Canada

The Canadian Shipbuilding and Repair Industry: Sector Profile

Government of Canada
Regional Industrial Expansion

Gouvernement du Canada
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THE CANADIAN SHIPBUILDING AND REPAIR INDUSTRY

SECTOR PROFILE

Automotive, Marine and Rail Branch
Regional Industrial Expansion
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CHAPTER 1

THE CANADIAN SHIPBUILDING AND REPAIR INDUSTRY:

A NATIONAL AND REGIONAL OVERVIEW

1.0 INDUSTRY STRUCTURE AND PERFORMANCE: A NATIONAL PERSPECTIVE

There are 21 shipyards in Canada which regularly and directly employ more than 100 workers. These major yards represent 90 per cent of employment, 91 per cent of value added and 92 per cent of total production in the Canadian shipbuilding and repair sector. The residual of the sector's activities are accounted for by approximately 50 smaller yards and repair shops. The shipbuilding and repair industry is one of the few manufacturing sectors in Canada with a regionally diversified base. The industry has facilities in the Northwest Territories and in every province, except Saskatchewan. The Canadian yards derive benefit from the graving docks owned and operated by the federal government's Department of Public Works (DPW). The DPW's graving docks at Lauzon, Quebec, and Esquimalt, B.C., have been available to all commercial vessel users at rates significantly below operating costs.

There exists some degree of vertical integration between shipping lines operating in Canada and Canadian shipyards. Several of the major yards are wholly or partially held by such transportation companies as ULS International, Genstar, Halco, Rivtow Straits and CSL. Such integration can provide Canadian yards with a more secure long-term perspective than might otherwise be the case, due to the work base provided by parent firms and the greater financial flexibility these yards can enjoy. As well, parent company orders can usually provide scheduling flexibility and smooth out demand fluctuations. From the perspective of the shipping lines, their shipyards are a secure source of supply for both new construction and repair and, moreover, at known cost and quality levels. It should be noted, however, that there are many yards which are not integrated with ship operators and that the degree of vertical integration appears to be somewhat on the decline.

Vertical integration does not characterize the relationship between the shipyards and their suppliers. The absence of such integration has meant that Canadian yards can exert less control over material costs than is the case in Japan or Korea. There is a lack of data on the size of the marine service and supply sector in Canada. The federal government's Ocean Industries Directory lists 300 firms whose principal activity is marine-related. It is also known, however, that more than 1,023 firms, excluding naval architects, are suppliers to the Canadian Patrol Frigate Program. This total includes 861 firms supplying manufactured products with a Canadian content of 50 per cent or more and a further 162 engineering and miscellaneous service firms.

An estimated 50 naval architect and marine consultant firms provide Canadian shipyards with design and engineering services although many shipyards also have in-house capability. Because of the close relationship between the use of pre-outfitting and module construction methods and the design configurations of vessels, a close relationship between the naval architect and the shipyard is essential for the adoption of new and efficient production methods. However, in certain cases the separation of the design and production function in Canada has created obstacles to the adoption of new technologies and vessel design refinements.

1.1 Volume of Production

The volume of vessel construction and conversion work in Canada, as reported by Statistics Canada, averaged $162 million annually between 1975 and 1984, in 1971 dollars. During the same ten-year period, the volume of ship repairs averaged $74 million annually, or approximately 31 per cent of the total value of shipyard work. In 1984 dollars, this corresponds to an average value of $509 million in construction and conversion and $233 million in repairs over the same period.

TABLE 1

Value of New Construction, Conversions and Repair Work
Canadian Shipyards 1971-1984
($000 Constant 1971 = 100)

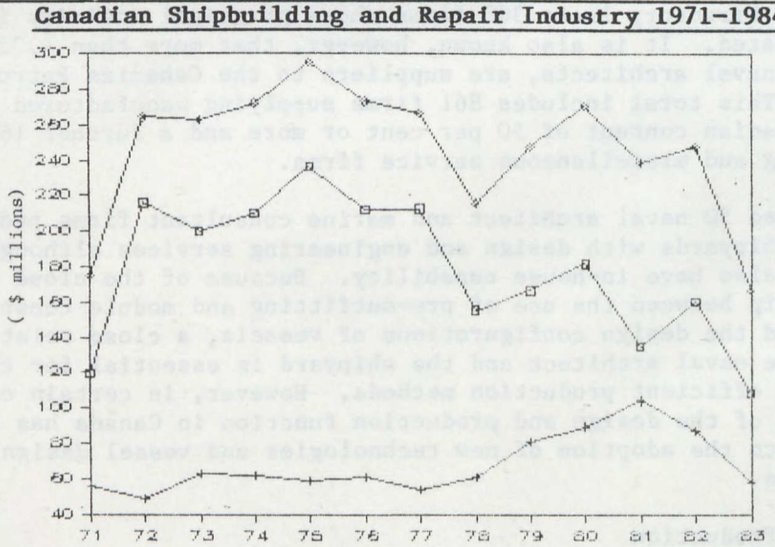
Year	Value of New Construction & Conversions	Value of Ship Repair	Total Production Value	Annual % Change in Total Production Value
1971	119,561	55,687	175,248	-
1972	215,983	48,465	264,449	46.3%
1973	200,202	62,844	263,046	(0.5)%
1974	210,282	62,225	272,507	3.6%
1975	236,401	59,068	295,469	8.4%
1976	212,566	61,137	273,703	(7.4)%
1977	212,752	53,970	266,722	(2.6)%
1978	155,230	60,693	215,923	(19.0)%
1979	166,439	81,336	247,775	14.8%
1980	181,690	89,543	271,233	9.5%
1981	134,696	104,048	238,744	(12.0)%
1982	160,194	87,363	247,557	3.7%
1983	86,714	63,816	150,530	(39.2)%
1984	75,246	75,026	150,272	(0.2)%
Average Annual Growth Rates				
1971-1975	14.6%	1.2%	11.0%	
1976-1980	-3.1%	7.9%	-0.2%	
1980-1984	-16.2%	-3.5%	-11.1%	
1971-1984	-3.3%	2.2%	-1.1%	

Source: Statistics Canada.

Notes: 1. Constant dollar estimates derived using GDP Implicit Price Index for SIC 327.
2. 1984 data estimated by DRIE.
3. See Annex 1 for CSSRA production data.

FIGURE 1

Real Value of New Construction and Repair and Conversion Work
Canadian Shipbuilding and Repair Industry 1971-1984



+Repairs □ New Construction & Conversions ◇ Total Production

Source: 1971-1983: Statistics Canada; 1984: DRIE Estimate.

It should be noted that repairs have been understated by Statistics Canada in some years, due to the omission of certain repair establishments from SIC 327 in those years.

Note: Current dollar values adjusted using GDP Implicit Price Index for SIC 327 (1971 = 100).

From Table 1 (above), a decline in the value of shipbuilding production and repairs by Canadian shipyards is evident. Despite real production gains in these areas in 1974-1975 and again between 1978 and 1980, the average annual rate of growth in the total real value of production for the period 1971-1984 was -1.1 per cent.

The real value of production in new construction actually declined, while the value of repair work increased for 1971-1984. The average annual decline in the value of new construction was -3.3 per cent for 1971-1984, while the annual rate of growth in the value of repair work was 2.2 per cent. Indeed, repair work has provided the industry with an important element of stability in the past and is expected to continue to do so in the future. It should also be noted from Table 1 that, with respect to the value of new construction, conversion and repair work, the rate of decline was steeper from 1980 to 1984, at -16.2 per cent, than during the 1976 to 1980 period, at -3.1 per cent. The decline in the value of production by Canadian yards reflects both a decline in the international market and a continuing erosion of the Canadian yards' competitive position in both domestic and foreign markets.

As can be seen from Figure 1 (above), there has been a severe decline in the value of production since 1982. During 1983, the current dollar value of production at member yards of the Canadian Shipbuilding and Ship Repairing Association (CSSRA) was $586 million.[1] This represented a decline of over 38 per cent from the $949 million value of work completed in 1982. The production figures for 1984, as reported by the CSSRA, are not encouraging. The value of total production for CSSRA member yards during 1984 was $539 million, or 8 per cent less than the 1983 value of production.

New construction has constituted between 70 and 80 per cent of the total value of marine work in CSSRA member yards over the past twenty years, with repair and conversion work making up the remainder. In 1983, 91 per cent of new construction was commercial work and 9 per cent represented government procurement. These shares will change in the 1984-1993 period as government procurement, accelerated under the Special Recovery Capital Projects Program (SRCPP) and defence spending, is expected to constitute approximately 49 per cent of total new conventional construction, mainly due to the large volume of government work projected for the 1985 to 1988 period.

1.2 Deliveries by Type of Vessel and Gross Tonnage

Table 2 (below) presents data on the number and gross tonnage of vessels delivered by CSSRA member yards for the two five-year periods 1975-1979 and 1980-1984. The 206 vessels delivered during the first period represented 924.5 thousand compensated gross registered tons (CGRT), while the 142 vessels delivered during the second period represented only 596.8 thousand CGRT.

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1 Member yards of the CSSRA now account for over 90 per cent of shipbuilding and ship repair activity in Canada. However, for the purposes of determining trends over time, it is necessary to rely on Statistics Canada data rather than CSSRA data because, prior to 1976, several major shipyards did not report their activity to the CSSRA. With respect to the post-1976 period, it is evident that CSSRA and Statistics Canada data are not comparable due to different data collection methodologies. It should also be noted that Statistics Canada data is not entirely satisfactory for all purposes due to the industry classification conventions adhered to by that Department. In this sector profile, both Statistics Canada and CSSRA data are used. A major effort has been made to present those data which present a reasonably accurate and fair picture of the industry's structure and performance.

TABLE 2

Vessels Delivered by CSSRA Shipyards

	1975-79		1980-84	
	Number	CGRT	Number	CGRT[1]
Federal Government	14	43.2	8	30.6
Ferries	15	54.4	10	68.4
Tankers	22	230.0	5	40.5
Bulk Carriers	17	243.9	10	181.1
Tugs	17	11.3	20	23.5
Barges	29	26.9	26	35.4
Container	7	138.9	0	0
Other Cargo	10	87.6	4	18.2
Fishing	55	21.6	32	35.9
Offshore Supply	5	13.6	18	78.6
Misc.	15	53.1	9	84.6
TOTAL	206	924.5	142	596.8

Source: Data obtained from annual reports of CSSRA and cover the production of member yards only. Omitted from the above table are a drill ship and semi-submersible drilling rigs built at Halifax between 1973 and 1978 and ten jack-up rigs built at Davie between 1979 and 1982 for export.

Note: 1. Thousands of compensated gross registered tons. Compensated tonnage is the gross tonnage of a vessel adjusted to reflect man-hours required in construction according to the OECD formula and, in some instances, for specialized Canadian vessel types.

1.3 Sales and Trade

Approximately 76 per cent of the gross tonnage delivered by CSSRA member yards since 1980 has been for domestic markets and 24 per cent for export markets. In 1983, 118 thousand gross tons were delivered to domestic markets and 11 thousand gross tons, under eight per cent of the total to export markets. This amounted to 24 thousand gross tons, accounted for entirely by the delivery of the Bow Drill 3. The value of new construction by CSSRA yards for export markets in 1983 was $116 million, 30 per cent of the total value of new construction in that year. This declined to $36 million, or 13 per cent of total production value in 1984. The export order book of Canadian yards is now virtually empty.

1.4 Investment

Capital expenditures by the shipbuilding and repair industry in Canada increased in constant dollar terms from $6.5 million in 1977 to $16.1 million in 1982 and thereafter dropped to $6.1 million in 1984. The average constant dollar level of new capital expenditures over the past five years has been $11 million annually.

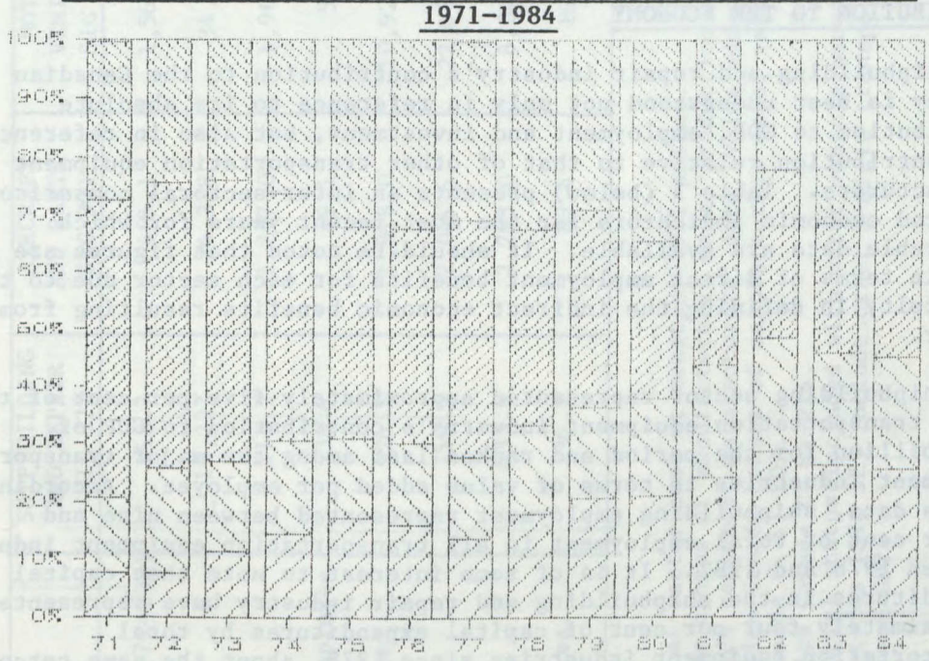
In nominal dollars, the industry's capital expenditures totalled $188 million between 1980 and 1984. Over this period, the government contributed $44 million to the investment programs of the shipyards through the performance improvement grant element of SIAP, and $100 million for the construction or improvement of dry docks.

1.5 Employment

According to Statistics Canada survey data, total employment in the shipbuilding and repair industry fell from 11,300 in 1983 to 9,433 in 1984, a decline of 17 per cent. During the period from 1971 to 1973, and as reported by CSSRA member yards, Quebec shipyards had approximately half the total Canadian shipyard employment. However, Quebec's relative share of shipyard employment declined during the remainder of the decade in part because all increases in CSSRA membership occurred outside Quebec, and, by 1984, only 31 per cent of shipyard workers were employed in Quebec yards. During the second half of the 1970s, yards on the West and East Coasts benefited from new domestic orders for offshore equipment and supply boats and therefore increased their relative share of employment. Yards in Ontario were able to retain their relative share of employment throughout the decade due to the continuing demand for bulk carriers for use on the Great Lakes.

FIGURE 2

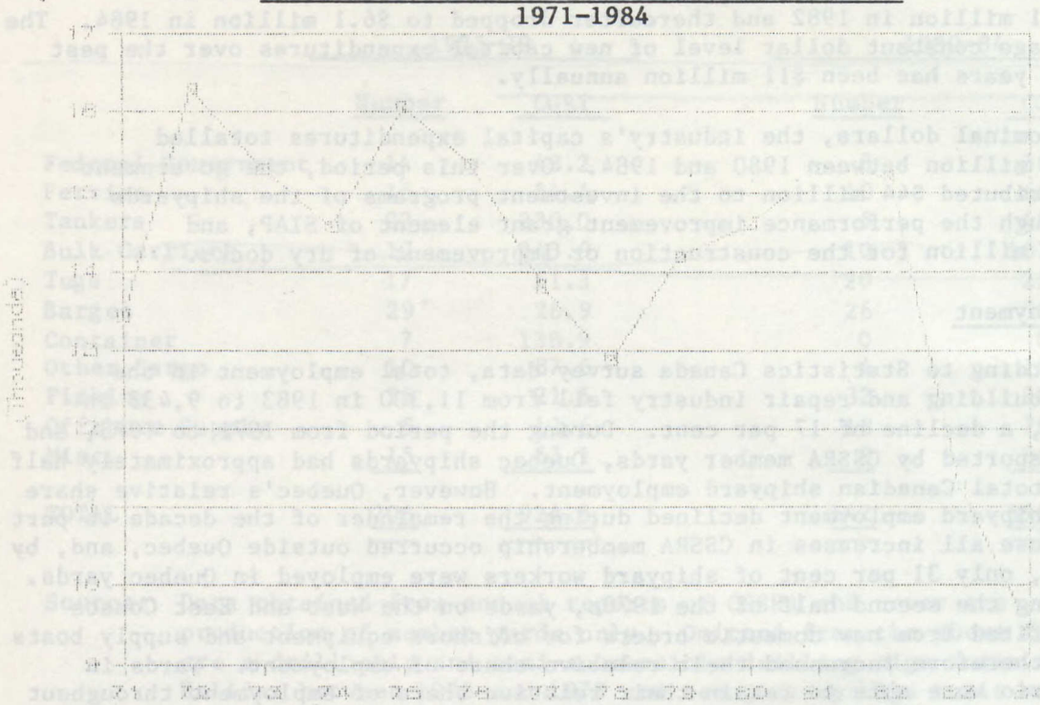
Regional Distribution of Employment in CSSRA Member Yards 1971-1984



Source: CSSRA.

