



Transforming Joint Air Power **The Journal of the JAPCC**



Editorial



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The Journal of the JAPCC,
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At the launch of the NATO Response Force (NRF), it was described by the Secretary General as "make or break for NATO". This is a daunting build-up, but it is one that has concentrated the minds of all those involved in developing the concept and achieving Full Operational Capability. As the Air Component Commander responsible for the air assets assigned to NRF 7 and 8, I have become intimately familiar with the challenges this involves. The process of preparation of those forces offered to the NRF by Troop Contributing Nations began some time ago, and the training and certification of these forces bring their own demands. Clarity of purpose, unity of effort and quality of endeavour encapsulate the aspirations of the Joint Commander. These are characteristics familiar to many of us who have been involved in air operations over many years and it is to these noble aims that this edition of the JAPCC Journal is dedicated.

The response to the first edition of the Journal was overwhelmingly positive, and I honestly believe this second edition is even better. It is through the Journal and the JAPCC's work on bare-base activation, strategic lift, distributed simulation training and other associated projects, that the organisation will make a valuable contribution to the effectiveness of the air contribution to the NRF. The message is clear: for those of you involved in NRF-related work, the JAPCC may well be able to offer help and advice that will make your job easier!

A handwritten signature in black ink, appearing to read "Doc", followed by a stylized flourish.

Robert H. "Doc" Foglesong
General, USAF
Director, Joint Airpower Competence Centre

**Transforming Joint Air Power:
The Journal of the JAPCC**

Director
Joint Air Power
Competence Centre
Gen Robert H. Foglesong

Executive Director
Joint Air Power
Competence Centre
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Design and Art Production
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The NRF Air Concept



Photo by Defensiekran

Prepared: NATO can cope with the security challenges of tomorrow

By Lieutenant Colonel Claudio Icardi ITA A, JAPCC

The NATO Response Force (NRF) is moving towards the achievement of Full Operational Capability. At this time, NRF 5 is in place, Joint Force Headquarters Lisbon is the nominated Joint Force Command (JFC); NATO Rapid Deployment Corps of Spain (NRDC Spain) is the Land Component Command (CC); the French Joint Force Air Component Command (JFACC) is the Air CC and Italian Maritime Forces (ITMARFOR) is the Maritime CC. Against this backdrop, this article considers how the NRF concept originated and how it is now being delivered.

NATO has undergone a striking transformation to cope with the new century's geopolitical challenges (see for example US Defence Secretary Rumsfeld's White Paper for NRF, 20 September 2002 and the Prague

Capability Commitments, 15 October 2002). The dramatic change from a predictable to an asymmetric and unplanned threat has resulted in the adoption of a functional rather than a geographical approach. Territorial defence remains an Alliance core function but, against a minimal territorial threat, security could not be delivered without addressing the potential risks and threats arising far from home. Projecting stability has become the precondition for the overall security environment.

Air responsiveness and rapid decisions

Consequently, NATO military forces were challenged to become more deployable, thus increasing their effectiveness and to shift from a threat-based approach to a capability based one. This required planning using generic scenarios of

potential future threats, based more on required NATO capabilities for achievement rather than just on considering only known threats. Rapid decision processes have been established to achieve coherence in terms of time responsiveness. However, this is no longer the Operational Planning Process done in a fast manner, but something new.

NATO has committed itself to a continuous transformation process, which encompasses the development of a high readiness joint force able to execute the full spectrum of missions. The NRF is an expeditionary package, flexible, deployable at high readiness, technologically advanced and interoperable. It has provoked a cultural transformation, focusing and accelerating the Alliance initiatives to improve military capabilities and optimise defence

planning. It has been and will remain a catalyst for the overall transformation. Moreover, the NRF has been an invaluable way to keep Europe abreast of the latest technological and geopolitical changes.

The Force Generation Process designates the pool of national forces along with the necessary command and control arrangements to ensure rapid response and cohesion of force. Rather than a force assembled on an ad hoc basis, the NRF gives to nations the opportunity to contribute to an integrated pool of forces. With this modular approach, nations are encouraged to invest in specific capabilities independent of their different military budgets. Once the mission is identified, the force package is further tailored.

The Supreme Allied Commander Europe (SACEUR) sets the standards and develops training, readiness, reporting and certification programmes that the NATO Response Forces and HQs have to achieve. An exercise programme is in place to certify

each operational Joint and Component HQ before the respective stand-by NRF period. Jointness is crucial to the tailored package, which requires training with a strong joint aspect. Each year Allied Command Operations (ACO) in Mons, Belgium, conducts dedicated NRF exercises to train and certify the package. The exercises, which are controlled by the Joint Warfare Centre (JWC) in Stavanger, Norway, and the Joint Force Training Centre (JFTC) in Bydgoszcz, Poland, on behalf of Supreme Allied Commander Transformation (SACT) in Norfolk, USA, train the operational joint level (JFCs and CCs). The Strategic Commander, SACEUR, trains and certifies the JFC, which, in turn, trains and certifies the CCs. Unit training and certification are accomplished by the nations and verified by the respective CCs.

Air perspective at the joint operational level

The rotation cycle includes, at the operational joint level, three JFCs (Naples, Brunssum and Lisbon) and at the Component level, National

Graduated Forces HQs or permanent NATO CCs. The CCs rotate every twelve months, with the exception of the Land Component, which has a rotation cycle of six months. However, the 2005 programme has seen, for the first time, the participation of a national Air HQ, the French and the United Kingdom JFACC for NRF Air 5 and 6 respectively.

During Exercise ALLIED ACTION 05, the French JFACC confirmed the importance, previously highlighted in former exercises, of collocating forward the Air Component Commander (ACC) with the JFC. As the JFC's best adviser on air power issues, the NRF ACC represents the air perspective at the joint operational level. His deployment forward, together with a dedicated staff, greatly enhanced the overall jointness of the exercise.

Commander NRF ACC retained the majority of his staff in the Rear. Command and Control was then tailored to meet specific requirements and circumstances. Reachback (R/B: reachback is the process of obtaining mission



Photo by Belgian Army

Worldwide: Projecting stability as the precondition for security, NATO supports the stabilization process in Afghanistan



Expeditionary: NRF is flexible and deployable at high readiness

essential Command and Control products, services and application in a timely manner by using communications between the deployed and non-deployed elements of a HQ) is the key tool to enhance relations between the NRF ACC and the permanent HQ. The air battlestaff remains in the rear and the Air Operations Centre (AOC) and the Deployed Operating Bases (DOB) are further away. The AOC cannot be split into cells and could be deployed as a whole or not. Therefore, R/B optimises the organisation at the operational level, but it does require a flexible Command and Control architecture.

