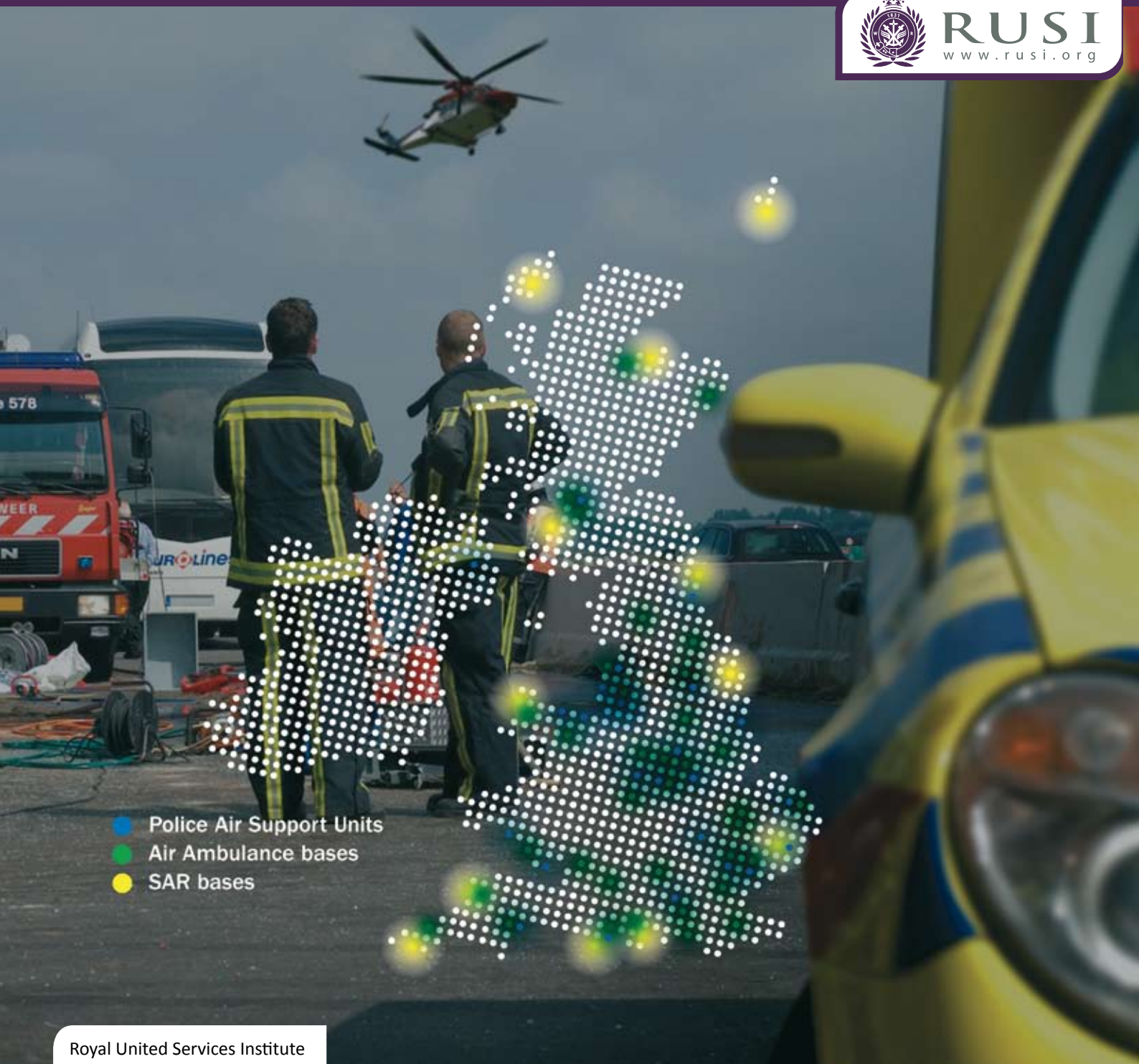


BLUE LIGHT AIR ASSETS

Cost-effective Operations for the Future

Jennifer Cole



- Police Air Support Units
- Air Ambulance bases
- SAR bases

Royal United Services Institute

OCCASIONAL PAPER

About the Research

The research project 'Blue Light Air Assets: Cost-effective Operations for the Future' was conducted between May and October 2011. The aim of the project was to examine how a more efficient and effective structure for the helicopter emergency services might lead to better interoperability and cost-effectiveness for the taxpayer. This paper represents the final findings of that research.

The discussions that have taken place throughout this project have sometimes resulted in conflicting opinions, and some respondents have questioned the factual accuracy of comments made by others. Where possible, RUSI has checked facts with the relevant agencies, but we acknowledge that some inaccuracies may remain, for which we apologise. The very nature of the disagreements highlights the need for more discussion and better understanding between public sector air asset operators.

This research project has been supported by AgustaWestland Ltd.

About the Emergency Management Programme

RUSI's Emergency Management Programme sits within the National Security and Resilience department, which studies the prevention of, response to, and recovery from man-made and natural disasters, including terrorist attacks, climate change impacts and hostile threats.

For more information, please visit: www.rusi.org/emergencymanagement

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The Royal United Services Institute (RUSI) is an independent think tank engaged in cutting-edge defence and security research. A unique institution, founded in 1831 by the Duke of Wellington, RUSI embodies nearly two centuries of forward thinking, free discussion and careful reflection on defence and security matters.

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Front cover: Map showing the current spread of helicopter bases across the UK. *Courtesy of AgustaWestland.*



Final Report, November 2011

Blue Light Air Assets

Cost-effective Operations for the Future

Jennifer Cole

The views expressed in this paper are the author's own, and do not necessarily reflect those of RUSI or any other institutions with which the author is associated.

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Search and Rescue capability for the UK is currently provided by helicopters operated by the Maritime and Coastguard Agency, Royal Navy and Royal Air Force, but this is under review.

Courtesy Royal Navy © Crown copyright/MOD 2004.

Executive Summary

This research project has sought to explore the current use of air assets by the blue light services, to assess the financial and operational efficiency of the current operational models, and to suggest ways in which efficiency might be improved in the future.

It aims to bring together the research and discussion that has taken place across a number of existing and ongoing reviews into public sector air asset use, including the Search and Rescue Helicopter Project (SAR-H) led by the Ministry of Defence (MoD) and Department for Transport (DfT); the National Police Air Service proposal undertaken by the Association of Chief Police Officers (ACPO); the future of the joint MCA and fire and rescue service Maritime Incident Rescue Group (MIRG); the Framework for a High Performing Air Ambulance Service undertaken by the Association of Air Ambulances, and two internal fire and rescue service reviews, carried out by Essex and Avon Fire and Rescue Service respectively. The research project hopes to provide an overview of these projects to ensure that organisations do not consider their air assets in isolation but investigate joint working and asset sharing with others where this is practical and reasonable, in order to highlight to parliament and other senior policy-makers where changes are needed. It will also suggest practical ways in which such changes might be implemented.

The timescale for decisions relating to the future of emergency helicopter operations in the UK is constrained by the fact that by 2016, the Royal Navy and RAF Sea King helicopters currently used for search and rescue (SAR) operations will come to the end of their operational lives. A replacement must be in operation by that time. While decisions on this replacement could be made in isolation, there is significant appetite for ensuring that the plans for the future of search and rescue operations fully consider how existing assets and air asset operators might form part of that replacement.

The research we have conducted over the past four months suggests that joint working and

air asset sharing across government agencies should be possible at a much higher incidence than is practised at present, with opportunities to harmonise not only the assets themselves but also training, maintenance, crewing, dispatch and the location of bases. Such a harmonised approach is likely to result in considerable future cost savings across all agencies, while improving operational efficiency and effectiveness for each air asset user.

The key findings of the research are as follows:

- Harmonisation of blue light air assets needs to take place across UK publicly-funded organisations as well as within them. This includes the Home Office (for police air assets), the Ministry of Defence (for Royal Navy and RAF SAR assets), the Department of Communities and Local Government (for fire and rescue service assets, including those provided to the Maritime Incident Response Group), the Department for Transport (for Maritime and Coastguard Agency assets including SAR and MIRG) and the Department of Health
- There is currently no mechanism at central government-level for issues to be discussed and resolved by all relevant stakeholder departments. This risks decisions being made in silos and hampers the development of operational and financial efficiency
- There is consensus between blue light air asset operators that there is scope for much greater asset sharing and joint working than exists at present and that these opportunities warrant further examination
- The National Police Air Service project, run through the Association of Chief Police Officers (ACPO) and the National Policing Improvement Agency (NPIA), offers not only the opportunity to harmonise police air assets, but also opportunities to explore the harmonisation of government-owned and operated air assets more generally, in order to identify further efficiency savings in the future

- Such an overview would benefit from a review of international models that might suggest a way forward for the UK, such as Airlift North West, based in Seattle,¹ and the Hong Kong Government Flying Service,² both of which use planes as well as helicopters and which might serve as models for a UK equivalent
- There is strong disagreement within the Helicopter Emergency Medical Services (HEMS) sector about the operational needs and requirements of helicopters flying medical missions; in particular, the advantages of a 'highly-technically configured', specialist

air ambulance, which is fitted with advanced medical equipment and systems, over a more general helicopter that can transport specially-trained medical personnel and injured or ill patients but is not so highly-technically configured. The internal politics in this sector seriously threaten the ability to join up HEMS operations with other public sector air operations, even where some of the key stakeholders feel this is possible. Further research on this is needed, which should be led by the Department of Health, reviewing the use of air assets in patient care across the UK.



The Maritime and Coastguard Agency uses air assets for search and rescue and MIRC operations.

Courtesy of AgustaWestland.

