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&#65533;(an edited version of remarks to the Air Power Association Dinner &#65533; 19 Apr 2011)

AFGHANISTAN

As was illustrated so graphically in Mark Urban's report on Newsnight recently, on operations in Nad e Ali in Helmand, the RAF's contribution to Operation HERRICK, including a helicopter air assault by some 12 helicopters, inserting a mixed UK and Afghan force (thankfully on this occasion, unopposed), remains absolutely critical to campaign success.

In February, Operation OMID SHASH saw a helicopter assault inserting an Afghan National Army Kandak, mentored by 2 PARA and 1 Irish Guards, into an area from which ISAF and the ANA had been absent for a number of months. The surprise engendered by helicopter mobility enabled the Afghan commander, Brigadier General Sherin Shah, accompanied by his British counterpart, Brigadier James Chiswell, to hold a shura, together with the local police chief and District governor, to meet local villagers on the following day - a fine example of air mobility enabling political influence.

It should be noted that the RAF supports the campaign by providing, attack, ISTAR and mobility assets across Afghanistan and not just in Helmand province.

The bravery and professionalism of our aircrew can lead to a down playing of the risks associated with operating in Afghanistan caused by the environment, the busy battle-space, the actions of the insurgents and the need to ensure that kinetic effect is precisely targeted. All place huge demands on the aircrew and those who support them and generate complex challenges that have to be constantly managed.

LIBYA

The political turmoil currently sweeping across the Middle East, and North Africa has led to the involvement of UK Forces, including the Royal Air Force in two operations, Operation DEFERENCE and Operation ELLAMY in Libya, the latter of which is likely to command our attention for some time to come.

Operation DEFERENCE was the evacuation of British and other civilians from Libya. At short order RAF Lyneham was tasked with providing 3 C130s to forward deploy to Malta, in preparation for the recovery of multiple Entitled Persons (EP's) from Libya. It quickly became apparent that there were a significant number of persons stranded in the remoter parts of the Libyan desert. In response to this operational escalation, 47 Sqn switched the focus from Tripoli and Benghazi to began a series of day time missions to recover those stranded in the desert.

Following a highly successful first day, the second day of missions saw one aircraft misidentified by local friendly forces and fired upon with small arms. The C130 sustained some limited battle damage. One round had entered the flight deck above the co-pilot's head, ricocheted off the Head-up Display and onto the co-pilot's flying helmet. Un-fazed by the event, he dusted himself down and pressed on with the task in hand. The Captain meanwhile flew the aircraft away from the threat area. A quick analysis was conducted by the crew and a plan formulated. The aircraft was low on fuel and now had a leaking fuel tank. The remaining fuel was transferred to a serviceable tank as the aircraft was flown at maximum endurance speed to the optimum cruise altitude. Aware of the potential implications that diverting to a country other than Malta could entail, the crew safely returned to the island with their extremely grateful passengers.

The RAF's contribution, in some very hazardous operational conditions, supported by airborne C2 and ISTAR including E3D Sentry, was an outstanding success, demonstrating the speed, reach and flexibility of air power, and the quality and skill of our people. As the political situation develops across the Middle East and North Africa, the RAF is well aware that there may be requirements for further, similar (and dissimilar) non combatant evacuations; MoD is working closely with the FCO to ensure that appropriate plans are in place.

Operation ELLAMY is the continuing operation in support of UN Security Council Resolution 1973 to

protect civilians and the civilian population under threat of attack. To achieve this, Control of the Air has been essential to provide freedom of operation for a wide range of air operations. Within 18 hours of the identification of Gioia del Colle as the Deployed Operating Base, we had recce'd it, deployed 10 Typhoons, provided the early entry support staff and equipment, delivered the Expeditionary Air Wing Commander and his staff, and were managing the flow of equipment and personnel into the Deployed Operating Base.

At the tactical level, we rapidly degraded the Libyan air defence system, and denied the use of Libyan airfields to the regime. War is an essentially combative business, and as the repairs and workarounds that we have noted at Tripoli airport to reconstruct the Libyan air force's capability indicate, there is absolutely no room for complacency. Combat Air Patrols remain essential to maintain control of the air; RAF Typhoons and other fighter aircraft working in the NATO-led coalition continue to provide it.