FIGURE 3

Canadian Shipbuilding and Repair Employment
1971-1984



Source: Statistics Canada Survey Data, Averages of monthly figures.

2.0 CONTRIBUTION TO THE ECONOMY

The shipbuilding and repair industry's contribution to the Canadian economy is best understood not only in reference to its absolute contribution to GDP, employment and investment, but also in reference to its contribution relative to that of other transportation equipment manufacturers. Table 3 (below) presents an inter-sectoral comparison of selected economic indicators for the most recent years for which comparable data are available. It should be noted that figures are given only in terms of direct employment benefits for each sector due to the difficulty in defining the indirect economic benefits resulting from each sector.

The shipbuilding sector represented approximately five per cent of the total transportation equipment industry's contribution to GDP of $3.3 billion for the period and ranked last among the major transport equipment industries in terms of value added per employee. According to census data, shipbuilding employment represented between nine and 11 per cent of total employment in all transportation equipment industries between 1978 and 1982. It is of some interest to note that capital expenditures in the shipbuilding and repair industry have represented approximately four per cent of capital expenditures by total transportation equipment industries since 1978, about the same percentage as output and sales, meaning that shipbuilding has similar capital intensity to other components of transport equipment.

The shipbuilding and repair industry is relatively small, regionally sensitive and has been somewhat unprofitable in the recent past. However, it is also labour-intensive providing significant employment in several disadvantaged regions. Indeed, according to analysis carried out by officials of the Quebec Department of Industry, Commerce and Tourism, the industry possesses a very high degree of integration in the Quebec economy. The shipbuilding industry would appear to have a more significant impact on economic activity within the province than other industries, for a given level of output, due to this high degree of regional integration. No figures are available for other provincial economies.

TABLE 3

Selected Economic Indicators

Transportation Equipment Industries Inter-Sectoral Comparison

FIVE-YEAR AVERAGE	INDICATOR***	SHIPBUILDING AND REPAIR SIC 327	AIRCRAFT AND PARTS SIC 321	MOTOR VEHICLES SIC 323	MOTOR VEHICLE PARTS SIC 325	RAIL ROLLING STOCK SIC 326	ALL TRANSPORT EQUIP. INDUSTRIES SIC 32**	SHIPBUILDING AS A % OF SIC 32
1978-1982	GDP (constant $ 1971=100)	158.7	405.1	1,563.7	824.7	112.7	3,279.0	4.8%
1978-1982	Employment	13,227	24,328	34,509	41,552	6,570	135,651	9.8%
1978-1982	Value Added	514.2	1,207.0	1,905.7	2,058.0	342.2	6,523.8	7.9%
1978-1982	Value Added per Employee	38.6	49.1	55.4	49.8	52.9	48.3	
1978-1982	Value of Production	926.5	1,968.0	10,922.4	4,438.5	852.1	20,204.2	4.6%
1978-1982	Sales	754.2	2,046.6	22,696.5	*	N/A	27,939.6	2.7%
1978-1982	Assets	633.9	2,293.0	8,002.1	*	N/A	13,009.9	4.9%
1978-1982	Capital Expenditures	36.2	83.4	161.5	434.1	84.9	845.4	4.3%

NOTES AND SOURCES:

1. GDP: Gross Domestic Product at factor cost at constant 1971 prices.
2. Employment: Statistics Canada census of manufacturers' data, production and related workers.
3. Value Added: Statistics Canada census of manufacturers' data, value added in manufacturing activity.
4. Value of Production: Statistics Canada census of manufacturers data, value of production related to manufacturing activity.
5. Assets, Sales: Statistics Canada C. 61-207.
6. Capital Investment. Statistics Canada C. 61-214.

* Motor vehicle and parts financial status included with motor vehicle manufacturers.
** All transport equipment industries (SIC 32) include other 3-digit transport equipment classifications not included in this table.
*** All dollar values nominal except GDP.

FIGURE 4

The Location of Major Canadian Shipyards

COMPANY NAME	YARD LOCATION	
1. Allied Shipbuilders Ltd.	North Vancouver	B.C.
2. Bel-Aire Shipyard Ltd.	North Vancouver	B.C.
3. Breton Industrial & Marine Ltd.	Port Hawkesbury	N.S.
4. Versatile Pacific Shipyards Inc.	Vancouver	B.C.
5. Versatile Pacific Shipyards Inc.	Victoria	B.C.
6. Canadian Shipbuilding & Engineering Ltd.	Collingwood	Ont.
7. Canadian Shipbuilding & Engineering Ltd.	Port Arthur	Ont.
8. Versatile Davie Ltd.	Lauzon	Que.
9. Georgetown Shipyard	Georgetown	P.E.I.
10. Halifax Industries Ltd.	Halifax	N.S.

COMPANY NAME	YARD LOCATION	
11. Marine Industries Ltd.	Sorel	Que.
12. Marystown Shipyard Ltd.	Marystown	Nfld.
13. Newfoundland Dockyard	St. John's	Nfld.
14. Pictou Industries Ltd.	Pictou	N.S.
15. Port Weller Dry Docks Ltd.	St. Catharines	Ont.
16. Rivtow Industries Ltd.	Vancouver	B.C.
17. Saint John Shipbuilding Ltd.	Saint John	N.B.
18. Shelburne Marine Ltd.	Shelburne	N.S.
19. Genstar Shipyards Ltd.	Vancouver	B.C.
20. Versatile Vickers Inc.	Montreal	Que.
21. Vito Steel Boat & Barge Construction Ltd.	Vancouver	B.C.

3.0 INDUSTRY STRUCTURE AND PERFORMANCE: A REGIONAL PERSPECTIVE

As previously pointed out, the shipbuilding industry has a diverse regional base, with facilities existing in nine provinces, and in the Northwest Territories. The regional significance of the shipbuilding industry is underscored by the active interest provincial governments have in several major yards. The governments of Newfoundland, Nova Scotia, Prince Edward Island and Quebec own or have an interest in a number of Canadian shipyards.

3.1 The East Coast

a) Facilities and Capabilities

With a graving dock of 1400' x 125' x 42' (draft over keel blocks), Saint John Shipbuilding is the largest yard on the East Coast. Saint John Shipbuilding has experience in building most types of conventional vessels as well as heavy-duty semi-submersibles. It recently won the prime contract and will build three vessels under the Canadian Patrol Frigate (CPF) program. The next largest is Halifax Shipyards Limited. Their facilities include a graving dock as well as a larger floating dry dock measuring 842' x 124' x 29'. The experience and capabilities of other East Coast yards are generally confined to particular vessel types. For example, between 1976 and 1980, most activity at Pictou shipyards (formerly Ferguson Industries Ltd.) consisted of fishing vessel construction.

The largest dry docking facilities on the East Coast are located in Saint John, N.B., and Halifax, N.S. Yards having smaller haul-out and dry-docking facilities are Newfoundland Drydock, Marystown, Georgetown, Shelburne, Pictou and Breton. Saint John Shipbuilding Ltd. and Halifax Industries Ltd. (HIL) directly compete for a fairly small market of major vessel construction and repair contracts and also compete for work on smaller vessels in order to fill their capacity. Saint John, HIL and Marystown have CAD/CAM systems for ship building, a technology which is now essential to be competitive internationally, and are using computerized project control systems. The smaller East Coast yards, other than Pictou, do not have direct access to these systems.

Saint John Consultants, an affiliate of Saint John Shipbuilding Ltd., has a design and engineering capability which makes them a highly competitive naval vessel design firm on the East Coast. The other shipyards use consultants as the need arises.

b) Markets

The traditional new construction market for East Coast shipyards has covered a wide range of vessel types. A consistent market focus for the smaller yards, however, has been the construction of fishing vessels and, to a lesser extent, offshore service vessels and small-scale government procurement.

During the 1970s, offshore oil and gas exploration activities on the East Coast and on the international market provided work for East Coast yards. HIL, for example, constructed seven Sedco rigs and a drillship during the 1970s, all for export. Saint John Shipbuilding completed a drill rig in 1984. Marystown Shipyard, in addition to its proven capability for building vessels of various types and sizes for the fishing and transportation industries, continues to place an emphasis on acquiring semi-submersible repair business, occasionally building supply vessels "on spec" financed by the Newfoundland government. The Pictou, Breton and Shelburne yards have benefitted from some service vessel repair work.

The East Coast fishing vessel construction sector is suffering from the current slowdown in the fishing industry. Due to the current

the current Atlantic fisheries situation, fishermen are taking vessels out of service rather than having them repaired. Nonetheless, the remaining repair work, while limited, sustains many East Coast yards, particularly smaller ones.

c) Industrial Relations

The workers in the major East Coast yards have similar contracts, but each collective agreement is negotiated separately, and working conditions vary from yard to yard. The smaller yards on the East Coast tend to be non-union and flexible in trade demarcation lines. The larger yards are negotiating or have clauses in their contracts that allow for relaxation of tradesmen demarcation. Gaining flexibility in trade demarcation lines is a major objective of all the major shipyard management teams at both Canadian and foreign yards, since it is critical to gaining the efficiencies available from modular/computerized production methods. It is not clear at this time whether or not this objective will be difficult to achieve given union concerns, although some progress has been made to date.

3.2 Quebec

a) Facilities and Capabilities

In Quebec, there are three major yards: Versatile Vickers Inc. in Montreal, Davie Shipbuilding Ltd. at Lauzon and Marine Industries Ltd. (MIL) at Sorel. The MIL yard is 60 km from Montreal and the Davie yard is located across the St. Lawrence from Quebec City. Both are the largest industrial employers in their respective regions. In the past, the principal activity of the Vickers yard has been repair work, but the recent award of part of a frigate contract to Vickers is allowing some diversification of activity. Both the Davie and MIL yards have experience in the construction and repair of a wide variety of vessel types including merchant and naval vessels. In addition, Davie has experience in the construction of jack-up rigs.

The industry in Quebec has probably suffered most from the international recession. As indicated above, employment in the Quebec yards fell from 4,045 in 1971 to 1,782 in 1983. Sales at the three major yards declined from a peak of $479.5 million in 1982 to $299.2 million in 1983, and net profits fell from $8.6 million to $0.4 million. The major companies in the sector, with the exception of Versatile Vickers, had concentrated their efforts on the export market, but now have to rely heavily on government procurement.

b) Markets

In general, the yards in Quebec do not have a captive market despite their corporate relationships with diversified parents. For example, the Vickers yard of Montreal is owned by Versatile Corporation of Vancouver, but no orders have been obtained through this connection. An exception is MIL, 65 per cent owned by the Government of Quebec, which has received several orders for ferry boats from the province in the past. It should also be noted, however, that Davie is currently working on a ferry contract for the Quebec government.

Repairs and conversions are an important market element for Quebec yards. Currently, the Société des Traversiers du Québec has four modern ferries with two more vessels under construction. Potential new shipbuilding and/or repair markets for Quebec yards are Department of National Defence projects (Tribal Class Update and Modernization Program - TRUMP, frigate and submarine construction) together with Coast Guard, offshore rigs and supply vessels. MIL and Versatile, both being diversified operations (MIL also includes hydro, industrial and rail equipment divisions, while Versatile is involved in heavy manufacturing), are best able to weather short-term problems. Davie,

however, is unique in Quebec, being almost exclusively a shipbuilding and repair operator.

c) Industrial Relations

The unions representing the Quebec shipyard workers, the Fédération des travailleurs du Québec and the Confédération des syndicats nationaux, have expressed reservations about how the objective of increasing management's flexibility in work assignment and subcontracting is to be met. As well, the length of the work week was a contentious issue and was one of the main issues in the recent strike at MIL.

3.3 The Great Lakes

a) Facilities and Capabilities

The majority of shipbuilding and construction work in Ontario is handled by Port Weller Drydocks near the Lake Ontario end of the Welland Canal, Collingwood Shipyards on Georgian Bay and Port Arthur Shipbuilding on Lake Superior near Thunder Bay. Both the Collingwood and Port Arthur yards are owned by the same company, Canadian Shipbuilding and Engineering Ltd. The Port Weller Yard is engaged in both building and repair of Seaway-size vessels. Collingwood has a shipbuilding facility for constructing maximum seaway-size vessels and can repair smaller vessels. Port Arthur is primarily a repair yard for seaway-size vessels, but on occasion has built small ships and components for larger ships. In general, these yards serve the needs of the Canadian Great Lakes fleet and, in recent years, have accounted for almost all building, conversion and repair of Great Lake bulkers and self-unloaders, as well as the extension of some vessels to maximum seaway size.

The ships built in these shipyards have tended to be specialized in relation to the cargoes carried and the operational environment. The primary transportation requirements for Canadian trade on the Great Lakes are, in descending order of tonnage, for the dry cargoes of ore, grain, coal, stone, salt and cement. These cargoes, with the exception of cement, have lent themselves to carriage by increasingly larger and specialized ships such as the "self-unloader" type. The major constraint on the trend towards larger-size vessels has been the physical size limitations imposed by ports, canals and locks in the Great Lakes system. For example, the seaway limitation for continuous vessel use in the lock system is 730' x 75' x 26' (draft), and any 1,000-foot ships in the Great Lakes must transship above the Welland Canal. Finally, it should be noted that, while these yards have primarily been engaged in the construction of lakers, they have also built a variety of fishing vessels, tugs, ferries, tankers and icebreakers.

b) Markets

The most important market for Canadian Great Lakes shipyards will continue to be building, repairs and conversions for the Canadian Great Lakes fleet. One new market opportunity is naval refits. Until recently, Ontario shipyards could not bid for work on active NATO-assigned vessels because they were prohibited from entering inland waters. This prohibition has now been removed. Another market opportunity perceived by the Great Lake yards is the shipbuilding and steel fabrication requirements related to East Coast offshore oil development. However, there exists considerable uncertainty over the eventual size of the offshore market when and if it materializes. Additional uncertainty exists with respect to the influence of East Coast provincial governments' local sourcing requirements on the eventual distribution of offshore contracts.

Building activity on the Great Lakes is expected to be lower in the future than it has been over the last decade, with only 21 to 23 per cent of shipbuilding capacity being used. Repair activity, which

represents between 15 and 30 per cent of yard activity, will likely be in line with historical experience; that is to say, 50 per cent utilization of repair capacity. One factor which may alter this projection is the potential for a large increase in the number of conversions of steam-powered vessels to diesel and of bulkers to self-unloaders, as well as the extension of some vessels to "maximum seaway size".

c) Industrial Relations

The three major Great Lakes yards are all affiliated with either the AFL/CIO or the United Steelworkers of America. Recent labour disputes have resulted in relatively long closure of facilities, though they have been few in number and concerned with non-wage issues. However, union-management relations would appear to be relatively good, and there seems to be a certain degree of flexibility in work assignments.

3.4 Western Shipyards Overview

a) Facilities and Capabilities

The shipyards in British Columbia are concentrated in the Vancouver area with the majority of the capacity on Burrard Inlet (Versatile Pacific Shipyards Inc., Vancouver Shipyard, Bel-Aire, Allied and Rivtow). The only other significant concentration is Esquimalt with Versatile Pacific Shipyards Inc., Point Ellice, the Public Works graving dock and the Naval Dockyard. Although there are shipyards in centres away from Vancouver and Victoria, in Nanaimo, Port Alberni, Prince Rupert and Kitimat, for example, these tend to be small and to concentrate on local repairs.

The largest yard on the West Coast is the Vancouver division of Versatile Pacific Shipyards Inc. The facilities at Versatile Pacific Shipyards Inc. include a floating dry dock with dimensions of 649' x 150' x 29' (over the blocks). At Esquimalt, the Department of Public Works operates a graving dock with a length of 1,178', a width of 126' and with a 30' maximum depth over the sill. Building berths of up to 481' x 97' are also available.

The provincially-owned BC Ferry Corporation, with a fleet of twenty-five vessels, has its own refit capability at Deas Dock in Richmond. However, the facility is limited in that it has no dry-docking capability. BC Ferry expects to have each vessel out of the water for five to seven days every second year generating a 60- to 75-day per year demand for suitable haul-out and repair facilities in commercial yards.