Study Objectives

For the last decade, RUSI has been working to define ways to break down or circumvent barriers to interoperability between the blue light services and to understand why these barriers have persisted over time even though the technology to overcome them is readily available. This has been explored in three RUSI reports, 'Communications Inter-Operability in a Crisis'³ and 'Interoperability in a Crisis 2: Human Factors and Organisational Processes'.⁴ A third publication, the White Paper 'Combined Effect: A New Approach to Resilience',⁵ published in late 2010, encourages a more holistic, collaborative approach to resilience planning. Its aim is to help to bring together public and private sector resilience stakeholders officially designated Category 1 and 2 responders under the Civil Contingencies Act 2004, the private sector suppliers, operators and contractors, as well as the volunteer organisations and community groups that support them. Importantly, the methodology seeks to identify where gaps in current knowledge, understanding and capability exist so that they can be more easily addressed. This 'combined effect' approach has since become the underlying methodology for a number of resilience initiatives across government, and has been taken up as a core text to inform multi-agency courses run by both the Fire Service College (in particular the National Interagency Liaison Officer course aimed at Silver Commanders in joint operations) and the Emergency Planning College.

'Interoperability in a Crisis 2: Human Factors and Organisational Processes' highlighted that agencies must fully understand one another if they are to work together effectively. This includes why and how they act (and sometimes do not act) in the way they do; what equipment they use and to what effect; and why differences between them may be necessary to meet operational requirements. A 'one-size-fits-all solution' can seem obvious to an outsider but is often anything but. In order for organisations to understand where they can join up, and also where they cannot do so, or where doing so is more complex, they need to identify what capabilities, policy, technology and operational

processes need to sit inside a shared resilience space and which belong, for very good reasons, outside it.

The next stage to this ongoing research has been to focus on some specific areas and to try to map the shared space Venn diagrams for that particular capability.

Air Assets and the Emergency Services

Currently, UK government-sponsored helicopter assets used by the emergency (blue light) services are provided by a large number of organisations and are managed and operated disparately. Of these, the two major publicly-funded capabilities, namely those providing the search and rescue (SAR) and police support functions, are both subject to separate major reviews that will shape their futures for several decades to come. Key stakeholders in the current and future use of air assets include:

- *SAR-H (Search and Rescue Helicopter project)*
SAR-H planned to harmonise the current RN/RAF/MCA search and rescue capability but was halted by the coalition government in February 2011, leaving the future of search and rescue operations in the UK unresolved, though MoD air assets are unlikely to feature as part of the long-term overall solution. Decisions on the future of SAR-H are due to be made before the end of 2011
- *National Police Air Service (NPAS)*
The police, through the National Policing Improvement Agency (NPIA) and the Association of Chief Police Officers (ACPO), are currently proposing a National Police Air Service (NPAS). NPAS will take a more national approach to police air assets, which are currently fragmented under the governance of individual police forces
- *Maritime Incident Response Group (MIRG)*
On 16 September 2011, the government formally announced that it would accept the recommendation of the Maritime and Coastguard Agency (MCA) to remove funding for the Maritime Incident Response



A winch capability may be a vital requirement in rural areas.

Courtesy AgustaWestland.

Group (MIRG), a joint MCA and fire and rescue service helicopter capability for offshore rescue,⁶ even though the majority of participating fire and rescue services have indicated this is likely to result in their withdrawal from the scheme. The plan is to replace the current capability by contracting to commercial salvors, despite this being discounted as a viable option by the FRS National Firefighting at Sea project, conducted from 2003–07

- *The introduction of NHS Major Trauma Centres* Some air ambulance operators voiced concerns about the additional burden they envisage being placed on air ambulances by the potential increase in patient transfer operations they may be asked to undertake following the introduction of regional NHS Major Trauma Centres.⁷ This concern is not mirrored within the NHS, however, which does not believe that the Major Trauma Centres will request this of air ambulances. At present, hospital transfers make up a very small proportion of overall air ambulance service operations – routinely between just 1 and 3 per cent – and there is no reason to believe that this will increase significantly in future. However, a more integrated use of air assets in the patient pathway has the potential to maximise the capacity of geographically-spread specialist care centres and thereby improve patient outcomes.

RUSI's ongoing research into interoperability has highlighted that overlaps in roles and capabilities often exist within and between the emergency services. If a more coherent, joined-up approach can be achieved, it is likely to lead to significant gains in both overall efficiency and cost-effectiveness for these publicly-funded services.

Exactly what helicopters are used for at present, in terms of which makes and models are used and how they are procured, is not well co-ordinated. The current state of play suggests a need for an overarching civil strategy for blue light helicopter operations that will ensure the current reviews do not take place in isolation from one another. The

research also suggests that this approach needs to be applied more broadly than the consideration of helicopter strategy: air assets in general should be considered, as should the requirement for these assets over certain surface assets such as lifeboats for offshore rescue and 4x4s for rural operations. For example, the Polaris six-wheeled vehicle recently procured by the ambulance service's Hazardous Area Response Teams (HART) is capable of operating in rougher, more rural terrain than ambulance service vehicles have previously been able to access; the military also has four-wheel drive ambulances that could play a part in rural search and rescue, but at present do not. There needs to be a more holistic view of operations and mission requirements across the whole of the emergency services, and the public sector more broadly, to ensure efficiency and value for money for the taxpayer.

Such an overview would benefit from a review of international models that might suggest a way forward for the UK, such as Airlift North West, based in Seattle, and the Hong Kong Government Flying Service, both of which use planes as well as helicopters and which might serve as models for a UK equivalent.

Purpose of this Paper

The purpose of this paper is to review the current capabilities, to identify and discuss options for change, to address obstacles and to make recommendations for the immediate and longer-term future. The research seeks to determine

whether the adoption of greater interoperability and an overarching civil strategy for the blue light helicopter services could also lead to an improved and more cost-effective overall capability.

It is important to point out that this has been a relatively small-scale, qualitative study that has sought mainly to consult the opinions of current helicopter operators and suppliers. There has not been the scope to conduct a more quantitative survey that would enable conclusions to be drawn on exact mission requirements, technical specifications and crew composition, nor to determine the optimum weight or technical configuration of public service helicopters. Neither has the research aimed to collect statistics on the number and type of missions flown. Where such figures are quoted, they have been taken from cited secondary sources which have been accepted as accurate. As the research discussed on the following pages will set out, such specifications can be determined after more fundamental questions have been answered. It is these fundamental questions and challenges which the research has sought to tease out.

We are grateful for the support we have received from across the blue light helicopter industry that has made this research project possible. This has enabled us to apply a 'combined effect' approach and methodology to a specific resilience capability and, in the process, will hopefully improve the understanding of operational requirements across the UK for a range of C1 and C2 responder agencies.



Seven helicopters in total helped to rescue villagers from flooded Boscastle in 2004 when all road access had been cut off.

Courtesy of PA Photos.

1. Current Capabilities and Practice

Air assets are currently used extensively by the emergency services in the UK and, indeed, around the world, to great effect. In the UK, the majority of these air assets are helicopters. During the devastating floods that hit the village of Boscastle in north Cornwall in 2004, for example, the severity of the flooding was confirmed by a Devon and Cornwall Police Air Operations Unit helicopter, Cornwall Air Ambulance was put on standby to receive casualties and rescue helicopters were scrambled from RAF Chivenor, RAF Mawgan, RNAS Culdrose and Portland MCA. In total, seven helicopters rescued more than 100 people, including six firefighters, from areas that were completely inaccessible by any other means.

Helicopters provide more than just flood rescue, of course. They have an important role to play in delivering specialist staff and equipment to incident scenes, particularly over large distances to locations that are remote or difficult to access by road or sea; providing aerial observation to inform command and control decisions and to track and record criminal activities; ensuring the quick transfer of seriously injured casualties from the incident site to hospital or from one hospital to another; enabling the safe rescue of sailors, surfers and swimmers who encounter difficulties at sea; searching for lost hikers and mountain climbers; and enabling access to vessels on fire at sea.

At present, there are more than 100 helicopters owned or in use by police forces, fire services, the Maritime and Coastguard Agency and air ambulance services around the UK, as well as a number of Royal Navy and RAF helicopters dedicated to search and rescue (SAR) operations. These helicopters operate from more than sixty separate bases.

Such services are not cheap. The Annual Report of Yorkshire Air Ambulance⁸ for the financial year 2009–10 shows that the governance and operational costs totalled nearly £2 million. A recent study by Essex Fire and Rescue Service estimated annual costs of one helicopter to be approximately £1.2–£1.4 million. Air ambulance services and the police

together spend approximately £60 million a year on helicopter operations.

Cost should not necessarily be seen as a reason not to use helicopters or other air assets for emergency response, however; around the world, their value to life-saving operations has been proven time and time again. So has the value of such a service being co-ordinated across all agencies that use such resources. The important factor is to ensure that the air assets themselves, as well as their operation and management, provide a cost-effective and efficient return for the public money invested in them.

Understanding Current Mission Requirements

In the UK, there is, at present, no co-ordination of air assets, either nationally or across agencies. Individual emergency services and regional forces of each emergency service procure and operate their own air assets in isolation.

This fragmentation of the sector means that there is no formal way to determine the exact operational uses of helicopters; the lack of a universal taxonomy or lexicon means that there are no agreed definitions of ‘search’, ‘rescue’ and other mission statements, for example. This makes it difficult to analyse helicopter usage across different organisations and consequently difficult to assess where join-ups may provide the best effect.

Nonetheless, the research indicates that usage falls into two broad categories: transportation and monitoring, each of which can be broken down further into more specific mission requirements.

I. Transportation

i. Transportation to the scene

Air assets enable personnel and equipment to be transported by air more quickly and over larger distances than can be achieved by road

They also enable personnel and equipment to be transported to locations that are

difficult or impossible to reach by any other means, such as into remote rural areas, out at sea, through heavily congested traffic or into regions that have suffered severe flooding

ii. Rescue and transportation from the scene

Air assets transfer persons from a hostile to a benign environment; in simple terms, they rescue people. The benign environment may be a place of temporary safety, from where the rescued persons will need to be transported on further, or a place of permanent safety. Transportation from the scene includes the transfer of injured casualties from an incident scene to hospital.

While both of the above can be seen as simply 'transportation', it is important to separate them for reasons that will be discussed further later in this report.