Our Tornado GR4s flew 12 STORM SHADOW missions in 3 waves, each supported by VC-10 and Tristar tankers. They, uniquely in the UK's inventory, had the ability to successfully attack key hardened installations and weapons storage facilities. Just how appropriate this capability is to the complex and cluttered contemporary battlespace, was demonstrated on the second night when the attack was aborted moments before weapon release due to the receipt of near real-time intelligence suggesting the presence of civilians (a CNN news team) in the area. The aircraft returned to the UK carrying their weapons, supported by refuelling from VC10's and Tristar; thus again reinforcing the flexibility of air power.

These sorties, involving 3000 mile round trips, are the longest attack missions ever flown by the RAF from the UK. They are an excellent example of the reach and responsiveness of our contemporary air power. The Tornados then forward deployed to Gioia Del Colle, and shifted focus to Combat ISTAR focussing direct action against Libyan armour, using the combination of the RAPTOR reconnaissance pod and the Litening 3 targeting pod with Dual Mode Brimstone anti-armour air-to-ground missiles and Paveway IV bombs. The effects have been remarkable, with Brimstone proving once again, as it has already demonstrated in Afghanistan, to be a unique munition capable of destroying manoeuvring targets; it is a highly accurate, lethal and a very low collateral damage weapon.

Of course, the Tornados and other attack aircraft have not operated in a vacuum. Indeed, it is the very combination of our airborne Command and Control capability provided by the E3D Sentry, combined with the critical intelligence collection capability of the Nimrod R1 and Sentinel R1, and the persistence delivered by our VC-10 and Tristar tankers, that are so critical to our success to date.

In the first 10 days of the operation, a typical mission (if such a thing exists) ran as follows. On arrival on station a Sentinel R1 checked in with a UK E-3D Sentry and was passed the latest priority areas of interest. Initial Synthetic Aperture Radar runs of the areas were conducted. These highlighted a number of possible armour locations and SAM sites, which were passed to the E-3D, which in turn passed them onto Tornado GR4s, who were air-to-air refuelling from a VC-10, for further investigation. The wide area SCAN capability of the Sentinel provided the necessary cue to the GR4 aircraft, allowing them to focus their much narrower field of view, but higher definition, sensors to obtain positive identification of potential armour and SAM sites for engagement.

Later, using its Moving Target Indicator capability, the Sentinel identified vehicle movement in the vicinity of a pump station. This position was passed via data link to the US JSTARs platform which cross correlated movement in the same area. The mission/target data was then passed via Link 16 to the Typhoons on combat air patrol and thence to the GR4s operating in the area which prosecuted the attack. It has become the norm for each GR4 to take on 4 to 6 targets, each of which has been positively identified and

crosschecked against the Rules Of Engagement.

This demonstrates the methodology of SCAN, CUE, FOCUS - or in Land parlance FIND, FIX and FINISH - that Combat-ISTAR provides, with interoperability between the UK Tornado GR4 and the US JSTARs coordinated by the UK E-3D. Operation ELLAMY has proved further validation of the Combat ISTAR concept • with a layering of, and cross cueing between, dedicated ISR and Combat ISTAR assets and capabilities, achieving a synergy that is greater than the sum of its parts. The value of the capabilities represented by Sentinel, Nimrod R1 and E3D, already apparent in Afghanistan, has been reinforced.•• They provide an essential level of understanding, without which the Coalition's ability to protect civilians would be severely hampered.

This operation has seen a number of firsts and unique elements • the 3000 mile attack sortie to name just one. But the debut of the Typhoon, not just on Air Defence operations but in the air to ground role as well, is a significant milestone in the delivery of this platform's potential and its latent capability. This marks the enhancement of our Combat ISTAR capability still further. Prioritising the integration of Paveway, provides an accurate and highly effective weapon suitable for this type of operation and others. In part this will assist us to provide the maximum capability to meet NATO's stated requirement for more air-to-ground capable aircraft.•• The effectiveness of operations so far can be judged by the fact that the employment of air power by the Libyan regime has been effectively neutered, while their conventional employment of armour has been denied. This rapidly removed the immediate threat to Benghazi.

It forced pro-regime forces to radically rethink their options and thus significantly limited their ability to prosecute their campaign to a rapid, decisive conclusion. This was dramatically demonstrated when the Regime forces were beaten back from Ajdabiyah by the use of Coalition airpower after the opposition had lost control of much of the city. Confronted by overwhelming air power, the regime's forces have largely switched to using light civilian vehicles and rocket launchers to infiltrate and manoeuvre amongst their opponents, creating the serious issue of combat identification.

