

The Evolution of Aircraft Support Concepts Within the UK MoD's Defence Logistics Transformation Programme

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ABSTRACT

Recognising that the goal of the session is to review the evolution of maintenance/support concepts for military aircraft fleets and to identify the factors that have driven the changes, the focus of this paper is on the transformation of UK military aircraft support concepts and activities under the auspices of the UK MoD's Defence Logistics Transformation Programme (DLTP). The paper summarises some of the history of change within the UK's Defence Logistics Organization and the genesis and aims of the DLTP. Emerging aircraft support concepts will be described such as the 2-level maintenance concept known in the UK as the 'Forward-Depth Construct' together with a description of how the concepts are being implemented. The type of transformation activities that have been undertaken will be explained and illustrated with examples; these include support rationalisation and the application of Lean tools and techniques. Finally, the paper will describe the UK MoD's next steps in the transformation of military equipment support through its recently-published 'Defence Industrial Strategy' and the subsequent 'Enabling Acquisition Change' report.

1.0 INTRODUCTION

This paper describes the transformation of UK military aircraft support concepts and activities under the auspices of the UK Ministry of Defence's Defence Logistics Transformation Programme (DLTP). The paper will set out some of the relevant historical context in terms of the main financial and political factors that are driving the change before describing some of the transformation activities that have been undertaken and the new support concepts that are emerging. Finally, the paper will illustrate some of the benefits that are being demonstrated through some aircraft-related DLTP change initiatives.

2.0 HISTORICAL CONTEXT

2.1 The Defence Logistics Organisation's Change Programme

The Defence Logistics Organisation (DLO) was formed in April 2000 as a result of some of the recommendations from the UK's 1998 Strategic Defence Review. The individual logistics organisations from the three Services were merged together and a new 4* level post, Chief of Defence Logistics (CDL), was created to lead the DLO. Upon its formation, Her Majesty's Treasury set the DLO a target to achieve a 20% reduction in total DLO operating costs by Financial Year 2005/2006 – this was referred to as 'the Strategic Goal'. The DLO Change Programme was launched by CDL on the 26 September 2002 as a single, organisation-wide programme to deliver change in the DLO driven by specific requirements and generating measurable benefits.

2.2 The End-to-End (E2E) Programme

In May 2002, the UK MoD appointed the consulting firm McKinsey & Co to help in the identification of areas where the DLO could achieve the Strategic Goal target while safeguarding, and preferably enhancing, the support the DLO was providing to the front-line. The resulting 'E2E Study' report, delivered on 1 July 2003, broke the paradigm that Logistics Support is bounded by organisations and established principles showing that true logistics transformation could only be achieved by taking a holistic, whole supply chain (that is from production to point of use or '*end-to-end*') approach to optimising the delivery of logistics support.

2.3 E2E Study Recommendations for Logistics Support

The E2E Study recognised that future support strategy must be based on expeditionary operations, that is, short-notice operations in distant-overseas locations often with poor infrastructure. These operations require Joint logistic support that is tailored to the level at which the UK Armed Forces will be operating (the so-called '*most likely*' operational scenarios at lower intensity), is rapidly deployable and robust. Logistic support requirements should be driven from the front line back ('*customer pull*') and based on the effects that the operational commander wishes to achieve.

The E2E Study aimed to identify ways to deliver more effective logistic support for military forces at lower cost, where possible, but not at the expense of mandated or increased operational effectiveness. The proposals to improve logistic supply and equipment support for deployed forces arose as a result of a systematic analysis of existing logistic processes. The analysis considered both equipment and logistic support end-to-end, and addressed both non-deployed and deployed operations, for the UK's standing and crisis commitments. Future Support would be founded on the following three key principles:

- Configure logistic support for the most likely operational scenarios (medium scale), but create sufficient flexibility to cope with the most demanding. Previously, logistics support was largely geared towards fighting a major conflict, whereas modern expeditionary operations have generally been more frequent and of a smaller scale.
- Concentrate support facilities at the 'logistic centre of gravity'. Withdraw stocks held in remote warehouses, centralise stock holdings and support major training exercises and operations with '*Deployable Spares Packages*' (DSPs, also known as '*Priming Equipment Packs*'), in line with Industry best practice. Hold only sufficient materiel for a unit, formation or squadron until the supply chain is established and where resources and materiel can deliver the required logistics support as effectively, flexibly and efficiently as possible.
- Streamline the supply chain and take a '*factory to foxhole*' perspective to synchronise all logistic efforts with delivering the final output. By applying 'Lean' principles (see below) to the end-to-end supply chain, excess capacity and duplication will be removed or reduced, defined organisational boundaries will be removed, and logistic support will flow more quickly, efficiently and effectively.