The Communications and Information Systems (CIS) are the essential enablers of effective command and control. Reliable and robust connectivity to enhance R/B capabilities including technical support are required, e.g. bandwidth and satellite communications. A more effective result can be achieved with less aircraft, UAVs or ground based air defence systems, but not with less connectivity. The NRF is also a catalyst for focusing and

promoting improvements in the areas of Alliance military capabilities and interoperability and it is a test bed for experiments on future concepts. The NRF will help accelerate those initiatives and improve Alliance Defence Planning. However, a gap still exists between the political aspiration of developing the force and the military and financial resources; more manpower, equipment and money has to be allocated in the force generation process.

More effort in commitment is necessary

Strategic airlift and logistics are two areas requiring special focus. In particular, strategic lift went through some good initiatives, but it still remains a national responsibility and it is an area where the European nations need to raise their commitment. From a NATO perspective, the JFC must consider the availability of assets in the first place to cope with the concept of operations, rather than waiting for a national allocation of the assets or even for a private company agreement. From a logistic perspective, a stronger joint

logistic approach is required in the future in order to increase deployability and flexibility.

The purpose of the NRF is therefore to enable the Alliance to face the new threats and react rapidly to events. Air power offers to the decision makers a range of options to support political efforts even before the first shots are fired. But the operating environment needs to be more joint and multinational than it has ever been in the past and in the future we need more focus on logistics, CIS, airlift and the whole force generation process.

Also, the forces will fight together on unpredictable battlefields, where the speed of decision-making and the collaborative actions required are decisive factors for the success of the mission. Interoperability therefore represents a vital ingredient, not only between NATO and nations, but especially the interoperability of training, procedures and tactics. This seems to be a very promising way to gain quick wins for NRF air. ■



Building NRF Air Power

By Major General M Veysi Agar TUR A, CC-Air Izmir

Operational Rehearsal NOBLE JAVELIN 2005 (NJ05) was held in spring 2005 in the Spanish Canary Islands to validate the NRF's expeditionary concepts for readiness, planning, command and control, deployment, sustainment, execution and redeployment. The deployment involved over 2000 NRF personnel, including a Deployed Joint Task Force (DJTF) and over 580 airmen under the leadership of Component Command Air Izmir (CC-Air Izmir). Adapting to the rapid NRF planning cycle, tight budget restrictions and the limited deployment of support serials all presented significant challenges.

However, NJ05 also clearly demonstrated that NATO has an expeditionary Air Force. In this article, I have identified six recommendations that I believe would enhance the Alliance's future NRF air capabilities.

CC-Air Izmir sees the NRF Operational Rehearsal as the premiere NATO exercise, which should be given the highest priority in the NATO exercise calendar for funding and delivery. Moreover, it is operationally imperative that all formations involved in NRF activities participate collectively in a similar practice during the months prior to their deployment vulnerability.

NRF Operational Rehearsal Vital

I believe for the NRF Operational Rehearsal to achieve its full potential, NATO common funding should resource a substantial proportion of the rehearsal's deployment costs. Reducing the cost to nations would entice more nations to commit their forces. A more robust commitment would also provide improved training value to participants and,

most importantly, a higher state of NRF combat readiness for NATO as a whole. During NJ05, because of fiscal constraints, the Air Component Command (ACC) lacked many of the capabilities that were most appropriate to the scenario. While valuable training was achieved with the forces available, additional forces were needed to achieve the desired effects.

The NRF Combined Joint Statement of Requirements (CJSOR) depicts combat forces with an impressive array of capabilities. However, whilst the CJSOR provides sufficient numbers and types of aircraft, it often contains "hidden shortfalls" in the support capabilities, which effectively compromise the NRF ACC's ability to support and sustain the force.

Moreover, some nations only bid support assets for their own



Photo by Defensiekraant

force contribution and do not offer assistance for the more general support that is required to operate an airbase – this could range from operations officers, to fuel truck drivers, to medical and catering support. This unbalanced approach leads to a precarious reliance on host nation support, which cannot be guaranteed in the crisis scenarios for which the NRF was foreseen.

More descriptive NRF CJSOR serials

To overcome these problems, NATO must incorporate CJSOR serials for national support elements and nations must also provide details of how they will support and sustain their force contribution. Ideally, the Alliance should encourage individual nations to provide support capabilities capable of sustaining an entire Deployed Operating Base (DOB), which would reduce both deployment costs and the NRF

footprint by increasing economies of scale across the nations and reducing duplicated support personnel. During NJ05 many CJSOR NRF 4 assets did not meet Allied Command Operations (ACO) Force Standards. This complicated operational planning, force integration and air campaign execution. To ensure the NRF Air Commander has the capabilities he needs to meet mission requirements, SHAPE must more clearly articulate force requirements through more descriptive CJSOR serials. Worst case, it is essential that mandated NRF CJSOR assets comply with ACO Force Standards or, if the operational requirement is less demanding than ACO Force Standards, it must fall to SHAPE to provide more descriptive NRF CJSOR serials.

NRF operations are characterised by short-notice, rapid deployment with minimum

planning. Air Command and Control (C2) suffered badly during the early stages of NJ05 due to delayed Computer and Information Systems (CIS) connectivity. NATO must continue to emphasise expeditionary CIS support to ensure NRF Commanders can count on rapidly deployable, global C2 connectivity, which needs to be 24/7 and 365 days/year.

CIS support vital for operations

Until the new Air Command and Control System (ACCS) is operational, identifying a lead Nation for DOB C2 and CIS coordination is vital. That lead nation must provide crucial leadership in the planning and implementation of C2 and the early development of the CIS operational requirement planning to ensure full compatibility with NATO CIS architecture, equipment and



Photo by
Royal Air Force

Support: More general assistance is needed

encryption. In turn, each deploying nation must take responsibility to ensure its CIS hardware and software is compatible with the latest NATO CIS systems.

Embrace effects based approach to operations

CC-Air Izmir fully embraced the Effects Based Approach to Operations (EBAO) and developed an air campaign focused on achieving “air effects” in support of the DJTF campaign’s “overarching effects”. However, legacy Operational Planning Process (OPP) techniques remained evident and attempts to apply EBAO at only the DJTF and Component Command levels produced significant disconnects in campaign planning and targeting processes.

EBAO methodology is contemporary NATO doctrine, which must be embedded in every headquarters involved in operations. NATO should embrace EBAO by facilitating Allied Command Transformation development of an Alliance common approach. Additionally, the NRF crisis establishment needs revision to ensure that staff functions and structure facilitate EBAO planning. Definition of NRF air certification criteria is

critical to assess effectively the mission readiness of NRF air-declared CJSOR forces, Air Operations Centres (AOC) and the HQ battle staff. The Tactical Evaluation (TACEVAL) programme, using existing ACO standards and guidance, should be applied to NRF forces but not in an exercise or operational rehearsal. While an operational rehearsal is an excellent venue to evaluate deployment readiness and HQ, AOC and DOB command and control, it does not provide a suitable venue for TACEVAL to evaluate and/or certify individual NRF units. Instead, current ACO Force Standards provide a better basis for individual NRF unit certification by incorporating these units into the annual TACEVAL programme.

