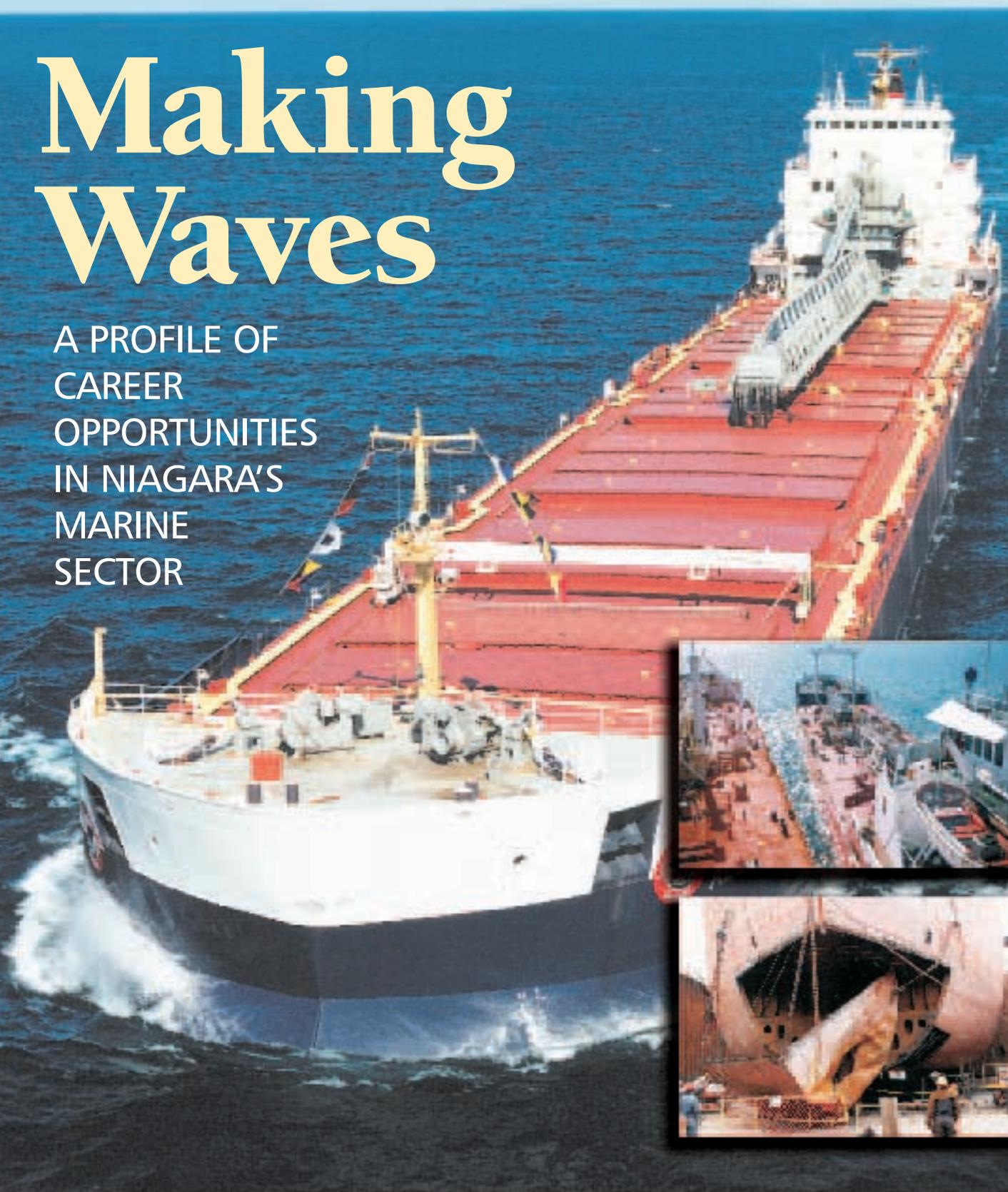


Making Waves

A PROFILE OF
CAREER
OPPORTUNITIES
IN NIAGARA'S
MARINE
SECTOR



IN PARTNERSHIP WITH AND FUNDED BY



Canadian Shipowners Association
Association des armateurs canadiens



Human Resources Development Canada **Développement des ressources humaines Canada**



Port Weller Dry Docks



Niagara College

Making Waves

A profile of
career opportunities
in Niagara's
marine sector

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We would like to recognize the gracious and candid participation of all the employers and union members who 'made' the time and effort to share their organizational and individual challenges with us. Clearly only through their involvement can we begin to develop a more valid understanding of Niagara's evolving marine industry and its emergent jobs and training requirements. The assistance and guidance provided by HRDC and the CSA is also gratefully appreciated. And, finally we would also like to express an appreciation for the leadership and project initiation work of Randy Chamberlain, Bob Birrell, and John Marchio.

July, 2000

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FOREWORD

During my interviews with industry employers, one employer referred to the marine industry as the *silent mode of transport*. It struck me then, as it does now, that he had revealed a tenet deeply entrenched in the mindset of many Niagara residents and in all probability, Ontario residents in general. Working frequently out of sight and sound, 225-metre vessels sail through the Welland Canal, quietly transporting the equivalent load of 1000 trucks, only to slip silently into the horizon of Lake Ontario or Lake Erie. The bulkers and self-unloaders, and the tankers and tugs lay low and largely out-of-sight January through March, as seasoned trades' hands ready them for their next shipping season. Sure, we know they're out there when we're inconvenienced by a raised bridge. We also know the national industry has weathered two decades of decline. For the Great Lakes fleets this has meant shrinking cargoes, fewer ships, and smaller crews. For the builders and repairers, two decades of declining work have taken their toll through closings, frequent layoffs, and precarious futures. These have all been reported. These we are conscious of.

Less conscious publicly is Niagara's 170-year history in the marine industry, an industry that affords us the safest, most cost-efficient and environmentally- friendly mode of bulk transport. Niagara's marine industry, home to Ontario's biggest marine centre, employs over 2,100 people at wages that are 60% higher than the Regional average, and annually contributes \$158 million¹ in direct spending to the Regional economy. The *silence* of the industry is particularly salient for Niagara. It's time to raise our collective consciousness.

Canadians in search of an industry and a career that promises a stable, meaningful, and rewarding future are constantly bombarded by the newer, sexier sectors, such as information technology and microelectronics. In Niagara specifically, the 'cleaner' tourism and call centre sectors have claimed more airtime of recent. The old industries are dead. Think again!

As with many of Niagara's 'grey' industries, such as auto parts manufacturing, the marine sector is facing significant labour force challenges. Throughout the past decade investments in new technology have enhanced productivity and environmental performance. It's now time for investments in people. Marine industry employers in Niagara and vicinity are facing acute shortages of qualified labour. With over 1,300 jobs projected over the next ten years, and a \$50,500 average salary across the top nine occupations, their challenge is Niagara's opportunity.

Over the past six months I've had the chance to peek into this historic and distinct industry, to reflect upon my assumptions and revise my beliefs, and assess its potential for Niagara. Through this report I will share our understanding of the needs and challenges facing this industry, and present for your consideration its unique opportunities. It's time to *make waves*.

– *Duncan MacDuff*
Study Co-ordinator,
Niagara College

¹*Economic Impact of the Marine Industry on the Niagara Region*, Dr. Lewis Soroka and Indra Hardeen, Brock Centre for Social and Economic Research on Niagara, 1998.

This report is divided into four sections.

The first section, entitled **Report Overview** includes an introduction to the report, a summary of the overall findings and a discussion of its recommendations. Study outcomes and methodology are also outlined here.

Following, in the section entitled **Sector Profile**, the sample is profiled. As well, background information about the industry structure, occupational certification requirements, and the industry's national and international contexts are presented. A brief review of the competitiveness of the Great Lakes/St. Lawrence Seaway system, an important contextual backdrop to the industry's employment and training needs, closes out this section.

Next is a presentation of the industry's **Employment & Training Needs**, with a focus upon the projected employment demands, and upgrading intentions and issues for current mariners. In this section we also consider cadet supply issues through the present training institutes, and the recruitment challenges facing industry employers and training institutions.

Finally, in the fourth and final section, entitled **Reflections & Recommendations** we try to synthesize the implications and caveats for Niagara, and propose specific strategies for further action. The Appendices (A through G) house seven sets of resource materials, including copies of each of the following elements:

- A- Occupational Profiles;
- B- Structured Employer Interview;
- C- Union Member Questionnaires;
- D- Training Institute Survey
- E- List of Participating Employers, Unions,
and Training Institutes;
- F- References;
- G- Communiqué.

Report Overview

INTRODUCTION

Marine industry employers in the Niagara Region met with Niagara College on a number of occasions over a 10 month period leading up to the summer of 1999, as individual companies and as a sector. They expressed concerns over employment and training issues for their rapidly evolving industry. Employers from both the shipbuilding and repair industry and the shipping industry called for an extensive investigation of the key employment and training issues facing the sector over the next five to ten years. They were concerned that a major portion of their present workforce would retire over the next 5-10 years. However, their evidence was primarily individual employer-based, and anecdotal. They asked for a comprehensive sector-wide investigation.

Sector employers also cited their interest in partnering with an educational institution that could provide practical and marine specific skills training in a timely and cost-effective manner. They in addition, indicated their preference for a local partner to provide them with a marine specific, Canadian-based labour pool.

Niagara College was asked by industry representatives to co-ordinate a study of the employment and training needs of the Regional marine industry, albeit within the context of the Great Lakes/St. Lawrence Seaway system. Human Resources Development Canada, encouraged by a recent economic impact study by Brock University, agreed to partner with industry employers, the Canadian Shipowners Association and Niagara College. Subsequent discussions with local representatives from the Canadian Marine Officers' Union (CMOU), Seafarers' International Union of Canada (SIU), the Canadian Merchant Service Guild (CMSG), and International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers and Helpers brought four of the most pivotal industry unions in to the study. An Advisory Group was set up, in late November 1999, to guide the study, which essentially ran January through to May, 2000.

SUMMARY OF FINDINGS

Making Waves presents the key forces, issues, and corresponding employment and training opportunities, facing Niagara's marine industry, to the year 2010. Employment totals for the employer sample are in excess of 4000 people², and represent over 90% of the Region's marine-related employment and 66% of the CSA³ fleet.

