



## **Training the maintainers – a case study**

Training is not just about instilling the skills and standard operating procedures necessary to operate or 'fight' complex weapon systems, advanced combat aircraft or multipurpose armoured fighting vehicles. Just as important – indeed, there are those who would argue, with some justification, even more important – is training the ability to maintain and support the often bewildering variety of equipment and systems required to sustain modern combat operations. Such equipment certainly includes weapon systems – but their number is utterly eclipsed by the number of non-lethal logistical systems that act in support of today's armed forces.

Consider, for example, the humble aircraft trolley. Not so much the contraption known to airline passengers; more the metallic behemoth used by the military to support wide bodied aircraft such as, for instance, the BAE Systems Nimrod MRA4 maritime reconnaissance aircraft now coming into service or the RAF's C-17 strategic transport aircraft.

Large aircraft such as these are packed to the gunwales with complex electronic systems, most of which produce considerable excess heat as a result of their functioning. The issue of air conditioning and control therefore becomes one of significance to the efficient functioning of said systems.

The Trolley, Air Cooling and Heating Mk12 (Mechanical) is a towable machine that weighs in at a respectable ten tons. Ensuring such an artefact performs reliably, effectively and with minimal disruption to operations requires engineers and technicians to be trained to maintain and support the system and its individual components. Such training also needs to provide students with a persistent ability to support the trolley in all potential environments, from peacetime to full combat operations.

According to the Royal Air Force's website, the current training at MoD St. Athan – Trolley, Air Cooling and Heating Mk12 (Mechanical), course 2273 – is intended "to train selected personnel in the skills and knowledge required in the safe handling of refrigerants and to operate and maintain..." the system. Individual components of the course include "Health and Safety, Safe Handling of Refrigerants, Trolley Air Cooling and Heating Mk12, Mk12 Pipe Repair Procedures."



Course 2273 was one of those selected for the Metrix treatment as part of the £31 million Early Training Transformation (ETT) contract awarded in August 2009. Focused on bringing the Metrix team's expertise to bear on enhancing key aspects of some training elements in advance of main contract award for the Defence Training Rationalization (DTR) programme, ETT has concentrated on a relatively small number of courses to provide concrete examples of the way that re-examination of a course from 'first principles' can radically improve training effect.

According to Ken Baker, Training Design Manager, the objective for ETT is systemically to analyse the course and to introduce modern learning techniques in order to create efficiencies. These include compression of the courses – DTR as a whole has a requirement to achieve 25% compression on average across the entire package of courses being restructured.

Like any venture in which change is proposed, there were some up-front challenges that needed to be addressed as the work review process launched. "There was some apprehension among the subject matter experts as to whether or not this 'new process' would work and how it would change things, but after a very short period – I would say two weeks – our process and their analysis had dispelled any apprehension and we had full buy-in," said Ian Graham, lead analyst for the programme.

Work commenced in November with a 'meeting of minds' between the Joint Training Development Team (JTDT, based at the Defence College of Electro-Mechanical Engineering at HMS Sultan in Gosport) and Metrix Training. Quite apart from discussing expectations for the eventual deconstruction and reconstruction of the training course, participants in this meeting took the opportunity of what one member calls "a gentle orienteering course" aimed at promoting teamwork and partnering – a vital component of the Metrix offer for DTR.

David Appel, director of the UK team for Raytheon, Metrix' key partner in the training transformation field, talks about ETT in general as characterised by "the bulk of this work being a systems approach across the entire curriculum." Course 2273 is one of the examples of the small number of courses selected for in-depth treatment as a demonstration of the way in which ETT will bring improved effect to specific training programmes.



Preliminary Work Deconstruction – for which read ripping the curriculum apart preparatory to rebuilding it from the ground up – involved the JTDT, Raytheon, Training Design and the Mechanical Engineering Training Flight of No. 4 School of Technical Training. This work then informed Full Work Deconstruction, completing the process, which was conducted at the Support Engineering Flight at RAF Brize Norton.