There are three main points which Operation ELLAMY illustrates. The first is that it demonstrated the flexibility and effectiveness of air power as a tool of political and foreign policy. As the political the crisis in Libya threatened to turn into humanitarian disaster, only the combination of maritime power transiting through the area and air power that could be deployed quickly enough was able to affect events.

The second is that the level of expertise that the RAF has developed over 20 years of continuous operations has been absolutely critical to the translation of political intent into operational results, and to the prosecution of the operation at Alliance level. This reflects the professional links and relationships that we have developed across the Atlantic and within NATO; it is typical of the way in which our people continue to punch above their weight in Combined Air Operations Centres and in Joint and Coalition HQs.

The third point is that Operation ELLAMY is now being conducted by Typhoon and Tornado GR4s based in Italy. The Typhoon provides both ground attack and that control of the air, a factor that is absolutely fundamental to the success of any operation, on the ground or at sea. The Tornados have delivered Storm Shadows to penetrate hardened buildings and the dual-mode Brimstone, a unique weapon which is now being sought by both the US and the French.

SDSR and FF2020

In the challenges that SDSR and PR11 pose, the RAF does not underplay the stress that the concurrent complex operations place on the Service or is it in any way complacent about the future; what we have been asked to do in Afghanistan and Libya is consistent with the adaptive Britain posture set out in SDSR. There have, inevitably been pinch points and specific exceptions, but we have had the flexibility to cope. Nimrod R1 has been

extended in the short term for Operation ELLAMY and while Typhoon training was disrupted, it is back up and running. The impact has been manageable - so far.

During the SDSR process, and within the financial realities facing the MoD, our aim, for the RAF, was to transition to a modern, overtly smaller, but balanced force by 2020, while meeting the overriding short term requirement of success on Operation HERRICK; to this we must now add Operation ELLAMY. This transition to Future Force 2020 will add to the considerable pressure already sitting on the very people upon whom we rely for operational success. How we manage the drawdown in numbers of people to mitigate turbulence, and design a professional structure and environment that will remain an attractive career, in the competitive employment market of the future, is a pivotal concern.

As we transition to Future Force 2020, the very people we rely on for operational success are under considerable pressure; more so, I contend, than people are in other public and private sectors.

Although we had already planned to reduce our manpower, to achieve the SDSR target we need to reduce the size of the Royal Air Force from our current strength of around 41 300 to around 33,500 by April 2015. We are reducing recruiting, making use of targeted redundancies and using all the manning levers available to us. This will not be easy. But we will work hard to strike the right balance between the Service need and the reasonable aspirations and expectations of our personnel.

In the longer-term, Defence is developing a new employment model that will deliver operational capability and control the cost growth of personnel. In the future, our personnel will spend longer in one location, are more likely to live in their own homes than in Service accommodation, and will be employed in more flexible career structures than hitherto. In many ways the RAF has been moving in this direction to Through-Service Career Management anyway, but we must ensure that the future employment model preserves the people component of capability, that our personnel have an attractive career and that their terms of service offer is competitive. At the same time, we will be developing the Whole Force Concept that seeks closer integration between Regular and Reserve personnel, civil servants and our partners in Industry. Of course, this concept has to a great extent prevailed throughout our history where these components have arguably always worked together.

In terms of Combat ISTAR, migration to a Typhoon and JCA force will give us a durable truly multi-role combat capability based on 2 modern combat aircraft types as we progress to 2020. Unlike Harrier, Tornado GR4, and Tornado F3, the combination of Typhoon and JCA will be as capable of delivering control of the air as they are of precision attack with the broadest intelligence and situational awareness. This means that in the contested and challenging operational environment of the future, the fewer platforms that we will have will be required to, and capable of, delivering greater capability - although mass, particularly when activities in which we and our key Allies are also engaged across multiple operations, remains a significant issue. But we need to remember, that while we would ideally wish to be able to fight as part of a coalition or NATO, there have been, and will continue to be, occasions when we will want to, or have to, operate alone and thus we need to maintain the coherent and comprehensive set of air power capabilities necessary to meet the unknown.

The further development of Remotely Piloted Air Systems remains a central element in the development of future British air power. Not only do they provide a key capability for the current Afghan campaign, but they also provide the basis for a persistent Combat ISTAR capability in future campaigns, and ensure that the RAF and UK remain in the vanguard of the development of RPAS tactics and techniques, and at the core of the investigation of autonomous ISR systems. It is not unreasonable to envisage a mix of, say, one third remotely piloted Combat-ISTAR platforms to two-thirds

manned after 2030.

