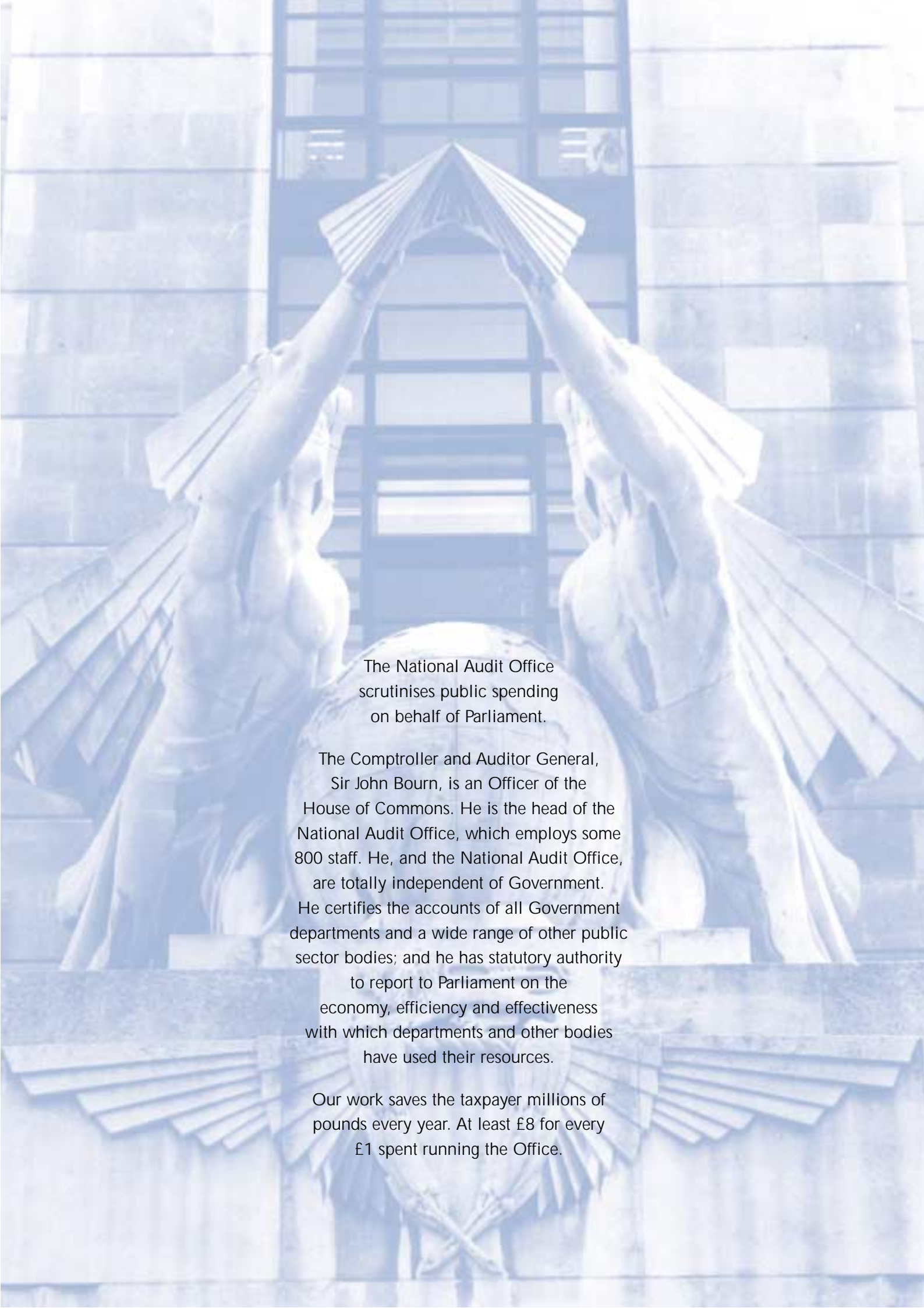


Ministry of Defence  
Operation TELIC - United Kingdom Military Operations in Iraq

REPORT BY THE COMPTROLLER AND AUDITOR GENERAL  
HC 60 Session 2003-2004: 11 December 2003





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Operation TELIC - United Kingdom Military Operations in Iraq



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This report has been prepared under Section 6 of the National Audit Act 1983 for presentation to the House of Commons in accordance with Section 9 of the Act.

*John Bourn* National Audit Office  
Comptroller and Auditor General 5 December 2003

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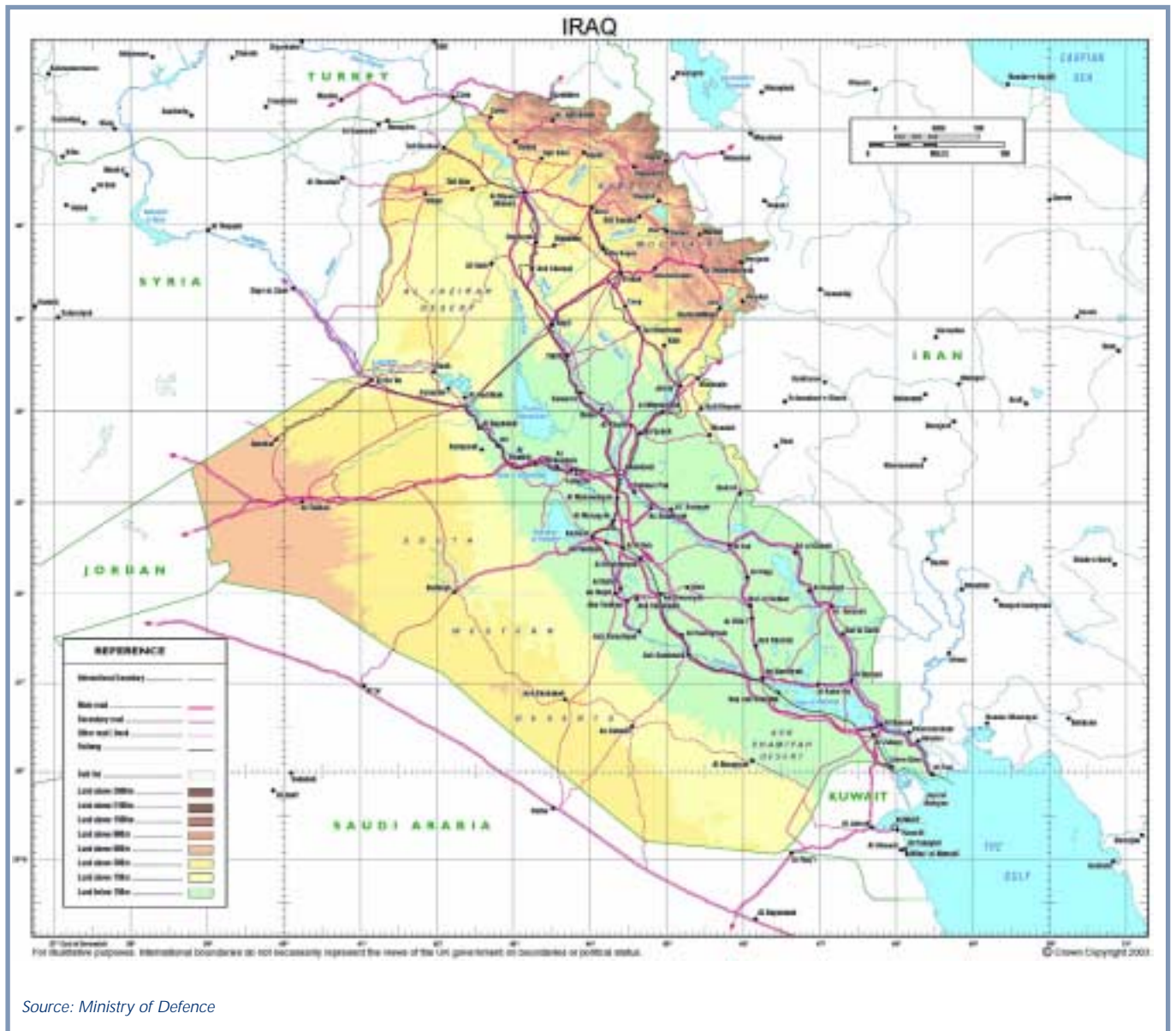
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Source: Ministry of Defence

# executive summary

- 1 Operation TELIC<sup>1</sup> was the United Kingdom's contribution to the Coalition effort in Spring 2003 to create the conditions in which Iraq would disarm in accordance with its obligations under United Nations Security Council Resolutions and remain so disarmed in the long term. Within this overall objective, two key tasks were to remove Saddam Hussein's Ba'athist regime and to rid Iraq of its weapons of mass destruction and their associated programmes and means of delivery. It was the United Kingdom's largest military operation since the 1990-91 Gulf War. The Operation involved the deployment of significant military capabilities from all three armed services including some 46,000 personnel, 19 warships, 14 Royal Fleet Auxiliary vessels, 15,000 vehicles, 115 fixed-wing aircraft and nearly 100 helicopters. In addition it was supported, in the United Kingdom and elsewhere, by large numbers from the Services, civilians and contractors.
- 2 The Operation took place against a background of concurrent operations and commitments, such as the continuing obligations in the Balkans, Sierra Leone, Afghanistan and Northern Ireland and the fire-fighters' strike. The Royal Air Force was also already over-flying northern and southern Iraq as part of the effort to enforce no-fly zones. In addition, the Royal Navy had maintained a continuous presence in the Gulf region enforcing United Nations sanctions against Iraq since 1991.



- 3 The Operation was preceded, in 2001, by Exercise Saif Sareea II in Oman which provided valuable experience of operating in the Gulf region. The National Audit Office and the House of Commons Committee of Public Accounts both issued reports on the Exercise<sup>2</sup>. This examination follows on from those reports. It covers the deployment and combat phases of Operation TELIC and the initial transition from conflict to post-conflict. Our methodology is at Appendix A.

<sup>1</sup> For the purposes of our report, 'Operation TELIC' refers to the deployment, warfighting and initial transition to peace phases of United Kingdom operations in Iraq. It is recognised that the main Peace Support phase of the Operation is still ongoing.

<sup>2</sup> Report by the Comptroller and Auditor General, HC 1097 Session 2001-02. 6th Report of the Committee of Public Accounts, Session 2002-03.

- 4 *We found that Operation TELIC was a significant military success, particularly in the deployment and combat phases, and the Ministry of Defence (the Department) has identified lessons that could reduce the risks associated with future operations. Planning for the Operation was responsive and flexible, reacting quickly when it was decided to enter the main United Kingdom force through southern Iraq rather than the north. A large and capable force was deployed quickly to the Gulf and within four weeks of the combat phase starting the Ba'athist regime fell. Overall, United Kingdom personnel and their equipment performed impressively. There are, however, important lessons for future operations, mostly about the need to review what our forces should be ready to do at short notice, ensuring that frontline forces receive appropriate levels of equipment and supplies and in managing the transition from conflict to the post-conflict phase.*

## Operation TELIC was a significant military success

- 5 United Kingdom and Coalition forces had achieved nearly all their military objectives including the removal of the Saddam Hussein regime and the securing of key infrastructure within four weeks of crossing into Iraq from Kuwait. The major exception was that no weapons of mass destruction were located. Success was achieved with few United Kingdom combat or Iraqi civilian casualties due in part to stringent targeting criteria and the use of precision weapons. The coordinated focus of Coalition combat power led to the regular Iraqi forces having, in the main, little will to fight in a concerted fashion. This represents a very considerable military success.

## Deploying the force into theatre quickly was a major achievement but gaps in capability had to be filled urgently

- 6 Within 10 weeks, around half the time it took for the 1990-91 Gulf War, the large United Kingdom force was deployed some 3,400 miles into an austere environment, and prepared for warfighting. This was a major achievement given that some elements of the force were required to be ready to deploy more quickly than planning assumptions envisaged. There were, however, some gaps in capability. Existing operational stock levels were, in many instances, not





sufficient for readiness and sustainability. The rapid deployment highlighted where the Department had made a judgement that it would have the time and ability to build up operational stocks in advance of deployment. Examples include Nuclear, Biological and Chemical warfare protection equipment, spare parts for tanks and armoured vehicles, medical supplies, helicopter spares, ammunition, particularly air munitions, and desert combat clothing and boots.

- 7 Substantial efforts were made to rectify shortfalls and to enhance capability. A number of equipments were urgently upgraded, for example 69 tonnes of combat identification equipment was fitted to over 1,800 vehicles. Some equipment not deployed to the Gulf was 'cannibalised' for spares. Urgent purchases were made of a range of supplies such as desert clothing. Although key equipment was largely modified or supplied on time, in some cases this was completed within 48 hours of the beginning of hostilities. For a few equipments, training time and the supply of ancillary equipment was curtailed.
- 8 Clearly it is costly to hold personnel at high readiness or to hold high levels of operational stocks. For any required level of readiness, a balance has to be struck between having people and equipment ready to go immediately and making good shortfalls in the time available. For Operation TELIC, forces were stretched to make good gaps in the much shorter time available than was expected. This raises questions about the link between current planning assumptions and holdings of operational stocks and whether the balance between stocks on shelves and 'just-in time deliveries' was drawn in the right place.

## The huge logistic effort was fundamental to the success of the Operation, but improvements need to be made to ensure effective delivery of supplies to the frontline

- 9 The logistic effort for the Operation was huge and key to success. It took 78 ships and 360 aircraft sorties to transport the personnel, equipment and supplies. Over 9,100 ISO containers were used. Once in-theatre, the forces had to be supported for example, 32,000 personnel were accommodated, 6,500 vehicles were repainted, 194 urgent upgrades to equipment were made, accepted and fielded and a training programme was supported.



- 10** Overall the logistic effort was successful and key equipments, for example the Challenger 2 tank which had experienced difficulties during Exercise Saif Sareea II performed well. Some key shortfalls and lessons were, however, identified. Many arose because of a combination of not having enough operational stock on shelves, enough time to make good the shortfalls and difficulties in ensuring supplies were delivered. In particular, the means of tracking supplies in-theatre was largely ineffective, manpower-intensive and swamped by the sheer volume of supplies. The whereabouts of some key equipment and supplies was unknown and therefore arrangements could not be made to get it to the people who needed it. This led to shortages, loss of confidence in the supply chain and inefficiency as personnel searched for items they had ordered or ordered duplicates urgently.

## Arrangements are in place for the post-warfighting stage of the Operation

- 11** It is too early for us to complete a full assessment of the transition to the post-conflict phase. Our initial findings are that our forces were very expert at making an immediate transition from warfighting to peacekeeping. And during our visit to Iraq we saw that considerable efforts were being made to get infrastructure running. A key issue emerging, however, is that, on a United Kingdom Government wide basis, the nature and size of the post-conflict task was extremely difficult both to predict and to plan for. There were gaps in both the coordination of the planning and in the capability to do more in the short and medium term than patch up the existing inadequate infrastructure.

## The Department has a comprehensive process for identifying lessons

- 12** The Department has a comprehensive process for identifying lessons emerging from operations and exercises. The Department published in July its 'First Reflections' on the Operation and is due to publish a full assessment in December 2003. In addition, the Vice Chief of the Defence Staff commissioned four special reviews to examine issues emerging from Operation TELIC on the logistics process, consignment tracking, combat identification and Nuclear, Biological and Chemical Warfare. Such a comprehensive process of identifying lessons is even more essential now that the operational tempo requires lessons to be implemented faster.
- 13** Some lessons may not have wider applicability, and the Department may not implement other lessons immediately for reasons such as affordability, prioritisation or technical difficulties.

# Recommendations

The Department should review its readiness assumptions and should develop procedures to identify the levels of stocks, or industrial surge arrangements, required to support approved levels of readiness.

The Department should improve management of logistics to reduce risks, in particular by introducing the means of tracking the distribution of materiel once it has arrived in-theatre.

The Department should work alongside Other Government Departments and Non-Governmental Organisations to put in place arrangements to ensure that the post-warfighting phase is well planned.

