own SES effort.

Hempel's Consolidates U.S. Companies Into Hempel Coatings (U.S.A.)

Poul Knudsen, president of Hempel's Industrial Coatings and Hempel's Marine Paints, Inc., has announced the consolidation of all Hempel's Marine Paints, Inc., in Wallington, N.J. Hempel's Industrial Coatings, Inc. and Hempel Technology, Inc. in Houston, Texas.

The new consolidated company is named Hempel Coatings (U.S.A.) Inc.

The consolidated companies will enhance the service capabilities of the Hempel Group in the U.S. and will be headquartered in Wallington, N.J. and Houston, Texas.

DoD Reports Launching Of USSR's First Aircraft Carrier

According to a report by the U.S. Department of Defense, the Soviet Union recently launched its first true aircraft carrier at a shipyard in Nikolayev on the Black Sea. Development of carriers capable of launching jet fighters is a major accomplishment for the Soviet Navy, said Defense Secretary **Caspar Weinberger**. It will provide a more aggressive force that could range far from home.

The 1,000-foot-long, 65,000-ton carrier has a long canted flight deck similar to American carriers. The Russian ship is believed to be nuclear-powered. Pentagon sources say that the new carrier will not be fully operational until the early 1990s. A second carrier of the same size, whose existence had not been previously announced, will be ready for launching in about three years.

Infrasonik Receives Order For Soot-Removal Systems From U.S. Shipping Line

Infrasonik AB of Finspong, Sweden, a subsidiary of ASEA STAL, has received an order from a major U.S. container shipping line, for 11 sets of Infrafone soot-removal equipment for installation in the exhaust gas economizers of the U.S. diesel vessels. The order was received through ASEA STAL Inc., Shawnee, Kan.

The order was placed after extensive trials of the equipment onboard the U.S. company's vessels for more than one year. During these trials, other audible sonic removal equipment was tested on ships in the same class.

In addition, the company recently received an order for 10 sets of Infrafone soot-removal equipment from Matson Navigation Company, U.S. The equipment will be installed in the main steam boilers of Matson's container vessels.

The Infrafone equipment, which is made by Infrasonik AB, removes soot from main boilers and exhaust gas economizers through the generation of infrasound, airborne pressure variations at the low frequency of 20 Hz. The system removes dry soot and dust from all parts of the boiler because of the omnidirectional reflecting properties of low-frequency sound in an enclosed space.

Since the equipment need only be operated intermittently, for example, only for 20 seconds every five minutes, running costs are kept to a minimum. Moderate investment cost, ease and speed of installation combined with operating savings from boiler efficiency, ensure a short payback period—approximately one year.

Infrafone equipment was launched into the marine market in early 1983 after successful tests in main boilers and waste-heat recovery boilers. Over 125 marine units have now been installed on vessels from France, Italy, Norway, Sweden, Belgium, the U.K., the U.S., Japan, etc. Infrafone equipment has been in use in land-based boilers for over five years and more than 450 are in operation throughout the world.

For further information on the Infrafone soot-removal system from Infrasonik AB,

Circle 93 on Reader Service Card

AWO: PROMOTING, PROTECTING AND DEFENDING THE BARGE AND TOWING INDUSTRY

The AWO Washington executive staff: (Center) **Joseph Farrell,** president; (L to R): **Thomas A. Allegretti,** vice president-operations; **Jeffrey A. Smith,** vice president-public affairs; **Lee H. Hill,** controller; and **Dena L. Wilson,** vice president-legislative affairs.

The American Waterways Operators (AWO), is the national trade association representing the inland and coastal barge and towing industry, and the smaller shipyards which service that industry. Since 1944, when AWO was founded, the association has worked at defining, supporting and promoting its members' interests and operations. In addition, AWO works towards achieving a keen public awareness of the marine transportation industry's contribution to the overall American economy.

AWO's primary mission is to function as the informed, persuasive and collective voice to the federal government, to the media and, when necessary, before the courts, speaking for the united interests of its varied and ever-expanding member companies. AWO spokesmen frequently testify before Congressional committees and maintain a continuous dialogue with the federal agencies whose activities affect the bottom line of their member companies.

AWO seeks to keep federal legislators up-to-date and informed—to ensure that legislative actions reflect thorough consideration of the potential impact on the economics and productivity of the inland and coastal barge and towing industry. And, AWO provides input to the executive branch agencies—primarily the Coast Guard, Corps of Engineers, OSHA, MarAd and EPA—that issue regulations on local and national levels that affect its member companies' ability to operate.

The membership of AWO includes all segments of the inland and coastal barge and towing industry including tugboat, towboat and barge operators, and the shipyards that build and repair the industry's vessels. The association's growing affiliate membership is comprised of suppliers, manufacturers, insurers, bankers, attorneys and other associations and businesses which make up the marine industry.

AWO assumes the task not only of monitoring and interpreting actions which may affect the association's members, but also of anticipating important developments and responding to them in a timely and effective manner. Moreover, AWO provides its members with up-to-date reports on issues of concern, and participates with federal officials during the key developmental stages on legislative and regulatory proposals which would affect the industry. Their main objective is to demonstrate to national policymakers and to the general public that barge commerce is a safe, fuel-efficient and cost-effective method of transportation that is a key part of the nation's economy.

The membership of AWO is divided into five regional organizations which, together, covers the entire United States. Each region meets as necessary to discuss current issues, to exchange views with officials from federal and state agencies and to develop plans for the future. In order to meet the regional needs of the association, AWO staff representatives located in New York City and New Orleans provide vital membership services both in their regions, as well as to the national organization. The AWO regional staff maintains a close working relationship with local officials and regional staff of the various federal agencies.

Reflecting its national character, AWO member companies are located along the banks of all major U.S inland waterways, and on the shores of the Atlantic, Pacific and Gulf Coasts. The association's concerns and influence span the country from Miami to Anchorage, from Pittsburgh to Corpus Christi. This national network provides for the effective communication and member action that is essential to the association's effectiveness.

AWO members serve on any number of AWO committees and conferences—which provide the opportunity for members to take an active role in directing policy formulation and the decision-making process of the association. The organizational structure of AWO's committees and conferences is dynamic, with task forces, special committees, ad hoc groups formed or dissolved as needs dictate—to meet quickly the rapidly changing needs of the industry. AWO committees meet often, rotating meeting sites among differnt cities. Committee members meet directly with Administration, regulatory or Congressional officials, providing valuable industry advice and consultation on important legislative and regulatory decisions to those who need to know.

The many issues covered by AWO committees and conferences vary as widely as the interest and expertise of AWO members, ranging from developing association policies and strategies on major waterways legislation, to refining Coast Guard regulations, from exchanging safety and training ideas to planning media strategy. AWO committees and conferences provide the vehicle for member involvement in these and other issues that directly affect its member companies' future.

Looking back on 1985, AWO president **Joe Farrell** notes that "The long and stormy voyage through the water transport industry's worst depression in its modern history continued without relief." Mr. **Farrell** said that published statistics reveal that fully 18-20 percent of the companies which make up the industry ceased to exist between the beginning of 1984 and the end of 1985, and that "This year begins by beckoning little hope for any substantial turnaround."

Nevertheless, Mr. **Farrell** said that there was no scarcity of challenges for AWO in 1985—in the Congress, in the executive branch and in the Courts—and that many of these challenges have serious potential for the industry his association represents.

"The shower of federal regulatory and legislative initiatives, with all their potential impact on the industry, continued to rain-down apparently unconnected to the severe economic plight of the industry," Mr. **Farrell** said.

The year 1986 offers a full plate of challenges to Mr. **Farrell** and AWO's highly-competent staff. Aside from the continuing debate over the threat of new user taxes, some of the issues highest on AWO's agenda for 1986 include: maintaining the sanctity of the Jones Act; solutions to overtonnage in the barge fleet; developing ways to expand U.S. exports of bulk products; raising the industy's public profile; maritime liability legislation; Coast Guard-OSHA jurisdiction for regulating uninspected vessels, and many others.

Of new and growing concern to AWO's members and staff is the Gramm-Rudman bill enacted late last year that forces about $200 billion in federal budget reductions over the next five years.

"Gramm-Rudman provides no method and little guidance on how to make the cuts," Mr. **Farrell** stated. "And at the same time it stimulates partisan confrontation and certain division between the executive and legislative branches in the process. What is certain is that our industry, like all others, will not escape the shadow of Gramm-Rudman."

These issues, and more, make the success and effectiveness of AWO's mission all the more important in

the coming year. According to Mr. **Farrell,** the economic plight of the industry, along with a full legislative and regulatory agenda, are all compelling reasons for increasing the membership of AWO, and thereby increasing even further the effectiveness of the industry's advocacy in Washington.

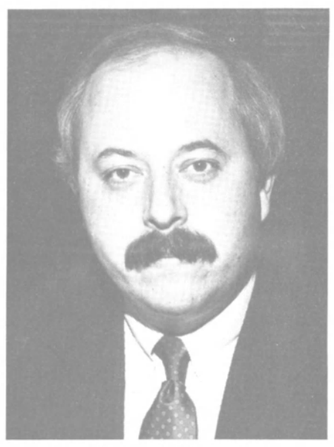
"I would propose that anyone contemplating joining AWO look at it in the same way he or she would look at a business investment. A business person doesn't make an investment unless they expect to get a return on that investment. And while the return AWO provides is less obvious than commercial gain, it is nonetheless a real return, one which hits right on a company's bottom line," Mr. **Farrell** said.

"There is no doubt that the federal government on an annual basis makes hundreds of decisions which land right on the barge and towing industry's bottom line. Everyone involved in this industry needs to know what the government is thinking about, what they're planning to do, and as a member of AWO to intercept that process in a way that effectively represents their company's interests. That translates directly to dollars and cents on any issues decision," he said.

For further information on the activities of the American Waterways Operators Inc., (the national association of the barge and towing industry) and the benefits of membership, write to the American Waterways Operators, Inc. 1600 Wilson Boulevard, Suite 1000, Arlington Virginia 22209 (telephone: 703/841-9300).

INTERCEPTING AND INFLUENCING THE REGULATORY PROCESS

By Thomas A. Allegretti,
Vice President-Operations,
The American Waterways Operators, Inc.



Thomas A. Allegretti

In 1985, the depressed state of the barge and towing industry further emphasized the longstanding need to secure a reasoned and stable regulatory environment for domestic marine transportation. This elusive goal took on greater importance as the dilemma of too many vessels chasing too few cargoes continued unabated. However, without apparent recognition of the industry's precarious economic condition, federal regulatory proposals continued to be generated by the agencies of government, often carrying with them burdensome requirements which threatened the fragile state of barge and towing operations.

In 1986, the industry must pursue sane regulatory stability both as a matter of national maritime policy and through specific efforts in response to individual agency proposals and initiatives. Similarly, the industry must continue to speak out in a national voice to the agencies of government—a voice that calls for a regulatory climate which encourages the efficiency of vessels and waterways operations and recognized the industry's current plight. Industry efforts in 1985 to intercept and influence the regulatory process produced several notable achievements.

One of the major challenges of 1985 dealt with an issue which had the potential to severely disrupt industry operations and substantially increase industry costs. The statutory recodification of Title 46 of the U.S. Code effected numerous changes characterized as neither substantive nor controversial. One such change was to modernize and standardize the references in Title 46 to licensed "persons" and "officers," to that of "licensed individuals." That single stylistic change threatened the longstanding use of the two-watch system aboard towing vessels.

The two-watch system has for decades been the standard operational practice aboard towing vessels. In 1973, the enactment of the Towing Vessel Operator Licensing Act required for the first time that the operators of non-steam propelled tugs be licensed by the Coast Guard. That statute also provided that these licensed operators not perform their duties in excess of 12 hours in any 24-hour period, thereby maintaining the use of a two-watch standard.

However, the enactment of the 1973 law soon gave rise to a watchstanding question: were the "licensed operators" of towing vessels also "licensed officers" and therefore subject to the three-watch requirement of the 1915 Seaman's Act? Two administrative decisions in 1974 and 1975 concluded that towing vessel operators were not governed by the three-watch requirement of the Seaman's Act. The first decision was based on the finding that the 12-hour requirement of the 1973 Licensing Act demonstrated the specific intent of Congress with respect to towing vessel watchstanding, and that the three-watch requirement was inconsistent with that intent; the second decision found that licensed "operators" were not "officers," and that the watchstanding rule for "licensed officers" was therefore not applicable.

The intent of Congress reflected in the 1973 Licensing Act, fortified by two separate administrative decisions, was threatened by the stylistic modification of the Title 46 recodification. Indeed, the initial reaction of the Coast Guard was to conclude that the recodified statute required all licensed personnel on towing vessels, operators as well as officers, to sail under a three-watch system on voyages of 600 miles or more.

AWO formed a working group of its members to pursue this matter with the Coast Guard. This working group of members and staff met with the Coast Guard to present legal memoranda which demonstrated that from the multiple perspectives of statutory construction, legislative history, and administrative interpretation, there was no basis to conclude that the longstanding watchstanding practices employed aboard towing vessels should be changed. The weight of the industry's argument was compelling, and succeeded in persuading the Coast Guard to allow towing vessel operators to continue to utilize the two-watch system. This opinion provides a strong foundation for the continued preservation of reasonable watchstanding requirements on towing vessels.

On another regulatory front, there was a major triumph on the pilotage issue after years of sustained effort. In June 1985, the Coast Guard issued a Final Rule authorizing tug masters, mates, and operators to qualify as pilots of coastwise petroleum tank barges of less than 10,000 gross tons, thereby alleviating the unnecessary and costly burden on operators of these units to use independent first-class pilots.

The genesis of the pilotage issue has much in common with that of the watchstanding controversy. Specifically, it was driven not by operational needs or safety considerations, but by a technical anomaly in the statutes which created a literal interpretation not envisioned or

(continued)

AWO

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intended by the Congress or reflected in federal regulation. Indeed, the anomaly in this case is so unintentional and arcane that it escaped public notice and Coast Guard enforcement for more than 40 years. The Final Rule adopted by the Coast Guard represents a positive step toward reestablishing reasoned operating practices consistent with Congressional intent and with the demonstrated safety record of the coastwise tank barge fleet.

On the issue of licensing, the Coast Guard published its massive proposal to revise and simplify the licensing regulations governing maritime personnel. This Supplemental Notice contains important and extensive changes to the U.S. licensing regime which have a direct and negative impact on the barge and towing industry. Our major concern with the licensing proposal is its attempt to harmonize U.S. regulatory terminology with that of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 (STCW). This harmonization has several serious side effects for the barge and towing industry, not the least of which is the elimination of the oceans endorsement on an operator's license, which has the corollary effect of requiring a three-watch system on towing vessels in ocean service. AWO guided a national campaign of direct advocacy, testifying at a series of public hearings on the licensing proposal earlier this year, to amplify the industry's message that domestic vessel operations should not be disrupted by international conventions which do not govern domestic commerce. There are encouraging signs that progress is being made on this front.

In June 1985, a Final Rule was issued by the Coast Guard concerning Boundary Lines. This rule achieved the two major AWO objectives: the Boundary Line in the eastern Gulf of Mexico was moved out to 12 miles offshore as it had been in similar waters in the Western Gulf for many years, and in New England, the Seagoing Barge Act Line was consolidated with other regulatory lines into a single Boundary Line.

Obtaining these changes to the original proposal by the Coast Guard required effort on several fronts. In addition to submitting written comments and encouraging other organizations to do the same, AWO commissioned a report which confirmed that U.S. regulatory lines were already a confusing tangle that the Coast Guard proposal was going to make worse. The graphic evidence presented on this issue was instrumental in achieving the industry objective to bring order to the tangle of regulatory lines in the Final Rule. Furthermore, as a part of the effort on this rulemaking, 10 principles were developed that will be useful in evaluating future proposals concerning regulatory lines. These principles were formally adopted by the Towing Safety Advisory Committee, and recommended to the Coast Guard to guide in the establishment or alteration of any safety or navigation lines in the future.

The troublesome issue of regulating and recovering vapor emissions from vessels took on new urgency in 1985 as several states moved forward with the development of individual state regulations. Longstanding industry concern with this issue took on clearer form as the potential for disparate state requirements of vapor emission controls on tank vessels became evident. An important corollary concern was that significant safety considerations regarding vapor control systems would not be properly addressed by state regulators with no particular expertise in vessel operations or marine safety.

The effort to secure Environmental Protection Agency jurisdiction over vessel emissions regulation through a federal preemption amendment to the Clean Air Act was not successful. The need for uniform regulations nonetheless remained a critical one. AWO therefore undertook and guided a campaign to rationalize the process of state regulation by urging the Coast Guard to assert its jurisdiction over the safety of vapor control and recovery systems, toward an ultimate goal of standard federal regulations governing the design and safety of these systems. This campaign resulted in the establishment of a National Academy of Sciences Marine Board study to assess the technical, safety, and economic aspects of maritime hydrocarbon vapor control and recovery systems. The study effort will provide important information which should rationalize the piecemeal character of state regulation which now persists.

The efficiency of vessel operations is closely linked to the condition of the system on which the vessels travel. Thus, the regulatory agenda concerning the U.S. Army Corps of Engineers in 1985 included the better scheduling of lock repairs, the provision of more timely information regarding lock closures, the placement of mooring cells at appropriate lock approaches, and the more effective use of Corps personnel to keep locks open during freezing conditions. Looking toward 1986, the state of the Corps' waterways program appears uncertain. While the logjam over new project starts may soon be broken with the enactment of a major new water resources authorization bill, the effect of the Gramm-Rudman deficit reduction bill on waterways programs may be severe.

The year 1985 presented the industry with many challenges; the agenda for 1986 appears to be no less demanding. In addition to the many regulatory proposals which follow us into the new year, there are several more on the horizon which also have the potential to further destabilize vessel operations and which will require the industry's close attention and best talent. Divining a solution to the persistent overtonnaging which saps the industry's strength, resolving the OSHA/Coast Guard jurisdictional issue for safety and health regulation aboard uninspected vessels and developing a benzene standard that balances the interests of health and commerce, are only the most apparent.

Intercepting and influencing the regulatory process remains a major part of AWO's charter in the industry's behalf. Nineteen eighty-six will surely present many challenges and obstacles to achieving the critical objective of regulatory stability. However, it is also certain to present opportunities. The barge and towing industry is prepared to meet the challenges, overcome the obstacles, and seize the opportunities which the new year offers.

THE BARGE AND TOWING INDUSTRY: A LEGISLATIVE REVIEW

By Dena L. Wilson,
Vice President-Legislative Affairs,
The American Waterways Operators, Inc.

Dena L. Wilson

The 99th Congress was sworn into office in 1985 with perhaps its primary challenge to control the spiralling federal deficit. Members of the House of Representatives and Senate, both Democrats and Republicans, and the President, expressed their strong commitment to decrease government spending without raising taxes. This atmosphere of fiscal restraint clearly foreshadowed potentially stormy seas for the domestic waterways industry.

The previous Congress (1983-84) was unable to pass legislation authorizing construction of badly needed water resources projects due to the Administration's insistence on onerous nonfederal cost-sharing requirements in exchange for project authorizations. In 1984, the House had twice overwhelmingly approved an omnibus water resources bill, at the same time it rejected additional waterway user taxes for the domestic barge and towing industry, inland and coastal. However, the Senate version, which would have placed a much greater user tax burden on the industry, was blocked from floor consideration. A final attempt to authorize projects in a wrap-up appropriations bill was, as stated above, thwarted by the Administration over-cost sharing requirements.

Given the Administration's seemingly inflexible position on user fees, combined with the emphasis on reducing the federal deficit, it appeared unlikely that a water resources authorization bill would stand much of a chance in the 99th Congress. Through AWO, the barge and towing industry reluctantly told Congress that it would oppose the authorization of new projects because the industry's continuing economic plight made it impossible to accept new (for coastal operators) and/or additional (for inland operators) user taxes.

Despite the industry's opposition, a group of Senators, led by Majority Leader **Robert Dole** (R-KS) and Appropriations Committee Chairman **Mark O. Hatfield** (R-OR), began negotiating with then-OMB Director **David A. Stockman** on water resources cost-sharing legislation. Mr. **Hatfield,** again, was attempting to authorize projects on an appropriations bill; Mr. **Stockman** and the Administration were tired

of tying up funding for the military and foreign aid because of water projects. Mr. **Stockman** and the Senators, June 20 and 21, finally came to terms; in exchange for project authorizations, the inland waterway fuel tax would increase, over 10 years, by 10 cents per gallon, in effect doubling the current tax to a total of 20 cents per gallon, with 50 percent of construction costs payable from the Inland Waterways Trust Fund. Coastal waterway operators would be required to aid in the financing of port improvement projects, regardless of project depth, with waterway shippers paying a tax on cargo value to assist in funding 40 percent of port operation and maintenance costs.

As the negotiations entered their final stage, AWO was asked to join in the fashioning of the agreement. As originally developed by Mr. **Stockman** and negotiators, the inland user tax increase would have taken effect January 1, 1986; as a result of AWO's efforts, the tax increase was pushed back to January 1, 1988. AWO was unable to modify the cargo value tax, but was effective, during the proposal's journey through the Congressional committee process, in insulating water carriers from payment of this tax.

While imperfect from the standpoint of all parties, this proposal will break the long stalemate over waterway funding which has prevented the enactment of a *comprehensive* water resources development bill since 1970. It will bring new revenue into the Treasury, and resolve the issue of inland user taxes for a number of years. Nevertheless, there still remains a great deal of uncertainty for coastal operators.

While the Senate bill, S. 1567, contains additional waterway user taxes for the barge and towing industry, the House-passed measure, H.R. 6, does not: the inland waterway fuel tax would be retained at its current level (10 cents per gallon); coastal carriers would be protected from paying user fees for projects which they do not presently need for their operations. S. 1567 must still be considered on the Senate floor before a House-Senate conference can take place.