II. Aerial observation and monitoring

Air assets enable overhead observation which provides a bigger picture than ground observation alone can provide. Such monitoring may search for people or vehicles that have been reported lost or missing, provide information to inform the common operating picture of a larger operation, or collect images that can be used as evidence during police operations.

The following sections will discuss these operational requirements in further detail.

1.1 Use of Air Assets for Transportation

Air assets can be used to transport personnel and equipment to and from incident sites. This may be necessary in order to reach areas that are impossible or difficult to access by road or to meet time-dependent operational efficiency targets. London Fire Brigade trials relating to the potential use of helicopters, undertaken in the late 1990s, estimated an average response time of thirteen minutes by helicopter against approximately thirty minutes for a fire appliance, for example; more recent studies have identified

similar time savings for routine response times within a given area.

Trials conducted for Essex FRS's Helicopter Feasibility Study showed that helicopters carrying sufficient personnel and equipment to attend a road traffic accident (calculated to be four firefighters plus approximately 240 kg of equipment) often passed fire appliances in congested traffic to reach accident sites first. Likewise, trials carried out recently by Avon Fire and Rescue Service showed significantly increased response times for helicopters⁹ over ground appliances in a number of different scenarios, including road traffic collisions, Urban Search and Rescue (USAR) incidents and flood response. The report came to the conclusion that:

In most cases this trial has demonstrated AFRS could have engaged its technical rescue assets where they are required more quickly [by helicopter] than it could do at present. The net benefit is that there could be an improved outcome for casualty survival.

Air transportation also enables specialist response to be delivered to areas of the country significantly distant from where those assets are on permanent standby. The proposed National Police Air Service (NPAS) is considering air transport to deliver specialist firearms teams to incidents around the country, for example. Air assets therefore enable swift responses while having the added advantage of enabling organisations to do more with fewer resources: if a helicopter enables specialist assets to be transported quickly over larger distances, it may enable a smaller number of specialist teams to be retained on permanent standby around the country.

It is, of course, recognised that where the operation is dependent on specialist equipment as well as specialist personnel, air assets may not be able to transport the same weight or volume that can be moved by road. Some equipment may be too heavy to transport by the available air assets at all. However, the initial responders at an incident site do not necessarily need large amounts of heavy equipment; they are more likely to be experts whose role is to assess the scene and to make quick decisions on what else is needed.

Flying Regulations for Helicopter Operations

Not all air operations in the UK are conducted under a single regulatory regime. The standards that apply are either those defined by the International Civil Aviation Organization (ICAO) Standards and Recommended Practices¹⁰ (SARPs) or those defined by the state and applied to state aircraft.

Civil Operations

ICAO regulations are recognised and permit the integration of Commercial Air Transport (CAT) aircraft into any airspace. The airworthiness and crewing of these aircraft is subject to ICAO standards, as are the rules governing what they are allowed to do in that airspace.

States that are signatories to the ICAO Convention apply common minimum standards to regulate civil aircraft in their airspace. In Europe, this approach has been further refined by the formation of EASA, the European Aviation Safety Agency.

UK Military Operations (State Aircraft)

Under ICAO, military aircraft are state aircraft and are not regulated by the civil authorities. As such, military helicopters fly under regulation that is defined and maintained by the independent Military Aviation Authority (MAA). These regulations cover the full range of crew competency, continued airworthiness of aircraft and allowable operating conditions.

UK Para-public Operations (State Aircraft)

A second group of aircraft defined as 'state' aircraft carry civil, rather than military, registration. These engage in para-public activities under the auspices of the state for purposes such as firefighting, policing and, more recently, civil search and rescue (SAR). Operation of these para-public services may be at the discretion of the state: as such, they are not subject to global common standards. In the UK, these aircraft are certificated and crewed to ICAO standards but regulated by the Civil Aviation Authority (CAA). This approach successfully merges ICAO and state standards with attendant benefits to safety. Specific dispensations (in particular to police operations) have permitted the effectiveness of specific services to be maximised.

Regulatory Environment: Civil vs Military

From a simplistic viewpoint, military operations can be regarded as goal-oriented with the mission risk profile established and accepted by the local operating authority, often on a flight-by-flight basis. By contrast, CAT operations are conducted to a general but comprehensive safety standard which has been specifically risk assessed by the airworthiness authority. Under these rules, the flying task can only be commenced, or continued, if it can be completed in compliance with that standard, leading to a general assumption that military aircraft are able to fly more 'dangerous' missions than civil aircraft and a consequent concern that some current capability will be lost by the withdrawal of military assets from SAR. This is not the case.

The CAA has recognised that there are situations where para-public missions can only be achieved successfully if the normal CAT regulations are relaxed. Appropriate dispensations have been successfully developed and implemented (exemplified by CAP 612, the Police Air Operations Manual Part 1) but these are identified and risk-assessed by the authorities, not the operator, and only apply to specific mission tasks and scenarios. In this way, the goal-oriented needs of the emergency services can be merged with accepted ICAO-derived standards to realise a safe and effective operation.

Options for the UK Blue Light Services

Simplifying the regulatory regime under which blue light services air assets fly may be possible if all were defined as 'state aircraft'. This may admit military services as a viable alternative to civil-regulated activities but does not need to imply that the civil option would be any less regulated than is the case for CAT services, nor that the service so regulated would be any less effective than that achieved by the military option. Taking the experience of the UK authorities as an indicator of what can be achieved when CAT regulation is merged with targeted mission and goal-oriented dispensation provides a clear model for how a civil-regulated blue light service can achieve full effectiveness.

A USAR exercise at RAF Waddington in Lincolnshire, undertaken by South Wales Fire and Rescue Service and Lincolnshire Fire and Rescue in August 2011 and observed by RUSI as part of this research programme, highlighted that the early stages of a USAR operation focuses on assessing the structural integrity of the site, identifying spaces where survivors may be located, using small echo-location devices to locate and make contact with survivors and to develop situational awareness. Heavy equipment for shoring up damaged buildings, lifting and cutting rubble and extracting casualties is not required until considerably later; the equipment needed by the initial expert team is contained within relatively small, man-portable rucksacks.

Understanding mission requirements such as these helps to elucidate how a helicopter can best deliver the appropriate capability at the appropriate time and to the appropriate place. The co-ordination of Standing Operating Procedures (SOPS) across the

different emergency services for the carriage of personnel and equipment in helicopters does not currently exist, however.

Nonetheless, in some regions, transportation functions are already conducted under joint-agency asset sharing arrangements: for example, at present, Wiltshire Air Ambulance does not actually own and operate a helicopter, but instead uses police helicopters to transport medics (who carry relatively little equipment with them) to incident sites ahead of a road ambulance; South East Coast Ambulance has partial call on a police South East Air Support Unit helicopter (on which some police observers are cross-trained as paramedics) as well as operating two dedicated air ambulances. Looking further afield, in the United States, the Maryland State Police helicopters carry paramedics for rescue and medical missions; it has one of the highest rates of patient survival recorded across HEMS operators.



The Defence Flying School at RAF Valley uses the medium-sized Bell 412 helicopter for SAR training. The model is also used for actual SAR missions in Cyprus.

Courtesy of the RAF © Crown copyright/MOD 2009.

It is important to note here that helicopter size and weight has specific implications for mission success; police respondents were keen to stress the need in urban environments for small, highly manoeuvrable helicopters that can negotiate tall buildings and land in relatively restricted spaces. Air ambulance representatives also highlighted the need for equally small and light helicopters capable of landing easily in rural areas on non-dedicated helicopter landing sites, including private gardens. The movement of larger fire and rescue teams and police firearms teams would, however, require a larger helicopter than any individual police force currently owns.

Rural, Urban and Offshore

The differences between urban, rural and offshore environments also need to be considered carefully when discussing transportation requirements. Within a metropolitan area, it may be easy to get thirty police officers on foot to an incident scene in five minutes; in rural areas it may take thirty minutes for four or five to arrive by road; for offshore rescue, an air asset may be the only practical option. There was also considerable feeling amongst research participants that there has not been sufficient discussion on the relationship between airborne and seaborne rescue assets in offshore rescue operations to assess the feasibility of some current offshore rescue functions being taken up by the Royal National Lifeboat Institute. This warrants further study.

Rural and offshore areas may be much more dependent on air transport to ensure any response at all, particularly during adverse weather conditions such as flooding, where roads are blocked. Extraction of people, as well as transfer of crew and equipment to the scene, may be impossible by responders without specialised equipment; winch capability in particular may be a vital requirement here.

Rescue and Transportation from the Scene

Transportation from the scene comprises two functions:

- Retrieving emergency response teams and their equipment
- Rescuing members of the public.

This includes rescuing hikers from remote locations; sailors, surfers and swimmers from dangerous seas; and injured casualties from locations that are difficult or impossible to access by road so that, where necessary, they can be transferred as quickly as possible to an appropriate hospital, which may be a considerable distance away.

Rescue operations are distinct from other transportation missions in that they are likely to involve travel to areas that are inaccessible by means other than by air. They are also more likely to involve transporting additional personnel – those who have been rescued – on the return leg of the journey; this is particularly relevant when considering offshore rescue and has implications for helicopter size.