In sum, E2E sought to provide operational commanders with the materiel they need, where they need it and when they need it.

2.4 The Defence Logistics Transformation Programme

On 1 April 2004, the logistics elements of the DLO Change Programme and the End to-End Review were brought together under the Defence Logistics Transformation Programme (DLTP) to form a single coherent programme of logistics change initiatives across Defence. The DLTP soon developed the E2E Study's 3 principles above into 7 of its own:

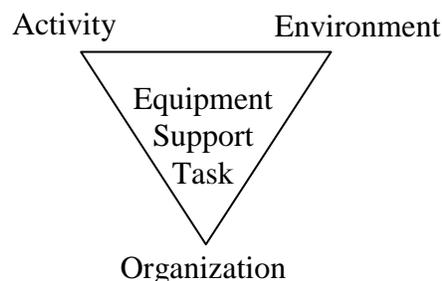
- **Configure for the ‘most likely’ operational scenarios.** Formerly, logistics support was geared towards supporting major conflict, whereas modern expeditionary operations, although of a smaller scale, are greater in number, occur at shorter notice and require greater agility.
- **Concentrate resources and materiel.** More efficient and effective equipment support can be achieved if resources and materiel are concentrated at ‘*logistics centres of gravity*’. For example, in aircraft support, this means striving to put as many Depth Support Activities in Depth Support Units, ideally collocated at aircraft Main Operating Bases thereby eliminating duplication of activity, overhead and infrastructure.
- **Apply the ‘Forward/Depth’ concept.** The traditional four ‘*lines*’ of maintenance are replaced by the two-level construct known as ‘*Forward/Depth*’. Closely related to the previous principle, this rationalisation of overcapacity also helps to eliminate duplication of activity and infrastructure.
- **Minimise the ‘deployed footprint’.** Today’s relatively small-scale expeditionary operations occur at short notice and demand far greater logistics agility. Therefore, force elements must incorporate the smallest possible organic support arrangements fed by efficient and effective support chains.
- **Optimize asset availability.** More effective asset tracking reduces waste, stock holdings and cost and improves operational availability of warfighting equipment.
- **Rely on an effective joint supply chain.** An effective, efficient and flexible end-to-end supply chain is essential to equipment support.
- **Access to timely, relevant and accurate information.** Timely access to relevant and accurate logistics information is another vital enabler to ensuring that logistics support in the military environment operates efficiently and effectively.

3.0 THE EVOLUTION OF AIRCRAFT SUPPORT CONCEPTS

3.1 The Three-Attribute Model of Equipment Support

3.1.1 Equipment Support Tasks

Defence equipment is employed in operations to generate military effects. By its very nature, such equipment is complex, costly and must be supported during missions, for the duration of each campaign and throughout its useful life. Equipment support comprises a series of tasks each of which may be considered as having three distinct but inter-related attributes: ‘*activity*’; ‘*environment*’; and ‘*organization*’, as illustrated below:



The E2E Study recommended that military equipment should be supported under a 2-level regime rather than the traditional 4 lines. This later became known as ‘*the Forward/Depth construct*’ under which each of the attributes above has 2 levels, defined as follows:

