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Differences Between Military and Commercial Shipbuilding

Implications for the United Kingdom’s Ministry of Defence

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Summary

The United Kingdom’s Ministry of Defence (MOD) now buys most all ships built by the country’s shipyards. A shipbuilding industry relying almost entirely on a single customer will have little motivation to find more efficient ways of working or to advance the state of the art. An uncompetitive industry is unlikely to be a robust and healthy one.

The MOD is thus interested in whether the United Kingdom’s shipbuilding industry might become more competitive in the commercial and foreign military marketplaces. It is our aim in this report to shed light on the prospects for the United Kingdom’s re-entering the commercial market or increasing its share of the military export market. We base our conclusions on literature reviews, including detailed projections of shipbuilding by country and ship type;¹ a survey of shipbuilders in the United Kingdom, United States, and European Union;² and interviews with personnel at the responding shipyards.

As first and second steps in assessing the prospects for expanding UK shipbuilders’ customer base, we review global shipbuilding trends and the differences between military and commercial shipbuilding. We then examine the commercial and military markets in turn and

¹ Unless specified otherwise, data reflect trends and conditions up to early 2003.
² For simplicity, the authors use the term ‘European Union’, or ‘EU’, to refer to those non-UK European shipbuilders surveyed (even though the United Kingdom is an EU member). Specifically, EU countries that participated in this report consist of Denmark, Finland, France, the Netherlands, Spain, and Italy.
evaluate the potential for constructing both commercial and military ships in the same yard.

**Shipbuilding Trends**

The demand for commercial shipbuilding in the global marketplace has increased from a lull in the late 1980s to a peak in 2002 and 2003. Some national shipbuilding industries, notably the German and the Dutch, recovered during this period. The French shipbuilding industry took somewhat longer but eventually recovered. The US commercial shipbuilding industry, largely a protected one and uncompetitive in the global market, also recovered slowly from a similar downturn in its domestic demand. The United Kingdom’s commercial industry began to recover in the early 1990s before fading again in the middle part of the decade. As of early 2003, there was only one sizable commercial ship under construction in a UK shipyard (the **HMS Anvil Point**, a roll-on/roll-off cargo ship).

The United Kingdom has, however, sustained a military shipbuilding industrial base of substantial size throughout the last quarter-century. The value of its future domestic demand is expected to be on the order of that of France and Japan and much larger than Germany’s. However, UK shipbuilders are expected to export very few military ships compared with projects of the Germans and French.

**Differences Between Military and Commercial Shipbuilding**

If the UK commercial market is to expand, military shipbuilders will presumably have to begin building commercial ships, because the commercial industrial base is so small. The construction of all but the most complex commercial ships, however, differs dramatically from that of warships along several dimensions:
• **Ship size and complexity.** The average commercial ship is about three times as big as the average military ship and thus cannot be built in facilities sized for military ships. At the same time, the average commercial ship is much simpler (e.g., no weapon system) than the average military ship.

• **Acquisition process.** Commercial ship owners are accustomed to much simpler contracting, designing, construction, and testing processes than those that pertain in the military world.

• **Design and construction.** Commercial ships are, for the most part, large steel boxes with relatively small and simple propulsion and navigation systems. Designing military ships takes longer because of their high equipment density, the large number of sophisticated systems involved, and a desire to at least match the current state of the art. Construction of commercial ships is mostly a volume business that depends on simple steel forming and welding processes repeated over and over. The construction of warships involves the use of exotic materials, the installation of large amounts of high-value, sensitive equipment, and the satisfaction of more exacting standards. The testing process for military ships is more involved because it has to reflect the high technology and technology density of the ships and take account of multiple possibilities for mutual interference of advanced electronic systems.