There has not been sufficient discussion on the relationship between airborne and seaborne rescue assets in offshore rescue operations to assess the feasibility of some current offshore rescue functions being taken up by the Royal National Lifeboat Institute. This warrants further study

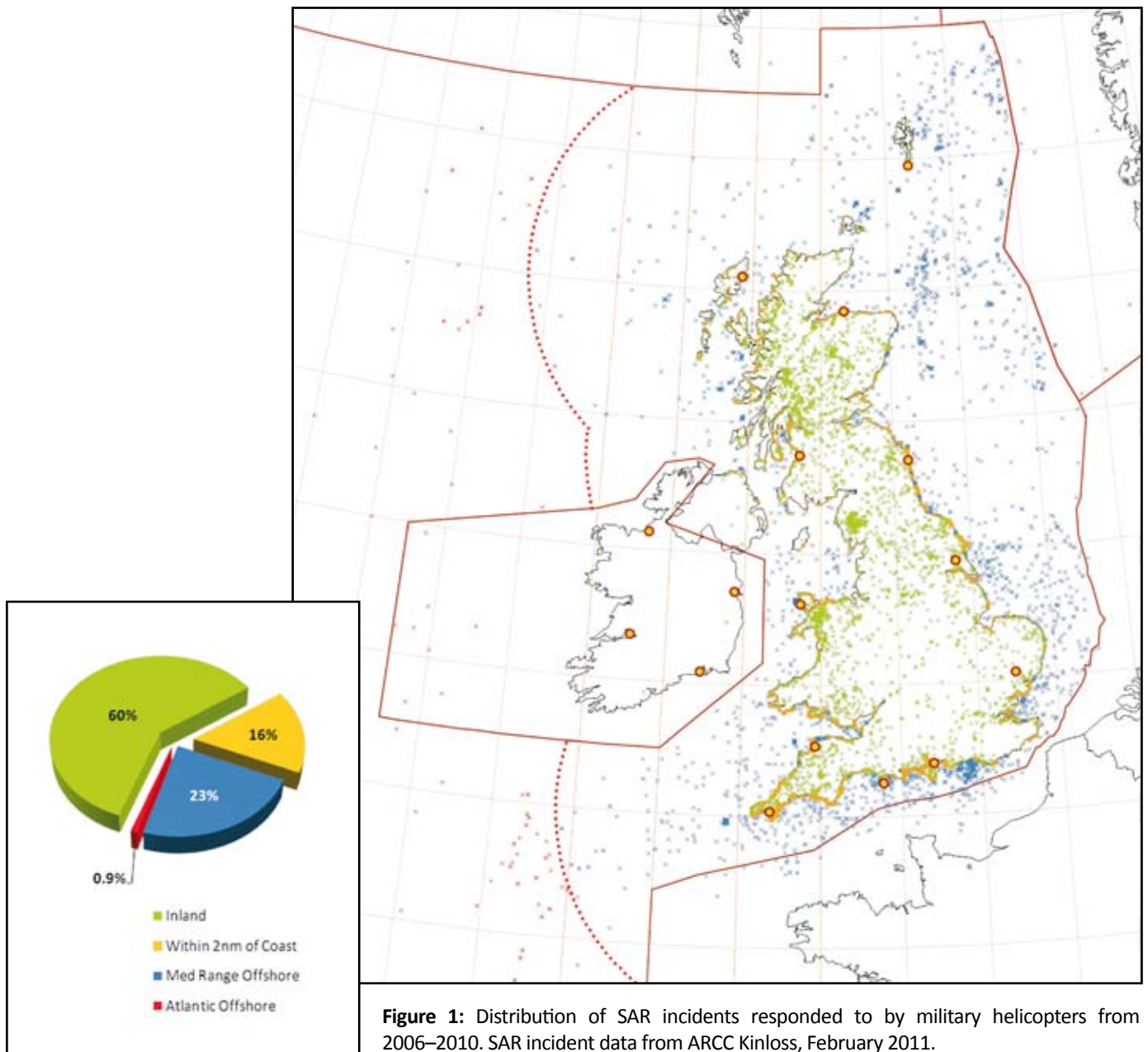


Figure 1 illustrates the typical distribution of SAR incidents and highlights the fact that the majority (76 per cent) occur either overland or within two miles of the coast. The underlying data also shows that the majority of incidents involve only one or two casualties, which is easily within the capabilities of a small-to-medium-sized helicopter.

Factors such as this are important when considering the future of search and rescue operations, as

the current military SAR capability is provided by large Sea King helicopters. Replacing the Sea King helicopters with small-to-medium-sized alternatives would retain more than 99 per cent of current SAR capability at a significantly reduced cost. The remaining <1 per cent could potentially be contracted to the Republic of Ireland's SAR helicopters (bases indicated on the map above) for the area to the west of the UK and to the Scandinavian countries, or North Sea oil platform operators, for the area to the northeast.

Both offshore and rural rescue missions may be dependent on a helicopter which has a winch capability; this requires a helicopter large enough to enable winching operations and also to carry a specially-trained crew. A helicopter which has a winch capability will probably be able to perform all other transport roles discussed above, but an identified requirement for a winch capability would drive many of the technical and crew requirements. Therefore whether or not a winch capability is required may need to be a primary consideration of helicopter and crew configuration.

Responsibility for Search and Rescue

Search and rescue operations consist of a monitoring and observation phase, during which the missing person(s) is located, and a transportation phase in which the person(s), once found, is extracted and transported to safety.

Primacy for search and rescue lies with three different agencies. The MCA has primacy for offshore rescue, the fire and rescue services have primacy over fire sites and inland waterways and the police have primacy for all other search operations over land (such as for missing people in remote rural areas, as well as during criminal operations). The general call-out path for a missing person inland is for the call to be made initially to either the local mountain rescue organisation, which refers the call on to the police where necessary, or to the police directly. The police are responsible for passing requests for helicopter assistance on to the Aeronautical Rescue Coordination Centre at Kinloss for tasking to a SAR helicopter.

1.2 Use of Air Assets for Observation and Monitoring

The second major use of air assets by public sector bodies is aerial observation. This includes SAR helicopters searching for missing hikers and surfers; police tracking criminals attempting to evade capture; monitoring crowds involved in protests or major events; gaining situational

awareness of incidents covering wide areas, such as major flooding or large fires; and monitoring the movement of people and/or vehicles during a mass evacuation. Aerial observation has a number of components, each of which is considered to be equally important:

- Live monitoring – including by the pilot and crew to inform their mission, and the feeding back of live images to incident commanders and control rooms
- Recording of video footage for later review
- Recording of stills images for later review.

There are distinct differences between monitoring and observation for police operations (in particular for criminal and counter-terrorism investigations) and for search and rescue operations that need to be considered carefully. These include the need for high-resolution imaging equipment to provide imagery that may be further analysed for additional evidence at a later date; thermal imaging capability which is important to determining heat sources in burning buildings; and night vision capabilities. The use of the latter, in particular, requires specific and extensive training that can add a significant training burden to the operator, both in terms of initial training and of providing training opportunities to keep skills current, if the capability is rarely used in practice.

Throughout the research, many examples were given of good existing joint working practices across organisations: for example, in a number of regions, police helicopters take aerial images of large fires and feed them back to fire service Incident Command Units (ICUs) – essentially mobile command posts – where the police then share ‘office space’ with the fire and rescue service to analyse the images in order to create a common operating picture that informs both the firefighting and public safety aspects of the operation.

Through the NPIA’s DataLink project, the police are already progressing ways to enable data recorded by police helicopters to be fed directly to other organisations and ensuring that download technology is compatible. The respondents

interviewed described the advantage of this being that one helicopter could record the data, while five or more organisations received, analysed and acted on it, a situation they described as 'true interoperability'.

1.3 Conclusions

An examination of the current situation across UK blue light helicopter services shows that while all operators make an important contribution towards the overall resilience of the UK and its emergency services infrastructure, they largely operate within individual stovepipes, each working to a different government department and agency. The fragmented nature of these services means that:

- There is little co-ordination of air assets either nationally, regionally or across agencies
- A lack of any universal taxonomy means there are no agreed definitions for 'search',

'rescue' and other missions and roles

- There is considerable overlap across the blue light sector regarding the kind of missions helicopters conduct and the type of helicopters operated
- Detailed quantitative research in this area is hampered, as cross-stovepipe reviews are difficult
- There are clear advantages in co-ordinating operations and procuring technology across different organisations to enable shared capabilities.

The sections above outline the general types of missions flown by blue light air assets. The following chapter will consider whether it is possible for a single air asset to carry out missions on behalf of more than one organisation, or for the air assets of one organisation to transport the personnel and equipment of another.



Police helicopter usage is due to be harmonised under the Police National Air Service.
Courtesy of ACPO/Metropolitan Police Service.

2. Determining Mission Requirements

The previous chapter set out how the emergency services in the UK currently use air assets; this chapter will consider to what extent it is possible for different organisations to work together more closely and whether increased joint working is likely to offer the most efficient and cost-effective use of such assets.

Understanding efficiency and cost-effectiveness for helicopter operations is dependent on fully understanding mission requirements. This is necessary in order to decide first of all whether an air asset is the most appropriate response and secondly, if so, exactly what type of air asset – in terms of the technical specification of the aircraft and its fittings, and also its crew – is needed. This needs to be considered both within and across organisations but is difficult to achieve in the current fragmented landscape.

End-users need first to set out what effect is required and then consider whether, and how, this can best be achieved using air assets. In this regard it would be pertinent to adopt the approach taken by Essex Fire and Rescue Service outlined in their recent Helicopter Feasibility Study:

Identify exactly what operational role the helicopter may be required for, then assess whether an aircraft [is] available that [can] meet the performance standards criteria. The requirement [is] to ensure that a helicopter fit[s] the role requirements; and not that the role requirements [are] fitted around a helicopter ... It is important ... to determine what our operational requirements are before we identify a suitable aircraft. If we select the aircraft first, we are at risk of making our operational requirements match the aircraft performance and capabilities rather than finding an aircraft that has the capability and necessary performance to meet pre-determined criteria.

Mission requirements need to be assessed first, to determine what role helicopters and other air assets

have in realising these requirements. Only then should we look at how the capabilities to meet these requirements might best be procured.

Several responders to the research felt that a major challenge with the troubled SAR-H project,¹¹ which sought to harmonise UK Search and Rescue helicopter capability, was that while it had sought to harmonise procurement for helicopter search and rescue operations as they were then being carried out, the project had not sought to review helicopter operations more generally – largely because there had been neither mandate nor funding available for this. It had not assessed if such operations were being carried out effectively, by the most appropriate type of helicopter nor whether some current helicopter taskings might be better carried out by other vehicles, such as lifeboats for offshore rescue or 4x4s in remote rural areas. In addition, it had considered search and rescue operations only and had not considered the many other types of operations in which air assets are utilised to assess the feasibility of joining up with, for example, police or air ambulance operations. Subsequent discussions on the future of search and rescue should encompass a broader remit.