Although the emphasis in western shipyards is on steel fabrication and assembly operations, they have recognized expertise in particular areas such as tugs and barges, low-draft vessels, fishing vessels, ferries and Arctic vessels. A significant naval architecture design capability exists in Vancouver, but it exists independently of any shipyard. This leaves the yards at a distinct disadvantage when it comes to marrying product design to production methods and in exploiting Canadian-developed designs and innovations internationally. On the other hand, some yards consider this to be an advantage as it allows them to choose designers for particular projects who have demonstrated expertise in the same area.

b) Markets

The West Coast of British Columbia has an active marine transport industry with barge and tug operations playing a significant role. Self-loading and unloading log barges have been developed for the forestry industry and bulk carriage of coal, cement and other minerals is common. Two of the major tug and barge fleets have their own

shipyard facilities; Seaspan (a Genstar company) operates Point Ellice, a small repair yard in Victoria and Genstar Shipyard in North Vancouver (the third largest B.C. yard), while Rivtow Straits (run by Rivtow Industries Ltd.) operates a complex of yards in Vancouver.

It should be noted that West Coast yards have collectively built more offshore supply vessels than have East Coast yards. Provincial policies regarding local sourcing for offshore work in the East Coast, however, could impact upon the viability of this market for West Coast shipyards. Due to its geographic proximity, the West Coast shipbuilding industry regards future developments in the western Arctic as a major potential market both for new building and for refits. The uncertainty over the rate, timing and type of resource development in the Arctic as well as the ultimate role of marine transportation has limited the amount of advance planning which the industry can afford to engage in. Although new vessel construction for Arctic use may be questioned, at the present time repair facilities in the Arctic are receiving intensive use.

Ship repair, refits and conversions play a significant role in the economics of West Coast shipyards. With a significant deep sea fishing industry, the world's largest sea-going tow boat industry, a major passenger and ferry operation and significant ship-borne international trade, the impact of repair and refit work on the West Coast is more important than in other areas of Canada. Repair and refit work tends to have a higher manpower requirement and profit potential per dollar of revenue than shipbuilding. Hence, while refit and repair work has declined, enough work of this type remains to help buffer the impact of the scarcity of new construction orders.

c) Industrial Relations

Union negotiations in British Columbia have produced a contract that is uniform for all major yards. The master contract has a three-year life (to August 1987), a high wage rate for tradesmen of $17.40/hour and is fairly restrictive as to flexibility of work assignment. One major management initiative is to increase the ability of individual yards to modify standard union conditions, understandings and work practices.

ANNEX 1

TABLE 1

Value of Shipbuilding and Ship Repair Completed at Member Yards of the CSSRA 1971 - 1984

($000 nominal)

Year	New Construction	Ship Repairs & Conversions	Total Production
1971	105,560	41,319	146,879
1972	180,857	44,902	225,759
1973	175,020	59,792	234,812
1974	248,711	62,145	310,856
1975	369,000	89,410	458,410
1976	349,868	88,222	438,090
1977	335,328	130,636	465,964
1978	350,870	142,444	493,314
1979	398,210	180,978	579,188
1980	476,651	207,108	683,759
1981	481,782	313,700	795,482
1982	652,918	296,228	949,146
1983	381,743	204,222	585,965
1984	288,204	250,685	538,889

Source: CSSRA.

ANNEX 1

TABLE 2

Value of Shipbuilding and Ship Repair[1]
($000 Nominal)

YEAR	VALUE OF SHIPS DELIVERED DURING YEAR	LESS VALUE OF WORK DONE IN PREVIOUS YEAR DELIVERED IN CURRENT YEAR(2)	ADD VALUE OF WORK DONE ON SHIPS NOT COMPLETED AT YEAR END(2)	TOTAL VALUE OF NEW CONSTRUCTION(2)	VALUE OF SHIP REPAIRS	TOTAL NEW SHIPBUILDING AND REPAIR	NEW SHIP CONSTRUCTION AS PERCENTAGE OF TOTAL	REPAIRS AS PERCENTAGE OF TOTAL
1971	122,252	129,921	127,230	119,561	55,687	175,248	68.22%	31.78%
1972	188,570	128,011	170,975	231,534	51,954	283,488	81.67%	18.33%
1973	264,957	165,313	126,144	225,788	70,888	296,676	76.11%	23.89%
1974	226,118	127,568	212,036	310,586	91,906	402,492	77.17%	22.83%
1975	300,176	163,417	255,666	392,425	98,053	490,478	80.01%	19.99%
1976	371,094	235,371	244,771	380,494	109,436	489,930	77.66%	22.34%
1977	286,702	197,057	331,179	420,824	106,753	527,577	79.77%	20.23%
1978	331,441	312,128	298,288	317,601	124,177	441,778	71.89%	18.11%
1979	403,790	403,790	337,638	426,917	208,628	635,545	67.17%	32.83%
1980	554,315	554,315	337,065	521,815	257,168	778,983	66.99%	33.01%
1981	413,091	413,091	334,252	444,767	343,566	788,333	56.42%	43.58%
1982	638,035	402,544	346,335	581,826	317,303	899,129	64.71%	35.29%

SOURCE: Statistics Canada.

1. Value of ships delivered to export markets during the year does not include value of any government subsidies paid.

2. Includes value of work done on reconditioning and conversion.

ANNEX 1

TABLE 3

Average Annual Employment in CSSRA Shipyards

1971 - 1984

	MEMBER YARDS				
Year	British Columbia	Ontario	Quebec	Atlantic Provinces	All Member Yards
1971	611	1,009	4,045	2,134	7,799
1972	809	1,871	5,156	2,541	10,377
1973	1,215	1,653	5,220	2,566	10,654
1974	1,377	1,499	4,036	2,453	9,365
1975	2,268	1,788	4,883	4,217	13,156
1976	1,999	1,724	4,568	3,986	12,277
1977	1,707	1,732	5,105	3,835	12,379
1978	1,929	1,576	3,620	3,451	10,574
1979	2,323	1,776	3,845	3,248	11,192
1980	2,421	1,927	3,144	3,940	11,410
1981	2,929	2,321	3,024	3,673	11,947
1982	3,433	2,338	3,513	2,652	11,936
1983	2,061	1,504	1,782	2,448	7,795
1984	1,783	1,382	2,154	1,703	7,022

Source: CSSRA Annual Statistical Report.

TABLE 4

Shipyard Employment in Canada

	CSSRA[1]	72-002[2]	42-206[3]
1971	7,799(a)	13,452	13,259
1972	10,377	16,293	14,647
1973	10,654	15,300	15,062
1974	9,365(b)	14,558	14,725
1975	13,156	16,072	16,344
1976	12,277	15,359	15,473
1977	12,379	13,821	14,598
1978	10,574	12,875	13,456
1979	11,192	14,187	16,013
1980	11,410	14,599	17,185
1981	11,947	15,305	16,692
1982	11,936	15,205	16,128
1983	7,795(c)	11,300	N/A
1984	7,022	9,433	N/A

Notes: 1. (a) In 1971, there were 11 member yards reporting. This dropped to 10 in 1972, all large shipyards.

(b) In 1974, the number of yards increased to 19 as medium size and smaller companies were recruited into the CSSRA. There were 20 in 1975.

(c) In 1983, there were 23 member yards, including several quite small establishments.

2. Statistics Canada survey data.

3. Statistics Canada census data.

CHAPTER TWO

COMPETITIVE POSITION OF THE CANADIAN SHIPBUILDING AND REPAIR INDUSTRY

CHAPTER 2

COMPETITIVE POSITION OF THE CANADIAN SHIPBUILDING AND REPAIR INDUSTRY

1.0 INTRODUCTION

Canadian shipyards do have the collective experience in the construction of a wide range of vessels and offshore equipment, but none of the Canadian yards can offer facilities comparable to those found in such shipbuilding countries as Korea, Japan, the United States or Western Europe. Moreover, the Canadian yards have both physical and equipment limitations which restrict the size and type of vessels which can be constructed or repaired. For example, Marine Industries, although one of the four largest shipyards in Canada, is located on the Richelieu River, upstream of a railway bridge, and has a size limitation imposed by the distance between abutments. No graving dock in Canada can accept a vessel larger than Panamax size. Although floating cranes can be rented for heavy lifts, the cranage in Canadian shipyards is far inferior to the heavy gantry cranes available in major foreign yards. While Canadian yards have adopted a number of construction techniques to overcome their physical limitations (Saint John Shipbuilding Ltd., for example, delivered one heavy-duty semi-submersible in 1983, but was obliged to fabricate the sub-structure in two halves for joining afloat), these limitations impede the competitiveness of the yards on international markets.

2.0 COMPETITIVE POSITION

As an introduction to the factors influencing the competitive position of Canadian shipyards, it is useful to review a number of recent bid packages from foreign and Canadian yards for like vessels. These packages are summarized in Table 1 below.

TABLE 1

Recent Bid Packages

	CANADA	JAPAN	KOREA	CANADA RELATIVE TO LOWEST BID
EXAMPLE 1 (1980) (supply vessel)	$19M-$28M	$19M	$15M	+ 28%
EXAMPLE 2 (1983) (bulk carrier) [1]	$30M	$20M	-	+ 50%
EXAMPLE 3 (1984) (offshore rig)	$108M	-	$61M	+ 77%

1. Canadian bid included cost of $5 million in offset purchases and costs of EDC financing.

In the first example, the lowest Canadian bids were competitive with Japanese bids, but not with the Korean bid (of the six vessels procured, two were sourced from Canadian shipyards and four from Korea). The higher Canadian bid packages (averaging $25 million) were from the Great Lakes and East Coast yards and suggest less than optimum estimating practice. In the third example, there is some question of whether the $61 million bid reflects full market costs. Leaving aside this issue, even with a 20 per cent tariff, the Korean bid would still be 48 per cent less than the Canadian package. Two-thirds of the final difference can be potentially explained in roughly equal proportions by the high charge-out rate used in bidding to cover all overheads with no other work in sight, high equipment prices for a single build and the need to amortize the investment and risk involved in a new product against one job.

Based on present price differentials between Canadian vessels and those produced in Japan and Korea, it is unlikely that tariffs would, on their own, reserve to domestic producers all of the domestic demand vulnerable to foreign competition. These differentials, which can include foreign subsidies and below market costing, are estimated at 50 per cent for lakers, 26 to 100 per cent for supply vessels, and 63 to 85 per cent for drilling rigs.

The failure of Canadian yards to be price competitive is usually explained by the Canadian industry in terms of the competitive advantages enjoyed by their foreign competitors, in particular their access to generous export financing and direct government subsidies. As discussed elsewhere in this paper, these factors indeed help to widen the gap between Canadian and foreign prices for similar vessels. However, to focus only on foreign aids to shipyards prevents one from identifying other factors which contribute to the Canadian industry's lack of price competitiveness. The influence of these factors is best shown through a comparison of the productivity of Canadian yards and that of their competition.

3.0 PRODUCTIVITY

In 1981, in order to place Canadian yards in an international context, A. & P. Appledore Company prepared a ranking of productivity levels of various countries' shipyards. The measure of productivity for both small and large yards was based on man-hours per ton for hull construction and man-hours per lightweight ton for the remaining work (i.e., outfit plus engineering). In this study, yards were classified in one of three broad groups on the basis of their productivity, which is shown in Table 2 below.

TABLE 2

	Productivity Level	Specifically Refers to Yards in:	Also Characteritic of Yards in:
BAND 1	Minimum for a developed country	Great Britain	Spain France
BAND 2	Good, internationally competitive productivity level	Norway Denmark (some) Sweden (some)	West Germany Japan (some)
BAND 3	Maximum or near-maximum productivity found internationally	Denmark (some Sweden (some) USA (small vessels) Korea (some)	Japan (some)

Canadian yards in general were found to fall somewhere between Bands 1 and 2. The larger Canadian yards did not appear to be as productive as the smaller ones, as the former carry larger overheads and enjoyed less union flexibility. Moreover, while the larger yards' productivity levels correlated well with technology levels, there seemed to be no marked correlation between technology levels and productivity for smaller yards.

A further indication of the competitiveness of the various shipbuilding countries, is provided in Figure 1 (below).

FIGURE 1

The Competitive Curve

Productivity - MHRS/TONNE

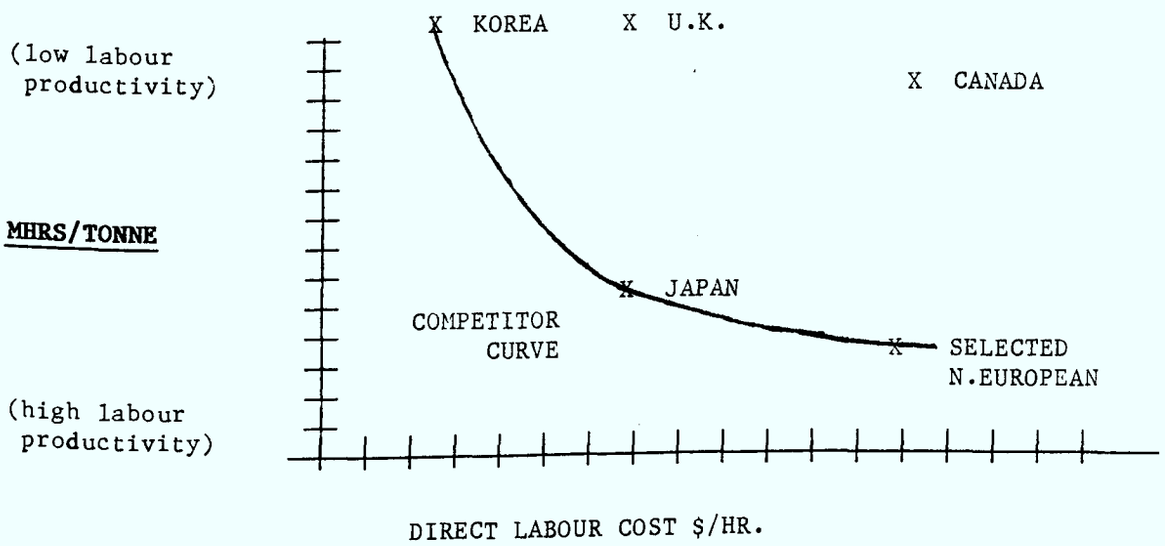


Figure 1 positions each country according to its labour productivity rating (man-hours per tonne of output on the Y axis) and direct labour cost rating (dollars per hour on the X axis). It should be noted that the graph serves only to provide an indication of the relative positions of these countries, and for this reason no specific values are assigned along either the X or Y axis.

With this in mind, it can be seen from the graph, for example, that Korea was positioned in the top left quadrant due to its low labour productivity and low wage bill. The "competitive curve" indicates combinations of productivity levels and wage rates that would produce, all other things being equal, a cost per tonne of output equal to the lowest cost producers.

Countries such as Canada, which fell above the curve, did so as a result of labour costs which are higher than their productivity levels would justify. As a result, these countries could be considered uncompetitive. However, it should also be recognized that while this was true in a general sense, Canadian yards have been highly competitive on the world market for a narrow range of specialized vessels and are competitive in the domestic market for most repairs and specified (e.g., defence) work. As with all economic environments, a number of changes could occur in the appearance of this curve, such as tighter markets and different exchange rates. In addition, should Korean yards achieve Japanese productivity levels and China emerge as a significant player, then both Japanese and North European yards would rise above a new curve and hence become relatively less competitive. There are signs that the Koreans have indeed moved closer to the Japanese production levels as the Koreans have acquired significant experience and new facilities in shipbuilding since 1981, the year on which the above graph is based. As well, China has entered the market as a very low-cost producer.

The remaining sections of this chapter review the major elements of the Canadian industry's operations and facilities which may be improved in pursuit of the productivity option.

4.0 ELEMENTS OF SHIPYARD PRODUCTIVITY

4.1 Technology and Operations Management

As part of A. & P. Appledore's 1981 study, an evaluation of the facilities and operations of Canadian yards in relation to foreign yards was carried out.[1] The methodology adopted for this evaluation involves examination of eight operational categories: steelwork production, outfit production and stores, other pre-erection activities, ship construction and installation, layout and material handling, amenities, design drafting, and production engineering, lofting and operating systems.

Several trends emerged with respect to the large yards:

a) On average, medium and large Canadian yards lagged behind foreign yards in technology. However, the size of this margin varied with individual yards.

b) By category, the largest average technology gaps occurred in the areas of ship construction, and yard layout and materials handling. To an extent, this reflects the fact that most of the Canadian yards are still on the same site with the same overall arrangements and built-in constraints as they had 30 years ago.

c) There were noticeable gaps in the "software" areas of design, organization and operating systems possibly due to three factors:

   1) The dominating influence of ship repair on the West Coast which places less demand for sophisticated software;

   2) The use of consulting naval architects retained by the yard or prospective owners which has sometimes led to designs which were not production-oriented for a particular yard. However, as discussed previously, the impact of this factor is debatable;

   3) A short supply of competent lower and middle management required to implement software systems.

d) The smallest gap appears in steelwork production, outfit production and other pre-erection activities. These are capital intensive areas where deficiencies can be easily identified and where improvements can be made relatively easily within the constraints of the existing facility.