• **Workforce character.** In the United Kingdom, military shipbuilding requires a much higher ratio of white- to blue-collar workers than that found in commercial shipbuilding. This is because military shipbuilding demands much more engineering support, as well as the need to interact extensively with the government oversight team. Military shipbuilding also requires more highly skilled and specialised workers. Such high overhead and high skill base cannot be sustained by any yard that expects to build typical commercial ships at competitive prices.

The differences between military and commercial shipbuilding are not as great, however, for auxiliary vessels (oilers, sealift ships, etc.) and some amphibious warfare ships as they are for surface com-
batants and submarines. Auxiliary vessels are similar to commercial ships and are often built to similar standards, and testing can be less rigorous where weapon and sensor systems are few.

**Prospects for Market Entry and Integration**

As suggested above, the United Kingdom would face strong competitors in attempting to re-enter the commercial shipbuilding market. Japan and South Korea dominate the market for ships of low and moderate complexity, mostly cargo ships and tankers of varying types. The European Union dominates the market for more-complex ships such as passenger vessels, although that market segment is also under pressure from Asian shipbuilders. The global shipbuilding market has for some years been characterised by excess capacity, so profits have been low. A newcomer would face formidable impediments to securing a meaningful market niche in such an environment.

Towards the latter half of 2003, demands for certain ship types (mostly very large container ships, bulk carriers, and liquefied natural gas [LNG] tankers) suddenly soared, pressing the available builders and, we surmise, increasing profits. The United Kingdom has not been in a position to take advantage of this shift and cannot count on it lasting for long. UK shipyards attempting to enter or re-enter the commercial shipbuilding market would also have to find a way to resolve all the workforce, process, and facility issues discussed above in a niche that took advantage of their special high-skill and high-complexity capabilities. Finally, the pound has recently been strong against the dollar, which also works against the United Kingdom’s export interests. We thus find prospects for re-entry of UK shipyards into the commercial market to be, on the whole, daunting.

The military export market is small in value compared with the commercial market. It nonetheless represents a tempting target for a nation with a largely military industry that is attempting to gain some ability to level the load over domestic military production lulls. Here again, UK shipbuilders face strong competitors in Germany and France, which together have more than 60 percent of the military
The United Kingdom certainly has a stronger industrial base to support military sales than it does in the commercial arena, but the match between most current UK military ship products and global demand is not a close one. The military export market is largely a market for modestly priced frigates and small conventionally powered attack submarines. It is not clear that a UK shipyard could build a conventional submarine at a competitive price; UK warships are, in general, too sophisticated and expensive to make them interesting to potential importers. Furthermore, export contracts often require that most ships in an order be built in the importing country, thus limiting the benefit such sales may have for the exporter’s construction workforce.

As mentioned above, should the United Kingdom attempt to re-enter the commercial market, shipyards currently building military ships would have to diversify into commercial production. While some yards do have experience with naval auxiliaries or recent commercial projects, the historical trend has been more towards specialisation than integration of commercial and military production. Integration can, of course, bring the benefits of military technological advances to commercial construction, and the benefits of efficient commercial processes can feed back to the military side. However, most successful shipbuilders have found it difficult to build both military and commercial ships, of any degree of complexity, within the same operation. Certain Japanese yards constitute a possible exception, and their practices warrant further investigation.

The Way Forward

While prospects for broadening UK shipyards’ customer base would appear to be poor, the shipbuilding industry is a volatile one, and events could always break unexpectedly in the United Kingdom’s favour. Taking advantage of such opportunities requires some preparation, such as the development of less expensive warship designs that reflect the needs of potential buyers. Research and development directed towards a generation-skipping commercial design or dra-
matic technological advances in systems and materials could also be fruitful.

Of course, development of new designs and technologies would require investment on the part of shipbuilders and marine equipment suppliers and potentially on the part of government, if appropriate and if consistent with EU rules. It would require investment, for example, in sustaining core design and programme management skills through lulls in orders. These investments would be risky, because the probabilities of payoff would not be high, but externalities might accrue to domestic military shipbuilding and to other UK industries.