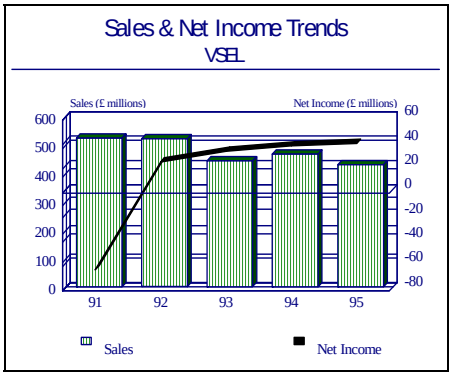
VSEL plc - Archived 12/97

Outlook

- The company's outlook has been brightened considerably through its acquisition by GEC.
- The GEC merger with VSEL has combined the two of the largest warship manufacturers in the United Kingdom.
- The merger has given the Royal Navy virtually one-stop shopping for all of its warship needs.



Headquarters

VSEL plc
Barrow-in-Furness
Cumbria LA 14 1AF
United Kingdom
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Established in 1871, Vickers Shipbuilding and Engineering Limited (VSEL) is one of Great Britain's largest warship builders. Having built England's first submarine in 1866, just before the company's official establishment, VSEL has grown into the sole supplier of nuclear-powered submarines for the Royal Navy. Through the use of computer-aided technology, VSEL has become a high-technology warship builder offering total "through-life support" for all the ships and submarines it builds — a vital element in achieving customer confidence. In addition to VSEL's warship-building capability, the company manufactures artillery systems that are used throughout the world on both land and sea.

VSEL consists of two divisions: Shipbuilding and Engineering. These two divisions, along with Cammell Laird Shipbuilders, continue to design, develop and construct submarines, warships, armaments and combat systems for both indigenous and export markets. In addition, VSEL also manufactures high-quality, specialist engineering products to order. VSEL has begun to diversify away from its primarily defense-oriented operations and seek work in the commercial sector. Although warship construction may continue to be the bread and butter of the company, the move into nondefense areas is a survival strategy aimed at preserving the company in the future.

In October 1994, following British Aerospace's estimated £500 million bid for shipmaker VSEL, GEC offered a counterbid of £532 million for the operation. Both offers were referred to Britain's Monopolies and Mergers Commission, which froze action until mid-1995. The commission decided to allow the both offers and BAe subsequently dropped out of the bidding, clearing the way for the GEC to acquire the company. VSEL is now a part of GEC Marine.

During 1996, the company employed approximately 5,954 people, down significantly from the 16,610 employed in 1990. The company's auditors are KPMG Peat Marwick.

Structure and Personnel

Prior to merger with GEC, VSEL's board of directors consisted of the following:

The Rt Hon The Lord Chalfont

Chairman of the Board
A.W.P. Stenham
Deputy Chairman
C. Noel Davies
Chief Executive
R.D. Holden
Finance Director
Anthony C. Peak
Joint Deputy Chief Executive
Professor J. E. Ffowcs Williams
Non Executive
A. Hugh Pope
Non Executive
M. Day
Company Secretary

Product Area

VSEL's products include warships, submarines, artillery systems, combat systems and specialist engineering products. VSEL conducts its businesses in the following manner.

VSEL

1. Shipbuilding Group
1.1 Nuclear-powered submarines
1.2 Diesel-electric powered submarines
2. Engineering Group
2.1 Armaments Division
2.2 Manufacturing Division
3. Business Development Group
3.1 Offshore Division
3.1.1 Sealand Industries
4. Product Support Division

Shipbuilding Group. The company's shipyard at Barrow-in-Furness is the only site in the United Kingdom presently licensed and equipped to commission nuclear powerplants for submarines. All the UK's nuclear-powered submarines have been built at the company's Barrow or Birkenhead shipyards, starting with the HMS Dreadnought which was commissioned in 1960. The key objectives of this division are to develop its capability as a prime contractor and to begin expansion into commercial shipbuilding. Programs with which this division has been involved include: Vanguard Class nuclear-powered submarines; Type 2400 Upholder Class diesel-electric submarines; SSN 20 W Class nuclear-powered submarines; Trafalgar Class nuclear-powered submar- ines; Type 42 Destroyers; and Invincible Class ships ASW (aircraft carriers).