It is important to note that the situation described is not static. Most of the large yards have improved their technology levels over the past five to 10 years, and several Canadian yards also have future development plans under consideration. However, foreign yards have also improved their technology levels, and this area of process technology is very competitive internationally. It is evident that Canada's international competitiveness has been handicapped by the lack of such items as integrated steel-working facilities capable of production of ship block assemblies, and heavy cranage facilities to transport these assemblies in the yard. However, many Canadian yards have made improvements in these areas over the last few years.

Significant points which emerge from the comparative evaluation of smaller yards include the following:

a) The average technology gap between small Canadian yards and their competitors is the same as with the large yards;

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1. A. & P. Appledore (1981).

b) Again, as with the large yards, the leading small Canadian yards are reasonably competitive technologically with similar sized yards abroad;

c) Apart from outfit installation, the largest gaps appear in the areas of ship design, production of working drawings and production engineering. The causes appear to be the same as outlined for the larger yards: a greater orientation towards repair rather than new building, a history of dependence on 'bought-in' design and a shortage of good lower and middle management.

The average technology levels of both Canadian and foreign small yards lag behind those of their larger counterparts. This is to a large extent to be expected: smaller yards do not need, nor could they support, the advanced technology of larger yards in areas such as high capacity berth cranage, or sophisticated operating and organizational systems. On the other hand, a number of areas of technology are just as important for small yards as for large ones (although possibly with a different emphasis), including steel and outfit production, outfit installation, layout, material handling, ship design and production engineering.

While the above discussion has centred on the technology present in Canadian yards, it should also be noted that some Canadian yards possess the ability to assemble technologically sophisticated vessels. This ability is possessed by other yards in a small number of other countries. All countries where such yards are to be found have high costs and thus higher priced products. The combination of import duties and these high prices make Canadian yards competitive within the domestic market for technologically advanced vessels such as frigates.

4.2 Labour Costs

Table 3 below provides a comparison of labour costs of 18 shipbuilding nations.

TABLE 3

Comparative Labour Costs

Hourly Compensation
1975 and 1982

COUNTRY OR AREA	1975 U.S. DOLLARS	1975 INDEX U.S. = 100	1982 U.S. DOLLARS	1982 INDEX U.S. = 100
United States	6.89	100	13.78	100
Canada[1]	6.83	99	12.81	93
Hong Kong[1]	1.02	15	2.11	15
Japan	3.93	57	7.09	51
Korea	0.60	9	2.36	17
Singapore[2]	1.18	17	2.45	18
Taiwan	0.67	10	2.38	17
Belgium	8.15	118	10.72	78
Denmark	7.04	102	9.32	68
Finland	5.50	80	8.16	59
France	5.17	75	8.81	64
West Germany	7.09	103	11.61	84
Greece[2]	2.01	29	4.39	32
Italy	5.75	83	8.26	60
Netherlands	7.07	103	10.21	74
Norway	7.46	108	11.65	85
Sweden	8.08	117	10.32	75
United Kingdom	3.67	53	7.49	54

1 EXCLUDING BOAT BUILDING AND REPAIRING.
2 TRANSPORTATION EQUIPMENT MANUFACTURING.

The table shows that wages in low labour cost countries rose with respect to U.S. rates between 1975 and 1982 and that wage rates in Northern European countries (Canada's closest competitors) fell more, relative to U.S. rates, than Canadian wages. This was due not only to the devaluation of several foreign currencies, but also to low wage settlements in these countries and high settlements in Canada. These trends, however, should not be allowed to overshadow the crucial point that, whereas in 1975 seven countries (U.S and Europe) had higher labour costs than Canada, by 1982 only one country (the United States) had higher labour costs.

Between 1971 and 1983, unit labour costs (defined as total compensation in current dollars divided by output (GDP), in constant dollars) in Canadian shipbuilding increased from 0.79 to 3.04, with an average annual rate of increase of 11 per cent. In comparison, the average annual rate of increase in unit labour costs for the automotive sector was only five per cent, rising from 0.49 in 1971 to 0.92 in 1982. Over the last five years, nominal hourly wages in Canadian shipbuilding have risen by 45 per cent. In contrast, hourly wages in Canadian transportation equipment manufacturing in general rose by 37 per cent. However, the rate of increase in shipbuilding hourly wage rates has moderated considerably since 1982.

4.3 Product Mix

Product mix has an important influence on the productivity of individual yards. Yards prefer to stay with one or two particular products in which the yard has built up expertise and for which yard facilities are suitable. However, if a shipyard ventures into a new area, it usually goes through a steep learning curve and may not be competitive because the yard and its facilities are not arranged to suit the efficient construction of the vessel. Indeed, the differences in facilities and general approach required between a yard building, for example, barges (almost all steelwork) and passenger ferries (high outfit content) are considerable. The same considerations also apply to a mixture of newbuilding and repair work. The low overall capacity utilization of Canadian yards has inhibited yard specialization which could otherwise introduce learning curve effects. In addition, the volatility of markets for particular vessel types in recent years has led many yards to prefer maintaining a capability for a range of vessel types.

4.4 Demand Factors

The sense of urgency imparted by a full order book and a tight production schedule can have a positive impact on productivity. If the order book is full, overheads and risk can be spread over a larger number of units, thereby reducing per unit overhead costs. Low capacity utilization has made it difficult for Canadian yards to spread out this overhead.

4.5 Material Costs

As noted in Chapter 1, partly due to the absence of vertical integration, the management of Canadian shipyards have less control over the costs of materials than Japanese and Korean shipyards which, on the other hand, have a larger degree of control over these costs due to their closer relationship with their equipment suppliers. Mitsubishi, for example, has its own engine and steel producing plants. Price reductions on material costs for this type of corporate arrangement are roughly estimated to total four to 10 per cent of these costs and therefore could amount to two to five per cent of total ship costs in Japan. Two other important factors which exacerbate the Canadian yards' problem of material cost control include their dependence on imported high value marine components and the lack of volume purchasing arising from the small scale of Canadian production. As well, the need to import marine components entails substantial transportation costs which integrated Japanese firms do not face and duty which must be paid on imported goods.

ANNEX 1

Productivity Measures for SIC 327, Shipbuilding and Repair

YEAR	OUTPUT $ CONSTANT 1971 = 100	PERSONS EMPLOYED TOTAL ACTIVITY	COMPENSATION $ CURRENT TOTAL ACTIVITY	OUTPUT PER PERSON TOTAL ACTIVITY	UNIT LABOUR COST TOTAL ACTIVITY
	(1)	(2)	(3)	(4)	(5)
1971	135,000,000	13,259	107,122,000	10,182	0.79
1972	156,000,000	14,647	124,914,000	10,651	0.80
1973	161,800,000	15,062	143,245,000	10,742	0.89
1974	155,900,000	14,725	162,729,000	10,587	1.04
1975	173,100,000	16,344	206,608,000	10,591	1.19
1976	161,800,000	15,473	222,891,000	10,457	1.38
1977	158,200,000	14,598	231,813,000	10,837	1.47
1978	133,600,000	13,456	235,409,000	9,929	1.76
1979	162,600,000	16,013	305,414,000	10,154	1.88
1980	181,100,000	17,185	357,621,000	9,799	1.97
1981	176,200,000	16,692	411,870,000	9,891	2.34
1982	159,700,000	16,128	438,497,000	10,169	2.75

Notes: 1) GDP for SIC 327 Constant Dollars (1971 = 100). This is by definition value added in this sector.
2) Total Employed Census: Includes all salaried and production employees of the firms total activities.
3) Total Compensation: Compensation, including both salaries and wages, for all employees in total activity of the firm.
4) Output Per Person: Value Added (GDP $ Constant) per person employed in total activity.
5) Total Activity Unit Labour Cost: total compensation in current dollars divided by output (GDP) in constant dollars. It should be noted that this is not a strict measure of productivity, but rather a general measure of competitiveness which provides an estimate of rise in labour costs associated with producing the same quantity of output in different years.

Source: Statistics Canada.

CHAPTER THREE

THE INTERNATIONAL CONTEXT

CHAPTER 3

THE INTERNATIONAL CONTEXT

1.0 WORLD DEMAND TRENDS

1.1 Decline in World Demand: 1974 - 1978

One cause of the crisis in the world shipbuilding industry has been the decline in international demand for new merchant ships, offshore equipment, and LNG and oil tankers since 1975.[1] High rates of industrial growth during the 1960s and early 1970s were manifest in high growth rates in world seaborne trade and fleet capacity (See Table 1 below).

TABLE 1

Seaborne Trade/Fleet Capacity
Annual Average Growth Rates

	1966-70	1970-73	1974-79
Shipments*	10.9%	8.9%	1.5%
Capacity**	8.2%	9.1%	8.0%

Source: Lloyd's Register of Shipping.

* Based on metric tonne measurements.

** Based on gross registered ton measurements.

Shipbuilding forecasts at the time were based on the assumption that this growth trend would continue. Existing facilities were modernized and expanded and world shipyard production doubled between 1968 and 1974.[2] International seaborne trade fell off in 1975 for the first time since the 1950s. Trade fell by seven per cent to 3,025 million metric tons in 1975 from a peak of 3,250 million metric tons reached in 1974. Some recovery in total seaborne trade occurred during the following five years to 1979 but, as shown in Table 1, shipments increased only 1.5 per cent during the period. The order book for merchant ships reflected the drop in trade during 1975 and the uncertainty surrounding the ongoing strength of the recovery. From 28 million gross tons (GRT) in 1974, the world order book for merchant ships declined by 50 per cent to 14 million GRT in 1975.

This decline in orders is less marked if the work content of a particular type and size of vessel is considered. For example, while the largest decline in deliveries occurred between 1977 and 1978, they declined by 34 per cent measured in gross tons, as compared to only 15 per cent measured in compensated gross tons (CGRT).[1] The reason for this difference is that the 1970s order book included a higher proportion of large tankers with a low CGRT factor. Thus, actual shipbuilding work did not fall as much as the gross ton measurement would indicate.

The decline in new shipbuilding continued through to 1978, when only eight million gross tons were ordered. The 1978 trough represented 30 per cent of the 1974 merchant ship order book and 11 per cent of the 1973 order book. Orders placed in the early 1970s were spread out over the decade so that output did not drop as drastically as did orders.

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1. Merchant ships are defined as vessels engaged in international trade, including lakers. Offshore service vessels are included in the category.

2. Canada did not participate in this expansion and, with the discontinuation of shipbuilding at three shipyards between 1968 and 1970, overall shipbuilding capacity in Canada declined.

Measured in gross tons, 1980 completions dropped to 38 per cent of peak 1975 output, while in compensated gross tons, completions dropped to 66 per cent of peak 1975 output.[1]

TABLE 2

Orders and Completions in World Shipbuilding (Merchant Ships) 1970 - 1983

	Orders Placed Millions of GRT	% Change	Completions Millions of GRT	Completions Millions of CGRT	% Change GT	% Change CGRT
1970	41.0		21.0	16.41		
1971	29.6	(27.8)	24.4	18.33	16.2	11.7
1972	30.4	2.7	26.8	18.38	9.8	.3
1973	73.6	142.0	30.4	19.67	13.4	7.0
1974	28.4	(61.4)	33.5	20.49	10.2	4.2
1975	13.8	(51.4)	34.2	20.46	2.1	(.2)
1976	12.9	(6.5)	33.9	19.85	(.9)	(3.0)
1977	11.1	(14.0)	27.5	19.10	(18.9)	(3.8)
1978	8.0	(27.9)	18.2	16.07	(33.8)	(15.9)
1979	16.8	110.0	14.3	14.66	(21.4)	(8.8)
1980	19.0	13.1	13.1	13.56	(8.4)	(7.5)
1981	17.2	(9.5)	16.9	14.87	29.0	9.7
1982	11.23	(34.9)	16.8	14.93	(.6)	.4
1983	19.9(est.)	77.2	15.8(est.)	15.32	(6.0)	2.6

Source: Lloyd's Register of Shipping Annual Report 1982. Appledore Report (September 1984).

A large increase in new offshore rig and drill ship construction took place in the early 1970s. The number of rig and drill ships delivered jumped from 11 in 1970 to 21 in 1971, reaching 70 in 1976 (see Table 3). This boom was primarily due to the North Sea oil field discoveries. However, by 1975, the supply of rigs far exceeded demand as signalled by the low day rates and financial losses experienced by many rig owners. The rate of growth in the size of the offshore rig fleet declined after 1976, falling from 17.8 per cent in 1976 to 7.3 per cent in 1977 and 2.4 per cent in 1978 (see Table 4). Deliveries of rigs and drill ships declined to 18 in 1978 as exploration activities slowed down worldwide. In Norway, the situation for owners deteriorated to such a degree that the government intervened through the Norwegian Guarantee Institute to help prevent the sale of Norwegian rigs to overseas interests at the low prices then prevailing. The oversupply situation in the rig market continued until the second oil price shock of 1979 when a second building boom took place.

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1. Compensated gross tons are calculated by applying a compensation factor to the Gross Registered Tons (GRT) of a vessel, which varies according to the work content in the vessel. Gross Registered Tons is the gross tonnage stated in the certificate of registry of a ship. Gross tonnage is a measure not of weight but of the cubic capacity of a vessel's enclosed spaces both under and above deck including holds and deck houses. The size of a country's merchant fleet is usually quoted in gross tons, where one ton is taken to equal 100 cubic feet. A third tonnage measure is: deadweight tonnage. This is the measure of the ship's total carrying capacity in tons avoirdupoids weight including cargo, fuel, passengers and crew when fully loaded down to her permitted load line. The relationship between gross tonnage and deadweight tonnage will, of course, differ considerably according to the type and size of vessel.

TABLE 3

Rig/Drill Ship Deliveries
1970 - 1983

	Submersibles	Drill Ships	Semi-Submersibles	Jack-ups	Total	Percentage Change
1970	1	2	2	6	11	
1971	-	11	2	8	21	91
1972	-	9	3	3	15	(29)
1973	1	2	12	10	25	67
1974	-	16	11	29	56	12.4
1975	5	12	28	4	49	12.5
1976	-	13	28	29	70	30
1977	2	12	24	20	58	(17)
1978	1	3	5	9	18	(69)
1979	4	4	2	32	42	133
1980	2	1	1	33	37	(12)
1981	1	5	7	71	84	127
1982	2	1	1	112	116	38
1983	13	22	41	28	104	(10)

Source: Appledore Report (September 1984).

TABLE 4

Offshore Mobile Rig Composition
1970 - 1985

	Number*	Percentage Change
1970	204	
1971	218	6.9
1972	225	3.2
1973	254	12.9
1974	281	10.6
1975	325	15.7
1976	383	17.8
1977	411	7.3
1978	421	2.4
1979	449	6.7
1980	493	9.8
1981	565	14.6
1982	685	21.2
1983	757	10.5
1984	772	2.0
1985	780	1.0

Source: Offshore Mobile Rig Outlook (April 1983)..

* Growth rates based on number of rigs are only approximations of level of activity in the industry.

1.2 Uneven Recovery: 1978 - 1983

Recovery from the slump in demand experienced from 1974 to 1978 has been uneven and tentative due to the economic recession and persistently high levels of industry overcapacity. Orders for merchant ships increased from 8 million GRT in 1978 to 16.8 million GRT in 1979, climbing again in 1980 to 19 million GRT. This recovery was not sustained, and new orders declined to 11.2 million GRT by 1982. However, orders totalling 19.9 million GRT were placed in 1983, the highest volume of new orders since 1974. The unexpected surge in demand was due to the faster than anticipated rate of economic growth and the exceptionally low prices prevailing in the marketplace. It should also be noted that a single Japanese company ordered 2.5 of the 19.9 million GRT total. This large

purchase apparently acted as a signal to other buyers and helped initiate the surge in new orders. Completions, of course, lag behind orders. The lowest level of completions, 13.1 million GRT, occurred in 1980, followed by an upward trend until 1983, when a slight decrease occurred. Output measured in compensated gross tons, however, has increased steadily since 1980.

As oil prices increased after 1979, the offshore rig fleet grew at rates of 15 per cent, 21 per cent, and 10.5 per cent in 1981, 1982 and 1983. Deliveries of rigs and drill ships totalled 84 in 1981, 116 in 1982 and 104 in 1983. However, these growth rates reflect overbuilding and are expected to fall to two per cent and one per cent in 1984 and 1985.