As a part of its overall deficit reduction package in 1985, the House and Senate directed the House Merchant Marine and Fisheries Committee and the Senate Commerce, Science and Transportation Committee to develop legislation establishing $100 million in *annual* Coast Guard user fees for fiscal years 1986, 1987 and 1988. AWO mounted a major lobbying attack to fight these new fees, including the formation of a 50-member maritime industry/labor coalition.

In late September 1985, the committees mentioned above met to formulate their deficit reduction proposals, as required by the budget resolution. Both committees rejected Coast Guard user fees, and developed alternate methods meeting the $100 million annual revenue reduction target. While we were successful in defeating generic Coast Guard user fees in 1985, the issue will surely reemerge in 1986.

In 1982, the U.S. ratified the International Convention of Measurement of Ships; in 1985, the House Merchant Marine and Fisheries Committee and the Coast Guard developed legislation to implement this Convention. As originally introduced, the implementing legislation, H.R. 1362, would have required remeasurement of domestic vessels under the new international system. This would prove particularly onerous for operators of coastal and oceangoing tugs—tonnage would drastically increase, thereby subjecting the vessel to a plethora of new requirements from which it had previously been exempt.

Problems with the bill centered around the impact on vessels in the domestic trade. While the original Subcommittee amendments contained a "grandfather" clause allowing existing vessels to continue use of domestic tonnage measurement, new vessels and new laws, as well as vessels traveling to U.S. territories and possessions would have utilized the new international system.

To resolve these problems, our association held a series of meetings with Congressional and Coast Guard officials to further refine H.R. 1362. AWO achieved many protections for the barge and towing industry, including industry participation in a Coast Guard study on the impact of converting to the international tonnage system, to be completed in 1992. The legislation passed the House in December 1985, and will be taken up by the Senate Commerce, Science, and Transportation Committee in 1986.

At the close of the 98th Congress, AWO was successful in amending the Loadline Act of 1935 to exempt from loadline requirements nonhazardous dry cargo barges operating on Lake Michigan. The legislation discussed above, H.R. 1362, would, in addition to implementing the International Tonnage Convention, consolidate various loadline statutes and, as introduced, could have jeopardized the exemption for the Lake Michigan barges. AWO asked the House Coast Guard and Navigation Subcommittee to insure that this exemption was retained; the language passed by the House of Representatives allows the Secretary of Transportation to grant exemptions where good cause exists.

In 1984 and 1985 AWO commented on draft legislation formulated by the staff of the House Merchant Marine and Fisheries Committee which would significantly rewrite maritime personal injury laws. A fourth version was formally introduced as a bill, H.R. 3156, by Rep. **Walter B. Jones** (D-NC), committee chairman. Chapter 311 of H.R. 3156 deals with shipowners liability for personal injury and death, and cargo. Limitation, which would not include hospitalization and medical expenses, would be on a per crew member basis.

In general, the maritime industry opposes H.R. 3156, rallying instead around H.R. 277, shipowner liability legislation introduced by Rep. **Mario Biaggi** (D-NY), at the request of the Maritime Law Association. Mr. **Biaggi,** chairman of the Merchant Marine Subcommittee, held two days of hearings on both his bill and Chapter 311 of H.R. 3156. AWO testified in support of H.R. 277, with several modifications. We believe the limitation provisions of H.R. 277, all inclusive and based on tonnage, would better provide for stability and consistency than the status quo in allowing vessel owners to limit their liability for maritime claims.

Concerning the Jones Act, in late 1985, the Senate passed H.R. 2466, which includes a provision to close a Jones Act loophole which could enable foreign-flag tugs to provide ship assist service to foreign-flag vessels in U.S. ports. While foreign tug companies had not in the past taken advantage of this loophole, recent interest has developed on the West Coast, making timing critical for passage of this legislation.

Legislation has again been proposed to allow re-flagging of foreign-built, foreign-flag passenger vessels. Introduced by Senate Merchant Marine Subcommittee chairman **Ted Stevens** (R-AK), S. 1935 would allow up to five passenger ships to be re-flagged as U.S. vessels and operate in the coastwise trade. The bill places certain conditions on applicable vessels, which the Cunard Countess and Cunard Princess would meet. In the 98th Congress, attempts to re-flag these two vessels were unsuccessful, and AWO continues to oppose allowing foreign-flag passenger vessels into the U.S. trade.

Our organization will continue to work to insure that reasonable liability limits and federal preemption remain in oilspill cleanup and compensation legislation; this proposal is included in the House-passed superfund reauthorization bill; it is not contained in the Senate version.

The 1986 legislative agenda—regardless of the particular issues involved—will be shaped by the Gramm-Rudman-Hollings balanced budget amendment, signed into law December 10, 1985. This controversial new law sets budget deficit targets for fiscal years 1986 through 1991, at which time it mandates a zero deficit. For the current fiscal year, $11.7 billion in federal spending cuts are required by March 1, 1986. For the barge and towing industry, cutbacks in the Corps of Engineers O&M budget can be expected. The Coast Guard's budget will be reduced. It is entirely conceivable, to be in compliance with the Gramm-Rudman-Hollings law, that new user fees could be put into effect without the expenditure of any federal funds for new projects. Needless to say, 1986 will be an interesting and challenging year.

THE INVISIBLE INDUSTRY

By Jeffrey A. Smith,
Vice President-Public Affairs,
The American Waterways Operators, Inc.

The practice of communicating information in order to influence actions, create a desired public image, or shape viewpoints, can be traced from the earliest civilizations. Much of what is known today of ancient Egypt, Assyria, and Persia comes from material intended to promote and glorify the rulers of that day. Much of ancient literature and art was designed to build support for kings, priests and other leaders. The walls of Pompeii were inscribed with election appeals. Caesar artfully prepared the Romans for his crossing of the Rubicon in 49 B.C. by issuing "news releases" to Rome on his epic achievements as governor of Gaul.

The techniques for courting public opinion and appreciation have become much more sophisticated today, but the value of such activity is nonetheless constant and, indeed, increasing. What is also constant is that in the space age—high-technology public relations and public affairs arena of today's politics, the barge and towing industry does not, and cannot, compete. The results of this nonparticipation are, in my opinion, catastrophic for our industry.

Jeffrey A. Smith

To say that the inland and coastal barge and towing industry suffers from an *image* problem is a vast understatement. Compared to our

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competitors, we are relatively invisible to the nation's public. Millions of Americans each year travel for business or pleasure by jet aircraft. Every day, the public encounters countless trucks on the highways. The railroads crisscross the nation in a huge, highly visible and audible network of tracks and trains. But the silent, lumbering, cargo-laden barges, towboats and tugboats that ply the inland and coastal waters of the nation—carrying a full 13 percent of the nation's freight—are relatively unnoticed, and unknown, by the very people who benefit from the products we deliver and from the efficiency and low prices we provide.

This obscurity from the public eye is damaging to us as an industry. If indeed our contribution to the nation's economy is invisible to the public, then it is likely to be invisible to those who represent the public—the United States Congress.

The millions and millions of dollars spent by the industries with which we compete each year on public relations campaigns, grassroots lobbying efforts, political action committees and advocacy advertising are not wasted on their intended audiences—and when the time comes for the lawmakers to make decisions about these industries, the perception generated by the natural, as well as the highly-promoted visibility of these industries, can only act in their favor—and probably against our less visible industry. As veteran newscaster **Daniel Schorr** put it recently, "If you don't exist in the media, you don't exist at all." And this is largely the case with our industry.

Much of the tug and barge industry's obscurity from public notice or concern, is our industry's own fault. Our industry has not, in the past, done enough, on enough of the right things, to tell our story to the American public, and, by extension, to the men and women who represent them in Washington and in the state capitals.

Our self-imposed invisibility is compounded by a bad habit exercised by many in the media and the government of characterizing the domestic waterways industry as the "pork barrel" industry. These facile types like to glibly caricature a greedy parochial politician with his face stuck in the public trough, lapping up "pork barrel" water project goodies for the voters back home. Any given lock and dam project, or any given port improvement project, is fair game to be labelled as a monumental and unnecessary "pork barrel" boondoggle, promoted by legislators and an industry that are concerned only with getting their particular slice of the federal budget pie.

Such indulgent cartoon characterizations are frustrating and damaging to us in the waterways industry, as well as to many in our government who understand the industry and support it. And our frustration is exacerbated because the facts, the cold hard statistical data on the importance of the waterways industry to the nation, are in direct refutation to the "pork barrel" image. And hardly anyone knows it.

AWO continues to concentrate much of its public affairs effort at confronting this major and damaging image problem. We have published numerous articles on the subject, given speeches in an attempt to debunk it, and have woven it as a theme in most of our contacts with government officials, other organizations, journalists and many others. The "pork barrel" case will continue to be tried in the court of public opinion. Changing the mindset of the American people about so ingrained and reinforced a prejudice is nothing short of a monumental task, so we will need to persevere and expand our efforts throughout 1986 and beyond.

In addition to working at dissolving the myth of the "pork barrel," it is essential that this industry continue to demonstrate that all Americans have a real stake in the well-being of the American waterway system. Unfortunately, it is little known that the benefits provided through commercial navigation are immense. So, to, the waterways serve the national defense, agricultural, wildlife, economic development and recreation interests of the nation.

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AWO

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We must continue to emphasize that the navigable arteries of commerce that moved their life-sustaining cargoes through the nation for shipment to foreign lands are fast becoming clogged and are deteriorating. We must continue to emphasize that it is in the nation's interest to allow our industry to provide continued service and employment, to serve as an integral part of the nation's defense system, to guard against flood damage, to keep consumer prices lower through the healthy competition we provide, to improve agricultural capacity and to provide a hospitable habitat for our wildlife.

AWO's programs for achieving these goals are varied, and range from publications to public appearances, from direct contact with the media to press releases, from personal interviews to magazine articles. In 1985, AWO actively sought new and expanded media contacts, attended conferences, meetings, and made numerous speeches to further project the industry's message, and expanded the news coverage and analysis contained in our association's newsletter.

Many different publics make up our industry's audience—Congress, the executive Branch, federal departments, agencies, offices and commissions, the barge and towing industry's customers and the local and national news media—all *need* to know the latest developments in our industry. It is essential to our industry that we maintain an ongoing program of education and information to promote our industry as the most energy-efficient, most cost-effective and safest form of transportation. It is essential that we work to build a strong public appreciation of the contribution and importance of the waterways industry to the economic growth of America, and to make it clear to the decision makers in Washington that an unfettered, healthy and competitive barge and towing industry is the best interest of the nation.

Looking back, perhaps even Julius Caesar should have done a better public relations job in preparing his citizens for his arrival in Rome. A few more news releases, bigger statues, some banners, perhaps a few friendly Senators giving public speeches about the great warrior's deeds, might have placed the Emperor more firmly in the hearts and minds of his citizens. With a stronger groundswell of public opinion and support on Caesar's side, Brutus and his cohorts might have kept their daggers in their sheaths.

R.J. Paine Named Marine Marketing Manager At Penske

Penske GM Power, Inc. of Lodi, N.J., has announced the appointment of **Richard J. Paine** as marine marketing manager. Mr. **Paine** will assume the responsibility for the coordination of sales and promotion of Penske's line of high performance marine diesel propulsion units ranging from 135 to 1,800 hp. Mr. **Paine** will headquarter at Penske's Ronkonkoma, N.Y., Engineering/Manufacturing/Sales and Service Facility.

Mr. **Paine's** experience in the industry includes most recently the vice presidency of Symbol Yachts, U.S.A., a builder and importer of foreign-built performance yachts, and prior, as Western Marine Electronic's national OEM sales manager.

The appointment initiates Penske's active marketing strategy in expanding its share of the OEM, retail and repower diesel propulsion market.

Intertrade Given Additional Navy Contract For Marine Fenders—Literature Offered

Intertrade Industries of Huntington Beach, Calif., recently received an additional U.S. Navy contract for the supply of foam-filled marine fenders. Contract DLA500-86-C-0758 was issued to the firm by the Defense Logistics Agency at Philadelphia for NSN 2040-00-807-4197 marine fenders to be delivered over 20 months.

These lightweight 70 pound fenders, measuring 2 feet in diameter by 3 feet long, will be utilized throughout the Navy for shipboard use in ship-to-ship and ship-to-dock applications.

This contract, in conjunction with the recently announced receipt of another contract from the Naval Supply Center at Norfolk, Va., for one hundred 6-foot by 12-foot floating fenders confirms Intertrade's position as one of the largest suppliers of marine fenders to the U.S. Navy.

For free literature containing full information on marine fenders from Intertrade Industries,

Circle 25 on Reader Service Card

Seebeckwerft Awarded Contract To Build Danube Cruise Vessel

Seebeckwerft AG of Bremerhaven, West Germany, and Peter Deilmann Reederei (Shipowners), Naustadt i. Holdtein, have signed a contract for the construction of a Danube cruise vessel. Financing of this order was secured by a consortium of banks led by Den norske Creditbank of Oslo.

The vessel will have an overall length of about 380.5 feet, beam of 53.8 feet, and draft of 5.25 feet. Main propulsion will be provided by two Deutz diesel engines, each with an output of 1,000 bhp, giving a service speed of about 14.3 mph. Beds for 231 passengers will be provided in 109 cabins. The lounge will have 182 seating places, with 60 in the salon and 231 in the restaurant.

Scheduled for delivery in February 1987, the vessel will operate on a seven-day schedule calling at Vienna, Budapest, Esztergon, Bratisalva, Durstein, Melk, and Passau.

Peter W. Gronbeck Appointed President Of Atlantic Cordage

Peter Gronbeck

The board of directors of Atlantic Cordage Corp., Carteret, N.J., recently announced the appointment of **Peter W. Gronbeck** as its president.

Mr. **Gronbeck** has been with Atlantic Cordage for the past 13 years as the company's vice president and sales manager. As president he will continue his role in sales and marketing as well as all other managerial and executive functions fitting the job.

Atlantic Cordage Corp. is one of the country's largest wire rope and cordage fabricators specializing in slings and bridles for heavy lift marine and construction equipment.

For copies of fully detailed catalogs and spec. sheets on Atlantic Cordage Corp.'s varied equipment and supplies,

Circle 90 on Reader Service Card

Saab Tank Control Expands In Secaucus

James Rolfe, president of Saab Tank Control (formerly Salwico) recently announced the company's location to new and larger quarters. Saab is now located at One Harmon Plaza, Secaucus, N.J. 07094. The new telephone number is (201) 348-3000.

"The move was necessary," stated Mr. **Rolfe,** "in order to supplement our expanding business and accommodate our personnel growth." All sales, marketing and technical information will be at the new location.

Taurus Marine Acquires Two Additional Tugboats

Taurus Marine Associates, Ltd. of Tampa, Fla., a harbor tugboat company, has announced the purchase of the ABS-classed tugs Kelly and Prodent. These boats, each powered by twin GM Electro-Motive Division 12-645-E5 diesels with a total output of 4,300 bhp in a hull less than 100 feet in overall length, are said to be among the most powerful tugs for their size operating in any U.S. harbor.

In addition to harbor work, these two vessels are fully equipped for all types of deepsea towing and rescue work. A Markey double-drum towing and anchor-handling winch is installed on each vessel.

Stellar Technology's Battleship Spare Parts Depot Locates In Camden

Edward J. McManimon Jr., chairman of the South Jersey Port Corporation, and **John J. Noonan,** president of Stellar Technology Corporation, have announced the lease by the Port Corporation of 80,000 square feet of warehouse space to Stellar. Aggregate rental of the transaction is in excess of $550,000. The warehouse will be used in support of the U.S. Navy's Battleship Program.

The Stellar Technology facility will be utilized by the Navy as a central assembly point for all of the spare "battleship unique" materials. These are parts that, because of the ships' age, are not used on other ships of the fleet. Much of it is material that has been assembled from numerous sources in order to provide "spare parts" for the battleships.

Stellar will be required to inspect, test, and repair this material and provide it to the ships as the need for repair parts arises. The company intends to accomplish this work in the Camden, N.J., facility.

For further information on Stellar Technology Corporation,

Circle 15 on Reader Service Card

Coastal Corporation Purchase Of Texaco Terminal And Pipeline Interest Expands Market For Belcher Oil

The Coastal Corporation, Houston, Texas, recently completed the purchase of five Texaco marketing terminals and Texaco's interest in a refined products pipeline, significantly expanding the geographic coverage of its Belcher Oil marketing subsidiaries. Coastal's Belcher Oil subsidiaries are major distributors of petroleum products on the Eastern Seaboard and Gulf Coast.

The Texaco terminals, which have total storage capacity of 3.8 million barrels of refined products, include a deepwater terminal in South Boston. Other terminals are located in Binghampton and Newburgh, N.Y.; Chelsea, Mass., and Jacksonville, Fla.

The refined products pipeline is used to move refined products from Coastal's Eagle Point, N.J., refinery to new Belcher markets in Pennsylvania. Coastal has purchased Texaco's 33.9 percent interest in the pipeline.

The purchase greatly improves Belcher's competitive position in serving new and existing customers in the Northeastern states and Florida. Last year, Belcher marketed over four billion gallons of products through 54 terminals on the East and Gulf Coasts.

Coastal said purchase of the Texaco assets was arranged in May 1985 and definitive agreements were executed in September. Transfer of the assets was finalized in mid-January. The purchase price was not disclosed.

The Coastal Corporation, a diversified company headquartered in Houston, has assets of $7.5 billion and principal operations in natural gas pipelines, oil and gas exploration and production, refining and marketing, coal and trucking.

Big Heavy-Lift Cargo Carrier Delivered By Hitachi Zosen

The 21,183-dwt heavy-lift cargo carrier Alps Maru was completed recently at Hitachi Zosen's Maizuru Works and delivered to co-owners Mitsui O.S.K. Lines and Baba-Daiko Steamship Company.

The new ship has an overall length of 475.7 feet, beam of 87.9 feet, depth of 45.3 feet, and full-load draft of 31.2 feet. Main propulsion is provided by a low-speed Hitachi/B&W diesel with a maximum continuous output of 8,750 bhp at 133 rpm. Trial speed was 16.5 knots.

The cargo area is divided into two long holds for loading long plant equipment and rolling stock. There are one 400-ton and two 30-ton cranes at midship, and one 50-ton crane each at the forward and aft end of the cargo holds. The deckhouse is eight levels high to provide good forward visibility, and is asymmetric to provide a storage space for the aft crane.

Tulewicz Promoted To Operations Manager At Curtis Bay Towing

Frank S. Tulewicz was promoted to operations manager for Curtis Bay Towing Company of Pennsylvania, according to an announcement made by **Malcolm W. MacLeod**, president.

Mr. **Tulewicz** joined Curtis Bay Towing Company in 1951 at the company's ship repair facility located on Delaware Avenue. After a tour of duty with the United States Air Force during the Korean War, Mr. **Tulewicz** returned to Curtis Bay. In 1961 he was promoted to dispatcher and then chief dispatcher in 1964. In January 1985, he was again promoted to assistant operating manager.

Curtis Bay operates transportation and marine towage services in the mid-Atlantic.

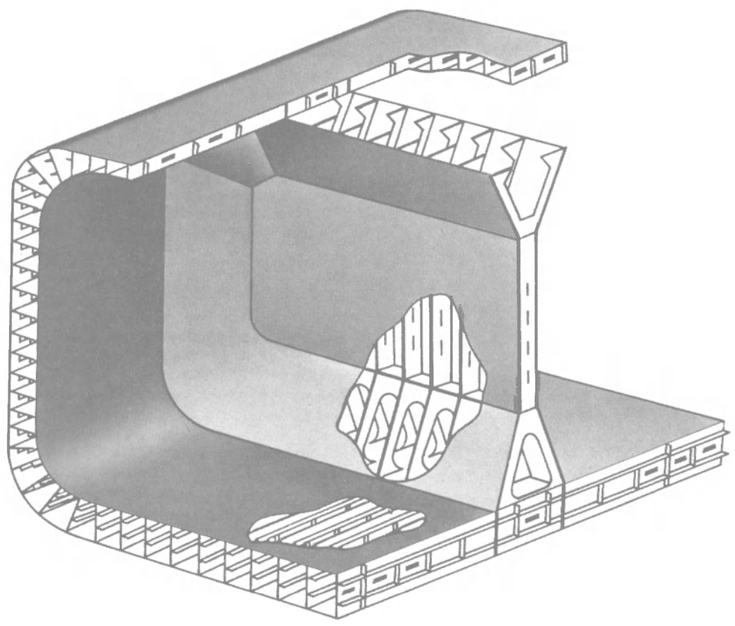
MarAd Awards $288,388 Repair Contract To B & A Marine Co., Inc.

The Maritime Administration has awarded a $288,388 contract to B & A Marine Co., Inc. of Brooklyn, N.Y., for maintenance and repairs to the Patriot State, school ship of the Massachusetts Maritime Academy at Buzzards Bay, Mass.

The work includes repairs required under regulations of the U.S. Coast Guard and American Bureau of Shipping. It will be performed at the vessel's berth at the academy pier and is scheduled to be completed in 40 working days.

INTRODUCING THE EPOCH MARK II SERIES.

A new era in product oil carrier design.



Hitachi Zosen has developed the EPOCH MARK II series which has a unique structure not found on conventional ship designs.

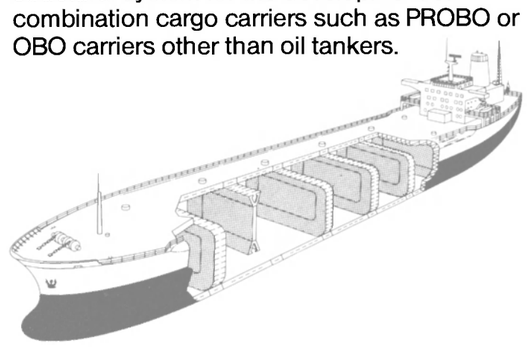
Revolutionary in concept, the MARK II incorporates a unidirectional girder system combined with a complete double hull structure.

