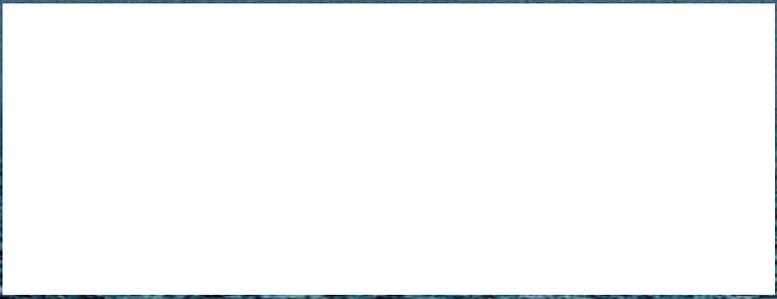
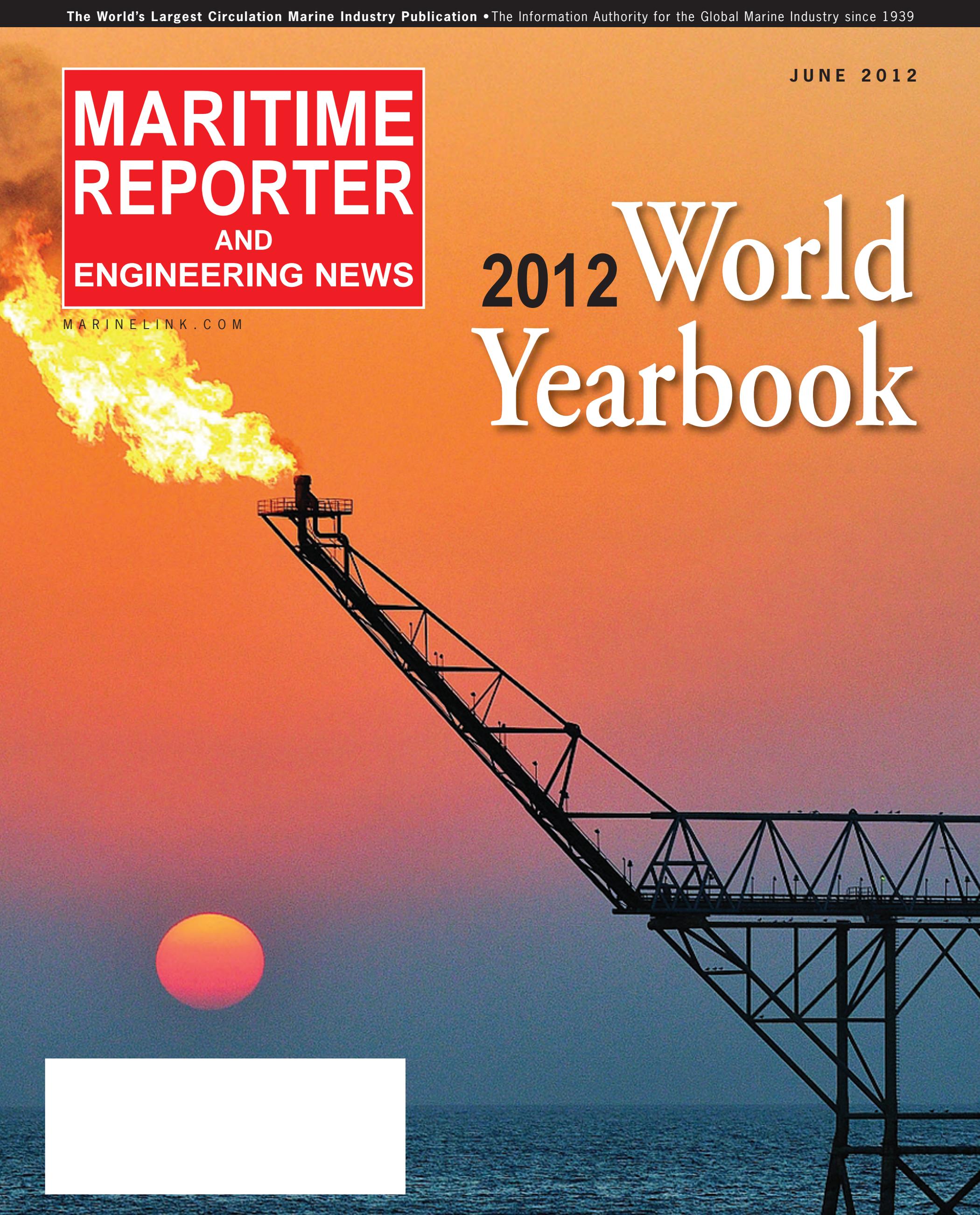