Despite the difficulties in determining these requirements jointly, the majority of the respondents to the research felt that there are few insurmountable challenges to sharing air assets across organisations and regions and that there is much greater scope for joint working (and therefore for operational and financial efficiency) than is currently being exploited.

Once mission requirements are fully understood (and a better way of ensuring they are understood is seen to be the most pressing need), key enabling factors can be addressed, such as:

- What types of helicopter are most appropriate?
- What equipment needs to be permanently fitted into the helicopter, and what can be loaded on according to the needs of the specific mission?

- How would joint assets be funded, both in terms of procurement and usage?
- How would assets be deployed?
- How would mission priority be determined?
- What would the governance structures look like?

The Need for a Common Language

Part of the challenge, and an area that would benefit from being addressed early on, is the lack of a universal lexicon and taxonomy for helicopter operations. There are no agreed definitions for 'search', 'rescue' and other mission statements, for example, which makes it difficult to analyse helicopter usage across different organisations and consequently difficult to assess where join-ups may be achieved. Organisations each keep detailed operational logs of their own activities but there is no consistency to the way this information is recorded and kept. Organisations do not necessarily analyse this information internally, let alone collectively, and it does not exist in a form that can be easily analysed by external assessors or researchers. Without a shared language, it will always be difficult to define an 'effects-based' outcome.

Such a common language would need to be adopted by at least the CAA, MAA, NPAS, AAA, ACPO, CFA, DH, MCA and MoD. It was thought that joint dispatch centres, as well as shared air assets in general, would help to drive forward common language for helicopter operations.

2.1 Interoperability and Shared Resources

Only when mission requirements are fully understood across all organisations will it be possible to determine effectively where such assets could be shared. Further to this, there are two separate issues to consider within the term 'sharing':

1. Does the 'sharing' relate to a jointly-owned pool of assets from which individual organisations can borrow in order to fulfil each organisation's own needs, but where the mission and tasking of each air asset remains distinct (for example, a base where 'fire', 'police' and 'ambulance' helicopters are located and maintained)?

2. Does the 'sharing' relate to a single asset that undertakes one mission on behalf of more than one end-user? For example, during a fire in a large block of residential flats, the fire and rescue service may use quick aerial observation to determine where the fire is most severe, the NHS may need to quickly deliver a specialist burns doctor to the scene, and the police may need to have a good understanding of the local area to plan the evacuation of buildings at risk.

These questions may have very different answers, as in the first case it may be possible to retain very specialised assets within a larger fleet of more generalised aircraft whereas, in the second example, each individual asset may have to serve the needs of many end-user organisations.

Configuration of Helicopters and Equipment

Properly undertaken, a move towards joint and shared air assets is likely to bring with it a drive towards development or configuration of air assets that is acceptable to all user organisations, and will also drive the development of more efficient and interoperable equipment. As an example, it was felt that should aerial observation and monitoring missions be undertaken by a neutral shared air asset, the likelihood is that the asset would be configured to the highest standards needed by all, with capabilities including the high-resolution capability needed by the police for evidence gathering, the heat-sensitive monitoring equipment required by the fire service and night-vision capability that would enable the helicopter to fly during darkness hours. Respondents from the fire and rescue service also gave examples of international USAR teams which have developed down-sized and lighter heavy-duty cutting equipment, with no detriment to operational effectiveness, for easy transportation by an air asset.

It is essential here that sufficient discussion takes place to ensure that all organisations fully understand the way in which their counterparts operate. Early on in the research, some concerns were raised that the size of the observation



Air ambulances such as London's Air Ambulance have different requirements from those operating in rural areas, which needs to be better understood.

Courtesy of Flickr/Nicobobinus.

equipment required by the police for missions with a crime or counter-terrorism element, to record information at a quality that could later be used for evidence, is prohibitively large to mount in a shared helicopter asset, as it would overwhelm the available cabin space. This concern proved to be unfounded: while such equipment has been large and bulky in the past, it has reduced in size considerably in recent years (the analogy of a desktop PC and 'tower'-style hard drive ten years ago as opposed to a laptop computer or even iPhone today was used) but the respondents who raised the issue were unaware of this. The challenges perceived may be more due to misconceptions than reality and increased opportunities for joint discussions and planning will help to dispel such misconceptions.

Joint Control Rooms

It is not only the sharing or joining up of air assets themselves that needs to be considered but also the infrastructure that supports them: in particular, joining-up the control rooms that co-ordinate air asset tasking and dispatch, across both regions

and organisations. The Aeronautical Rescue Co-ordination Centre (ARCC) at RAF Kinloss currently provides a single point of contact for all SAR call-outs; requests for air support are received by specialist staff who can make informed decisions on whether or not sending an air asset is the most appropriate response. There is support for possibly applying this approach more broadly, to cover all blue light helicopter operations. This was felt to be particularly essential in order to determine primacy when there are competing demands on shared helicopter assets, or when an asset may need to be re-deployed while on another mission. This would not prevent local dispatch to forces close to the aircraft base but it would ensure the best use and greater resilience on a fleet-wide basis, particularly during large-scale emergencies.

Which government department or organisation should fund and operate a joint control centre is, however, considered to be a challenge as, currently, no single responsible owner exists; this will be addressed later in the report.

Shared Operations in Northern Ireland

In Northern Ireland during the Troubles, all helicopter assets were owned and operated by the UK MoD in direct support of the Royal Ulster Constabulary and the civil authority. Tasked through a single air tasking cell, a helicopter would switch from a life-saving mission to a police task while in the air, dependent on need. It could leave one scene as a police helicopter and arrive at another to provide primarily medical assistance at a road traffic accident, for example. Lessons from past experience such as this is where true multi-agency planning can start, enabling operators to ask (and answer) questions such as whether a single air asset can serve the same function for more than one organisation simultaneously – for instance, can it provide aerial observation of a fire or flood that serves the needs of the police and fire service – as well as whether shared assets cover all capabilities required.

2.2 Location of Air Assets

Location of air assets is important both nationally, to ensure the most efficient and logical spread, and also within each region.

With regard to search and rescue, respondents felt that the current SAR bases are reasonably well sited, though their locations were originally determined by existing military bases rather than any strategic plan; four additional MCA sites (whose positioning was agreed between the MoD and DfT) contribute to a currently effective national coastline coverage for offshore SAR. This may, however, be adversely affected by the planned closure of some of the military bases currently used. By contrast, there has been no national or strategic approach to the development and basing of individual police Air Support Units or other air assets, though the National Police Air Service (NPAS) plans to rationalise this. Air ambulances have similarly been established under wholly local initiatives and, as a result, some major cities including Liverpool and Hull have poor or no coverage. A more joined-up approach is needed to ensure that assets are strategically placed across the UK according to need.

There are two separate issues when considering the location of assets; one is joint-agency working at a local level (between local police, fire and rescue service, air ambulance and so on); the other is the joining-up of regional forces of the same organisation at national level (between Devon and Cornwall, Western Counties and South Wales, for example). Work is currently being undertaken to rationalise the use of helicopter assets within a single region between organisations (for example, the sharing of air assets between one county's police and air ambulance services) or across different regions of the same organisation (for example, between Cumbria, Cheshire, Merseyside, Lancashire and North Wales police forces), but it is not yet happening across both different organisations and different regions simultaneously.

Better strategic oversight could reduce the number of police and SAR bases from the current footprint of more than forty separate bases, of which only twelve are SAR, to around thirty combined bases. This would allow significant and obvious savings as well as the opportunity to improve the capability provided to the local communities by having multi-role platforms at the majority of the newly-designated bases. In short, while the total number of bases would be reduced, the number of SAR-capable bases would increase, as would resilience in general, as system and mission redundancy would arise from multiple platforms at multiple bases.

It is worth noting that few blue light helicopters are co-located with the organisation's other assets. Lincolnshire and Nottingham Air Ambulance, for example, operates out of RAF Waddington, while Essex FRS's Helicopter Feasibility Study rejected Essex FRS HQ at Kelvedon as a viable operating base and instead proposed siting assets at the Metropolitan Police Air Support Unit base at Lippitts Hill in Loughton. Several air ambulances already co-locate with other agencies' air assets: Devon Air Ambulance shares maintenance and pilots with police in Exeter, for example, while Great Western Air Ambulance and West Counties Air Support Unit are both located at Filton (though they function independently of one another); Filton was also used as a base for fire service air assets during the recent trial by Avon Fire and Rescue Service.

Current Challenges

During the project workshops, and throughout the additional interviews and discussions that took place, there was some inevitable disagreement between respondents over how capable other organisations' helicopters are of multi-tasking, which illustrates the need for better engagement of all end-user organisations.

For example, police respondents saw no reason why Police Air Support Units and SAR helicopters with stretcher-fit modification could not be used by air ambulance services, while some air ambulance responders considered air ambulances to need much more specialised equipment and staff, and higher levels of hygiene than is likely in shared assets. There was concern that an air ambulance should not be seen as 'simply representing a stretcher on a cabin floor'; and that the value of highly specialised air ambulances and crew should not be overlooked. This view was not universal, however: other air ambulance responders, and responders from other areas of the healthcare sector, felt that more asset sharing was possible.

The swift transfer of medical staff to an incident scene to treat and stabilise a patient was considered by many (though not all) respondents to be far more important than the removal of the casualty from the scene by air ambulance.

There are important differences between planned operations and emergency (unplanned) operations which need to be considered further. An air ambulance involved in patient transfer may have very different mission requirements, and therefore require very different technical and crew specifications, from one that mainly attends road traffic accidents and other emergencies. The interplay between such requirements affects the ability of the organisation to integrate more widely and determines its internal requirements.

The level of disagreement encountered during the above discussions highlights the need for more joint-agency and national discussion of HEMS operations in the UK.



Mountain and cliff climbers regularly call on helicopter rescue when they get into difficulty.

Courtesy of AgustaWestland.