While a ship's hull is customarily designed with a grillage of longitudinal and transverse members for strength, this system uses only longitudinal members in a double hull to provide sufficient strength.

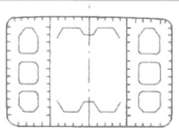
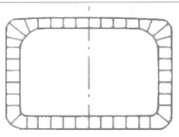
This unidirectional girder system results in unprecedented structural simplicity and completely flush surfaced cargo tank interior. MARK II product oil carriers provide unrivaled advantages in performances over more conventional designs.

The EPOCH MARK II series is available in 40, 60 and 80 thousands dwt designs. And has won the approval of leading classification societies (ABS, BV, LR, NK, NV). At present many worldwide patents are under application.

Hitachi Zosen is also expanding this new structural system for the development of combination cargo carriers such as PROBO or OBO carriers other than oil tankers.



The Superior Performance of the EPOCH MARK II Series:

		Conventional	EPOCH MARK II
Tank configuration			
Cargo/ballast segregation		★	★★★
Unloading efficiency	unloading time	★	★★★
	stripping	★	★★★
Cargo tank cleaning	cleaning time	★	★★★
	completeness	★	★★★
Gas free	cargo tank	★	★★★
	ballast tank	★★	★★
Cargo tank heating		★	★★★
Cargo purity		★	★★★
Maintenance	cargo tank coating	★	★★★
	ballast tank coating	★★	★★
	hull construction	★	★★★
Safety	crack free	★★	★★★
	stranding & collision	★	★★★

★★★: Excellent ★★: Good ★: Normal

We build industries

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Circle 30 on Reader Service Card

MarAd Approves Title XI Mortgage Insurance For $15.9-Million Dredge

The Maritime Administration has approved in principle an application from American Dredging Company of Camden, N.J., for a Title XI guarantee to aid in financing the construction of a 288-foot, self-propelled hopper dredge and a 200-foot barge to serve as a mobile mooring facility for the dredge.

The dredge is to be built by McDermott, Inc. of Amelia, La., and the barge by Eastern Marine, Inc. of Panama City, Fla., with delivery anticipated in 1987. The vessels will be operated in the Delaware Bay area.

The Title XI mortgage guarantee would cover $11,910,000, or 75 percent of the estimated total cost of $15,880,530 for the two vessels.

Chantiers de l'Atlantique Awarded BV Certificate For Quality Assurance

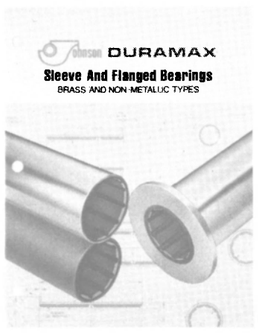
The French classification society Bureau Veritas has awarded Alsthom's Shipbuilding Division (Chantiers de l'Atlantique) its certificate of approval for a ship hull construction quality assurance system. This is the first time that BV has awarded such a certificate to a shipyard. The award was made after careful examination and approval of the fabrication and inspection procedures used by Chantiers de l'Atlantique.

Bureau Veritas has classed a total of 7,230 ships in service throughout the world, amounting to 30.5-million grt, as of the end of 1985. Ships on order to be built to BV classification aggregate 1.65-million grt.

Daewoo Wins Contracts Valued At $260 Million From Norwegian Owner

Korea's first ship order this year, newbuilding contracts for five newbuildings worth a total of $260 million was won by Daewoo Shipbuilding & Heavy Machinery Ltd. The orders, placed by Norway's Ugland Group, are for two pure car carriers, each with a capacity for 5,100 units, and three 118,000-dwt tankers.

Free 28-Page Color Catalog On Bearings Offered By Duramax



A full-color 28-page catalog featuring both sleeve and flanged water-lubricated bearings is now available from the Duramax® Marine Division of The Johnson Rubber Company, Middlefield, Ohio.

This comprehensive catalog serves as a useful guide for both heavy-duty commercial and pleasure craft bearing selection. Products featured in the catalog include Duramax brass or nonmetallic sleeve bearings, solid or split brass flanged bearings and solid nonmetallic rudder bushings.

The publication features complete descriptions and charts listing each part number, code name, dimension, and weight specification. One informative section, which is devoted to bearing tolerances, features a chart of shaft or sleeve sizes including shaft clearance and OD tolerances. Complete drilling diagrams for strut and foward stern bearings are also provided. Plus, three sections of handy code conversion tables are provided. Additionally, special metric sizes are detailed for worldwide applications. The publication explains the economical Duramax bearing relining service.

For your free copy of the catalog,

Circle 91 on Reader Service Card

Kockums To Retrofit Swedish Sub With Air-Independent Stirling Engine

Kockums AB of Malmo, Sweden, has been awarded a contract by the Swedish Navy to install its air-independent propulsion system, based on the Stirling principle, in an existing conventional submarine. The combat efficiency will increase with an increase in submerged endurance, allowing the submarine to operate in highly troublesome areas with a minimum of risk of being detected. Conventional submarines are vulnerable to detection when showing the snorkel to recharge the batteries. The new air-independent Stirling propulsion system developed in Sweden will increase the sub's submerged endurance from days to weeks.

The Stirling engine is an externally heated, continuous combustion motor. For combustion, fuel oil is provided from the ordinary onboard bunker oil supply, and oxygen from liquefied oxygen (LOX) storage tanks. The Stirling generators will provide the necessary electrical energy for the extended submerged endurance that will be limited only by the size of the LOX tanks.

As the Stirling engine is extremely quiet, and the exhaust from the overpressure combustion chamber is dissolved in the seawater, the air-independent machinery could be used whenever submerged. The Stirling has been developed for use at slow speeds; for high speeds the storage batteries will be used.

The Swedish Navy order at Kockums will involve cutting an existing conventionally powered submarine and lengthening it with the neutrally buoyant Stirling section containing the air-independent propulsion system with its LOX supply. The system was developed by the Swedish submarine design authority and Kockums, in cooperation with United Stirling AB for the engine and AGA for the LOX system.

For further information on Kockums,

Circle 67 on Reader Service Card

For free literature on the Stirling engine,

Circle 68 on Reader Service Card

Curtis Bay Towing Elects Swensen VP And General Manager

Paul P. Swensen has been elected vice president and general manager of the Curtis Bay Towing Company of Pennsylvania, according to an announcement by **Malcolm W. MacLeod**, president.

Mr. **Swensen** came ashore in 1976 to join Curtis Bay Towing as a dispatcher in the Baltimore office. In 1978, he was promoted to corporate sales representative and continued in that capacity until April of 1985, when he was assigned to Curtis Bay Towing Company of Pennsylvania as acting general manager.

Prior to joining Curtis Bay Towing, Mr. **Swensen** sailed as mate and relief captain aboard coastwise and oceangoing tugboats. He is a graduate of the National River Academy and served in the United States Coast Guard Reserve. He has had an active role in The Propeller Club of Baltimore, The Maryland Marine Club and is a member of The Seascout Executive Committee of Baltimore.

Curtis Bay Towing Company operates transporation and marine towage services in the mid-Atlantic Region.

Submarine Polk Begins $135-Million Overhaul At Portsmouth Naval Shipyard

The ballistic missile submarine USS James K. Polk (SSBN-645) arrived at the Portsmouth Naval Shipyard in Kittery, Maine, recently to begin a $135-million overhaul, her third since commissioning in 1966. Built by the Electric Boat division of General Dynamics, she was converted to Poseidon missile capability in 1971. The current overhaul is scheduled to be completed in 1987. The Polk has an overall length of 425 feet, beam of 33 feet, and displacement of about 8,200 tons.

TTS Heavy-Lift Units Available From Marinette —Literature Available

Marinette Marine Corporation of Marinette, Wisc., has acquired the most advanced heavy-lift moving equipment available on the world market. Marinette says it is the only U.S. company to currently have Total Transportation System's dual walking beam heavy-lift units. These units are now available for rent or lease by Marinette Marine to other shipbuilders or any company with a heavy-lift problem weighing up to 1,760 short tons.

For a free four-page brochure describing and illustrating the TTS system,

Circle 14 on Reader Service Card

Unique Warning Feature On EMI Steering Systems —Free Literature Offered

Engine Monitor, Inc. (EMI) of Harahan, La., offers a unique warning feature on its steering systems that allows the operator to maintain control while switching to backup systems, thus saving time in an emergency situation. All steering systems are designed and built by specialists at Engine Monitor, Inc., and are fully powered and tested in the shop before being installed.

For free literature containing full information on steering systems from Engine Monitor, Inc.,

Circle 82 on Reader Service Card

Duff And Butera Hired At CDI Marine Company

CDI Marine Company recently announced the hiring of **Franklin D. Duff** as Naval Architecture Division manager for the Bremerton, Wash., office and **Robert J. Butera** as chief engineer for the Boston, Mass. office.

Mr. **Duff**, as Naval Architecture Division manager, will be responsible for the administration and technical coordination of tasks. Mr. **Duff** comes to CDI Marine Company with over 20 years' experience in research and development obtained as a naval officer. His most recent assignment was as officer-in-charge of Hydrofoil Special Trials Unit.

Mr. **Butera**, as chief engineer, will be tasked with the technical management of all applicable contracts and tasks for the Boston office. Prior to joining CDI Marine Company, Mr. **Butera** served as chief of hull design and hull process for General Dynamics. He has over 20 years of experience in the engineering and ship design field.

Hempel Group Founder Dies At Age Of 91

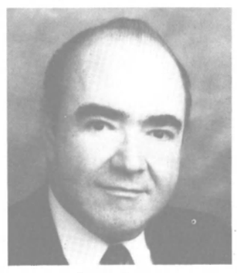
J.C. Hempel

J.C. Hempel, founder of the Hempel Group of companies and chairman of the Hempel Foundation, passed away in Copenhagen recently at the age of 91. He was a legend in his lifetime, having in just over 70 years built up a worldwide organization from a relatively small beginning in Denmark. Hempel's Marine Paints is one of the most well-known names in the maritime industry worldwide.

Born on the island of Funen in Denmark, Mr. **Hempel** went into business at a very young age in Odense and later in Germany, and in 1915, when just 21 years old, he obtained a trading license and established his own company. Over the years it developed into the world's largest independent marine and industrial paints and coatings group, with 27 factories, 43 sales offices, and more than 200 stocking locations around the world.

Established in 1948, the Hempel Foundation is the principal shareholder of the Group's companies.

Michell Bearings Appoints Peter Pagan President



Peter Pagan

Michell Bearings has announced the appointment of **Peter Pagan** as president of Michell Bearings, Inc. U.S.A.

Mr. **Pagan** was formerly vice president and marketing director of American Metal Bearing.

Michell Bearings is the original company founded in England by **A.G.M. Michell** FRS—the first man to patent a bearing in which load was carried upon oil film generated by a series of white-metaled, faced pads. This principle is universally known today as the Michell Bearing. In the United States, a similar development of white-metal bearing technology was associated with Dr. **Albert Kingsbury.**

Michell Bearings is one of eight companies that form the Marine Engineering Division of Vickers PLC.

For further information on Michell pivoting pad thrust and journal bearings, or on special bearing designs for all kinds of applications,

Circle 89 on Reader Service Card

Record Well Depth For Floating Drilling Rig Set By ODECO's 'Ocean Rover'

The semisubmersible rig Ocean Rover has set new world records for drilling the deepest offshore well and running the longest and heaviest casing string from a floating structure.

Owned by Ocean Drilling & Exploration Company (ODECO) of New Orleans, the rig achieved the records while drilling for Chevron U.S.A., Inc. in Destin Dome Block 422 in the Gulf of Mexico, about 60 miles west southwest of Panama City, Fla. The well was drilled to a depth of 22,222 feet, which surpassed the previous offshore record well depth of 21,872 feet drilled by ODECO's Ocean Victory in 1977 on Georges Bank offshore New England.

A record 19,260 feet of 9-5/8 and 10-inch casing string was run and landed into the Destin Dome well. Indicator weight of the tapered casing string was 1,050,000 pounds.

Since a major upgrading in June of last year, the Rover has met its most challenging drilling assignments with great success. The upgrading prepared the rig for the high pressures that were expected as it drilled to its targeted depth.

TDI Introduces New Infrared Thermometer Kit —Free Catalog Offered

TDI Catalog Sales, Transamerica Delaval, Inc., has introduced a convenient infrared thermometer kit that will handle all non-contact temperature measurement needs. The kit comes complete with thermocouple probe, test leads, type K naked bead probe, infrared thermometer, a multimeter and rugged carrying case. Two models are available: for °F or °C.

A battery-operated probe (1.25 inches in diameter by 6 inches long) plugs into the multimeter to generate a calibrated output of 1 millivolt per degree. It allows for accurate aiming. The target size is ¼-inch at ½-inch. The multimeter measures DCV, ACV, DCA, ACA temperature and resistance. It is lightweight and measures 7⅛ inches by 3⅜ inches by 1⅜ inches. Its 10 Megaohm input impedance contributes to accurate measurement of ±1 percent of reading (plus one digit).

This new temperature kit is only one of dozens of new products included in the new 1986 Sensors and Controls Catalog from TDI. For your free copy,

Circle 96 on Reader Service Card

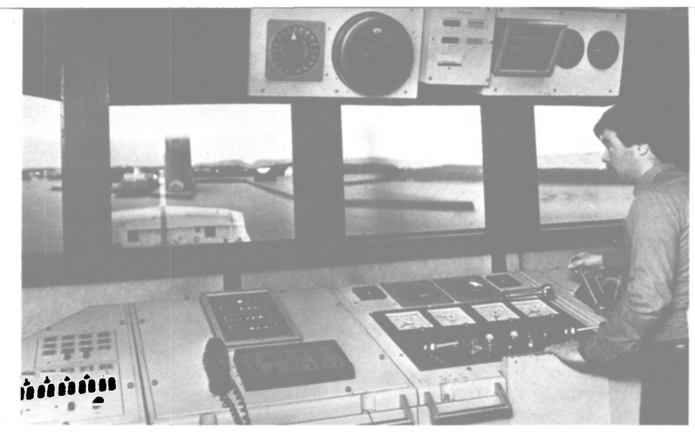
ELECTRONICS UPDATE

MarineSafety Initiates Tug-Barge Simulator Training Course

After many months of development work, MarineSafety International conducted its first training course for tugboat skippers recently in its ship simulator facility at La Guardia Airport in New York City. Mobil Oil captains **Craig Kinney, Doug Ruhl,** and **John Flynn** participated in the rigorous three-day course aimed at providing them with accelerated experience in pushing and maneuvering a large, heavily loaded barge in various situations. All three skippers rated the course as being very worthwhile.

The trainees used a 7,000-bhp, twin-screw tug to manage a barge 400 feet long and 99 feet wide under a variety of wind, current, and visibility conditions. The tug-barge combination was worked in different rivers and harbors experiencing strong currents and winds, and interaction with other traffic. The trainees practiced decision-making under stress as they faced unexpected failures and emergency situations on the final day of the course.

The response of the tug and barge to the skippers' engine and steering controls and to external conditions is accurately simulated in a computer. The tug-barge computer response model was developed for MarineSafety by Tracor-Hydronautics of Laurel, Md. Crowley Maritime of San Francisco provided sea trial and operational data for the tug and barge.



Mobil Oil's Capt. **Craig Kinney** is shown on bridge of MarineSafety ship simulator during a refresher course on tug-barge operations at the La Guardia Airport facility.

Present exercises include operation of the tug in the notch and on the hip. Various types of towing exercises are under development. MarineSafety plans to offer the three-day, three-person simulator course monthly throughout the year.

For further information on this tug-barge course and on other MarineSafety simulator training,

Circle 70 on Reader Service Card

Alden Introduces Series Of Marinefax Recorders— Literature Offered

The first of a new series of Marinefax weather chart recorders is currently being introduced by Alden Electronics, Inc., Westboro, Mass. Designated the Marinefax TR 1, the new recorder features a high-quality thermal printer for crisp, white dry paper recordings and a microprocessor-based programmable memory that lets the operator select not only the time and frequency of desired charts but various transmitters as well. The Marinefax TR 1 will automatically turn itself on, select the desired frequency, select the desired transmitter, receive the chart and turn itself off. This cycle can be programmed to occur for up to 250 on/off sequences. A scrolling LCD display provides all necessary prompts.

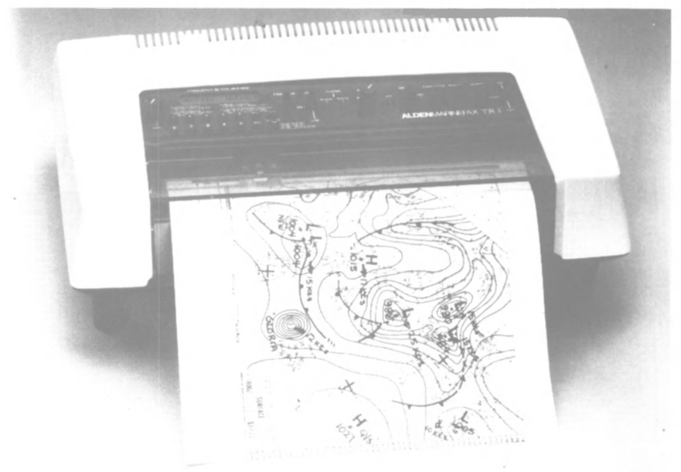
The Marinefax TR 1 also incorporates two unique memory functions. One function is permanent and is used to store all worldwide radiofax frequencies for easy two-step recall, the other function is used as a local memory to store up to ten frequencies for single-button recall. Any HF frequency in the world may also be manually entered into the receiver.

The Marinefax TR 1 also features a new highly stable radio that can be tuned as precisely as 0.1 kHz for optimized reception without fine tuning. This feature makes it easier to program the radio to receive from transmitters using odd frequencies of half a cycle above whole kHz stops.

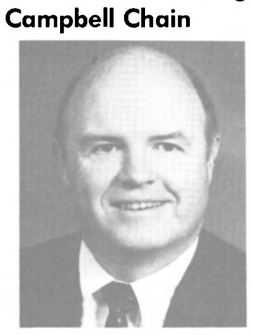
The Marinefax TR 1 shares all the features, such as compact size and light weight, as previous Marinefax recorders. It operates off 110 and 220 VAC as well as 12, 24, 32 VDC.

For further information and free literature on the Marinefax TR 1 from Alden Electronics,

Circle 62 on Reader Service Card



Cartwright Appointed VP And General Manager Of Campbell Chain



J. David Cartwright

J. David Cartwright has been named vice president and general manager of the Campbell Chain Division of Cooper Industries, Inc. He replaces **Clark Wilson,** who has been appointed president of Kirsch, another Cooper division located in Sturgis, Mich. Mr. **Cartwright** will report to **Jerry H. Godwin**, vice president and general manager of The Cooper Group, headquartered in Raleigh, N.C.

Mr. **Cartwright** joined Campbell Chain in 1973 as plant superintendent. He was named manager, manufacturing services in 1974 and became vice president, operations in 1977. Prior to his association with Campbell, he served for 12 years in various engineering and manufacturing management positions with SKF Industries. He holds a BS degree in mechanical engineering and an MBA degree from Drexel University in Philadelphia.

Jones Joins Taurus As Marketing Representative

Taurus Marine Associates, Ltd., a towboat operator in Tampa, Fla., has announced the addition of **G.E. (Pete) Jones** to its staff as marketing representative. With more than 25 years of experience in the marine industry, he is well known in the shipping community.

Mr. **Jones** will be marketing Taurus Marine's harbor services in Tampa to customers throughout the world. He will be headquartered in New York City.

Reiss Named President Of Rexnord Automation's Defense Systems Group

James J. Reiss Jr. has been appointed president of the Defense Systems Group of Rexnord's newly established subsidiary, Rexnord Automation of Hunt Valley, Md. The Defense Systems Group located in New Orleans, the former Tano Corporation, a Rexnord company, designs and manufactures electronic and computer-based marine automation systems for military and commercial ships. The group is also active in the design and integration of other control systems and equipment for the defense industry.

Mr. **Reiss** had been president of Tano Corporation. He is a graduate of Tulane University in New Orleans, and served as chairman of the Governor's Task Force on high-technology industry for the State of Louisiana.

For further information on the Defense Systems Group,

Circle 94 on Reader Service Card

Great Lakes Seeks Title XI For Dredge And Two Barges To Cost $34.4 Million

Great Lakes Dredge & Dock Company of Oak Brook, Ill., has applied to the Maritime Administration for Title XI mortgage guarantees to aid in financing the construction of a clamshell dipper dredge and two barges. Total cost for the three vessels is stated to be $34.4 million; Title XI would guarantee 75 percent of that, or $25.8 million.

The application states that the dredge is under construction at Southern Shipbuilding in Slidell, La., and the barges are being built by Bay Shipbuilding in Sturgeon Bay, Wisc. Deliveries are scheduled for November this year.

Wärtsilä Delivers Advanced Icebreaker To Finnish Board Of Navigation

The icebreaker Otso (shown), ordered in March 1984 by the Finnish Board of Navigation, was delivered recently by Wartsila's Helsinki Shipyard. She is the first of two technologically advanced icebreakers of a new type. The second vessel was ordered in December 1985 and is scheduled for delivery in January 1987.

Christened by Finnish Premier **Kalevi Sorsa,** the Otso and her sister ship will replace three icebreakers of the Karhu Class, which are all more than 25 years old and too small to assist today's much larger merchant vessels. The Otso was handed over by **Martin Saarikangas,** managing director of the Helsinki Shipyard, and accepted on behalf of the Navigation Board by **Jan-Erik Jansson,** director general.