The Department should review its process for implementing lessons learned to ensure that, subject to issues such as affordability, technical feasibility or other priorities, lessons are implemented as quickly as possible and that warfighting lessons do not unjustifiably slip down the list of priorities during peacetime.



# Part 1

## Operation TELIC was a significant military success

- 1.1 Operation TELIC, the United Kingdom's contribution to the overall Coalition effort to remove Saddam Hussein's Ba'athist regime in Iraq in Spring 2003 was the United Kingdom's largest operational military deployment since the 1990-91 Gulf War. It involved some 46,000 personnel, 19 warships, 14 Royal Fleet Auxiliary vessels, about 15,000 vehicles, 115 fixed-wing aircraft and around 100 helicopters.
- 1.2 This Part of the Report examines the planning phase of the Operation, the contribution from the three branches of the Armed Forces, and the achievement of the campaign objectives. A chronology of the Operation is at Appendix B.

## Planning was responsive and flexible

- 1.3 In planning for the Operation the Department had to balance the possibility of overt preparations prejudicing the diplomatic process against the need to be ready to take action if the diplomatic process failed. Consequently, the Department did not begin enabling activities for a potential large-scale deployment to the Gulf region until early December 2002. In the event, deployment started on 16 January 2003, with the last deployment vessel arriving in Kuwait on 17 March 2003. A key lesson is that, in the modern environment particularly for large-scale operations, the Department might not have the preparation time available to it that it had previously assumed.
- 1.4 Under original planning assumptions, drawn up in conjunction with other Coalition partners, United Kingdom forces were to deploy into southern Turkey and, if required, push into northern Iraq alongside the United States 4th Infantry Division. However, as it became apparent that the Turkish Government would have difficulty in securing parliamentary approval for this option, the United Kingdom abandoned it in January, and planned instead for a deployment into Kuwait and a subsequent push into the Basrah region of southern Iraq. Preparations adapted very quickly to this major change of plan and in responding to other challenges such as securing basing and overflight rights.

## All three Services jointly made a major contribution to the overall Coalition effort

- 1.5 The United Kingdom's contribution of some 46,000 personnel out of a total Coalition force of 467,000 made a significant impact on the military campaign. An account of this is given in the Department's publication 'Operations in Iraq: First Reflections.'<sup>3</sup>
- 1.6 From our examination we noted three particular actions that illustrated the contribution of all three Services working jointly together and with Coalition partners.
  - a **the deployment of the Amphibious Task Group** which, because of its expeditionary nature, helped to sustain land forces in the early stages of the Operation and launched the amphibious assault on the Al Faw peninsula. This was the first amphibious landing against an enemy-held coastline since the 1982 Falklands War;
  - b **the taking of Basrah:** United Kingdom forces established control of the city from outside, allowing movement by civilians while preventing manoeuvre by Iraqi military forces. In the course of a raid into Basrah on 6 April, commanders seized the opportunity to launch a co-ordinated assault and Basrah was taken;
  - c **the Royal Air Force's use of precision weapons:** The Royal Air Force conducted 2,519 sorties as part of a Coalition total of 41,000 sorties. The majority of the 900 munitions used were precision guided "smart" weapons.

## Within four weeks United Kingdom forces achieved their key military objectives and overall success in the campaign

1.7 In the period between the beginning of hostilities on 19 March and the end of the major combat phase on 1 May, United Kingdom forces in Iraq achieved a number of Coalition military campaign objectives, including:

- contributing to the overthrow of the incumbent Ba'ath Party Regime and its key figures, notably Saddam Hussein and his sons Uday and Quasay;
- overcoming organised resistance from Iraqi regular military forces, security organisations and irregular fighters;
- securing key economic and civic infrastructure in Basrah and Maysan provinces;
- deterring wider conflict in the region; and
- denying the Hussein regime the use of weapons of mass destruction now or in the future.

As yet, no chemical or biological weapons capability has been uncovered in the United Kingdom area of operations.

1.8 In pursuing its military campaign objectives, the Department intended to minimise civilian casualties and damage to essential economic infrastructure through a combination of a stringent targeting and approval process for the deployment of air delivered munitions and the use of a high proportion of precision-guided munitions. Infrastructure was, however, generally in very poor condition due to neglect and the impact of previous wars. The key campaign objectives were achieved with relatively low United Kingdom casualties (27 killed in action and 55 wounded in action to 19 April 2003), the majority of fatalities resulting from operational accidents.



# Part 2

## Deploying the force into theatre quickly was a major achievement but gaps in capability had to be filled urgently

2.1 This Part of the Report sets out the effort made by the Department to deploy forces, its success in doing so more quickly than its own planning assumptions catered for, the capability gaps identified and the actions taken to remedy them.

### The Operation was successfully mounted very quickly

2.2 Operation TELIC was classified by the Department as a large-scale warfighting operation. Departmental guidelines (the Defence Planning Assumptions) envisaged<sup>4</sup> that for an operation of this scale, a task-force should be ready to deploy from its base or other location within 90 days of an order to do so. In the case of Operation TELIC, elements of the force were already at high readiness and were therefore available for earlier deployment. However, some units at lower readiness were required to deploy before their notice to move period had elapsed. The Department instructed units to deploy in mid-January 2003. The deployment was completed in less than 70 days, with the final deployment vessel arriving in Kuwait on 17 March, approximately 48 hours before hostilities began. That the Department was able to surpass its own assumed timescales for generating such a large force and was able to deploy it so quickly was a considerable achievement, due largely to the efforts of civilian and military personnel from across the Department and the three Services.

2.3 The Department's achievement was particularly marked when compared to the 1990-91 Gulf War. **Figure 1** indicates that the United Kingdom deployed a force comprising a similar quantity of personnel and materiel, other than ammunition, on both operations. On this occasion, however, the Department completed the deployment in around half the time taken previously.

### 1 Comparison of Land Forces personnel and materiel deployed to Kuwait in 1990-91 and 2003

*A broadly similar sized force was deployed to theatre significantly more quickly than in the previous Gulf War.*

	1990-91	2003
Personnel	34,000	32,000
Vehicles	14,700	15,000
Ammunition (tonnes)	47,700	15,000
Shipping Containers	7,181	6,804
Deployment Time	22 weeks	10 weeks

#### NOTE

The 32,000 personnel were forces deployed into Kuwait as opposed to the 46,000 personnel deployed in total. The ammunition figure does not include Royal Air Force or Royal Navy stocks.

*Source: Ministry of Defence*

### Before deployment, potential enhancements to capability were assessed

2.4 The forces earmarked for deployment to the Gulf were highly capable, but before their deployment, the Department assessed whether any equipment enhancements needed to be made in the light of the potential challenges of the Operation. Enhancements were only made if a business case was approved by the Department.

2.5 The type of enhancements considered included:

- a modifications in respect of environmental conditions in Iraq or in the light of the particular threat posed by the Iraqi forces. Examples include

<sup>4</sup> The Department issued a revised version of the Defence Planning Assumptions in August 2003.

modifications to equipment to mitigate dust and heat and Nuclear, Biological and Chemical warfare protection equipment;

- b the early introduction of new equipment or capabilities already in the pipeline, for example new appliqué armour for the Challenger 2 tank;
- c measures to facilitate working in coalition with the United States, for example, combat identification equipment;
- d purchases to make good shortfalls in operational stocks and consumables, for example, spares for the Challenger 2 tank and helicopters, and in air-dropped precision guided munitions; and
- e measures, not previously considered affordable, to fill long-standing capability gaps such as medical equipment.

## Action was taken to enhance capability

2.6 **Figure 2** and **Figure 3** set out the main enhancements (by value) that were made. A total of 194 urgent procurements needed to support warfighting worth £510 million and operational sustainability purchases, to address stock shortages, worth £140 million were made. In addition, shortfalls in stocks required spares and major assemblies to be removed ('cannibalised') from equipment not deployed to the Gulf (**Figure 4**).

## The enhancements were beneficial

2.7 Overall, the enhancements worked very well. For example, the enhancements to the armour, and for dust-mitigation, made to the Challenger 2 tank, partly following experience on Exercise Saif Sareea II, were very successful (**Figure 5**).

### 2 Key Urgent Operational Requirements

*A range of equipment needed to be procured or modified to support warfighting on Operation TELIC.*

Urgent Operational Requirement	Cost (£m)	Delivery	Additional information
Temporary Deployable Accommodation (for 5,250 personnel)	67.0	Completed June 2003	Procurement planned but brought forward for peace-support phase.
Enhancements to Temporary Deployable Accommodation (extreme hot weather and power improvements)	10.0	Completed June 2003	
Additional stocks of Maverick anti-armour missiles	23.9	70 per cent delivered by 15 March; remainder by 30 April	Remaining weapons added to stockpile
Head Mounted Night Vision System	16.7	Full capability delivered by 17 May	
Deployable field hospital upgrade	16.2	Delivery completed by 30 April	
Global Positioning Systems	14.6	66 per cent delivered by 19 March; full capability delivered by 30 March	
Challenger 2 dust-mitigation modifications	8.2	Completed by 19 March	Procured to enhance operation in desert environment. An additional £3.6 million was incurred for contractor support.
AS90 environmental enhancement package	10.8	Full capability delivered 29 April	Enhancements were not fitted in time for the warfighting phase; the conclusion of combat operations before onset of extreme temperatures eliminated the impact of delay
Extension of existing lease on ARTHUR weapon locating radar and purchase of four new leases	10.6	Completed by 19 March	
Tactical Radiation Monitoring Equipment	10.4	Delivery completed by 19 March	
Additional stocks of Interim Precision Guided Bombs	9.6	Delivered by June	Weapons not deployed; added to stockpile
Upgrade of Joint Operational Command System	8.8	Delivery completed by 19 March	Seen as invaluable enhancement to Information Systems
Challenger 2 Enhanced Armour Protection	8.5	Completed by 19 March	
Additional stocks of CRV-7 rockets	7.6	Completed by 15 March	Weapons not deployed; no longer required
Vehicle Nuclear Biological and Chemical decontamination systems	6.9	10 per cent of systems delivered by 19 March	



**2 Key Urgent Operational Requirements (continued)**

Urgent Operational Requirement	Cost (£m)	Delivery	Additional information
Night Vision System for Chinook helicopter	6.7		
Medical Intensive Therapy Modules	6.5		
Temporary Deployable Accommodation for Headquarters	6.2	Full capability delivered by 30 May	
Cockpit chaff/flare grab handles for Tornado GR4A	5.4		
Combat Identification equipment	4.9	Completed by 14 March	
Tornado F3 Suppression of Enemy Air Defence capability	4.1	Not applicable	Decision that this capability was unnecessary due to threat level; now held in United Kingdom for future operations
Medical anaesthetic modules	3.9		
Battlefield ambulance upgrade	3.6	Full capability delivered mid-April	
Blue Force Tracking - enhancement to situational awareness for land forces	2.9	Full capability delivered by 11 March	
Minimi Light Machine Gun	2.3	50 per cent of systems delivered by 19 March; full capability delivered by 4 April	
Medical pathology modules	1.4		
Medical resuscitation modules	1.4		
All Terrain Vehicles	1.1	Full capability delivered by 28 February	

**NOTE**

The Department defines an Urgent Operational Requirement as a procedure used for the rapid purchase of new or additional equipment, or for an enhancement or essential modification to existing equipment, in order to support a current or imminent military operation.

Source: National Audit Office

**A number of potential lessons have been identified**

2.8 A series of potential issues and lessons have emerged on the deployment of forces and the urgent enhancement of capability.

a readiness planning assumptions. For Operation TELIC, as set out in paragraph 2.2, some elements of the force were, in practice, required to be ready to deploy much more quickly than planning assumptions envisaged. The planning assumptions are a key factor in deciding what level of resources is required overall and where resources should be allocated. The question arises whether the existing planning assumptions remain appropriate in current day circumstances and for the near term, although changes to readiness will be subject to affordability;

b levels of stock holding. Holding stocks is expensive and the Department, encouraged by the National Audit Office and the Committee of Public Accounts, has set ambitious targets to remove stocks it does not need. The Department has also been aware for several years that while there have been surpluses of some stock, there have also been critical shortages of others, for example, spares for the Challenger 2 tank, the AS90 self propelled gun and the Challenger Armoured Repair and Recovery Vehicle. One of the key lessons identified by the Department was that operational stock levels were, in many instances, not sufficient for readiness and sustainability requirements of Operation TELIC;

### 3 Key Operational Sustainability Fund Purchases

The Department made a number of urgent purchases to provide a range of supplies needed for the Operation.

Spares and consumables for platform or capability	Cost (£m)	Reason for purchase
Bulk fuel deliveries	26.5	Primarily aviation fuel for Cyprus airbases
Lynx Mk 7 and Mk 9 helicopters	18.3	Provide for additional flying hours above funded levels and additional spares
Chinook Mk 2 helicopter	14.6	Provide for additional flying hours above funded levels and additional spares
Nimrod Maritime Reconnaissance aircraft	11.7	Provide for additional flying hours above funded levels and additional spares
Challenger 2	10.0	Purchase of repairable items and consumables from Alvis Vickers Ltd; increase in existing contracts to repair major assemblies; procurement of specialist containers to transport cannibalised items
Sentry Airborne Early Warning and Control aircraft	4.0	Provide for additional flying hours above funded levels and additional spares
Total Asset Visibility system	3.6	Enhancement of asset-tracking capability
AS90 self-propelled gun	3.5	Procurement of additional consumable spares; procurement of specialist containers to transport cannibalised items
Desert clothing and boots	3.5	40 per cent of additional clothing requirement delivered to theatre by 13 April 2003; procured to make up shortfall between clothing for 9,000 troops with three sets per person and requirement for 34,000 troops with three sets per person
Sea King Mk 4, Mk 6 and Mk 7 helicopters	3.4	Provide for additional flying hours above funded levels and additional spares
Puma helicopter	3.4	Provide for additional flying hours above funded levels and additional spares
Enhanced Combat Body Armour	3.0	To provide additional sets to equip all personnel in-theatre
Challenger Armoured Recovery and Repair Vehicle	2.6	Purchase of repairables and consumables from Alvis Vickers Ltd; increase in existing contracts to repair major assemblies; procurement of specialist containers to transport cannibalised items
Naval Goalkeeper/Phalanx weapons system	2.1	Increase of spares to overcome previously identified deficiency
Type 996 naval surveillance and target indication radar	2.0	Increase of spares to overcome previously identified deficiency
Combat Vehicle Reconnaissance (Tracked)	1.5	Procurement of additional spares
Hercules transport aircraft	1.4	Provide for additional flying hours above funded levels and additional spares
Nuclear, Biological and Chemical Protection	1.1	Additional consumable stock for Preliminary Biological Detection System

Source: Ministry of Defence

### 4 Vehicle types and number affected by cannibalisation

Equipment was removed from a number of vehicles held at home bases to provide additional spares for those vehicles deployed to the Gulf.

Vehicle	Number of vehicles cannibalised	Percentage of non-deployed fleet cannibalised	Total number of components cannibalised by vehicle type
Challenger 2	44	22.4	172
Warrior	24	4.7	30
AS90	37	29	149
Challenger Armoured Repair & Recovery Vehicle	5	12.5	10
Chieftain Armoured Repair & Recovery Vehicle	13	36	46
Chieftain Armoured Vehicle Launched Bridge	8		
Chieftain Armoured Vehicle Royal Engineers	8		
Combat Vehicle Reconnaissance - Tracked (variants)	56	5.8	149

Source: National Audit Office

5 Challenger 2 modifications for Operation TELIC

A range of modifications contributed to the successful performance of the Challenger 2 main battle tank

**Challenger 2 Main Battle Tank**

The Challenger 2 main battle tank was originally accepted into service for deployment in a temperate European environment and was specified to operate within the temperature range - 19°C to + 30°C. Air filters were designed to operate at 99.5 per cent efficiency and to last up to 12 months in a training year before replacement. They were specified to operate for 14 hours in "zero visibility".