1.3 Short-Term Demand Outlook: 1984-1987

1983 was a better year than expected for the world shipbuilding industry, but the short-term forecast is poor. In 1982, the Shipbuilders Association of Japan (SAJ) and the Association of West European Shipbuilders (AWES) predicted that newbuilding would remain at 1982 levels until 1986-87, and the A. & P. Appledore Company, in a September 1984 forecast, predicted that demand will remain at current levels until 1989. While the unexpected surge in demand in 1983 benefitted Korean and Japanese yards, the scarcity of orders received by European and Canadian yards continued. European and Canadian order books remain empty. Orders for European yards, for delivery up to 1987, total only 3.7 million CGRT, almost 80 per cent below an estimated annual capacity of 5.9 million CGRT. Given the poor short-term demand prospects, the increase in demand experienced in 1983 may result in a general dearth of orders from 1984 to 1986.

1.4 Expected Recovery: 1987-1990s

Forecasts for the medium to long term are somewhat more optimistic. The age structure of the world merchant fleet is expected to provide increasing demand for replacements in the second half of the 1980s. This, combined with increased oil exploration and development, is expected to result in increased output and substantial reduction of overcapacity. Specifically, the SAJ has estimated that annual output will reach 20 million CGRT in 1990, almost equal to the peak of 20.5 million CGRT in 1975, and well above 1983 output of 15.3 CGRT. Appledore projects an output of 18.62 million CGRT in 1990.

Appledore cautions that the market balance which is expected to occur in 1990 could be upset by over-reaction to increased demand. This might induce developed countries from postponing the withdrawal of facilities and over-expansion in South Korea and China. Further, it should be noted that while 35 per cent of Japan's capacity has been mothballed, it is not obsolete and could easily be put back into production should demand pick up. This also applies to facilities which have been mothballed in Europe.

1.5 Demand Projections by Vessel Type - Merchant Shipping Vessels

Although some sectors of the tanker and bulk carrier markets are in a position of substantial oversupply, demand for newbuilding is expected to revive by 1990. Buying of tankers has been light in recent years, and the existing fleet will begin to require replacement by the late 1980s. However, one segment of this market, LNG tankers, is in disarray due to the weakness of the gas market, and recovery is expected to be slower than for other types of tankers.

Demand for general cargo vessels is expected to grow, although it is anticipated that roll on-roll off vessels, container vessels, and small general cargo vessels, which are more versatile, will gain at the expense of large general cargo vessels.

Offshore service vessels also face poor short-term prospects, but medium- to long-term demand is expected to increase, particularly for larger, more powerful vessels with sophisticated designs.

TABLE 5

New Building Requirement
(Millions CGRT)

	Average per Year		
	1978-83	1984-89	1989-94
Tankers	1.72	2.59	3.67
Bulk Carriers/OBOs	3.0	2.81	3.50
General Cargo/Container	4.0	4.04	3.92
LGN/LPG/Chemical	1.35	1.10	1.30
Fishing Vessels		1.30	1.34
Others	4.82	3.34	3.39
Subtotal	14.9	15.18	17.12
Offshore		.86	1.50
Total Requirement		16.04	18.62
Capacity		20.70	20.80
Overcapacity		4.66	2.18

Source: Appledore Report (September 1984).

1.6 Offshore Vessels and Equipment

Within the offshore exploration equipment sector, demand for semi-submersibles is expected to recover before demand for drillships and jack-ups. The semi-submersible fleet is modern and, over the next five years, there are unlikely to be many replacements. However, as semi-submersibles can overcome many of the problems associated with the use of drill ships and can move into deeper waters than jack-ups, demand is expected to increase sharply in the late 1980s and 1990s. The jack-up market has been unable to absorb the bulge of deliveries which has occurred during the last three years, but as long as speculative ordering is resisted, industry observers predict that recovery may start as soon as 1985, with the number of new jack-ups required in 1989 similar to the level produced in the last five years. Demand for drilling ships is expected to remain low, as 25 per cent of the world fleet was delivered in 1983, and semi-submersibles are expected to capture part of the drill ship market.

The most likely sources of growth for offshore production equipment are floating production systems, particularly ship-shaped systems, and sub-sea facilities.

TABLE 6

New Building Requirement - Offshore Vessels
(Number of Units)

	1979-1983	1984-1989	1989-1994
Submersibles	22	12	16
Drill Ships	33	28	38
Semi-Submersibles	52	101	150
Jack-Ups	276	263	334
Total	383	404	538

Source: Appledore Report (September 1984).

2.0 WORLD SUPPLY TRENDS AND SUPPLY-DEMAND BALANCE

2.1 Supply Trends: 1980-1983

The shipbuilding industries in Western Europe and Japan benefitted from the buoyant world economy in the late 1960s and early 1970s and increased demand for LNG tankers and VLCCs. They were able to capture 40 and 49 per cent, respectively, of the total shipbuilding market. As indicated above, however, forecasts of continued growth proved to be mistaken, and the industry was left with considerable surplus capacity in 1975. This overcapacity continued to grow as ships ordered in 1974 did not reach the market until 1975-1977.

Industry overcapacity has been further increased as South Korea has emerged as a major shipbuilding nation. Korea's spectacular rise from twenty-third position in the world market in 1973 to second in 1983 has been made possible by technology spin-offs from Japan, cheap and abundant labour and the ability to produce a wide variety of ship types. The Korean government has been frequently accused of aggressive pricing policies and of granting excessive subsidies and export credits, but the Korean government has denied these allegations and Korean shipyards declare that they receive no direct government subsidies. Technology spin-offs from Japan to Korea are also being passed on by Korea to China; China moved from a .4 per cent market share in 1973 to a 3.5 per cent share in 1983.

2.2 Supply Trends: 1983-1990

World shipbuilding capacity, in the aggregate, is forecast to remain stable at approximately 20.7 million CGRT for the next decade (Appledore), while output is expected to increase from 15.32 CGRT to 20 million CGRT (SAJ), resulting in a balance of supply and demand. Appledore's estimate is more conservative. With demand for traditional shipping expected to increase only to 17.12 million CGRT by 1989, with an additional 1.50 million CGRT for offshore work, Appledore predicts that some overcapacity will persist into the 1990s (see Table 5).

While overall capacity is expected to remain stable, the geographical distribution of that capacity is forecast to change significantly. Korea is expected to increase both its capacity and market share, with annual increases in output of 15 per cent. Although most of the growth in the shipbuilding industries of Korea and China to date has been at the expense of European yards, in future the effects of this growth are expected to be felt by Japan. Japanese shipbuilders have already reduced capacity by 35 per cent, and further reductions are projected by 1989. Europe's share of total world capacity is projected to fall below 20 per cent in the 1980s from 5.9 million CGRT to 4.2 million CGRT. Less developed and newly industrialized countries, including China, Brazil and Korea, are expected to increase their output. It is anticipated that the Eastern Bloc's share of world output will remain constant or increase slightly.

3.0 GOVERNMENT RESPONSE TO TRENDS IN WORLD SHIPBUILDING

The initial reaction of several European countries and Canada to decreased demand and increased competition was to provide greater support to their shipbuilding industries. However, as demand continued to fall, the governments of Europe and Japan directed capital to assisting the contraction of their industries, and specializing and reducing output. Partly as a result of these initiatives, the capacity of European yards has fallen by approximately 48 per cent since 1975, while the capacity of Japanese yards has fallen by 35 per cent. Traditional government support, primarily direct and indirect subsidies and export financing, has been concentrated on the capacity which remains. Since overcapacity is expected to persist until at least 1990, government support is crucial to the survival of many yards, particularly in Europe.

3.1 Traditional Policy Instruments

Price Subsidies

Until the mid-1970s, most European countries provided direct subsidies for shipbuilding involving open-ended commitments by their public treasuries. In the midst of the shipbuilding boom, the Commission of the European Communities sought to limit the use of subsidies. The Second Directive for Shipbuilding Aids of the Commission of the European Communities established a limit for direct subsidies of five per cent in 1972 and four per cent in 1973. The Third Directive, released in 1975, encouraged the abolition of all direct aids to shipbuilding.

Several countries, including Germany and Belgium did abolish subsidies, while Britain reduced levels of subsidization. However, falling shipbuilding employment prompted France and Germany to reintroduce subsidies, at least in the short term, and the European Commission has recently proposed that EEC member states be allowed to increase aid to shipbuilding industries.

Direct price subsidies are now offered by seven out of 10 European shipbuilding countries: the Netherlands, France, Italy, Spain, Sweden, Germany and Britain. The degree of subsidy varies from seven per cent in the Netherlands to 30 per cent in France.

Japan and Korea report no production subsidies, although Lloyd's List of August 1984 states that general government aid in Japan totalled £340 million in 1984. The United States provides differential subsidies, used to subsidize the price by the amount that domestic production costs exceed those in foreign yards. The Canadian government has decided to eliminate direct subsidies, which, in 1980, were reduced from 20 per cent to nine per cent.

Yard Subsidies

In addition to direct subsidies, governments have given indirect subsidies to shipyards, usually with the aim of strengthening competitiveness. Measures used include preferential terms on loans for yards, grants for specific improvements, exemption from tax and excise duty and writing off outstanding debt. In general, such assistance has been tied to the contraction of the industry (see Section 3.2).

Export Financing

Export financing by some OECD countries is guided by the OECD Understanding of Export Credit for Ships, which limits subsidization of the market rate to eight per cent. Most OECD countries are party to the understanding. There is speculation that Korea has lowered rates below eight per cent, but recent reports from Marine Engineering/Log indicate that this is not the case.

Almost all shipbuilding nations offer export financing, and most also have home credit schemes or offer loan guarantees for domestic purchases. For instance, the United States Ship Financing Act provided direct government guarantees of up to 87.5 per cent of loans for U.S. built and owned ocean-going vessels, service vessels and drilling rigs. During the 1970s, Britain offered grants to British suppliers to offset export credit advantages enjoyed by foreign firms exporting to the North Sea.

Fiscal Policy Instruments

The use of fiscal policy instruments has also been common. Tax benefits to the industry have been provided through exemption from value-added tax, accelerated depreciation and tax deferral. Most European countries do not levy value-added tax on ships. Spain and Britain provide relief from certain indirect taxes levied on the shipbuilding industry. Britain, Norway and Canada offer special depreciation provisions to ship and rig owners, while in the United States, if proceeds from vessel disposition are re-invested in new vessel construction there is no tax on recaptured depreciation.

Non-Tariff Barriers

The purchase of domestically built vessels is also encouraged through moral suasion, requirements to use domestic products when competitive, and such non-tariff barriers as cargo preference legislation. Britain, Norway and Canada require domestic manufacturers to be given full and fair opportunity to supply goods and services for offshore exploration and production. In all three countries, review processes have been instituted to ensure that local suppliers are given full consideration. It should be noted, however, that the size of the North Sea markets relative to the Canadian offshore provides the U.K. and Norway with more leverage in exercising these policies.

The United States protects its market through cabotage laws, collectively known as the "Jones Act". These laws stipulate that only vessels built in the United States can engage in domestic trade, while domestic commerce is reserved to U.S. flag vessels. There are no prohibitions for drilling platforms and rigs, but no foreign vessels can engage in transporting merchandise between structures attached to the continental shelf or from the U.S. coast to the attached structures.

Tariff Barriers

Canada, Spain, Australia and the United States are the only countries which impose import tariffs on vessels. The United States has no need of tariffs for the coasting trade, since it has cabotage laws, but imposes a 7.1 per cent tariff on fixed platforms. The CSSRA, however, has expressed concern about the effectiveness of the current tariff regime in Canada, in view of the perceived adverse effects of allowing duty as an eligible expense under the Petroleum Incentive Program (PIP) particularly when combined with the operation of the temporary entry tariff system. According to the CSSRA, the effectiveness of the shipbuilding and offshore benefits policy announced in 1983, as enacted in Bill C-16, The Customs and Excise Offshore Application Act, is severely impeded by the application of the PIP and temporary entry.

3.2 Rationalization Plans

Traditional policy instruments, particularly yard and price subsidies, have been used in recent years to ease the implementation of rationalization plans in Europe and Japan. These plans usually involve capacity reduction, specialization of output and diversification into other industrial sectors.

Following capacity increases during the post-war period in Belgium, France, Germany, Italy, Britain and Sweden, the state in several countries has assumed ownership of major shipyards and initiated rationalization plans. For example, 16 yards were closed in Britain, and five shipyards have been amalgamated into two groups in France. In all of these countries except Belgium, price subsidies were either reintroduced or maintained, while shipyards were consolidated and additional yard subsidies were also introduced. For example, along with reducing capacity by 80 per cent Sweden has established specialized centres around the remaining yards and introduced employment programs to reduce regional disparities resulting from the closures.

In Denmark and Norway, capacity has been reduced but the rationalization has not been state-directed. However, government subsidies are available in Denmark for vessels with sophisticated designs, while government financing to shipyards to convert to offshore work is available in Norway.

The Spanish government has attempted to save its industry by a high level of protection and has only recently introduced a program to reduce capacity by 50 per cent, accompanied by an increase in subsidies and concessional financing.

In Japan, a capacity reduction of 35 per cent has been directed and financed by the government. It should be noted that this capacity could be easily brought back into use, given sufficient demand. In contrast, the American industry, which underwent a slight expansion in the early 1970s and the Canadian industry, which did not undergo any expansion during these periods, have yet to restructure.

Despite the rationalization policies adopted in Europe and Japan, overcapacities of 27 per cent still remain worldwide. Given the projected expansion of the Korean shipbuilding industry and the forecast for modest increases in demand, further reductions in capacity and a continuing need for government support would seem to be unavoidable.

4.0 IMPLICATIONS FOR CANADIAN INDUSTRY

As a marginal supplier to the world shipbuilding market, the Canadian shipbuilding industry benefits when world supplies are tight and suffers when world supply exceeds demand. The existence of substantial overcapacity since 1975 has served as an incentive for many countries to cut prices and actively pursue customers. This competitive environment will continue during the 1980s, as demand is not expected to increase until 1989, and even then only modest increases are projected. Given this environment, Canada's prospects of winning export contracts are limited. A recent report by A. & P. Appledore, commissioned by DRIE, stresses that international price competitiveness is even more difficult to achieve because of the direct and indirect subsidies available to foreign yards and concessional financing offered by foreign countries. Thus, the major objective for the Canadian industry would now appear to be the preservation of the domestic market against increasingly severe export pressure by foreign shipyards. In addition to securing the domestic market, efforts could be made to capture more repair work, for open flag vessels calling at Canadian ports.

APPENDIX 1

Summary Table: Government Assistance to the Shipbuilding Industry in the Major (Western) Producing Countries

COUNTRY	DIRECT SUBSIDIES	EXPORT CREDIT ASSISTANCE (TO SHIPBUILDERS)	INSURANCE NOTE 1	DOMESTIC CREDIT ASSISTANCE (TO SHIPOWNERS) CREDIT SHARE	REPAYMENT PERIOD	INTEREST*	OECD SIGNATORY NOTE 2	OTHER
JAPAN	None to shipbuilders.	Up to 80 per cent of contract price	Yes	JDB: Max. 70%	13 years	Variable	Yes	Customs duty exception for components. Cargo preference system.
				Commercial Banks: Max. 100%	8 years	c. 9%		
SOUTH KOREA	Available for vessels engaged in foreign trade.	Up to 80 per cent of vessels costs, repayment period of eight years and interest rate of nine per cent.		Max. 92%	7-12 years	9% +	No	Reduced custom duties on components and in certain cases VAT exemption. Cargo preference system.
FEDERAL REPUBLIC OF GERMANY	Federal: Direct subsidies terminated in 1981 but grants available to owners for 12.5 per cent of construction cost; in 1982, DM 170 million was available. Local: Coastal States grant financial aid to yards.	Market interest rate is subsidized by a maximum of two per cent.	Yes	Max. 57.5%	8.5 years	2% below market rate	Yes	Some exception from customs duties for components. No customs duties on ships.
SPAIN	Domestic and export orders are eligible for maximum subsidy of 9.5 per cent of contract price.	Export credits cover 70 per cent of contract price at eight per cent interest repayable over seven years. Special conditions for export to LDCs.	Yes	New: Max. 85%	12 years	8%	Yes, but withdrawn	Customs duty of 12.4 per cent on imported vessels, 9.3 per cent on vessels of EEC origin. Customs duty exemption for components. Government purchases restricted to domestic yards
				Conversion/ Repair: Max. 70%	5 years	8%		

COUNTRY	DIRECT SUBSIDIES	EXPORT CREDIT ASSISTANCE (TO SHIPBUILDERS)	INSURANCE NOTE 1	DOMESTIC CREDIT ASSISTANCE (TO SHIPOWNERS) CREDIT SHARE / REPAYMENT PERIOD / INTEREST*	OECD SIGNATORY NOTE 2	OTHER
BELGIUM	None.	In accord with the OECD Understanding on Export Credits for Ships.	Yes	Loans up to 70 per cent of value, state guarantee, interest rate reduction up to a maximum of .3 per cent. Recoverable financial aid.	Yes	Materials and equipment exempt from import duty.
DENMARK	Not granted.	Credits available for export of second-hand ships less than 10 years old.	Yes	Max. 80% / 12 years / 8%	Yes	Imported components exempt from customs duties. No customs duties on ships.
BRITAIN	Seventeen per cent of contract price under the Shipbuilding Intervention Fund.	Credits available for export second-hand ships less than 10 years old.	Yes	Max. 80% / 8.5 years / 8%	Yes	No customs duties on sea-going vessels. Components exempt from customs duties.
NORWAY	Interest rate subsidy scheme with maximum governmental contribution of Krone 1,000 million p.a.	Norwegian Guarantee Institute warrants export credits.	Yes	30%* (*New scheme provides state guarantee for up to 18 per cent of the contract price, by guaranteeing 60 per cent of second priority mortgage; the latter usualy covers 30 per cent of contract price.)		
SWEDEN	Subsidy in form of production bonus paid from 1980-84.	Up to 80 per cent export loan guarantees available.	Yes	Max. 90% / 12 years / 9.8%	Yes	Imported components exempt from customs duties. No customs duties on ships.
FRANCE	Construction subsidies granted of between 10 per cent to 20 per cent of contract price depending on both vessel and size of yard. Operational and investment subsidies also available.	Private financial institutions may grant state-guaranteed ship export credits at standard OECD terms.	Yes	Interest Subsidy: 60% / 7 years. Export cost guarantee scheme also available.	Yes	Coastal services restricted to vessels under French registry. No customs duties on ships, but import permit required.