Compared with the Urho Class icebreakers built in the mid-70s, the Otso has a 21.33-foot shorter waterline but a beam 1.3 feet wider. This allows efficient assistance to the bigger ships in use today. The design draft is only 24 feet, less than the Urho Class, making a larger number of harbors accessible to the new icebreaker. The Otso has an overall length of 324.8 feet, beam of 79.4 feet, and maximum draft of 26.25 feet.

The forward propellers common in recent Baltic icebreakers have been replaced by Wartsila's patented air-bubbling system. This and the absence of forward propeller bosses decreased the reisistance encountered by the vessel in ice. The ice resistance has also been reduced by modification of the hull shape and the use of compound plate with a surface layer of stainless steel in the ice zone. These features, together with application of epoxy paint to the underwater surfaces, will keep frictional resistance low for longer periods than could be achieved by the methods used previously.

The general arrangement of the Otso differs considerably from that found on earlier icebreakers. The diesel generators are placed on the upper deck, below the helicopter deck, resulting in simpler cable and piping systems. The heavy fuel tanks are placed amidships well away from the hull plating, which decreases the risk of pollution.

A new feature in comparison with earlier Finnish icebreakers is the "power station" type of machinery, in which no auxiliary units are needed. This is an economical arrangement as the vessel can run entirely on heavy oil, which is cheaper than diesel fuel.

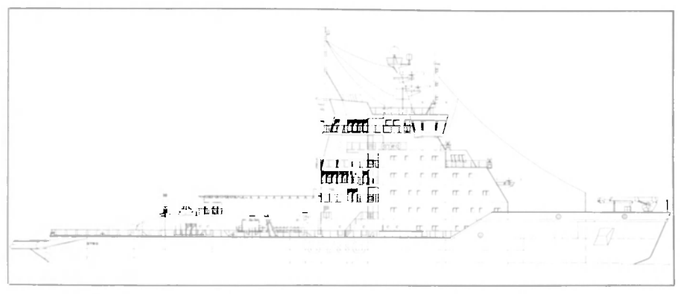
The main machinery comprises four Wartsila Vasa 16V32 diesel engines, each developing 7,320 bhp, driving propulsion motors developed and manufactured by Kymi-Strombery Oy. The motors are of an advanced AC type, in which the rpm is regulated by altering the AC frequency. The machinery can be started and supervised from the wheelhouse using a computer-assisted control system.

The control consoles in the wheelhouse are placed far out on the bridge wings, from which there is nearly 360-degree visibility. The computer-assisted radar system can also supply information on the speed and course, and data on the fairway can be fed into it in advance.

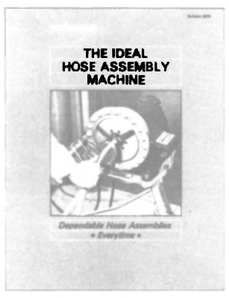
Crew accommodations have been designed to provide sufficient rest and recreation even under arduous working conditions. All cabins are located in the superstructure, which decreases the noise of breaking ice coming from the hull. Each of the 28 crewmembers has a separate cabin. Separate messes and dayrooms are provided for the officers, crew, and catering personnel, and the ship has two saunas and a gymnasium.

For free literature on the facilities available at Wartsila shipyards.

Circle 99 on Reader Service Card



New Aeroquip Bulletin Explains Hose Assembly Machine Advantages



The advantages of using Aeroquip Corporation's FT1097 portable hose assembly machine, a simple, fast and reliable way to produce hose assemblies with reusable fittings, are explained in a new company bulletin.

Designed to speed production of Aeroquip reusable hose assemblies in sizes up to 1¼ inches diameter, the FT1097 portable hose assembly machine can be bench-mounted or stand on an optional folding metal stand.

The machine will assemble reusable hose assemblies with all Aeroquip standard reusable fittings, including male pipe, swivel, flange and elbow types.

Aeroquip Corporation of Jackson, Mich., is a Libbey-Owens-Ford company (LOF). A worldwide leading manufacturer of fluid power and fluid system components, Aeroquip's diversified product lines include flexible hose, fittings and assemblies; quick disconnect and V-band couplings; hydraulic and pneumatic cylinders; ball, rotary and swivel joints; custom-engineered rubber products; spring brakes; cargo control equipment; refrigeration/air conditioning components; railroad products and aerospace components.

For further information and a free copy of this bulletin,

Circle 92 on Reader Service Card

Congressional Conferees Agree To Appropriate $228.4 Million For Strategic Sealift Program

Conferees from the Senate and the House of Representatives have agreed to appropriate $228.4 million in support of the Navy's Strategic Sealift Program. The money will be used to purchase additional commercial tonnage from private owners for the Ready Reserve Force, as well as to modernize and re-engine some of the vessels procured.

The Conference Report accompanying the measure read in part: "Upon enactment of legislation authorizing 'Mariner Fund' for the construction and charter of commercial vessels, the conferees agree that the Navy may charter any vessels modernized through these strategic sealift funds, provided such authority is granted. It is the conferees' intent to begin the charter program as soon as possible after authorization is enacted, thereby generating early revenues to the Mariner Fund. Approval for modernization of vessels procured under this section should be considered an exception, not a precedent."

Re-engining and modernization of vessels acquired for the Ready Reserve Force could be of short-term assistance to hard-pressed domestic shipbuilders.

Barber Steamship Lines Elects Directors And Officers

Robert H. Pouch has been named chairman of the board of Barber Steamship Lines, succeeding **Edward J. Barber,** who retired in December.

Haakon A. Ostberg has been elected vice chairman and serves on the board with **Niels Werring** and **Wilhelm Wilhelmsen,** partners in Wilh. Wilhelmsen of Norway. **Sanford Miller,** who also serves as corporation counsel, rounds out the board of directors.

The company has restructured its operating management in North America into three geographic regions and will be run by **Hans J. Hjelde** as vice president/general manager of the Atlantic Region, **Rolf C. Olsen** as vice president/general manager of the Pacific Region, and **Gilbert O. Nilsson** as vice president/general manager of the Gulf Region.

SNAME Chesapeake Section Meeting Hears Paper On SWATH Survey Ship

The Chesapeake Section of The Society of Naval Architects and Marine Engineers met recently to hear a paper entitled "SWATH AGS Deep Ocean Survey Ships," presented by **H. David Kaysen** of MAR, Incorporated. The evening began with a discussion of Marine Systems Committee activities by **Edward M. MacCutcheon**. Moderator **Nat Kobitz** of the Naval Sea Systems Command then introduced Mr. **Kaysen** for the main technical presentation.

The U.S. Navy currently uses auxiliary ships designated T-AGS, crewed by the Military Sealift Command, to survey the ocean floor for the Fleet Ballistic Missile Submarine Program. This is the Deep Ocean Survey (DOS) mission. The current ships are displacement monohull vessels. Two of these, the USNS Bowditch and the USNS Dutton, are scheduled for replacement, and a construction contract has been awarded for two new monohull ships.

The author's paper presented a discussion of the merits of the application of a Small Waterplane Area Twin Hull (SWATH) type ship to the DOS missions. A design comparison was presented, based on the Circular of Requirements (COR) issued by the Navy for the Bowditch/Dutton replacements. The SWATH platform offers improved DOS mission performance compared with a monohull by reducing the motions experienced by the sensors in a seaway. This would enable the SWATH AGS to operate in higher latitudes.

In attendance at Chesapeake Section meeting were (L to R): **Nat Kobitz,** moderator; **Wolfgang Reuter,** vice chairman; **Amos Baki,** chairman; **H. David Kaysen,** author; **Edward M. MacCutcheon,** Marine Systems Committee chairman; and **John J. Nachtsheim,** past president of SNAME.

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Garrett Division To Participate In Design Of New Engine For Mid-Sized Navy Ships

The U.S. Navy has selected a team composed of The Garrett Corporation's AiResearch Manufacturing Company, Allison Gas Turbine Engine Division of General Motors, and Rolls Royce for the conceptual design of an intercooled and regenerated advanced technology gas turbine engine for propelling the Navy's future mid-sized ships.

The conceptual study contract was awarded by the U.S. Naval Sea Systems Command in Washington, D.C.

AiResearch Manufacturing Company's part in the program is to design the intercooler and regenerator, as well as to package the complete engine for shipboard use. Both AiResearch and Rolls Royce have recently conducted funded studies for the U.S. Navy on the design of intercooled and regenerated gas turbine engines. These studies helped lead the way to the conceptual design award.

It is expected that the current program will lead to a multimillion-dollar full-scale development program to provide new-technology engines in the 24,000-shaft-horsepower class for use on future naval destroyers and frigates.

A key to the successful design is the development of a regenerator matched to the advanced technology engine. Regenerators are heat transfer devices which significantly improve the efficiency and reduce fuel consumption of gas turbines by using waste heat in the exhaust stream to preheat the incoming compressed air entering the combustor.

Preheating the combustion air dramatically decreases the amount of fuel required compared to non-regenerated, simple cycle gas turbines.

The intercooler, another type of heat exchanger, removes the heat of compression between the low and high stage compressors. That results in increased net power output and better efficiency in the recovery of exhaust gas heat by the regenerator.

Navy requirements for the propulsion system include reduction in fuel consumption and longer range.

According to **Anthony G. Izuel,** president of AiResearch Manufacturing Company, "AiResearch regenerators installed in non-naval industrial applications, such as natural gas compressor stations and electric utility power generation plants, are saving as much as one third the amount of fuel normally required to operate gas turbines."

AiResearch Manufacturing Company, which will conduct the regenerator and intercooler design program at its facilities in Torrance, Calif., is a division of The Garrett Corporation, a unit of Allied-Signal Inc.

Lindenau Installs Firefighting System On Offshore Supply Boat —Literature Available

The Paul Lindenau shipyard in Kiel, West Germany, recently installed a modern high-capacity firefighting system aboard the offshore supply vessel Kaubturm, owned by VIG Offshore of Bremen, in the record time of only 12 days. The boat left the shipyard two days earlier than agreed upon the contract, after extensive tests to the system.

The short time span and early completion date was made possible because the Lindenau yard was able to copy and prefabricate many mounted parts, especially piping, from a sister vessel, the Huntetor. This was done in close cooperation with the shipping inspectors and the Elsflether shipyard.

New fire-extinguishing system aboard supply vessel Kaubturm has two pumps powered by Deutz diesels.

The fire-extinguishing system consists of two pumping units driven by Deutz BA16M816 diesel engines, each with an output of 1,190 bhp at 1,650 rpm. A monitor is installed at the stern for each of the pumping units. Water flow rate per monitor is 25,000 liters per minute, with a pressure at the monitor entrance of 13 bar. Height of the water stream is 230 feet at a distance of 230 feet from each monitor. The monitors, which are operated from the navigating bridge via electro-hydraulic remote control, are able to swivel plus or minus 170 degrees horizontally and vertically from minus 45 to plus 85 degrees.

The vessel also was fitted with a complete self-protection approved by Germanischer Lloyd. The shipyard also installed an additional fire pump in the fire-extinguishing unit room. The entire system was developed jointly by VIG Offshore and Preussag AG Minimax.

For additional information on the Paul Lindenau shipyard,

Circle 74 on Reader Service Card

Schaffran Offers Free Literature On Propellers And Shaft Liners

Schaffran propellers shown above are, from left to right: high-speed propeller; anti-sound propeller for submarines; and CP propeller with subordinated Grim Wheel.

Schaffran Propeller Lehne & Co. of West Germany is offering free literature on the line of propellers and shaft liners produced by the company. The material points out that Schaffran serves the shipbuilding marketing with the following range of products and services:

(1) A single source and sole responsibility for combinations of propulsion systems, including those with Grim Wheels®; (2) comprehensive consulting in projecting and planning—design, manufacture, modification, spare parts, replacement, maintenance and repair of all kinds of FP and CP propeller installations and Grim Wheels; (3) propeller systems by individual design and construction based on innovative technology and solid craftsmanship for (a) FP and CP propeller installations approved by all classification societies for all kinds of vessels up to Panamax size; (b) proven FP and CP propellers for main propulsion, thrusters, maneuvering aids and Grim Wheels; and (c) high performance FP and CP propellers with optimum efficiency, minimized noise excitation and cavitation for all kinds of craft.

Schaffran also offers individual propeller systems based on computerized design programs; propellers and propulsion systems for main propulsion plants, bow and stern thrusters, rudder propellers, stirrers (agitators), and pump propellers; and castings for foreign and special needs.

The company's program of shaft manufacturing consists of every kind of shafting, lengths up to 15 meters. Shaft installations include tube with sealings, shaft brackets, protecting tubes and bearings.

The literature is well illustrated with color photos, cutaway and design drawings, charts, etc.

For further information and free literature on Schaffran propellers and shaft liners,

Circle 72 on Reader Service Card

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Curtis Bay Towing Elects Cudworth VP

Louis N. Cudworth has been elected vice president of Curtis Bay Towing Company, according to an announcement by **Malcolm W. MacLeod**, president.

Mr. **Cudworth** served on tankers and freighters during World War II then moved on to tugs in 1945 when he joined Wood Towing Company in Norfolk, Va. His Curtis Bay Towing career started in 1951 when Wood Towing was purchased by Curtis Bay. He advanced to port engineer in the Philadelphia office in 1956, and moved to Baltimore in 1966 as corporate engineering coordinator. He became manager of construction and repair in 1972, and assistant vice president in 1981.

From his office at Corporate Headquarters in Baltimore he directs the maintenance and repair activities of Curtis Bay Towing's 23-tug fleet.

Marco-Seattle Awarded Cargo Ship Conversion

Sunmar Shipping, Inc. has awarded a contract to Marco-Seattle for the conversion of the M/V Sunmar Sea from a general cargo vessel to a modern refrigerated vessel to be used in the trade between Alaska and the U.S. West Coast. According to Sunmar president **Hans W. Mauritzen**, the changeover is scheduled for completion in June.

The Sunmar Sea conversion plan calls for the construction of an entirely new and self-contained forebody that will replace the existing one. "We'll practically build a new vessel," commented Marco Shipyard Division vice president **Bob McMahon**, "including refrigeration and electrical systems, hydraulics, deck gear, and rigging. When this innovative conversion is finished, the entire vessel will satisfy the requirements for Det norske Veritas Class 1A1, KMC, the highest class for refrigerated vessels." The new forebody was designed by Jensen Maritime Consultants of Seattle.

The "new" Sunmar Sea will feature a highly efficient refrigeration system designed to accommodate cargoes at any temperature from +12 to −35 degrees (centigrade) in four separate compartments. The vessels will also be able to carry most cargoes typical of the trade in containers.

The conversion process will lengthen the Sunmar Sea from 170 to 190 feet, and her breadth will go from 27 to 34 feet. Her hold capacity will increase from 17,500 to 50,700 cubic feet, with a net cargo-carrying capacity of approximately 1,000 tons.

Sunmar Shipping, Inc. is an independent Seattle-based firm that specializes in the domestic and international ocean transporation of refrigerated cargoes, with particular emphasis on seafood products from Alaska. Among other activities, the company has operated its "Rainbow Reefer Service" for the past four years, offering regular break-bulk reefer transporation directly to major Northern European destinations from the high seas and various ports in Western Alaska and Puget Sound.

Marco-Seattle has been involved in shipbuilding for more than 30 years, and is well known for its large number of commercial fishing vessels ranging from 32 to 220 feet. For additional information on conversions and other shipyard services,

Circle 95 on Reader Service Card

Ellicott Machine Forms New Engineering Company —Morse Named Manager

Ellicott Machine Corporation of Baltimore, marking its centennial this year and well known for its success in dredge manufacturing, has announced the formation of a new subsidiary—Ellicott Engineering, Inc. This new company will provide machining, assembly, fabricating, and computer-aided engineering/drafting services to maritime, military, and commercial customers.

Peter A. Bowe has been elected president, and **Alan E. (Ted) Morse** general manager to run the new company. Mr. **Morse** brings to his position more than two decades of experience in engineering and manufacturing in other posts at Ellicott.

Alan E. Morse

The general manager explained the move as a response to increasing cases of unsolicited requests by new customers asking Ellicott to perform such services. The volume of these requests has reached a level that can be satisfactorily serviced only by a separate company.

Customers include the U.S. Coast Guard, Shell Oil, Gould, AAI, Washington Aluminum, and Teledyne Energy Services. According to Mr. **Morse,** the company's Baltimore facility is one of the most complete in the mid-Atlantic region, equipped with large machine tools, large fabrication capability, and sophisticated computer-aided design equipment.

For further information on Ellicott Engineering,

Circle 88 on Reader Service Card

BUYERS DIRECTORY

This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER/Engineering News. A quick-reference readers' guide, it includes the names and addresses of the world's leading manufacturers and suppliers of all types of marine machinery, equipment, supplies and services. A listing is provided, at no cost for one year in all 20 issues, only to companies with continuing advertising programs in this publication, whether an advertisement appears in every issue or not. Because it is an editorial service, unpaid and not part of the advertisers contract, MR/EN assumes no responsibility for errors. **If you are interested in having your company listed in this Buyers Directory Section, contact John C. O'Malley at (212) 477-6700.**

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Borg-Warner Air Conditioning, P.O. Box 1592-361C, York, PA 17405
Flakt AB, Box 8862, S-40272, Gothenburg, Sweden
Mechanical Resources Inc., 210 West Side Ave., Jersey City NJ 07305
Stal Refrigeration AB, Butangsgatan 16, S 601 87 Norrkoping, Sweden
United Technologies, Carrier Transicold Division, P.O. Box 4805, Syracuse NY 13221
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Markey Machinery Co., Inc., 79 S. Horton St., Seattle, WA 98134
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Goltens, 160 Van Brunt Street, Brooklyn, NY 11231
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Seaward Marine Service, Inc., 201 N. Union Street, Alexandria, VA 22314
Seaward Marine Service, Inc. 5409 Beamon Rd., Norfolk, VA 23513 TX: 710-881-1182
Seaward Marine Service, Inc. 424 West 8th Street, National City, CA 92050
Taylor Diving & Salvage Co. Inc., 701 Engineers Rd., Belle Chasse, LA 70037
HYDRAULICS
Aeroquip Corp., 1130 Maynard Road, Jackson, MI 49202
Bardex Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA. 93116
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Del Gavio Marine Hydraulics Inc., 207 W. Central Ave., Maywood, NJ 07607
Hydra-Dynamics, Inc., 2141 Greenwood Ave., Wilmette, IL 60091
Parker Hannifin Corporation, 17325 Euclid Avenue, Cleveland, OH 44112
Titeflex Corporation, P.O. Box 54, Springfield, MA 01109
Washington Chain & Supply, Inc., P.O. Box 3646, Seattle, WA 98124
INERT GAS
Saab Tank Control, One Harmon Plaza, Secaucus NJ 07094
INSULATION—Cloth, Fiberglass
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001
Duracote Corp., 350 North Diamond St., Ravenna, Ohio 44266
Superior Energies, Inc. P.O. Drawer 386, Groves, TX 72619
INSURANCE
Adams & Porter, 510 Bering Dr., Houston, TX 77057-1408
Adams & Porter, 1 World Trade Center, Suite 8433, New York, NY 10048
Wm. Keith Hargrove, Inc., 1300 Post Oak Blvd., Suite 2050, Houston, TX 77056
United States P&I Agency, Inc., 80 Maiden Lane, New York, NY 10038
JOINER—Watertight Doors—Paneling
Advanced Structures Corp., 235 W. Industry Ct., Deer Park, NY 11729
Astech, 3030 S. Red Hill Ave., Santa Ana, CA 92711
Bailey Distributors, Inc., 2323 Randolph Avenue, Avenel, NJ 07001
Masonite Commercial Division, Dover, OH 44622
Walz & Krenzer Inc., 725 Glen Cove Ave., P.O. Box 6, Glen Head NY 11545
KEEL COOLERS
R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
Carlisle & Finch, 4562 W. Mitchell Avenue, Cincinnati, OH 45232
Midland-Ross Corp., Russellstoll Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039
Perko Inc., P.O. Box 6400D, Miami, FL 33164
Phoenix Products Company, Inc., 4769 North 27th Street, Milwaukee, WI 53209
LINE BLINDS
American Piping Products Inc., Box 1056, New Hyde Park, NY 11040
Stacey/Fetterolf Corp., P.O. Box 103, Skippack, PA 19474
MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
A-C Brake Co., 308 E. College St., Louisville, KY
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DEL-MARINE
Jered Brown Brothers Inc., 1300 Coolidge, P.O. Box 2006, Troy, MI 48007
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94080
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
MINING
Rocky Mountain Energy, 10 Longspeake Dr., Box 2000, Broomfield, CO 80020
NAME PLATES—BRONZE—ALUMINUM
Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707
NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356
American Hydromath Inc., Box 2450, Danby-Pawlet Road, Pawlet, VT 05761
American Systems Engineering Corp., P.O. Box 4265, Virginia Beach, VA 23454
Ameritech Corporation, 7 Belver Avenue, Suite 215, N. Kingston, RI 02852
Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, MD 20015
Art Anderson Associates, 148 First St., Bremerton, WA 98310
B.C. Research, 3650 Wesbrook Mall, Vancouver, B.C. Canada V6S 2L2
Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130
C.D.I. Marine Co., 5520 Los Santos Way, Suite 600, Jacksonville, FL 32211
C.T. Marine, 18 Church Street, Georgetown, CT 06829
Century Engineering, inc., 32 West Rd., Towson, MD 21204
Childs Engineering Corp., Box 333, Medfield, MA 02052
Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, MA 02026
C.R. Cushing, 18 Vesey St., New York, NY 10007
Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
Designers & Planners, Inc., 1725 Jefferson Davis Highway, Suite 700, Arlington, VA 22202
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
Encon Management & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706
Engineering Visions, 1111 Bay Blvd., Chula Vista CA 92011
Capt. R.J. Fearson & Associates, P.O. Box 983, Tampa, FL 33601
Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington, NY 11050
Gibbs & Cox, Inc., 119 West 31st Street, New York, NY 10001
John W. Gilbert Associates, Inc., 66 Long Wharf, Boston, MA 02110
The Glosten Associates, Inc., 610 Colman Bldg., 811 First Ave., Seattle, WA 98104
Phillip Gresser Associates, Ltd., 3250 South Ocean Blvd., Palm Beach, FL 33480
Morris Guralnick Associates, Inc., 620 Folsom Street, Suite 300, San Francisco, CA 94107