In order for TACEVAL to evaluate and assess NRF

forces in accordance with ACO Force Standards, Nations must identify and nominate NRF ACC units and personnel a minimum of 18 months prior to the NRF deployment vulnerability window. With this information, units requiring a TACEVAL visit for NRF certification can be scheduled in the year prior to their NRF rotation. It is appropriate, however, that the HQ staff and AOCs be assessed prior to their certification as fully mission capable in advance of their ready period. NJ05 was the first time that ACO Force Standards were used to assess a NRF AOC. CC-Air Izmir and Ramstein are working together to draft criteria for CJFACC and AOC assessments in the future.

Continue to improve NRF capabilities

In summary, NATO is capable of NRF expeditionary air operations. The deployment of the NRF ACC to conduct air operations during NJ05 was an unqualified success. To build on this success, the six recommendations above will help to strengthen NATO’s ability to train, evaluate, project and sustain NRF air power in order to fulfil NATO’s worldwide NRF ambitions. ■

Training and Evaluation: NRF Operation Rehearsals are vital



Photo by Defensiekrant

DEPLOYING THE NRF

MEETING THE AIRLIFT CHALLENGE

Image courtesy of Boeing

By Colonel Carlo Massai ITA A, JAPCC

In the new NATO expeditionary environment, the subject of rapid deployability has now come to the fore. New military capabilities are now required, or at least capabilities that are different in both size and organisation to previous years. This area is certainly a key focus for both NATO and national force planners.

Rapid airlift of forces now vital

A fundamental component in the deployability jigsaw is having the capability to be able to “lift” the required force rapidly to the required destination in the required timescale. Clearly, sealift plays a vital part in all this but the real premium in today’s uncertain world rests upon having a strong military airlift capability. Without the airlift, the readiness timescales for deployment are unlikely to be met, particularly when one considers the distances involved and the likely deployment scenarios. This is particularly the case for the NRF, with force elements held at high readiness to deploy worldwide rapidly.

In this article I will examine the current NATO airlift capability to meet likely NRF deployment requirements. With the NRF’s Initial Operational Capability having been delayed in 2004 and with its

achievement of full operational capability next year, it is interesting to assess NATO progress in meeting the NRF airlift challenge.

My comments are based upon a study conducted in the Joint Air Power Competence Centre (JAPCC), which looked at the current NATO airlift capability against two generic NRF deployment scenarios. The scenarios focused upon middle Africa (3,300 NM), which represented a continental deep inland deployment, together with the Bahamas (4100 NM), a coastal scenario. Quantifying what should represent a “typical” NRF size was always going to be difficult, particularly when one considers the sheer range of potential NRF missions – we therefore took a balanced approach, drawing upon the emerging CJSOR for a full NRF deployment (NRF 7), together with data from the NATO MOVEX 04 exercise, which simulated a NRF 3 and 4 deployment. This approach identified a potential NRF requirement to move some 22000 personnel and around 100,000 tons of equipment – this excludes maritime forces, which we assumed were self-deployable. The numbers appear to be huge, but are not if you compare them to those related to the higher scale intervention of

a Combined Joint Task Force (CJTF), albeit a CJTF deployment could make much more use of sealift, due to slower intervention times. Therefore, in some ways, the shorter readiness timescales for NRF means that it could be the NRF that represents the greatest test of military airlift capability.

Methodology of JAPCC study

All NATO airlift assets were included in the study, with the main assets being the A-310, TU-154, KDC-10, KB0707, C5, C17, Tristar and VC10. We also assumed that the current NATO work to provide a short readiness An 124 heavy lift capability was successful. However, with this exception, we did not assume the availability of any other commercial aircraft.

The JAPCC study also included a host of other assumptions, all of which were meant to ensure that the scenario modelling process, together with the subsequent findings, were as realistic and robust as possible. Assumptions were therefore made on issues such as aircraft serviceability, aircrew availability, APOE, APOD / FOB aircraft handling capabilities, plus loading / unloading times.

In terms of a timeline, the JAPCC study set a requirement for the full NRF deployment to be completed by air within a total period of one month. Interestingly, current NATO planning only provides details of Notice to Move – the time needed by the force to prepare and depart from the home base. The deployment timescale is left to the operational planners dealing with the specific deployment. Although NATO policy does not specify a figure, we felt that a one month timeline was a good benchmark. Finally, the JAPCC study did not assume any use of sealift, primarily because of the relatively short notice for completing the NRF deployment.

All of the above data and assumptions were then modelled within the NATO computer simulation tool, which is known as the Allied Deployment and Movement System (ADAMS). NATO routinely uses ADAMS to simulate movements options and to develop NATO deployment plans. As such, it is a computer tool which has an excellent track record.

Against this backdrop, the aim of the JAPCC study was to compare the current NATO airlift capability against the identified requirement and then to make recommendations to overcome any shortfalls over the next 10 years.

Deploying equipment in shorter timescales

I will now highlight some of the key findings of the study. Firstly, the study suggested that, whilst it would be feasible today for NATO to execute a short notice deployment by air of an NRF size combat force, this could only be done with much assistance from the US Strategic airlift fleet. I think this finding illustrates very starkly that, excluding the USA, and with the possible exception of the UK, the remainder of the NATO members currently possess insufficient in-house strategic military airlift to be able to deploy the required manpower and equipment in the new and much shorter timescales.

Apart from comparing the current total airlift capability against

the NRF requirement, it is interesting to examine the question in more detail by breaking the airlift requirement down into its two main components: manpower and equipment. In terms of manpower, the study highlighted no problems in moving the military personnel – assets such as the Airbus A310 or equivalent aircraft are already widely available in the inventory of European NATO nations and our study showed that all the personnel could be moved well within the NRF planning timescales.

The position for the movement of “standard size” equipment, that is equipment that fits into a C-130, was also positive. NATO already possess a number of tactical airlifters and these assets could achieve the requirement within the planned timescale.

Understanding of current capability problems

However, the JAPCC study showed that NATO currently has insufficient airlift capacity to arrange the timely airlift of out of



size equipment, by which I mean equipment that does not fit into a C-130. The study highlighted that the massive use of light transport aircraft cannot compensate for the lack of the heavy type assets necessary to move outsized and heavy equipment. Because of their cargo bay dimensions and weight limitations, neither the C-130 nor C-160 can carry the majority of the equipment necessary for a full NRF deployment. According to the JAPCC study, almost 60% of the total equipment could not fit into the C-130 or C-160 and would therefore require the use of a C-17, C-5 or the lease of an An-124. Such a figure illustrates that the current lack of capability to move out of size equipment does present NATO with real limitations in quickly moving the types of equipment that the NRF would need on deployed operations.

However, whilst meeting the airlift challenge in the short term will not be easy, the JAPCC study also highlighted that the NATO position in the medium and longer term is much better. The key to this step change in NATO capability will be the acquisition of the A400M. Seven European Nations have agreed to buy a total of 180 A400M aircraft over a 12 year period starting in 2009 and running up to 2021. The A400M is planned to replace the C-130 Hercules and C-160 Transall in many European countries. Compared to such aircraft, the A400M will provide a useful increase in load-carrying capability, whilst also retaining important tactical characteristics such as short take-off and landing and soft field operations.