COUNTRY	DIRECT SUBSIDIES	EXPORT CREDIT ASSISTANCE (TO SHIPBUILDERS)	INSURANCE NOTE 1	DOMESTIC CREDIT ASSISTANCE (TO SHIPOWNERS) CREDIT SHARE	REPAYMENT PERIOD	INTEREST*	OECD SIGNATORY NOTE 2	OTHER
CANADA	Construction subsidy available equal to nine per cent of approved costs of shipbuilding (not available for ships delivered after June 30, 1985).	In accord with the OECD Understanding on Export Credits for Ships.	Yes	None			Yes	Customs duty of 25 per cent on ships, duty remission on imported components and parts if used in export ship.
FINLAND	Not granted.	Cost guarantee scheme for exports Export credits available in accord with OECD.	Yes	Max. 80%	8 years	9.25%	Yes	
U.S.A.	Construction Differential Subsidy: To compensate for cost differences between U.S. and foreign-built ships. Up to 50 per cent of vessel costs may be subsidized. Operating Differential Subsidy: Subsidizes differences in operating costs.	Exim bank for export financing.	Yes	Maritime Administration guarantees obligations to aid construction financing up to 87.5 per cent of vessels' costs; interest rate is variable.			No	Inter-coastal trade and cargo preference systems. ("Jones act") 1983 research contribution c. US $20 million.
NETHERLANDS	Production subsidies available depending on vessel cost. Also investment premium scheme.	Government pays interest support dependent on size of contract over period of 8.5 years.	Yes	As per OECD terms, but with (maximum) interest subsidy of two per cent.			Yes	Imported components exempt from customs duties. No customs duties on ships.

COUNTRY	DIRECT SUBSIDIES	*EXPORT CREDIT* ASSISTANCE (TO SHIPBUILDERS)	*INSUR-* ANCE NOTE 1	*DOMESTIC CREDIT* ASSISTANCE (TO SHIPOWNERS) CREDIT SHARE	REPAYMENT PERIOD	INTEREST*	*OECD SIGN-* ATORY NOTE 2	OTHER
IRELAND	No.	Up to OECD Understanding on Export Credits for Ships.	Yes Never used	Credit facilitates up to the OECD Understanding on Export Credit for Ships.			Yes	No customs duties on ships.
ITALY	Between 17 and 23 per cent of the amount of ship-building contract, differentiated according to yard size and on a falling scale.	In accord with OECD Understanding for Export Credits for Ships.	Yes		12 years	8%	Yes	No customs duties on ships. No customs duties on components.

Notes: 1. Export Credit Insurance availability.

2. Signifies whether producer has signed OECD understanding on Export Credits for ships.

CHAPTER FOUR

DOMESTIC DEMAND AND CAPACITY FORECAST: 1984-1993

CHAPTER 4

DOMESTIC DEMAND AND CAPACITY FORECAST: 1984-1993

1.0 OVERVIEW

Regardless of the overall demand scenarios used, certain assumptions must be made with respect to the proportion of available business that will actually be obtained by Canadian shipyards. On all products, there is strong competition from foreign shipyards, most of which are working at well below their potential capacity. Also, with respect to offshore structures and, for that matter, barges and other relatively simple conventional ships, the Canadian shipyards must face domestic competition from steel fabricators and, in some cases, civil engineering firms.

Despite the possibility of obtaining work related to offshore oil and gas development, the forecasts presented in this chapter suggest that there will be significant underemployment in the industry for the rest of this decade. The effects of weak commercial demand are temporarily obscured by substantial government orders for new vessels (frigates for the Navy, a variety of ships for the Coast Guard and the ferry for CN Marine), but could become painfully evident by 1986 and could continue until the end of the period under review. Even this rather dismal picture is based on the assumption that there will be a continuation of present levels of productivity and does not allow for additional unemployment related to any reductions in the number of person-years required to build a ship.

The international picture lends support to the pessimism of these forecasts. Developing countries such as Korea have been investing heavily in new shipbuilding facilities and are vigorously competing for contracts to build almost any type of vessel, including drilling equipment and offshore structures. Meanwhile, currency fluctuations have caused a deterioration in Canada's competitive position against the European shipyards. Forecasts made by the Association of West European Shipbuilders (AWES), the Shipbuilders' Association of Japan (JAS) and A. & P. Appledore do not envisage any improvement in market conditions for at least several more years, and Canada is being squeezed between Europe, Japan and the developing countries, all of which are fighting for whatever work may be available.

The base demand forecast to follow so greatly diverges from forecasts made as recently as 1981 that some reconciliation is necessary. In 1981, there was a feeling of considerable optimism regarding offshore development. In particular, all forecasts made during that year assumed that Dome would soon be developing oil and gas in the Arctic and that there would be consequent demand not only for drilling units and supply vessels, but also for large tankers. It was seriously proposed that a new shipyard would be required to supplement existing Canadian capacity. The probability that projects such as the Arctic Pilot Project will materialize is smaller than was forecast at that time, and estimates of the size of such projects have been reduced. Other areas where the present forecast is considerably less optimistic than 1981 forecasts include the demand for conventional ships and the demand related to east coast oil and gas development. Generally, the downturn in the economy and the weakness of world oil and gas prices are factors leading to the more pessimistic present forecasts, and the only optimistic area is that related to government contracts.

2.0 BASE FORECAST BY VESSEL TYPE

This forecast has been arranged to present data for each of five segments of the domestic market: new building of commercial ships, government orders, repairs to ships and to offshore equipment, work related to offshore oil and gas exploration, and work related to offshore oil and gas development.

The forecast shipbuilding work for new construction presented in this paper is based on discussions with major potential purchasers of Canadian built vessels and identified requirements from increased traffic or service activity, new specialized product handling and replacement of obsolete or uncompetitive vessels. The scenario chosen for commercial demand could be described as intermediate. This assumes some recovery in

the Canadian and world economies, which will lead to a moderate demand for new cargo vessels. Requirements for naval and other government vessels are based on discussions with the departments concerned.

Table 1 (below) shows an average of just under 4,000 person-years, generated annually over the period from 1984 to 1993, for conventional commercial and government new construction work (excluding repair work). The main reasons behind the demand forecasts for each vessel category are outlined below.

TABLE 1

Base Forecast

Known and Projected New Construction Shipbuilding work (excluding repairs and offshore related work)

Vessel Category	Total Projected Person-Years 1984-1993
Lakers	6,200
Tankers	0
Other Cargo	0
Deep Sea Vessels	0
Fishing Vessels	4,750
Ferries	7,000
Tugs & Barges	2,300
Coast Guard	6,500
Dept. of Public Works	1,800
Dept. of Fisheries	3,400
Dept. of National Defence	7,500
Total	39,450

2.1 Conventional Commercial

The demand forecast for lakers is based on a number of factors including future demand for the three commodities (grain, iron ore and coal) which together account for more than two-thirds of the traffic by lakers on the Great Lakes/St. Lawrence system. Other relevant factors include the financial situation of major buyers and the physical constraints posed by the seaway system. Due to the uncertainty of future seaway transit of goods and the large number of vessels presently laid up, a new laker construction rate in Canada of 1.2 ships/year is forecast for the period from 1984 to 1993. This forecast is more optimistic than projections made by York University, predicting that a total of 5.6 seaway-sized vessels will be required to 1990. However, the York study also predicts a deficit of 15 to 18 seaway-sized vessels by the year 2000, which coincides with DRIE's forecast, if the 1.2 construction rate is assumed to continue until the year 2000. A study by Woods Gordon for the federal and Ontario governments concurs with the York University estimates.

No new construction for conventional tankers is forecast as current owners have no plans to replace of existing fleets, and export orders, which had been substantial in the 1970s, are not anticipated due to the large international overcapacity. No new domestic construction of deep sea vessels is forecast as the Canadian companies involved are expected to source their requirements from abroad. While demand is projected for offshore shuttle tankers for the East Coast (two 75,000 d.w. ton tankers for the Grand Banks and three 15,000 d.w. ton tankers for the Scotian Shelf), this is included in Section 2.4 of this chapter and not under conventional shipbuilding, Table 1.

The fishing vessels considered in this forecast were those over 20 metres in length on the East Coast and over 18 metres in length on the West Coast. There are currently around 800 vessels in Canada in these two categories, with each coast accounting for approximately 50 per cent of the total fleet. Policies set by the Department of Fisheries and Oceans (DFO) will result in a freeze in the size of the Canadian fleet for most

categories of fishing vessels between 1984 and 1993, and in fact may result in some capacity reduction. At best new fishing vessel construction is likely to be limited to specified replacement purposes. It has been estimated that this replacement demand could lead to new construction of six fishing vessels per year in Canada over the period. However, this will depend on a number of factors including the policies of DFO, the financial strength of the fishing companies, demand for fish products, tariff policies for large fishing vessels and the international competitiveness of Canadian builders.

The estimate of 7,000 person years of employment on new ferry construction over the forecast period is based on the acquisition plans and estimated replacements for all of the ferry operators in Canada, including the governments of Atlantic provinces, Quebec, Ontario and B.C. One negative factor which restricts new construction on the West Coast is the B.C. Ferry Corporation's recent decision to lay up two ferries until at least 1986 due to a lack of demand for their services.

Demand for tugs and barges is determined largely by the level of resource development activity in B.C. and in the Arctic. The low level of resource activity forecast from 1984 to 1993 period is expected to result in approximately 2,300 person-years of employment and a value of new production of around $400 million.

2.2 Government Orders

The six Navy frigates and related components now on order represent shipyard work valued at around $1.6 billion. Each vessel is expected to generate 1,250 person years of direct employment and a further 1,700 person years in component and systems manufacturing, with delivery of the final ship in 1992. Three of these frigates will be constructed in the Saint John shipyard, the other three in Quebec (Versatile Vickers and MIL). Although additional frigates may be required, funds have not been committed for them, and the potential demand represented by these possible orders is therefore not included in the base forecast.

Total capital expenditure for Coast Guard vessels between 1984 and 1993 will be around $1 billion, with approximately $800 million spent between 1984 and 1987. As of August 1984, the Coast Guard had eleven vessels on order at Canadian shipyards which will be delivered at various times between September 1984 and December 1987. It is estimated that the Department of Fisheries and Oceans will acquire 15 new vessels by 1993, generating approximately 3,400 person-years of employment. The Department of Public Works operates a fleet of 125 small vessels, and it is anticipated that replacement of obsolete vessels will generate around 1,800 person-years of employment over the next 10 years.

The annual breakdown of commercial and government new construction work is shown in Table 2 below. Excluding any work that may be related to offshore oil and gas exploration and development, this table gives the base forecast of the new construction work that will be available to Canadian shipyards where they are competitive in each of the next ten years.

TABLE 2

Forecast of New Construction Shipyard Work Available Excluding Offshore and Repair (person years)

	Government[1]	Private[2]	Total
1984	2,300	2,100	4,400
1985	6,200	1,000	7,200
1986	3,700	1,150	4,850
1987	2,300	2,300	4,600
1988	1,700	2,300	4,000
1989	1,000	2,500	3,500
1990	1,000	2,300	3,300
1991	1,000	2,200	3,200
1992	0	2,200	2,200
1993	0	2,200	2,200

Note: 1 Government work is based on projects approved.
2 Private work is an estimate and has a lower confidence factor, particularly in the later years.

2.3 Repairs to Ships and to Offshore Equipment

Repair and conversion work in member yards of the CSSRA was worth about $300 million (equivalent to approximately 4,000 jobs) in each of the years 1981 and 1982, before falling off to just over $200 million in 1983. Work done on Canadian vessels represented 90 per cent of the total and work done on foreign ships amounted to only $30 million in 1981, $42 million in 1982 and $20 million in 1983.

With the present international overcapacity in ship repair facilities, it is unlikely that any significant improvement can be expected in the volume of repair work to foreign ships. Meanwhile, the recent recession and the slowness of the recovery have resulted in the Canadian merchant fleet operating at well under potential capacity, reducing available domestic repair business.

Some additional work could be attracted to Canada if a new dry dock, wide enough to accommodate drilling rigs, were to be put into operation on the East Coast. The amount of work available could also be increased through the amendment of the Canadian Oil and Gas Land Administration's (COGLA) inspection requirements for rigs. Re-engining of lake vessels could add 150 p.y./year to the work available to Ontario yards, but this project would require government assistance.

The costs of maintenance and repair work on offshore platforms has been estimated by COGLA to average $171,600 per year per rig. Given current forecasts for the level of rig activity, $6 million to $7 million per year in repair and maintenance work can be expected over the period in question. This could correspond to an additional 100 p.y./year of work, were shipyards to carry out this work.

Based on the above considerations, the level of ship repairing activity will likely average just over 3,000 p.y./year over the next decade. Due to the impracticality of attempting to forecast ship repair work on a year-to-year basis, the figure of 3,000 p.y. is used for each year from 1984 to 1987 and 3,200 p.y. from 1988 until 1991. The higher level of repair work after 1987 reflects the effect of the TRUMP program. These figures would increase by only 100 p.y./year if capital expenditures are made to permit dry-docking of rigs and other vessels that exceed the capacity of existing facilities.

2.4 Work Related to Offshore Hydrocarbon Exploration

The three market areas for floating equipment used in exploration for offshore oil and gas are: the Grand Banks (including Hibernia), the Scotian Shelf (including Venture) and the Beaufort Sea (including the Mackenzie Delta). Other areas, such as the Labrador Shelf, the Gulf of St. Lawrence, the Bay of Fundy, etc., hold relatively minor prospects for new equipment and are not anticipated to have any significant impact on demand.

The prospects for work building rigs for exploration are weak. Exploration drilling on the Grand Banks may peak in 1985 or 1986, but the short-duration demand for additional rigs could be met by chartering on the world market and/or by transferring semis from the Scotian Shelf. On the Scotian Shelf, exploration rig demand has probably peaked.

However, the two or three additional rigs required at that time will most likely come from existing world supply and will not be built specially for this service because rig, requirements after 1986 are expected to be back down to 1983-84 levels. There is no foreseeable demand in the base scenario for new drilling rigs in the Beaufort Sea. If demand should develop on the Alaskan side, it is unlikely to result in contracts to Canadian shipyards. In summary, the base forecast is that no new exploration rigs will be built in Canada during 1984-1993.

It is commonly agreed that there is a requirement for two to three service vessels per rig. It is projected that exploration activities will utilize 12 to 15 drilling rigs, over the next three to five years. With two service vessels per rig this would mean a requirement for 24 to 30, and with three per rig this would mean a requirement for 35 to 45 vessels. There are some 30 duty-paid or grandfathered service vessels working on the continental shelf, and 10 could be retired in the near future. Therefore, any demand for additional service vessels off the East Coast is likely to come from replacements.* There is also a possibility of two new service vessels being required for exploration in the North.