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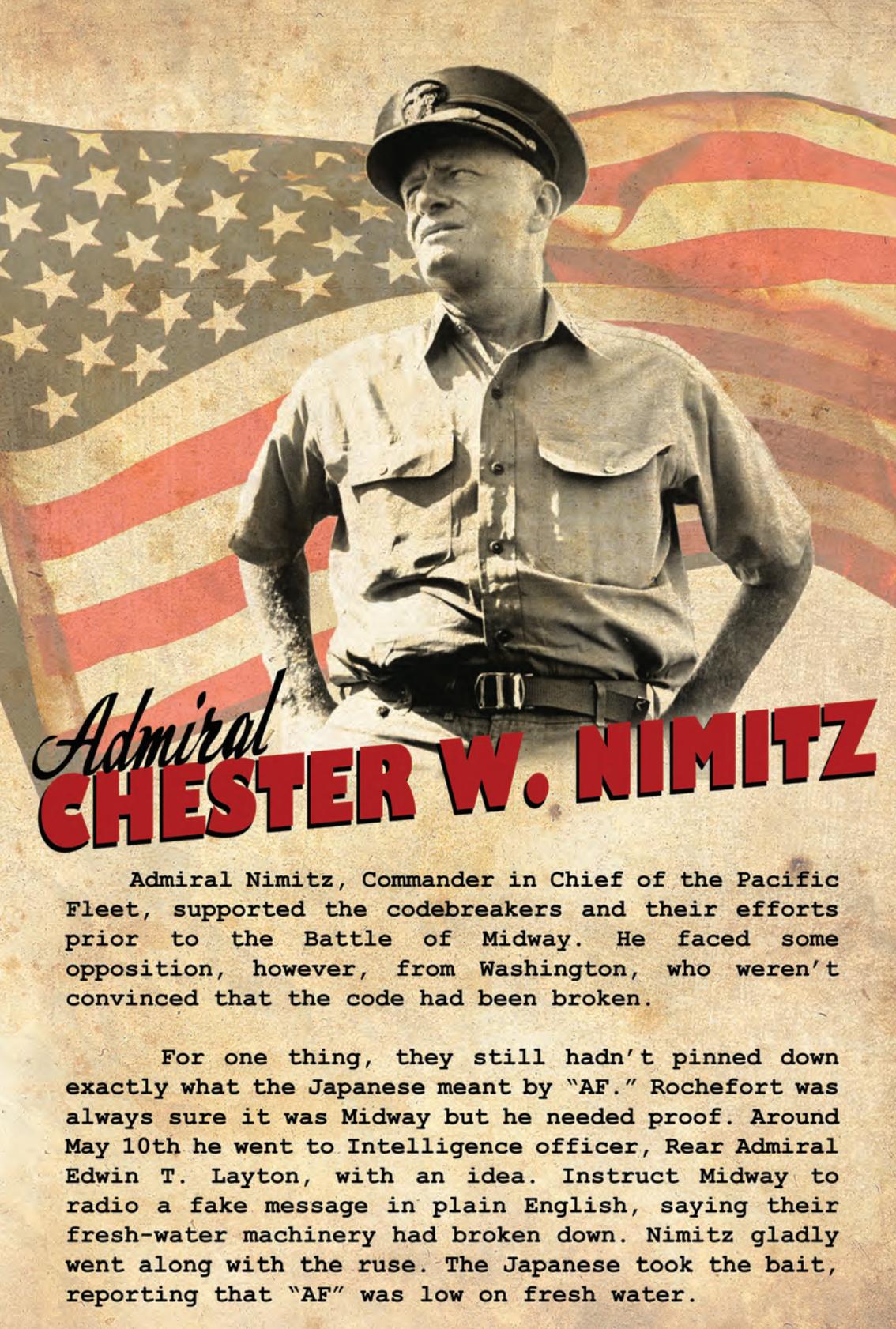
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**2012 World
Yearbook**



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Admiral CHESTER W. NIMITZ

Admiral Nimitz, Commander in Chief of the Pacific Fleet, supported the codebreakers and their efforts prior to the Battle of Midway. He faced some opposition, however, from Washington, who weren't convinced that the code had been broken.