Engineering Group. Most of the capacity of the Engineering Group has, for a number of years, been utilized in support of VSEL's shipbuilding activities. Through the Manufacturing Division, the group pro duces high-quality machined parts and assemblies, Trident missile tubes, quality gearing and copper-nickel and nickel-aluminum-bronze castings. These exemplify the wide range of technologically advanced skills available in this particular division. The Engineering Products Division is currently looking into expanding into nonmilitary markets which require the division's particular skills. One of the objectives of the division is to build upon the benefits already obtained from the recent modernization of the division's light and medium engineering facilities designed to improve competitive performance and increase production. Products include: Trident missile tubes; high-quality machined parts; castings; and gears.

Armaments Division. This division operates in the international defense market as a systems house, which undertakes research, system effectiveness studies, conceptual and detailed design, the procurement of manufactured and proprietary components, system integration and through-life product support. The division's products and services include artillery, naval guns and missile launchers, military vehicles, underwater weapon systems, long-range ammunition, and product support. This division is actively pursuing a number of opportunities including the development of AS90 vehicle variants for other applications, such as armored repair and recovery vehicles and a mine-dispensing vehicle. Products include: Artillery System 90 155-mm self-propelled howitzer; FH 155-1 (FH-70) 155-mm howitzer; Ultra-lightweight 155-mm howitzer; 4.5-inch/Mk 8 naval gun; military vehicles; and underwater weapons systems.

Business Development Group. This group is in charge of handling VSEL's diversification plans. The Offshore Division activity is the first of the company's diversifications away from its traditional businesses.

Facilities

VSEL plc, Barrow-in-Furness, Cumbria LA 14 1AF, United Kingdom. The majority of the company's operations are at this location, including the Combat Systems, Shipbuilding, and Armaments.

Warship Design Services Ltd, Upper Borough Court, 2a Upper Borough Walls, Bath BA1 1RG.

Corporate Overview

VSEL segments its businesses into two sectors: submarines & warships and other activities (which include Armaments, Combat Systems and Product Support). Submarines & Warships provides the bulk of VSEL businesses. During the company's fiscal year 1995 this segment accounted for 75 percent of the company's sales and 72 percent of its income. The other activities segment generated 25 percent of the company's revenues and 28 percent of its income.

New Products and Services

Batch 2 Trafalgar class (B2TC). In 1992 the Royal Navy announced that it would not build the SSN-20 class submarine. In its place the Royal Navy initiated the design process for a second batch of Trafalgar-class boats. During September 1993, Vickers Shipbuilding and Engineering Ltd (VSEL) and other prospective contractors outlined the basic specification of the planned Batch 2 Trafalgar class (B2TC) nuclear attack submarines. Ministry of Defence (MoD) sources have confirmed that five B2TCs are currently in the long-term costing. There are suggestions that this could increase to six, although it is acknowledged that numbers could also fall. VSEL is currently teamed with Loral ASIC on this project. GEC-Marconi Naval Systems is expected to be a major competitor for the B2TC prime contractorship. In early 1996, VSEL's bid was passed over in favor a rival GEC-Marconi consortium with price being quoted as the key factor.

Plant Expansion/Organization Update

Cammell Laird Closed. In July 1993, VSEL closed its Cammell Laird shipyard, with the loss of approximately 900 jobs, following the hand-over of the last Upholder-class submarine, the HMS *Unicorn*. In May 1995, VSEL successfully completed the sale of about one third of the former Cammell Laird shipyard. The search continues for a cost-effective disposal of the remainder of the Birkenhead site. A joint venture initiative for the future development of the site between VSEL and English Partnerships remains an option, together with a combination of leasing and outright sale.

Restructuring. Since the company's first restructuring in 1990/91, two issues have become apparent. First, there is intense competition for a reduced volume of UK Ministry of Defence work. Second, the worldwide recession and reductions in military spending have limited both entry into new markets and export opportunities in the defense sector. As a consequence, VSEL's management felt that the company's cost structure was inappropriate and could no longer support a multidivisional organization from its existing core businesses. Thus, in June 1992 the company announced a restructuring of the VSEL management structure. In February 1993, the firm established a Product Support Division intended to handle logistics engineering and publications, and provide naval spares and material support. VSEL now consists of two principal groups, one dealing with Shipbuilding, the other with Engineering. Each group comprises two divisions. In Shipbuilding, one is responsible for product development and winning new work, while the other undertakes the shipbuilding operations. The Engineering Group is made up of the Armaments Division, responsible for marketing and product development, and the Manufacturing Division which carries out all engineering manufacture and assembly. According to the company, it is anticipated that this revised organization will lead to significant reductions in management costs.