As identified in the SDSR, strategic intelligence is a key capability for the United Kingdom. In the current strategic environment, the ability to detect the development of threats and deal with them early is critical. Our ability to do this will be significantly enhanced by the introduction of the Air Seeker programme which is able to span the full spectrum of intelligence collection and dissemination, from the strategic to the micro-tactical.

Operationally focused and tactically effective air mobility is not an optional extra, it is absolutely essential to the core business of Joint warfare. The last 10 years have seen a quantum leap in our ability to provide air mobility in the demanding High Intensity Counter-Insurgency environment. Our equipment is better protected, and our crews more tactically adept. This proved its worth yet again in Operation DEFERENCE and Operation ELLAMY and is something that we will maintain after the drawdown of operations inside Afghanistan. The intent is to replace old with new. The C17, A400M and FSTA represent a better future capability for Defence than C130, VC10 and Tristar. One should note that FSTA is more than a tanker; it will also provide enhanced strategic airlift capability.

At the end of this year the FSTA is due into service, providing a considerable increase in capability compared with its long-serving predecessors, the VC-10 and TriStar. The first 2 aircraft have undergone military conversion and are due to commence an intensive programme of trials and evaluation at Boscombe Down.&#65533; The ground-breaking PFI service is not just about the aircraft but also includes the provision of all necessary infrastructure at RAF Brize Norton, including the newly opened squadron hub of the two-bay hangar, squadron accommodation and flight ops. The FSTA squadron engineers are currently undergoing training with flight crew training to commence in August 2011.

Looking further ahead, to 2014, we will see the first of 22 A400M aircraft enter service. The flight test campaign continues apace and has included an evaluation sortie for RAF aircrew, who were impressed with the maturity of the development aircraft, underlining the impressive displays on the airshow circuit last year. The A400M represents a significant increase in the tactical airlift and aerial delivery capacity over the C130 and, despite its relative size, will be able to operate into short, natural surface landing zones, at long range. Supported from their base at RAF Brize Norton, the A400M will initially complement the Hercules on UK operations and exercises. Once RAF tactical techniques and procedures are matured the A400M will replace the C130 and become the cornerstone of the RAF's tactical airlift capability and a key force element of Future Force 2020.

The Royal Air Force will remain central to Defence's contribution to a national cyber capability. For us, in many ways, this is non discretionary &#65533; our weapons systems depend on cyber defence to function. Our expertise in cyber defence gives us a cadre of individuals with the skills necessary for wider cyber operations. The same applies to Space, for which the RAF has the UK military lead. In times of financial stringency, the development of a capability that will provide the non-discretionary assured access to Space that the UK needs to protect all nine elements of critical national infrastructure will be challenging. With an innovative approach however, involving a sensible mix of allies, commercial bandwidth and potentially small satellites, it should be possible.

While the overall message of SDSR is that we will have a balanced and capable 'premier division' air force by 2020, there are areas of risk. The addition of a high intensity air centric campaign in Libya to the enduring requirement of complex COIN in Afghanistan, highlights the importance of mass. 4th and 5th generation combat aircraft may be exponentially more capable but they cannot be in two places or two theatres at once. Nor can our dedicated ISR platforms.

Some of areas of risk can be mitigated by partnerships with allies, some by close work with our sister services - the use of Royal Navy-fired Tomahawk

Land Attack Missiles against enemy air defences is one such example while others can be mitigated by partnerships with industry. Some capabilities we have attempted to maintain by reducing to core in particular areas, thereby maintaining a seedcorn of expertise from which to regenerate. Success will require a ruthless focus on delivering value for money; we must remember that it is not the MOD's money, or that of the defence industry, rather it is the taxpayers' money that we are spending. Delays and cost overruns have both reputational and practical implications. The need to do more with less must drive innovation. There are few good reasons why every airframe in an operational area should not be an ISR collector &#65533; or that FSTA could not be configured as a strategic ISR platform - off the shelf modular capabilities to make this happen exist and can, indeed should, be integrated into current and future platforms, affordability allowing.

The way the RAF has risen to meet the twin challenges of Afghanistan and Libya should be a matter of considerable national pride. However, we must recognise that our ability to meet these critical operational demands has only been possible because of the willingness, skill and ethos of the men and women in the Royal Air .

The future delivery of our country's security and capability in the air depends upon a whole force generated from Regular and Reserve personnel as well as Industry and the civil servants who provide essential support to our operations. I pay tribute to the outstanding commitment which they all show in achieving it.</p>