Hamilton Cornell Associates, Box 188, Snug Harbor Station, Duxbury, MA 02331
J.J. Henry Co., Inc., 40 Exchange Place, New York, NY 10005
Hi-Test Laboratories, Inc., P.O. Box 226, Buckingham C.H., VA 23921
HydroComp, Inc., 10 Cutts Road, P.O. Box 865, Durham, NH 03824
Intramarine, Inc., P.O. Box 53043, Jacksonville, FL 32201
JJH Inc. of Virginia, 330 County St, Portsmouth VA 23704
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
Jantzen Engineering Co., 6655-H Amberton Drive, Baltimore, MD 21227
James S. Krogen, 1515 NW 7th St., Suite 124, Miami FL 33125
Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
John J. McMullen Associates, Inc., 1 World Trade Center, New York, NY 10048
Fendall Marbury, 1933 Lincoln Drive, Annapolis, MD 21401
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, OH 44114
Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, NY 11746
Marine Power Associates, 1010 Turquois St., Ste 217, Son Diego, CA 92109
Maritime Design, Inc., 2955 Hartley Rd., Jacksonville, FL 32217
George E. Meese, 194 Acton Rd., Annapolis, MD 21403
R. Carter Morrell, 715 S. Cherokee, Bartlesville, OK 74003
NKF Engineering Inc., 12200 Sunrise Valley Dr., Reston VA 22091
Nelson & Associates, Inc., 610 Northwest 183rd St., Miami, FL 33169
Nickum & Spaulding Associates, Inc., 2701 First Ave., Seattle, WA 98121
Northern Marine, P.O. Box 1169, Traverse City, MI 49685
Ocean-Oil Internatinal Engineering Corporation, 3019 Mercedes Blvd., New Orleans, LA 70114
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, FL 33156
Q.E.D. Systems Inc., 4646 Witchduck Rd., Virginia Beach, VA 23455
M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 667 Mission St., San Francisco, CA 94105
Sargent & Herkes Inc., 611 Gravier St., New Orleans, LA 70130
Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, FL 33316
SEACOR Systems Engineering Corp., 520 Fellowship Rd., Ste C306, Mt. Laurel NJ 08054
STV/Sanders & Thomas, Inc., 1745 Jefferson Davis Hwy., Arlington, VA 22202
Seaworthy Systems Inc., 28 Main St., Essex CT 06426; 17 Battery Pl., New York, NY 10004; P.O. Box 205, Solomons MD 20688; 2 Skyline Pl, 5203 Leesburg Pike, Falls Church VA 22041
Seaworthy Electrical Systems, 17 Battery Pl. N.Y. N.Y. 10004
George G. Sharp, Inc., 100 Church St., New York, NY 10007
Simmons Associates, P.O. Box 760, Sarasota, FL 33578
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
Thomas Coudon Associates, 6655 Amberton Drive, Baltimore, MD 21227
Timsco, 622 Azalea Road, Mobile, AL 36609
Tracor Hydronautics, Inc., 7210 Pindell School Rd., Laurel, MD 20707
Thomas B. Wilson, Associates, 1258 North Avalon Blvd., Wilmington, CA 90744

NAVIGATION & COMMUNICATIONS EQUIPMENT
Atkinson Dynamics, Section 6, 10 West Orange Ave., South San Francisco, CA 94080
COMSAT World Systems, 950 L'Enfant Plaza, S.W., Suite 6151 Washington, DC 20024
A/S Elektrisk Bureau, P.O. Box 98, N-1360 Nesbru, Norway
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
General Electric Company, Mobile Communications Division, Lynchburg, VA 24502
Harris Communications (RF Communications), 1680 University Avenue, Rochester, NY 14610
Henschel, 9 Hoyt Drive, Newburyport, MA 01950
Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631
ITT Mackay, 441 U.S. Highway #1, Elizabeth, NJ 07202
Kongsberg Vopenfabrikk, Norcontrol Division, P.O. Box 145, Horten 3191, Norway
Krupp Atlas-Elektronik, 1453 Pinewood St., Rahway, NJ 07065
Micrologic, 20801 Dearborn, Chatsworth, CA 91311
Naval Electronics, 5479 Jetport Industrial Blvd., Tampa FL 33614
Nav-Com, Inc., 9 Brandywine Drive, Deer Park, NY 11729
Navigation Sciences Inc., 6900 Wisconsin Ave., Bethesda, MD 20815 TX: 705999
Perko Inc. (Lights), P.O. Box 6400D, Miami, FL 33164
Racal Marine Inc., 1 Commerce Blvd., Palm Coast, FL 32037-0029
Radio-Holland USA, Inc., 6033 South Loop East, Houston, TX 77033
Raytheon Marine Co., 676 Island Pond Road, Manchester, NH 03103
Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914
Raytheon Service Co., 103 Roesler Rd., Glen Burnie, MD 21061
Robertson-Shipmate, 400 Oser Ave., Hauppauge NY 11788
S.P. Radio A/S, DK 9200 Aalborg, Denmark
SAIT Inc., 33 Rector St., New York, NY 10006
Simrad, 2208 NW Market St., Seattle WA 98107
Sperry Corporation, Rte 29 North, Charlottesville, VA 22906
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
Telesystems, 2700 Prosperity Ave., Fairfax, VA 22031 USA
Tracor Instruments Austin Inc., 6500 Tracor Lane, Austin, TX 78725

OILS—Marine—Additives
B P North America Petroleum, 555 US Route 1, So. Iselin, NJ 08830
Exxon Company, U.S.A., Room 2323 AH, P.O. Box 2180, Houston, TX 77701
Gulf Oil Company—U.S. (Domestic Oils), 909 Fannin Street, Houston, TX 77001
Gulf Oil, New York District Sales Office (Domestic), 433 Hackensack Avenue, Hackensack, NJ 07601
Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022
Mobil Oil Corp., 150 East 42 Street, New York, NY 10017
Texaco, Inc. (International Marine), 135 East 42nd St., New York, NY 10017

OILY WATER ALARMS/MONITORS
Biospherics, Inc., 4928 Wyaconda Road, Rockville, MD 20852

OIL/WATER SEPARATORS
Alfa Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ 07647
NALCO Chemical, Co., 2901 Butterfield Road, Oak Brook, IL 60521
Oil Recovery Systems, Inc., 1420 Providence Hwy., Norwood, MA 02062
Peck Purifier Sales Co., 3724 Cook Blvd., Chesapeake, VA 23323
Sigma Treatment System, Merry Meadows RD 1 Box 70, Chester Springs, Pa 19425

PAINTS—COATINGS—CORROSION CONTROL
American Abrasive Metals Co., 460 Coit St., Irvington NJ 07111
Ameron, 4700 Ramona Blvd., Monterey Park, CA 91754
Devoe Marine Coatings Co., P.O. Box 7600, Louisville, KY 40207
E.I. DuPont De Nemours & Co., Inc. Nemours Bldg., Rm. N-2504-2, Wilmington, DE 19898
DuPont Co. MPS , Room X40750, Wilmington, DE 19898
Esgard, Box 2698, Lafayette, LA 70502
Farboil Company, 8200 Fischer Rd., Baltimore, MD 21222
Hempel Marine Paints, Inc., Foot of Currie Ave., Wallington, NJ 07057; 6868 NorthLoop East, Suite 304, Houston, TX 77028; P.O. Box 10265, New Orleans, LA 70181
International Paint Company, Inc., 2270 Morris Avenue, Union, NJ 07083
Jaegle Paint Company, Inc., 1012 Darby Road, Havertown, PA 19083
Jotun Marine Coatings Inc., 175 Penrod Court N&O, Glen Burnie, MD 21061
Magnus Maritec International Inc., 150 Roosevelt Pl., P.O. Box 150, Palisades Park, NJ 07650
Products Research & Chemical Corp., 5454 San Fernando Rd., Glendale, CA 91203
Selby Battersby & Co., 5220 Whitby Ave., Philadelphia, PA 19143

PIPE-HOSE—Cargo Transfer Clamps, Couplings, Coatings
Amermarine International, P.O. Box 9205, Dundalk, MD 21222
Ameron Fiberglass Pipe Division, P.O. Box 801148, Houston TX 77280
Deutsch Metal Components, 14800 S. Figueroa St., Gardena, CA 90248
Hydro-Craft Inc., 1821 Rochester Industrial Dr., Rochester, MI 48063
Knights Piping Inc., 5309 Industrial Road, Pascagoula, MS 39567
Tioga Pipe Supply Co. Inc., 2450 Wheatsheaf La., P.O. Box 5997, Philadelphia, PA 19137

PLASTICS—Marine Applications
Hubeva Marine Plastic, Inc., 390 Hamilton Ave., Brooklyn, NY 11231

PROPELLER POLISHING
Aquafacs Marine Technical Services, Pier One, Berth One, Boston MA 02128
Pacific Marine Services, P.O. Box 3400, Terminal Island, CA 90731

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines
Allison Gas Turbine Division, General Motors Corp., P.O. Box 420 Speed code U6, Indianapolis, IN 46206
Amarillo Gear Co., P.O. Box 1789, Amarillo, Texas 79105
Armco Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
Bergen Diesel Inc., 2110-10 Service Rd., Kenner, LA 70062
Boston Metals Co., 313 E. Baltimore St., Baltimore, MD 21202
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
Colt Industries Inc. (Fairbanks Morse Engine Div.), 701 Lawton Avenue, Beloit, WI 53511
Columbian Bronze Corporation, 216 No. Main Street, Freeport, NY 11520
Combustion Engineering, Inc., Windsor, CT 06095
Coolidge-Stone Vickers, Inc., 56 Squirrel Rd., Auburn Hills, MI 48057
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340
Elliott Company, 1809 Sheridan Ave., Springfield, OH 45505
George Engine Company, Inc., Lafayette, LA
General Motors, Electro-Motive Division, LaGrange, IL 60525
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231
KHD Canada Inc., 180 Rue de Normandie, Boucherville, Quebec J4B 5S7, Canada
Lips Propellers, 3617 Koppens Way, Chesapeake, VA 23323
M.A.N.-B&W Diesel, 2 Ostervej, DK-4960 Holeby, Denmark
MTU of North America, 10450 Corporate Dr., Sugarland, TX 77478
MWM-Murphy Diesel, 12 Greenway Plaza, Suite 1100, Houston, TX 77046
Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507
Mitsubishi International Corporation, Mita Kokusai Bldg. 4-28 Mita 1-chome, Minato-ku Tokyo 108 Japan
National Marine Service Louisiana, Inc., 222 Bayou Rd., Belle Chasse, LA 70037
North American Marine Jet P.O Box 1232 Benton, AR 72015
Omnithruster Inc., 9515 Sorensen Ave., Santa Fe Springs, CA 90670
Penske GM Power, Inc., 600 Parsippany Road, Parsippany, NJ 07054
Inland Water Propulsion Systems, Inc., 580 Walnut St., Cincinnati, OH 45201
Propulsion Systems, Inc., 21213 76 Ave. So., Kent, WA 98032
Schottel of America, Inc., 8375 N.W. 56 St., Miami, FL 33166
Skinner Engine, Co., P.O. Box 1149, Erie PA 16512
Stewart & Stevenson Services, Inc., P.O. Box 1637, Houston, TX 77251-1637
Sulzer Brothers, Dept. Diesel Engines, CH-8401 Winterthur, Switzerland
Tech Development Inc., 6800 Poe Ave., P.O. Box 14557, Dayton, OH 45414
Transamerica DeLaval Inc., Engine & Compressor Div., 550 85th Ave., Oakland, CA 94621
Transamerica DeLaval, Inc., Turbine & Compressor Div., P.O. Box 8788, Trenton, NJ 08650
Ulstein Maritime Ltd., 6307 Laurel St., Burnaby, B.C. Canada V5B 3B3
Ulstein Trading Ltd. A/S, N-6-65, Ulsteinvik, Norway
J.M. Voith GmbH Dept. WErung, Postfach 1940 7920 Heidenheim/Brenz, West Germany
Voith Schneider America, 159 Great Neck Rd., Ste. 200, Great Neck, NY 11021
Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647
WABCO Fluid Power, an American-Standard Company, 1953 Mercer Rd., Lexington, KY 40505
Wartsila Power Inc., 5132 Taravella Rd., P.O. Box 868, Marrero, LA 70072
Waukesha Engine Division, Waukesha, WI 53187

PUMPS—Repairs—Drives
Allweiler Pump Inc., 5410 Newport Dr., Rolling Meadows, IL 60008 TX: 270-0444
Cat Pumps Corp., 1681 94th Lane NE, Minneapolis MN 55434
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DEL-MARINE
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
Jim's Pump Repair, 48-55 36th St., Long Island City, NY 11101
Meco (Mechanical Equipment Co., Inc.), 861 Carondelet Street, New Orleans, LA 70130
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238
Transamerica Delaval, Pyramid Pump Div., P.O. Box 447, Monroe, NC 28110
Vita Motivator Company, 200 West 20th St., New York, NY 10011
Warren Pumps Division, Bridges Avenue, Warren, MA 01083
Wilden Pump & Engineering Co., 22060 Van Buren St., P.O. Box 845, Colton, CA 92324

REFRIGERATION—Refrigerant Valves
Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, NY 11231
Grasso, Inc., 1101 N. Governor Street, P.O. Box 4799, Evansville, IN 47711-0799
United Technologies, carrier Transicold division, P.O. Box 4805, Syracuse, NY 13221

ROPE—Manila—Nylon—Hawsers—Fibers
A.L. Don Co., Foot of Dock St., Matawan, NJ 07747
Allied Fibers, 1411 Broadway, New York, NY 10018
Atlantic Cordage Corp., 60 Grant Avenue, Carteret, NJ 07008
DuPont Co., KEVLAR Aramid Fiber, Room G-15465, Wilmington, DE 19898
Tubbs Cordage Company, P.O. Box 709, Orange, CA 92666
Tubbs Cordage Co., P.O. Box 7986, San Francisco, CA 94120-7986
Vermeire N.V. Industripark Zwaarveld, B-9160 Hamme, Belgium TX: 21687

SANITATION DEVICES—Pollution Control
Davit Sales Inc., P.O. Box 232, Jefferson Valley, NY 10535
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
Fast Systems Inc., 1717 Sualette Ave., St. Louis MO 63110
Galar Metal A/S, P.O. Box 70, 4901 Tvedestrand, Norway

SCAFFOLDING EQUIPMENT—Work Platforms
McCausey Lumber Co., 7751 Lyndon, Detroit, MI 48238

SCUTTLES/MANHOLES
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

SHAFT SEALS, MECHANICAL PACKING
EG&G Sealol Engineered Prod. Div. Marine Products Group, Warwick, RI 02888
Garlock Inc., Mechanical Packing Div., 1666 Division St., Palmyra, NY 14522

SHIPBREAKING—Salvage
Fred Devine Diving & Salvage, Inc., 6211 N. Ensign, Swan Island, Portland, OR 97217
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201

SHIPBUILDING EQUIPMENT
Bardex Hydronautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA. 93116
M.A.N.—GHH Sterkrade Werfsrabe 112 D-4100 Duisburg 18, West Germany
Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, FL 33156
Total Transportation System Inc., 813 Forest Dr., Newport News, VA 23606
Total Transportation Systems (International) A/S, Bjornegarden, P.O. Box 248, N 5201, Os, Norway

SHIPBUILDING STEEL
Armco Steel Corp., 703 Curtis St., Middletown, OH 45042
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
High Strength QA Steel, P.O. Box 40606, Houston, Tx 77240-0606
Welded Beam Company, P.O. Box 280, Perry, OH 44081

SHIPBUILDING—Repairs, Maintenance, Drydocking
Arsenale Triestino-San Marco Shipyard, Trieste, Italy, U.S. Rep: Marine Technologies & Brokerage, 33 Rector St., New York, NY 10066
Astilleros Unidos De Veracruz, S.A. San Juan Ulua S/N, Apdo. Postal 647 Veracruz, Ver Mexico
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
Bardex Hydrenautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA 93116
Bath Iron Works Corp., 700 Washington St., Bath, ME 04530
Bay Shipbuilding Corp., 605 N. 3rd Ave., Sturgeon Bay, WI 54235
Bender Shipbuilding & Repair Co., Inc., P.O. Box 42, Mobile, AL 36601
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
Blohm & Voss AG, P.O. Box 100720, D-2000 Hamburg 1 (In US)-Blohm & Voss CO, Springfield, N.J.
Blount Marine Corp., P.O. Box 368, Warren, RI 02885
Boston Whaler Commercial Div., 1149 Hingham St., Rockland MA 02370
Brodosplit, Put Udarniku 19, P.O. Box 107, 58000 Split YUGOSLAVIA
Burrard Yarrows Corporation, P.O. Box 86099, North Vancouver, B.C., Canada
Cantieri Navali Riuniti, Via Cipro, 11, 16100 Geneva, Italy
Chesapeake Shipbuilding Inc., 710 Fitzwater St., Salisbury, MD 21801
Cityvarvet AB, Lindholmen, P.O. Box 2753, S-402 76 Goteborg SWEDEN
Conrad Industries, P.O. Box 790, Morgan City, LA 70380
Coast Iron & Machine Works, 5225-7th Street E., Tacoma, WA 98424
Curacao Drydock (U.S.A.) Inc., 26 Broadway, Suite 741, New York, NY 10004
Eastern Marine, Inc., P.O. Box 1009, Panama City, FL 32401
Gladding-Hearn Shipbuilding, Box D (1 Riverside Ave.), Somerset MA 02726
HBC Barge Co. Brownsville, PA 15417
Hitachi Zosen Corp., 1-1-1 Hitotsubashi, Chiyoda-ku, Tokyo 100, Japan
Hong Kong United Dockyards Ltd., P.O. Box 534, Kowloon Central Post Office, Kowloon, Hong Kong
Hyundai Mipo Dockyard Ltd., 456 Cheonha-Dong, Ulsan, KOREA
Industrial Marine Engineering Ltd., P.O. Box 172, Suva, Fiji
Jakobson Shipyard Inc., P.O. Box 329, Oyster Bay, NY 11771
Jeffboat Inc., Jeffersonville, Ind. 47130
Jered Brown Brothers, Inc., 56 S. Squirrel Rd., Auburn Hills, MI 48057
Keppel Shipyard Limited, 325 Telok Blangah Road, P.O. Box 2169, Singapore 0409
Koch Ellis Barge & Ship Service, P.O. Box 9130, Westwego, LA 70094
Paul Lindenau GmbH, & Co., Schiffswerft u. Maschinenfabrik, D-2300 Kiel-Friedrichsort, West Germany
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, WA 98134
M.A.N. GHH Sterkrade, P.O.B. 110240, D-4200 Oberhausen 11, West Germany
Main Iron Works, Inc., P.O. box 1918, Houma, LA 70361
Marathon LeTourneau Offshore, P.O. Box 61865, Houston, TX 77208
Marinette Maine Corporation, Marinette, WI 54143
Mitsubishi Heavy Industries, Ltd., 5-1, Marunochi 2-chome, Chiyoda-ku, Toyko, 100 Japan
MonArk Boat Co., P.O. Box 210, Monticello, AR 71655
Moran Shipping Agencies, 602 Sawyer, Suite 200, Houston, TX 77077
Moss Point Marine Inc., P.O. Box 1310, Escatawpa, MS 39552
National Marine Service (Shipyard Division), P.O. Box 38, Hartford, IL 62048
National Steel & Shipbuilding Corp., San Diego, CA 92112
Nautilus Surveys Inc., 10822 Sageleaf Lane, Houston, TX 77089
Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607
Nichols Brothers Boat Builders Inc., P.O. Box 580, 5400 S. Cameron Rd., Freeland, WA 98249
Pennsylvania Shipbuilding, P.O. Box 442, Chester, PA 19016
Port Allen Marine, P.O. Box 108, Port Allen, LA 70767
Promet (PTE) Ltd., 27 Pandam Rd., Jurong Industrial Estate, Singapore 22
Promet Marine Services Corp., 242 Allens Ave., Providence, RI 02905
Samsung Shipbuilding & Heavy Industries Co., Ltd., Samsung Main Bldg. 250, 2Ka, Taepyong-ro, Chung-ku, Seoul, Korea
Southwest Marine, Inc., P.O. Box 13308, San Diego, CA 92113
Tampa Shipyards Inc., P.O. Box 1277, Tampa, FL 33601
Thomas Marine, 37 Bransford St., Patchogue, NY 11772
Todd Shipyards Corp., 1 State St. Plaza, New York, NY 10004
Tracor Marine, P.O. Box 13107, Port Everglades, FL 33316
Verreault Navigation Inc., Les Mechins, Quebec, G0J 1T0
Walker Boat Yard, P.O. Box 729, Paducah, KY 42001
Waller Marine, Inc. 11777 Katy Freeway/Suite 395, Houston, TX
Westport Shipyard, Inc., P.O. Box 308, Westport, WA 98595
Zidell Explorations, Inc., 3121 S.W. Moody Street, Portland, OR 97201

SHIPPING—PACKING
Pilotage Consultants, Inc., P.O. Box 2046, New Hyde Park, NY 11040
Signet Corporation, 1800 West Loop South, Suite 1600, Houston, TX 77027

SIMULATOR TRAINING
Marine Safety International, Marine Air Terminal, LaGuardia Airport, NY 11371