Business Development Group Formed. As part of the reorganization, a small, highly focused Business Development Group was created to concentrate on VSEL's diversification efforts by way of acquisition, joint venture and internal growth. The strategy of this group is to concentrate its efforts on businesses offering good long-term employment prospects and profitable repetitive work. The parameters for selection are limited to those international markets for the core business of naval and defense land systems, plus a small number of other commercial markets including offshore oil and gas.

1990 Restructuring. In April 1990, five autonomous and fully accountable divisions were created within VSEL. The main objective of this streamlining and strengthening of the company was to delegate to the division's responsibility and accountability for the fulfillment of its shipbuilding and other programs. The overall expected benefit is the promotion of profitable and indigenous growth within the company. The five divisions are Shipbuilding, Armaments, Engineering Products, Fleet Support and Combat Systems (discussed in detail in the Product Area section). Each division has its own Board and has been given management resources to enable it to operate as an independent profit center. Company audit panels covering finance and contractual matters have also been formed for review and performance monitoring purposes. Cammell Laird Shipbuilders Limited and Topexpress Limited continue to trade on the stock market as separate companies, although they are treated as divisions and are under the control of the managing director of Vickers Shipbuilding and Engineering Limited.

Mergers/Acquisitions/Divestitures

BAe Bails Out of VSEL Merger. In June 1995, BAe dropped out of the bidding for VSEL, clearing the way for rival GEC to buy the UK shipbuilder after an eight-month battle. The competition for VSEL began in October 1994 when BAe offered an estimated £500 million for the company, prompting a rival bid from GEC. The GEC bid was allowed to proceed only after the UK Government overruled recommendations of the Monopolies and Mergers Commission and complaints from British Aerospace. GEC already has a significant shipbuilding operation in the form of Yarrow Shipbuilders, now Britain's only yard specializing in the construction of frigates and destroyers. GEC has long regarded VSEL as being an ideal complement to its existing naval-industry portfolio since it would add large ship and submarine-building capability to its existing strengths.

Swan Hunter Rights Acquired. IN April 1995, VSEL bought the intellectual property rights of Swan Hunter for an undisclosed sum. The deal includes surface-ship designs, tendering documents and other naval construction data.

Sealand Industries. In August 1991, VSEL acquired Sealand Industries plc and its then-sole operating company, Seaboard Lloyd Limited, a company supplying oil and gas wellhead equipment, valves, and associated equipment to the oil and gas industry. Through this acquisition, VSEL has established a foothold in the oil and gas industry. In April 1992, Sealand Industries acquired Forsac Limited, a company involved in the design and supply of subsea ball valves and check valves.

Teaming/Competition/Joint Ventures

Loral. In May 1994, VSEL and Loral ASIC, Portsmouth, England, teamed to compete for the UK's Batch 2 Trafalgar-class program. VSEL will lead the design, manufacture and production of the submarines and the procurement of the subsystems. Loral ASIC will lead on combat systems integration.

RDM. In September 1993, Vickers Shipbuilding and Engineering Ltd and RDM signed a collaborative agreement to jointly promote exports of the Upholder and Moray-class submarines to six prospective client nations. These are believed to include Canada, Chile, Malaysia and Saudi Arabia. Under the terms of this agreement, VSEL would build hull sections or other components of any Moray-class submarines sold to the target countries. The agreement also covers joint marketing of the two companies' air-independent propulsion technologies, fuel cells in the case of VSEL and CCD for RDM.