As such, the planned introduction to service of the A400M represents a crucial capability improvement for NATO and NRF deployability. Based upon the military requirement for

the aircraft, especially its load-carrying capability and its range, together with the number of airframes expected to be delivered, the JAPCC study identified that it will be more than sufficient to “fill the gap” highlighted earlier in this article. Importantly, the A400M can move out of size equipment.

The introduction of the A400M should therefore enable the timely deployment of the NRF without prejudicing the availability

Operational: The JAPCC looked at the A400M as a NATO airlift alternative



of US and UK strategic airlift assets for national tasks, nor requiring NATO to depend upon complicated and expensive lease arrangements for An 124s. However, it will be some 10 years before the A400M is available in good numbers.

Need to improve management of airlift

Beyond aircraft numbers and out of size capability, the JAPCC study also raised questions concerning the management of NATO military airlift assets. In particular, the issue of whether it is now time to change from the present arrangements where air transport is controlled by individual nations, to a situation based upon a more integrated and NATO led approach.

At present, the NATO doctrine on movements and transportation establishes different roles for NATO and the nations. NATO commanders are responsible for establishing the total movement and transportation requirements. Member nations are responsible for obtaining all the transportation resources required to deploy, with this responsibility spanning the full spectrum from the APOE to the APOD/FOB. NATO commanders must then prioritize, coordinate and deconflict the deployment of forces – this is done by using the SHAPE Air Movements Coordination Centre (AMCC) who transform the complete airlift package into the NATO Operational Commander's final Deployment Plan.

We believe there is now a strong argument for the NATO commander to take control of the NRF deployment from the assembly area or APOE all the way through to the deployed location. Such a move would reduce the need for coordination, speeding up the movement execution. We believe the best method of achieving this would be to arrange for NRF commanders to be given pre-assigned command and control of airlift assets – perhaps as part of the CJSOR process, where each nation specifies which operational assets it will provide to each NRF.

Such assured availability of airlift would allow NATO commanders to more quickly match the airlift assets with the corresponding units to be moved, together with the priority for moving them, thereby speeding up the whole deployment. We also believe that such a move would reduce the risk of overlap and waste in the use of precious airlift assets – whilst individual nations and the AMCC all undoubtedly do their best to cooperate and coordinate in

their use of airlift, this will always be sub-optimal when compared to a fully integrated approach. Also, on a day to day basis, there might be benefit in developing a “NATO Airlift Management Centre”, perhaps along the lines of the European Airlift Centre at Eindhoven, but with a more executive role. This might serve to improve overall NATO airlift organisational arrangements, enhancing compatibility and interoperability across the Alliance and thereby helping to mitigate the effects of the current airlift shortfall.

Managing the airlift gap

The JAPCC study also made some proposals on how to manage the capability gap until the A400M arrives in large numbers in about 2015.

Looking at the current capability gap in a positive way, I would argue that the JAPCC study has been invaluable in developing a good understanding of the current capability problems, from which options can then be developed to rectify them. Encouragingly, this is already happening across NATO, with the initiative to develop a formal contract with the aviation industry to provide an assured (and short notice) lease of An 124 aircraft being a case in point. However, this will provide a capability to move only some 4% of the required NRF cargo, which is nowhere near enough. Yes, you could increase it, but it still does not radically change the numbers.

Another potentially useful initiative would be to work with USAF and RAF colleagues to establish a formal mechanism to allow NATO access to some US and

UK Strategic airlift assets to deploy the NRF. Without these types of arrangements, the current “out of size” problem could mean that NATO could face a situation where the air deployment of the NRF is not possible in the required timescales.

We also need to take another close look at commercial aircraft availability, looking upon it as an alternative to military lease. The US development of the Civil Reserve Air Fleet is a good case in point. Whilst there can be difficulties



Innovation: Commercial lease options need to be explored

regarding assured aircraft availability, together with potential security problems, especially at the deployed location, the sheer size of the civilian charter market suggests that this is an option we must explore more fully – certainly in the period before the A400M enters service.

Other innovative solutions should also be explored. A good current example is fast sealift – new technologies indicate that it might be possible to obtain ships capable of cruising at 30 knots, as opposed to the 12 knots of previous years.

Finally, perhaps we should go back to basics and have another hard look at the stated movement requirement for the NRF. Do we

really need to move 22,000 personnel and 100,000 tonnes of equipment or is there scope for a more streamlined approach? Could we slim down some of the movement requirement by trying to change some of the logistics capabilities from being a purely national responsibility to being a more collective one? Apart from reducing the airlift requirement, such a change would also help by reducing national costs and also optimise the teeth to tail ratio at the deployed base. In sum, we need to actively manage the A400M gap, coming up with a range of measures and initiatives to help ensure that the NRF can still meet its readiness and deployment requirements, albeit with some increased military risk.

Taking the JAPCC study forward

In conclusion, I hope this article has served to provide a useful perspective on a capability

which is fundamental to NATO operations. The results of the JAPCC study have now been briefed across the NATO command structure, where feedback has been very positive, and some airlift aspects have also been considered within the NATO Defence Requirements Review process. The study has also been passed to HQ SACT, who are looking to incorporate many of the recommendations into their transformational project concerning “Expeditionary Operations”.

There are clearly a number of important airlift issues to tackle, particularly over the next 10 years, but we believe that the JAPCC Airlift Study has given NATO the information to help it to meet the NRF airlift challenge. ■

Time Sensitive Targeting



Photo by EADS

By Squadron Leader Tim Harrison GBR A, HQ ARRC

Time for a Change?

The shout goes up in the Joint Operations Centre. A well-rehearsed procedure swings into place. Representatives from across the HQ gather to discuss the possibilities and implications of striking that target. The target has been categorised by both the Intel and the senior Fire Coordination Officer and, as it fulfils the LCC guidance as a significant target, all available effort will be expended in order to strike it. Once the detail has been briefed, the Team then disperse to their own areas where they provide answers and possible strike solutions. They also ensure that any potential solution complies with the guidance given in the targeting directive, that the response is proportional (falling within the

Collateral Damage Estimate allowed) and that, most importantly, engaging it is legal. The current method sees the Fire Coordination Officer then collecting all the information and agreement signatures on a (paper) target folder. Once all the solutions have been gathered, the Commander will decide which means to engage the target will be used. The engagement would then take place using organic assets and the whole process resets ready to meet the next challenge. The team have all been doing their own jobs but have been involved in the target as an additional task.

The above procedure is replicated throughout the command chain and is how the Army deals

with lucrative targets that have just appeared or been discovered. It is routine business and therefore it is fair to ask the questions: "What makes TSTs different? In fact, are they different and, if so, what then is the big deal?"