**Rationale for the modifications**

Challenger 2 tanks experienced severe operating difficulties during Exercise Saif Sareea II in Oman in 2001 when, at times, they encountered extremely high dust densities and crews were forced to change air filters once every four hours. As a result of lessons identified on the Exercise, the Department approved a range of dust-mitigation measures as part of the forward equipment plan, which was agreed by Ministers in March 2003. Enhancement packages for two brigades' worth of Challenger 2 tanks (232) were approved with a planned entry into service of April 2005. Operation TELIC required one brigade's worth of these modifications to be brought forward as an Urgent Operational Requirement, approved in October 2002. In addition, an upgraded appliqué armour package was also approved.

**Fitting of modification packages**

A team of 65 personnel deployed to theatre from the United Kingdom between 25 to 27 February 2003 to fit the modification packages. The team comprised staff from the military and engineers from Alvis Vickers Ltd. The work was carried out in Kuwait and began on 8 March, completing on 19 March, just before the start of hostilities. The cost of the contractor support to carry out the modifications was an additional £3.6 million.

**Performance**

It appears from post-operational reports and discussions with personnel in theatre that these modifications all performed extremely well. Air filter consumption was much reduced compared to Exercise Saif Sareea II while the appliqué armour withstood all direct attacks by Iraqi forces, including those from rocket propelled grenades.



**Combat Identification**

As part of an overall package of combat identification equipment enhancements, the Challenger 2 (along with the majority of other deployed vehicles) was fitted with a number of modifications. These consisted of thermal panels and chevrons (pictured), and other measures.



**Dust Mitigation**

During contingency planning for Operation TELIC, it became clear that environmental conditions in Iraq might mimic those of the Oman exercise area. The Department, therefore, approved, in October 2002, an urgent procurement of dust-mitigation measures for 137 Challenger 2 tanks, 116 of which were ultimately deployed on the Operation and 28 Challenger Armoured Repair and Recovery Vehicles. The dust-mitigation package incorporated:

- Extended side skirts (extension to appliqué armour packs fitted to hull) and improved sealing between extensions covering the running gear, with front and rear spoiler skirts;
- Improved air filters and fans achieving at least a threefold increase in performance; and
- Oil health monitoring (OHM) equipment to provide predictive failure data on engine sub components.

The total cost of the dust-mitigation modifications was £8.2million.



**Enhanced armour protection**

In October 2002, the Department approved a separate Urgent Operational Requirement to fit a new generation of appliqué armour to 137 Challenger 2 tanks, of which 116 vehicles were deployed to theatre. The total cost of this package was £8.8 million.

- c ability of industry to quickly make good gaps. Because of the costs involved, it generally makes sense not to hold large stocks, if industry can supply what is required in time. Operation TELIC revealed cases where risks had been taken that low levels of operational stock, such as in combat clothing and boots, medical supplies, helicopter spares and ammunition, could be made good by industry in time. In practice, this was extremely difficult for industry to do. Because of the need to maintain operational security and the speed of deployment, the Department could not engage with industry early enough to allow all the required items to be delivered on time;
  - d risks had also been taken that certain types of equipment would not be needed urgently or at all. When required for Operation TELIC, some stocks were found to be unusable. For example, 4,000 sets of the Residual Vapour Detector used to detect residual chemicals following an attack, were unserviceable;
  - e the use of Urgent Operational Requirements and Sustainability Purchases. Urgent Operational Requirements were successful in delivering enhanced capability quickly. One advantage to the Department was also that they were funded, not from existing budgets held by the Department, but from funds supplied by the Treasury from the Contingency Reserve. In addition, the process allows the Department to avoid the need to maintain large stockpiles for every possible operational contingency. Urgent Operational Requirements have, however, a number of disadvantages:
    - (i) there is a risk that they cannot be completed on time. An example of this was the AS90 self-propelled gun where, following on from Exercise Saif Sareea II, 40 modification packs were procured to enable the AS90 to work properly in hot conditions. These modifications were originally requested by the end of March but in the event could not be fitted until the end of April, which proved to be too late for the warfighting phase. In the event, however, temperatures were not sufficiently high to affect the AS90 and it performed well;
    - (ii) delivery of Urgent Operational Requirements at a late stage left limited time for training and familiarisation. Ancillary equipment and spares for Urgent Operational Requirements are often delivered later than the actual systems. For example, the Minimi Light Machine Gun was issued to the Battle Groups of 7 Armoured Brigade less than a week before hostilities began, without the necessary equipment for zeroing weapons and with few spare barrels or spare parts. Despite these issues, the weapon was extremely effective and was popular with the troops;
    - (iii) the Urgent Operational Requirement process can have value for money penalties in that urgent items may only be purchased quickly at a premium price. Urgent Operational Requirements fitted for warfighting may be removed, even sold, if long-term funding is unavailable or there is no identified requirement to retain them for the long term. In one case, that of 'All Terrain Mobility Platforms', vehicles that had been disposed of were repurchased from a company at a cost of £1.1 million; and
    - (iv) Urgent Operational Requirements can result in 'fleets within fleets', where only some equipments in a fleet are modified, and this can complicate the sustainment of these fleets and the flexibility with which they can be used in the future.
- The National Audit Office is currently conducting a review of the procurement arrangements for Urgent Operational Requirements.
- f Figure 4 shows the extent of 'cannibalisation' of the armoured vehicle fleet. Cannibalisation of equipment is a fallback rather than a preferred option because it is frequently inefficient, introduces engineering risk, is manpower intensive, and uses manpower and resources that are already busy during force preparation. While it may have some advantages, particularly for older equipments and those approaching their out-of-service date, it must not replace prudent and sensible plans to provide operational sustainability; and
  - g deployment scales. When forces deployed they were supposed to take enough stores and supplies with them to sustain themselves for 30 to 60 days. Our findings suggest that, in its application to the Army, the Department's methodology for estimating the requirements for these supply levels is both outmoded and unclear. Specifically, individual unit scalings for stocks are based on a forecast of quarterly demand which, given the low usage of many items in peace time, results in insufficient stocks being held by the Department to support an operational deployment. Individual units do not appear to have a range of clear deployment scales specific to the size and type of deployment to which they may be committed. As a result, units deploying on Operation TELIC were required to make their own estimates of what 30 days warfighting stocks implied. Following an internal review in July 2003, the Department now intends to migrate from the current system to one where spares requirements are issued to meet planned operational requirements.

# Recommendations

## 2.9 The Department should:

- a review its readiness assumptions and associated resourcing allocations to ensure that they remain valid given the speed at which large deployments might be required to be made against a background of affordability constraints;
- b review its stock levels to establish whether there is scope for reducing stocks not needed and to hold greater stocks of those items that are required;
- c introduce measures to reduce the risk of Urgent Operational Requirements not being delivered on time such as:
  - involving industry earlier if possible;
  - where possible, risk funding for engineering studies of potential operational enhancements; and
- d reissue guidance that sets out that cannibalisation should be used only as a fallback option.





# Part 3

## The huge logistic effort was fundamental to the success of the Operation, but improvements need to be made to ensure effective delivery of supplies to the frontline

3.1 This Part of the Report sets out the logistic effort to support the Operation, the main lessons identified and the improvements that need to be made to ensure effective delivery of supplies to the frontline.

### The Operation involved a huge logistic effort

3.2 Operation TELIC required a massive logistic effort to be made by personnel and organisations from across the Department and the three Services. Between January and April 2003, the Operation required 1,002 military and civilian transport flights and 113 surface vessel sailings. These deployed and sustained some 46,000 personnel, 9,103 shipping containers and 15,000 vehicles. In the United Kingdom the key locations for deploying the stores and materiel for the Operation were RAF Brize Norton and RAF Lyneham for military air transport and Marchwood military port for surface transport.

### There were particular examples of success

3.3 There were many examples of success in the way that the logistics challenge was met. Particular examples include the part played by the Defence Transport and Movements Agency in arranging transport by sea and air, the contribution of contractors and the role of the Defence Logistics Organisation's Logistics Operations Centre. More details on these successes are set out below.

3.4 The Defence Transport and Movements Agency, part of the Defence Logistics Organisation, was responsible for sourcing and managing the air and sea strategic lift assets required to both deploy and sustain United Kingdom forces involved in the Operation. In carrying out this role, the Agency achieved a notable success, in chartering a significant number of roll-on, roll-off transport vessels, partly by taking a well-managed risk. The Agency was originally authorised to charter shipping capacity of 10,000 linear metres to service force requirements for the northern land option (paragraph 1.4). But, due to its well structured approach to the market, and with an eye to developments elsewhere, the Agency secured over 50,000 linear metres of capacity at an early stage. Not only were these vessels secured at lower than expected cost, but the Agency provided sufficient shipping to lift the entire force in one movement. If the Agency had not secured these vessels in good time, it is highly unlikely that the United Kingdom's contribution to the Operation would have been as successful as it was.

3.5 A second area of success was the commitment of contractors. Increasingly, United Kingdom military operations rely on the involvement and co-operation of commercial contractors and their personnel. Operation TELIC saw a considerable degree of contractor support, both during the procurement of Urgent Operational Requirements (paragraphs 2.4 to 2.6) and in the support and upgrade of equipment in-theatre. A particularly successful example was the upgrading of the Challenger 2 main battle tank. This involved the deployment of a mixed Departmental and Alvis Vickers Ltd. team to Kuwait to carry out the upgrade work as is set out in detail at Figure 5. The Department has recently chosen Kellogg, Brown and Root as the preferred bidder for a seven-year enabling contract for Contractor Logistics Support.

3.6 A third example of success was the Defence Logistics Organisation's Logistics Operations Centre, created in February 2003, to better manage priorities within the supply chain. This co-ordinating team was set up specifically to facilitate the Operation TELIC logistics effort. Its main responsibility was to manage the strategic supply chain, from depots in the United Kingdom to the ports of entry in-theatre. This involved managing and prioritising the flow of materiel along the air and surface supply chains and the receipt, consolidation and dispatch to theatre of Urgent Operational Requirements. We found that the Defence Logistics Organisation's Logistics Operations Centre made a significant contribution to the overall logistic effort for Operation TELIC.

## Despite overall success some problems arose

- 3.7 Although very large quantities of supplies and numbers of people were successfully deployed to Iraq, some problems did arise. These are set out in paragraphs 3.8 to 3.15.
- 3.8 There were shortfalls at the front line of some equipment and supplies. These are set out at **Figure 6 (see throwout opposite)**. These shortages arose from two main factors. The first was that in some cases equipment had arrived in-theatre but difficulties in locating it prevented it from being delivered to where it was needed (for example desert clothing and footwear, body armour and medical supplies). The second factor was that shortfalls in stocks set out in paragraph 2.8(b) could not be rectified in time (for example Nuclear, Biological and Chemical warfare detection and protection equipment and supplies and vehicle spares).





6 Key personal equipment and weapons issued for Operation Telic

Some frontline troops experienced shortfalls in their equipment and supplies

**Enhanced Combat Body Armour**



Doctrinally, the Department only intended to issue Enhanced Combat Body Armour for peace-keeping operations, for which the Department already held approximately 30,000 sets.

These included 690 desert pattern covers, which were increased by 49,000 sets for operations and a further 31,500 sets for sustainability. 23,700 pairs of armour plates were also contracted, to supplement the 16,000 pairs already in service. The delivery deadline for items was set at 4 April 2003. The cost per soldier (cover, pairs of plates and filler) is £167.70, with total spending on body armour amounting to £2,954,300 (excluding the contracts for equipping the sustaining forces for Operation TELIC 2).

21,759 covers and 32,581 pairs of plates were issued into the supply chain by 24 March 2003. However, the Department's Defence Clothing Integrated Project Team estimated that approximately 200,000 sets had been issued since the Kosovo campaign in 1999, greatly exceeding the theoretical requirement, but these seem to have disappeared. The Team questioned whether items should, therefore, be issued as part of an individual's personal entitlement for which they would be held accountable.

Despite these efforts, insufficient numbers were distributed in-theatre, largely as a result of difficulties with asset-tracking and distribution.

**Desert Clothing & Boots**

The pre-TELIC requirement was based on desert clothing for 9,000 troops with three sets per person. An additional 20,000 pairs of desert boots were ordered on 29 November 2002 and a further 10,000 pairs on 10 January 2003 at a total cost of £742,500. 89,700 pairs of desert trousers (total cost £886,800) and 92,750 desert lightweight jackets (total cost £1,031,080) were also ordered.

Approximately 40 per cent of the additional clothing requirement was available in-theatre by 13 April 2003.

The procurement was regarded as of limited effectiveness because few troops received their full complement, and mismatches in sizing remained into the post-conflict phase of the Operation.



**Night Vision Equipment**

151 Short Range (Lion) and 167 Mid Range (Sophie) thermal imagers and 5,654 image-intensifying Head-Mounted Night Vision Systems were required. The helmet systems were to be issued primarily to frontline troops.

Approximately 80 per cent of the thermal systems were in-theatre by 19 March 2003- partially accelerated by loans of 'Lion' systems from a NATO ally. Pulling forward the delivery to provide forces in-theatre with at least some capability ahead of the original planned schedule was a major achievement. This was achieved as a result of the Defence Logistics Organisation's good working relationship with the equipment manufacturer, Thales. The contract for Head-Mounted systems required them all in-service by the end of May. Insufficient numbers were therefore available during the combat phase of the Operation.

Despite minor technical problems, all systems were generally well regarded and highly effective.



**SA80 A2 Rifle and Light Support Weapon**

The Vice Chief of the Defence Staff directed that all personnel in theatre should be equipped with the A2 version of the SA80 rifle.

Sufficient SA80A2s were available to equip the whole force and almost all personnel were equipped with the A2 variant; Departmental reports state that less than 400 SA80A1s were in-theatre, mostly belonging to individual reinforcements who had slipped through the system and those with Royal Navy/Royal Air Force personnel already stationed in the Gulf region.

Some difficulties were encountered, largely due to desert conditions. Despite the issuing of additional instructions on the maintenance regime for the SA80A2, not all troops were aware of the correct cleaning regime to adopt in desert conditions. There were problems supplying the additional quantities of cleaning oil needed. Soldiers noted in both Afghanistan and Iraq that the Safety Plunger tended to stick, the user then being unable to operate the safety catch freely. However, the problem was infrequent, quick to rectify and did not result in catastrophic failure. The Defence Logistics Organisation issued 85 redesigned plungers into theatre which were well-regarded. A new design is now being trialled. During training for amphibious operations, it was found that salt water removed oil from the weapon, resulting in a high incidence of stoppages. This information was used to reinforce the importance of the training regime. Nonetheless this issue still arose several times during contacts with the enemy although no equipment failure reports were submitted. Despite this, the clear impression received by the Department from forces in-theatre is that the SA80A2 performed well overall during the Operation.

**Nuclear, Biological and Chemical Defence Equipment**

Although overall protection against chemical agents was good, there was a "significant shortfall" (some 40 per cent) of Nerve Agent Immobilised Alarm and Detector units (a tactical nerve agent detection system) and a severe shortfall in Residual Vapour Detector kit availability (required as an aid to troops when they unmask following a suspected chemical attack). The latter was largely due to the discovery that the Department's entire stock of 4,000 Residual Vapour Detector kits was unserviceable (though subsequent tests declared 2,000 sets were in fact usable, which were sufficient for the Operation). While these shortfalls could be partially mitigated by use of the Chemical Agent Monitor and training, it made detection and therefore response to an attack inefficient.

There were difficulties in providing Nuclear, Biological and Chemical protective suits for certain sizes in sufficient numbers. In addition, a new testing regime had revealed that some respirators did not fit as well as had been presumed. Procurement of the Respirator Testing System was accelerated but only limited testing, especially of the more mobile elements of the force, could be carried out before the move forward to assembly areas began. However, much had been done to bring protection levels up to an acceptable level, from, in some instances, mainly in the Army, a low starting point.