Twenty-three (23) employers, 267 mariners from four unions, and representatives from 4 training institutions participated in this study. Mariner and training institute participants reside principally in eastern Canada. The employer sample includes a broad range of employers. Forty per cent (40%) have a unionized workforce. Seven (7) SIC⁴ codes are represented, with the majority of employers falling into the *shipbuilding and repair* and *freight & passenger water transport* sub-sectors. Their number of employees is also varied.

Chart 1⁵ illustrates the employer sample by the number of employees.

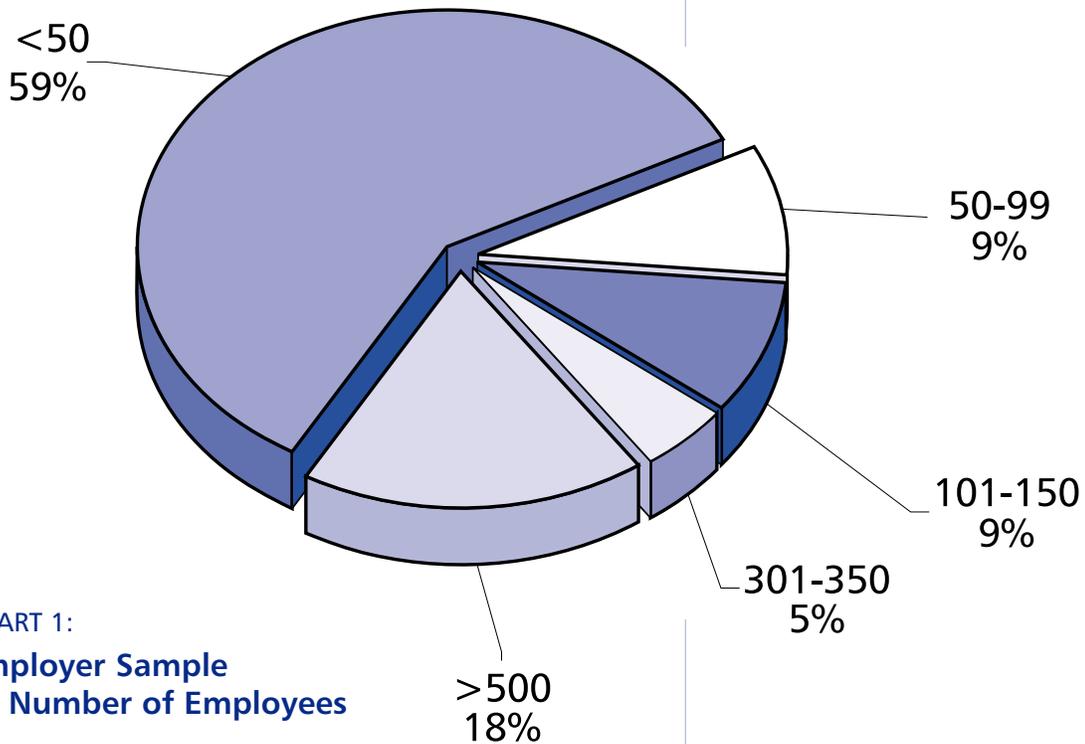


CHART 1:
Employer Sample
by Number of Employees

² Given the distinct mobility of the sector, projections from organizations that employ Niagara-based mariners but whose head offices are located elsewhere in Ontario/Canada are included in the study.

³ Canadian Shipowners Association (CSA).

⁴ Standard Industrial Classification (SIC).

⁵ A third employer was in the 101-150 category, but is presently in receivership. Their data has been excluded from the findings.

Participants cited four crucial and very interdependent labour force issues. Briefly outlined below, they include the following issues:

- an ageing workforce with significant replacement needs
- increasing cross-sector competition for skilled workers
- a lack of accessible training, and
- a lack of effective recruitment of new employees into the marine industry.

In excess of 1,300 jobs are projected to arise over the next ten years. Approximately 760 of these will occur before 2005. And fully 73% of these will arise through the need to replace retiring personnel. Over 98% of the projected jobs are for full-time work, with the majority tied to the shipping season. Nine (9) occupations account for $\frac{3}{4}$ of the projected jobs. Chart 2 illustrates the number of jobs projected by sample participants within each of the 9 leading occupations.

CHART 2:

Projected Jobs by Occupation

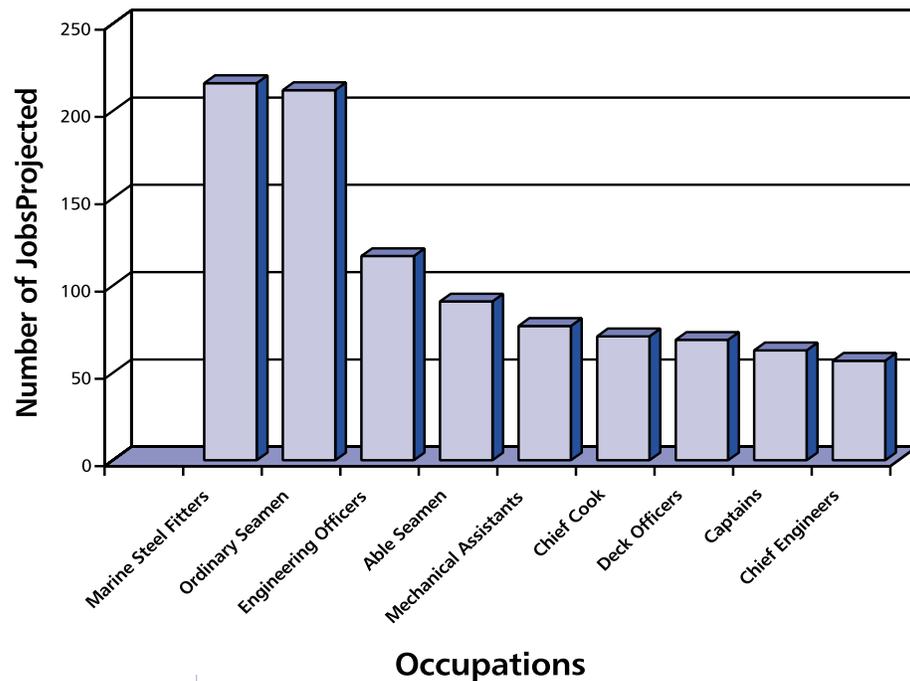
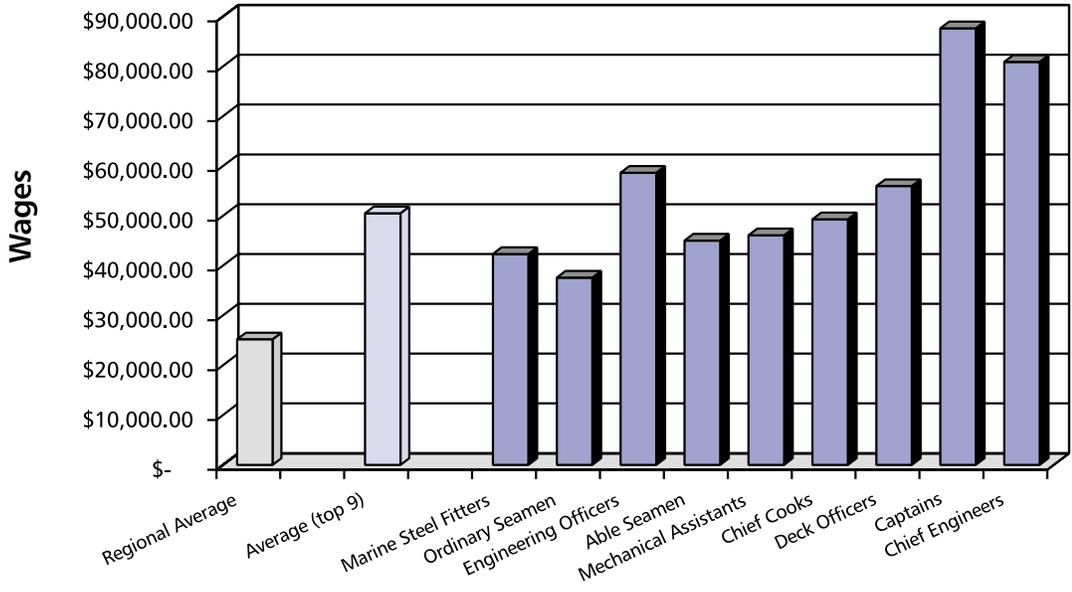


CHART 3:
Wage by Occupation



Occupations

The salary range across all of the projected occupations is from \$30,000 to \$95,800 with an average, across the top 9 projected jobs, of \$50,500, an astounding 100% above the Regional average. Chart 3 shows the average annual income by occupation.

The challenge to replace a sizeable chunk of the marine workforce is exacerbated by the increasing cross-sector competition for skilled workers. Many Regional employers⁶, including manufacturing and construction companies, have already identified their need to replace significant numbers of their workforces over the next five years.

The capacity to replace senior officers is further compounded by the lengthy and developmental learning process. A minimum of 8-10 years of combined sea service and applied education is needed to become a qualified Master Mariner or a 1st Class Engineer. Although an impressive 60% of the sample's officer respondents expressed an interest in upgrading their classifications, they also cited several training barriers to advancing their careers. The three most cited barriers include a lack of time to do the courses with limited 'off-time', expensive course fees, and high travel costs/time to training locations.

⁶ Work in Niagara 1999-2003 – A Profile of sectoral and occupational opportunities, April 1999.

Additional 'supply' issues are exposed through the relatively small number of projected cadet graduates, and the industry's lack of employment equity. The significant international demand for officers while extending the range of jobs for junior and senior officers, simultaneously compounds the replacement challenges facing the Great Lakes fleets.

Industries operating in the Great Lakes – St. Lawrence waterway contribute billions of dollars and thousands of jobs to the Canadian economy. They have played, and will continue to play, an essential role in the efficient and effective transportation of bulk goods. Working diligently with governments and other stakeholders, industry employers and associations are developing partnerships to address any threats to their competitiveness, including an ageing fleet, which will soon require significant investment in infrastructure and shipbuilding.

In the more public domain the marine industry needs to also flaunt its environmental leadership. Vessel transport on the Great Lakes and St. Lawrence River is safer, uses less fuel, and produces less air and noise pollution than carriage by road, rail or air⁷.

A skilled and ready labour force is critical to the success of the marine industry as it evolves over the next ten years. This study is intended to help the sector meet its workforce needs and sustain its significant contribution the Regional economy by illustrating the significant number of jobs available to individuals willing to and capable of flowing with the industry's unique tide.