- **Activity.** Support task activities are necessary to sustain the equipment during its short-term operation (sorties, missions, campaigns) as well as to sustain it throughout the whole of its useful life. In the past, support activities have been defined by the notion of maintenance ‘depth’¹ [1] as well as in terms of the capabilities of the various repair agencies² [1]. Further aspects of support activities are: the frequency with which they are required to be undertaken; the length of time they take to complete and whether they are ‘portable’ between locations. Here, the two levels of activity are referred to as ‘Forward’ or ‘Depth’ support activities, defined as follows:
 - **Forward Support Activities (FSAs).** Support activities in this group are those that are directly concerned with preparing equipment for use and sustaining it in an operational condition throughout a period of need such as a sortie, a mission or a campaign³. Such activities include the following, all of which are optimised for effectiveness, will be relatively frequent and of short duration:
 - Flight Servicing⁴ (including preventative maintenance and replenishment activities) [1], re-fuelling, re-arming and role changing.
 - Functional testing and adjustment.
 - Minor modification.
 - Fault diagnosis and minor⁵ corrective maintenance.
 - Scheduled maintenance.
 - Expedient Repair⁶ [1].
 - **Depth Support Activities (DSAs).** Such support activities are broader in scope and encompass the efficient and effective sustainment of equipment throughout its useful life as well as the enhancement of its capabilities and the improvement of its reliability. Such activities have a greater focus on efficiency and include the following, all of which will be far less frequent than Forward Support Activities but will consume significant time and resources and may require special skills and equipment:
 - Scheduled maintenance (including bay maintenance, reconditioning and overhaul).
 - Major⁷ unscheduled corrective maintenance.
 - Modification and conversion.
- **Environment.** Support tasks can be considered to arise in one of 2 locations or ‘environments’, referred to here as ‘Forward’ or ‘Depth’. One factor that should be taken into account is whether an emerging support activity requirement is necessarily tied to a given location. For example, the requirement to effect a major airframe repair (a Depth Support Activity) may emerge in a Forward location (see below), but it may be more cost effective (and/or operationally expedient) to move the repairers to the aircraft rather than vice versa. The Forward and Depth Environments are defined as follows:

¹ Maintenance depths A, B, C and D – JAP100A-01, Ch 0.4.

² For instance, the Repair Categories 1 to 5 – JAP100A-01, Ch 9.13.1.

³ In military aviation, such activities are often said to pertain to ‘sortie generation’.

⁴ Maintenance to determine aircraft condition prior to, or following, a period of flying - JAP100A-01 Ch 2.8.

⁵ Achievable within notice to move times, for instance.

⁶ Rapid repair solutions designed to restore operational capability at potentially reduced airworthiness levels - JAP100A-01 Ch 9.12.

⁷ Not achievable within notice to move times, for instance.

- **Forward Environment.** Forward support locations will not always be predictable since they will be determined by the operational circumstances prevailing at the time. They will range from the operational elements of Main Operating Bases (MOBs) and well-found Deployed Operating Bases (including aviation-capable ships) to austere Forward Operating Bases in the Deployment Theatre that may well be '*in harm's way*'. Such locations will always be under the command of an operational commander and will include Forward Mounting Bases and the Coupling Bridge⁸.
- **Depth Environment.** The location of Depth support will always be determined well in advance by the relevant commodity, weapon system or platform DLO Integrated Project Team⁹ (IPT), often in partnership with industry, such that it is able to provide the level of support required as cost-effectively as possible. Depth Support Units (see below) will therefore be established on value for money grounds and may be collocated at MOBs to capitalise upon synergies with operating units¹⁰ or may be otherwise consolidated to maximise support rationalisation benefits in organisations such as the UK MoD's Defence Aviation Repair Agency (DARA) or Industry.
- **Organization.** There are considered to be 2 *groups* of support organizations:
 - **Forward Support Units.** Personnel who predominantly work in the Forward Environment will be formed up into organizations known generically as '*Forward Support Units*' (FSUs) which will belong to the Front Line Commands (FLCs)¹¹.
 - **Depth Support Units.** Alternatively, IPTs will be responsible for delivering DSAs and so will form '*Depth Support Units*' (DSUs) (such as elements of DARA Fleetlands) which will primarily deliver their capabilities in the more stable, UK-based Depth Environment. The sub-set known as '*Deployable Depth*' encompasses those logistic processes and functions that are optimized in peacetime within a DSU on grounds of effectiveness and efficiency and yet need to be configured as deployable to provide responsive DSA support to FSUs when required by the scale of the operation or fragility of the supply pipeline. Some support activities will be required to be undertaken in the deployed Forward Environment which could either be militarily benign or '*in harm's way*'. In the benign case, civilians or Contractors on Deployed Operations (CONDOS)¹² [2] could be employed; for non-benign scenarios, either Sponsored Reserves¹³ [3] or Service personnel will be required.

3.1.2 Support Attribute Inter-Relationships

The particular support organisation required to undertake equipment support tasks will be determined by a combination of the nature and location of the support activities (see Figure 1 below).

⁸. The Air or Sea Port of Embarkation (APOE or SPOE) designated for onward movement of equipment into the Deployment Theatre.

⁹. The DLO team charged with providing for the whole-life support of the platform, system or equipment.

¹⁰. This so-called '*roll-forward*' option was the E2E Study preferred model.

¹¹. In UK military aviation, these are Strike Command, Fleet and the Joint Helicopter Command.