A number of units reported shortages of necessary consumable items required for the effective operation of chemical agent detector systems, such as the Chemical Agent Monitor. These included batteries, detector papers and other ancillaries. The lack of these items prevented units from turning on these systems in order to preserve some reserve capability, amounting in some cases to between six and 24 hours worth of operation.

It is Departmental policy that armoured vehicles are routinely fitted with Nuclear Biological and Chemical defence training filters which are not suitable for operational use. The operational filters are held in reserve and are issued when required. On Operation TELIC, the war reserve of filters was issued from central holdings and dispatched to theatre. However, we found that these vehicle filters (for both Challenger 2 and other armoured vehicles) had not been delivered to the frontline units by the time of our field visit in late June 2003. Consequently, 7 Armoured Brigade armoured vehicles did not have viable Nuclear Biological and Chemical defence filters fitted throughout the warfighting phase of the Operation.



**Firepower Enhancements**

**Underslung Grenade Launcher:**



520 Underslung Grenade Launchers were required for Operation TELIC, to supplement 130 already acquired for Operation VERITAS (Afghanistan). The anticipated issue rate was one per four-man infantry team.

Final weapons were dispatched on 14 April 2003, against a latest acceptable agreed date of 30 March 2003 (20 per cent of the Urgent Operational Requirement was available on 19 March). Some ammunition was delivered early, but the final 10,000 rounds were not delivered until 7 May 2003 because the Swiss Government withdrew the export licence. This had no impact on operational capability as there were sufficient quantities of rounds in the supply chain.

This system was regarded as a key infantry capability but concerns were expressed by units in-theatre over an initial failure to link up the weapon with its ammunition, limiting its use. There was insufficient time to train on the system prior to the Operation and it was distributed to 7 Armoured Brigade after Basrah had effectively been taken.

**L110 "Minimi" Machine Gun**



587 Minimis were procured for Operation TELIC to supplement 180 procured for Operation VERITAS

All weapons were delivered by 4 April 2003 (half of the requirement was available by 19 March 2003).

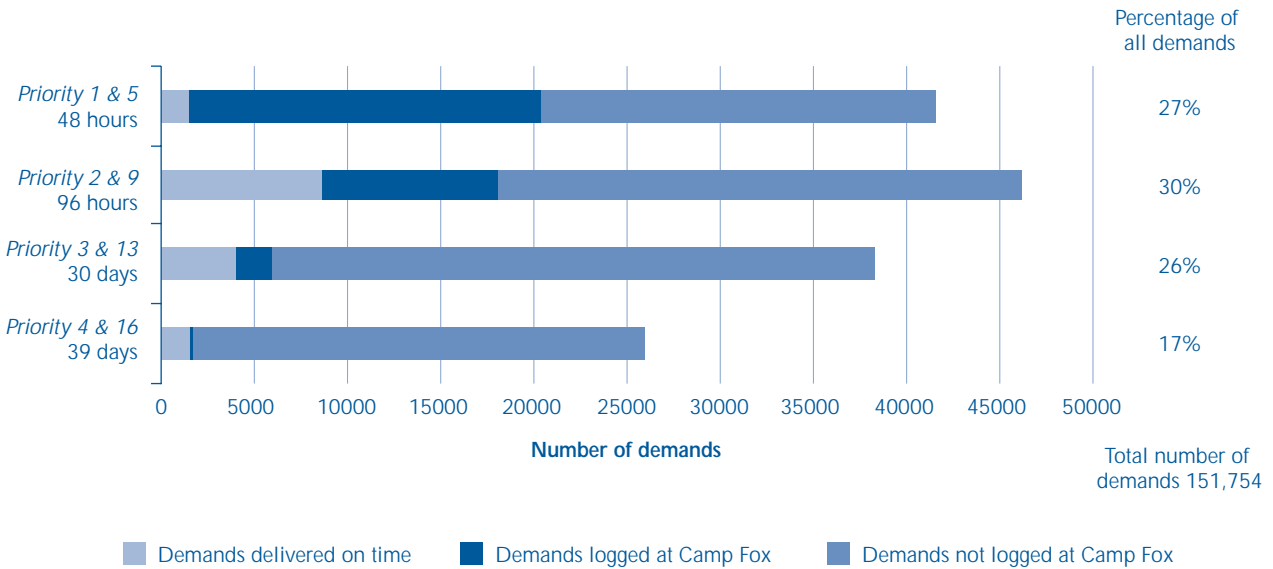
The weapons were extremely popular with troops though there were insufficient spare parts and a lack of zeroing equipment. There was an initial lack of belted ammunition to train with during the pre-operational phase and the weapons were only issued to the battlegroups a week before the Operation began.

- 3.9 Difficulties in identifying the location of equipment within theatre led to frontline units sending teams back down the supply chain to identify their equipment or stores and to ensure that it was delivered to them in time. In many cases the only practical way to identify containers and their contents was to physically locate and open them. In one extreme case 1 (United Kingdom) Armoured Division sent a team from Kuwait back to the Defence Stores and Distribution Agency depot at Bicester in an unsuccessful attempt to locate consumables for Nuclear, Biological and Chemical detection systems.
- 3.10 The system by which supplies are ordered was overstretched. A key feature of the system is the range of priorities that can be used for materiel requirements. Unit demands were raised and prioritised in accordance with their individual requirements. As a result of the failure to meet the majority of delivery times (Figure 7), and a lack of visibility from Theatre of items within the supply chain, Headquarters 1 (United Kingdom) Armoured Division lost confidence in the ability of the

logistics system to supply what they required when it was needed. This loss of confidence led to instances of "priority inflation" within the system, whereby units which had demanded an item at a certain level of priority were unsure if it would be delivered in time and therefore re-ordered the item and overstated its level of priority. In practice few priority requests were met in the target time; Figure 7 shows that only eight per cent of those items requested by units in the shortest timescales logged at the main logistics centre in Kuwait were delivered within the planned 48 hour period. However, only a very small proportion of those demands were designated "operational" (priority 1); the remainder were designated "non operational", and despite attracting a 48 hour target delivery time would have been afforded a lower priority than all operational requests. These difficulties were to an extent addressed through the use of a daily Priority List drawn up by the National Contingent Headquarter in Qatar which provided a force-wide priority order for Priority 1 demands and other urgently required equipments and stock.

**7 Graph showing the number of demands satisfied on time, compared to the number of demands recorded at the tracking node and the total number of demands, by priority from stores from 1 Jan 2003 to 4 April 2003**

*A significant number of demands were not met within the time requested*



**NOTES**

- The average demand fulfilment time for priority 1 & 5 demands logged at Camp Fox was 127 hours (compared to a target of 48 hours - 265 per cent increase).
- The average demand fulfilment time for priority 2 & 9 demands logged at Camp Fox was 206 hours (compared to a target of 96 hours - >200 per cent increase).

Source: Ministry of Defence

- 3.11 Lack of consignment tracking led to inefficiencies. For example, commanders were concerned that the main consignment of engines and main assemblies for armoured vehicles, which had been dispatched by sea in around 60 containers, would not arrive in-theatre for the beginning of hostilities given that this date was subject to change. The absence of an accurate consignment-tracking system meant that the commanders could not verify precisely where the equipment was in the supply chain, despite the Defence Logistics Organisation holding this information. A duplicate consignment was therefore cannibalised from equipment in Germany and the United Kingdom (in addition to equipment cannibalised earlier) and flown out to theatre as a contingency measure.
- 3.12 The lack of confidence in the ability of the logistics system to meet units needs in-theatre led to a considerable degree of misappropriation of equipment and stores moving through the supply chain; items included desert combat clothing, boots and Nuclear, Biological and Chemical protective clothing. The unauthorised removal of items as they moved through the chain towards the frontline served to further complicate the logistics process.
- 3.13 There were difficulties in scheduling the delivery of some supplies due to mis-prioritisation of loading of stocks for transport. For example, the majority of the force's flat-racks (required for the movement of ammunition by specialist vehicles) were on the penultimate deployment ship, arriving in Kuwait on 17 March. This significantly limited the ability of logistic units to move ammunition to the frontline and exacerbated a perception among troops that there were ammunition shortages.
- 3.14 There were a number of shortfalls in the capabilities of logistic support units deployed on Operation TELIC:
- a as has been highlighted on previous occasions, there are shortages of key personnel within the logistics specialisation and deployed units required a degree of augmentation with reservist personnel in addition to that which would normally be the case on smaller-scale operations;
  - b increasingly, the Department's operations involve the use of International Organisation for Standardisation specified-shipping containers. Operation TELIC necessitated the use of some 9,103 such containers and exposed shortfalls in the Department's ability to handle these containers both in the United Kingdom and in-theatre. While the Department procured an additional 20 container-handling vehicles, 6 Supply Regiment highlighted that it had only three container-handling vehicles to deal with several thousand containers<sup>5</sup>; and
  - c given the extremely hot temperatures experienced in Iraq and Kuwait, the controlled movement of temperature sensitive items was particularly important. A lack of suitable equipment to transport and store supplies at the right temperature, combined with a lack of training of logistics personnel, resulted in instances of drugs and vaccines being thrown away since medical personnel had no confidence that they had been transported correctly.
- 3.15 Although the Department has a well developed policy for the use of contractors on deployed operations, some difficulties did arise. There were two examples of contractor personnel refusing to deploy to theatre prior to the combat phase. Concerns have also been raised over the proximity of civilian contractor personnel to the frontline (for example, the capture by the Iraqis of two Kenyan drivers who were subcontracted by the Department's main food supplier). The Department encountered problems in ensuring that contractors' personnel were suitably equipped for the Operation; for example, with Nuclear, Biological and Chemical defence equipment and also body armour. Shortages of civilian body armour forced the Department to issue contractor personnel with military, camouflage-pattern body armour.

## Problems resulted from a range of factors, including the way supplies were tracked in transit

- 3.16 Three main underlying factors have been identified as contributing to the logistic difficulties: asset and consignment tracking, the ability of various organisations responsible for logistics to co-ordinate their actions and a lack of expertise, at a senior level, at the centre of the Department.

<sup>5</sup> This issue has been highlighted in previous National Audit Office reports; see Report by the Comptroller and Auditor General HC 1097 Session 2001-2002 and Report by the Comptroller and Auditor General HC 530 Session 1999-2000.

### a Consignment-tracking

3.17 Consignment-tracking is a generic term used to describe the Department's ability to monitor and locate materiel or major assets transiting through the supply chain. Given the Defence Logistics Organisation's annual spending on logistic support amounts to some £11.6 billion, this is an important issue. The Department has identified the need to establish a coherent and effective consignment-tracking capability on a number of previous occasions (Exercise Saif Sareea II, the 1990-91 Gulf War, operations in Bosnia-Herzegovina during 1995-96 and the 1999 Kosovo campaign). The National Audit Office and the Public Accounts Committee have also reported on this issue on several occasions (Appendix C). The Department has cited affordability constraints and technical difficulties as the main reasons why this previously identified capability gap has not yet been addressed.

3.18 The current Army and Royal Air Force system VITAL (Visibility In Transit Asset Logging) is, itself, the result of an Urgent Operational Requirement identified after the 1990-91 Gulf War. It is a complex system to use and was due to be replaced by a tri Service consignment-tracking system that has since been placed in abeyance on affordability grounds. The use of VITAL on deployed operations is limited by it not having its own dedicated communications capability and a lack of sufficiently trained personnel. The Department carried out a review of consignment-tracking immediately after the combat phase of Operation TELIC. The review recommended that the Department develop an interim solution, at a cost of some £17.5 million.

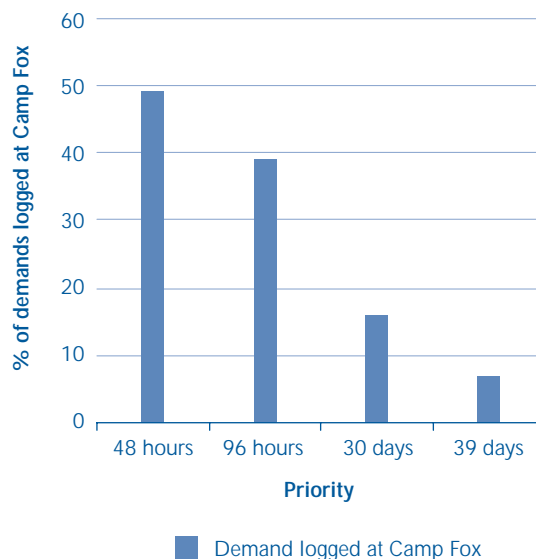
3.19 As noted at paragraph 1.3, the original plan for Operation TELIC was that United Kingdom forces should deploy to southern Turkey. This plan would have required the use of a 500-kilometre supply route over difficult, mountainous terrain. The United States, which was to manage this route, originally stipulated as a condition of its use that the United Kingdom should have a compatible consignment-tracking system. The Department therefore approved an urgent procurement for a system known as Total Asset Visibility (TAV), a radio frequency tagging system manufactured in the United States. While this system went some way to addressing the capability gap, it was originally expected that the system would be loaned to the Department by the United States Department of Defense; in the event this was not the case and, as a result, it was not in place until the end of February 2003 - too late to be utilised in the crucial early stages of the deployment.

3.20 A key enabler in effective consignment-tracking are the underlying communications and information systems on which it functions. The lack of an effective logistics communications infrastructure has been highlighted as one of the Chief of Defence Logistics' top lessons identified, and had been identified on a number of previous operations. In particular, there was a shortage of military satellite terminals to allow the exchange of data between the United Kingdom and the logistics infrastructure in-theatre; this served to compound asset-tracking difficulties as systems such as VITAL could not be accessed. Although significant funding was obtained to purchase commercial band terminals there is an inherent risk in not having control over the system; the Department considered this risk and judged it acceptable. The Department has now commissioned a review examining the shortfalls in logistic communications and information systems.

3.21 **Figure 8** shows the extent to which items were being logged as they were being delivered to Camp Fox, a key logistical node in Kuwait. The data suggests that tracking for higher-priority items was more consistent than that for lower-priority items. Overall, however, only 30 per cent of the total number of items (some 150,000 items) in the supply chain were actually logged.

**8** Graph showing the percentage of demands logged at the tracking node by priority from Stores System 3 from 1 January 2003 to 4 April 2003

*There were difficulties in tracking consignments into theatre, particularly for lower priority items*



Source: Ministry of Defence

## b Co-ordinated action

3.22 The delivery of logistics support to the frontline involves a number of organisations. These include the Defence Stores and Distribution Agency, the Defence Transport and Movements Agency, Permanent Joint Headquarters, other elements of the Defence Logistics Organisation and the Joint Force Logistics Component in-theatre. Experience on Operation TELIC suggests that there is a lack of overall responsibility for the delivery of logistics from the factory to the frontline. The formation of the Defence Logistics Organisation's Logistics Operations Centre, a temporary arrangement for Operation TELIC, went some way to improving this situation, but more remains to be done. The Centre has since been permanently established by the Department. In addition, a lesson identified by the Department is that control over the management of materiel as it transits through the air and sea routes could be improved, and the Department is looking at ways in which to achieve this.

## c Greater expertise at senior level

3.23 Under the reforms resulting from the 1998 Strategic Defence Review, the post of the Assistant Chief of the Defence Staff (Logistics) was abolished. A lesson emerging from Operation TELIC is that this led to inadequate senior logistics representation and advice within the Department's central staff during the planning phase of the Operation. To address this shortcoming, the Department has now established the post of Assistant Chief of the Defence Staff (Logistics Operations).

