

DME ANNUAL REPORT

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Executive Summary

The Chief of Defence Logistics (CDL) and Chief Executive Warship Support Agency (CE WSA) requirement for the Director Operations (Equipment) DOpsE post occupant also to act in the role of Director of Marine Engineering (DME), has been actively pursued over the last year. The requirement was aimed at ensuring that the level of Marine Engineering competence and quality was sustained throughout the major organizational and culture changes across the MoD as a whole. The emerging approach is to identify a Centre of Marine Engineering Excellence, which if sustained will allow DME to discharge his remit. The novel feature of this Centre of Excellence is that it is a virtual organization. It is centred on a core consisting of the ME IPTs, Training Establishments and the Dockyards and Naval Base engineering capability, but also including individuals, for example the Chief Naval Engineer Officer and the ME Commander on the Washington Embassy Staff. The elegance of this approach is that it is robust to organizational change and allows DME an overall visibility of the total ME capability giving the ability to highlight weak or missing areas for action. Although still early days it would appear that at present the main components exist and further development of this virtual Centre of Marine Engineering Excellence is a practical proposition that will continue to provide a long-term focus in this area.

Over the last year there have been significant achievements in the WSA's support of Marine Engineering in the Navy with much progress being made in supporting the design phase of the T45, providing significant pull-through of technology derisked by the Marine Engineering Development Programme (MEDP). WSA specialist sections provide the expertise for this programme, which is primarily focussed on reduced through life costs and hence is of major benefit to the Agency in the future. The same expertise and technology development was also put to excellent use keeping an old but still very capable ship, HMS *Fearless*, at sea. The general standard of performance is reflected by MPS IPT who won a Minister's Award for Excellence in Acquisition. Retention of appropriate expertise and the ability to invest in future improvements present the major challenges if this standard is to be maintained.

Introduction

The formation of Integrated Project Teams (IPTs) in the Ship Support Agency (SSA) occurred in February 2000 as part of the SMART procurement initiative. This saw the disaggregation of an organization that had been dedicated to the management of marine engineering technology development and its application since the formation of the Engineer in Chief's Department of DG Ships, when he was a member of the Navy Board. This organization had survived various reorganizations as DG Marine Engineering and finally ended up as Director of Marine Engineering.

The business gains from forming IPTs through this restructuring were judged to be significant. However there were risks and CDL's approval of the new organization contained a specific requirement for the DOpsE post to also act as Director of Marine Engineering (DME). In the DME role he was charged with

maintaining the excellence of marine engineering in the MoD to ensure that this unique and valued capability was retained.

Further developments have seen the merger of the SSA with other organizations to form the Warship Support Agency (WSA) and this Report is timed to coincide with the first anniversary of this new Agency. It has two main elements. The first deals with the continuing evolution of the 'centre of excellence in marine engineering'. The second reviews some of the many achievements of the constituent parts of that centre of excellence.

Strategy

To be charged with 'maintaining a centre of excellence in marine engineering in the MoD' has turned out to be a challenging concept to interpret and has required much thought.

Examination of what would constitute a centre of excellence revealed that it required a far wider ranging input than the constituents of the original DME organization. Although the five ME EIPTs are central to the concept, it is clear that, industry, classification societies, academia, the Training establishments, Washington Embassy staff, and UK personnel on exchange appointments are an essential part.

From this it is become clear that the Centre of Excellence would be best suited to being a virtual organization. This is the vision that is gradually being developed. The component parts of the organization have yet to be fully identified but it would appear to be a viable way in which the DME remit could be discharged. The method of operation could be to:

- Monitor the competence, quality and resources of the various parts.
- Identify and highlight shortfalls or holes in the capability.
- Ensure corrective action is taken.

Further work is required in development of this area but one of the major attractions is the robustness of the concept to future organizational change.

Standards

Marine Engineering standards are enshrined in a library of Naval Engineering Standards (NES) which has a rolling three year update cycle managed by DOpsE on behalf of the EIPTs. So far 230 NESs are in the cycle with the last 40 joining in 2002. DStan have recently taken the responsibility for publishing the NESs under DStan covers and have placed the unclassified ones on the Internet.

In the last year extensive assistance has been given to Lloyds Register in compiling and issuing Lloyds Naval Machinery Rules (LNMR). During this exercise it became obvious that the NESs, on which LNMR are extensively based, are held in high regard and are widely used both in industry and by foreign navies. An acceptable alternative to the NES for specification in procurement now exists in the form of LNMR but only when amplified by Owner's Requirements currently contained in the NES.