¹². JSP 567, 1st Edition, Feb 04 – CONDO Policy.

¹³. Defence Contracts Temporary Memorandum 54/2002 – Sponsored Reserves Terms & Conditions.

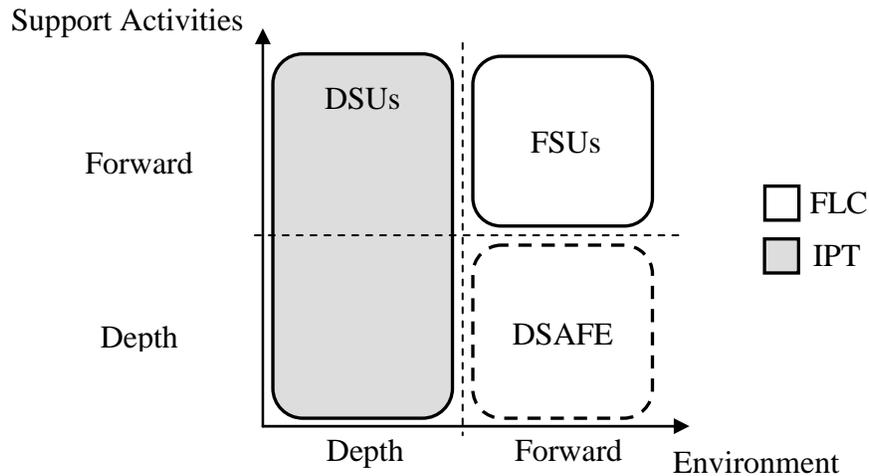


Figure 1: Support Attribute Inter-relationships.

FSUs will be manned, equipped and trained to undertake Forward Support Activities for FLCs in the Forward Environment (top right-hand corner of Figure 1).

Conversely, DSUs will normally undertake the majority of planned Depth Support Activities for the relevant IPT in the Depth Environment (bottom left-hand corner of Figure 1) and, while acting as the equipment custodian, the DSU will also undertake limited Forward Support Activities, such as the Flight Servicing or refuelling associated with post-production test flying (top left-hand corner of Figure 1).

However, there will be occasions where Depth Support Activities arise in the Forward Environment (DSAFE) either in the UK or abroad which, for cost and/or operational reasons, cannot be moved to a DSU (bottom right-hand corner of Figure 1).

3.2 Delivering Depth Support Activities in the Forward Environment

3.2.1 Discriminating Between the Delivery Options

The planning for such Depth Support Activities in the Forward Environment (DSAFE) will be largely dependent upon their complexity and likely frequency of arising (see Figure 2). If such activities occur frequently in all scenarios up to and including the most likely, the FLCs may require to up-skill their operating FSUs¹⁴ or otherwise retain certain, more specialist skills within their direct control as ‘Support Augmentation’ (see below). Alternatively, if such eventualities arise less frequently (for instance, in more demanding scenarios), personnel from the relevant DSU could be deployed¹⁵.

¹⁴. Squadrons, Flights, Regiments and so on.

¹⁵. This could be rare for all eventualities up to and including the most likely scenario (occurring, for instance, if the supply chain were fragile) but the scale and duration of a much larger scale operation is likely to generate a large number of such ‘immovable’ activities requiring that personnel from DSUs deploy (as ‘Deployable Depth’) under the command and control of the operational commander.