# Recommendations

- a Figure 6 points to several areas where frontline troops did not receive full supplies of combat equipment due to failings of in-theatre distribution systems. The Department should, as a matter of urgency, continue to work to develop appropriate logistics systems to track materiel to theatre and ensure its timely delivery to frontline units;
- b within the above, the Department should implement the Public Accounts Committee recommendation on Exercise Saif Sareea II to ensure that, in future, forces sent into harsh environments are equipped appropriately<sup>6</sup>. To this end it should hold, or have access within readiness timescales to, sufficient stocks of appropriate combat clothing. While these items do not necessarily affect combat capability, they are nevertheless important to the morale of the troops;
- c the Department should improve its management of Nuclear, Biological and Chemical defence stocks to prevent the holding of life-expired items;
- d the Department should clarify its policy on the circumstances under which troops are to be issued with Enhanced Combat Body Armour for warfighting and ensure that sufficient stocks are held;
- e the Department should assess in the light of its planning assumptions the required container-handling capability; and
- f the Department should ensure that it is properly equipped to transport temperature-sensitive supplies, such as medicines, within the supply chain.



# Part 4

## Equipment performed well during the warfighting phase, and was also supported effectively

4.1 This Part of the Report examines the performance and availability of key equipment during the Operation. It also notes the measures introduced by the Department to minimise the risk of fratricide during the war.

### A number of new and in-service equipments proved their effectiveness

4.2 Throughout the warfighting phase of Operation TELIC a number of both new and in service equipments operated effectively in the austere environment of Iraq. Several examples of good performance are set out in paragraphs 4.3 to 4.7.

4.3 Operation TELIC saw the first operational deployment of the Sea King Mk 7 Airborne Surveillance and Command helicopter. Tragically, two of these aircraft were lost in a collision on 22 March 2003; however this did not prevent the remaining aircraft from making a significant contribution to the Operation. While the helicopter's radar is primarily designed to provide early warning radar coverage for the fleet, its crews quickly realised that the system had the potential to also contribute to Coalition operations ashore by detecting land vehicles and they began exploiting this added capability. In particular, during actions on the Al Faw peninsula, Sea King Mk 7 aircraft were able to provide detailed targeting information to other naval and land forces, which contributed directly to the successful engagement of a number of enemy units.

4.4 The Challenger 2 main battle tank was modified prior to the Operation to cope with desert conditions and was up armoured for combat (see Figure 5). A total of 116 Challenger 2s were deployed on Operation TELIC. The Department's post-operation reports indicate that Challenger 2 performed impressively throughout the Operation, overmatching anything the Iraqi opposition could field against it. The dust-mitigation measures successfully reduced air filter consumption while the new-generation appliqué armour allowed several vehicles to withstand multiple hits from rocket propelled

grenades without detriment to their operation. In addition, the Warrior armoured infantry fighting vehicle again proved its reliability in desert conditions.

4.5 Operation TELIC saw the first operational use of the Royal Air Force's new Storm Shadow Conventionally Armed Stand-Off Cruise Missile. Carried by a Tornado GR4A strike aircraft, Storm Shadow has a range of over 230 kilometres and a Global Positioning System guidance system with terminal-seeking capability which enhances its accuracy considerably. Although the weapon system was not due to achieve full operational capability until October 2003, the Department worked with the manufacturer, MBDA (United Kingdom), to bring forward production in order to give the United Kingdom a new long-range strike capability. A total of 30 missiles were ready in time for Operation TELIC and 27 were used to strike a number of targets within Iraq. Early Departmental assessments indicate that the weapon system performed impressively.

4.6 Operation TELIC again highlighted the continuing requirement for strategic lift assets. The Department's fleet of four leased C-17 Globemaster transport aircraft demonstrated their utility, flying some 162 sorties between the United Kingdom and the Gulf during the deployment and warfighting phases of the Operation and carrying, on average, 40 tonnes of cargo per flight. The Department is currently assessing options to increase the number of C-17 aircraft it holds. In addition to moving equipment by air, the Department's fleet of Joint Rapid Reaction Force Roll-on Roll-off ferries made 14 voyages. The Department's dedicated strategic lift assets performed very well. As we have reported previously, the Department continues to rely upon the leasing of commercial air and sea transport to deploy forces on medium-scale or larger operations<sup>7</sup>. The Department considers this to be a manageable risk.

4.7 All but a few troops deploying on Operation TELIC were issued with the SA80A2 assault rifle, the upgraded version of the original SA80A1. Despite some isolated difficulties with the weapon, units' post-operational

reports have indicated that there is now general acceptance that the SA80A2 is an effective and reliable weapon system (Figure 6).

4.8 The majority of communications equipment worked well on the Operation, although the force sometimes had difficulty maintaining strategic communications between the United Kingdom and units in-theatre. Despite previous difficulties with the Department's primary tactical communications system (CLANSMAN), during Operation TELIC it proved reliable and was praised by commanders for its performance around Basrah. The Department deployed additional equipment into theatre as a reserve in case of difficulties, but in the event less than 10 per cent of the total CLANSMAN equipment required repair, demonstrating that its performance was in fact good. The Bowman Personal Role Radio, which permits section-level communication between troops and was trialled in desert conditions on Exercise Saif Sareea II, was highly effective and is a significant capability enhancement to infantry units.

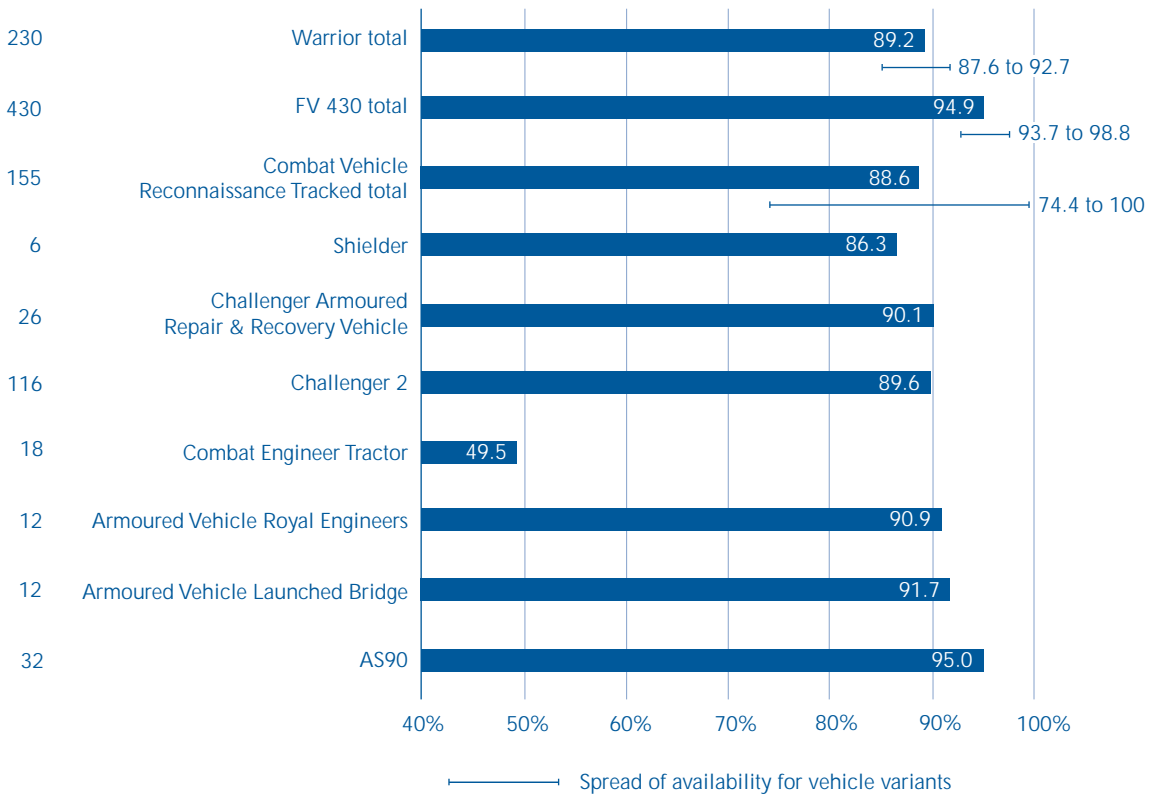
## Generally equipment availability was high throughout the warfighting phase

4.9 Throughout the warfighting phase, the availability of the major warfighting equipments (ships, armoured vehicles, helicopters and aircraft) was generally high. Figure 9 shows the average availability of major land equipments, including Challenger 2 (90 per cent) and the AS90 self propelled gun (95 per cent). Average helicopter availability throughout the warfighting phase of the Operation was 66 per cent (Figure 10). This was a marked improvement on the performance of the Department's helicopter fleet during Exercise Saif Sareea II when the average was 55 per cent. The Lynx anti tank helicopter's availability peaked at approximately 80 per cent during the warfighting phase, but averaged 53 per cent overall, largely due to the harsh, dusty environment in which it was continuously operating and also, to a lack of spare parts for the aircraft.

### 9 Average Vehicle Availability from 21st March to 30th April 2003

Availability rates for land equipment during the main conflict phase were consistently high

Average Fleet size across the period



**NOTE**

The Combat Engineer Tractor (CET) has been in service since the early 1970s and is due to be replaced by TERRIER in 2008.

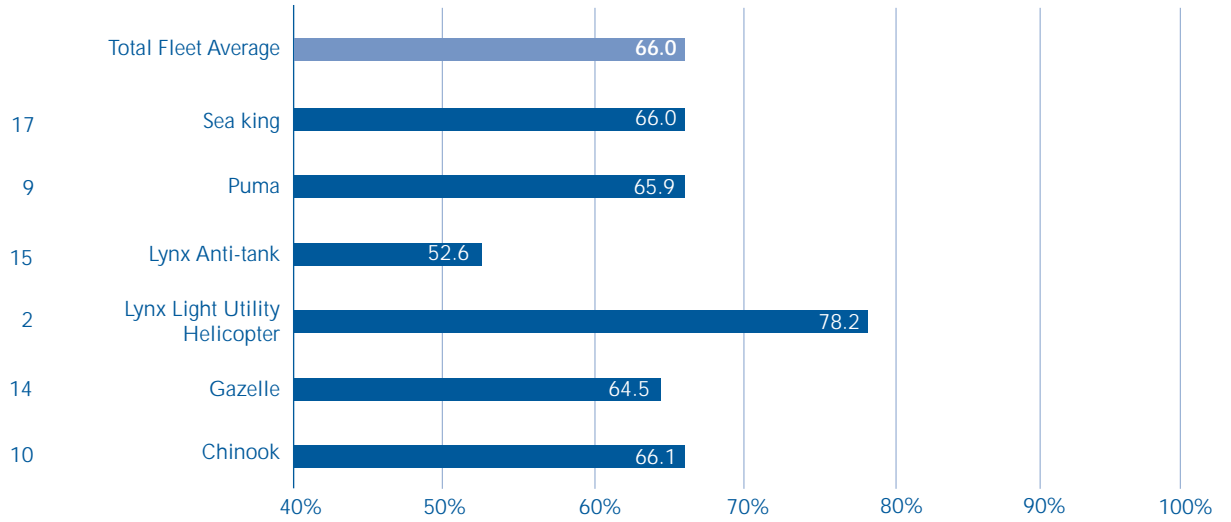
Source: National Audit Office



**10 Average Helicopter Availability from 21st March to 30th April 2003**

The average availability rate for the helicopter fleet during the main conflict phase was 66 per cent

Average Fleet size across the period



Source: National Audit Office



4.10 The availability and performance of the majority of the fighting equipments demonstrates that the Department's major equipments, both new and in-service, contributed significantly to overall military capability and the success of the Operation. Equipment worked well in the challenging environment due to a combination of factors such as its inherent quality, the availability of large quantities of spares (itself partly due to the Department's decision to cannibalise equipments not deployed to Iraq to provide a ready source of spares in-theatre), the efforts of equipment-support personnel in-theatre and the urgent environment specific modifications such as those carried out on the Challenger 2 main battle tank.

## Combat Identification

4.11 We have reported previously on the issue of Combat Identification<sup>8</sup>. There is no single equipment-based solution to this issue, rather it is most effectively addressed utilising a combination of equipment, training and procedures. For Operation TELIC, to improve interoperability with other Coalition forces and to minimise the risk of fratricide, the Department procured a number of equipments designed to enhance forces' capability to distinguish friend from foe. These measures comprised a number of visual identification measures fitted to vehicles and worn by individual soldiers (costing some £5 million) and the Blue Force Tracking system which enhanced Coalition land forces' situational awareness. These measures, in conjunction

with training and procedures appear to have been largely effective. There were, however, several instances of fratricide involving United Kingdom forces during the warfighting phase of the Operation, including:

- on 23 March 2003 a Royal Air Force Tornado GR4A aircraft returning to Kuwait from a mission over Iraq was destroyed by a United States Army Patriot Surface to Air Missile battery. Both pilot and navigator were killed;
- on 25 March 2003, during an engagement outside Basrah, a Challenger 2 main battle tank was mistakenly engaged by another Challenger 2. Two crewmen were killed, two seriously wounded; and
- on 28 March 2003 a United States Air Force A10 ground attack aircraft mistook reconnaissance elements from D Squadron, The Household Cavalry, for Iraqi forces and engaged them. Two consecutive attacks left one trooper dead and three wounded. Two Combat Vehicles Reconnaissance (Tracked) were also destroyed.

The causes of the above incidents are the subject of ongoing Boards of Inquiry. It is, therefore, too soon to conclude whether any are the result of a failure of Combat Identification equipment, training or procedures.

4.12 The Department is currently undertaking a separate review of Combat Identification in the light of experience gained from Operation TELIC.

8 Report by the Comptroller and Auditor General HC661 Session 2001-2002.



# Part 5

## Personnel at all levels performed impressively but there is a need to reduce strain in key disciplines and for continued improvement in the mobilisation of reserves

5.1 This Part of the Report focuses on the contribution of United Kingdom Armed Forces personnel to the success of the Operation, the continuing shortages of personnel in some disciplines, and the improvements needed to the mobilisation process for reservists.

### The high calibre of our Armed Forces personnel and the quality of their training was again demonstrated

5.2 Throughout our fieldwork, and in particular during our visits to Iraq and Kuwait, interviewees consistently commented that the key to success for Operation TELIC was the quality, motivation and training of Armed Forces personnel across all Services. Many post operational reports and analyses have supported these assertions. For example, 1 (United Kingdom) Armoured Division's report referred to the quality of its troops as the foremost 'battle winner' leading to success.

5.3 A key tenet of the United Kingdom Armed Forces' approach to conducting operations, and a significant factor in engendering quality, is the principle of Mission Command. This concept promotes the delegation of initiative throughout the chain of command, which encourages increased speed and freedom of action, while fulfilling the overall mission. Commanders considered that the success of Operation TELIC fully vindicated the concept of Mission Command.

5.4 Recent training and exercises also played a key role in preparing troops for operations in Iraq. In particular, commanders in-theatre and unit post-operational reports have highlighted that Exercise Saif Sareea II, undertaken in Oman in Autumn 2001, proved invaluable in preparing troops and equipment for a potential warfighting operation in an austere, desert environment. Separately, and directly related to preparations for Operation TELIC, in December 2002, the United Kingdom's National Contingent Commander and his staff participated in a joint headquarters exercise with the United States ('Exercise Internal Look') which contributed significantly to improving the integration of Coalition forces during the Operation.

5.5 The United Kingdom Armed Forces demonstrated their inherent flexibility in successfully fulfilling a range of roles in-theatre. For example, within 24 hours of intensive close-quarter fighting in Basrah, elements of 7 Armoured Brigade had moved seamlessly into a peace support operation, aiming to stabilise and secure the town and begin short-term humanitarian and reconstruction work. Such flexibility is the product of quality training and experience gained over many years in other theatres of operation such as Kosovo and Northern Ireland.

### Undermanning persists in key areas

5.6 The Department successfully met the challenge of providing a large force for Operation TELIC at a time when it was committed to a number of concurrent operations. The most significant of these was Operation FRESCO, under which the Armed Forces deployed some 19,000 personnel to replace striking fire brigade staff. Other commitments included operations in Afghanistan, the Balkans, Sierra Leone and Northern Ireland.