Potential demand for new construction of offshore service vessels (OSVs) in Canada is difficult to predict due to highly competitive international market conditions, uncertainties regarding the role of retirement of the existing fleet, the availability of foreign-built vessels and the anticipated re-entry into Canadian waters of as many as six Canadian vessels which have been working abroad and have acquired rights.

In the light of world oversupply and expectations of continuing world overcapacity for offshore service vessel construction until at least 1990, we have included no provision for Canadian service vessel work in our base forecast for 1984-1993. Nevertheless, if Canada were to capture orders for those service vessels which may be required, it would be of significant benefit to Canadian yards, creating 200 to 250 person years of employment per vessel.

2.5 Work Related to Offshore Hydrocarbon Development

On the Grand Banks, development of oil is projected to begin with a floating early production system in 1989 followed by a concrete-base gravity structure (GBS) in 1991. The floating base (possibly, a semi-submersible of the GVA-5000 type) could be built in Canada, but would be subject to extreme price competition and as a result will likely be foreign-built while Canadian suppliers, but not necessarily shipyards, could fabricate the topsides. The GBS will probably be built in Newfoundland by a non-shipyard consortium with topsides fabricated elsewhere in Canada. Two or three additional service boats will be required for this offshore development and may be built in Canada, while two shuttle tankers (75,000 d.w. tons) could also be built for delivery in 1989-1991.

On the Scotian Shelf, if reservoir delineation and marketing both produce satisfactory results, Venture and other gas fields may proceed, with contracts let in 1987 for completion in 1989 or 1990. Steel structures will be fabricated on shore, again not necessarily by a shipyard, and installed off Sable Island. The topside modules will be fabricated in Canada and barged to the site for installation. Pipe will be laid using foreign (specialized) vessels. Perhaps three tankers of about 15,000 d.w. tons will be required for natural gas liquids and three or four offshore vessels could be required to service the offshore facilities.

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* Forecasts related to the offshore supply vessel market and replacements are being reviewed further in consultation with COGLA.

It is assumed in the base case that any development in the Beaufort Sea region during the next decade will take place in shallow water, drilling from artificial islands and bringing the hydrocarbons ashore by pipeline. Use of these artificial islands will require comparatively little dredging work. As well, with a lower rate of exploration and development work than originally forecast, it is not expected that significant work will result for Canadian shipyards.

Under the base scenarios and assumptions described above, there will be very little shipyard work related to construction of production structures and platforms. The principal work that is envisaged may arise from construction of: 1) two or three service vessels for the Grand Banks, to be delivered by 1989, and three to four for the Scotian Shelf; 2) two shuttle tankers (75,000 d.w tons each) for the Grand Banks, to be delivered by 1989; 3) three tankers (15,000 d.w. tons each) for the Scotian Shelf gas plant, delivery 1990. Projected employment as a result of this potential new construction in Canada is built into the forecast employment in Table 3 (below). Some repair work at the production stage may also be generated for Canadian yards and, although this work is not incorporated into the forecast, it could well range between 100 and 300 person-years per year by 1992.

2.6 Base Forecast Demand Summary

The base forecast is summarized in Table 3, which projects new construction for Canadian shipyards over the ten-year period from 1984 to 1993 expressed in person-years at current productivity levels.

The table includes offshore-related contracts as well as conventional shipbuilding and ship repair. It shows a surge in 1985, attributable entirely to government contracts, followed by a sharp drop in work that will bring employment, in 1986 and subsequent years, back down almost to the level of 1983-1984.

Employment from 1986 to 1988 is expected to average around 8,200, below present levels of 9,300, and approximately 70 per cent of average employment during 1975-1982, a period when the shipyards were operating at well below their full capacity. From 1989 to 1991, shipyard employment is forecast to average around 7,500 or just over 60 per cent of 1975-1982 employment.

TABLE 3

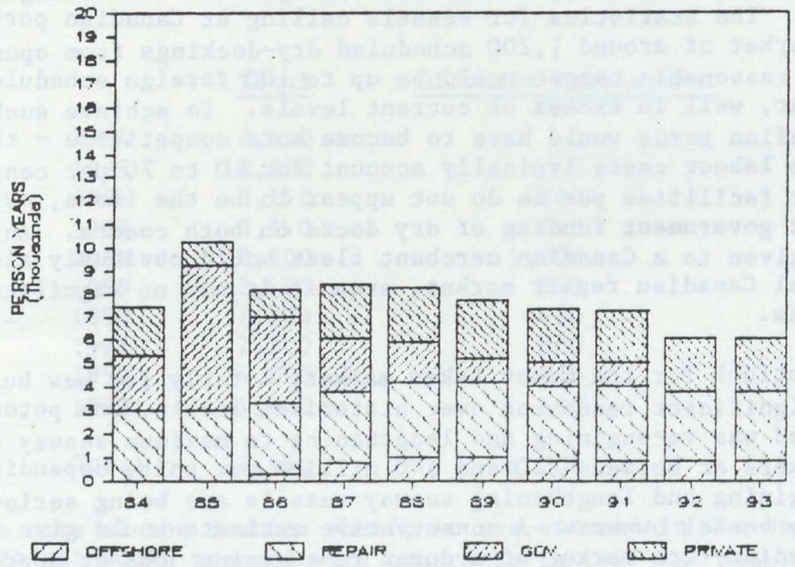
Base Forecast of Total Shipyard Work (Person-Years)

Calendar Years	Ship Repairs	New Construction	Offshore Development	Total Work
1984	3,000	4,400	0	7,400
1985	3,000	7,200	0	10,200
1986	3,000	4,850	300	8,150
1987	3,000	4,600	750	8,350
1988	3,200	4,000	1,000	8,200
1989	3,200	3,500	950	7,650
1990	3,200	3,300	800	7,300
1991	3,200	3,200	800	7,200
1992	3,000	2,200	800	6,000
1993	3,000	2,200	800	6,000

Note: New construction work in 1992 and 1993 excludes any government procurement since procurement for those years has not yet received government approval.

FIGURE 1

Base Forecast Total Shipyard work
1984 - 1993



3.0 OPTIMISTIC DEMAND SCENARIO

The base scenario presented above provides a best estimate of potential work that could be captured by Canadian shipyards, given current competitive conditions and existing policies. However, under more favourable circumstances certain areas of domestic demand could stimulate shipyard activity over and above the base scenario. Favourable circumstances could include changes in the economic environment (e.g., energy prices), the competitiveness of Canadian yards, devaluation of the Canadian dollar or government policy (e.g., DND capital budget, program eligibility) and could have a significant impact on overall capacity utilization.

3.1 Government Procurement

Given the already considerable impact of the SRCP Program on government ship procurement, there are few areas where additional procurements could be accelerated. One prime area is that of **Defence.** Not only are there a number of marine projects being planned at DND, but there are also possibilities for re-profiling these projects as well as accelerating them, if the real increase in the DND capital budget is maintained and/or extended. These include a variety of harbour, coastal and auxiliary vessels, the submarine program and the second phase of the frigate program. For the purposes of this analysis, only the latter two projects are considered.

The submarine and frigate (SRP II) programs could have a combined cost of $3.5 billion (1984-85 dollars). Neither of these programs is likely to start before 1987, and both could be affected by budgetary and scheduling decisions, which could mean that two-thirds of their combined expenditures could occur within our forecast period (to 1993). This could mean an increase in shipyard activity of between 1,000 and 1,500 person years per annum from 1987.

A second potential area of government activity relates to the **Polar (Class 8) icebreaker.** While this $500 million project has been on the books for a number of years, its urgency has subsided over the last few years with the reduced expectation of tanker traffic in the Arctic. The project is now in the contract definition stage with three shipyards to report early in 1985. A potential start to this project in early 1986 would mean an average of 500 person-years of additional employment for four to five years subsequently.

3.2 Traditional Commercial Requirements

There are few areas of potential demand for Canadian shipyards beyond those included in the base demand forecast. In terms of repair, in 1983 less than 10 per cent of **repair** turnover was gained from foreign repair work. The statistics for vessels calling at Canadian ports show a potential market of around 1,200 scheduled dry-dockings from open market vessels. A reasonable target would be up to 100 foreign scheduled repair jobs per year, well in excess of current levels. To achieve such a target, Canadian yards would have to become more competitive - this is a market where labour costs typically account for 60 to 70 per cent of a job. Repair facilities per se do not appear to be the issue, especially given recent government funding of dry docks on both coasts. Any incentives given to a Canadian merchant fleet would obviously also affect the potential Canadian repair market, even if it had no significant impact on new builds.

While the outlook for the **Great Lakes market**, notably for new builds, was for a significant reduction over historical levels, one potential area not discussed was re-engining and lengthening to maximum seaway size. With new lakers at between $30 and $40 million per unit, depending on type, re-engining and lengthening seaway vessels are being seriously looked at by vessel owners. A conservative estimate would give a potential medium-term market of a dozen re-engining jobs at approximately $5 million each. With engines being imported, however, the industrial benefits to Canada would amount to only 75 person-years per vessel. While the economics of re-engining appear marginal (six per cent real return) to operators at the moment, both market and government program and policy adjustments could accelerate these projects. For illustration, given appropriate conditions, two vessels could be converted per year to the end of the forecast period. However, shipyards would have to be more competitive if they were not to lose work to non-shipyard operations.

While much more speculative, **specialized product areas** where Canadian yards would appear to have some potential in the international market include:

i) mid-range cargo vessels;
ii) small container and Ro-Ro ships;
iii) small tankers; and
iv) icebreakers and research vessels.

Many of these areas represent growing market opportunities in developing countries, many of which do not have shipbuilding capacity. Apart from normal competitive problems, shipbuilding has never been an area of concentration for CIDA financing, an issue which would also likely have to be addressed for significant results to be achieved.

3.3 Offshore Development

It is apparent from earlier discussions that the potential for industrial benefits from East Coast offshore oil and gas **exploration** has all but been lost, other than for the odd service vessel, and that the real question has become potential opportunities in offshore **development** for both the Grand Banks and the Scotian Shelf. As can be seen from Table 4 (below), rather than serving to sustain historical employment levels, offshore development is currently forecast to provide only eight per cent of total shipyard work over the period.

TABLE 4

Base Forecast Shipyard Work
(Person-Years)

	Total	Offshore Development	Offshore as Percentage of Total Work
1984	7,400	0	0%
1985	10,200	0	0%
1986	8,150	300	4%
1987	8,350	750	9%
1988	8,200	1,000	12%
1989	7,650	950	12%
1990	7,300	800	11%
1991	7,200	800	11%
1992	6,000	800	13%
1993	6,000	800	13%
Total	76,450	6,200	8%

In the case of the Scotian Shelf, it was assumed in the base forecast that the project would proceed with contracts in 1987 and completion in 1989-90. The offshore structures (production complexes) were not included in the base forecast of demand for shipbuilding, due to competition from both foreign yards and non-shipyards; however, three tankers and three to four offshore vessels were included. Two conditions could increase shipyard demand. If the offshore production structure and relevant deck modules were built in shipyards, requiring competitive bidding against other metal fabricators, this could provide 750 person-years of employment per year in 1988 and 1989. If there were a more extensive near-term development of the Scotian Shelf, as many as six fields could be developed by the late 1990s. In these circumstances, the fabrication for the first field from 1987 to 1989 could be followed by work related to later fields, with a second set of offshore structures and incremental support vessels built from 1989 to 1991. This would yield an additional 850 person years of employment in each of those years.

The assumption in the base forecast for the Grand Banks was for an early floating production system in 1989, followed by a concrete-base gravity structure. With international competition for the floating system and domestic (metal fabrication) and international competition for the topsides, no work was included in the base forecast for shipyards, other than two or three service vessels and two to four shuttle tankers.

In the potential demand scenario are again two possibilities for increased shipyard work. If the floating systems were built in Canada, this could create 2,000 person years of potential shipyard employment. If the Grand Banks were developed exclusively through floating systems, this would increase the potential competitiveness of Canadian yards through potential scale effects in addition to increasing the total demand. Under these assumptions, 1,000 shipyard jobs would be created in 1986 and 1987 for the first floating production system, 2,000 person years for the floating system delivered every two years thereafter, plus 750 person-years per year for service vessels and shuttle tankers. If, rather than a series of floating production systems, an early floating production system were followed by a gravity-based production system, this would still generate 2,000 person years of employment per year from 1990. However, a gap in demand would exist in 1988 and 1989 between the delivery of the floating and gravity-based systems.

It is apparent from Table 5 (below) that it would take all of the above more optimistic assumptions and scenarios, including the prerequisite competitive reaction on the part of the shipyards and sizeable government support, to provide a potential shipyard demand sufficient to maintain employment at the levels experienced in the 1970s (i.e., 60 per cent of maximum capacity). It is also apparent that most of these items would fit quite nicely into the drop in demand once current government shipbuilding projects are completed in 1986.

TABLE 5

Canadian Shipyards

Potential Demand (person-years)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
DND Projects				1,250	1,250	1,250	1,250	1,250	1,250	1,250
Polar 8				500	500	500	500	500	-	-
Re-engining		150	150	150	150	150	150	150	150	150
Scotian Shelf					750	750	850	850	850	850
Grand Banks			1000	1000	1,750	1,750	1,750	1,750	1,750	1,750
Arctic	-	150	270	270	270	270	270	-	-	-
Subtotal Potential	0	300	1,420	3,170	4,670	4,670	4,770	4,500	4,000	4,000
Base Forecast	7,400	10,200	8,150	8,350	8,200	7,650	7,300	7,200	6,000	6,000
Grand Total	7,400	10,500	9,570	11,520	12,870	12,320	12,070	11,700	10,000	10,000

FIGURE 2

Forecast of Total Shipyard Work (Including Potential Demand) 1984 - 1993

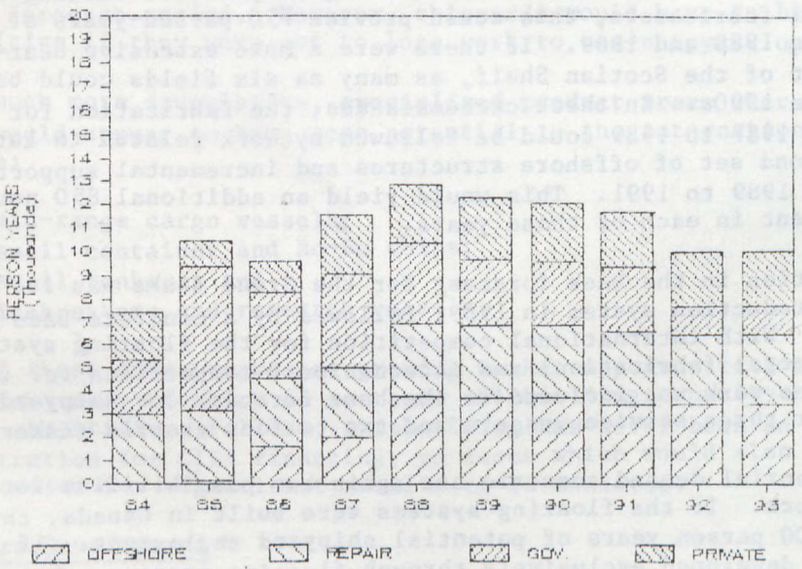
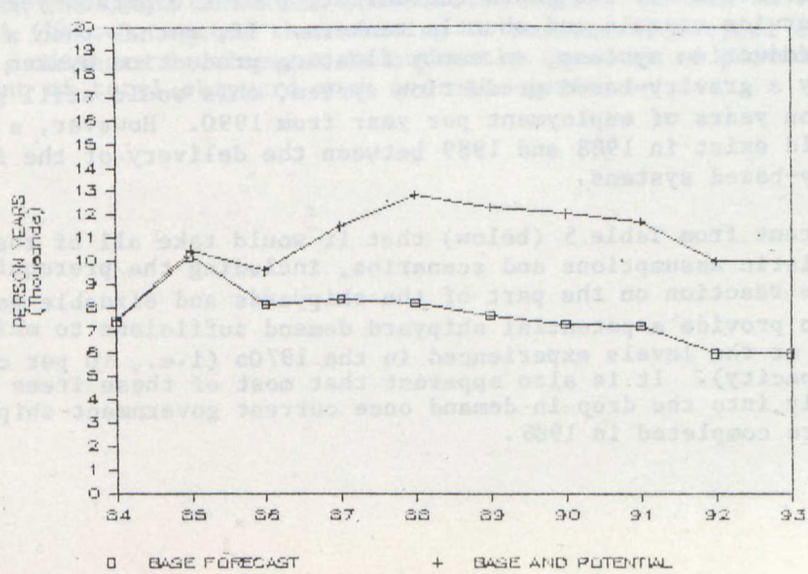


FIGURE 3

Base vs. Potential Demand Forecasts 1984 - 1993



4.0 SUPPLY

There are a number of ways in which the current and projected capacity of the Canadian shipbuilding industry could be measured. Ideally, a whole range of factors should be considered in the measurement of capacity, including maximum employment and steel throughput, financial factors, and physical and capability limitations. All of these impact on capacity and vary significantly between individual shipyards. In theory, then, a model for each shipyard incorporating all of these factors could be developed which would provide a relatively accurate measure of capacity, and an aggregate model by region or for the whole Canadian industry could also be prepared.