For one thing, they still hadn't pinned down exactly what the Japanese meant by "AF." Rochefort was always sure it was Midway but he needed proof. Around May 10th he went to Intelligence officer, Rear Admiral Edwin T. Layton, with an idea. Instruct Midway to radio a fake message in plain English, saying their fresh-water machinery had broken down. Nimitz gladly went along with the ruse. The Japanese took the bait, reporting that "AF" was low on fresh water.

Glory Days

As the U.S. Navy tries to balance ever-tightening budget constraints with rapidly evolving and expanding missions, Captain Ned Lundquist examines the daunting task facing "the world's preeminent maritime force."

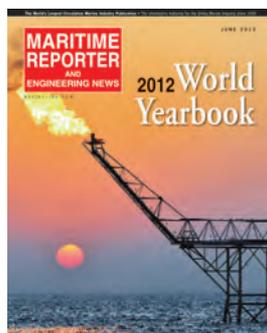
Pictured above: In commemoration of the Battle of Midway, fought June 4-7, 1942. The U.S. Navy effectively destroyed Japan's naval strength by sinking four of its aircraft carriers. It is considered one of the most important naval battles of World War II. Sailors assigned to the aircraft carrier USS Nimitz (CVN 68) created posters for a Battle of Midway Remembrance Dinner.

Navy Coverage, central to the June Yearbook, starts on page 36

ON THE COVER

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We are pleased to present the Overall Winner of the Don Sutherland Photo Contest on our Yearbook cover, this dramatic photo entitled "Bombay High Clean & Dirty Energy" submitted by Jan Berghuis of the Netherlands.



SUBSCRIPTION INFORMATION

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MR's Second Annual "Don Sutherland Photo Contest" again drew more than 1,500 entries from around the world.

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With an \$8B slice of the Canadian shipbuilding pie, Seaspan is investing mightily in relationships, facilities and people. *Edited by Greg Trauthwein*

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Shipbuilding in Nova Scotia

By Joonkoo Lee & Lukas C. Brun, Center on Globalization, Governance & Competitiveness, Duke University

Irving Shipbuilding's successful C\$25 billion bid for the combatant portion of the National Shipbuilding Procurement Strategy (NSPS) illustrates the strength of Nova Scotia shipbuilding industry. Under the program, Irving Shipbuilding, Inc. (ISI) will build six to eight Arctic/Offshore Patrol Ships and 15 Canadian Surface Combatants for the Department of National Defense (DND) over the next 20-30 years. The NSPS contract is in addition to ISI's contract to build nine mid-shore patrol vessels for the Canadian Coast Guard, valued at C\$219 million, and to refit seven Halifax-class navy frigates, valued at C\$549 million. This article, excerpted from a recently completed report on Nova Scotia's ocean technology sector by the Duke University Center on Globalization, Governance and Competitiveness, reviews Nova Scotia's shipbuilding capabilities and emerging market opportunities.

SHIPBUILDING IN NOVA SCOTIA

Nova Scotia's shipbuilding industry is based on three key features: a strong shipbuilding tradition and infrastructure, an emerging ocean technology sector, and continued large-scale federal shipbuilding projects.

Strong shipbuilding tradition and infrastructure: Nova Scotia and Halifax, in particular, have a history in shipbuilding dating to the 1880s. Irving Shipbuilding, the centerpiece of the region's shipbuilding, has built 80% of Canada's current surface combat fleet, including icebreakers. The company, owned by J.D. Irving, has in Nova Scotia two shipyards (Halifax and Woodside), one repair facility (Shelburne), and one support service affiliate (Fleetway). With 470 full-time equivalent employees in 2009, ISI's Halifax Shipyard is a full-service shipyard, offering a range of services from fabrication to machine shops. It also provides access to a large and extensive local subcontractor community. Currently, ISI has contracts under way to build nine mid-shore patrol vessels for the Canadian Coast Guard (valued at C\$219 million) and to refit seven Halifax-class navy frigates (valued at C\$549 million). Beside ISI, several smaller shipbuilders are also in operation in Nova Scotia, includ-