5.7 The mounting of Operation TELIC was further complicated by longstanding shortfalls in specialist personnel. Specialisations most affected included: medical personnel including nurses, surgeons and anaesthetists; signals and communications personnel; logisticians; vehicle-maintenance technicians; intelligence staff, aircrew, engineers and chefs. The demands of concurrent operations lead to an increasing pressure on a small pool of expertise, which is required to deploy overseas more frequently, and could give rise to retention problems among these personnel. This, in turn, exacerbates existing manning shortfalls. The Department has long recognised these problems and is working to improve recruitment and retention rates in key specialisations such as medical staff and aircrew. While such shortfalls continue, however, in addition to the normal integration of reservists into regular forces, the Department draws further on reservist personnel to meet its needs.

## Reservist personnel made a significant contribution but improvements are required in their mobilisation process

- 5.8 Reservist personnel made a valuable contribution to the overall success of the Operation. From an initial pool of 8,000 personnel contacted, and after allowing for exemption from mobilisation, the Department accepted around 5,200 reservists into service for the deployment and combat phases of the Operation. These were drawn from a wide range of specialisations, although a large number were medical personnel.
- 5.9 The Department intended that most reservists should receive a minimum of 14 days notice to report for deployment. While this was largely achieved, some individuals received considerably less, in some cases as little as two or three days. These instances were often due to a reservist's absence from home, postal times and incorrect records of addresses. The Department has recognised that this situation was unsatisfactory and has increased the notice period on future operations, wherever practicable, to a minimum of 21 days.
- 5.10 For the duration of their mobilisation period, reservists are paid at a salary equating to their military rank. Where an individual would be financially disadvantaged as a result of mobilisation (that is, a discrepancy between their military and civilian rates of pay) individuals are entitled to apply for financial assistance to make good the shortfall. Interviews with personnel in-theatre and in the United Kingdom indicated that elements of this system were overly cumbersome, requiring a considerable degree of effort on the part of reservists to prove the extent to which they were being disadvantaged, and there is a time limit within which the claim must be made. The short notice received by some individuals further complicated the process, with reports of some personnel attempting to manage their applications from Iraq. The Department has recognised that improvements are needed and is planning to revise the system in Spring 2004.

## Recommendations

- a Exercise Saif Sareea II was noted by several commanders as having been particularly beneficial in preparing their forces for Operation TELIC. The Department should ensure that large-scale exercises of this type continue on a regular basis within the overall exercise programme although owing to their cost, such exercises will always be subject to affordability;
- b the Department should continue in its efforts to reduce manning shortfalls in key specialisations; and
- c the Department should further improve its arrangements for reservists. In particular, it should provide maximum notice to mobilise wherever possible and streamline its arrangements for reimbursing personnel.



# Part 6

## Arrangements are in place for the post warfighting stage of the Operation

6.1 This Part of the Report sets out the challenges faced by United Kingdom forces in the immediate aftermath of hostilities and the wider difficulties in coordinating the early efforts of the military and other government and non governmental agencies to improve conditions in southern Iraq. It also notes the Department's arrangements for identifying the full resource cost of the Operation, which will not be known for some time.

### The transition to peace stretched the United Kingdom's capabilities and there remains much to do

6.2 Following the collapse of the Saddam regime, and the declared end of major combat operations on 1 May 2003, the Government became, in effect, an Occupying Power. Under international law, this position carries a number of obligations in relation to the maintenance of public order and safety and supporting the provision of healthcare, and represented a considerable challenge to the Government.

6.3 From the outset of the campaign, the Department wanted to minimise damage to civilian and economic infrastructure to aid the Coalition's subsequent efforts to rebuild Iraq's essential facilities. It became clear, however, that the Saddam regime had for some years deliberately neglected the maintenance of existing infrastructure in the Basrah region, for which the United Kingdom is currently responsible. This neglect was compounded by the effects of three significant conflicts between 1988 and 2003. Consequently, public utilities such as electricity, water supply and sewerage services were, at best, rudimentary and in a significant state of disrepair when British forces took control of the city on 8 April 2003. Although the Armed Forces have since secured considerable improvements to these and other services, looting and deliberate sabotage have hampered progress.

6.4 It was a Government wide responsibility to plan for the post-conflict period. In filling the gap left by the disintegration of the Saddam regime, however, there was an initial absence of some aid agencies (many of which had been funded by the Department for International Development) due to the poor security environment and of effective civilian Coalition structures. In this absence, commanders in Basrah and Maysan Provinces, acting in line with their planned approach, undertook a number of roles in addition to their main military task of providing security. In Basrah city, for example, at the time of our visit in late June 2003, 7 Armoured Brigade was managing most aspects of the city's administration, from security and policing to the central bank, setting the currency exchange rate and managing the judicial system. Specific examples included:

- the use of Royal Engineers and Royal Signals personnel to make short-term repairs to electricity and water supplies and the telephone network;
- the use of Royal Military Police personnel to recruit, vet, train and supervise Iraqis acting as new local security and police forces; and
- military personnel helping to run the Basrah central bank and acting as payroll staff for newly employed local personnel.

United Kingdom forces were, therefore, instrumental in securing early and worthwhile improvements to conditions in southern Iraq.

6.5 In acting as an Occupying Power, jointly with the United States, the Government faces challenges that have not arisen for many years. It is clear that, notwithstanding the progress made in the initial stages following the collapse of the Saddam regime, the scale of the task was beyond that which the Armed Forces, acting alone, could reasonably have been expected to meet. Nor are other Government departments designed to take on this full range of duties. The Department successfully planned and led the warfighting phase of the Operation, and had planned its contribution to a range of possible scenarios following the conflict. In-theatre coordination between the various Departmental representatives (the Foreign and Commonwealth Office and the Department for International Development) attached to 1 (United Kingdom) Armoured Division was good and the Quick Impact Projects fund administered by the Division (some £10 million over six months) made a major visible difference in the early post conflict period.

6.6 Our experience from the field visit to Iraq was that the Government had not fully anticipated the consequences of a total collapse of the Saddam regime and what the United Kingdom's obligations would be once hostilities had ceased. The Office for Reconstruction and Humanitarian Affairs was established prior to the conflict to lead the Coalition's rehabilitation and reconstruction effort. The Office for Reconstruction and Humanitarian Affairs had very large financial resources provided by the United States, much greater than those from the United Kingdom, and which were intended to cover the whole country, including the south. But the challenges were huge and coordinated plans to bridge the gap between what the Armed Forces achieved in the short-term and what was required to be done in the medium to longer term were not, therefore, well developed. Reconstruction is not a simple task and a great deal remains to be done within the United Kingdom's area of responsibility in southern Iraq, as across the whole country.

## Arrangements are in place to identify the costs of the Operation

6.7 For the first time in a major operation, the Department is attempting to identify costs on a resource basis. The Department is seeking to capture 'net additional' or marginal resource costs (that is, costs over and above those that would have been incurred if Operation TELIC had not taken place), rather than full resource costs, such as the salaries and wages of personnel involved in the Operation. **Figure 11** shows that the cost of Operation TELIC in the financial year 2002-03 was some £847 million, including the costs of equipment lost in battle or accidents (£30 million) and munitions (£64 million). As at November 2003, the Department estimated that the cost of the Operation in 2003-04 would be around £1.2 billion, comprising primarily the

### 11 Costs of Operation TELIC: 2002-03

*Operation TELIC cost £847 million in the year to 31 March 2003*

	£ Million
<b>Resource costs</b>	
Deployment and equipping the force	476
Warfighting total (including ammunition gross book value £64 million)	79
Guided weapons	61
Destroyed equipment	30
Other costs	15
Provisions on ammunition	-32
<b>Resource costs total</b>	<b>629</b>
Capital costs (all pre-deployment) <sup>1</sup>	218
<b>Total costs</b>	<b>847</b>

#### NOTE

1. Capital costs include Urgent Operational Requirements such as communication equipment.

*Source: Ministry of Defence*

cost of peacekeeping and associated Urgent Operational Requirements. The final cost of the Operation will not be known for some time, since the duration of the Armed Forces' commitments in Iraq is unknown. The Department has also yet to incur recuperation costs arising from, for example, the repair of equipment used.

6.8 The Department issued guidance on capturing the costs of the Operation to its top level budget holders in December 2002. There were marked differences between top-level budget holders' interpretations of what should be included, or what costs should be deducted, to arrive at the net additional costs of the Operation. For example, on savings resulting from Operation TELIC: Land Command deducted planned costs from cancelled exercises and identified the possibility of savings on utilities, but a number of factors led to these being negligible (including the need to maintain rear parties, the occupation of married quarters by dependants, and the maintenance of messes and medical services). Fleet examined whether there were savings, but were unable to identify any to offset their costs; and the Chief of Joint Operations identified savings of £1.8 million from the exercise programme. Within the Defence Logistics Organisation, the Equipment Support (Land) Business Unit took account of cancelled exercises but Equipment Support (Air) was unable to do so as it does not have funds for exercise activity. Costs incurred by Royal Air Force aircraft on exercises are borne by Strike Command, and flying-hour savings were identified here to offset Strike Command's

Operation TELIC costs. While the effect of these differences in approach on the overall cost estimate may be marginal, the accounting arrangements for the non-cash elements - stock consumed, battle-damaged equipment and Urgent Operational Requirements - may be more significant.

6.9 During peacetime, stock is "consumed" when items are issued by the supply systems within the three Frontline Commands. But, particularly within Land and Strike Commands, these systems are not sophisticated enough to discern actual stock consumption. The Department recognised that there was a high risk that stock consumption on Operation TELIC would be overstated, with much of the issued stock not actually being consumed, and undertook a special exercise to determine the actual value of consumed stock that was attributable to its 2002-03 Resource Accounts. We have reported separately on the outcome of this exercise<sup>9</sup>. The Department is to carry out a further special exercise to determine the cost of stocks consumed on Operation TELIC in 2003-04.

6.10 The Department has not yet assessed the cost of battle damage to equipment beyond 2002-03. The Department, with Treasury agreement, has ruled that the procurement cost of equipment purchased under the Urgent Operational Requirements procedure should be charged to the Operation. The Department is continuing discussions with the Treasury to determine the longer-term funding treatment of the costs, such as depreciation, arising from holding these assets.

## Recommendations

- a In the light of experience on Operation TELIC, and the subsequent humanitarian and reconstruction efforts, there is a need for greater coordination in planning and early execution between the Department, the Foreign and Commonwealth Office and the Department for International Development when responding to future potential complex situations such as that in southern Iraq. A cross-departmental group was convened in July 2003 and is drawing up policy on United Kingdom management of military/civilian transitions;
- b the Department needs to ensure that all relevant operational costs are identified on a consistent basis by its top-level budget holders; one option could be to improve its guidance on what constitutes net additional costs for deployed operations; and
- c the Department should look to include an assessment of the full cost of Operation TELIC in its Resource Accounts for 2003-04.







# Part 7

## The Department has a comprehensive process for identifying lessons

7.1 This Part of the Report outlines the Department's process for identifying lessons and highlights lessons that have been consistently identified from exercises and operations.

### The Department has a comprehensive process for identifying lessons emerging from operations and exercises

7.2 The Department has developed a comprehensive process for identifying and capturing lessons arising from operations and exercises, drawing input from the Permanent Joint Headquarters, the chain of command and across the Department, and coordinated by the Director of Operational Capability. Formal review action on the Departmental lessons identified takes place every six months. Complementing this process is an annual Joint Warfare Resourcing Priorities List submitted by the Chief of Joint Operations. This list identifies the most pressing requirements for the development of the United Kingdom's rapid reaction capability. These priorities are then balanced with wider equipment requirements in the Departmental planning round. In the case of Operation TELIC, the Department published a preliminary report in July 2003, based on the Director of Operational Capability's findings. It plans to publish a final report on lessons from Operation TELIC in December 2003.

### Some key lessons from Operation TELIC have been identified before

7.3 A number of important emerging lessons from Operation TELIC have been identified on previous operations and exercises. For example, **Figure 12** indicates those logistics lessons that have recurred, in some cases, since 1996. Such lessons include:

- Asset-tracking - the need for an effective asset tracking capability to enable more efficient logistical management was identified on five of the six occasions listed, and has been an outstanding lesson since at least the 1990-91 Gulf War; and
- Stock levels - shortfalls in Departmental stocks and supplies were identified as a significant issue on a number of previous operations and exercises. They have also been highlighted as part of the Department's ongoing assessment of the capability of the Joint Rapid Reaction Forces.

- 7.4 Operations will always have unique characteristics and some lessons may not, therefore, have wider applicability. And the Department may not implement other lessons for reasons such as affordability or prioritisation or simply because the required technology has not been developed.
- 7.5 There is, however, a risk that lessons that are relevant only to major warfighting operations, which are relatively infrequent, will not be implemented due to different priorities and judgements taken in peacetime. This is particularly so where the lessons relate to critical but lower-profile areas, for example, the 'enablers' for an operation such as logistics management.
- 7.6 The Department is now called upon to undertake operations with increasing regularity (for example, between 1982 and 2003 three medium-scale or larger warfighting operations and numerous smaller-scale operations). It needs, therefore, to ensure the timely implementation of operational lessons more effectively, to the benefit of future operations. Following Operation TELIC, the Department quickly established four special project teams to examine, for selected areas, how lessons from this and other operations since 1991 can be addressed<sup>10</sup>.

<sup>10</sup> In June 2003, the Department established project teams to examine lessons arising on: Chemical, Biological, Radiological and Nuclear Warfare; Combat Identification; Logistics Process; and Consignment-Tracking.

**12 Repeated identification of logistics lessons on previous operations/exercises**

Several important lessons about the performance of logistics systems have recurred since 1996

Operation/Exercise	Logistic shortcomings identified				
	Poor asset tracking	Poor logistic communications	Stock shortages	Priority deadlines not met	Lack of control over coupling bridge
Operation RESOLUTE (Bosnia-Herzegovina 1995-1996)	✓	✓	✓		
Operation LODESTAR (Bosnia-Herzegovina 1996-1998)	✓	✓			
Operation AGRICOLA (Kosovo 1999)		✓	✓	✓	
Operation BESEMER (Macedonia 2001)	✓			✓	✓
Exercise Saif Sareea II (Oman 2001)	✓	✓	✓	✓	✓
Operation TELIC (Iraq 2003)	✓	✓	✓	✓	✓

**NOTE**

The coupling bridge refers to the logistical air, land and sea lanes which lie between the points of embarkation in the United Kingdom and the points of disembarkation in-theatre

Source: Ministry of Defence



## Recommendation

- a the Department should ensure that lessons identified during warfighting should not slip unjustifiably down the priority list in peacetime. One option would be to quantify the impact of a lesson not being implemented together with the probability of it occurring and ranking the result with other spending priorities.

# Appendix A

## Methodology

- 1 This Appendix sets out the methodologies utilised in the course of the study.