⁷ *A Competitive Vision for the Great Lakes - St. Lawrence Waterway, CSA, 1997.*

STUDY OUTCOMES

The marine sector employment and training needs study was designed to assist in reducing future skill shortages and to contribute to the long-term vitality of the marine industry in the Niagara Region. Two broad phases were carried out. Phase One involved an assessment of the challenges facing the Niagara and area marine industry and its corresponding jobs / issues and training requirements. Phase Two focused upon a review of existing marine training programs, including an assessment of their capacity to meet the sector's present and projected needs.

Deliverables specific to Phase One include the following items:

- A comprehensive understanding of the key issues affecting the sector;
- Trends analysis of the utilization of technology with respect to occupations in the marine sector and their implications in terms of future skill requirements;
- An employment profile of the number and types of individuals employed in the Regional sector, and an understanding of the issues affecting the immediate and future labour supply for the sector;
- An analysis of additional human resource issues facing the Regional marine sector;
- Occupational profiles of key jobs; and
- The provision of both 'hard' and 'disk' copies of the complete study to the Advisory Committee and Human Resources Development Canada.

Deliverables specific to Phase II include the following items:

- An inventory of current marine training programs;
- A concise picture of the sector's training / education delivery requirements over the next ten years; and
- An assessment of the capacity of existing marine training programs to meet the sector's present and projected needs.

To ensure that we had acquired a comprehensive understanding of the industries' employment and training needs, over 90% of the Regional sector was consulted. The Advisory Group met on four occasions through the life of the study to clarify specific study parameters; assist with the implementation of the study; to monitor its validity and utility; and ensure sustained progress. Human Resources Development Canada (HRDC); the Canadian Shipowners Association (CSA); industry employers; and three union/ association locals (CMOU, SIU, and the Boilermakers) have all endorsed the recommendations of the study.

STUDY METHODOLOGY

Six complementary research stages were conducted. They are briefly outlined, essentially chronologically, below.

Stage 1 – Partnership and Collaboration

A Marine Advisory Group worked with Niagara College and Human Resources Development Canada to clarify and refine specific study parameters and monitor the validity and utility of the study. Ongoing collaboration through the entire life of the study ensured consistency of interpretation and sustained progress.

Stage 2 – Process Design

Stage 2 included a review and confirmation of the information needs and priority issues; the verification and refinement of study outcomes; and the design of the research process. Preliminary research initiatives consisted of first hand discussions with selected leaders from the industry, government, and trainers / educators; and a literature review of related studies, demographic profiles and training providers / programs.

Stage 3 – Development

This stage encompassed the creation of research instruments, sampling strategies and procedures, and communication strategies and tools. Four complementary research methods were used. They are listed below, sequentially, reflecting the order in which they were implemented.

- *Review and Content Analysis* of an extensive set of secondary data sources and materials ranging from the local to the international scene; and from individual occupations to the broad implications for change in the future design and structure of marine-related work. This method helped to establish the dominant issues, trends and opportunities, demographic and vessel profile data, and context for local needs.
- *Interviews with Regional & Area Employers/Union Representatives* were designed to gather detailed, employer, union, and occupational-specific employment and training needs and projections; and to widen and build commitment to the study and its recommendations.
- *Questionnaires administered to Union Members and Training Institutions* were intended to do two crucial things: to help clarify and localize issues, trends and opportunities; and to stimulate commitment to the study and its recommendations.

Stage 4 – Data Collection

The Data Collection Stage involved the collection of both the secondary and primary data, and the compilation and processing of the data. In total, over 25 studies/reports were reviewed, and 23 employers and 3 unions participated in interviews. In addition, 4 training institutes and 267 union members responded to questionnaires.

Stage 5 – Data Analysis

This stage involved the analysis of the various data sources and a synthesis of all of the data sources. It also includes the preparation of a complete report and appendices related to both phases of the study.

Stage 6 – Dissemination and Commitment

During this stage the findings of the study will be communicated to the community partners (e.g. industry, educators and government) with the aim of promoting meaningful, community-wide commitment to act upon the recommendations. Short summary communiqués will also be shared with sample participants and community partners.

Sector Profile

This section focuses upon four sector-related matters. First, it includes a profile of the employer sample. A profile of the mariner respondents is provided in the section entitled *Upgrading Intentions*. Following the employer sample profile is a brief description of the industry structure, its national and international context, and other issues challenging the competitiveness of the Great Lakes – St. Lawrence Waterway system.

EMPLOYER SAMPLE PROFILE

Twenty-three (23) employers participated in the study. Forty per cent (40%) have unionized workplaces. Their total employment is over 4000 employees, and represents over 90% of the Region's marine-related employment and 66% of the CSA fleet. Chart 4 illustrates the 'size' of the employer sample by the number of employees.

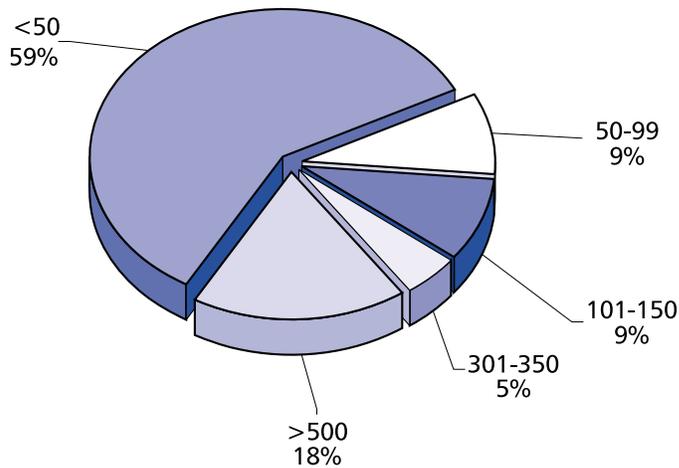
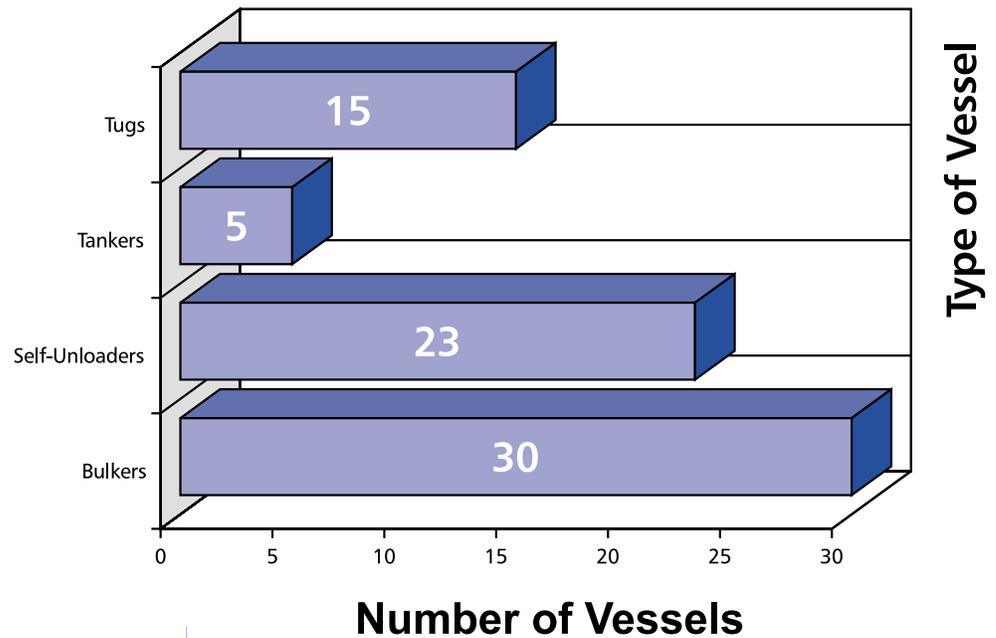


CHART 4:⁸
**Employer Sample
 by Number of Employees**

⁸ A third employer was in the 101-150 category, but is presently in receivership. Their data has been excluded from the findings.

The representation of the employer sample can also be considered by looking at the collective number of vessels operated by sample participants. Chart 5 shows the type and number of vessels operated by sample participants.

CHART 5:
Vessel Types



INDUSTRY STRUCTURE

Industry structure typically refers to the nature of the work performed by a business. We have chosen to use Canada's Standard Industrial Classification codes as an initial reference, to divide the marine industry into the nature of the service/manufacturing work performed by each business. This study includes employers from each of the following classifications:

- Shipbuilding and Repair – 11 participants
- Freight and Passenger Water Transport – 4 participants
- Marine Towing – 1 participant
- Marine Cargo Handling – 2 participants
- Harbour & Port Operation – 1 participant
- Marine Salvage – 1 participant
- Other Service Industries incidental to water transport – 3 participants.

The classifications most crucial to this study include shipbuilding and repair, freight transport, and marine towing. The structure and composition of each of these is outlined below.

Shipbuilding and Repair

Within the Great Lakes Region, Port Weller Dry Docks, in St. Catharines, is the only Canadian shipyard capable of building ships; and they are recognized as a world leader in self-unloader technology. There are more than a dozen smaller companies involved in ship repair throughout the Niagara and Hamilton Regions, which represents one of the greatest concentrations in the country⁹.

Freight Transport & Marine Towing

For the nature of this study it is crucial that we also consider the type and size of the Canadian-domiciled Great Lakes fleet, as it is the foundation to Niagara's marine interests. Fleet information also allows us to estimate the total employment across this segment of the sector. The Canadian-domiciled Great Lakes merchant fleet includes:

- 34 – Bulklers
- 34 – Self-unloaders
- 12 – Tankers, and
- 15 – Tugs¹⁰.

The primary cargoes transported by the above vessels include salt, petroleum, iron ore, coal, limestone, and grain.

Seven Canadian-flag ship companies whose ships ply the waters of the Great Lakes – St. Lawrence Waterway system own the majority of these 95 ships. Over 60% of the bulkers, self-unloaders, and tankers are concentrated within two shipping companies. Table 1, below shows the fleet breakdown by company.

TABLE 1

	BULKER	SU	TANKER	TUGS	OTHER
Algoma Central	9	14	5		
Acromarit Canada-CSL	1	11			
Groupe Desganes Inc.	3		2		3
N.M. Paterson & Sons Ltd.	7				
McKeil Marine Limited				15	
P & H Shipping	2				
Upper Lakes Group Inc.	12	9			

⁹ Canadian Industry Statistics cite 39 establishments involved in shipbuilding and repair across Canada.