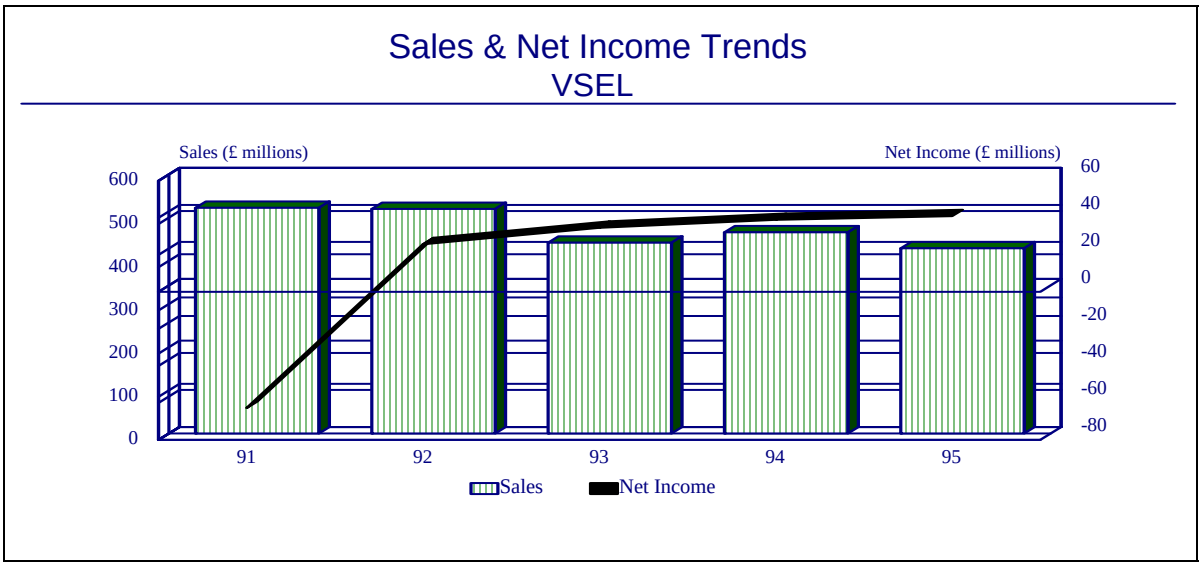
General Dynamics. As a part of VSEL's move toward more projects with international cooperation, the Company is working closely with General Dynamics Land Systems division to offer the AS90 as a contender for the US Army's Advanced Field Artillery System.

Underwater Management Associates Ltd (UMA). This joint venture was formed in 1990 to carry out the SSN20 submarine project definition. UMA was created to give GEC, BAe and Rolls-Royce the necessary experience to compete for SSN20 prime contractorship, since VSEL is the only UK company capable of constructing nuclear submarines. With the cancellation of the SSN20 program, it is unclear whether this joint venture will remain intact to study the Batch 2 Trafalgar plan, which is the canceled program's replacement.

Financial Results/Corporate Statistics

VSEL's 1995 sales decreased to £428.7 million from the previous year's £465.6 million. The company posted net income of £40.9 million, a five-percent increase over 1994's £38.9 million. Latest year statistics are provided below. US dollar figure translated as a 1994 average at the rate of £1=$1.5316.

Y/E March 31	1991	1992	1993	1994	1995	1995
(£ billions)						**US$**
Net Sales	522.5	519.9	441.8	465.6	428.7	656.6
Net Income	-62.8	25.7	34.6	38.9	40.9	62.6

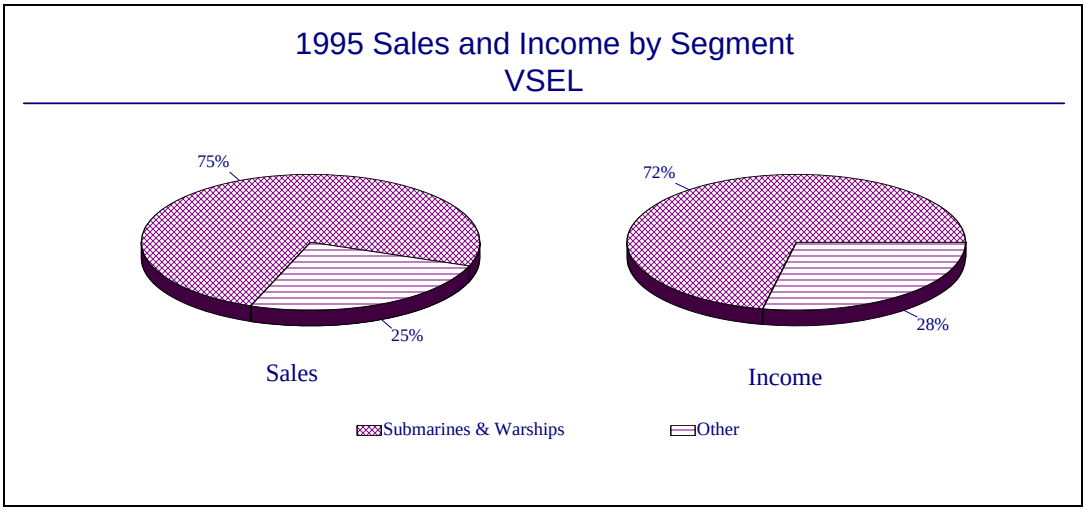


Industry Segments

A breakdown of VSEL's sales by major market segment for the years 1992 through 1995 is given below. Other activities include Armaments, Combat Systems and Product Support.