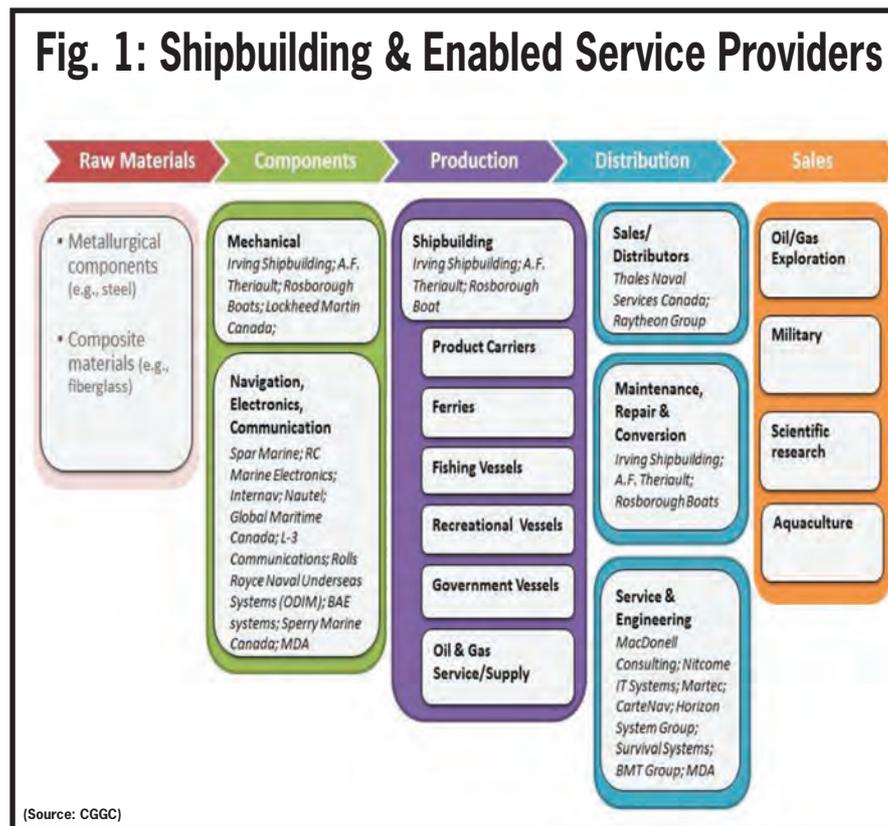


Table 1: Canada's ship and boat exports by destination and province (C\$ '000)

By Export Destination	2007	2008	2009	2010	2011
United States	562,682	449,033	270,037	209,931	290,339
Brazil	7,940	17,199	19,713	15,210	25,837
Australia	20,256	31,192	23,817	24,983	22,914
Belgium	15,578	26,331	24,058	19,073	14,391
India	21	99	207	145	7,910
Russia	12,407	18,837	8,754	2,110	6,500
Finland	3,161	4,750	3,774	3,212	4,924
Japan	8,528	9,607	8,643	6,813	4,915
Argentina	534	2,149	2,004	2,794	3,936
South Africa	6,038	3,675	2,692	2,914	3,823
Rest of the World	110,390	86,703	107,547	69,445	60,513
By Province					
Quebec	509,328	523,136	330,927	256,159	317,895
British Columbia	129,359	60,944	100,756	53,347	60,917
Ontario	68,143	54,892	29,414	36,728	50,946
Nova Scotia	6,740	5,502	8,667	4,252	10,718
Alberta	1,472	1,614	455	3,371	3,964
Newfoundland and Labrador	28,967	353	616	457	644
New Brunswick	3,221	1,876	288	1,769	610
Prince Edward Island	156	329	71	366	307
Manitoba	84	6	8	35	1
Saskatchewan	66	922	44	145	-
Total Exports	747,535	649,575	471,246	356,628	446,002

Source: Industry Canada Trade Data Online

ing A.F. Theriault and Rosborough Boats. These large and small shipbuilders and suppliers make up valuable infrastructure for shipbuilding and repair.

Nova Scotia's shipbuilding assets also

include its ability to develop a skilled workforce. Higher education institutions, including the Nova Scotia Community College and Dalhousie University, are continuing to develop a workforce with

the skills required in the marine construction and transportation industry. Demand for a range of shipbuilding skills, from welders to software engineers, is provided by the presence of large-scale shipyards like the Halifax Shipyard. Nova Scotia has maintained a nice balance in both the supply of and demand for a skilled shipbuilding workforce.