SILENCERS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

STUFFING BOXES
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062

SURVEYORS AND CONSULTANTS
Advanced Technologies Dept. PZ-01, 7926 Jones Branch Dr., McLean, VA 22102
Frank Jeffrey & Assoc., 5201 Westbank Exp., Suite 206, Marrero, LA 70073

BUYERS DIRECTORY

This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER/Engineering News. A quick-reference readers' guide, it includes the names and addresses of the world's leading manufacturers and suppliers of all types of marine machinery, equipment, supplies and services. A listing is provided, at no cost for one year in all 20 issues, only to companies with continuing advertising programs in this publication, whether an advertisement appears in every issue or not. Because it is an editorial service, unpaid and not part of the advertisers contract, MR/EN assumes no responsibility for errors. **If you are interested in having your company listed in this Buyers Directory Section, contact John C. O'Malley at (212) 477-6700.**

AIR COMPRESSORS
Squire-Cogswell Company, 3411 Commercial Ave., Northbrook, IL 60062
AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION
Bailey Refrigeration Co., Inc, 2323 Randolph Avenue, Avenel, NJ 07001
Borg-Warner Air Conditioning, P.O. Box 1592-361C, York, PA 17405
Flakt AB, Box 8862, S-40272, Gothenburg, Sweden
Mechanical Resources Inc., 210 West Side Ave., Jersey City NJ 07305
Stal Refrigeration AB, Butangsgatan 16, S 601 87 Norrkoping, Sweden
United Technologies, Carrier Transicold Division, P.O. Box 4805, Syracuse NY 13221
ANCHORS AND CHAIN
Baldt Incorporated, P.O. Box 350, Chester, PA 19016
G.J. Wortelboer Jr. B.V., Eemhavenstraat 4, P.O. Box 5003, 3008 AA Rotterdam, Netherlands
ANODES—Cathodic Protection
Engelhard Industries Division, 2655 U.S. Route 22, Union, NJ 07083
Federal Harco, P.O. Box 40310, Houston, TX 77240
Thermal Reduction Company, 1 Pavilion Avenue, Riverside, NJ 08075
Wilson, Walton International, Inc., 66 Hudson St., Hoboken, NJ 07030
BALLASTS
Genstar Stone Products Co., Executive Plaza IV Hunt Valley, MD 21031
BASKET STRAINERS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130
BEARINGS—Rubber, Metallic, Non-Metallic
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn NY 11231
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, OH 44309
Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470
Thomson-Gordon Limited, 3225 Mainway, Burlington, Ontario, Canada L7M 1A6
Waukesha Bearings Corp., P.O. Box 798, Waukesha, WI 53186
BLASTING—Cleaning—Equipment
Clemco, P.O. Box 7680, San Francisco CA 94120
E.I. DuPont De Nemours & Co., Inc., Starblast Division, Room X39186, Wilmington, DE 19898
Inventive Machine Corp., P.O. Box 369, Bolivar, OH 44612
BOILERS
Aalborg Vaerft, P.O. Box 661, DK-9100 Aalborg DENMARK
Combustion Engineering, Inc., 1000 Prospect Hill Road, Windsor, CT 06095
Industrial Engineering & Equipment Co., 425 Hanley Industrial Ct., St. Louis, MO 63144
Boiler Tube Company of America, P.O. Drawer 517, Lyman, SC 29365
Murray Tube Works, P.O. Drawer 517, Lyman, SC 29365
Senior Green Economizers, P.O. Drawer 517, Lyman, SC 29365
BOILER CLEANING
Asea Stal, 50 Chestnut Ridge Rd., Montvail N.J. 07645
BROKERS
Capt. Astad Company, Inc., P.O. Box 53434, New Orleans, LA 70153
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
Jack Faulkner, Inc., 1005 W. Harimaw Ct., Metairie, LA 70001
Mowbray's Tug & Barge Sales Corp., 21 West St., New York, NY 10006
Western Maritime, 701 B Street, San Diego, CA 92101
BRONZES—COMMEMORATIVE
Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707
BUNKERING SERVICE
Belcher Company, Inc., 8700 West Flagler, P.O. Box 525500, Miami, FL 33152
Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022
National Marine Service Inc. (Transport Div.), 1750 Brentwood Blvd., St. Louis, MO 63144
CARGO HANDLING EQUIPMENT
MacGregor-Navire International, Box 8991, S-402 74 Goteborg, Sweden
MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016
CASTINGS/FORGINGS
NKS Industria Pesada, Grupo Industrial, Reforma 404, 140 Piso, Mexico, D.F. 06600 U.S. REP.—Lexington International Trading, Inc., 551 Fifth Ave., Room 910, New York N.Y. 10017
CLAMPS
Inter Product, Inc., Avon Street Business Center, P.O. Box 1848, Charlottesville, VA 22903
CLOSURES—Marine
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203
COMPUTERIZED INFORMATION SYSTEMS
TIMSCO, 622 Azalea Rd., Mobile, AL 36609
Veson Systems, 29 Broadway, Suite 1002, New York, NY 10006
CONDENSERS/SEPARATORS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130
Wright Austin Co., 3245 Wight St., Detroit MI 48207
CONTROL SYSTEMS—Monitoring
American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
ASEA, Inc., 4 New King St., White Plains, NY 10604
Bailey Controls, 29801 Euclid Avenue, Wickliffe, OH 44092
Barringer Research, 304 Carlingview Dr., Rexdale, Ontario, Canada M9W 5G2
Biospherics Inc., 4928 Wyaconda Rd., Rockville, MD 20852
Cooper Energy Services, Mount Vernon, OH 43050
Ergon, Inc., P.O. Drawer 1639, Jackson, MS 39205
Indikon Corp., 26 New St., Cambridge, MA 02138
Leslie Co., 401 Jefferson Rd., Parsippany, NJ 07054
Pandel Instruments Inc., 2100 N. Hwy. 360, Grand Praire, TX 75050
Propulsion Systems, Inc., 21213 76 Ave., Kent, WA 98032
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
Thomas Products Ltd., Flow Switch Div., 987 West St., Southington, CT 06489-1023
Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062
Valmet Automation A.S., P.O. Box 130, N-3430, Spikkestad, Norway
CRANES—HOISTS—DERRICKS—WHIRLEYS
Allied Marine Crane, P.O. Box 23026, Portland, OR 97233
Davit Sales, Inc., P.O. Box 232, Jefferson Valley, NY 10535
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
J.D. Neuhaus, Hebezeuge, D5810, Witten Heven, West Germany
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202
DECK MACHINERY—Cargo Handling Equipment
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, WA 98134
McElroy Machine & Mfg. Co., Inc., Lorraine Rd., Industrial Seaway, Gulfport, MS 39501
DECKING—GRATING
Alligned Fiber Composites, Highway 52, South Chatfield, MN 55923
International Grating, 7625 Parkhurst, Houston, TX 77028
Selby, Battersby & Company, 5220 Whiby Ave., Philadelphia, PA 19143
DIESEL ACCESSORIES—CYLINDER LINERS
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, MA 02360
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn NY 11231
Haynes Corporation, P.O. Box 179, Jackson, MI 49204
Illman Jones, 1111 Green Island Rd., American Canyon, CA 94589
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637
Transamerica Delaval Engine & Comp. Div., 550 85th, Oakland, CA
DIESEL ENGINE—Spare Parts & Repair
Alban Engine Power, Inc., 6455 Washington Blvd., Baltimore, MD 21227
Alco Power Inc., 100 Orchard St., Auburn, N.Y. 13021
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
Cummins Engine Co., Inc., Mail Code 40642, Box 3005 Columbus, IN 47202-3005
Goltens, 160 Van Brunt Street, Brooklyn, NY 11231
Granges Repair Service GMBH, Gutenbergring, 64 D-2000 Hamburg-Norderstedt TX:0215553
Markisches Werk GmbH, P.O. Box 1442, D-5884 Halver 1, Federal Republic of Germany
Schoonmaker Service Parts Co., Inc., P.O. Box 757, Foot of Spring St., Sausalito, CA 94966
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637
Sulzer Brothers Inc., 200 Park Ave., New York, N.Y. 10166
Transamerica Delaval Engine & Comp. Div., 550 85th, Oakland, CA
Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647
ELECTRICAL EQUIPMENT
Midland-Ross Corp., Russellstoll Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039
Newmar, P.O. Box 1306, Newport Beach, CA 92663
Sigmaform Corporation, P.O. Box 515, Richboro, PA 18954
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201
ELECTRONIC SYSTEMS
Marine Electric RPD, Inc., 666 Pacific St., Brooklyn, NY 11217 TX: 125327
EMULSIFICATION SYSTEMS
Sunbelt Energy Systems, Inc., Park Square, 2105 Park Ave., Suite 14, Orange Park, FL 32073
S/S Research & Development Inc., 1050 State St., Perth Amboy, NJ 08862
Todd Marine Systems, 61 Taylor Reed Place, Stamford, CT 06906
ENGINE TEST EQUIPMENT
General Thermodynamics Corp., P.O. Box 1105, 210 S. Meadow Road, Plymouth, MA 02360
EQUIPMENT—Marine
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94083
Band-It Division, Houdaille Industries, Inc., P.O. Box 16307, Denver, CO 80216
Beaver Tool Co., 1525 SE 29th St., Box 94717, Oklahoma City, OK 73143
Boston Metals Co., 313 E. Baltimore St., Baltimore, MD 21202
Thomas Coudon Associates, 6655 Amberton Dr., Baltimore, MD 21227
Daito Engineering Co., Ltd., 10-23 Kawaguchi, 3-chome, Nishi-ku, Osaka JAPAN
Genstar Stone Products Co., Executive Plaza IV, Hunt Valley, MD 21031
Hossfeld Manufacturing Co., P.O. Box 557, Winona MN 55987
Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon, NY 10550
Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302
Marketec, Inc., 27 Bowers Lane, Chatham NJ 07928
Nicolai Joffe, P.O. Box 5362, 9171 Wilshire Blvd., Beverly Hills, CA 90210
Raytheon Service Co., 100 Roesler Rd., Suite 103, Glen Burnie, MD
Waterman Supply Co., Inc., 2815 E. Anaheim Street, P.O. Box 596, Wilmington, CA 90748
EVAPORATORS
Alfa-Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Atlas-Danmark Marine & Offshore, Baltorpvej 154, KD-2750 Blleriup, Copenhagen DENMARK
Meco (Mechanical Equipment Co., Inc.), 861 Carondelet Street, New Orleans, LA 70130
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130
FANS—VENTILATORS—BLOWERS
Joy Manufacturing Company, 338 So. Broadway, New Philadelphia, OH 44663
Jon M. Liss Associates, Inc., 411 Borel Ave., P. O. Box 5554, San Mateo, CA 94402
FASTENERS
Action Threaded Products, Bridgeview IL 60455
Hardware Specialty Co., Ships Division, 48-75 36th St., Long Island City, NY 11101
FENDERING SYSTEMS—Dock & Vessel
InterTrade Industries, 15301 Transistor Lane, Huntington Beach, CA 92649
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Seaward International, Inc., 6269 Leesburg Ave., Falls Church, VA 22044
FILTERS
Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307
Parker Filter Division, 16810 Fulton County Road, #2, Metamora, OH 43530
FINANCING—Leasing
JMJ Marine Investors Corp., 1525 River Oaks Rd East, Marahan LA 70123
FIRE PROTECTION, DETECTION & ALARM SYSTEMS
Formica Corp., One Cyanamid Plaza, Wayne NJ 07470
Walter Kidde, Walter Kidde Dr., Wake Forest, NC 27586
FUEL OIL/ADDITIVES—Analysis & Combustion Testing
Ferrous Corporation, 910-108th N.E., P.O. Box 1764, Bellevue, WA 98009
McTigue Industries Inc., 1615 9th Ave., Bohemia, NY 11716
FURNITURE
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001
Comfort-Mate, Inc., 7988 NW 56th Street, Miami, FL 33166
GALLEY EQUIPMENT
Insinger Machine Co., 6245 State Rd., Philadelphia, PA 19135
GANGWAYS
Rampmaster Inc., 9825 Osceola Blvd., Vero Beach, FL 32960
HATCH & DECK COVERS—Chain Pipe
MacGregor-Navire Internatinal, Box 8991, S-402 74 Goteborg, Sweden
MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203
GAUGES
Oil Recovery Systems, Inc., 1420 Providence Hwy., Norwood, MA 02062
HEAT EXCHANGERS
Alfa-Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Industrial Engineering & Equipment Co., 425 Hanley Industrial Ct., St. Louis, MO 63144
Meco (Mechanical Equipment Co., Inc.), 861 Carondelet Street, New Orleans, LA 70130
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130
Vapor Corp., 6420 West Howard St., Chicago IL 60648
HULL CLEANING
Aurand 1270 Ellis Street, Cincinnati, OH 45223
Petroferm Marine, Route 2, Box 280, Amelia Island, FL 32034
Phosmarine Equipment, 21 Bd. de Paris, 13002, Marseille, France
Seaward Marine Service, Inc., 201 N. Union Street, Alexandria, VA 22314
Seaward Marine Service, Inc. 5409 Beamon Rd., Norfolk, VA 23513 TX: 710-881-1182
Seaward Marine Service, Inc. 424 West 8th Street, National City, CA 92050
Taylor Diving & Salvage Co. Inc., 701 Engineers Rd., Belle Chasse, LA 70037
HYDRAULICS
Aeroquip Corp., 1130 Maynard Road, Jackson, MI 49202
Bardex Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA. 93116
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Del Gavio Marine Hydraulics Inc., 207 W. Central Ave., Maywood, NJ 07607
Hydra-Dynamics, Inc., 2141 Greenwood Ave., Wilmette, IL 60091
Parker Hannifin Corporation, 17325 Euclid Avenue, Cleveland, OH 44112
Titeflex Corporation, P.O. Box 54, Springfield, MA 01109
Washington Chain & Supply, Inc., P.O. Box 3646, Seattle, WA 98124
INERT GAS
Saab Tank Control, One Harmon Plaza, Secaucus NJ 07094
INSULATION—Cloth, Fiberglass
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001
Duracote Corp., 350 North Diamond St., Ravenna, Ohio 44266
Superior Energies, Inc. P.O. Drawer 386, Groves, TX 72619
INSURANCE
Adams & Porter, 510 Bering Dr., Houston, TX 77057-1408
Adams & Porter, 1 World Trade Center, Suite 8433, New York, NY 10048
Wm. Keith Hargrove, Inc., 1300 Post Oak Blvd., Suite 2050, Houston, TX 77056
United States P&I Agency, Inc., 80 Maiden Lane, New York, NY 10038
JOINER—Watertight Doors—Paneling
Advanced Structures Corp., 235 W. Industry Ct., Deer Park, NY 11729
Astech, 3030 S. Red Hill Ave., Santa Ana, CA 92711
Bailey Distributors, Inc., 2323 Randolph Avenue, Avenel, NJ 07001
Masonite Commercial Division, Dover, OH 44622
Walz & Krenzer Inc., 725 Glen Cove Ave., P.O. Box 6, Glen Head NY 11545
KEEL COOLERS
R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
Carlisle & Finch, 4562 W. Mitchell Avenue, Cincinnati, OH 45232
Midland-Ross Corp., Russellstoll Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039
Perko Inc., P.O. Box 6400D, Miami, FL 33164
Phoenix Products Company, Inc., 4769 North 27th Street, Milwaukee, WI 53209
LINE BLINDS
American Piping Products Inc., Box 1056, New Hyde Park, NY 11040
Stacey/Fetterolf Corp., P.O. Box 103, Skippack, PA 19474
MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
A-C Brake Co., 308 E. College St., Louisville, KY
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DEL-MARINE
Jered Brown Brothers Inc., 1300 Coolidge, P.O. Box 2006, Troy, MI 48007
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94080
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
MINING
Rocky Mountain Energy, 10 Longspeake Dr., Box 2000, Broomfield, CO 80020
NAME PLATES—BRONZE—ALUMINUM
Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707
NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356
American Hydromath Inc., Box 2450, Danby-Pawlet Road, Pawlet, VT 05761
American Systems Engineering Corp., P.O. Box 4265, Virginia Beach, VA 23454
Ameritech Corporation, 7 Belver Avenue, Suite 215, N. Kingston, RI 02852
Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, MD 20015
Art Anderson Associates, 148 First St., Bremerton, WA 98310
B.C. Research, 3650 Wesbrook Mall, Vancouver, B.C. Canada V6S 2L2
Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130
C.D.I. Marine Co., 5520 Los Santos Way, Suite 600, Jacksonville, FL 32211
C.T. Marine, 18 Church Street, Georgetown, CT 06829
Century Engineering, inc., 32 West Rd., Towson, MD 21204
Childs Engineering Corp., Box 333, Medfield, MA 02052
Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, MA 02026
C.R. Cushing, 18 Vesey St., New York, NY 10007
Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
Designers & Planners, Inc., 1725 Jefferson Davis Highway, Suite 700, Arlington, VA 22202
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
Encon Management & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706
Engineering Visions, 1111 Bay Blvd., Chula Vista CA 92011
Capt. R.J. Fearson & Associates, P.O. Box 983, Tampa, FL 33601
Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington, NY 11050
Gibbs & Cox, Inc., 119 West 31st Street, New York, NY 10001
John W. Gilbert Associates, Inc., 66 Long Wharf, Boston, MA 02110
The Glosten Associates, Inc., 610 Colman Bldg., 811 First Ave., Seattle, WA 98104
Phillip Gresser Associates, Ltd., 3250 South Ocean Blvd., Palm Beach, FL 33480
Morris Guralnick Associates, Inc., 620 Folsom Street, Suite 300, San Francisco, CA 94107

Hamilton Cornell Associates, Box 188, Snug Harbor Station, Duxbury, MA 02331
J.J. Henry Co., Inc., 40 Exchange Place, New York, NY 10005
Hi-Test Laboratories, Inc., P.O. Box 226, Buckingham C.H., VA 23921
HydroComp, Inc., 10 Cutts Road, P.O. Box 865, Durham, NH 03824
Intramarine, Inc., P.O. Box 53043, Jacksonville FL 32201
JJH Inc. of Virginia, 330 County St, Portsmouth VA 23704
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
Jantzen Engineering Co., 6655-H Amberton Drive, Baltimore, MD 21227
James S. Krogen, 1515 NW 7th St., Suite 124, Miami FL 33125
Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
John J. McMullen Associates, Inc., 1 World Trade Center, New York, NY 10048
Fendall Marbury, 1933 Lincoln Drive, Annapolis, MD 21401
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, OH 44114
Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, NY 11746
Marine Power Associates, 1010 Turquois St., Ste 217, San Diego, CA 92109
Maritime Design, Inc., 2955 Hartley Rd., Jacksonville, FL 32217
George E. Meese, 194 Acton Rd., Annapolis, MD 21403
R. Carter Morrell, 715 S. Cherokee, Bartlesville, OK 74003
NKF Engineering Inc., 12200 Sunrise Valley Dr., Reston VA 22091
Nelson & Associates, Inc., 610 Northwest 183rd St., Miami, FL 33169
Nickum & Spaulding Associates, Inc., 2701 First Ave., Seattle, WA 98121
Northern Marine, P.O. Box 1169, Traverse City, MI 49685
Ocean-Oil Internatinal Engineering Corporation. 3019 Mercedes Blvd., New Orleans, LA 70114
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, FL 33156
Q.E.D. Systems Inc., 4646 Witchduck Rd., Virginia Beach, VA 23455
M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 667 Mission St., San Francisco, CA 94105
Sargent & Herkes Inc., 611 Gravier St., New Orleans, LA 70130
Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, FL 33316
SEACOR Systems Engineering Corp., 520 Fellowship Rd., Ste C306, Mt. Laurel NJ 08054
STV/Sanders & Thomas, Inc., 1745 Jefferson Davis Hwy., Arlington, VA 22202
Seaworthy Systems Inc., 28 Main St., Essex CT 06426; 17 Battery Pl., New York, NY 10004; P.O. Box 205, Solomons MD 20688; 2 Skyline Pl, 5203 Leesburg Pike, Falls Church VA 22041
Seaworthy Electrical Systems, 17 Battery Pl. N.Y. N.Y. 10004
George G. Sharp, Inc., 100 Church St., New York, NY 10007
Simmons Associates, P.O. Box 760, Sarasota, FL 33578
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
Thomas Coudon Associates, 6655 Amberton Drive, Baltimore, MD 21227
Timsco, 622 Azalea Road, Mobile, AL 36609
Tracor Hydronautics, Inc., 7210 Pindell School Rd., Laurel, MD 20707
Thomas B. Wilson, Associates, 1258 North Avalon Blvd., Wilmington, CA 90744

NAVIGATION & COMMUNICATIONS EQUIPMENT
Atkinson Dynamics, Section 6, 10 West Orange Ave., South San Francisco, CA 94080
COMSAT World Systems, 950 L'Enfant Plaza, S.W., Suite 6151 Washington, DC 20024
A/S Elektrisk Bureau, P.O. Box 98, N-1360 Nesbru, Norway
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
General Electric Company, Mobile Communications Division, Lynchburg, VA 24502
Harris Communications (RF Communications), 1680 University Avenue, Rochester, NY 14610
Henschel, 9 Hoyt Drive, Newburyport, MA 01950
Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631
ITT Mackay, 441 U.S. Highway #1, Elizabeth, NJ 07202
Kongsberg Vopenfabrikk, Norcontrol Division, P.O. Box 145, Horten 3191, Norway
Krupp Atlas-Elektronik, 1453 Pinewood St., Rohway, NJ 07065
Micrologic, 20801 Dearborn, Chatsworth, CA 91311
Naval Electronics, 5479 Jetport Industrial Blvd., Tampa FL 33614
Nav-Com, Inc., 9 Brandywine Drive, Deer Park, NY 11729
Navigation Sciences Inc., 6900 Wisconsin Ave., Bethesda, MD 20815 TX: 705999
Perko Inc. (Lights), P.O. Box 6400D, Miami, FL 33164
Racal Marine Inc., 1 Commerce Blvd., Palm Coast, FL 32037-0029
Radio-Holland USA, Inc., 6033 South Loop East, Houston, TX 77033
Raytheon Marine Co., 676 Island Pond Road, Manchester, NH 03103
Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914
Raytheon Service Co., 103 Roesler Rd., Glen Burnie, MD 21061
Robertson-Shipmate, 400 Oser Ave., Hauppauge NY 11788
S.P. Radio A/S, DK 9200 Aalborg, Denmark
SAIT Inc., 33 Rector St., New York, NY 10006
Simrad, 2208 NW Market St., Seattle WA 98107
Sperry Corporation, Rte 29 North, Charlottesville, VA 22906
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
Telesystems, 2700 Prosperity Ave., Fairfax, VA 22031 USA
Tracor Instruments Austin Inc., 6500 Tracor Lane, Austin, TX 78725