To begin this, I think we must first look at what constitutes a TST. NATO defines it as:

"...those targets requiring immediate response because they pose (or soon will pose) a danger to friendly forces or are highly lucrative, fleeting targets of opportunity whose engagement is of a high enough priority to warrant immediate action to support campaign objectives".



“Though we have heard of stupid haste in war, cleverness has never been seen associated with long delays.”

Sun Tzu, the Art of War

“Target!! BM21 identified by Phoenix at grid 8352156784”

Interestingly, in this definition, there is no mention of the air tasking order cycle or whether or not this target falls within or outside the cycle. We are dealing with an opportunity that is of such high priority to the Joint Force Commander (JFC) that everything else should be sidelined until an option has been exercised.

TSTs and component dynamic targets are defined in the JFC TST Matrix. So what does HQ ARRC have to offer to the JFC in response to a TST and how does it go about actually passing data and information around the HQ? HQ ARRC is very well situated for information systems support and it has been actively involved with the NATO Command Control and Communications Agency (NC3A) in developing a NATO TST Tool. However, for the last three years HQ ARRC has also used a tool called the Automated Deep

Operations Coordination System (ADOCS) and has had the system configured specifically for land operations. ADOCS provides the ability to collaboratively manage and work on targets and has proved invaluable during recent operations. Given collateral damage limitations, land's preferred means of TST engagement will frequently be the Close Air Support (CAS) aircraft that are tasked through the Air Support Operations Centre (ASOC).

Seamless transfer of data, corroborated & efficient

However, this means of attack should not be seen as exclusive and all available means of achieving desired operational effects should be considered. Using ADOCS, the end-to-end process becomes a seamless transfer of data that, once corroborated, is not molested or ‘fat fingered’ by anyone in the chain.

For example, a potential target or track could be detected by a Link 16 capable platform (ASTOR/JSTARS). The target data would therefore enter the ADOCS system by Link 16 data transfer. The G2 Staff then have the opportunity to work on the data and, if necessary, to authenticate it from other sources. Once sufficient granularity has been gained and the target is categorized as a TST, the other TST team members are alerted to the data by the system. All can now work on the target data from their own workstation and manipulate the picture to suit their own needs.

From the ASOC perspective the Air Tasking Order (ATO) and CAS stack aircraft data can be trawled. Aircraft configurations and weapon loads are visible as is weapon effect data and the ability to carry out automatic weapon target pairing. Once a solution has been found, it is offered to the

Senior Fire Coordination Officer. He then compares the different solutions and decides which should be offered to the JFC. Execution, once granted, is an equally simple process. ADOCS can produce and send an automatically populated CAS tasking brief to any aircraft provided that the aircraft designated to conduct the mission is Improved Data Modem (IDM) capable. The system produces an automated acknowledgment of the mission and will inform the originator via ADOCS once the mission has been completed thus alerting the Battle Damage Assessment staff to start collecting data from their sources.

Equipped with the best available weapons

All of the above begs the question: “Should TST be shrouded in mystery or is it just business as normal from the land perspective with a few more rules and a higher degree of importance?” In joint operations until now, the JFACC has been seen as the most readily available CC equipped with the best available weapons for the engagement of TST. However, responsibility for deciding which targets to attack, including TST,



Time Sensitive Targeting: “Targets requiring immediate response because they pose a danger” (NATO)

Photo by Royal Air Force

rests with the JFC, through the Joint Targeting Working Group (JTWG). The nomination of those targets to the JTWG for priority consideration will come from a variety of sources but, in particular, all CCs will be required to nominate their targets of choice, regardless of which CC will ultimately be called upon to engage them. I would therefore argue that TST should not be seen as some mythical beast, surrounded by mystery and awe and treated differently to all other targeting.

Rather, it is simply another, perhaps more dynamic string to the targeteers’ bow. NATO now needs to take a holistic approach to TST by stringent examination of the entire targeting process in the broader context of EBO. Evolving concepts should develop the ability to share data and work collaboratively, in preference to adopting individual CC stovepipes.

The cross-component challenge for all of us in NATO is to actually make that happen. ■

Photo by US Air Force



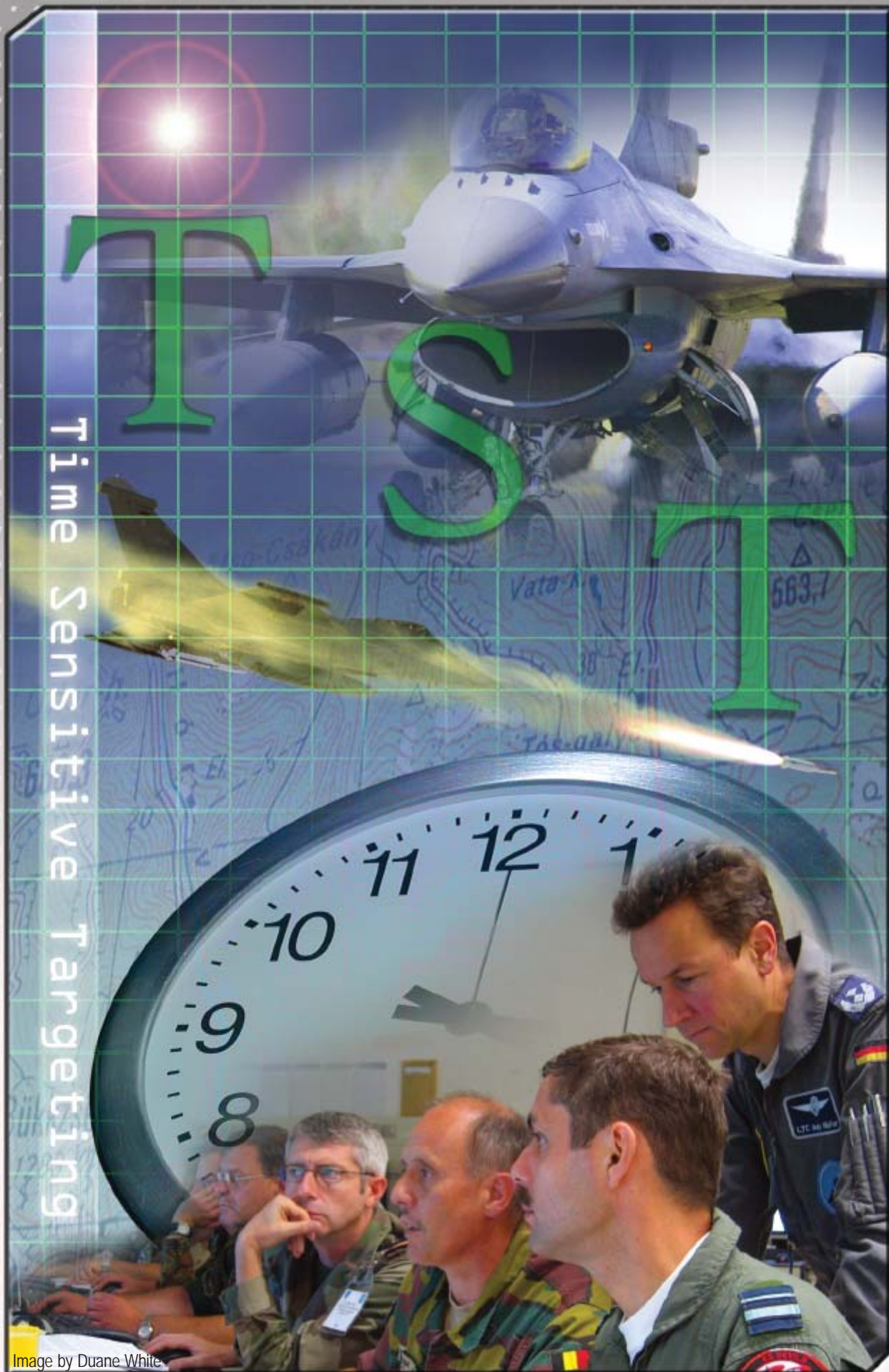
Consciousness: TST is not a mythical beast, but a more dynamic string to the targeteers’ bow