Such a sophisticated analysis was not possible for this study. However, it was determined that the factor setting an upper limit on capacity in Canadian shipyards would be the maximum amount of labour which could be efficiently utilized, including supervisory staff and tradesmen. Each shipyard was asked to state what it considered to be its maximum employment level for both new construction and repair, and these were amalgamated for the whole industry. These figures, supplied by the shipbuilding companies, indicate that the Canadian shipbuilding and repair industry could employ 19,300 persons if all shipyards were working at full capacity. This "maximum capacity" was broken down into 12,800 in new construction and 6,500 in repair work. This is theoretical capacity; CSSRA records for the past decade show that the highest monthly employment level was approximately 17,000 and the average for 1976-1983 was only 11,192.

As indicated earlier in the chapter, the Canadian industry has some physical constraints which affect its ability to supply products and repair services. Only three Canadian yards currently operating have built offshore rigs (Saint John Shipbuilding, Davie and Halifax Shipyard), and in each case special assembly processes had to be utilized to overcome the physical limitations of the yards. In terms of repair work, there is no dry dock in Canada which can accommodate a semi-submersible drilling rig, and the moored storage tankers proposed for the Grand Banks will probably be too wide for existing dry docks in Canada. However, substantial repair work could still be carried out in Canada using existing facilities.

5.0 REGIONAL OUTLOOK

Future regional activity is difficult to forecast, since many types of ships and offshore equipment can be built in any one of the four regions. Examples given include service vessels for the East Coast, which have been built in B.C., and Kigoriak, now in service in the Beaufort, which was built at Saint John. However, based on discussions with shipowners across the country together with an evaluation of the shipyard capabilities, the regional division of work portrayed in Table 6 appears most probable. Table 6 was derived by looking at the current government orders, much of which have been allocated, and adding in "captured markets" such as Great Lakes repairs and new vessel construction, West Coast repairs, etc. This leaves a smaller proportion of the base forecast to estimate regionally. Specifically, given the regional development considerations in relation to offshore developments, all of this work was allocated to the Atlantic. It should be recognized that these estimates are highly speculative, however they do provide a useful indication of potential future capacity problems from a regional perspective.

TABLE 6

Base Regional Forecast For Shipbuilding and Repair (Including Offshore)
Annual Averages 1984 - 1993

Region	Maximum Total Capacity	Employment 1976-1983	Employment 1976-1983 Maximum Total Capacity	Projected Total Work	Total Projected Work/Capacity	Total Projected Work/Annual Average Employment 1976-1983
ATLANTIC	5,350	3,404	63.6%	2,970	55.5%	87.0%
QUEBEC	6,030	3,575	59.3%	1,730	29.0%	48.5%
ONTARIO	3,080	1,862	60.5%	950	31.0%	51.0%
WEST COAST	4,870	2,350	48.3%	2,000	41.0%	85.0%
TOTAL	19,330	11,192	57.9%	7,650	39.6%	68.4%

We could assume that each region will suffer equally in the event that demand continues to fall short of supply. However, in the absence of federal government intervention and given traditional regional markets, it seems more likely that some regions will suffer more than others. If East Coast oil and gas activity continues at the present rate, then the small volume of shipyard activity is likely only to benefit East Coast yards. Quebec could be hard hit in the absence of further federal government procurement. Quebec yards have no captive construction or repair business, and export business is no longer readily obtained. Only in a more optimistic offshore and defence procurement scenario does the Quebec outlook improve. Ontario and B.C. shipyards do have at least a significant assured volume of repair business from local vessels. As can be seen from Table 6, B.C. yards, as a whole, appear to be able to continue operations at well below peak capacity levels (average employment during 1976-83 was only 48 per cent of maximum total capacity).

CHAPTER 5

OVERVIEW OF GOVERNMENT POLICY AND ASSISTANCE TO THE SHIPBUILDING INDUSTRY

CHAPTER 5

OVERVIEW OF GOVERNMENT POLICY AND ASSISTANCE TO THE SHIPBUILDING INDUSTRY

1.0 HISTORICAL REVIEW OF FEDERAL GOVERNMENT ASSISTANCE TO THE SHIPBUILDING INDUSTRY

Since World War II, the federal government has provided assistance to the shipbuilding industry through direct subsidies, forgone or deferred tax revenue, concessionary export financing and major government procurements. Since 1961, the largest component of assistance has been through production or export subsidies.

1.1 Direct Production and Export Subsidies

Production subsidies as a device to reduce the selling price of Canadian-built ships have been provided by the federal government through various programs since 1961. The Ship Construction Assistance Program commenced in that year and paid subsidies of up to 40 per cent on commercial ships and up to 50 per cent on steel trawlers. This was replaced by the Ship Construction Subsidy Program in 1966, whereby a subsidy was offered to provide some protection against Commonwealth-built ships which could enter Canada duty-free. The 25 per cent rate of subsidy paid was reduced over time until a 17 per cent rate was reached in 1973. Neither of these programs was intended to promote exports, and only ships built for Canadian registry were subsidized.

By 1970, it became apparent that a strong demand was developing internationally and that Canadian yards could enter foreign markets if some subsidy support was made available. In November 1970, the Shipbuilding Temporary Assistance Program (STAP) was introduced offering subsidies ranging from 12.5 to 17.0 per cent of the cost of exported vessels. The program required shipbuilders to source Canadian goods where available and competitive. The rate of subsidy was dependent on the size of the ship. The program was temporary, with no new applications to be accepted after June 1972 and all vessels to be completed by the end of October 1975. These cut-off dates were subsequently extended to March 31, 1975, and October 1978, respectively. Total federal subsidies to the industry under STAP amounted to around $194 million, mainly in the 1971 to 1978 period.

In 1975, the Shipbuilding Industry Assistance Program (SIAP), was introduced to integrate the previously separate domestic and export-oriented programs. The initial program provided for a production subsidy at the rate of 14 per cent of vessel cost, and it was intended that this rate would fall by one percentage point per year until a stable rate of eight per cent was reached in 1981. As in the case of the previous export-oriented program, shipbuilders were required to source Canadian goods where available and competitive. To encourage increased investment in modern shipbuilding plants and equipment, assistance for this purpose was provided for under the Performance Improvement Grant (PIG) component of SIAP. The shipbuilder earns a "credit" equal to three per cent of approved vessel costs for all vessels built above a size specified in the program regulations. The credit can be applied as a 50 per cent grant against approved productivity improvement projects.

The SIAP was subject to a number of amendments. In 1976, the subsidy became available for conversions as well as for new construction and, in the following year, the subsidy rate was increased from 12 per cent to 20 per cent on a temporary basis. After the 1977 announcement, the 20 per cent rate was extended on five occasions. This rate subsequently declined to nine per cent for applications received after June 30, 1980. In addition, a cap of $75 million was placed on annual expenditures under SIAP for fiscal years 1980-81 through 1983/84. Federal assistance under SIAP (subsidies and the PIG component) totalled over $433 million for the 1976-77 to 1983-84 period and ranged between $70 and 75 million annually from 1979-80 to 1983-84.

In the face of dwindling prospects for exports and forecast opportunities in the domestic offshore market, the Canadian Government changed its policy measures directed towards the shipbuilding industry in early 1983. While the PIG component of SIAP was maintained, the SIAP production subsidies were phased out in favour of a uniform and extended tariff regime. With this new tariff regime and the potential for investments to meet new offshore requirements, Canadian shipbuilders were expected to compete more effectively in the domestic offshore market.

With the elimination of production subsidies for ships ordered after January 6, 1983, and delivered after June 30, 1985, it is estimated that total SIAP assistance will decline to $45 million in each of 1984-85 and 1985-86 due to production subsidies from previous applications and $15 million to $20 million per year thereafter strictly under the PIG component.

Over the last five years, additional direct assistance to the industry took the form of $100 million of grants for dry dock construction to three major Canadian shipyards. Versatile Pacific Shipyards Inc. of Vancouver received $39 million over the period 1979-80 and Saint John Shipyard received $9.6 million over the period 1982-83 to 1983-84. Joint federal-Nova Scotia assistance for the Halifax dry dock amounted to $62 million, 70 per cent of which came from the federal government. The federal government is in the midst of a $200 million program to modernize the Halifax Naval Dockyard (1982-85) through DND appropriations. The federal government also provides subsidies and loans to fishermen for fishing vessel improvement and acquistion. Expenditures in the Fishing Vessel Assistance program totalled approximately $6.5 million in 1983-84.

Finally, the federal government has given direct assistance through the upgrading of the Department of Public Works Esquimalt facility and through work carried out at the Newfoundland Dockyard, which is owned by CN, a Crown corporation.

1.2 Tax Measures

Since 1949, the first owner of a Canadian-built ship has been allowed to claim depreciation at 33 1/3 per cent per annum, on a straight-line basis compared to 15 per cent per year on a declining balance basis on foreign-built ships. The October 1981 budget reduced this accelerated write-off by reducing the depreciation by one-half to around 16 2/3 per cent in the first year only, 33 1/3 per cent in the next two years and 16 2/3 per cent again in the fourth year. The value of accelerated depreciation was initially enhanced by the leasing property provisions of the Income Tax Act, which allowed financial institutions and other high income companies to purchase a new vessel, lease the vessel to an operator, then apply any losses created through taking the CCA on the leased property against income from other sources. This provision was changed in May 1976 so that only a corporation whose principal business was renting or leasing property could claim CCA to create a loss on leasing property. Thus a tax shelter which had previously provided an incentive to purchase and lease ships in Canada was virtually eliminated.

From 1957 until 1975, special tax relief was granted to shipowners for converting or building replacement vessels in Canada. Under what was sub-section 13(15) of the Income Tax Act, depreciation recaptured on disposition of a ship was not taxable if the proceeds were used to construct a replacement or for conversion work in a Canadian shipyard. This measure was particularly valuable between 1957 and 1961, but lost some of its popularity after the introduction of subsidies as the benefits could not be cumulative. During subsequent years, it was used chiefly to reduce the cost of conversions, which were not subsidized until 1976, and for ships below the minimum size for subsidy.

1.3 Export Financing

Although export financing from EDC has become less relevant as exports from our shipbuilding industry have declined in recent years, it was of more relevance in the early 1970s and is available on future export business which qualifies. As an example, concessionary export financing through EDC loans was estimated to be worth $3.5 million per year over the eight year period 1969 to 1977, using a very conservative opportunity cost

of 9.5 per cent and about $10 million per year using a more realistic opportunity cost for government funds during that period of 13 per cent.

1.4 Government Procurement

Federal government procurement has been a significant factor in maintaining industry production and development since World War II and at various times has constituted the major portion of industry activity. In addition to the major benefits derived by the industry from these major purchases, government procurement premiums are often significant, although difficult to measure.

The importance of the government as a customer for the shipbuilding industry has varied over the years and government procurement is currently critical to the survival of the industry. At the end of 1983, Canadian shipyards had 27 vessels under construction or on order. Of this total, 16 vessels were federal government orders made in 1983 through the Frigate Program, SRCP and CN Ferry. However, delivery of these ships will be on a phased basis from 1985 through 1992. The government orders, including those of CN Marine, represent around $2 billion of shipyard work and $2 billion of associated components and service activity. These government orders accounted for 74 per cent of the value of the new orders placed with the Canadian industry in 1983 and have been a lifesaver for the sector. Federal government orders over the 1984 to 1993 period are expected to generate a major portion of shipbuilding work.

1.5 Summary of Assistance Measures and Comparison with Other Sectors

As indicated in the above sections, the Canadian shipbuilding industry has received substantial assistance since the early 1960s, both in terms of direct production and export subsidies and other measures such as accelerated tax write-offs, export financing and major government procurements. Under the various programs since 1961, the industry has received more than $1 billion in direct subsidy assistance alone from the federal government, excluding the cost of tax measures, government procurement premiums and export financing.

Direct subsidy assistance to the shipbuilding industry from 1979-80 to 1983-84 has averaged $75 million per year, mainly under the SIAP program. During the years 1979 to 1982, the survey data given on page 25 indicates that employment has averaged around 14,824. Therefore, a very broad approximation indicates that direct program assistance only over the years 1979 to 1982 was over $5,059 per worker.

This is consistent with the results of a study by the Department of Finance covering the fiscal years 1982/83 to 1984/85. Total annual federal government outlays over that period for all of the manufacturing and processing sectors averaged $1,424 per employee. The aerospace sector received the highest level of support within manufacturing, amounting to approximately $15,000 per job. The shipbuilding sector, at around $6,200 per job, was the second highest among manufacturing industries, accounting for 3.2 per cent of total outlays for these sectors compared to shipbuilding's .6 per cent share of manufacturing employment.

Federal assistance to the shipbuilding industry is also high compared to that offered to sectors outside of manufacturing and processing over the 1982-83 to 1984-85 period. Total average federal government outlays per employee annually over the period were as follows:

	Federal Government Outlays per Employee
- Transportation and Communications:	$3,820
- Fisheries :	$8,350
- Mining :	$3,000
- Agriculture :	$3,600
- Forestry :	$ 700

2.0 PROVINCIAL INVOLVEMENT IN THE SHIPBUILDING INDUSTRY

The provinces have assisted their shipbuilding industries to a significant degree through a number of measures including direct subsidies, provincial ownership of major shipyards, loan guarantees, fishermen's loan boards and preferential procurement practices.

Newfoundland owns the Marystown shipyard and P.E.I. owns the Georgetown shipyard. Quebec, through Société Générale de Financement, owns 65 per cent of Marine Industries Limited (MIL). The Nova Scotia government owns dry-docking facilities at three shipyards in the province and leases these to the shipyards.

The Government of Quebec has provided financing for vessels purchased at MIL by a foreign shipowner. This was done because EDC financing was not available since the owner presented a significant potential for default on the loan needed for the purchase of the vessels.

All four Atlantic provinces have fishermen's loan boards, which offer loans at below market rates, primarily for small fishing vessels. Expenditure on this program totalled approximately $12.5 million in 1983-84.

All provinces have actively encouraged federally-funded expansion of facilities in their regions. Provinces have, in many cases, kept shipyards afloat by guaranteeing their bank loans after losses on export contracts and other events (e.g., Quebec for MIL and New Brunswick for St. John Shipbuilding). New Brunswick has recently guaranteed an $85 million loan for frigate construction to Saint John Shipbuilding.

B.C., Ontario, Quebec and the Atlantic provinces all purchase from within their provincial shipyards wherever possible when undertaking major procurements such as ferries and other provincial requirements (e.g., Ontario's self-unloading bulk carriers for Ontario Hydro coal).

Finally, the recent agreements signed with Newfoundland and Nova Scotia with respect to the development of offshore resources will provide increased opportunities for these provinces to enhance the sourcing of goods and services from within their own provinces. Since marine related work is expected to represent a significant market, shipyards in these provinces will likely be affected by these agreements.

3.0 GOVERNMENT SHIPBUILDING POLICY SINCE 1983

The phasing out of direct production subsidies announced in January 1983 was part of a package of policies designed to enhance Canadian control of the offshore areas and promote achievement of the substantial industrial and employment benefits which were expected to flow from resource activities there. The measures reflected a strategy for the shipbuilding industry which acknowledged that export opportunities would be few and focussed on what was expected to be a thriving domestic market. Canadian yards would have exclusive access to government procurement. While they would lose direct production subsidies, they would benefit from the extension of the tariff regime to equipment used for offshore resource activities and from the introduction of a uniform tariff rate of 20 per cent on drilling rigs and 25 per cent on all other vessels (except large fishing vessels) including those which previously would have been duty-free under the Commonwealth Preference. No assistance for new or improved facilities was announced. However, it was expected that the shipyards, with their capacity strained by the demands of the offshore market, would individually propose such investments, giving the government a lever with which to promote modernization and enhanced productivity.

Legislation extending customs and excise jurisdiction to the offshore and removing preferential tariffs received Royal Assent June 14, 1984, with an effective date of June 30, 1983. Legislation to give effect to the new coastal trade policy, reserving most domestic commercial marine activity in the offshore to Canadian-flagged vessels, is in the drafting stages. No production subsidies are being considered for any vessel ordered after January 6, 1983, and scheduled for completion later than June 30, 1985.