SALES	1992	1993	1994	1995
(£ millions)				
Submarines and Warships	389.8	293.1	317.2	321.3
Other Activities	130.0	148.7	148.4	107.5

OPERATING INCOME	1992	1993	1994	1995
(£ millions)				
Submarines and Warships	41.7	52.2	47.7	43.8
Other Activities	0.6	.2	11.9	17.1



Strategic Outlook

As one of Great Britain's primary warship manufacturers, VSEL is an integral part of the United Kingdom's defense industry. By providing the country with a range of warships ranging from nuclear-powered ballistic missile-carrying submarines to coastal patrol frigates, VSEL has provided this island nation with one of the most powerful navies in the world. Although the recent geopolitical changes have hurt the company, due to reduced defense spending, the company's prospects have been increased dramatically through its acquisition by GEC.

Following a bidding war with British Aerospace, GEC prevailed with an offer of £835 million. BAe pulled out of the takeover battle by announcing that it would not match GEC's offer for VSEL.

The acquisition, which was completed in mid-1995, should help both companies. The merger has combined the two largest warship manufacturers in the United Kingdom. While VSEL manufacturers submarines and other large warships, GEC produces frigates at its Yarrow shipyard. The combination will effectively give the Royal Navy one-stop shopping for almost all of its warship needs. With this newly found critical mass, the new GEC-VSEL should do quite well in the years ahead.

With the merger complete, this report will no longer be updated. Future information on VSEL and its programs will be available in the GEC report located elsewhere in this binder.

Prime Award Summary

Unavailable.

Program Activity

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

- Ordnance Systems
- Warships

Ordnance Programs

Artillery System 90

In 1984, VSEL's market research indicated that a specially built chassis, optimized for the 155-mm self-propelled gun role and integrated with an enhanced variant of the GBT 155 turret, had a good deal of potential through the turn of the century; in fact, the study showed a potential of 3,500 units, a good deal of them replacements for the M109. The Artillery System 90 is a modular system, designed to be easily upgraded with new technology as needed; this is because artillery systems tend to remain in operational service somewhat longer than other weapons. The Artillery System 90 was also designed for ease of manufacture, maintenance and operation; standard off-the-shelf components are widely used. The initial prototype testing and evaluation is complete and the serial production program is ongoing.

FH 155-1 (FH-70) 155-mm Howitzer

During the early 1960s, the Federal Republic of Germany, United Kingdom and United States agreed that a requirement existed for a new 155-millimeter field howitzer for the 1970s and beyond. Germany and the United States wanted to replace their operational M114 howitzers, while the British needed to replace their 5.5-inch guns. The Germans and British agreed to jointly develop a weapon originally designated FH-70 (Field Howitzer 1970) with an auxiliary power unit. The United States decided to pursue the development of its indigenous M198 155-millimeter piece, since United States Army doctrine demands air-portability of towed artillery. The Western Europeans, however, feel this doctrine is unnecessary due to the extensive European road network and the number of towing vehicles available. Vickers Shipbuilding and Engineering has developed a new ammunition hoist system that greatly eases the handling of the 155-millimeter projectiles. The hoist system is suspended from a steel joist gantry that is mounted on the right side of the carriage, forward of the breech mechanism. This device is offered as an option to new-production FH 155-1 systems or as a retrofit to existing pieces. As of January 1, 1995, a total of 707 FH 155-1 systems had been manufactured. Production is currently dormant.

Lightweight Indirect Fire Support Weapon
British Light 155 Requirement
British Light 155-Millimeter Towed Artillery