Source: Strategis, 1997

¹⁰ Greenwood's Guide to Great Lakes Shipping, John O. Greenwood, 1999

OCCUPATIONAL CERTIFICATION

A significant percentage of the occupations within the marine sector require specific certification. The *Canada Shipping Act* regulates the certification of all shipboard personnel working in the Canadian marine industry. Administration of the *Act* is the responsibility of Transport Canada's Marine Safety Branch. Officer classifications of most pertinence to this study are displayed in Table 2.

TABLE 2

Deck Officers	Engineering Officers
Master Mariner (MM)	1st Class
Ocean Navigator I (ONI)	2nd Class
Ocean Navigator II (ONII)	3rd Class
Watch Keeping Mate (WKM)	4th Class

Transport Canada provides two basic options to becoming an officer, essentially a school-to-work option and a work-to-school-to-work option. Both paths require the completion of established examinations. Aspiring officers wishing to pursue the first option start by attending full-time studies in a Transport Canada approved marine training program. Existing programs run between 36-45 months, and include both in-class and on-board ship training. Aspiring officers wishing to pursue the second option start by securing employment on-board a ship, and accumulating two (nautical) to three (engineering) years experience. They then proceed to complete part-time studies, while retaining their employment. The method of study is optional except for set courses in first aid, marine emergency duties, and simulated engine room/navigation training. The Marine Safety Branch of Transport Canada administers the examinations at Marine Safety offices across Canada.¹¹

¹¹ The Examination and Certification of Seafarers, Marine Safety Branch, Transport Canada, 1998.

NATIONAL & INTERNATIONAL CONTEXTS

The primary focus of this study considers the Niagara Region and its Welland Canal within the context of the Great Lakes – St. Lawrence Waterway system. The global nature of the industry necessitate that we also review and consider the needs of Niagara's marine industry within their broader national and international contexts. Each of these contextual rings is touched upon below.

The Welland Canal

At 170 years of age the Welland Canal has been significantly expanded since the schooner *Annie and Jane* first bypassed Niagara Falls on November 29, 1829¹². Trade via today's 42-kilometre long Canal, the fourth to be constructed, grew most dramatically with the 1959 opening of the St. Lawrence Seaway. It peaked at a high of 66 million tonnes of cargo in 1979, before leveling off to approximately 40 million tonnes through each of the past two years. The Welland Canal, a 12- hour transit, continues to be a vital component of the Great Lakes – St. Lawrence Waterway system and contributes to the Regional marine industries' \$222 million¹³ economic impact.

Great Lakes- St. Lawrence Waterway System

The Great Lakes – St. Lawrence Waterway extends from the Atlantic Ocean to Duluth, Minnesota, on Lake Superior, a distance of 3,780 kilometres, or 8.5 sailing days. An international area comprising more than 90 million people, or nearly ¼ of North American's population is served by this vital trade route. It encompasses over 245,000 square kilometres of navigable waters, and has seen over 2 billion tonnes of cargo move to and from Canada, the United States, and nearly 50 other nations over the last 40 years.¹⁴

The Canadian Shipowners Association (CSA) has documented a ten-year profile of its members' fleet. Between 1988 – 1998, it shows a 27% reduction in its number of ships and a 9% reduction in the tonnage of cargo transported by its membership. The much smaller reduction in cargo volumes can be accredited primarily to increased efficiencies (e.g. more self-unloaders). Table 3¹⁵ illustrates the trends in the number of vessels and cargo volumes.

TABLE 3

CSA – Ten Year Profile, Fleet & Cargo Volumes (in millions of tonnes)

YEAR	No. of Ships	Total Cargo Volumes
1988	121	80.5
1989	119	77.3
1990	124	77.3
1991	119	74.5
1992	115	69.5
1993	112	66.0
1994	108	67.9
1995	101	68.0
1996	89	67.3
1997	88	70.1
1998	89	72.7

The drop in the volume of grain transported by the CSA Fleet represents the single biggest decline, dropping from 13.2 million tonnes in 1988 to 8.4 million tonnes in 1998. Please see the CSA paper entitled *A Competitive Vision for the Great Lakes – St. Lawrence Waterway* for a further discussion of the implications of this trend.

¹² *Niagara's Shipbuilding Heritage, From 1828 to Port Weller Dry Docks*, by Skip Gillham, 1999.

¹³ *Economic Impact of the Marine Industry on the Niagara Region*, Dr. Lewis Soroka and Indra Hardeen, Brock Centre for Social and Economic Research on Niagara, 1998.

¹⁴ *The Great Lakes Seaway System- Seaway Facts*, by the St. Lawrence Seaway Management Corporation, 2000.

¹⁵ CSA Fleet - Ten Year Profile & Cargo Volumes, 1988-1998, by the Canadian Shipowners Association, 1999

Freight movement can also be considered in terms of the type of trade. In 1998, 41% (29.8 million tonnes) of the CSA total was domestic trade. Imports represented 39.1% (28.4 million tonnes) of the trade, and the balance, 19.9% (14.5 million tonnes) were exported

National Marine Industry

Canada's marine industry directly employs approximately 18,000 people. Just over 2/3rds are employed in the transport segment of the industry, while just under 1/3rd are employed by the shipbuilding and repair industry.¹⁶ Collectively the industry handles over 224 million tons of cargo a year and contributes \$2 billion annually to Canada's national revenue.

Although the transport side of the industry has faced continued decline (as illustrated in our discussion of the number of ships and cargo volumes in the previous section) the shipbuilding segment has faced the greater descent. Industry sales dropped by ½ through the 90s and employment plummeted from 12,000 to 5,000.¹⁷ Four of Canada's large shipyards are located on the east coast, two are on the west coast, and Lake Ontario and Lake Superior each have one.¹⁸ Their concentration on the east coast has been particularly devastating for the Maritimes. Although Niagara and area employers have also noted how difficult it is to attract and retain skilled workers (e.g. fitters), which further undermines their ability to compete for the available work.

International Marine Industry

The nature and complexity of the international marine industry is well reflected by the following excerpt.

*Imagine a modern supertanker that is owned by a Greek investor but is registered with a Liberian company. The vessel was probably built in an Asian shipyard and financed through a New York based banking group with additional financial assistance devised by the country in which the vessel was built. The ship is crewed by a mix of foreign nationals, perhaps German deck and engineering officers and Taiwanese crew. The vessel is time-chartered on a long-term contract to carry crude oil from the Middle East to a series of refineries in Eastern North America, including Canada.*¹⁹

As the interconnectedness of the international marine industry increases so too has the volume of seaborne trade. World seaborne trade continued to grow through the 90s, reaching in excess of 5 billion tons for the first time, in 1998. Although the annual growth rate in world seaborne trade

¹⁶ These are estimates. They have been calculated on the basis of 1990 Statistics Canada data, and the 1992 study entitled *Human Resources Study of the Canadian Marine Transportation Industry*.

¹⁷ *A Shipbuilding Policy for Canada*, Shipbuilding Association of Canada & Marine Workers Federation/CAW-TCA Canada, 1999.

¹⁸ *Ship Technology, Architecture, Building and New Technologies*, by the Marine Institute, 1999

¹⁹ *An Overview of the Marine Transportation Industry*, Marine Institute, 1986, in *Here The Tides Flow: Career Opportunities in the Marine Transportation Industry*, Marine Institute & Memorial University, 1999.

recorded its 13th consecutive annual increase in 1998, it represented a slow-down, to 2.2% in 1998, the lowest increase since 1987. The Asian economic crisis continued to restrict the growth rate in 1999. A moderate increase is projected for 2000, provided that dry bulk trade regains its momentum.²⁰

In terms of the number of ships in the global commercial trading fleets, the trend established over the past decade, of an average annual increase of 1%, is projected to continue over the next five years²¹. This conservative growth estimate still translates into over 1,300 additional vessels by the year 2005²².

The Baltic and International Maritime Council (BIMCO) and the International Shipping Federation (ISF) recently released their third study of the global supply and demand for merchant seafarers. The study, conducted in co-operation with the Institute for Employment Research, University of Warwick, UK, entitled *2000 Manpower Update*, builds on BIMCO/ ISF's 1990 and 1995 findings. Their results estimate a 4% (16,000) shortfall of officers²³ to staff the world fleet. The authors of the study predict that the *global supply scenario will worsen unless training is increased or measures are taken to address the rate at which seafarers leave the industry*.²⁴ Based on a conservative 1% annual increase in the number of ships, and assuming recruitment and turnover levels remain constant with the past five years, BIMCO/ISF project a shortfall of 46,000 officers (12% of the world's total seafarer workforce) by the year 2010²⁵.

The report also raises a number of key issues related to the population mix, including the:

- changing nationality of the seafarer population, and
- reliance upon ageing OECD senior officers coupled with relatively few Asian officers having progressed to senior positions.

The country origin of the international seafarer population is continuing its shift away from the more traditional maritime centres in Europe, Japan and North America, towards countries in the Far East, the Indian sub-continent and Eastern Europe. Approximately 27% of the present global marine workforce, is from OECD countries, a 4% decline since 1995.²⁶ BIMCO/ ISF's authors note that the continued reliance upon large numbers of officers from OECD countries is of concern, given that over 40% of these officers are over 50 years old, and 18% are aged over 55.²⁷

²⁰ *Review of Maritime Transport 1999*, United Nations Conference on Trade and Development, 2000.

²¹ *BIMCO/ISF2000 Manpower Update, The Worldwide Demand for and Supply of Seafarers*, Institute for Employment Research, University of Warwick, 2000.

²² The rapidly growing cruise industry, albeit not our focus, will exacerbate the projected labour shortages. New orders for the global fleet will increase the world fleet by about 20% (41) and the market capacity by 33%.

²³ For 'ratings' (non-officer crew) the authors suggest there continues to be an overall surplus of 224,000; although they raise some doubt whether many ratings would meet international service standards.

²⁴ *BIMCO/ISF2000 Manpower Update, The Worldwide Demand for and Supply of Seafarers*, Institute for Employment Research, University of Warwick, 2000.

²⁵ *Ibid.*

²⁶ *Ibid.*

²⁷ *Ibid.*

INDUSTRY COMPETITIVENESS ISSUES

Several issues are briefly mentioned below. Their inclusion broadens the context for our understanding of the industry's workforce needs, and reinforces that the job opportunities projected through this study represent a conservative estimate, for they are based upon the status quo.