Planning Ahead Together: Training and Recruitment of Emergency Service Pilots

Joint planning and discussion is not only necessary to ensure harmonisation of existing air assets but also to enable appropriate forward planning and to predict where a change to one organisation's procedures may have a significant effect on another's. For example, police respondents raised serious concerns relating to the future recruitment and training of police helicopter pilots. At present, police forces recruit a significant number of their helicopter pilots (estimated at 80–95 per cent) from military backgrounds. These pilots therefore join the police virtually fully trained.

Currently, the size of the military is decreasing, and the number of fully-trained helicopter pilots leaving the military each year is shrinking accordingly. There are concerns within the police that this needs to be acknowledged now so that potential problems can be mitigated: the financial burden of training police pilots from scratch in the future is likely to be significant, particularly as there is currently no mechanism in place to do this. It would be better to determine how this will be addressed sooner rather than later, ideally by exploring arrangements for civilian pilots to train alongside military trainees on a joint 'public services' training programme run through existing military flying schools. Such an arrangement could enable military flying schools to remain viable in the face of shrinking numbers of military students.

2.3 Conclusions

The majority of helicopter operators believe there is more scope for joint working than is happening at present and see distinct advantages in working together more closely. There are a number of examples of good existing joint working practices in the UK and overseas that can be used as case studies and models for better asset sharing in the future. What is missing in the UK at present is the mechanism by which joining up the existing assets may be taken

forward. Suggestions for how this might progress, and current challenges that need to be overcome, are discussed in the following chapter.

Most respondents considered the ideal solution to shared assets to be a multi-roled helicopter that can change from one mission or tasking to another without needing to return to base to be re-roled. The difficulties lie in how, considering the fragmented ownership and governance of the emergency services, it will be possible to move towards a more joined-up and coherent framework that will allow such asset sharing to take place. Nonetheless, the research has suggested the following:

- The SAR-H project that concluded in February 2011 was too constrained as there was no mandate to examine or review helicopter operations beyond existing search and rescue arrangements, or to explore where savings might be made by, for instance, replacing some helicopter search and rescue capability with other assets, such as 4x4s in rural areas, or lifeboats in coastal regions
- Challenges to the wider pooling of blue light assets do not seem to be generally insurmountable – the key is a full understanding of mission requirements
- A shared lexicon and taxonomy is required across all user organisations and government departments. This will enable shared mission requirements to be identified properly
- Greater dialogue between the different helicopter blue light services will facilitate decision-making regarding the sharing of assets as it will improve knowledge of each other's operational and technical requirements
- Joint or central control rooms would contribute to better resilience, particularly during large-scale emergencies
- The rationalisation of bases across the blue light helicopter services need not result in a reduction in capability; indeed, the multi-rolling and pooling of aircraft inherent in an integrated SAR and police basing strategy could improve both capability and resilience.

3. Options for Change

Without joint discussion, planning and doctrine around air operations, moving forward to more efficient and cost-effective models is difficult. In particular, there is a tendency to assume that each organisation currently using a helicopter wants that asset to be more specialised to its own operational needs than may actually be the case, due to the misunderstanding of others' requirements and the new technologies available, as previously discussed.

It is acknowledged that in joining up operations and sharing assets, some compromises may need to be made. A multi-purpose helicopter may need to be larger than a single-agency one, due to the additional equipment it may need to carry, for example. Such a helicopter may prove more expensive to procure and more expensive to fly per mission, but this might be offset by such aircraft being more capable of multi-tasking and sharing with others, so that money is saved within the wider pool overall and there is improved cost-effectiveness due to the increased utilisation rate of a rationalised fleet.

Respondents raised concerns that multi-tasking (as well as potential multi-skilling of crew) could lead to a 'Jack of all trades but master of none' situation; an example given was of one helicopter responding to a road traffic accident, carrying crew with appropriate skills and equipment to cut someone out of the wreckage as well as to stabilise their injuries; such a crew may not be as highly skilled as dedicated air ambulance paramedics. This does not mean that multi-tasked helicopters and crew should not be considered, but that such join-ups need to be carefully thought out, especially in terms of multi-tasked helicopters needing to carry more equipment or personnel to meet all the mission requirements.

Nonetheless, the study has highlighted a widespread view within the industry, supported by analysis of SAR data over the last five years, that there is much greater opportunity to share aircraft across the police and SAR requirements than has generally been considered. Modern aircraft performance and cabin design, coupled with a new generation of lighter mission equipment,

now enable cost-effective, multi-role blue light capability, disabusing the previous notion that SAR requires a large helicopter. For example, in some emergency scenarios, particularly major floods, a larger number of smaller aircraft able to winch simultaneously may well be more effective than fewer, larger aircraft.

Air Assets: Risk and Resilience

The resilience that air assets can bring is well recognised, as well as the additional resilience that would be gained from sharing assets, particularly during times of stress, such as staff absenteeism due to pandemic flu or industrial action. However, it is also acknowledged that organisations do already have robust internal plans for dealing with such contingencies. For example, within the South Western Ambulance NHS Trust (SWAST) the assets of three air ambulance charities are factored into efforts dealing with contingencies including pandemic flu.

Sharing helicopter assets and the understanding of one another's operations that would come from closer working was thought likely to benefit joint emergency planning more widely.

It was, however, also remarked that air assets should never be the only available solution to a challenge, as their resilience is, in general, weaker than that of other assets. Helicopters are more prone to being grounded due to poor weather conditions than road assets, and they also require more servicing and essential maintenance and repair, though this can be addressed by ensuring that a mission requirement for twenty-four-hour coverage provides just that. Consolidating assets into widely dispersed centres that can only reach the incident site in sufficient time by air was seen to be a particularly dangerous approach that should be taken with caution, if at all. The impact of weather on the likely success of missions was particularly noted by the Avon FRS Helicopter support trials.

Emergency Response and Civil Defence: Helicopter Usage Worldwide

Different countries around the world approach the ownership, management and operation of emergency services helicopters and of state aircraft more widely in different ways, but there are a number of examples that could be used as good case studies or models for the UK, for example:

US National Helicopter Service

When Hurricane Katrina hit New Orleans in 2005, ninety helicopters in total, including publicly- and privately-owned aircraft, took part in a successful but unco-ordinated rescue. As a result of the lessons learned and the recognised value of the helicopter contribution, a US National Helicopter Rescue Service has been set up under the command of the US National Guard. In the short time since the service has been in operation, the US has decided to double the size of the initial fleet to 640 helicopters. The service is tasked with transport of personnel and equipment; the rescue of trapped persons; landing in areas that are inaccessible by land or sea; winch rescues (including of casualties); and supporting the command and control of major incidents and natural disasters. Across Europe, countries including France, Germany, Italy, the Ukraine and Switzerland operate publicly-owned civil defence and rescue helicopters. These services do not need to be a burden on taxpayers and the public purse: Switzerland's REGA air rescue service, for example, is a non-profit organisation financed through private donations and patronage, and income from insurance services.

3.1 Funding

Air capability does not come cheap: air ambulance services spend approximately £50–60 million annually with helicopter service providers, and the recent Helicopter Feasibility Study undertaken by Essex Fire and Rescue Service estimates that each fire and rescue service helicopter would cost £1.2–1.4million annually. NPAS estimates a similar

spend of around £60 million per year across all police forces.

Currently, the fragmented procurement process results in a high unit cost that is likely to be considerably reduced by a more co-ordinated approach. In addition, the lack of ability to plan collectively and nationally results in procurement decisions being made by individuals who may have little experience of helicopter operations and who, consequently, may not have a good understanding of how such assets can be used most appropriately and efficiently.

In general, the main financial savings and benefits provided by air operations are considered to be the ability to cover a wider area with fewer assets and to respond more quickly. This can enable resources, and in particular specialist resources, to be consolidated into more regional centres, reducing the need for each region to have rarely used assets on permanent standby. For example, the fire and rescue service may be able to deploy a single Urban Search and Rescue team across a wider area of the country, or the police a single specialist firearms team. Such a situation is also likely to be of benefit to the specialist team in that it would result in each one gaining more regular experience of real operations and therefore drive up expertise, as well as reducing unnecessary redundancy.

It is important to remember, however, that not all UK emergency services helicopter operations are funded by public money. Air ambulances are charities and there was some feeling among respondents that SAR operations could potentially move towards a funding model similar either to this¹² or to that of the Royal National Lifeboat Institute. As has been mentioned previously, Switzerland's REGA air rescue service is a non-profit organisation financed through private donations and patronage, and income from insurance services.

The relationship between public and independent funding is highly complex, as the Association of Air Ambulances pointed out in its 2008 report, 'Framework for a High Performing Air Ambulance Service':

Public perception of what government should provide changes over time, as do relative levels of provision by the charitable and public sectors ... More recently, whilst retaining responsibility for the provision (or funding) of services, public authorities have contracted out delivery of some services to private or voluntary sector organisations.

Savings from Co-ordinated Procurement

A major advantage that it is assumed will come from a more co-ordinated and joint approach to air assets is a national procurement programme that will enable a centralised approach to procurement. The assumption is that this will make procurement more streamlined, provide better unit costs and enable the unit price of air assets to be driven down; the time spent by each regional force and different end-user organisation to procure its own assets will also be reduced.

In general, the main financial savings and benefits provided by air operations are considered to be the ability to cover a wider area with fewer assets and to respond more quickly

Military respondents were, however, quick to point out that while this is often the perception, it is not necessarily the reality. The large procurement contracts the MoD undertakes are often highly bureaucratic with huge overheads and management costs and the procurement often takes longer, preventing agility and flexibility as mission requirements and technology progress. Funding models should not assume that centralised procurement automatically saves money and need to consider the above points extremely carefully.

Any discussions on the short- and long-term joining up of air assets need to consider not only how such operations should be funded now, but also how they will be funded into the future.

'New Dimension' as a Funding Model

The fire service New Dimension programme is highly relevant to these discussions and acts as a potential funding model. The New Dimension programme has seen specialist fire service assets including, for example, high volume pumps used in flood response, Urban Search and Rescue capabilities and Mass Decontamination Units for Chemical, Biological, Radiological and Nuclear (CBRN) response – to be co-ordinated and deployed nationally.