These enhanced-design artillery systems are in some stage of development by FMC Corporation/Northern Ordnance division, Minneapolis, Minnesota; Bowen-McLaughlin-York Corporation of York, Pennsylvania; and AAI Corporation, Hunt Valley, Maryland; all these firms are

located in the United States. In addition, Royal Ordnance plc/Guns and Vehicles division, Nottingham, and Vickers Shipbuilding and Engineering Limited Cumbria, England, United Kingdom, are developing weapons of this type. In the early 1980s, the United States Army and United States Marine Corps began investigating the future artillery needs of the United States. Events in the Falklands and Grenada, plus the then-omnipresent possibility of the use of the Central Command (Rapid Deployment Force) in the Middle East, pointed out the fact that in many potential cases, United States forces would be sorely lacking in artillery support. This was partially due to the fact that the United States Army had abandoned 105-millimeter artillery development in the Seventies, in favor of 155-millimeter systems. Yet the 155-millimeter M198, while a fine system that is significantly lighter than all competitors, still cannot be transported by a UH-60 helicopter due to its weight of 7.09 tonnes (7.82 tons). During the United States' interventions in Grenada and Panama, the continued need for lightweight artillery was more than amply demonstrated. For the interim, the United States Army decided to procure the L119 Light Gun from Royal Ordnance of the United Kingdom. (See FORECAST INTERNATIONAL's ORDNANCE AND MUNITIONS FORECAST binder for more information.) Vickers Shipbuilding and Engineering, which had first examined the market for a new lightweight 155-millimeter towed howitzer in 1982, revived its program shortly after the initial 1985 contract award to the Bowen-McLaughlin-York/Royal Ordnance team from the United States Army. The VSEL development program proceeded rapidly after its April 1987 revival, and the United States Army was fully briefed on the Ultra-lightweight Field Howitzer in mid-1987. The United States Army agreed to fully evaluate the VSEL system if the company would fund the fabrication with its own money. VSEL decided to proceed in this manner but to build two prototypes, so that one could be retained in the United Kingdom for further trials and development. The two prototypes were completed by late 1989. One prototype was sent to the United States, where it was unveiled at the Association of the United States Army convention in 1989. Following that, the prototype was shipped to the United States Army's Yuma Proving Ground for the test program. In late 1990, the test program was completed; the United States Marine Corps, also interested in a lightweight 155-millimeter towed howitzer, closely monitored the test and evaluation program.

Vickers 4.5-Inch L55 Mk 8 Gun

The Royal Armament Research and Development Establishment began design studies for a new 4.5-inch gun and mount in 1965. The Royal Navy was planning new surface combatants and wanted a lightweight automatic gun for the ships. Vickers Shipbuilding and Engineering received a contract to design a new mount in 1965/66, and a test model was ready in late 1966. This model passed all its tests, and the first British and Iranian ships designed to use the new mount started construction in 1967. However, long British shipbuilding times kept the Royal Navy from receiving the first new mount, and the first 4.5-inch/Mk 8 gun went to sea in May 1971 aboard an Iranian frigate. The Royal Navy plans to order at least twelve Type 23 frigates, each of which will have one 4.5-inch/Mk 8 gun. This program is progressing at a slow pace and probably will run through the mid- or late 1990s. A total of 55 guns have been produced to date, with a further 10 ordered or required for known building programs.

Warship Programs

CVSG(R)

This is an air-capable ship tasked with ASW, strike and general-purpose power projection. The CVSG(R) program is intended to produce a successor to the Invincible-class air-capable ships. They will operate helicopters and advanced short take-off/vertical landing (ASTOVL) aircraft. This program is still in the concept formulation stage. The CVSG(R) will probably resemble an enlarged Invincible-class air-capable ship. The primary visual differences will be the deletion of the Sea Dart launcher from the bows, and the institution of a full-length flight-deck with a ski-jump in the extreme bows. The ship will retain gas turbine propulsion. Three ships of this class are projected to be built in the next century.

Ocean Class LPH

This is an air-capable ship tasked with supporting amphibious operations. On February 28, 1993, the cancellation of the LPH requirement was formally reversed and the program was assigned a high priority. Bids were invited from VSEL and from Swan Hunter shipyards, with a view to the order being placed in October 1993. Finally, on May 11, 1993, VSEL plc was awarded a US$245 million order for the new Royal Navy LPH. The contract was awarded to VSEL in partnership with Kvaerner Govan, after a tightly fought contest with the rival Swan Hunter yard. The deciding factor in awarding the contract to VSEL was that its bid was some US$75 million lower than that of Swan Hunter. This difference was so marked that the time allowed for bid evaluation could be drastically reduced and the ship was ordered six months earlier than originally intended. The VSEL/Kvaerner Govan bid was also more compliant with Royal Navy specifications. Although its design uses the basic hull form of the Invincible class carriers, it will be built to merchant-ship standards and will effectively be a large merchant ship with a flight deck and naval features added on. The Swan Hunter proposal was to be built to warship standards and would, thus, have had much more limited internal capacity, although the ship would have

been substantially more battleworthy. The ship is expected to enter service by mid-1997.

