



TESTIMONY OF DAMIEN BLOOR
PRINCIPAL CONSULTANT, FIRST MARINE INTERNATIONAL LIMITED

BEFORE THE HOUSE COMMITTEE ON ARMED SERVICES
PROJECTION FORCES SUBCOMMITTEE
ON THE U.S. SHIPBUILDING INDUSTRIAL BASE

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First Marine International Limited (FMI) is a small, UK-based, independent, specialist maritime consultancy company formed in 1991. FMI consultants are, in the main, professional naval architects and marine engineers with shipyard management experience and knowledge of a wide range of shipbuilding market sectors. Members of the team have worked on projects in over fifty countries and were first involved together in the 1970s in the design and engineering of the some of the largest and most successful shipyards in the world.

In June 2004 FMI was contracted by the Office of the Deputy Under Secretary of Defense (Industrial Policy) (ODUSD(IP)) to assist with the department's Global Shipbuilding Industrial Base Benchmarking Study (GSIBBS) Part 1. FMI was tasked to:

1. Compare the practices of the six U.S. first tier shipyards and seven leading international commercial and naval shipbuilders in Europe and Asia.
2. Identify specific changes to U.S. shipbuilding industry processes and to U.S. Navy design and acquisition practices that would improve the performance of the shipbuilding enterprise.

The FMI shipyard benchmarking system was used to make the comparisons as it was in a similar study in 1999/2000. The system allows the processes and practices applied in individual shipyards to be compared to others and to international best practice on a consistent basis.

The study found that the overall average best practice rating for the six major U.S. yards has increased from 3.1 in 1999/2000 to 3.6 in 2004. This is similar to the rates of improvement demonstrated by leading international commercial builders and confirms that there has been a marked increase in the rate of improvement in the U.S. yards over the last five years. This is the result of substantial capital expenditure by several yards and a concerted, industry-wide effort to employ higher levels of technology. Although individual U.S. yards still have some way to go, and there are some large gaps in key elements, at an industry level the technology gap with the international shipbuilders is closing. Some U.S. yards have clear strengths and the benchmarking team was impressed by the improvements that have resulted from the efforts of the last five years.

Indicative estimates of U.S. shipyard productivity were made using a combination of proprietary and public domain data. The estimates took vessel complexity and the additional work that the shipyard is required to do as a consequence of working on Government, rather than commercial, contracts into account. This has been named the "customer factor" and was estimated to be between 10% and 15% for most U.S. naval vessels types. The analysis indicated that there was a wide range of productivity being achieved across the industry and that the core productivity of some yards compared quite well to builders of similar vessels overseas. However, the performance drop-off that occurs on a new first-of-class appeared to be much higher.

The analysis of vessel work content indicated that U.S. naval vessels tend to be more complex and have more work content per unit of volume than some similar international vessels. Cost, risk, first-of-class performance drop-off, and the probability of cost and schedule overrun, all increase with vessel complexity. Therefore, if exposure to all of the above is to be minimized, overly complex vessels should be avoided.

Some observers have commented that as the commercial vessels built by naval shipbuilders tend to be expensive, they must inherently be constructing equally expensive naval vessels. Other studies by FMI have shown that a naval builder can provide good value for money in the construction of naval vessels



but be unable to compete in high-volume commercial markets. This said, both navies and naval builders can undoubtedly continue to make improvements by studying the most successful commercial models.

Although there are a few infrastructure deficiencies, and putting aside the effects of Hurricane Katrina, the industry is now generally well equipped to achieve internationally comparable levels of productivity in naval construction. However, there are major opportunities for improvement in the 'soft' areas including design, production engineering, planning, estimating, logistics, accuracy control, and manpower and organization. Deficiencies in these areas results in high levels of inherent work content, high first-of-class performance drop-off, and poor cost and schedule adherence. The report titled "First Marine International findings for the global shipbuilding industrial base benchmarking study", which presents FMI's findings in full, contains suggestions for improvements that can be effected through industry collaboration. Suggestions for individual yards have been made in proprietary shipyard reports.

The responsibility for the majority of the improvements suggested principally lies with the industry; however, Congress, the Navy and other Government departments could take action to assist. The principal suggestions for the Navy and Government are:

- Gain a more in-depth understanding of the relationship between ship specification, complexity and work content and work with the design authorities to reduce the inherent work content of naval vessels while not compromising functionality.
- Work with industry to develop the pre-production processes to reduce first-of-class performance drop-off.
- Review the acquisition rules, regulations and practices to determine if each adds value and work with the shipyards to find ways to reduce the effect these have on shipyard work content (i.e., reduce customer factor).
- Stabilize the ship acquisition program.
- Improve shipyard incentives.
- Continue to support performance improvement initiatives such as the National Shipbuilding Research Program (NSRP).

The proposals made in the study are aimed at both improving shipyard productivity and reducing work content by:

- Increasing the use of best shipbuilding practices in U.S. shipyards
- Making more effective use of the technology employed
- Optimizing ship designs to reduce work content in U.S. naval vessels
- Reducing the customer factor
- Reducing first-of-class performance drop-off
- Improving the acquisition environment

An order of magnitude estimate of the value of the savings that can be made confirms that there would be considerable benefit in reaching the targets suggested in the report for the above actions. The time required to achieve the targets will depend on the motivation of the industry, Navy and Congress, and the availability of funding. However, a realistic time-frame would be in the order of five years.