### Interviews with key stakeholders in the United Kingdom

- 2 Prior to, and following, our field visit to Iraq and Kuwait, we consulted with key personnel, organisations and agencies involved in Operation TELIC. These included:

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115 Provost Company (1 Royal Military Police Regiment)

3 Commando Brigade Royal Marines

6 Supply Regiment (Royal Logistics Corps)

Air Chief Marshal Sir Brian Burridge KCB CBE ADC Royal Air Force (United Kingdom National Contingent Commander during Operation TELIC Deployment and Warfighting phases)

Augusta Westland

BAE Systems plc

Brigadier G. J. Binns DSO CBE MC (Commander 7 Armoured Brigade during Operation TELIC Deployment and Warfighting phases)

Brigadier S. P. Cowlam CBE QCVS (Joint Force Logistics Component Commander during Operation TELIC Deployment and Warfighting phases)

British Naval Equipment Association

Chief of Joint Operations

Claverham Limited

Cobham plc

Commando Logistics Regiment (Royal Marines)

Contractors on Deployed Operations Policy Unit (Defence Logistics Organisation)

Defence Clothing Integrated Project Team (Defence Logistics Organisation)

Defence Logistics Organisation's Logistics Operations Centre

Defence Manufacturers Association

Defence Storage and Distribution Agency (Defence Logistics Organisation)

Defence Transport and Movements Agency (Defence Logistics Organisation)

Director General Operations (Defence Logistics Organisation)

Director of Operational Capability (Ministry of Defence Centre)

Directorate Capability Resources and Scrutiny (Equipment Capability Customer)

Directorate Joint Warfare (Ministry of Defence Centre)

Directorate of Equipment Capability Combat Service Support (Equipment Capability Customer)

Directorate of Reserve Forces and Cadets (Ministry of Defence Centre)

Dismounted Close Combat Integrated Project Team (Defence Procurement Agency)

Field Artillery Systems Support Integrated Project Team (Defence Logistics Organisation)

Headquarters Fleet (Royal Navy)

Headquarters Land Command (British Army)

Headquarters Strike Command (Royal Air Force)

Kellogg Brown & Root Limited

Major General R. V. Brims DSO CBE (General Officer Commanding 1 United Kingdom Armoured Division during Operation TELIC Deployment and Warfighting phases)

MBDA Missile Systems

Permanent Joint Headquarters

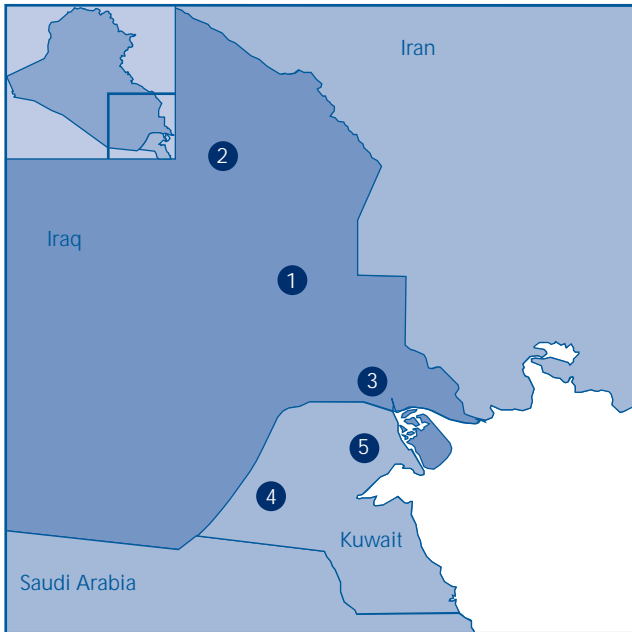
Rolls Royce plc

Smiths Industries

Tank Systems Support Integrated Project Team (Defence Logistics Organisation)

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**13 Sites and units visited by NAO Team in Iraq and Kuwait**



**1 Basrah International Airport - 20.06.03**

- Headquarters 1 (United Kingdom) Armoured Division
  - General Officer Commanding
  - Chief of Staff
  - Deputy Chief of Staff
  - Commanding Officer 1 (United Kingdom) Armoured Division Signals Regiment
  - Commanding Officer, Air Point of Disembarkation

**Basrah City - 21.06.03**

- Commander and Staff, 7 Armoured Brigade
- Commanding Officer and Staff, 1 Royal Regiment of Fusiliers
- Cyclops Squadron, 2 Royal Tank Regiment
- 202 (V) Field Hospital
- 2 Close Support Regiment, Royal Logistics Corps
- 2 Battalion Royal Electrical & Mechanical Engineers

**2 Al-Amarah - 22.06.03**

- 1 Battalion, The Parachute Regiment

**3 Um Qasr - 23.06.03**

- Joint Force Logistic Component Headquarters
  - Commander
  - G4 Equipment Support Branch
  - Logistic Support Branch
  - Force Movements Control
  - Engineer Support Branch
  - Civil Secretariat

**4 Ali Al Salem Airbase - Kuwait - 24.06.03**

- RAF Deployed Operating Base
  - Base Commander and Staff

**5 As Sabahiyah Port - Kuwait - 24.06.03**

- 165 Port & Maritime Regiment

**Fieldwork Visit to Iraq and Kuwait**

3 A key aspect of our fieldwork was sending a National Audit Office team to Iraq and Kuwait. The team, comprising four staff, accompanied by a military liaison officer, visited a number of locations and consulted with a wide range of military personnel on issues relating to the various phases of Operation TELIC. **Figure 13** provides greater detail about the locations and units visited.

**Analysis of Lessons Identified from the Operation**

4 Following the end of the warfighting phase of the Operation, the Department provided us with copies of various Lessons Identified reports that had been produced by units involved in the Operation. We reviewed these reports in order to supplement and confirm the evidence we had already gathered during our fieldwork in Iraq, Kuwait and the United Kingdom. We also examined a wide range of documents relating to the planning and deployment phases of the Operation.

**Consultants**

5 In order to provide us with high-level military guidance for our work, we engaged the former Vice Chief of the Defence Staff, Admiral Sir Peter Abbott, as a consultant.

# Appendix B

## Operation TELIC: Chronology of Events

Date	Event
25 November 2002	House of Commons debates United Nations Security Resolution 1441; Secretary of State for Defence announces contingency planning is taking place for possible military operations in Iraq.
18 December 2002	Secretary of State for Defence announces further contingency preparations, including an approach to the shipping market to charter vessels.
7 January 2003	Secretary of State for Defence announces a call-out Order for 1,500 reservists; the reinforcement of the Naval Task Group 2003 with 3 Commando Brigade is announced.
16 January 2003	Main deployment begins from the United Kingdom and Germany.
20 January 2003	The Department details the composition of Land Forces to be deployed to Kuwait.
30 January 2003	Secretary of State for Defence announces a further call out of reservists to overall total of some 6,000.
6 February 2003	Secretary of State for Defence announces the composition of the air component to be sent to the Gulf.
27 February 2003	The United Kingdom, the United States and Spain table a draft resolution at the United Nations Security Council outlining Iraq's failure to comply with Resolution 1441.
17 March 2003	Following the meeting in the Azores, the Foreign Secretary announces the abandonment of the United Nations process; final deployment vessel arrives in Kuwait.
18 March 2003	President Bush issues an ultimatum for Saddam Hussein and his sons to leave Iraq within 48 hours or be removed by force. The House of Commons authorises United Kingdom military action by 412 votes to 149. The formal decision to commit United Kingdom forces follows the debate.
20 March 2003	'Decapitation' air strikes are launched against the regime in the early hours of the morning; the ground campaign begins in the late evening with Coalition forces including 40 and 42 Commando Royal Marines seizing the Al Faw peninsula.
21 March 2003	The main phase of the air campaign begins at 18:00 hours GMT.
23 March 2003	Royal Navy begins minesweeping operations in the Khawr Abd Allah waterway to enable the port at Umm Qasr to be opened to shipping.
24 March 2003	Basrah International Airport comes under United Kingdom forces control.
26 - 30 March 2003	United Kingdom forces engage enemy forces in and around Basrah.

1 April 2003	United Kingdom forces begin transition to peace operations in Az Zubayr.
5 April 2003	United States forces enter Baghdad for the first time.
6 April 2003	United Kingdom forces enter and hold Basrah.
13 April 2003	Joint United Kingdom/Iraqi patrols begin in Basrah.
22 April 2003	United Nations declares United Kingdom Area of Operations 'permissive' environment for beginning of humanitarian operations.
1 May 2003	President Bush announces the end of major combat operations.
20 - 24 June 2003	National Audit Office Team visits United Kingdom forces in Iraq and Kuwait.

# Appendix C Previous Parliamentary Interest

This Appendix illustrates the Public Accounts Committee's recommendations from previous exercises and operations, the Government's response, and our findings from Operation TELIC on each recommendation.

## Equipment Modification

Committee of Public Accounts, 6th Report, Ministry of Defence: Exercise Saif Sareea II, HC 502, Session 2002-03

PAC Conclusions	Treasury Minute
<p><b>PAC conclusion (i.):</b> "In planning future exercises, the Department should balance the cost of modifying key equipment against that of supporting unmodified equipment in-theatre. In this case, the decision on grounds of economy not to 'desertise' the Challenger 2 Main Battle Tank increased the costs and decreased the effectiveness of the Exercise."</p> <p><b>PAC conclusion (vii.):</b> "In the event of an operation, the Department says that it could quickly modify equipment such as the Challenger 2 to operate in the desert. But the AS90 self-propelled gun will not be modified for another 12 months despite the fact that over a year has already elapsed since the end of the Exercise. The Department needs to speed up its programme of modifications to ensure that it is able to meet potential commitments."</p> <p><b>PAC conclusion (x.):</b> "The Department's decision not to issue all personnel with desert equipment and boots was bad for morale and had other adverse impacts. For example, some boots fell apart and footrot became a major issue. The Department should ensure that, in future, forces sent into harsh environments are equipped appropriately."</p>	<p>"The Department does not accept the Committee's conclusion in relation to the decision to 'desertise' the Challenger 2 tanks. The cost of modifying the Challenger 2 for the exercise would have been substantial and a judgement was made not to proceed with the modification on the grounds of cost-effectiveness. This decision resulted in greatly increased consumption of air filters (costing around £1,000 each) and affected availability of Challenger 2 at certain points during the exercise. But it did not detract significantly from the military value of the exercise or the experience gained from it."</p> <p>"A distinction must be drawn between routine plans to upgrade equipment which is decided in the Departmental Planning Round, and the ability to undertake similar activity more rapidly under the Urgent Operational Requirements (UOR) process. The UOR process was used to enable modifications to be made both to Challenger 2 and the AS90 self-propelled gun to meet the conditions anticipated on operations in Iraq. These modifications were completed in theatre. The Department's contingency planning and Urgent Operational Requirement process are both robust and effective."</p> <p>"The decision not to issue desert clothing to all exercise participants was not based solely on the expected temperatures: the Department decided to retain stocks of desert clothing in case we needed to conduct real war fighting at Medium Scale."</p> <p>"The Department recognises the Committee's comments about boots falling apart and of foot rot are based on the Comptroller and Auditor General's report on Exercise Saif Sareea II, which alluded in paragraph 2.43 to boots falling apart, or melting in the desert heat and to foot rot being a major issue. However, as we explained in the evidence to the Committee, the Department has been unable to substantiate reports of boots, and in particular the modern military combat boot, falling apart. The boots in question were not normal combat boots, but were chukka boots, issued for use by headquarters staff. They were not appropriate in desert conditions and should not have been used. Most people who wore normal combat boots had no problem with their feet. Footrot was not a major issue, although some incidences occurred early in the deployment largely as a result of the inadequate personal hygiene being applied by personnel inexperienced in the conditions. The need for the correct hygiene regime was emphasised to all personnel and the problem subsided. The Department regrets that these issues were not made clearer during the clearance of the C &amp; AG's report."</p>

### Our findings

In light of Lessons Identified emerging from Exercise Saif Sareea II, the Department undertook to modify the 116 Challenger 2 main battle tanks deploying for Operation TELIC. These modifications were effective, and the vehicle performed very well throughout the Operation. See paragraph 4.3 and Figure 5 for more information.

Whilst the Department did indeed successfully modify the 116 Challenger 2 main battle tanks deployed, the Environmental Enhancement Package for the 36 AS90 self-propelled guns deployed was not delivered and fitted in time for the warfighting phase of the Operation. Temperatures during the warfighting phase did not exceed 43°C and the operational effectiveness of the weapon system was not therefore affected. However, this does demonstrate that the Urgent Operational Requirements process cannot guarantee the delivery of a required capability within significant time constraints. See paragraph 2.8e for more information.

Despite the Lessons Identified during Exercise Saif Sareea II, prior to the beginning of preparations for Operation TELIC, the Department held desert clothing for 9,000 troops with three sets per person (in accordance with planning assumptions). Whilst significant efforts were made to make up the shortfall in desert clothing a combination of long production lead times and difficulties with in-theatre distribution, some troops were still not fully equipped even after the ending of the major warfighting phase on 1 May 2003. See Figure 6 for more information.

## Costs

Committee of Public Accounts, 6th Report, Ministry of Defence: Exercise Saif Sareea II, HC 502, Session 2002-03

PAC Conclusions	Treasury Minute
<p><b>PAC conclusion (v.):</b> "In costing and budgeting for the Exercise, the Department counted only the additional, or marginal, costs of the Exercise. Such exercises are a crucial means of maintaining military capability, and the full cost of resources consumed should be taken into account and balanced against other calls on the defence budget."</p>	<p>"Decisions on resource options for activity (e.g. exercises) are based on net additional costs, which provide a common comparator with operations and other military activity. Identification of full costs would not, in the view of the Department, improve the process of establishing the cost-effectiveness of an activity. It would also be very costly and time-consuming to produce. This position reflects the agreement reached with the Treasury in October 1999."</p>
<p><b>Our findings</b></p> <p>Operation TELIC is the first occasion on which the Department has attempted to fully capture resource costs. The Department continues to identify costs on a net additional basis only. See paragraphs 6.7 to 6.10 for more information.</p>	

## Lessons Identified Process

Committee of Public Accounts, 6th Report, Ministry of Defence: Exercise Saif Sareea II, HC 502, Session 2002-03

PAC Conclusions	Treasury Minute
<p><b>PAC conclusion (vi.):</b> "The Exercise produced new lessons but also showed areas, such as the under-provisioning of spares, in which lessons from past exercises and operations had not been learnt. The Department has improved its processes for capturing lessons from this and future exercises. The Chiefs of Staff should monitor these processes every six months, as the database of lessons identified is updated, to ensure that they are working."</p>	<p>"The Department has rigorous and effective procedures to identify and apply lessons from previous operations and exercises. Numerous lessons from Exercise Saif Sareea II were applied to the Iraq operational deployment. It is important to note, for example, judgments about spares provisioning differ between exercises and operations because of the need to balance cost and risk and, in the case of an exercise, to guarantee the availability of stocks for operational contingencies which must take priority."</p>
<p><b>Our findings</b></p> <p>The Department has an effective process for capturing and identifying lessons emerging from exercises and operations. However, some key lessons have been identified before. This appears to be particularly true for those lessons which only have a significant impact during high-intensity warfighting operations. See paragraphs 7.2 to 7.6 for more information.</p>	

## Readiness

Committee of Public Accounts, 6th Report, Ministry of Defence: Exercise Saif Sareea II, HC 502, Session 2002-03

PAC Conclusions	Treasury Minute
<p><b>PAC conclusion (xi.):</b> "Important elements of the Joint Rapid Reaction Forces were not tested during the Exercise. For example, medical services could not be tested under operational conditions; and readiness cannot be effectively tested in an exercise of which the participants have many months notice. The Department should therefore look to include untested elements of the Joint Rapid Reaction Forces in future exercises to demonstrate their capability."</p>	<p>"It is inherently difficult to test readiness with absolute certainty on an exercise because the scale and frictions of war are absent. There will undoubtedly be lessons identified from operations in Iraq. As the Joint Rapid Reaction Force continues to evolve there will be a need to test these elements within a Joint Task Force. The Department accepts that this is an area for further consideration."</p>
<p><b>Our findings</b></p> <p>For Operation TELIC, preparation for deployment was required much more quickly than planning assumptions envisaged and the question arises whether existing assumptions remain appropriate in current day circumstances and for the near term. A key lesson for the Department arising on this Operation was also that operational stock levels were, in many instances, insufficient for readiness and sustainability requirements. See paragraphs 2.8 a and b for more information.</p>	



## Asset Tracking

### Twenty-sixth Report from the Committee of Public Accounts 1993-94 - Ministry of Defence: Movements of Personnel, Equipment and Stores to and from the Gulf

#### PAC Conclusions

**PAC conclusion (iii):** .... we are concerned that systems designed to establish movements priorities were swamped, and that the failure properly to determine movements priorities led to items being moved unnecessarily by air .... We recommend that the Department build on their review of their prioritisation system and, in conjunction with improvements in movements planning, pursue vigorously an effective system to ensure that movements are economic, whilst meeting operational requirements and priorities.

