



The Royal Academy
of Engineering

Employment and Skills for the Defence Industry in Scotland

Response from The Royal Academy of Engineering to the Scottish Affairs Committee

January 2008

1. The Royal Academy of Engineering is pleased to respond to the Scottish Affairs Committee's inquiry into 'Employment and Skills for the Defence Industry in Scotland'. This response has been collated from the views of a number of Fellows of the Academy, all of whom have experience in defence, shipbuilding or Scottish affairs. The Academy would be happy to provide further information on any of the points raised if the committee felt that this would be helpful to their inquiry.
2. The Government's decision to build two new Royal Navy aircraft carriers, with a budget of £3.8bn, represents a significant engineering undertaking for the UK and especially Scottish shipyards on the Clyde and at Rosyth. This is particularly true given that very few large merchant ships are currently built in the UK. While the contracts associated with the carriers will undoubtedly provide major opportunities for wealth creation and employment, there are also considerable challenges to complete the projects on time and on budget. In addition, the effect that such large projects will have on employment and related industries in the future will also be significant.
3. There are a number of issues regarding the skills base in Scotland which will affect a wide range of engineers and businesses for the next 10 years and beyond. Warship design and construction are demanding and specialised skills and hence, continuity of activity in all areas is vital to maintain the relevant experienced personnel and ensure that projects are successful. This has been demonstrated before on several occasions, most recently on the Astute nuclear submarine programme. Overall, the Defence Industrial Strategy, launched by the Ministry of Defence (MoD) in 2005, has had a positive effect in providing assurances of future contracts and improving partnerships with industry. Indeed, the 'Aircraft Carrier Alliance' set up to deliver the future aircraft carriers is potentially a good example of MoD/industry partnerships. It is, however, one of the first such alliances and must be closely monitored to ensure it is functioning effectively. Also, future improvements can always be made and continued efforts to maintain and support links between the MoD and businesses, both in design and construction, are to be encouraged.
4. Current experience of building warships in the UK is limited to a small number of companies, most notably for Scotland: BAE Systems Surface Fleet Solutions and Babcock International (both of which are members of the Aircraft Carrier Alliance). While these companies do have experience of building large vessels for the MoD, the proposed specifications for the carriers represent the largest ships in Royal Navy history and the UK shipbuilding industry has no recent experience of building ships of such a size. In addition, the intention to build the carriers in five separate blocks before final assembly, while common in the shipbuilding industry elsewhere, is relatively new for the UK. The Type 45 Destroyers are built using a degree of modular construction but given that each of the blocks of the new carriers will be equivalent in size to an entire Type 45 Destroyer, this represents a serious step up in construction complexity. Moreover, unlike major Royal Navy warships of recent times, the new carriers are to be built to commercial standards. New methods of working will therefore be involved which, once learned, could be turned to commercial advantage. It is essential that the shipbuilding industry in Scotland, and in the UK generally, finds a way of capitalising on the huge investment the Government is about to make in helping the industry face up to these challenges. This may be the last chance the UK industry has of re-entering the commercial market for cruise liners and other large commercial vessels. Failure to do so is likely to result in a major contraction of the shipbuilding industry once work on the carriers is complete.

5. In terms of specific skills, those of most urgent need at this stage are the initial design disciplines such as design engineers, project managers, naval architects and systems integration. It is vital that the project management and designs for the carriers are right from the outset as any mistakes early on may result in considerable costs or time overruns further down the line. There are naval architecture and maritime engineering courses in Scotland, particularly at Glasgow and Strathclyde universities, although these do not focus on the problems associated with warship design (only University College London offers this in the UK). It is therefore likely that the majority of the design and planning work will be carried out in England and hence will not directly benefit the Scottish economy.
6. As far as construction is concerned, the main challenge here will be in building and joining large structures. Quality assurance and project management between the different sites will be of paramount importance. Securing a sufficiently skilled workforce could also be a challenge, although the increased fluidity of the labour market throughout Europe should help in this regard. Specialised machinery will also be required to complete a project of this size along with personnel trained in its use. Overall, it has been the case in the past that companies have taken on contracts without due regard to the required workforce. It is important that this is not allowed to happen in this case. Opportunities exist for the creation of a sizeable number of new jobs if sufficient foresight is given to the construction requirements. The skills acquired will also be more readily transferable than those in the design phase of the project, particularly in general shipbuilding, offshore energy industry, electrical engineering and future MoD projects. However, efforts must be made to ensure that those trained in the relevant disciplines are retained by the industry and not lost to competing businesses in what is currently a buoyant job market. Efforts must also be made to ensure that the skills learnt by both individuals and companies will have continuing applications beyond the current contracts for the aircraft carriers.
7. The new carriers do represent major opportunities for Scottish industries and employment. However, the order by the MoD is to the Aircraft Carrier Alliance and though the final assembly will be at Rosyth, the bulk of the ships will be built and assembled in both English and Scottish facilities. Furthermore, most of the expenditure will be either in the design work, largely in English locations where most of the naval ship design resources are located, or in equipment manufacturing sub-contractors, which again are located throughout the UK. The precise distribution of jobs arising from this order is not straightforward as modern ship building is largely an assembly process with most of the ship equipment (e.g. combat systems, main machinery, service systems and outfitting) likely to come from manufacturers all over the UK and even some foreign material and equipment expenditure. Thus, while £3.8bn is a significant amount of money, it should be noted that the expenditure will be over a period of more than 10 years and will be spread throughout the UK and not just in Scotland.
8. In conclusion, this programme will have a substantial effect on the UK shipbuilding industry and in particular the Scottish shipyards involved and the many Scottish marine industry suppliers involved in such a highly advanced design and build task. As such, the programme should help preserve and develop this key industry which has benefits beyond the final shipbuilding facilities. However, care must be taken to train people in the suitable skills and also to look beyond the current contracts to ensure a lasting legacy from the present investment.

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