Vanguard Class SSBN

Like the earlier Polaris program, this program is a smaller copy of the United States' submarine-launched ballistic missile program. The Vanguard Class provides the United Kingdom its strategic deterrent force. Four submarines of this class have been ordered — all of which will be produced by VSEL. In April 1986 the MoD placed an order for *HMS Vanguard*, the first Trident submarine, with VSEL. The US$1 billion contract would give VSEL up to 125 percent of the costs of a canceled submarine, depending on the company's assessed liability at the time. The keel of *HMS Vanguard* was laid down on September 3, 1986. The order for the second Vanguard class submarine, *HMS Victorious*, was placed in July 1987, and its keel was laid down on December 3, 1987. In November 1990 the third submarine of the class, *HMS Vengeance*, was ordered. This name was subsequently regarded as being politically incorrect and was changed to *HMS Vigilant*. In November 1992, the final Trident submarine was ordered from VSEL. Work had already started on this boat in anticipation of the order, some estimates indicating that up to 25 percent of the hull steelwork had been fabricated. The submarine is due to enter service in 1997, and will be named *HMS Valiant*; the hunter-killer currently bearing that name will be decommissioned by that time. The original name, *HMS Vindictive*, was changed, since this was also regarded as being politically incorrect. The *Vanguard* was launched in 1992 and it was expected to enter service in 1994/95. The *Valiant* probably will not enter operational service until 1998.

Type 2400 Upholder Class

The Type 2400 Upholder-class ships are intended to serve as open-ocean and coastal patrol submarines, conducting surveillance missions and anti-ship and anti-submarine warfare. They have a secondary mission as training platforms for surface ships and nuclear submarines in anti-submarine warfare. The Upholder was commissioned on July 9, 1990. This is approximately 18 months later than the originally scheduled commissioning. The vessel was returned to the shipyard for post-commissioning refit. It was reported that part of the repairs involved a cooling fan for one of the diesel generators. A total of four ships have been completed, representing the end of the class. VSEL and the Royal Navy will continue marketing the Type 2400 Upholder design to various foreign navies. However, this class is very unlikely to see any export sales because of its size and the problems it has experienced.

Trafalgar Class

This submarine class is part of the Royal Navy's buildup of its nuclear-powered attack-submarine forces. They are an outgrowth of the preceding Swiftsure class, but with greater speed and endurance, improved sensors, and anechoic tile coating. To date, seven submarines have been delivered by VSEL. Following the completion of these boats, the UK and France initiated a joint submarine design. This new class, the Batch 2 Trafalgar, will enter service in the next decade. To ensure that the SSN fleet remains at complement, the RN will build approximately four to six more of this class. The new design will be enlarged. The Royal Navy began modernization of the Trafalgar class during the early 1990s. The modernization is to include the retrofit of the Type 1007 radar and the Type 2046 processing system (as well as the Type 2046 towed array in some cases). In addition, the command and control system will probably be upgraded.

Type 42 Destroyers

The Type 42 guided-missile destroyers are designed to serve as area anti-air defense escorts for naval task forces. The class was also designed to have anti-submarine and anti-surface capabilities. They can be used both as elements of a naval task force and on independent operations. There have been a total of 16 ships built, 14 of which are still in service. The HMS Coventry was lost to bombs on May 4, 1982, and the HMS Sheffield foundered on May 10, 1982 after being hit by Exocet missiles. VSEL and Cammell Laird have built six of these ships. VSEL lost the bid to build the final three ships of this class.

Invincible Class

The Invincible-class ships were designed to carry the anti-submarine warfare helicopters for a naval task force or ASW hunter/killer group. Although officially designated as ASW aircraft carriers, they can also serve as power projection ships. The Invincible-class ships are the British Royal Navy's anti-submarine warfare and light fleet aircraft carriers. They are similar to ships built by Italy and Spain. The primary armament is the Sea Dart surface-to-air missile, which has a 40- to 80-nautical-mile range, with a semi-active homing system and ramjet propulsion. It also has limited anti-surface capabilities. The Sea Dart is launched by a twin-rail Mk 30 GWS (Guided Weapon System). Each ship originally carried 22 missiles, but all have been modified to carry 36 missiles. The Illustrious was scheduled to begin overhaul in mid-1991. The MoD plans to make a decision about a successor to the Invincible class during the late 1990s.

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