The key threats to the competitiveness of the Great Lakes – St. Lawrence Waterway and to the shipbuilding and repair industry located in the Great Lakes Region include: declining market share, outmoded regulation, various trade-related issues, and an ageing fleet, which will soon require significant investment in infrastructure and shipbuilding. The age of the Great Lakes vessels is particularly crucial to the long-term competitiveness of the industry. The following quotation captures the essence of this factor for both the shipbuilding and shipping segments of the marine industry.

Even though vessel owners have invested heavily in fleet maintenance and renewal in recent years, as is evidenced by the increase in activity at Port Weller Dry Docks, market earnings are insufficient to allow for new vessel replacements. In fact, a new lake freighter has not been built in Canada since 1985. The average age of the Canadian bulker fleet now exceeds 30 years while the average age of our self-unloader fleet exceeds 20 years. Clearly, these vessels won't last forever and we are concerned about the prospect of renewing the Canadian fleet. In our view, Canada's marine industry must renew itself on a competitive basis and Canada's shipbuilding industry must be able to respond.²⁸

And the most recent challenge to the competitiveness of the Great Lakes – St. Lawrence Waterway is of course the low water level, resulting in reduced cargo loads per ship for, probably, the next three to four years²⁹.

For a thorough discussion of the key competitiveness issues see the CSA paper entitled *A Competitive Vision for the Great Lakes – St. Lawrence Waterway* and the SAC paper entitled *A Shipbuilding Policy for Canada*.

Industries operating in the Great Lakes – St. Lawrence Waterway contribute billions of dollars and thousands of jobs to the Canadian economy. They have played, and will continue to play, an essential role in the efficient and effective transportation of bulk goods. Working diligently with governments³⁰ and other stakeholders, industry employers and associations are developing partnerships for change that will lead to the most competitive, technologically advanced, and environmentally responsible water management system in the world.³¹

²⁸ *The Welland Canal - 170 Years Later*, excerpted from a speech given by Wayne Smith, Vice President and General Manager, Seaway Marine Transport, November 25, 1999.

²⁹ *Low water, ebbing fortunes strand Great Lakes Shipping*, *The Toronto Star*, May 13, 2000.

³⁰ The federal Treasury Board, for example, is currently reviewing the impact of recently imposed user fees and the industry is hopeful that it will rectify their negative effect upon the industry's competitiveness.

³¹ *A Competitive Vision for the Great Lakes - St. Lawrence Waterway*, CSA, 1997.

In this section we turn to the core focus of this study – the employment and training needs of the Niagara/ Great Lakes marine industry. Six tightly related matters will be discussed. We will start by taking a look at the *Employment Demand* projections from our employer sample. After which, we will review the *Upgrading Intentions* articulated by our mariner sample, as well as their perception of the *Upgrading Issues* and barriers they face. A survey of the broader *Labour Supply* potential, including cadet projections through *Institutional Training*, and the overall *Replacement Challenges* confronting the industry will round out this section.

EMPLOYMENT DEMAND

Industry participants refer to three broad ‘employee’ groups, namely core employees, relief personnel, and a general marine labour pool. The discussion in this section refers principally to the employers’ core employees and regular relief personnel. The union member sample, discussed in *Upgrading Intentions* and *Upgrading Issues* reflects a cross-section of all three labour force groups.

Across the sample 18 of 22 employers anticipate hiring new personnel over the next 5 years. They have projected that 1,304 jobs will arise through to the year 2010. Of these, 761 (58%) are projected to arise over the next five years, with the balance (543) projected to arise between the years 2005-2010. Chart 6 illustrates the number of projected jobs across the sample between 2000-2010.

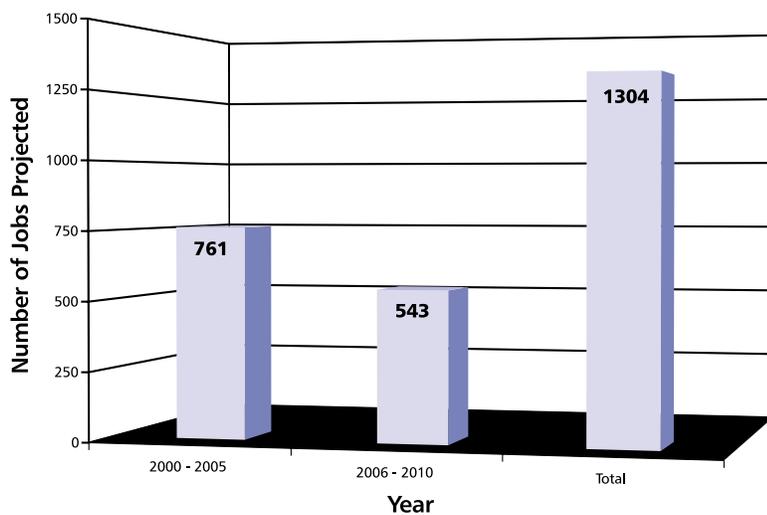


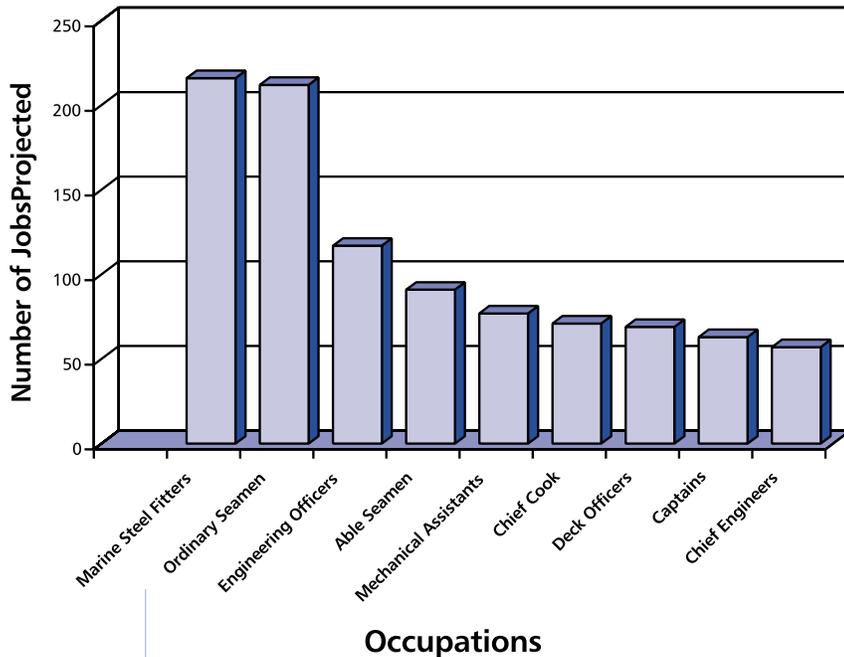
CHART 6

Employment & Training Needs

Ninety-nine per cent (99%) of the employment projections are for full-time employment³². Business growth accounts for 27% of the projected opportunities, whereas 73% are projected to arise through replacement needs, particularly through anticipated retirements.

Out of the 44³³ occupation codes projected, 9 occupations account for 968, or 74% of all of the projected jobs. Chart 7 illustrates the number of jobs projected by sample participants within each of the 9 leading occupations.

**CHART 7:
Projected Jobs by Occupation**



³² Many of the projected jobs involve a compressed year. For example on-board crew may work more than 2000 hours (a full calendar year based upon a 40-hour week) during a 9-month period.

³³ Additional occupations other than the top 9, include: engine fitters, painters/blasters, electricians, foremen, machinists, and sales personnel.

Occupations

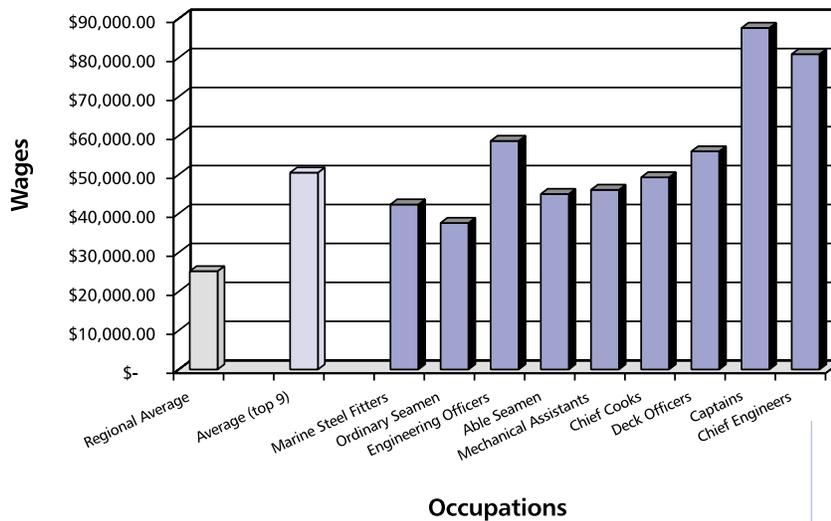
With ¾ of the projected opportunities concentrated in 9 occupations, it's crucial that we understand their context. The shipping sector of the industry accounts for 8 of the top 9 occupations. And age is a crucial indicator of the replacement need across most of these occupations. In 7 out of 9 of the occupations projected to have the greatest number of jobs, 50% to 73% of the current workforce is over 45 years of age. Table 4 provides a breakdown of the age of the employees across the employer sample for the top 9 occupations.

TABLE 4

AGE BREAKDOWN BY OCCUPATION				
Occupation	<31	31-44	45-54	>54
Marine Steel Fitters	8.3%	31.7%	40%	20%
Ordinary Seamen	12.4%	47.9%	26.7%	13%
Engineering Officers	9%	29%	21.6%	35.2%
Able Seamen	4.4%	30.1%	43.4%	22%
Mechanical Assistants	7.8%	35.2%	24.2%	32.8%
Chief Cooks	1.3%	26%	33.8%	39%
Deck Officers	16.9%	45.9%	25.7%	11.5%
Captains	4.2%	29.6%	43.7%	22.5%
Chief Engineers	6.9%	29.2%	33.8%	30.6%

Salary/wage rates for the top 9 occupations ranged from \$30,000 to \$96,000/ year. The average annual income across all 9 occupations is \$50,509. All 8 of the shipping-specific occupations are based on a typical 8-10 month season. Chart 8, reveals the average annual income for the projected jobs, by the top 9 occupations. The Regional average wage is included in Chart 8, as a comparative reference.