TST

TST

Time Sensitive Targeting

Image by Duane White





By Major Allen Pennington USA A, CC-Air Izmir

Photo by US Air Force

In recent years, much has been written about Effects-Based Targeting (EBT) and Effects-Based Operations (EBO). Over my last two years as the CC-Air HQ Izmir's Chief Targeteer I've heard many say "We already do Effects-Based Targeting". I've also heard many planners and operators say "If you accomplish good objectives-based planning then the result is the same". I believe there really is a difference in conducting EBO. This article presents my view of real Effects-Based Targeting, how it relates to EBO and why we should embrace the concept.

Lessons learned from the desert

The mission seemed simple at first. Six Desired Mean Points of Impact (DMPI) on a weapons storage facility, 48 Gator Mine cluster munitions and six Strike Eagles to deliver them. But, for the unit targeteer weaponizing this mission, it became clear that the intended purpose of the strike was, well, not clear. Employing mines implied that we were trying to deny the enemy access to the facility. But, not even six mighty F-15Es could carry enough mines to deny access to such a large complex. A secure call to my colleagues at the Combined Air Operations Centre (CAOC) was in order. After speaking with multiple targeteers,

one Senior Airman familiar with this target gave me the information I needed. "We think there might be Weapons of Mass Destruction at this facility", she said. "We want to deny them access to it, so we picked a few DMPI to get it on the target list", she added. She had given me the information that had been lost in the traditional targeting and Command and Control (C2) process.

She had given me the precise desired effects. Armed with this jewel of information, and some good intelligence on the facility, we selected the optimum aim points and release parameters to deny access to a specially secured area of the target facility. This transformed the mission from six wasted sorties to a precision engagement that could achieve tactical, operational, and strategic-level effects.

The Strike Eagle example above illustrates two important points. The first is the importance of relaying your desired tactical effect to the team executing the mission. If we had flown the mission against the DMPIs fraged by HHQ, we would have wasted six valuable sorties while risking at least twelve lives. But, by understanding the desired tactical effect, we were able to plan a precision engagement to achieve that effect. The second, and more

important, point is illustrated by the Senior Airman's firm understanding of what was to be accomplished. She understood the desired result and how this target and others, helped achieve that result. The point is that targeteers, when given adequate time for planning, normally accomplish a type of operational effects analysis. The targeting team at the CAOC had been given an objective by the planners and, starting with that objective and the desired end-state, had worked backwards to identify a desired operational effect: enemy forces unable to employ WMD.

Analyzing and understanding effects

From this first level effect, they had undoubtedly identified several sub-effects including: enemy forces unable to access WMD in storage areas. From that desired effect, they were able to identify individual targets, DMPI and desired tactical effects. This is the thought process of a good targeteer. Unfortunately, this result-to-action analysis is usually not fully documented during the target development stage. Instead, we simply document the connection between the target and the objective. This is unfortunate for three main reasons.