The assets are owned and held by individual forces where actual requirement is sufficiently high, and deployed to regions that require them less frequently on a by-need basis, co-ordinated nationally, through a single control room, under robust mutual aid agreements. This has enabled, for example, Urban Search and Rescue capabilities to be held by approximately one in three fire and rescue services only.

The area each team is able to cover is partly determined by speed of deployment, and greater use of air assets could reduce the number of teams required even further.

There are distinct parallels between the New Dimension programme and the way in which the greater use of air assets might enable similar consolidations within other services. Within the police, for example, specialist firearms teams, CBRN expert responders and hostage negotiators could be similarly consolidated if they could be transported around the country sufficiently quickly when needed.

There are further opportunities to share bases, ground and maintenance crew, as well as pilots across organisations, while enabling specialist staff and equipment to be transported by the air asset to the incident scene. The ambulance service's Hazardous Area Response Teams already work and train very closely with the fire service, and are already identifying joint assets and better ways to co-operate. They too would benefit from wider deployment by helicopter.

Charitable Funding

Not all air assets used by the emergency services in the UK are publicly-funded. The air ambulance services¹³ in England and Wales that are members of the Association of Air Ambulances, for example, are funded through seventeen separate charities, of which the majority are independent, with others being NHS Corporate Trustees or independent charities with NHS representation on their boards. These air ambulance services are managed either by the charity in collaboration with the NHS, or by the NHS itself. It could be argued that air ambulance services do not have the same responsibility to the public purse as services funded by taxpayers' money do, and they are certainly not subject to the cuts instigated by the 2010 Comprehensive Spending Review and the Strategic Defence and Security Review. However, they nonetheless have to display efficient use of their funds in order to satisfy the Charities Commission and may well find donations harder to come by in the current financial climate.

The distinct difference between this and virtually any other area of blue light operations provides a useful and valuable case study and suggests a number of potential financial models that might be adopted more widely. It is already the case, for example, that many air ambulances operate on a model of one organisation owning and/or managing the helicopter assets, including the pilots, and another (generally the NHS) employing and managing the medical staff. In some regions, the air ambulance service has no helicopter assets of its own; Wiltshire Air Ambulance, which currently operates by

transporting medical staff to incidents in police helicopters, was consistently raised by both police and air ambulance responders as a good example of joint working. The fact that the arrangement has enabled the air ambulance to become established in the region and to reach the stage where it is able to procure and operate its own helicopter (due to come into service in 2014) is considered to be a success, even though the new arrangement will result in the service working less closely with Wiltshire Police.

The charitable status of air ambulances certainly raises questions over whether other helicopter operations currently funded from the public purse – in particular SAR operations – could potentially move to a more charitable model. This would be the opposite of the approach suggested by the Coroner's Report into the 7 July London bombings, which asked whether air ambulances should receive more public funding, but may be more realistic in the current financial climate. A further option would be for some, if not all, of the current SAR capability provided by the military to move to a role for the Reserves, possibly linked to a sponsored Reserves programme supported by civilian helicopter operators or the police, or to move to other charitable organisations such as the RNLI for offshore rescue, or cave and mountain rescue groups for rural search and rescue. There is no reason why, where these groups do not currently operate air assets, they could not move to doing so in the future should the operations prove to be impossible with their current assets alone.

3.2 Governance and Ownership of Shared Air Assets

The majority of respondents felt that some kind of single agency for air assets, co-ordinated and managed at central government-level, would help to drive harmonisation and improve joint working. Several respondents favoured the idea of a centralised national pool, from which assets would be drawn according to mission-by-mission requirements. The advantages this would bring

included more efficient procurement, better understanding of mission requirements across all services, potential for the harmonisation of training, regulation, standards and other issues many of which are discussed below. It was also thought likely to encourage each mission to utilise the most appropriate assets (such as a smaller helicopter where possible) and to request assets only when really needed.



Night flying requires specialist equipment and specially trained crew, which not all organisations currently possess.

Courtesy of ACPO.

The single agency was described as a 'Government Flying Service', 'National Air Fleet', 'National Air Service' and equivalents; there was general consensus that it should cover air assets in general, not just helicopters, and be multi-agency, across not only the blue light services but also more broadly to cover all public sector helicopter use.

Determining which government department should be responsible for any national air service-type shared fleet (or lead any proposed review of air operations across all government agencies) is challenging, however. As has been discussed, there are many different reasons for public sector use of air assets, not all of which are emergency response activities. Helicopters are used for offshore and inland search and rescue; medical emergency response; police observation for public safety and public order; counter-terrorism and criminal investigations; VIP or prisoner transfer; and offshore observation operations, including anti-pollution monitoring and fisheries violations, to name just a few.

Research respondents who favoured the idea of a single National Air Service felt that it should ideally cover more than just SAR, HEMS and police operations and include all the other tasks outlined above. It was considered that the most logical place for such a service to sit is within the Cabinet Office (due to the cross-departmental remit), with the Department for Transport suggested as a viable alternative. The lead agency could hold and administer helicopter assets and then hire them out on a need-to-use basis; this is the model already in use, and which works successfully, in Hong Kong and the US. It is also the model being proposed by AirFire, an initiative in Wales providing helicopter assets primarily to the fire and rescue services, and to other public service bodies including the police and MCA.

A potential additional benefit of governance under a single government department would be a national database of all public sector air assets, regardless of which agency owns them; at present, no such database exists.

Joint Helicopter Command

One possible model for a joint pool of emergency services air assets might be the MoD's Joint Helicopter Command (JHC). JHC was formed after a recommendation in the 1998 Strategic Defence Review and brings together the majority of the UK's military helicopters, although exceptions include the Royal Navy's fleet helicopters, and the Royal Navy and Royal Air Force's search and rescue helicopters. The JHC operates more than 250 aircraft, including the Sea King and Lynx helicopters of the Royal Navy's Commando Helicopter Force; the Chinook, Puma and Merlin helicopters of the Royal Air Force; and the Apache, Lynx, Gazelle and Bell 212 helicopters and the Islander/Defender fixed wing aircraft of the Army Air Corps (AAC). It also has operational command of 16 Air Assault Brigade, which comprises four infantry battalions in the air assault and parachute infantry roles, plus supporting elements.

The principal role of the JHC is to integrate the helicopter platforms, pilots and support personnel from the three services and to provide a joint service into theatre. Personnel continue to be recruited and receive initial training from their individual services and remain within them for the duration of their service. The JHC provides advanced training, exercises and pre-deployment training for the MoD. It also provides the complete UK helicopter capability for expeditionary operations and is, for example, responsible for the UK's Joint Helicopter Force in Helmand Province.

Overall, the JHC employs over 15,000 personnel, some 8,000 of whom are in 16 Air Assault Brigade. This figure includes more than 900 volunteer reserves from the Territorial Army and Royal Auxiliary Air Force, and 380 MoD civilian staff. It is staffed, from lowest rank to director, by personnel from all three services and the role of the director rotates between the three services.

3.3 The Way Forward

An interim report paper, which detailed many of the discussions and considerations set out in the previous chapters of this report, was disseminated widely in September 2011, ahead of the final project workshop held in London on 21 September. This enabled discussion at the workshop to focus on how the sharing of assets and development of joint assets suggested in the previous sections may be taken forward. A list of organisations participating in that workshop, and those who were unable to attend but sent in written responses, can be found in Annex B.

In general, there would appear to be no strong reason why a 'National Air Service' which shares assets between all public sector end-users could not be achieved in the UK. Research participants suggested several examples of such initiatives that already operate across the world, and were generally positive about the benefits of such an approach. Examples included Airlift North West, based in Seattle in the US and the Hong Kong Government Flying Service. The latter provides air assets for search and rescue, VIP transport, air ambulance activities, firefighting capabilities for forest and bush fire suppression, coastguard operations, police operations and aerial surveys for the Survey and Mapping Office of the Lands Department, the national equivalent of the Ordnance Survey. Both examples would warrant further study as models for a UK equivalent.

Configuration of a Shared Fleet

Opinion was largely consistent that a shared fleet should include a range of helicopters, and not be served exclusively by one type of aircraft, although there are obvious reasons why restricting the number of different aircraft types is more cost-effective. Whilst resilience against the possibility of a single fleet being grounded due to a technical issue or following an accident is an important consideration, a balanced fleet spread across a rationalised number of bases, some with more than one aircraft type, would enable a flexible response to emergency blue light tasking in the round. The combination of SAR, police and fire and rescue service bases, while fewer than the total number

today, is likely to increase the overall multi-mission footprint and lead, for example, to more SAR bases than the twelve that currently operate.

The exact composition of a National Air Service, however, in terms of the ratio of large, medium and small helicopters, and the ratio of helicopters to other air assets such as fixed wing and unmanned aerial vehicles (UAVs), is an area that warrants further research; other questions to ask would include how many (if any) highly specialised air assets are needed in relation to how many more generalised ones; what crew are needed; where assets should be located and how they should be maintained and funded. Highly specialised air assets would include such considerations as highly-technically configured air ambulances used to transport (and transfer) casualties with complex medical needs, and large aircraft required only very occasionally for long-range off-shore rescue, currently undertaken by Royal Navy and RAF Sea King helicopters.

Pace of Change

The pace of change is also an important consideration, particularly in the current financial climate: large changes which require a considerable initial outlay are unlikely to gain traction, regardless of the long-term savings they may be able to demonstrate. Across the current fleet of police helicopter units there are many different contractual models which will take time to work through before full harmonisation is complete. However, there is the opportunity now to influence the shape and structure of the SAR fleet with a combined National Air Service in mind when the new long-term structure takes over from the current MoD-MCA structure in 2016.

Change management will need to be handled carefully and the general feeling at the workshop was that a relatively slow, gradual change based at least partly on existing initiatives would be more likely to succeed than a 'big bang'. In this regard, the idea of a National Air Service should be seen as a suggestion – an idea to work towards – rather than a definite proposal. In the short term, the most pressing issue is to conduct a cross-government

review of the blue light helicopter services with the aim of expressing a long-term harmonised vision to which both the NPAS and SAR work can be directed. This would include a better understanding of what air assets are currently being used, who they are being used by and for what purpose, so that it will be possible to determine where duplication and overlap is occurring and where there is potential for greater harmonisation and therefore greater efficiency.