CHART 8:
Wage by Occupation



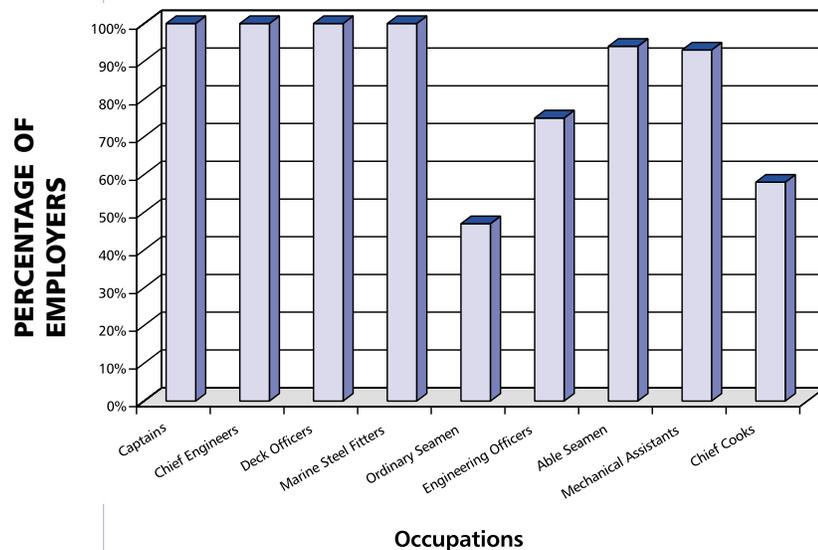
Employers consistently indicated that they anticipate difficulty filling all of the projected jobs related to the following occupations:

- Captains
- Chief Engineers
- Deck Officers
- Marine Steel Fitters

Across the five additional occupations, the degree to which they anticipate difficulty recruiting qualified crew varied by employer. Chart 9 shows the percentage of employers that anticipate difficulty recruiting personnel, by occupation.

CHART 9:

Recruitment Difficulty by Occupation



Occupations

The 45 jobs projected across the sample for a 10th occupation, shore-based engine fitters, may further exaggerate the demand for engineers. Typically employers look for people to fill the engine fitter role with skills comparable to the marine engineer.

Appendix A includes four short profiles of the nine occupations cited above. Marine Steel Fitters are described in one profile. The 8 shipping focused occupations are clustered into three occupational groupings. Chief engineers and engineering officers are described in a second profile. Captains and deck officers are outlined in another profile. And the fourth profile summarizes the jobs for ordinary seamen, able seamen, mechanical assistants and chief cooks. Each profile includes a brief description of the job and the education and experience requirements, working conditions, training availability, and employment outlook.

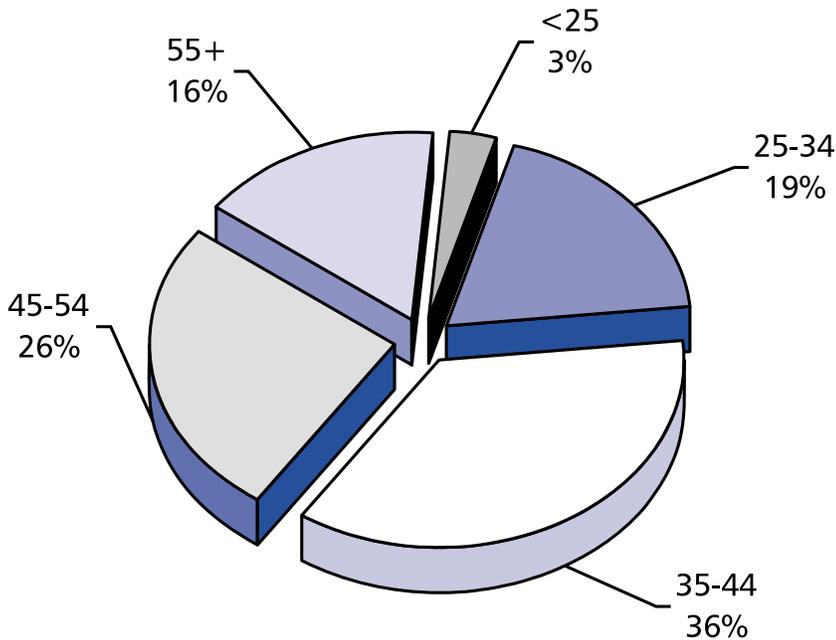
UPGRADING INTENTIONS

A total of 267 union members from the CMOU (Canadian Marine Officers Union), SIU (Seafarers' International Union of Canada), the CMSG (Canadian Merchant Service Guild), and the International Brotherhood of Boilermakers responded to member questionnaires.³⁴ Of the 267 respondents, 55% (148) are CMOU members, 22% (60) are SIU members, 14% (38) are with the IBB, and 9% (21) are CMSG members.

Respondent Profile

- Gender – 97% male, 3% female
- Age – The age of the respondents is set out in Chart 10.

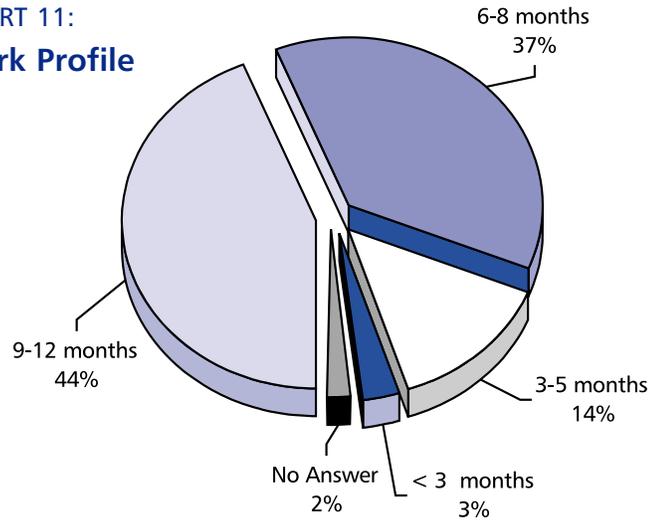
CHART 10:
**Union Member Respondent
 Age Profile**



³⁴ The participating members from the three marine unions cited here are employed by a cross-section of shipping companies plying the Great Lakes. They include employees and relief personnel from the employer sample, employees and relief personnel from employers that did participate in this study, and members of the general marine labour pool. The employees of Upper Lakes Shipping, represented by the CMU, are not reflected in this section. All of the IBB respondents work for Port Weller Dry Docks.

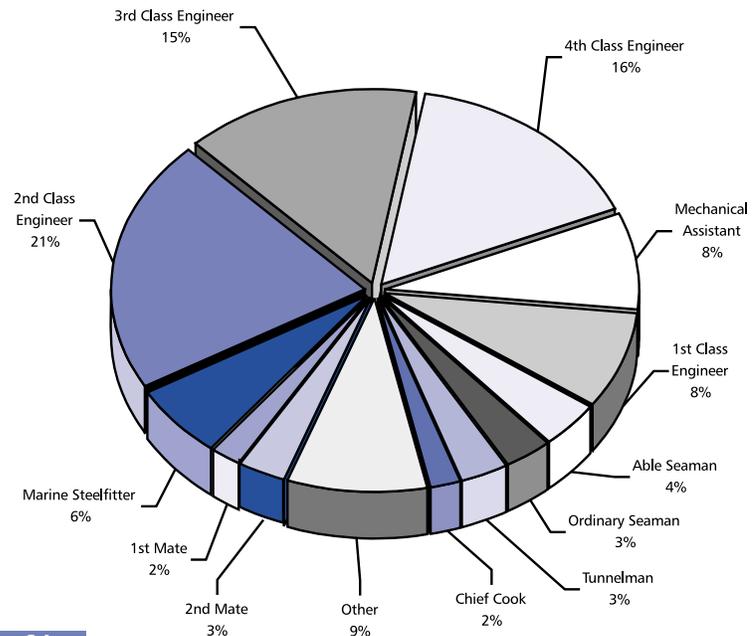
- Work Profile – Chart 11 illustrates the number of months respondents' worked in the marine sector during the 1999 calendar year.

**CHART 11:
Work Profile**



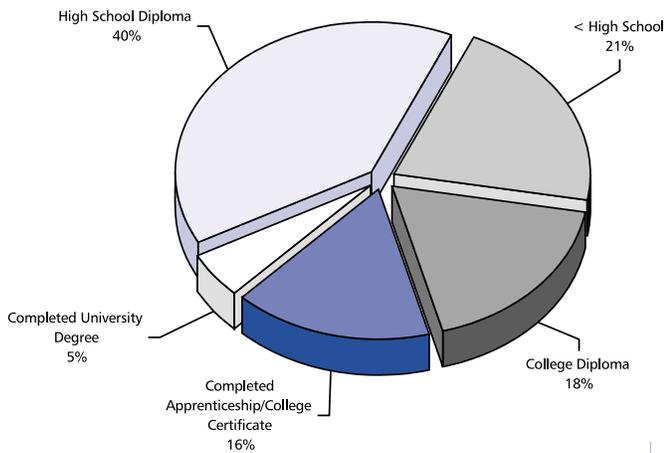
- Occupational Profile – Chart 12 illustrates the occupational breakdown of the respondents.

**CHART 12:
Occupational Profile**



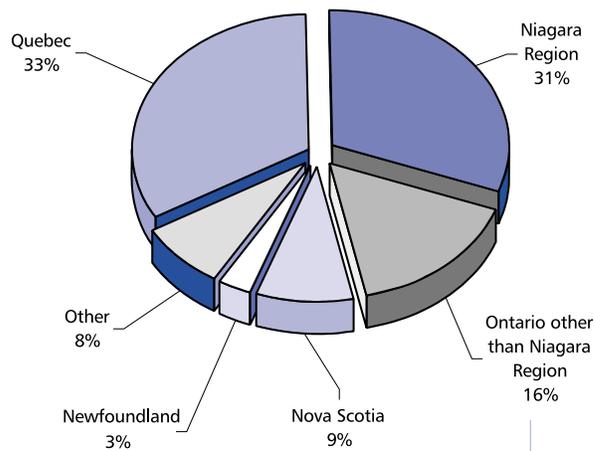
- Educational Attainment – Chart 13 illustrates the level of formal education completed by the respondents.