First, once we engage our targets and the enemy reacts, we

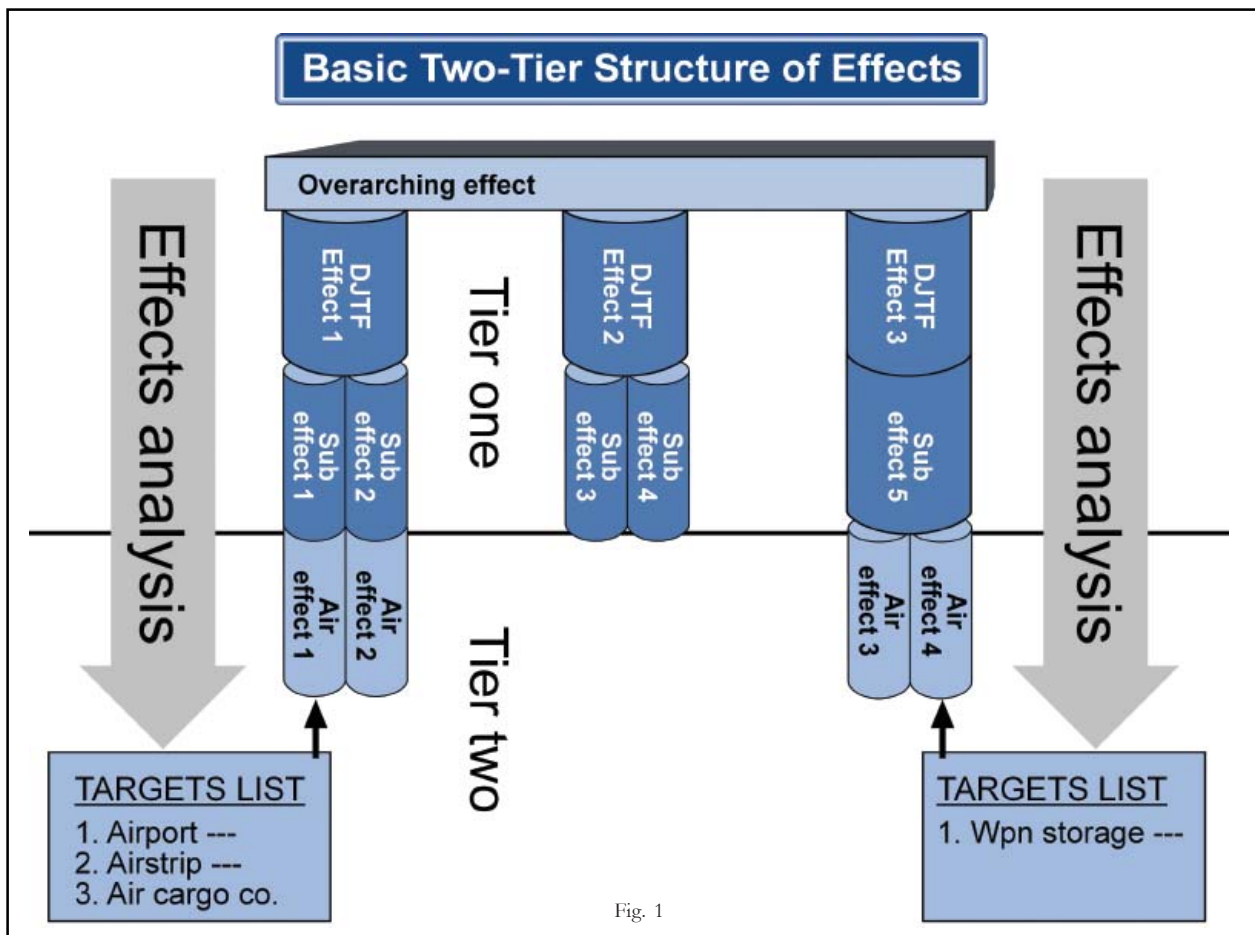


Fig. 1

will probably need to adjust our targeting. This would be much easier if the full effects analysis were recorded so we could simply back up a couple of steps and easily see the anticipated impact of changes on the effects “tree”. Or, if necessary, re-examine that effects analysis based on our observations of the battlespace.

Second, a great synergy could be unleashed if all operations were planned, targeted and executed based on one agreed effects analysis. Having this common, detailed depiction of the campaign in use by operations, plans and intelligence facilitates better sharing of information and identification of links between different actions.

Finally, conducting this analysis and using it for the basis of reporting will support a more robust combat assessment effort. If we know and record the linkage

of targets, desired tactical effects and desired operational effects, then we can focus our collection and analysis efforts to better assess the resultant operational effects based on inputs from plans (desired effects), operations (means), and intelligence (observed effects).

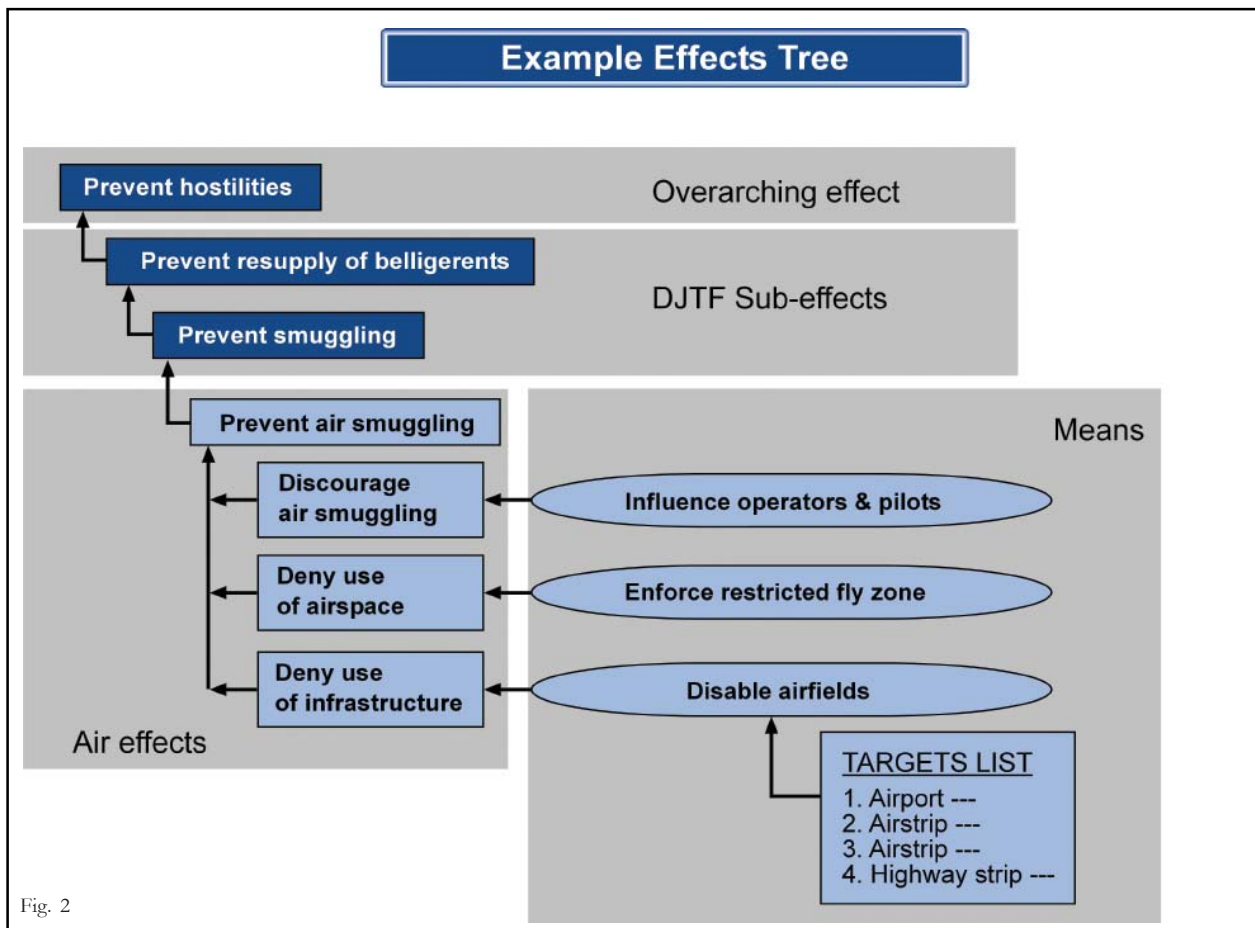
So, having a common understanding of how the battlespace is to be shaped (desired effects) at the operational and tactical levels is a very good thing, but how does that relate to targeting?

Very robust effort to employ EBO

During Operational Rehearsal NOBLE JAVELIN 05 (NJ 05), the NRF Air Component Command (NRF ACC) made a very robust effort to employ EBO from the top down. Prior to execution, the joint players involved in targeting agreed to changes in the planning timeline

that would allow for more detailed analysis of effects prior to target selection. The result was beneficial and many lessons were learned. We used a two-tiered approach to define effects and target nominations were based on the bottom tier. For tier one, the DJTF would define overarching desired effects and two levels of sub-effects.

For tier two, the components would then define their desired effects necessary to achieve the DJTF-defined effects and provide targeting nominations based on these component-level effects. The basic structure of effects is shown in simplified form in Figure 1. Using this methodology, the air component could show a clear, continuous linkage of NRF ACC actions and targets with the DJTF’s overarching effects. Initially, we suffered the same difficulties in selecting targets that we normally encounter during



every Peace Support Operation (PSO). Identifying the things you want to affect is difficult since we are often restricted to non-lethal actions. Unlike other exercises however, these problems lessened significantly after the first few days of NJ 05.