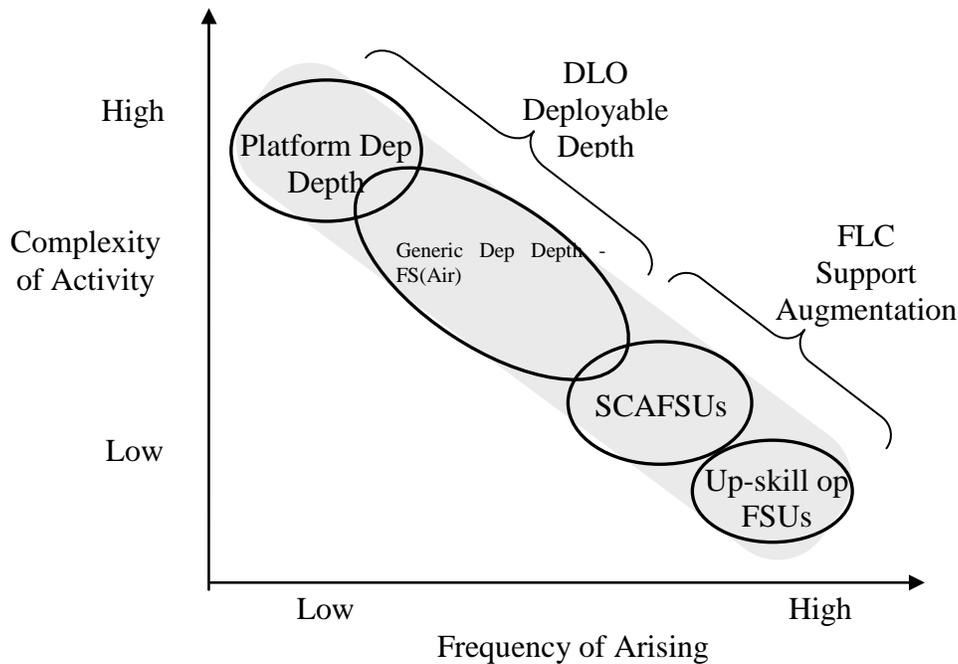


Figure 2: Delivery of Depth Support Activities in the Forward Environment.

3.3 Deployable Depth

In principle, Deployable Depth can either come from a platform IPT's own DSU or from the 'generic DSU' that the 'Forward Support (Air)' (FS(Air)) organisation represents. FS(Air)¹⁶ contains deployable specialists with generic, pan-platform skills and is currently being reorganised to increase the scope of its deployable generic support, principally in the areas of airframe repair, aircraft Non-Destructive Testing (NDT), Health & Usage Monitoring (HUM), salvage and transport. As the ellipse in Figure 2 implies, FS(Air)'s terms of reference could be increased further to take on activities hitherto planned for platform Deployable Depth or to be retained by FLCs.

3.3.1 Support Capability Augmentation FSUs

The challenge for FLCs will be to determine the high frequency DSAs of lower complexity that will need to be conducted in the Forward Environment (as Support Augmentation), deduce the resources that will be needed to undertake these tasks and then apportion these resources among their various FSUs which, by definition, have a deployment liability. Such FSUs will either be their operating FSUs or what might be termed 'Support Capability Augmentation FSUs' (SCAFSUs)¹⁷.

Although the Support Augmentation provided to operating FSUs will be primarily for capability augmentation purposes, some Forward Support Activities will be required in Forward Environment where an operating FSU

¹⁶ Currently comprising Fixed and Rotary Wing elements under the DLO's 'Strike' domain. Note, under the Forward/Depth construct, this name is now rather anachronistic.

¹⁷ The Joint Helicopter Command have a unit known as 7 Battalion and Fleet are currently developing a SCAFSU concept known as the 'Tailored Air Group Support Unit (TAGSU)'.

is unable to undertake them due to lack of resources. A likely example scenario would be where a Squadron returns from a deployment with Forward Support Activities outstanding. However, its personnel need to take leave, attend courses and so on and so the FLC would arrange for the Squadron to be augmented to enable the post-deployment recovery work to be completed. Such 'Capacity Augmentation' is illustrated in Figure 3.

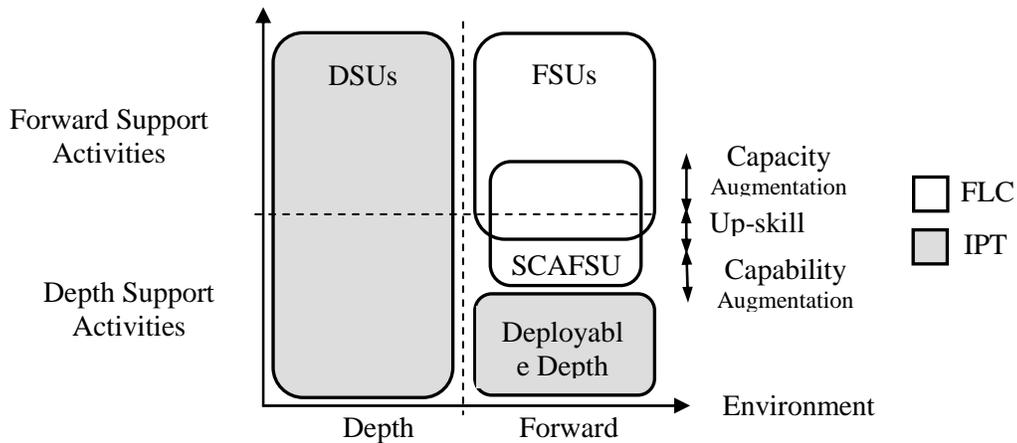


Figure 3: Capability versus Capacity Augmentation.