A total of some 15-20 people were involved in these two phases of breaking down and rebuilding the course. One of the lessons learned, according to Baker, was the degree of benefit that came from paying attention to the relationship-building and interpersonal work that has surrounded the project to date. “Briefings around the process strengthened the teams, helped to alleviate anxieties regarding the effects of change and contributed to more efficient project management,” he said, adding that Course 2273 is just one of a total of nineteen individual projects encompassed within the ETT contract.

Other positive lessons that can and will be applied to other ETT projects as well as the many components of the full contract when let include methods of improving inter-team communications and understanding still further, according to Amanda Watts, DCEME Supervisor for the DTR Training Design & Development team. She also adds that “engaging the right sort of subject matter expert from the beginning – making sure the current jobholder is involved – is fundamental to the project”

The ‘buy-in’ from all components of the broad spectrum of service personnel involved in examining the Mk12 training course has been obvious throughout the process and has been the subject of positive comment from all sides. The spirit of “we can do this” has permeated every level of discussion and has enabled the team to develop a Milestone 2 report that was presented at a decision forum at Farnborough in early March 2010. As well as the ‘front line’ input from technicians and administrators intimately involved with the current course, the equipment IPT, the St. Athan Learning Centre and the Training Analysis Centre all contributed to a robust and effective solution being offered. “We really have had a fantastic relationship throughout this process,” Watts said.

The grass roots, experience-derived knowledge that was fundamental to the success of this phase came from an exhaustive process of discussion with technicians who currently work with the Mk12 on a daily basis. Critical to any training needs analysis, this type of elemental approach speaks to the MetriX desire to ensure that ETT is both truly transformational and also rooted in accurate, reliable and current in-depth knowledge.



Looking at the issue of course compression, the Metrix team has achieved savings “in the order of 30-40% so far,” according to Graham. A week-long City & Guilds course in aspects of refrigerant handling, which was an integral part of the original course, has now been separated from it and is considered to be part of the entry standard for Course 2273. With this separation achieved, the total course length is now “predicted to be six or seven days,” he said.

Transformation suffers slightly from being seen as a ‘buzzword,’ despite the crucial nature of its impact on the future of technical training. But transformation is truly what ETT is delivering. The key to achieving transformation – and thus delivering effective training in the right place at the right time – lies in injecting the right technology at the right point in the learning process and at the right cost. “Technology augments, it does not replace,” Raytheon’s Appel said.

From an instructor-led, classroom-based course, technical training for the Trolley, Air Cooling and Heating Mk12 (Mechanical) has become a real blended learning solution, with interactive courseware modules and instructor-facilitated ‘hands-on’ learning components integrated to provide comprehensive learning for students. These students, who are designated ‘Level 3’ in that they have been in their current jobs for a minimum of three years, graduate from this course and go straight to operational maintenance of the trolley.

Course 2273 has continued to move forward rapidly since the decision forum approved Milestone 2 in March and is set to provide RAF student technicians with more effective, more focused and more sustainable training in the near future. As an example of what ETT will deliver – and of what the ‘full blown’ DTR contract will be able to deliver after main contract award – training for the ‘ten ton trolley’ will continue to be the subject of incremental but rapid improvement.



## **About Metrix**

Metrix is the consortium which has been appointed Preferred Bidder to transform three types of specialist training that is critical to the UK Armed Forces, and to manage, build and run what will become the UK Ministry of Defence (MOD) Defence Technical College (DTC) which will be based in St Athan, South Wales. Arising out of the Government's Defence Training Review (DTR) in 2000/2001, which recommended a new approach to training, the DTR Package 1 Project will, when completed, have created a College which will be the largest vocational training operation in the country, and will provide the chance to deliver important changes in training delivery across all three armed services over the course of the next 30 years. Metrix is led by technology services company QinetiQ, and facilities management specialists, Sodexo. QinetiQ is a leading international provider of technology-based services and solutions to the defence, security and related markets. With over 14,000 employees, QinetiQ operates principally in the UK and North America and already has a significant presence in Wales through the test and evaluation facilities at Pendine and Aberporth, managed on behalf of the MOD, and the West Wales UAV Centre, operated in partnership with the Welsh Assembly Government. In the UK and Ireland, Sodexo employs 43,000 people and provides food and facilities management services to clients at over 2,300 locations in the corporate, education, healthcare, leisure and defence sectors.

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