OILS—Marine—Additives
B P North America Petroleum, 555 US Route 1, So. Iselin, NJ 08830
Exxon Company, U.S.A., Room 2323 AH, P.O. Box 2180, Houston, TX 77701
Gulf Oil Company—U.S. (Domestic Oils), 909 Fannin Street, Houston, TX 77001
Gulf Oil, New York District Sales Office (Domestic), 433 Hackensack Avenue, Hackensack, NJ 07601
Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022
Mobil Oil Corp., 150 East 42 Street, New York, NY 10017
Texaco, Inc. (International Marine), 135 East 42nd St., New York, NY 10017

OILY WATER ALARMS/MONITORS
Biospherics, Inc., 4928 Wyaconda Road, Rockville, MD 20852

OIL/WATER SEPARATORS
Alfa Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ 07647
NALCO Chemical, Co., 2901 Butterfield Road, Oak Brook, IL 60521
Oil Recovery Systems, Inc., 1420 Providence Hwy., Norwood, MA 02062
Peck Purifier Sales Co., 3724 Cook Blvd., Chesapeake, VA 23323
Sigma Treatment System, Merry Meadows RD 1 Box 70, Chester Springs, Pa 19425

PAINTS—COATINGS—CORROSION CONTROL
American Abrasive Metals Co., 460 Coit St., Irvington NJ 07111
Ameron, 4700 Ramona Blvd., Monterey Park, CA 91754
Devoe Marine Coatings Co., P.O. Box 7600, Louisville, KY 40207
E.I. DuPont De Nemours & Co., Inc. Nemours Bldg., Rm. N-2504-2, Wilmington, DE 19898
DuPont Co. MPS , Room X40750, Wilmington, DE 19898
Esgard, Box 2698, Lafayette, LA 70502
Farboil Company, 8200 Fischer Rd., Baltimore, MD 21222
Hempel Marine Paints, Inc., Foot of Currie Ave., Wallington, NJ 07057; 6868 NorthLoop East, Suite 304, Houston, TX 77028; P.O. Box 10265. New Orleans, LA 70181
International Paint Company, Inc., 2270 Morris Avenue, Union, NJ 07083
Jaegle Paint Company, Inc., 1012 Darby Road, Havertown, PA 19083
Jotun Marine Coatings Inc., 175 Penrod Court N&O, Glen Burnie. MD 21061
Magnus Maritec International Inc., 150 Roosevelt Pl., P.O. Box 150, Palisades Park, NJ 07650
Products Research & Chemical Corp., 5454 San Fernando Rd.. Glendale. CA 91203
Selby Battersby & Co., 5220 Whitby Ave., Philadelphia, PA 19143

PIPE-HOSE—Cargo Transfer Clamps, Couplings, Coatings
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Ameron Fiberglass Pipe Division, P.O. Box 80148, Houston TX 77280
Deutsch Metal Components, 14800 S. Figueroa St., Gardena, CA 90248
Hydro-Craft Inc., 1821 Rochester Industrial Dr., Rochester, MI 48063
Knights Piping Inc., 5309 Industrial Rood, Pascagoula, MS 39567
Tioga Pipe Supply Co. Inc., 2450 Wheatsheaf La., P.O. Box 5997, Philadelphia, PA 19137

PLASTICS—Marine Applications
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PROPELLER POLISHING
Aquafacs Marine Technical Services, Pier One, Berth One, Boston MA 02128
Pacific Marine Services, P.O. Box 3400, Terminal Island, CA 90731

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Amarillo Gear Co., P.O. Box 1789, Amarillo, Texas 79105
Armco Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
Bergen Diesel Inc., 2110-10 Service Rd., Kenner, LA 70062
Boston Metals Co., 313 E. Baltimore St., Baltimore, MD 21202
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
Colt Industrres Inc. (Fairbanks Morse Engine Div.), 701 Lawton Avenue. Beloit. WI 53511
Columbian Bronze Corporation, 216 No. Main Street, Freeport, NY 11520
Combustion Engineering, Inc., Windsor, CT 06095
Coolidge-Stone Vickers, Inc., 56 Squirrel Rd., Auburn Hills, MI 48057
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340
Elliott Company, 1809 Sheridan Ave., Springfield, OH 45505
George Engine Company, Inc., Lafayette, LA
General Motors, Electro-Motive Division, LaGrange, IL 60525
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231
KHD Canada Inc., 180 Rue de Normandie, Boucherville, Quebec J4B 5S7, Canada
Lips Propellers, 3617 Koppens Way, Chesapeake, VA 23323
M.A.N. B&W Diesel, 2 Ostervej, DK-4960 Holeby, Denmark
MTU of North America, 10450 Corporate Dr., Sugarland, TX 77478
MWM-Murphy Diesel, 12 Greenway Plaza, Suite 1100, Houston, TX 77046
Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507
Mitsubishi International Corporation, Mita Kokusai Bldg. 4-28 Mita 1-chome, Minato-ku Tokyo 108 Japan
National Marine Service Louisiana, Inc., 222 Bayou Rd., Belle Chasse, LA 70037
North American Marine Jet P.O Box 1232 Benton, AR 72015
Omnithruster Inc., 9515 Sorensen Ave., Santa Fe Springs, CA 90670
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Propulsion Systems, Inc., 21213 76 Ave. So., Kent, WA 98032
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Skinner Engine, Co., P.O. Box 1149, Erie PA 16512
Stewart & Stevenson Services, Inc., P.O. Box 1637, Houston, TX 77251-1637
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Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647
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Cat Pumps Corp., 1681 94th Lane NE, Minneapolis MN 55434
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
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Jim's Pump Repair, 48-55 36th St., Long Island City, NY 11101
Meco (Mechanical Equipment Co., Inc.), 861 Carondelet Street, New Orleans, LA 70130
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238
Transamerica Delaval, Pyramid Pump Div., P.O. Box 447, Monroe, NC 28110
Vita Motivator Company, 200 West 20th St., New York, NY 10011
Warren Pumps Division, Bridges Avenue, Warren, MA 01083
Wilden Pump & Engineering Co., 22060 Van Buren St., P.O. Box 845, Colton, CA 92324

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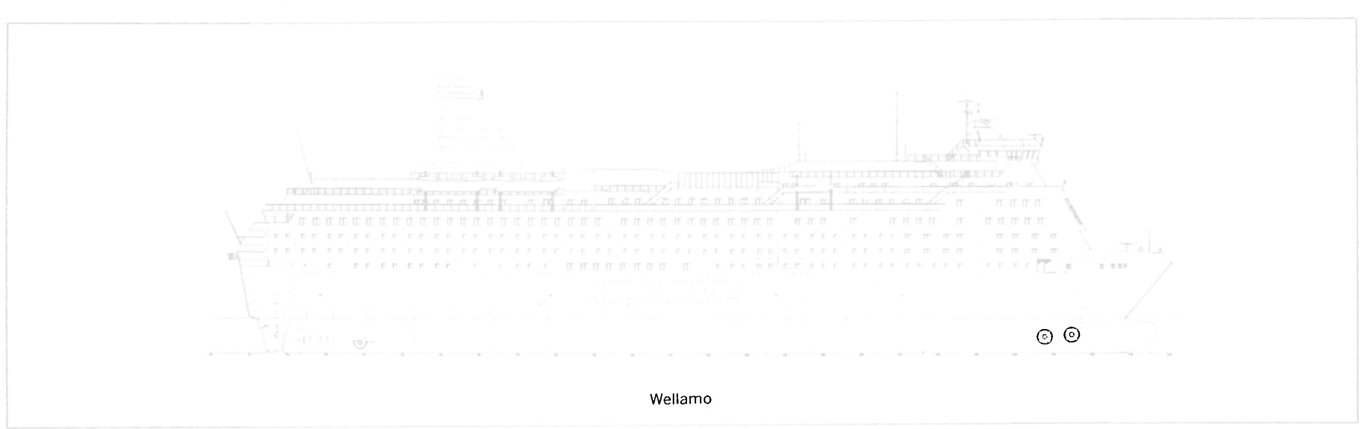

Wellamo

Wartsila Delivers Passenger/Vehicle Ferry To EFFOA-Finland Steamship

The 2,000-passenger cruise ferry Wellamo ordered by EFFOA-Finland Steamship Company Ltd., was delivered recently by Wartsila's Helsinki Shipyard. Before the new vessel left the shipyard for a short flag-changing cruise, she was christened by the Governor of the County of Turku and Pori, Mrs. **Pirkko Tyolajarvi.** The ferry is a sister ship to the Svea (MR/EN July 1, 1985) that was delivered in May last year to Oy Svea Line (Finland) Ab.

As the Wellamo will spend only about one hour in port, special attention was given to reducing the time required for unloading and loading the car decks, handling provisions and stores, and discharging waste ashore. As in the Svea, careful consideration has been given to the special requirements posed by the part of the route that goes through the sensitive archipelago environment.

The main machinery consists of four Wartsila/Pielstick 12PC2-6V medium-speed engines, each developing 8,975 bhp at 52 rpm, driving two controllable-pitch propellers of moderately skewed design via twin-input/single-output reduction gears. Auxiliary machinery includes four Wartsila Vasa 6R32 diesels, each developing 2,780 bhp at 750 rpm and connected to a 2,500-kva synchronous generator. Both main and auxiliary engines operate on heavy fuel oil.

Passenger accommodations comprise 566 cabins with beds for 1,625 people; these include 138 single cabins. All cabins have individual climate control and toilet/shower cubicles. All the restaurants are concentrated on Deck 7, and the passengers may choose between a la carte, cafeteria, smorgasbord, or gourmet style service. Bars and tax-free shops are situated on Deck 8, which also has a conference center for more than 400 persons.

All accommodation spaces are protected by a temperature alarm system, and the engine rooms by a Halon system. The car decks, which have a capacity for 350 automobiles or, as an alternative, 60 long-distance trucks and 40 cars, are fitted with a sprinkler system. Lifesaving appliances are provided on a basis of 30 percent in boats and 70 percent in life rafts. These comply with the latest IMO requirements.

Navigation equipment includes a magnetic compass, two gyrocompasses with repeaters, an autopilot, echo sounder, draft indicator, wind meter, two speed logs, radio direction finder, Decca Navigator, weather chart receiver, and comprehensive radar gear comprising four units and an Automatic Radar Plotting Aid (ARPA).

The Wellamo is registered in Finland and built according to the Finnish requirements for passenger vessels. She is designed to comply with the rules of Det norske Veritas, and is classed +1A1, Car Ferry A, EO, Finnish/Swedish Ice Class rules 1971, 1A Super, and fulfills the regulations of SOLAS 1974. The extent of the remote control and monitoring systems exceeds the DnV rules for unmanned machinery spaces.

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ELECTRICAL & ELECTRONIC Design Engineers, Marine OPEN

Resume: **McCUTCHAN RECRUITING, PO Box 19392, Seattle, WA 98109 206/282-5056**

DIRECTOR OF ESTIMATING (CHIEF ESTIMATOR)

Deep South shiprepairer/boatbuilder is seeking strong manager to direct Estimating Department. Applicants should have:

Minimum 5 years experience in estimating or planning preferably in marine field;
Good communication and managerial skills to organize, schedule, plan and direct the department;
Engineering or maritime academy degree preferred but not required;
Previous experience in supervising 6 or more employees.

This position reports to the CEO.

Send resume in confidence to:

Executive Department
Bender Shipbuilding & Repair Co., Inc.
P. O. Box 42
Mobile, AL 36601

Port Captain—Tugs

Sonat Marine, the nation's leading independent marine transporter of petroleum products, offers an immediate opportunity at our Eastern Fleet Center for a Port Captain with at least 4-6 years' wheelhouse and two years shoreside experience. Directly accountable for cost-efficient vessel operations and establishing productive communications with crews, USCG and customers. Position located in Philadelphia, PA, with approximately 35% travel.

Offering challenge and responsibility, the position requires experience in:

- **TUG/BARGE OPERATIONS**
- **MANAGEMENT BY OBJECTIVES**
- **BUDGETING AND EXPENSE CONTROL**
- **TRAINING AND DEVELOPMENT**
- **DAMAGE CONTROL/PREVENTION**

Desire a licensed Operator of Towing Vessels upon Oceans in Inland Waters possessing a BS degee in marine sciences.

Sonat Marine is proud to offer its employees relocation assistance and an outstanding benefits program including insurance, pension, profit sharing and stock plans. To explore this opportunity, send resume with salary history to:

SONAT MARINE
Three Parkway
14th Floor
Philadelphia, PA 19102

CANDIDATES WHO MEET OUR REQUIREMENTS WILL BE CONTACTED

Equal Opportunity Employer, M/F

PURCHASING EXECUTIVE

Rapidly growing marine firm is seeking a purchasing executive to join its team of professionals. This position has overall responsibility for the purchase of material and equipment required for the construction of ships for the U.S. Navy. Dollar volume of material is in excess of $40 Million.

Successful candidate will:

- **Have several years' experience at Senior levels in a purchasing function.**
- **Have knowledge of the marine field.**
- **Have experience in dealing with the U.S. Navy (military specifications).**
- **Have a proven ability to negotiate contracts of large dollar amounts.**
- **Have a proven track record of successful management of a purchasing department.**
- **Be a good communicator.**

This position offers an excellent salary and benefits package. Qualified candidates should forward their resumes and salary history to:

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Department F-34
Philadelphia, PA 19102

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NEW ORLEANS BASED DREDGING CONTRACTOR SEEKING HOPPER DREDGE MASTER. UNLIMITED LICENSE MANDATORY. 28 DAYS ON/OFF SCHEDULE WITH GOOD COMPANY BENEFITS. ONLY QUALIFIED APPLICANTS APPLY. SEND LICENSE AND RESUME TO:

BEAN DREDGING CORPORATION
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EQUAL OPPORTUNITY EMPLOYER
FEMALE/MALE

Marine Superintendent—manage and coordinate on-shore maritime activities for visiting Tall Ships and sail training vessels with ship husbanding, tides, local regulations and operations planning; serve as liaison between vessels' crews and port officials/shipping institutions; coordinate public relations and mass media coverage of events; supervise on-shore programs for trainees aboard visiting ships; serve as assistant to personnel aboard visiting ships regarding administration, illness etc. High school graduate with 5 years work experience as Marine Superintendent required. Experience with Tall Ships and Tall Ship events also required. References. 40 hours per week, $49,000 per annum. Send resumes to NYS Job Service J.O. #0602139, 344 Fulton Ave., Hempstead, NY 11550.

SALES DIRECTOR (Marine Construction) SEEKS POSITION

East Coast based Sales Director seeks position with greater challenge and faster growth.

27 years of marine experience, familiar with all aspects of marine construction and sales. Experienced with government contracts and proposal requirements. First hand experience in international business from development to completion. Excellent customer relations. Experienced in advertising and public relations.

Resume upon request.

MARITIME REPORTER
Box 116
118 East 25th Street,
New York, NY 10010

SENIOR MARINE ENGINEER

International Consulting Engineering company involved with sophisticated computer technology, Houston, Texas, seeks degreed Senior Marine Engineer. 10 plus years experience in shipbuilding, offshore structures, fabrication. Project and upper corporate management and EDP experience. Should possess an outgoing personality, decision making capability, and be client and sales oriented. $50,000 plus, based on experience and credentials. Excellent benefits, relocation package. Principals only. Send resume in strictest confidence to:

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THREE RIVERWAY
SUITE 1776
HOUSTON, TEXAS 77056

INDUSTRIAL SPECIALIST, GS-1150-11
$26,381-$34,292 PER ANNUM

The Supervisor of Shipbuilding, Conversion & Repair, USN, New Orleans has a vacancy for the above position which requires that the employee be familiar with all disciplines and outfitting efforts related to new construction. Employee must be able to evaluate schedules and performance, communicate both orally and in writing; organize and prioritize tasks pertaining to sea trials, guarantee period, and postdelivery industrial periods. Interested applicants should contact the Consolidated Civilian Personnel Office, New Orleans, Department of the Navy, New Orleans, LA 70142-5200 or call Ms. C. Ebberman at (504) 361-2560.

PORT ENGINEERS

American Systems Engineering Corporation has openings for experienced Port Engineers. Our Port Engineers maintain selected U. S. Navy ships in a Phased Maintenance Program.

Applicants should be degreed Marine Engineers holding USCG Engineer's License. U.S. citizenship is required.

Send resume and salary requirements to:

American Systems
Engineering Corporation
Box 8988
Virginia Beach, VA 23452

Superintendent Marine Engineer—To design and oversee maintenance and repair of marine powerplants, propulsion systems, heating and ventilating systems and other systems in three tankers. Applicant also will ensure compliance with applicable regulations and oversee and evaluate operation of equipment and safety of vessel. Must have experience with diesel engine propulsion systems. B.S. in Mechanical or Marine Engineering or Marine Engineering Technology and 6 years of experience required. $50,000.00 per annum. 40 hrs per wk. Send resume to: Job Service Technical Unit, Conn. Dept of Labor, 200 Folly Brook Blvd., Wethersfield, CT 06109. Refer to Job Order No. 0508520.

MARKETING/SALES MANAGER SEEKS POSITION

Manager, 20 years plus experience within maritime industry. Strong contacts with Naval Government Staff and Facilities, Port Authorities, Shipyards and commercial accounts. Presently residing in Washington D.C. area.

Willing to travel. Resume on request.

Reply to Box 101 **Maritime Reporter**
118 East 25th St. **New York, NY 10010**

FOR SALE

FOUR SINGLE SCREW TUG BOATS

MORANIA OIL TANKER, CORP.
STATEN ISLAND, N.Y.
718-442-0700

1. Morania No. 24
   ALCO 16-251-B, Built 1964, ABS loadline, 2-60kw Gen. sets, Towing winch. Length: 99.5, G.T. 196 Radar, SSB, Loran C,2VHF Autopilot, Fathometer.

2. Morania No. 12
   EMD 16-645-CE2, Built 1957, 1 Shaft generator, 1 60 kw Gen., length 89', GT: 147 Retractable pilothouse. Overhauled 1985, VHF, Radar, Gyro, Autopilot.

3. Morania No. 8
   EMD 12-645-CE2, Built 1957, 1 shaft generator, 1-25 KW Gen., length 89', GT 146, Retractable pilothouse. Overhauled 1985, VHF, Radar, Gyro Autopilot.

4. Morania No. 9
   Cleveland Diesel 12-278A, Built 1951, 1-Shaft generator, 1-30 KW Gen., length 82', GT. 138. Retractable pilothouse. VHF, Radar, Gyro, Autopilot.

Mt. Hope & Narragansett Bays
DOCKING & COASTAL TOWING
All Diesel Fleet
PROVIDENCE STEAMBOAT COMPANY
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401-331-1930

NOTICE OF
UNITED STATES MARSHAL'S SALE
Multipurpose Offshore Maintenance and Diving Support Vessel
m.v. "TZIMIN" ex "STENA SEAHORSE"

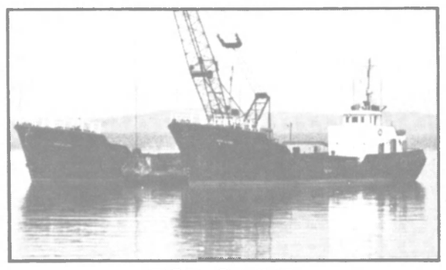
Vessel built 1976 in Norway and converted to diving support vessel 1980 in West Germany.

Pursuant to an order issued out of the United States District Court for the Southern District of Alabama, Southern Division, Mobile, Alabama on December 30th, 1985, the United States Marshal will sell to the highest bidder, for cash, at public auction, at Twelve (12:00) o'clock Noon, Central Standard Time, on March 12, 1986, in front of the Federal Building, U.S. Court House, corner of St. Louis and St. Joseph Streets, Mobile, Alabama, the m.v. "Tzimin" her engines, hull, tackle, equipment and appurtenances, etc., and all other necessaries thereunto belonging and appertaining, said vessel at present being under seizure by the United States Marshal and laying afloat at the docks of Bender Shipbuilding and Repair Co., Inc., Water Street, Mobile, Alabama, 36602.

Terms: The successful and highest bidder for the vessel at said sale shall, on the date of the sale and within the time allowed by the United States Marshal, deposit with the United States Marshal at least ten percent (10%) of the amount bid for the vessel, said deposit to be either by cash or by cashier's check or certified check drawn on a Mobile bank. The balance of the purchase price shall be paid on or within 24 hours of the confirmation of said sale, and the balance likewise shall be paid in cash or by cashier's check or certified check drawn on a Mobile bank. If the successful bidder should fail to pay into the Court the full balance of the purchase price due on or within 24 hours of the confirmation of said sale, the deposit shall be forfeited to be treated as additional proceeds of the sale. The vessel and her engines, hull, tackle, equipment and appurtenances, etc., and all other necessaries thereunto belonging and appertaining will be sold "as is, where is" and free and clear of any and all liens and encumbrances.