4.0 TRANSFORMATION ACTIVITIES

4.1 Implementing the Forward/Depth Construct and Rationalising UK Military Aircraft Support

4.1.1 From Four Lines to Two Levels

Traditionally, four 'lines' of maintenance have supported UK military aircraft. There were previously defined¹⁸ [1] as follows:

- **First Line.** The maintenance organization immediately responsible for the maintenance and preparation for use of complete systems or equipment. For instance, aircraft squadrons.
- **Second Line.** The maintenance organization responsible for providing maintenance support to specified First Line organizations. For example, workshop facilities at aircraft MOBs.
- **Third Line.** The maintenance organization within the Services (*sic*), but excluding the organizations within First and Second Line. For instance the MoD's own Defence Aircraft Repair Agency.
- **Fourth Line.** The industrial maintenance organization providing maintenance support to the Services (*sic*) under contract. Defence contractors such as BAE Systems and AgustaWestland, for example.

4.1.2 Rationalising to the Forward/Depth Construct

Under the Forward/Depth construct, these four 'lines' have been reduced to two 'levels'. Over the last 2 years, the DLO, in partnership with Industry and its FLC customers, has been transforming UK military aircraft

¹⁸. JAP100A-01, Ch 0.4.

support to align with the Forward/Depth construct. Since DARA still has significant capacity for airframe repair and overhaul (R&O)¹⁹, there have been 2 principal routes to the Forward/Depth Construct:

- 'Roll forward' where all DSAs are moved to a single DSU or 'hub'.
- 'Roll back' where all on-aircraft DSAs are moved from former aircraft Second Line facilities at MOBs to consolidated facilities within DARA or Industry. This has the result that, in contrast to the roll-forward case, DSAs for a given platform's on- and off-aircraft R&O are split. However, DARA Fleetlands, for instance, is able to derive certain economies of scale by effectively being a single on-aircraft R&O 'hub' for a total of 3 helicopter types²⁰.

4.1.3 Examples of Rationalisation Under the Forward/Depth Construct

Roll forward examples include the following:

- A Tornado DSU hub has been formed at RAF Marham supporting all RAF Tornados.
- A Harrier DSU hub has been formed at RAF Cottesmore supporting all RAF and RN Harriers.
- The UK's Merlin helicopter fleet is supported from a DSU hub at RNAS Culdrose.
- All the UK's Puma helicopters are being supported by a DSU hub at RAF Benson.
- The UK's fleet of Gazelle helicopters is supported from a DSU hub at the British Army's Middle Wallop Station.
- A DSU hub for the UK Apache Attack Helicopter is being formed at the Army's Wattisham Station.

'Roll back' examples include the following:

- All on-aircraft R&O for the UK's Chinook, Lynx and Sea King helicopters is carried out at DARA Fleetlands with off-aircraft R&O activities taking place on MOBs, in industry and at the DARA Electronics facility at Sealand.
- VC10 on-aircraft R&O work is now centralised at DARA St Athan.
- All on-aircraft R&O work for the Hercules fleet is now conducted at Marshall Aerospace at Cambridge.

4.2 The Application of Lean Techniques

The ideas behind what is now termed '*lean thinking*' were originally developed in Toyota's manufacturing operations (where the company established the '*Toyota Production System*') and spread through its supply base in the 1970s. The term '*lean*' stems from the fact that Japanese business methods used less of everything: human resources; capital investment; facilities; spares; consumables; and time. In their book '*Lean Thinking*' [4], James Womack and Daniel Jones proposed the following lean transformation process:

- Identify all the steps in the chain of events (or 'value stream') for each customer output.
- Whenever possible, eliminate those steps that do not add value (that is, eliminate 'waste').
- Ensure that the value-adding steps flow smoothly.
- Each successive step should trigger those that supply it with '*pull*' signals.

¹⁹. This is known as 'on-aircraft' activity as opposed to aircraft component repair and overhaul which is known as 'off-aircraft' activity.

²⁰. Chinook, Lynx and Sea King.

Lean tools have been used extensively over the last 3 years at every level within UK military aircraft support. Experience has shown that the tools and techniques have been particularly successful in driving out waste in the workshop and hangar environments. For example, all the various on-aircraft DSUs have used Lean to establish so-called '*pulse*'²¹ lines to replace the traditional bay approach to airframe R&O. As a result, the numbers of aircraft undergoing such work and the total time each spends being worked on have been reduced. The next section provides some more quantitative examples.