Emerging ocean technology sector: Ocean technology (OT) firms provide goods for ocean-related industries, ranging from marine robotics to electronic navigation equipment. They also provide services such as enhanced engineering and environmental and computer knowledge for marine industries. Nova Scotia, along with Newfoundland, represented over 80% of the OT firms in Atlantic Canada. A 2006 report estimated that the annual sales of the OT sector in Atlantic Canada were C\$329.2 million based on sales figures in 2003-05. When indirect economic activities are included, the sector was responsible for close to 5,298 person-years of employment, C\$201.8 million of household labor income, and C\$280.9 million of gross domestic product on an annual basis. These economic impacts are largely the result of small- and medium-sized enterprises (SMEs) with high rates of investment in research and development (R&D).

Nova Scotia has a great number of SMEs specializing in various ocean technologies, from naval architecture to software engineering. These SMEs are mainly supported by the presence of a robust aerospace and defense cluster that serves the government sector, the biggest customer of the OT sector in Atlantic Canada. 45% of Canada's military assets and a significant part of its defense R&D are present in the province. The defense cluster includes over 200 companies, 6,000 employees, and generates about C\$600 million annually in Nova Scotia. Major defense multinational corporations in the province include Lockheed Martin Canada, L-3 Communications, General Dynamics, MacDonald, Dettwiler & Associates (MDA), Raytheon Canada and Ultra Electronics Maritime Systems.

The OT sector in Nova Scotia has the potential to play a key role in global shipbuilding. Figure 1 presents the shipbuilding and enabled service providers in

Nova Scotia in the shipbuilding value chain. Nova Scotia's firms are particularly strong in the high value-added portions of the shipbuilding value chain, specifically navigation, electronic and communications equipment sub-systems, and shipbuilding engineering and support services, including integrators.

Federal shipbuilding projects: The presence of this large-scale, long-term federal project in Nova Scotia will provide several benefits to the Nova Scotia shipbuilding sector. First, it will ensure a steady demand for shipbuilding for an extended period. Most of the smaller shipbuilding sectors outside East Asia, due to unstable demand, tend to suffer from the frequent loss of accumulated local infrastructure and skilled labor. NSPS will ensure long-term stability in shipbuilding in Nova Scotia. Second, the project will generate new investments in the region. ISI has already invested C\$90 million in the past few years in expanding its infrastructure, and the company is expected to invest tens of millions of additional dollars as the largest portion of the NSPS program develops.

It will help upgrade infrastructure and stimulate employment across the region. Finally, NSPS will help the region attract large and small firms, skilled workers, and engineers from other Canadian

provinces and foreign countries, making the region's shipbuilding and OT cluster diverse and dynamic.

A number of opportunities exist for Nova Scotia's companies in the global markets for shipbuilding and OT value chains. Although Nova Scotia does not account for a large percentage of Canadian ship exports relative to Quebec and Ontario, it is well-positioned to take advantage of three opportunities in the shipbuilding sector.

(See Table 1, previous page.)

First, the increasing importance of modularization and high-tech systems offers companies in Nova Scotia opportunities to enter into global shipbuilding supply chains. Emerging economies are good candidates for expanding Nova Scotia's exports, particularly to countries experiencing recent growth in trade, oil production, per capita income, or requiring enhanced security of their ports and territorial waters, notably Indonesia, Turkey, Vietnam and United Arab Emirates. These countries are keen to develop local shipbuilding but not yet capable of developing integrated high-tech systems, to which Nova Scotia firms can contribute. Second, the increasing demand for Arctic vessels presents new opportunities to Nova Scotia firms. Refitting ships for Arctic conditions, in particular, appears a

promising activity for firms in Nova Scotia, and the province has several companies already active in this business. In addition, Nova Scotia companies could find opportunities to collaborate with East Asian shipbuilders. East Asian shipbuilders, compared to their Northern European peers, are not particularly strong in harsh climate technology and research. As they attempt to upgrade into high value-added ships, such as icebreakers, they are requesting R&D and technology assistance from Canada. International partnership could provide opportunities for firms and researchers in Nova Scotia to participate in large commercial projects oriented to global markets.

Third, a rapidly changing environment in energy demand and use can provide new market opportunities for Nova Scotia firms. As one of Canada's major offshore oil and gas industry bases, Nova Scotia can benefit from the need of the growing offshore oil and gas sector for specialized ships, such as platform service vessels and anchor handling tug supply vessels. Furthermore, as environmental standards tighten in the marine sector, there is a growing demand for energy-efficient ships or ships that use alternative sources of energy. This latter opportunity will introduce a new area for technological innovation in ship design and building.

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