For further information or to arrange to inspect the vessel, please contact the court-appointed brokers, W.P. Sauer Company, 19940 Mona Road, Tequesta, Florida, 33469, U.S.A., tel: 305-746-7744, telex: 6815164 SAUER.

W.P. SAUER COMPANY
SHIPBROKERS FOR
THE UNITED STATES MARSHAL
UNITED STATES DISTRICT COURT FOR THE
SOUTHERN DISTRICT OF ALABAMA
SOUTHERN DIVISION



FOR SALE
TWO MOTORIZED DUMP SCOWS

Specifications:

LOA	38.4m
Beam	8.1m
Draft	4.3m
Bottom Dump Hopper Capacity	300.0m³

Miscellaneous:
Two GM Diesel V-12 Mod 71,350 HP
Twin Screw — Speed 9 Knots
Bow Thruster
Hercules Diesel Generator 25Kw 110-220 VAC
Radar and 2 VHF radio Telephones

Located:
Notre Dame de Pierreville, Quebec

Last Survey:
June 1984 by A. Stuart Inc., Marine Surveyors.

Contact:
Bernard Prevost, Canamont Construction Inc., 2045 Stanley St., Montreal, Quebec, H3A 2V4
Telephone: **(514) 842-2581** Telex: **0525621**

Can be inspected by appointment

FOR SALE

TWO IDENTICAL 70' x 28' x 10' PUSHBOAT HULLS BLASTED & PRIMED. LOCATED ON BUILDING WAYS—HWY 24, BOURG, LA FOR COMPLETE DESCRIPTION INCLUDING PHOTOS WRITE OR TELEPHONE (COLLECT):
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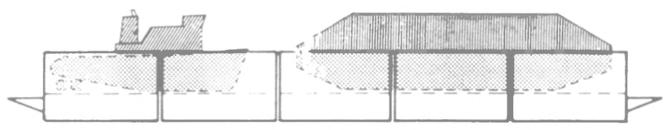
P.O. BOX 50867
NEW ORLEANS, LA 70150
PHONE: 504/529-2761

DRYDOCK FOR SALE

Length over keel blocks: 458 feet (139.6 meters).

Depth over keel blocks: 28 feet (8.5 meters).



Lift capacity: 9,000 long tons (9,144 metric tons).

Length overall: 514 feet (156.7 meters).

Clear width: 92.7 feet (28.3 meters).

Sectional pontoon design enables each of its five sections to operate independently. The dock is used primarily for tugs, barges, dredges, and small- to medium-sized vessels. Recent survey, located in U.S. Price negotiable. Contact:

John C. O'Malley
Telephone: 212/477-6700 Telex: 424768 MARINTI
Box 1202, **MARITIME REPORTER**/Engineering News
118 East 25th Street, New York, NY 10010

Marine Industries Appointed Distributor Of Thordon Products In Ohio Valley Region

Marine Industries Corporation, Utica, Ind., has been appointed as exclusive stocking distributor for Thordon marine bearings and industrial products in the states of Tennessee, Kentucky, Missouri, S. Ohio, S. Indiana, and W. Illinois, including the Quad Cities area.

M.I.C. is a specialist marine supplier for the Midwest inland waterways region of the U.S.

Thordon synthetic polymer-alloy marine bearings are manufactured by Thomson-Gordon Limited, Burlington, Ontario, Canada, and are marketed all over the world.

For further information on Thordon products,

Circle 76 on Reader Service Card

MarAd Awards $638,000 Contract To Stevens Technical Services

The Maritime Administration has awarded a $638,000 contract to Stevens Technical Services, Inc. of Brooklyn, N.Y. for maintenance and repairs to the Empire State, the school ship of the State University of New York Maritime College at Fort Schuyler, N.Y.

The work includes repairs required under regulations of the U.S. Coast Guard and the American Bureau of Shipping. It will be performed at the ship's berth at the Fort Schuyler pier and is expected to be completed in 54 working days.

MARINE EQUIPMENT FOR USE ASHORE OR AT SEA!

750 KW A.C. TURBO GENERATORS

Ex-USN — GEI-16846 — type FN3-FN24 — seven stage — 10033 RPM — typical serial # 49351 or 61718. Single helix reduction gear — 10033-1200 RPM — type S-187 GENERATOR 750 KW — 6-pole 0.8 P.F. — 450/3/60 1200 EXCITER 10 KW — 120 volts. Steam inlet flange 2'.'' — exhaust 17 .-'' X 25 .-'' rectangular. Overload 25% 2 hours. Units can be upgraded to 1250 KW for USN applications. Complete with throttles, etc. 8 Available

1500 KW TURBO GENERATOR SET

11-Stage turbine — FN4 - 8145 RPM — 3 .'' steam — 525# — 825' TT GEARS 195-8145-1200 RPM GENERATOR 1500 KW — 450/3/60-1200 RPM — 2405 amps — 0.8 P.F. EXCITATION 13.2 KW — 120 volts DC. Weight 36,000 lbs — exhaust flange 18" X 38"

L.P. 450KW A.C. TURBO GENERATORS

Suitable for waste heat turbo generators on motor ships

175 PSIG — D&S — 27 .'' vacuum GENERATOR Westinghouse 450KW — 563KVA — 450 3/60 — 1200 RPM GEAR 6097/1200 RPM TURBINE 175 lbs/D&S—27 .'' vacuum. Other pressures & temps 250# @ 40 C—27 .'' vacuum. Turbine serial #7801-7802 OAL 13' 1-3/16''—OAH 5'—OAW 5 .-'' Total dry wt 17,100 lbs. Plans on request.

TURBINES/ROTORS REDUCTION GEARS

ROTORS: DRV-618M-73 — 700 KW — 10938/1200 RPM — GEI 90755 — 850#. DIAPHRAGMS: Labyrinth — bearings GEAR S-432 — Form B — 10938/120

G.E. ROTORS: 600KW — 700KW — 618M — 6-stage — 10022 RPM — G.E.I. 34822. GEAR: S-277A — 10022/1200 RPM — MARAD units.

G.E. ROTOR: DRV-318 — MRI non-condensing — 10938/1200 — 24 lbs.

DeLAVAL TURBO GENERATOR SETS: ROTOR 7-stage class CD — 5910 RPM. REDUCTION GEAR type KD — 5910/1200 — double helical. Newport News hulls 499-504. Some Sparrows Point hulls.
DeLAVAL 1000 KW TURBO GENERATOR SET ROTOR 1442 HP — Class G.J.N. — 10009 RPM — 9-stage

TURBO GENERATORS, ROTORS, GEARS 1000 KW G.E. Ships Service TURBO GENERATOR

CC Rotation facing rotor coupling. TURBINE 7-Stage — 1048 BHP — 1033 RPM — steam 410#g — 725° TT — 3" steam inlet. REDUCTION GEARS: 1033/1200. GENERATOR: 1000 KW — 450 volts — 3-phase 60 cycle. EXCITATION: Amplidyne. Total weight 24,000 lbs. OAL 13 ft. — OAH 7'10" — OAW 6'¾" — exhaust 18" x 20" rectangular. Steam consumption 100% — 8640 lbs/hr. USN Tenders JASON, YOSEMITE AD19, SIERRA AD18, GRAND CANYON AD28, TIDEWATER AD31

WILL SELL ROTOR SEPARATELY

UNUSED FARRELL-BIRMINGHAM MAIN PROPULSION REDUCTION GEAR

Single reduction 1.81:1. Will handle up to 3200 HP input at 402 RPM. Complete with hydraulic coupling

PORT GEAR ONLY

700 GPM @ 150 PSI NEW EX-USN DE LAVAL MOTOR DRIVEN ROTARY HORIZONTAL PUMPS WITH 4-SPEED 440/3/60 MOTOR AND CONTROLLER

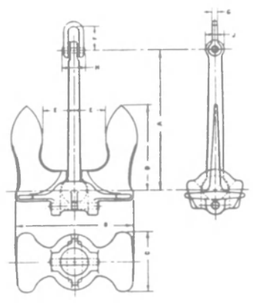
Inlet 8" — outlet 6". Powered by 4-speed 440/3/60 motor — 100/75/50/37.5 HP — 1200/900/600/350 RPM — with Cutler-Hammer control. Wt 10,000 lbs. Inquire for complete details.

NEW U.S. MARAD-TYPE AXIAL FLOW FANS

(1) 10,500 CFM Model AF-100 — BALDOR 5 HP motor — 440/3/60 — 40° — 1750 RPM — 7 amps

(1) 40,665 CFM — size 43AF - 60 HP BALDOR motor 440/3/60 — 1760 RPM — 75 amps — 50° rise — Frame 364TZ Ins. F

NEW — UNUSED — LARGE BALDT TYPE ANCHORS



ALMON JOHNSON CONSTANT TENSION LST STERN ANCHOR WINCHES WITH ALL CONTROLS

Drum capacity 900' of 1 .-'' wire. Gypsy performance 12,000 lbs @ 125 FPM. OAL 12' CAW 10'1''. Driven by 50 HP 230 VDC 181 amp motor. 2 Available with controls

WEST COAST LOCATION

PERFORMANCE

Max. Control	Auto. Tension Control	
100,000 lbs	26,000 lbs	3000 lbs
10 FPM	Stall	400 FPM

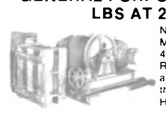
50HP VARIABLE SPEED ELECTRO-HYDRAULIC CARGO WINCH

Made by Lakeshore. DUTY 7400 lbs SLP — 220 FPM — drum size 24 .' diameter — 15" wide. Complete with ratchet & pawl. CAPACITY 600' of wire. MOTOR 50 HP — 440 volts — 66.3 amps — 3-phase 60 cycle — squirrel cage — 1200 RPM constant — Frame CC-445-N

UNUSED STEAM WINCH FOR MOORING & CARGO SERVICES

With Morse controls. 8 .-x10 10,000 lb line pull — 225 FPM — declutchable gypsy — hand compression brake

GENERAL PURPOSE WINCH 3500 LBS AT 200 FPM



New — Unused — Ex-USN A.C. Motor drive — 25.12.5 HP — GE 440.3.60 — 40.C. AB — 1750 RPM — Type KR — full load amps 32. Motor drives winch through Falk reduction gear. Has compression hand brake

LARGE STEAM TOWING ENGINE 9X10 TWIN ENGINE DRIVE

Air or Steam — 125-250 PSI

Heavy duty Clyde with 36" diam. X 51" Face single drum. Flanges 68". CAPACITY up to 2800' of 2" wire rope. Normal line pull 40,000 lbs @ 50 FPM. Steam or air pressure required 125 to 250 PSI. Can be adapted to electric drive or increased steam or air pressure to a capacity of 82,000 lbs @ 20 FPM. Pawl holds 270,000 lb pull from any layer. Equipped with level wind device. Approx wt 30,000 lbs. DIMENSIONS: 12'6" wide — 6'6" high. Write for details. ALSO AVAILABLE: Large towing ring — 36" diameter

SMALL 4 X 6 WINCH

STEAM OR AIR

DRUM 20" Diameter X 23" width — 8" flange. Rated 2000# 90 FPM on 3rd layer of rope. 125# Steam or 3500 @ 90 FPM 150 PSI steam. 13,000 lb static load. Fitted with ratchet & pawl so drum can be locked in off and on position

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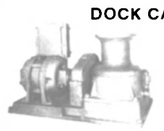

Spool 10" diam. X 4" — 15 HP — 220/440/3/60. 10,000 lbs @ 40 FPM. 48" Long — 32" wide — — 28" high

WORTHINGTON 16" X 14" X 18" VERTICAL DUPLEX STRIPPING PUMP

1400 GPM @ 110PSI — suction lift 11.5 ft. — steam back pressure 15 lbs. 14" Suction — 10" discharge — 2 .'' steam — 4" exhaust. Overall width 6'8" — overall height 9'1 .'' — depth 3'9 .'' Wt. approx 10,000. Reconditioned 1980 ABS — ready to go

CLYDE PILE-DRIVING DECLUTCHABLE WINCH WITH FOOT BRAKE Like New Condition With Control

Serial 23497. 7000 lbs @ 50 FPM — 1 layer of cable. MOTOR: 15 HP — 208 volts — 42.3 amps — 52° C rise — frame 286 — U.D. — 30-minute duty — mfg by Reliance. Code E — 1D-YD1 300

CAPSTAN

Mfg by N.E. Trawler. 5000 lbs @ 20 FPM — 2500 lbs @ 40 FPM. MOTOR: 5 HP 440/3/60 — with control. DIMENSIONS: Base 26"x26½" — capstan barrel 12" diameter — total height 31". Stainless steel control box cover.

NEW BUFFALO 100 GPM CIRCULATORS

Bronze — 25 lbs or 56 ft. head. 3½" Suction — 2½" discharge. Flanged. 3 HP 440 volt AC 3500 RPM motor with magnetic starter.

NEW — UNUSED DAVIDSON BRONZE CIRCULATION PUMP

Type AONSIE — distiller — fresh water. NAVSHIPS 347-3269. Single stage — close coupled — 25 GPM — 75 lbs. — 3500 RPM — 1¼"x1 — Wt 162 lbs — OAW 13¼"x22¾"

U.S. NAVY FANS

25000 CFM — A25A4W6 — 42 .'' ID — 52" high — 25/14 HP — 440/3/60 — 1200/900 RPM — 36/24 amps. 4 Available

3000 CFM — A3A4W6 — 21¼" ID — 29 .'' high — 3 HP — 1150/1750 RPM. Mfg. by Joy

5000 CFM — A5A4W6 — 23¼" ID — 29 .'' high — 4 HP — 1150/1750 RPM. Mfg. by Joy

WORTHINGTON 300 GPM CENTRIFUGAL 150 LB HEAD FIRE PUMP

No. 1223620 — 3550 RPM — 5½" suction — 4 .'' discharge. Impeller diam. 10½" — test pressure 225 lbs. MOTOR G.E. model 15K1405Y — 60 HP — 400/60/3 — Frame 405 — Type K-72 — 3550 RPM

MATCHED PAIR 900 HP GM 12-567A DIESELS W/ FALK REVERSE & REDUCTION GEARS

ENGINE: GM 12-567A 8 .- x 10 2-cycle V-type - 747 RPM - electric starting. GEAR: Falk Auti+x reverse & reduction — 2.48:1 forward — 2.52:1 reverse. From USN LST

LOUIS-ALLIS M.G. SETS

2.5 KW 120 volt single phase 60 cycle output. 230 volts DC input — 1800 RPM. NEW — UNUSED — EX U.S. NAVY

TANKER EXPANSION TRUNK

36" Diameter — 26" coaming — 7-dog drop bolts. Drawing #26/36.

TANK TOP COVERS

15" x 23" — 24¾" Stainless steel bolts

SEAGOING BARGE QUICK ACTING 4-DOG HATCHES

Heavily constructed. Handwheel operated, with handwheels top & bottom. Size A: 27" x 21" w/12" coaming. Size B: 31" x 31" w/12". For ocean-going barges, etc.

25" ROUND HATCH

25" Diameter with 18" coaming. 4-Dog handwheel top and bottom. Quick-acting dogs. 11mm x 12mm steel.

WATERTIGHT DOORS QUICK ACTING RIGHT AND LEFT HAND

WHEEL OPERATED

26" x 48"
26" x 60"

LEVER OPERATED

26" x 66"

CARGO PUMP TURBINES AND REDUCTION GEARS

G.E. CARGO PUMP TURBINE

Model 7TDPY125MR82 — 700 HP — 6002 RPM. Inlet pressure 775/835 psig. Outlet 530° — exhaust pressure 17.9. Rotation CC facing turbine coupling — 6" steam inlet — 10" exhaust.

G.E. REDUCTION GEARS

700 HP — type S-233 — Form A.E. — 6002/1885.

CARGO PUMP TURBINE

Type 7TDPY125MR93 — 340 HP — 5000 RPM — 775/835 psig — exhaust pressure 53 psig-temp 530°.

ALSO:

7TDPY-120MR41 — 1775 RPM — exhaust pressure 45 psig
7TDPY-125MR50 — 5002 RPM — exhaust pressure 45 psig

The BOSTON METALS Co.

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NEW

U.S. NAVY SHIP PROCUREMENT

A Thoroughly Professional Assessment Of The Future $40 Billion Annual Navy Market For Ships, Ship Systems, System Integration And Engineering Services

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- Market Drivers
- Impact of Technology
- Important Issues

II. INDUSTRY STRUCTURE
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- Contract Operators
- Summary of Recent Work Distribution

III. PROJECTED MARKET
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- Projected Geographical Impact
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- Recent Variants in Navy Procurement

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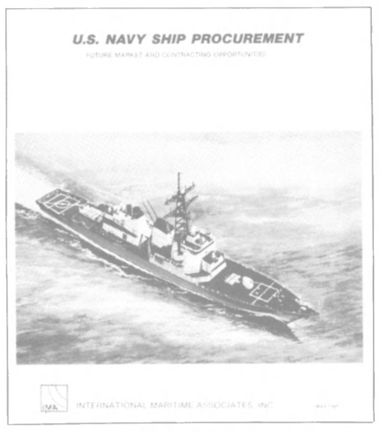
- Breakdown of Major Components by Manufacturer and Recent Ship Class
- Engineering Services and Design Contracts Awarded by NAVSEA and NAVELEX in FY 1984
- Detailed Projection of Navy Procurement and Research Budgets for FY 1986 and 1987



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PRICE: $480.00 INCLUDING FOUR UPDATES

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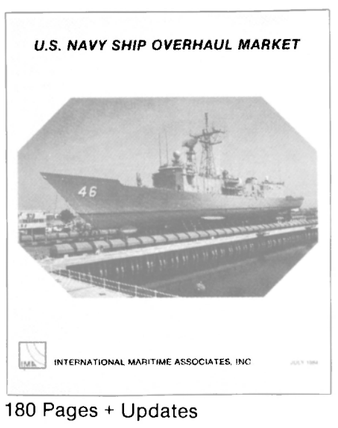
A Thoroughly Professional Assessment Of The Future $6.8 Billion Annual Market For Navy Ship Maintenance, Repair And Alteration

Updated Thru December 1985



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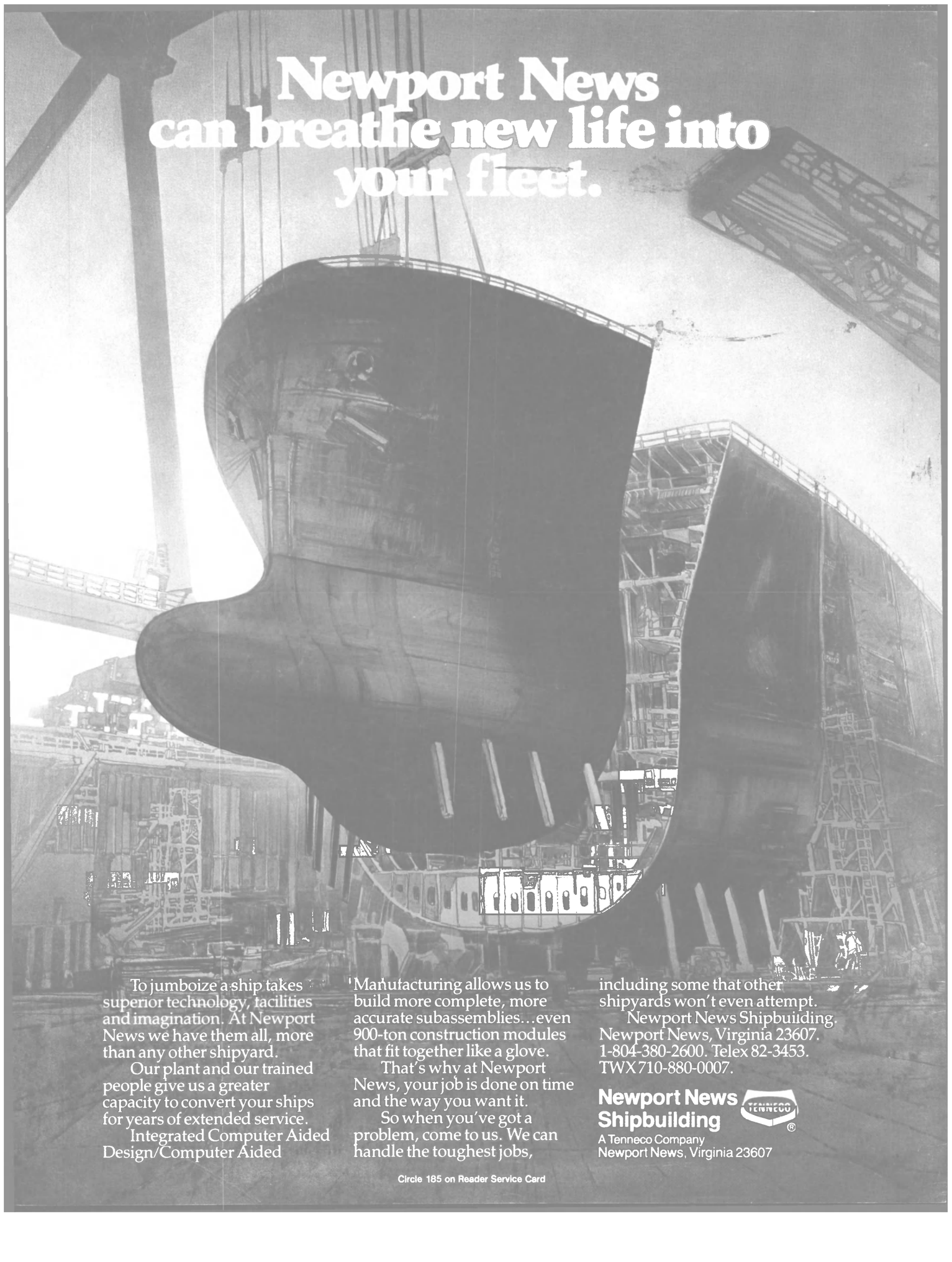

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