4.3 Partnering with Industry

In the UK, the MoD and the defence industrial base have recognised the mutual importance of working in close collaboration. The resulting strategy of '*partnering*' places very strong emphasis on developing an effective and co-operative working environment between the two parties, based on better transparency, increased openness and mutual respect. This represents an important culture change which is non-adversarial and through which both parties co-operate in meeting their respective aims.

The following lists some key tenets of the partnering approach:

- Joint planning and decision making in both programmes and finance.
- Information sharing.
- Joint risk and performance management.
- Joint continuous improvement of the delivery of products, services and capabilities.

It is considered that partnering with Industry will produce the following benefits:

- Improved speed of delivery of programmes.
- Reduced acquisition and support costs.
- Increased availability of aircraft to the front line.
- The retention and sustainment of the skills necessary to provide onshore military aircraft Design Authority, systems engineering and through-life support capabilities.
- Enhanced confidence and deeper mutual understanding.
- More assured revenue streams for Industry based on long-term support and ongoing development activities rather than a series of large new equipment procurements.

4.4 Contracting for Availability

4.4.1 The DLO's Transformation Staircase

Since shortly after its formation, the DLO has been transforming the support arrangements for its various defence platforms, systems and equipments in such a way that more of the risks are transferred to Industry. The so-called '*transformation staircase*' illustrates successive steps in moving away from traditional support arrangements, where the DLO pays Industry to repair items and supplies it with the piece part spares to do so, ultimately to those where the UK MoD pays Industry to provide specified levels of military capability.

²¹. Lean manufacturing production lines flow continuously whereas, in the aircraft maintenance world, the best that can be achieved is a regular pulse between successive maintenance phases.

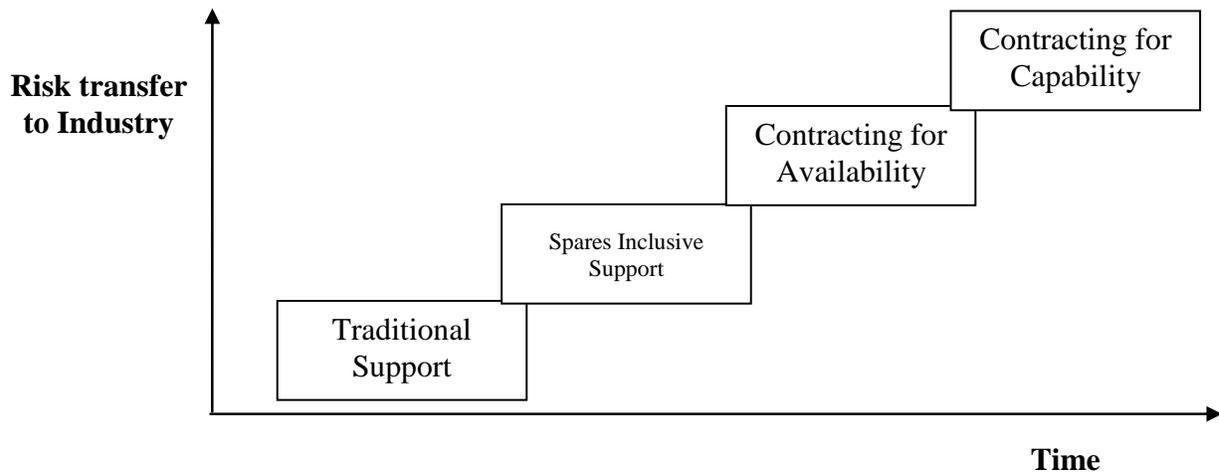


Figure 4: The DLO's Transformation Staircase.

- **Spares Inclusive Support.** Here, Industry is paid a fee to repair equipment, but it must source its own piece part spares and consumables.
- **Contracting for Availability (CfA).** Under CfA arrangements, Industry's payment is linked directly to quantitative measures of the provision of a platform or equipment's availability for use. Such requirements are expressed in output terms which should be directly related to (and flow from) the relevant Customer/Supplier Agreement (CSA) that the DLO has with the FLCs.
- **Contracting for Capability (CfC).** CfA Key Performance Indicators (KPIs) are measures of platform or equipment availability. Ultimately, however, the DLO is aiming to contract with Industry against measures of capability. One example is where the UK MoD pays for air-to-air refuelling capability and allows its contractor to benefit from aircraft not required by the RAF in peacetime by generating revenue through commercial use.