CHART 13:
Education Attainment



- Geographic Distribution – Chart 14 illustrates the provincial/regional home residence of the CMOU, SIU, and CMSG respondents.

CHART 14:
Geographic Distribution



Career Intentions

Sixty per cent (60%) of the responding officers expressed an interest in upgrading their classifications, with 31% aspiring to achieve their 1st class ticket. Sixteen per cent (16%) intend to retire/leave the industry, with the majority (71%) of this group planning to retire/leave by the year 2005.

Over 40% per cent of the SIU member respondents expressed an interest in staying in their present positions. Thirty per cent (30%) indicated an interest in upgrading to various positions, including navigation officer, wheelsman, chief cook, mechanical assistant, and engineering officer, which was the most frequently cited (67%) career goal expressed by members with career aspirations.

Sixty-five per cent (65%) of the IBB member respondents expressed an interest in staying in their present positions. Almost 24% indicated an interest in upgrading their classification or position. The most frequently cited 'upgrading' goal related to becoming a marine steel fitter.

UPGRADING ISSUES

Members were asked to comment on eleven potential barriers that may hinder their ability to achieve their career aspirations. Table 5 illustrates comparatively, the significance of each of the barriers to CMOU, SIU and CMSG members.

TABLE 5

Potential Barriers	
Lack of time to do the courses with limited 'off-time'	37%
Travel costs/time to training location are too high	33%
Course fees are too expensive	33%
Lack of flexible course scheduling	30%
Lack of specific training courses/programs	23%
No financial incentive to upgrade skills	22%
Lack of basic computer knowledge	16%
Lack of opportunity to acquire sufficient 'sea service'	9%
Other barriers	4%
Not sure what career options are	3%
Not sure what training needed	2%

Current mariners clearly view the *lack of time to do the courses* (37%), *travel costs/time to training location* (33%), *expensive course fees* (33%), and a *lack of flexible course scheduling* (30%) as the greatest barriers to upgrading their skills.

Twenty-four per cent (24%) of respondents from the IBB cited selected barriers as significant impediments to their upgrading/training aspirations. The most cited barrier (16%) was the lack of flexible course scheduling.

Preferred Learning Methods

Forty-seven per cent (47%) of the union member respondents indicated their preferred learning methods for upgrading their knowledge and skills. The majority of the respondents prefer a combination of workshop tutorials, including hands-on applications where relevant, with self-directed, particularly computer-assisted, support. A third (1/3rd) of this group cited an interest in on-board, computer-assisted learning. The majority IBB respondents prefer a combination of workshops and on-the-job training.

Assessment of Recent Training

Across the sample, 63% of the respondents indicated they had participated in one or more training activities during the past three years. Courses ranged from welding, propulsion plant simulator training and engine room resource management to first aid, bridgework, and MED training. Training deliverers included Georgian College, Institut Maritime du Quebec, Nova Scotia Nautical School, Canadian Coast Guard College, Holland College, Marine Institute, Pacific Marine Training Institute, Niagara College, St. John's Ambulance and various company specific training providers. Overall, respondents rated the *content* and *facilities* of their various training experiences favorably. Across all courses and all training providers, the respondents who rated their courses, rated their training experiences as *good* 82% of the time. The most frequent criticisms were consistent with the barriers cited earlier. Respondent comments include the following criticisms:

- *the high cost of courses* (less of an issue in Quebec);
- *the difficulty in attending traditionally delivered courses with limited time off during the shipping season;*
- *a lack of hands-on practice;*
- *a lack of company financial support;* and

- *the difficulty of completing the theory portion of the Transport Canada exams.*

Suggestions included the following comments:

- *changing the on-board/leave system to 1 month on and 1 month off;*
- *introducing more on-board training through CD-ROM; and*
- *more support, resources & time are needed in order for on-board studying to be feasible.*

A number of individual comments suggest a polarization of the upgrading issues facing the industry. Many of the existing officers that have moved up through the ranks by following the more experiential route are distressed by the academic challenges of Transport Canada's certification standards. Whereas the more recent college educated officers need the opportunity to complement their academic knowledge with more hands-on skill development. This polarization may be intensified by the perception, expressed by individual officers and selected employers, that the colleges are biased toward the cadet route. Although the two different approaches to training have, at times, contributed to a counterproductive rift between mariners, employer and college commitment to meet the training needs of 'both camps' could help mitigate differences, and enhance the development of both academic and experiential proficiency.

LABOUR SUPPLY

Consideration of the potential labour supply should consider at least three areas. First it requires an understanding of the upgrading intentions of existing mariners, which we covered in the previous section. It is also important that we review the actual number of certificates issued by Transport Canada in recent years. An analysis of the institutional capacity of the marine training colleges/institutes rounds out the supply context.

Transport Canada Issued Certificates

Table 6 (with footnote) shows the total number of new nautical and engineering certificates issued in Ontario by Transport Canada in 1998 and 1999. It is estimated that Ontario residents make up between 25-30% of the Great Lakes mariners, so the small number of new tickets issued over the past two years raises serious supply concerns. Concomitantly, it is anticipated that a significant number of current mariners will need to renew their tickets over the next few years, which will put increasing pressure on the training institutes to meet the demand for simulator training.

TABLE 6³⁵

Classification	1998	1999
Master Mariner (MM)	3	5
Ocean Navigator I (ONI)	1	1
Ocean Navigator II (ONII)	6	1
1st Class Engineer	7	13
2nd Class Engineer	5	9
3rd Class Engineer	11	13
4th Class Engineer	16	31

*Institutional Training*³⁶

Seven colleges/institutes across Ontario east to Newfoundland provide marine training. Presently four offer engineering cadet programs and six offer navigation cadet programs. Moving from west to east, the following training institutes deliver full-time co-op programs in both engineering and navigation:

- Georgian College
- Institut Maritime du Quebec
- Nova Scotia Nautical Institute, and
- Marine Institute.

³⁵ Transport Canada Centre – Marine, St. Catharines Office, May, 2000. Also note the engineering certificates include motor and combined certificates.

³⁶ Industry employers and unions co-ordinate/provide various training courses for their employees/members. Their focus, however, has been upon upgrading and process specific areas. The costs incurred to upgrade certifications may be shared by the employer and employee; or borne exclusively by the employer or individual.

A full-time co-op program in engineering is also delivered by New Brunswick Community College. And the Canadian Coast Guard College delivers a full-time co-op program in navigation.³⁷ In addition, both New Brunswick Community College and Holland College deliver continuous-intake, modularized courses in navigation. Most of the above colleges/ institutes also provide a full range of upgrading, safety, and environmental training to meet Transport Canada and STCW³⁸ standards. Some, for example the Marine Institute and l'Institut Maritime du Quebec also offer programs in Naval Architecture.

With the exception of Georgian College and L'Institut Maritime du Quebec, the more easterly colleges/institutes primarily serve the eastern and international demand for officers. All boast placement rates of between 90-100%. Less than 10% of the 1998 and 1999 graduates from the maritime colleges/institutes have gone on to careers with the Great Lakes fleets. Whereas approximately 60% of the 1998 & 1999 graduates from central region colleges are now working the Great Lakes.

Table 7, presents a forecast³⁹ of the number of graduates, by the two cadet programs of most relevance to the study, across the colleges/institutes.

TABLE 7

Program	Projected # of Graduates 2000-2005					
	YEAR					
	00	01	02	03	04	05
Marine Engineering	33	45	88	93	78	80
Marine Navigation	54	61	65	94	93	80

³⁷ The CCGC is projecting to deliver engineering programs commencing in 2002 and 2003 to meet Coast Guard fleet demand.

³⁸ STCW refers to the 1995 Standards of Training Certification and Watchkeeping Convention.

³⁹ Projections are based upon a survey of the training institutes. Four out of seven colleges/institutes provided concrete graduate and enrolment projections. The projections include our estimates for the non-participating colleges/institutes.

Participating colleges/institutes based their graduate projections on a 60-65% completion rate. Enrolment forecasts were based upon 50-100% of enrolment capacity. So there is clearly room in some programs to expand the number of cadets further than projected, if the recruitment challenges can be addressed.

Based upon recent graduate placement patterns, we can estimate that between 18-24% of the graduates from the seven colleges/institutes will find work with the Great Lakes fleets, with the bulk of them coming from Georgian College and l'Institut Maritime du Quebec. Charts 15 and 16 illustrate the basic supply (cadet graduates by program) and demand (employer sample participants) comparisons, based upon these assumptions.

CHART 15:
Engineering Graduates (Supply) vs Great Lakes Demand

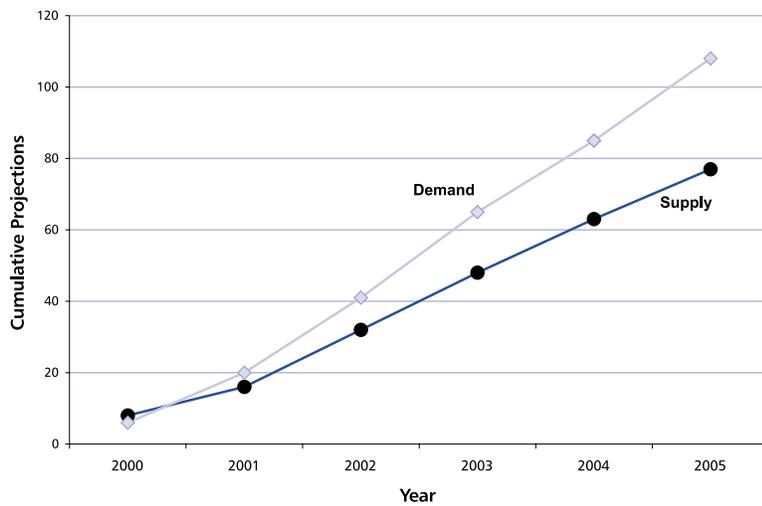
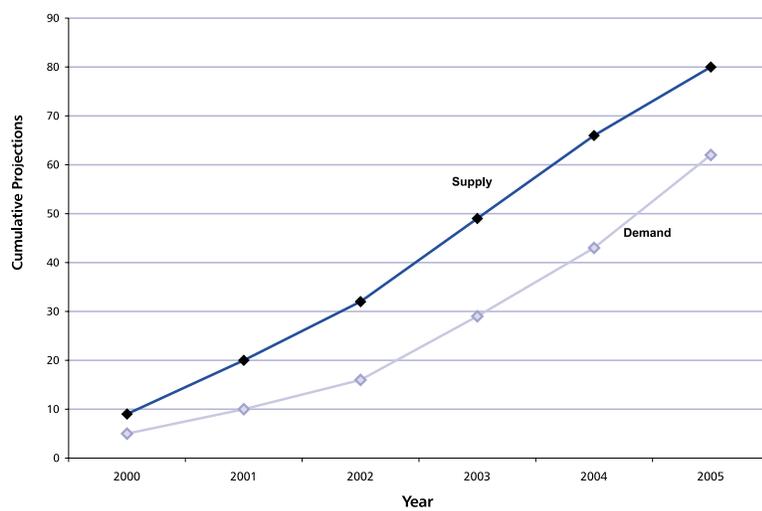


CHART 16:
Navigation Graduates (Supply) vs Great Lakes Demand



Three notes need to be made related to these comparisons. First, the graduate projections (supply numbers) of the colleges/training institutes, are themselves based upon significant increases in enrolment. Second, they are based on an 18% ratio of graduates entering the Great Lakes-based industry; which may be seriously cut into by the significant international shortages and projected growth in the cruise industry. Finally, although these comparisons show that the colleges/ institutes have the capacity to meet the projected long-term demand of the Great Lakes fleets⁴⁰, the short term demands for senior officers will need to be met through the upgrading of the officers currently working in the industry. And it is in this area, the upgrading of existing mariners, where the colleges/institutes need to improve access to their courses through more flexible and timely modes of delivery.