Safety

The safety aspect of the DME role is one of increasing profile, not because the engineering is becoming less safe but because there is an increasing requirement to demonstrate safe practice and the organizational changes in procurement and support require new processes to be put in place. The key objective being to protect the privilege of self-regulation.

DME, as a member of the recently formed Naval Authority Council that reports to the Ships Safety Management Board, has been tasked with investigating the requirement for further new Naval Authorities in the field of marine engineering. Initial investigations so far confirm that the Safety Case system currently operated for in-service ships is adequate. There is however a distinct possibility that two new Naval Authorities, focussing on 'ship manoeuvring and control' and 'high voltage systems', may be the optimum way in which to modify the internal regulation process to accept the new ships currently being procured. The key differences are the ship Design Authority being retained by industry and Contractor Logistic Support for these vessels.

To allow the safe introduction into service of the ships fitted with electric propulsion currently under construction a High Voltage Steering Group, chaired by DOpsE/DME, and an associated HV Working Group, chaired by the Marine Electrical Systems (MLS) IPT, have been set up. DOpsE/DME has also recently been given formal delegation from the Chairman of the Ship Safety Board, to act as the Naval Authority on Fire Safety with the MFFM IPTL, acting as the competent authority on his behalf.

Capability

Capability, interpreted as competence plus resource, is under investigation and both aspects give cause for concern. Changes to the organization and its underlying culture away from the technical foundations of the past raise questions about certification of competence. Technical competence unlike finance, contracts and commodity requires no internal license to operate.

This is a high-risk safety and financial situation for the WSA which the Technical Director (DTech) has recognized and is taking the lead in correcting. The concern here is the ability to fill the posts with identified competence levels in the future.

The available resource is a major cause for concern particularly at professional level due to three reasons.

1. The effect of dockyard privatization with the loss of both qualified manpower and the excellent training ground.
2. The conscious decision in the early 1980s to stream civilian mechanical engineering graduates towards the project management route rather than a second degree in marine engineering (Dagger Course).
3. As a result of the first two a significant number of individuals with key knowledge and experience retire from the service in the next two years.

In the short term, and at the more junior levels, adequate resource can be provided by the uniformed professional marine engineers, however the RN has its own retention challenges to meet.

This area is one, which DME has highlighted as a major threat to the maintenance of a centre of excellence and one that requires immediate action to at least quantify the problem.

Performance

There has been substantial evidence of a high level of professional support to the Fleet. A particular example being the justification of HMS *Fearless* steam plant both for operation after a major fire and also in excess of its design life. This was a model exercise that should be used as a pattern for tackling the resolution of future major in-service marine engineering problems. It did reveal, however, that

industry expertise is limited confirming that in-house competence needs to be maintained at least at current levels to allow extended life operation of old designs which appears to be becoming the norm with the current climate of restricted funding and procurement slippage.

Investment in the future progresses better than could ever have been expected with major, unplanned, early pull-through of MEDP development into the Type 45. This investment has allowed the Prime Contractor to achieve significant cost of ownership and programme risk reductions. This enlightened approach by the Type 45 has avoided the stagnation of marine engineering in the Fleet that could have occurred. The Marine Propulsion Systems (MPS) IPT won a Minister's Award for Excellence in Acquisition for its Gas Turbine Alternator Development Programme.

There is significant synergy existing between the in-service and future areas to demonstrate that currently, for marine engineering, the MoD is in the position to be an informed and competent ship owner.

Forward Programme

The future programme for the technical aspects is clear and well managed in the MEDP. Some exciting work of international interest will be undertaken at the Electric Ship Technology Demonstration (ESTD) facility at Rugby and two new gas turbines will appear in the next two years. At the same time new technologies will reach a maturity where intelligent systems using smart components will allow the MEDP to address the automation of the internal battle space. This has the potential to enhance the capability, reduce the cost of ownership, reduce the numbers of people placed in harms way and could be incorporated by technology insertion.

Future challenges

Three challenges will be addressed during the next year:

1. To fully establish the virtual centre of excellence and agree the standards and benchmarks against which it can be maintained.
2. To update the MEDP programme in light of the Type 45 success to allow CV(F) to have similar opportunities and to obtain the funding approval.
3. To identify the requirement for competent staff and put in place a programme to provide sufficient manpower to ensure that the track record of safety, self-regulation and cost reduction can be maintained in the future.