The Future of Air Asset Usage

A number of ways forward emerged from the final workshop that could form the basis of future discussions. In particular, and generally agreed to be the strongest option by the majority of participants, was using NPAS as a starting point and

gradually expanding this to cover more than just police operations. A first step would be to explore how the potential SAR capability could be shared by NPAS in the medium and longer term, as current contracts move on and fleet changes can be made economically. In addition, further work exploring shared assets with fire and rescue services and other government agencies could be conducted. This is not dissimilar to the proposals currently being made by the AirFire scheme in Wales. Rolling in air ambulance services to such a shared fleet was received less enthusiastically (particularly from the air ambulance services themselves), but as it is already the case that most air ambulance groups contract many of their operational services such as maintenance, ground crew and hanger facilities from an external operator, there is no reason why



The military performs many medical evacuations overseas, usually in multi-purpose helicopters configured for general use.

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this contract should not be with the National Air Service. Some air ambulance services already secure services from their local police forces.

Cross-government Review

In the short term, the most pressing issue is to conduct a cross-government review of the blue light helicopter services with the aim of describing and expressing a long-term harmonised vision to which both the NPAS and SAR work can be directed. This would include a better understanding of what air assets are currently being used, who they are being used by and for what purpose, so that it will be possible to determine where duplication and overlap is occurring and where there is potential for greater harmonisation and therefore greater efficiency. In particular, the costs relating to flying time, and the number of hours each service's helicopters currently fly per day, needs to be reviewed.

In the longer term, it was felt that NPAS might eventually expand past police-only operations to the point where it would truly become a National Air Service, by which time its management and governance should also move away from the police and the Home Office to fall under a more neutral government department such as the Cabinet Office or the Department for Transport. At this stage, it might also be feasible to consider the ownership of the assets being contracted out to a private sector organisation and leased back by the government on a pay-per-use basis. The general feeling was, however, that this should only be contemplated once such a service is fully operational and accepted practices are embedded across government.

3.4 Conclusions

Participants in the research process saw distinct benefits to a single National Air Service administered by one central department. Building on the good working relationships that already exist, it is clear that there is a strong case for a cross-government review of the blue light helicopter services with the aim of describing and expressing a long-term, harmonised vision. This review needs to be conducted within a timescale that enables it to influence the shape and structure of the SAR and NPAS projects with a combined National Air Service in mind.

This process is more likely to be evolutionary rather than a 'big bang' approach in recognition of current contractual commitments – particularly within the police air support units. However, a National Air Service could bring the following benefits:

- Single agency for air assets, co-ordinated and managed at central government-level, providing improved governance and harmonised management and direction
- A balanced fleet spread across a rationalised number of bases, some with more than one aircraft type, increasing the overall multi-mission footprint
- Exploitation of modern aircraft performance and cabin design, enabling cost-effective, multi-role blue light capabilities
- Improved cost-effectiveness due to the increased utilisation rate of a rationalised fleet
- Centralised procurement process resulting in reduced unit cost.



Winching is essential for some rescue missions but requires a helicopter large enough to carry the winching equipment and its specialist operator.

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4. Conclusions and Recommendations

Helicopters are now a key component of the UK's emergency services, with a large fleet established in more than sixty bases. An analysis of the operational requirements of the different agencies demonstrates that there is significant overlap in roles and missions. Despite this, the current structure and organisation of blue light helicopters across the UK is fragmented with little co-ordination of air assets – either nationally or across agencies. This suggests that there may be more efficient and operationally effective ways of delivering this capability.

An analysis of the practicalities of establishing a harmonised approach demonstrates that there are many areas where pooling and sharing is both feasible and beneficial across the police and SAR sectors. While there are some challenges, specifically relating to integrating HEMS capabilities, there is a general consensus that even these can be overcome.

Key Recommendation

We recommend that a cross-government review is conducted to examine the potential to develop a harmonised vision for the blue light helicopter services within the UK as a first and critical step to developing a future National Air Service.

Supporting Recommendation 1

There needs to be a common lexicon and information management system used to record helicopter operations that enables information to be shared and analysed across end-user organisations.

Supporting Recommendation 2

The overlapping of roles and mission requirements identified by this research needs to be better understood and mapped, in order to confirm how assets may be shared and a joined-up blue light helicopter capability might be established.

Supporting Recommendation 3

It is recommended that the cross-government review be completed in time to inform the long-term SAR and NPAS projects in order that

Another potential benefit to be gained from harmonising and joining-up air assets across the many government agencies is the centralisation of assets that are not needed around the clock by every local force into fewer regional centres.

Actioning this, however, will require a strategic vision that is currently lacking due to the fragmentation of the emergency services sector and the lack of a single responsible owner at central government-level.

In the short term, it may therefore be more appropriate to look at driving change through existing initiatives such as the National Police Air Service or the SAR programme, enabling other organisations to 'fold into' this until it develops into a genuinely multi-agency, cross-government National Air Service able to provide the assets and crew required to meet all organisations' operational requirements.

they can align their plans with the National Air Service vision.

Supporting Recommendation 4

Central tasking from a multi-agency control room staffed by specialist operators, either by extending the remit of the ARCC or by introducing regional and national multi-agency dispatch centres, would benefit all blue light helicopter operations.

Supporting Recommendation 5

There needs to be further discussion in both the long-term SAR and NPAS projects, regarding the sharing of assets, roles and missions in the future.

Supporting Recommendation 6

There needs to be a further review of HEMS in the UK, and their essential mission requirements, to overcome the internal politics within this sector and suggest the best way forward. In the short term, it would be extremely difficult to fully integrate air ambulance services with a National Air Service, though some essential medical emergency missions required by the NHS could be incorporated.

Glossary of Terms

AAA	Association of Air Ambulances
ACPO	Association of Chief Police Officers
ARCC	Aeronautical Rescue Co-ordination Centre
CAA	Civil Aviation Authority
CFOA	Chief Fire Officers' Association
CFOA (NR)	Chief Fire Officers' Association National Resilience (formerly NRAT; see below)
DfT	Department for Transport
DH	Department of Health
HEMS	Helicopter Emergency Medical Service
ICAO	International Civil Aviation Organization
HLS	Helicopter Landing Site
LAA	London's Air Ambulance
MAA	Military Aviation Authority
MCA	Maritime and Coastguard Agency
MERIT	Medical Emergency Response Incident Team
MIRG	Maritime Incident Response Group
MoD	Ministry of Defence
NPAS	National Police Air Service
NPIA	National Policing Improvement Agency
NRAT	Fire and Rescue Service National Resilience Assurance Team (now CFOA National Resilience)
RAF	Royal Air Force
SAR	Search and Rescue
SAR-H	Search and Rescue Helicopters project
USAR	Urban Search and Rescue

Notes and References

1. See <www.airliftnw.org/>, accessed 11 November 2011.
2. See <www.gfs.gov.hk/eng/home.htm>, accessed 11 November 2011.
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4. J Cole, 'Interoperability in a Crisis 2: Human Factors and Organisational Processes', *RUSI Occasional Paper* (2010).
5. J Cole and L Marzell, 'Combined Effect: A New Approach to Resilience', Serco (2010).
6. See <www.publications.parliament.uk/pa/cm201012/cmselect/cmtran/1482/148204.htm>, accessed 11 November 2011.
7. See <<http://www.nhs.uk/NHSEngland/AboutNHSservices/Emergencyandurgentcareservices/Pages/Majortraumaservices.aspx>>, accessed 11 November 2011.
8. See <http://www.yorkshireairambulance.org.uk/annualreport/YAA_Report&Accounts.pdf>, accessed 11 November 2011.
9. The trial used non-specialised helicopters carrying four firefighters plus 150 kg–400 kg kit.
10. See <<http://www.icao.int/icao/en/anb/meetings/IALS/proceedings/PAPERS/2-Day.pdf>>, accessed 11 November 2011.
11. The Search and Rescue Helicopter project (SAR-H) had been due to replace the UK's Navy, RAF and MCA helicopters with a unified SAR service operated by the private sector consortium Soteria. It was halted by the coalition government shortly after the general election of 2010. See <http://www.dft.gov.uk/mca/mcga07-home/emergencyresponse/mcga-searchandrescue/mcga-theroleofhmcoasguard/dops_-_sar_helo_harmonisation.htm>, accessed 11 November 2011.
12. It had been hoped that this could be explored further through discussions with the RNLI but unfortunately, due to timing considerations, such discussions have not yet been possible to schedule.
13. The location of air ambulance services is shown on p. 8, 'Framework for a High Performing Air Ambulance Service – Final Report 2008' by the Association of Air Ambulances.

Further Information and References

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Annex 2: Organisations that Participated in the Final Project Workshop

22 Sqn RAF SAR

AgustaWestland

Association of Air Ambulances (AAA)

Avon Fire and Rescue Service

Civil Aviation Authority (CAA)

College of Paramedics

Department of Health (DH)

Department for Transport (DfT)

Dorset and Somerset Air Ambulance

Elevacion Ltd

Eurocopter UK Ltd

FBH Heliservices

Lockheed Martin

London's Air Ambulance

Midlands Air Ambulance

Ministry of Defence (MoD)

National Health Service (NHS)

National Police Air Service (NPAS)

Royal United Services Institute (RUSI)

Sloane Helicopters Ltd

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BLUE LIGHT AIR ASSETS

Cost-effective Operations for the Future

Jennifer Cole

This research project examines the current mission requirements for blue light air operations and makes suggestions for increased joint working. It explores the current use of air assets by the blue light services, in order to assess the financial and operational efficiency of the current operational models, and to suggest ways in which efficiency might be improved in the future.

Bringing together the research and discussion that has taken place across a number of existing and ongoing reviews into public sector air asset use, the project aims to help relevant organisations investigate joint working and asset sharing with others wherever possible. It highlights where changes are needed and also suggests practical ways in which such changes might be implemented.

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