Recruitment Challenges

Representatives from all of the colleges/ institutes that we spoke with remarked on the difficulty in attracting students into marine engineering and navigation programs. BIMCO/ ISF's international study demonstrates that low levels of recruitment are a concern across OECD countries, not an issue isolated to Canada.

The Canadian public, arguably, is well aware of the employment decline of the national and regional marine industries. Couple this awareness with, at least for the shipping segment of the industry, the long periods at sea, it's clearly an industry suited to only a small percentage of Canadians.

Employers from our sample suggested looking to the industry's employment inequities as a potential source for increasing recruits. Women were identified as one of the untapped potential labour force sources. With women representing only 3% of our sample's respondents, industry employers may be accurate about their 'untapped potential'; albeit, perhaps overly optimistic of their willingness to enter the industry without significant changes in the milieu of life on-board.

Internationally, women represent less than 2% of the world's 1.25 million seafarers, with the majority working as cooks, porters, or waitresses in the cruise segment of the industry. European Union fleets fair a little better, with women representing 4 – 5% of their total workforce.⁴¹ The socio-cultural factors impeding the integration of women on-

⁴⁰ With some need to still further increase the number of marine engineer graduates.

⁴¹ *Women on-board – ten years of the IMO Women In Development Program*, Pamela Tansey, International Maritime Organization (IMO), 1999.

board have deep historical roots in most countries. And although we may wish to think Canada is different, our findings (through both employer interviews and respondent questionnaires) suggest that we too need to improve not only our (hiring) numbers, but also our support for the integration of female mariners.

The International Maritime Organization (IMO) was the first organization to develop a formal strategy for the integration of women into the maritime sector. The *IMO Women In Development Programme* was initiated in 1989, and offers the best resource for learning how to enhance marine training and jobs for women. Their experience suggests the need for multifaceted interventions, including, but not limited to, the following areas:

- Gender-Awareness Training across the sector
- Gender-specific Fellowships
- Shorter voyages and/or longer home leave, and
- Improved on-board accommodation and facilities.

The IMO also notes that the strategies above not only attracts more women to the marine professions but also benefits all seafarers, regardless of gender.⁴²

⁴² Ibid.

The report concludes with some reflections about our findings, including some of the implications and caveats for Niagara, before turning to a presentation of the core recommendations for further action.

Implications & Caveats for Niagara

The findings of this study are consistent with HRDC's 1992 nation-wide study, and the Marine Institute's 1999 study, namely, that the marine industry is facing serious skill shortages, particularly in the officer professions. For Niagara, the most immediately relevant sphere relates to the Great Lakes focused industry, which is commanded by a small number of dominant companies. Within this group, employment and training needs vary significantly, resulting in a further concentration of the projected jobs. Over 60% of the 1,304 jobs projected across the sample fall to two employers. Given the sample's employment pattern is representative of the total Great Lakes Industry, the total number of jobs approaches 1,800, but would still be primarily localized within fewer than five organizations.

Regionally, the sample projections include the loss of 67 shore-based positions over the next five years. Also of note, during the study one employer went into receivership, leaving 125 (ship repair segment) unemployed. And one, more positive, finding suggests that a small number of senior, shore-based positions, such as superintendents and pilots, will also arise over the next ten years. These would typically be filled by senior officers, and have not been included in the projections above.

Seven significant factors, discussed earlier, ease the confinement of the sample's projected jobs, by providing a broader, albeit at a distance, spectrum of opportunities for interested Niagara residents. The magnitude of the marine-related opportunities rests upon the following seven factors, precisely the:

- projected retirements within the Great Lakes fleets
- current mariners' intentions to upgrade, leaving junior officer positions open
- need to begin to replace the aged Great Lakes vessels
- growth in Canada's east coast oil and gas sector
- forecasted world shortages
- difficulty in recruiting students into marine programs; and
- growth potential through enhanced industry competitiveness.

Reflections & Recommendations

Overall, even with the aforementioned caveats about the concentration of jobs, we can conclude from the broader market scope that plentiful numbers of rewarding jobs will prevail for individuals willing to and capable of flowing with the industry tide⁴³.

The potential for Niagara's broader labour pool

There are three basic labour pool sources that may benefit from the marine sector's projected jobs. Most obvious is the unemployed, which is currently just over 13,000⁴⁴ people or 6.9%. Of this group just under 1/3rd are between the ages of 15-24 years, and approximately 1/2 are between 25-44 years of age. Marine jobs may be particularly appealing to this group, as it may offer an immediate chance for a more secure future.

Marine opportunities may also appeal to upcoming labour force entrants, our second potential source for labour. Included here are three audiences – recent, young graduates; adults in- transition; and immigrants to the Niagara Region. Youth 'graduates' include new high school and post-secondary graduates. Adults in-transition include people moving, for the first time, into the 'official' labour force from home, and people returning to the paid labour force after a period of absence (e.g. due to illness, time away to care for children). Another audience of upcoming entrants is comprised of the people we attract to the Niagara Region.

The third potential source of labour supply is Niagara's underemployed. People already working in the marine sector in a relief or contract capacity, and labour force members employed in other industries but whose potential is under-utilized, would make up this potential labour pool.

Recommendations for Further Action

We have organized the recommendations by the industry partners. There is, of course, overlap, to ensure an integrated response. The recommendations are intended to provoke dialogue and encourage action that will benefit all industry and community partners.

Industry Employers

- Continue with and expand the industry's recent initiatives to raise community awareness of the impact and benefits of, and opportunities within the marine industry.

⁴³ We have borrowed the metaphor of the 'tide' from the Marine Institute's 1999 report entitled *Here The Tides Flow- Career Opportunities in the Marine Transportation Industry*.

⁴⁴ *Unemployed Labour Force for the St. Catharines-Niagara CMA*, Labour Force Survey- Annual Average, Statistics Canada, 2000.

- Promote the environmental benefits of bulk transportation via marine shipping, and facilitate and encourage public dialogue about these benefits.
- Develop and implement recruitment strategies directed to both the broader population and specific audiences, including youth, women and minorities.
- Ensure that equity policies and practices genuinely support the recruitment and integration of women and minority groups.
- Review existing on-board – leave policies and practices with the aim of supporting recruitment initiatives.
- Ensure training policies and practices support employee upgrading.
- Develop reciprocal mentorship programs to promote academic and experiential development.
- Review the feasibility of on-board training, through the use of distance education.
- Develop the technological and operational capacity for crew to participate in training while on-board ship.
- Strengthen relationships with training institutions by ensuring appropriate cadet berths.
- Continue the dialogue with governments to ensure the industry is able to compete evenly with its competitors.

Industry Unions

- Develop and implement, in collaboration with industry partners, gender and minority awareness training.
- Promote and facilitate the development of members' computer skills.
- Ensure that union contracts and practices adequately support member upgrading goals.
- Promote and support equitable treatment of all crew by members.
- Ensure equity and training support mechanisms are adequately addressed in future collective agreements.

Human Resources Development Canada- HRCC, Niagara Region

- Communicate and promote the marine industry's jobs to the community.
- Review and assess the labour force supply characteristics.
- Promote and support upgrading training for current mariners, similar to the incentives available in Quebec and British Columbia.

- Promote and support accessibility to and training for the marine industry for appropriate equity groups.

Training Institutes

- Communicate and promote the marine industry's jobs to potential and current students.
- Develop, promote and facilitate flexible and integrated training delivery options that incorporate a combination of traditional and distance education modes.
- Develop, promote and facilitate flexible and integrated training tutorials (focusing upon certification requirements) that incorporate a combination of traditional and distance education modes.
- Integrate marine courses, where appropriate, with related programs to reduce costs and broaden student exposure to the opportunities in the marine industry.
- Review the potential to fast-track cadet (engineers in particular) development through intense post-diploma programs for mechanical/ manufacturing engineering graduates.
- Incorporate on-site 'coaching' tutorials to compliment college lab and classroom training.
- Develop and implement recruitment strategies directed to both the broader population and specific audiences, including women and minorities.
- Develop partnerships with industry that will facilitate the capacity of the training institutes to attract and retain qualified instructors.⁴⁵
- Develop institutional partnerships to extend the present enrolment capacity using the existing infrastructure (e.g. simulators).
- Consider, in consultation with industry partners, introducing a mandatory 2-3 week on-board pre-enrolment experience for new students.⁴⁶
- Develop and implement, in collaboration with industry partners, gender and minority awareness training.

The above recommendations are expressed with the genuine intention to help make a difference. For all of the partners – employers, unions, mariners, government representatives at all levels, student and labour force members, and the colleges/ institutes – stand to benefit from a coordinated and integrated response to the needs articulated through this report.

⁴⁵ Given the projected shortage of officers, it may be difficult for colleges/institutes to retain and attract qualified instructors. Professional development leaves or 'teaching sabbaticals' may attract selected senior officers, provided the rewards and benefits warrant their consideration.

⁴⁶ The aim is to reduce the attrition rate, by an up-front exposure to the life on-board ship.