**PAC conclusion (v):** We are concerned the Department did not have a sound system for tracking freight and that the recovery stage of GRANBY was consequently difficult ... we are disappointed that the Department have made so little use of the latest technology to develop systems to track assets, to keep track of what had gone into particular containers and the movement of those containers.

**PAC conclusion (vi):** We consider it unacceptable that the lack of elementary tracking led to some operationally critical items being "lost to view", and note that 228 aircraft pallets ... went missing completely during GRANBY.

**PAC conclusion (vii):** We stress the importance of the Department taking urgent action to improve their management information systems relating to movements .... we recommend that the Department have regard to the best systems in operation in the commercial sector, in particular those used for keeping track of assets.

#### Treasury Minute

"The new freight distribution information technology (IT) systems which are being developed by all three Services will provide the facility for dynamic management of the freight distribution system to an operational theatre. Real time information will be available to key supply personnel at the nodal points in the system which will guarantee stores visibility, tight control and provide the information required for an effective prioritisation procedure. This will ensure that the most economic use is made of resources. A prioritisation system review has developed new procedures which, in conjunction with the new freight IT and supporting numbering systems, will facilitate the proper management of priority freight and improve operational prioritisation including the necessary division between air, land and sea transportation".

"A new tri-Service freight numbering system is being introduced, and this, in conjunction with the development of interworking IT systems, will allow the necessary flow of freight data to provide the tracing of assets and containers. Automatic data capture of freight consignment will follow as the new IT systems are introduced and bar coding technology is progressively applied".

"The systems detailed in the Department's response to conclusion (iv) should ensure that operationally critical items are not "lost to view" in future. The Department did not have a pallet tracking system at the time of Operation GRANBY. However, the RAF is shortly to introduce the Pallet and Accessories Tracking System (PATS), a commercial derivative, which will provide a database facility to record, by serial number, the location of aircraft pallets and associated accessories within the air movements system. PATS should reduce losses of pallets and accessories to between 1 per cent and four per cent annually, which represents the range of losses experienced by commercial airlines with comparable IT control systems".

"Action has been taken to improve both the management of movements and tracking of assets, and the Department has developed for its own use those commercial systems which it considers represent best practice".

## Asset Tracking (continued)

### Twenty-third Report from the Committee of Public Accounts 1996-97 - Ministry of Defence: Management of the Military Operations in the Former Yugoslavia

PAC Conclusions	Treasury Minute
<p><b>PAC conclusion (ix):</b> We consider it unsatisfactory that, despite the assurances the Department gave us following the Gulf Conflict and despite the experience they gained in the former Yugoslavia before the IFOR operation began, keeping track of high-value and operationally important equipment has again proved to be a problem. We are concerned that systems developed by the Department were unsuitable to cope with the operational conditions in the former Yugoslavia and that they therefore did not give full value for money.</p> <p><b>PAC conclusion (x):</b> We suggest that some of the problems with the Department's asset tracking systems, particularly the strain on communications systems and the large volumes of data, could be regarded as foreseeable consequences of an operational environment. We note that the Department are considering what systems might be appropriate for the future. We recommend that, in doing this, they give particular attention to ensuring that they have systems robust enough to deal with operational conditions; it is at such times that large quantities of equipment and stores tend to be moving around, and it becomes easy to lose sight of them.</p>	<p>"The Department accepts that this is an area requiring further attention. As regards the tracking of equipment, the Theatre Equipment Database Yugoslavia (TEDY) project was introduced to establish a single system for tracking all key equipments in theatre making use of modern bar coding and computer technologies. As regards other logistic information systems, the Department used a number of systems, some well established and others being introduced to take account of experience in the Gulf Conflict, that would in due course have been linked to provide complete visibility of spares and assets both in units holding stores and in transit. These systems, though their utility was affected by problems of handling and communicating the large volumes of data involved in operations in the former Yugoslavia, were nevertheless able to provide improved visibility, for example, of resources in the supply chain from base depots into theatre (VITAL) and of spares held in theatre (GLOBAL)".</p> <p>"The Department notes the Committee's view that some problems with its asset tracking systems could be regarded as foreseeable. Although the new systems had been developed to operate in circumstances where there was no familiar infrastructure, the particular conditions that prevailed in the former Yugoslavia (principally the terrain, the pattern of troop deployments and the lack of a reliable telephone bearer system) imposed different problems not previously encountered. These made it extremely difficult to cope with the communication of the large volumes of logistic data required. The Department will ensure that the lessons learned from the former Yugoslavia are applied to future systems for tracking high value and operationally important assets".</p>

### Forty-Sixth Report from the Committee of Public Accounts 1999-2000 - Ministry of Defence: Kosovo - The Financial Management of Military Operations

PAC Conclusions	Treasury Minute
<p><b>PAC conclusion (xiv):</b> The Department has little capacity to monitor the supply chain's performance in theatre, nor the condition and reliability of equipments in theatre. The Department do not expect to have IT systems fully operating to provide such information until 2003, and they will not be in a position to assess the cost effectiveness of logistics support until then. The Department must ensure that this timetable is met.</p>	<p>"The Department recognises that it does not yet have adequate means of measuring supply chain performance. It has established a Tri-Service organisation to measure supply chain performance and recommend improvements. Improved IT is the key to achieving the successful operation of the supply chain. The Department is developing a Defence Stores Management Solution (DSMS) to replace the separate systems currently in use by each of the Services. This will provide operational staffs with common policy and processes that will lead to greater synergy and improved supply chain performance. The new system will provide Defence-wide visibility of stores, allow users to order stores from any of the depots and contribute to the long-term requirement to reduce stockholding. DSMS will initially replace elements of the current RAF supply system in September 2002 and will replace the main Army supply systems and remaining RAF supply system elements in 2003. DSMS will be extended to the Royal Navy and deployable forces operational units in 2004".</p> <p>"At the same time the Department recognises the need to improve its ability to track items as they move forward into a theatre of operations. The In-Transit Visibility project is targeted specifically at this need. The provision of a full operational capability will commence in the first quarter of 2003, and be completed by the third quarter of 2005. This will greatly enhance military capability and effectiveness of operational logistic support. In the meantime, in-theatre inventory management and consignment tracking systems are performing beyond expectation".</p>

## Asset Tracking (continued)

Committee of Public Accounts, 6th Report, Ministry of Defence: Exercise Saif Sareea II, HC 502, Session 2002-03

PAC Conclusions	Treasury Minute
<p><b>PAC conclusion (viii.):</b> "There are important programmes in place to enhance capability, such as those for Bowman, asset tracking, and helicopters. The Exercise reinforced concerns about the limitations of the Clansman radio system and the inadequacy of the Department's asset tracking systems. The Department needs to demonstrate that, for example, Bowman will operate in austere conditions similar to those encountered in Oman, by testing rigorously that equipment specifications meet the demands of operating in extreme temperatures."</p>	<p>"New secure communications equipment, and asset tracking systems, cannot be introduced overnight. The shortcomings of Clansman, the communications system of the 1970s, are well known, and the first Army units start to train on its replacement Bowman, in the late summer of 2003. Trials of Bowman in extremes of climate are scheduled to take place this year. Hot-dry trials will be held in the US and hot-wet trials will be held in Brunei. The hot-dry trials will subject the equipment to temperatures in the region of 32-49 degrees Centigrade, which is similar to that which our forces might experience in Iraq. Extreme cold trials are scheduled to take place in Canada next year, where the testing will be in the range -21 to -31 degrees Centigrade.</p> <p>"The Department provided a partial asset tracking capability for operations in Iraq through its Urgent Operational Requirement process and has plans to develop an enhanced asset tracking capability."</p>
<p><b>Our findings</b></p>	
<p>The shortcomings of the Clansman communications system are well known and have been highlighted by previous National Audit Office and Public Accounts Committee reports. In order to improve the reliability of communications, the Department assembled large spares pools and quantities of replacement radios.</p> <p>The lack of an effective asset-tracking system added significantly to the pressures on the logistics system. Whilst the Department did procure the Total Asset Visibility system at short notice, it was originally planned that the system would be loaned to the Department by the United States Department of Defense; in the event this was not the case and, as a result, it was not in place until the end of February 2003 - too late to be utilised in the crucial early stages of the deployment. The lack of an effective asset tracking capability has been highlighted repeatedly on previous operations and exercises. See paragraphs 3.17 to 3.21 and Figure 12 for further information.</p>	

## Strategic Lift

### Twenty-sixth Report from the Committee of Public Accounts 1993-94 - Ministry of Defence: Movements of Personnel, Equipment and Stores to and from the Gulf

PAC Conclusions	Treasury Minute
<p><b>PAC conclusion (viii):</b> We note that the Department's own staff had limited direct experience and expertise in the dry shipping market and we are surprised that it was not until operation GRANBY that the Department first established a Shipping Committee specifically to handle a large volume of dry shipping cargo. They subsequently relied heavily for advice and expertise in chartering on the Government Freight Agent (the Agency) and on the Government Freight Market Representative (the Representative) ....</p> <p><b>PAC conclusion (ix):</b> We are concerned that the Department did not issue detailed instructions to the Shipping Committee ... that no records were kept by the Committee to show what options were considered, what bids were received and the basis on which decisions were reached. We note the Department's explanation that this was because of the hectic pace of the Shipping Committee's business .... However, it is unacceptable that a Government department should not keep records to support major financial decisions. We are concerned at the lack of records and database of the Shipping Committee which were contributory factors to the doubts that existed concerning whether value for money was obtained and financial propriety was observed in ship chartering.</p> <p><b>PAC conclusion (x):</b> We recognise that the Department were faced with a "military market" for ship chartering and note that prices paid were inevitably above normal peacetime rates.</p> <p><b>PAC conclusion (xii):</b> We are concerned that the Department did not always observe normal best practice with regard to the signing of charter parties .... The Department also did not exercise their rights under the Agency contract to scrutinise the charter parties ... they relied upon the Agency to protect their interests .... We note that the Department accept this was poor practice .... We regard the absence of a burst telex facility as an important matter since the rules which govern chartering give a clear advantage to anyone with early information.</p>	<p>The Department did not, and still does not, employ its own ship broker to provide expert advice, as an in-house broker would rapidly become out of touch with the volatile dry shipping market. During Operation GRANBY the Department was therefore reliant on the company contracted to provide such advice. Following GRANBY arrangements were reviewed, and this requirement is now met by the Defence Freight Market Representative under the Department's contract with the Baltic Exchange.</p> <p>The Department has produced detailed Terms of Reference for the Shipping Committee. Committee meetings are now comprehensively minuted and records maintained of the operational requirement, options considered for meeting the requirement, price and capability of each ship offered, reasons for rejection, brokers involved and their levels of commission. A database is now maintained.</p> <p>The Department agrees that two distinct markets formed and that it had to pay a significant cost premium over and above prevailing commercial rates.</p> <p>The Department now has a much tauter contract which it has placed with the Baltic Exchange and the signing of charter parties is undertaken by the Principals concerned in all cases unless owners have specifically authorised brokers to sign on their behalf. In addition, all charter parties are now fully scrutinised by the Department before full payment is made. A burst telex facility is now in use.</p>

## Strategic Lift (continued)

### Twenty-third Report from the Committee of Public Accounts 1996-97 - Ministry of Defence: Management of the Military Operations in the Former Yugoslavia

PAC Conclusions	Treasury Minute
<p><b>PAC conclusion (xvi):</b> We note that the Department's arrangements for moving personnel and equipment to and from the former Yugoslavia are an improvement over those for the Gulf Conflict, but we are concerned that the Department had to pay premium prices to charter shipping. We recommend that, in future, the Department explore the scope for generating more competition, and therefore better prices, by approaching the market earlier for some of their requirements, especially those that can be planned ahead with a degree of certainty. These would include for example, the routine turnover of troops and equipment operating in the former Yugoslavia as part of the Stabilisation Force, and the final withdrawal.</p>	<p>The Department notes the Committee's recommendation. When the operation began the planning time from approach to the civil market to expected presentation of the ship was 14 days and has now been extended to around 30 days. This may improve the availability of certain militarily useful ships for charter. In all cases, however, the Department has to balance the advantage of an early approach to the market against the risk of nugatory expenditure if the operational requirement subsequently changes.</p>

### Forty-Sixth Report from the Committee of Public Accounts 1999-2000 - Ministry of Defence: Kosovo - The Financial Management of Military Operations

PAC Conclusions	Treasury Minute
<p><b>PAC conclusion (x):</b> The Kosovo operations exposed the Department's lack of adequate heavy lift capability. It was unsatisfactory that they were heavily reliant on Russian registered aircraft which were not available during much of the air campaign. The Department have announced that they will lease roll-on roll-off ships and US C17 transport aircraft, and these equipments must be introduced to schedule as well as on budget.</p>	<p>The Department accepts the Committee's conclusion and had recognised the need to increase its sealift and airlift capacity in the Strategic Defence Review. The unavailability of the Antonovs for Kosovo-related activity did not have an operational penalty in Kosovo, primarily because MOD was able to use other aircraft and sealift. But the campaign confirmed the need to improve our lift capabilities, given that for other operations where MOD might have less time to prepare, a lack of in-house assets could be a significant constraint. As the Committee notes, since the Kosovo campaign the Department has announced several major improvements in this area: a PFI strategic sealift service of six roll on/roll off ships ('Ro-Ros'), with a provisional service of up to four ships until the PFI service is available; and the lease of the four C-17 aircraft, with (at least) the first aircraft entering service this year, which will provide a new outsized airlift capability for the RAF until the A400M enters service in the latter part of this decade. The Ro-Ros will provide a capability, not readily available on the commercial market, to carry, load and off load large amounts of heavy and bulky material equipment without the need for specialised port facilities. The leased C-17s will allow us to respond rapidly to provide humanitarian aid, to swiftly deploy a peace-keeping force, or promptly react to a military threat by moving outsize vehicles and cargo into landlocked theatres without being reliant upon commercial charter. Both C-17 and Ro-Ros are integral to the deployment of Joint Rapid Reaction Force.</p>

## Strategic Lift (continued)

Committee of Public Accounts, 6th Report, Ministry of Defence: Exercise Saif Sareea II, HC 502, Session 2002-03

PAC Conclusions	Treasury Minute
<p><b>PAC conclusion (xii.):</b> "The Exercise was a limited test of strategic lift, and the Department remains reliant on the availability of commercial assets. The Department needs to manage the risk of continuing to rely on the ready availability of civilian strategic lift assets. It should carry out a detailed risk assessment to examine the options fully, including the possibility that arrangements could be made with civilian operators to guarantee strategic lift capacity when required."</p>	<p>Strategic air and sealift capability is examined annually by the Department as part of a wider assessment of logistic capabilities. This is a rigorous and objective review of tasks against assets with the aim of identifying potential capability gaps and thus helps inform future equipment investment decisions. It represents, therefore, a thorough risk assessment process.</p> <p>The current assessment, based principally on recent operations, indicates that recent major investments in both C-17 aircraft and RoRo shipping leaves us reasonably well placed for strategic lift capability. Nonetheless, the Department is looking at ways further to enhance its strategic capability. Military capability is also supplemented, as and when necessary, from the commercial market. The Department has enabling contracts with commercial brokers for airlift charter that can be activated at very short notice: these arrangements proved to be highly effective during Operation TELIC. Contracts for strategic sea lift can also be activated rapidly.</p>
Our findings	
<p>As on Exercise Saif Sareea II the Department's four leased C-17 Strategic Lift aircraft performed extremely well during Operation TELIC. In addition, the Department was able to call upon four of its new Joint Rapid Reaction Force Roll-on Roll-off ferries, which appear to have performed well.</p> <p>Despite the availability of these very capable assets, the Department will remain reliant upon the availability of commercial lift assets in the mounting of operations such as TELIC. The success of the Defence Transport and Movements Agency in securing sufficient commercial lift assets at a lower than expected cost made a significant contribution to the overall success of the Operation. See paragraphs 3.4 and 4.5 for further information.</p>	