5.0 AIRCRAFT SUPPORT TRANSFORMATION EXAMPLES

5.1 Examples of Lean Transformation

5.1.1 Tornado Depth Support

Support for the RAF's Tornado fleet has been rationalised with the adoption of the Forward/Depth construct and the formation of a single DSU 'hub' for the vast majority of Tornado DSAs at RAF Marham, one of the RAF's largest Tornado MOBs. Lean tools have been used extensively in establishing 'pulse lines' at Marham including Combined Maintenance and Upgrade (CMU) work to the airframes and significant engine, hydraulic and avionic DSAs.

Expected benefits are listed as follows:

- A 50% reduction in operating costs per flying hour over 5 years.
- A £321m (50%) reduction in the aircraft's support budget.
- The number of aircraft undergoing DSAs at any one time will be reduced from 22 to 16 by 2008.
- Approximately 500 fewer personnel will be required for Tornado GR4 support.

5.1.2 Tornado Forward Support

At RAF Lossiemouth, Lean tools have been used to improve many aspects of the way squadrons support their aircraft. For instance, a consolidated team of personnel has been formed to undertake FSA rectification work far more efficiently and dispersed operation of aircraft from Hardened Aircraft Shelters has been ceased.

5.1.3 Harrier Depth Support

Support for the Harrier fleet has also been rationalised with the adoption of the Forward/Depth construct and the formation of a single MOB-based, Harrier DSU 'hub' at RAF Cottesmore. Again, Lean tools have been used to establish on- and off-aircraft 'pulse lines' and the CMU approach has also been adopted.

Expected benefits are listed as follows:

- A £4m reduction in the aircraft's support budget over 4 years.
- The number of aircraft undergoing DSAs at any one time has been reduced from 9 to 6.
- The adoption of an an-aircraft pulse-line has reduced Harrier GR7 turn-round times from 120 days to 80 days.
- Approximately 310 fewer personnel will be required for Harrier support.

6.0 NEXT STEPS

6.1 The Defence Industrial Strategy

Published in June 2006, the UK MoD's Defence Industrial Strategy (DIS) [5] recognised the important contribution that the UK's defence industry makes to delivering military capability and challenged the whole of the defence acquisition community, within both the MoD and Industry, to improve performance in the delivery of capability to the Front Line whilst increasing value for money. The DIS recognised that, with today's increasing emphasis on agility, the concept of Through Life Capability Management would need to be adopted in order to ensure that military capability is built from the most cost-effective mix of components and is both affordable to operate through life and readily adaptable.

6.2 Through Life Capability Management

The traditional approach to defence equipment procurement has been to design and manufacture successive generations of platforms (or at least to fund major upgrade packages) each with step changes in capability. The concept of Through Life Capability Management (TLCM) centres on support, sustainability and the incremental enhancement of existing capabilities from technology insertions. In TLCM, the emphasis will be on developing the systems engineering competencies necessary to facilitate gradual capability evolution. For its part, Industry will benefit by having longer, more assured revenue streams based on long-term support and ongoing development rather than a series of large new equipment procurements.

6.3 Enabling Acquisition Change

The Enabling Acquisition Change (EAC) Report [6] was commissioned to advise what changes should be made to the UK MoD's organisational structures, processes and behaviours in order to achieve the goals of TLCM. Whilst recognising that the UK's track record in delivering for its Armed Forces highly capable,

battle-winning equipment within available resources was excellent, the report also observed that the UK MoD's acquisition system has a history of suffering from what it called '*...a conspiracy of optimism...*': targets and incentives are often poorly aligned; behaviour is stove-piped; and boundaries between organisations make the achievement of a through life approach difficult.

The report made a significant number of recommendations including the following:

- The reinforcement at every level of the acquisition system of the message that improved skills are key to improving the UK MoD's TLCM performance.
- The UK MoD should maintain a clear focus on committing sufficient resources to the early stages of new projects.
- The establishment of an integrated procurement and support organisation by merging the UK MoD's Defence Procurement Agency and the Defence Logistics Organization to be led at 4-star level, or equivalent. It has recently been announced that the new organization is to be known as '*Defence Equipment and Support*' lead by the '*Chief of Defence Materiel*'.
- The reinforcement of the notion of through life delivery by setting targets for the delivery of a defined level of project performance and its cost effective sustainment through life.

7.0 REFERENCES

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