Understanding of desired effects

Over the first couple of days of NJ 05, NRF ACC planning, operations, and targeting personnel met to further develop the air effects analysis and our common effects tree. As we expanded the DJTF's desired effects into desired air effects, potential targets became obvious. Furthermore, the significance of the targets was more easily understood across the staff. For instance, as shown in Figure 2, when considering the DJTF's desired effect of "prevent arms smuggling", the obvious first-level air effect was to "prevent air

smuggling". Once these desired effects were understood, then the required actions and targets (means) were easily identified. In the case of "deny use of infrastructure", we targeted small airfields and airstrips in the operations area.

However, instead of using traditional lethal weapons, such as bombs or air-delivered mines, our recommended weapons were obstructions placed in the take off and landing areas. The recommended component for execution was the NRF Land Component Command (NRF LCC). Analysis of other effects led to targeting of aircraft operators and pilots, using psyops, to discourage involvement in smuggling. These are two examples of targeting opportunities that were captured and actioned as a result of good effects analysis. Moreover, the relevance of these targets to the DJTF's desired effects was easily demonstrated to the Joint Targeting

Working Group (JTWG). However, our nomination of the LCC to achieve a desired air effect raised eyebrows at both the joint level and LCC HQs. This is contrary to the more common scenarios in which the LCC would nominate targets for attack by the ACC in support of land objectives. However, the target nomination process is about identifying the targets each component requires to be engaged and a major responsibility of the JTWG is to prioritise and allocate targets to the component best suited to engage.

Clear link of targets and effects

The need to synchronise operations during PSOs and the need to clearly link targets to specific effects will drive changes to the NATO target nomination process. So what is the impact for the targeteer? The answer is more detail, and more detail means a better targeting

solution. Some may be concerned about having too much detail in the plan and trespassing on the tactical commander's turf. However, if accomplished correctly, we are putting more effort into defining what is to be accomplished (the effect) instead of how to accomplish it (the means).

In NJ 05, we found that in contrast to very broad OPLAN or Joint Coordination Order (JCO) objectives, DJTF and component-level desired effects are much more focused. This clearer guidance makes the targeteers job easier but it requires more time up front in the planning process to absorb changes to the desired effects.

Even pace of target adjustment

The most time-consuming analysis will be accomplished during the Joint Operations Planning Group (JOPG) and Air Operations Planning Group (AOPG). A good analysis of the required effects will require little adjustment over time and advancing to the next phase of an operation tends to be a gradual adjustment of desired effects and the means to accomplish them. The

result, in the end, is a more even pace of target adjustment rather than an all-at-once replacement of the Joint Prioritized Target List (JPTL) with each new JCO.

On the back end of the targeting process, having well-defined and agreed desired effects helps us to focus our combat

“On the back end of the targeting process, having well-defined and agreed desired effects, helps us to focus our combat assessment efforts”.

assessment efforts. Under the traditional process, the focus of combat assessment was on mission accomplishment (Phase I Battle Damage Assessment, BDA), physical and functional target damage (Phase II BDA), and overall target system damage (Phase III BDA). Phase II is not timely and physical or functional damage does not provide a complete picture of our progress towards objectives. Using

an effects-based approach, we can fuse information from operations (achieved tactical effects), traditional BDA (confirmed tactical effects), and intelligence (observed operational effects) to form a more complete picture of our progress. Figure 3 illustrates one example of an effects-based assessment.

Learning through exercises

While JFC Naples and CC Air Izmir have been innovative in exploring Effects-Based-Operations, NATO as a whole has some distance to go before institutionalising this capability. We have learned a lot through our collective experiences in the NRF exercises of the recent year. The targeteers of CC-Air Izmir have already recognized several advantages to its implementation.

The bottom line is better guidance, better targeting solutions, a better basis for combat assessment, and, perhaps most importantly, better coordination across the NRF. As we see further development and formalization of this process, I'm certain we'll see some thinning in the fog of war. ■

Effects Based Assessment				
AIR OPERATIONAL EFFECT: No Air Smuggling				
AIR SUB-EFFECT	Ops	Means	Intel	Comment
Airspace Denied				All detected aircraft diverted. CAPs flown as planned. Intel indicates possible air resupply.
Smuggling Discouraged				1 Cargo Company not contacted. HUMINT indicates pilots not discouraged. Intel indicates possible air resupply.
Infrastructure Denied				No unauthorised ops detected. All known local landing areas obstructed. Intel indicates possible air resupply.

Fig. 3

NATO Air Operations in a Joint Environment

Interview with Lieutenant General Jean Patrick Gaviard, Chief of Air Defence and Air Operations, FRA A



Photos by French Air Force (3)

Lieutenant General Jean-Patrick Gaviard, The French Air Force Chief of Air Defence and Air Operations elaborates about his understanding of proactive commanding, the lessons learned during Exercise ALLIED ACTION 05 and his vision of NATO's future Air Command and Control Architecture.

An interview by Wing Commander Pete York of the JAPCC

it events which occurred in Kosovo could not and should not happen again in the future.

Question: You emphasised the unique role played by the Air Commander both in advising the Joint Force Commander (JFC) on air issues and in directing air operations. Do you think that the Air Commander has a greater need to deploy forward with the JFC than the other CC Commanders and does the Air Commander need to remain physically located beside the JFC?

Question: Sir, you recently commented on the need for a proactive operational level of command of operations in order to synergise the activities of the subordinate Component Commands (CC). Amongst other things, you also said that Operation ALLIED FORCE, the Kosovo Campaign in 1999, became unnecessarily protracted and politically controversial. What operational level lessons should we learn from this and how should the military avoid repeating the mistake, especially in relatively low level, outwardly single CC operations? Do you think that single CC operations are at all likely in the future?

Answer: Operation ALLIED FORCE was conducted too deep in current ops. It was a mistake to locate the Air Commander at Vicenza in routine contact with his current ops staff and the Recognised Air Picture (RAP). The result was that tactical level decisions predominated the whole campaign and, to a certain extent, the staff lost sight of the strategic and operational level objectives. This was a major lesson learnt, which has hastened the introduction of Effects Based Operations (EBO). EBO forces commanders to consider which of the components is best placed to achieve a specific effect. This concept is much broader than single CC thinking and because of

Answer: There is no doubt at all in my mind that the Air Commander should be physically located with the JFC. In that position, he is well placed to hold informal discussions with the JFC in order positively to help him develop the Joint Plan, which the Air Commander can agree to and then interpret for the ACC through his Air Operations Directives (AOD). If the Air Commander is located remotely from the JFC he will be limited to VTC discussions, where it is more difficult informally to express opinion and virtually impossible to develop an agreed plan of action. Of course, this holds true for the other CC Cdrs too. I am in full agreement with

the Supported/Supporting CC arrangement, which works very well. During the recent Exercise ALLIED ACTION 05 (AA05), the CC Cdrs developed an excellent working relationship, which served the planning process well.

Follow-up Question: The price the Air Commander pays for deploying forward with the JFC is relinquishment of a major element of control over the direction and support that he can give to the ACC Staff. Do you see this as a problem?

Answer: There can only be one boss. He must retain control and responsibility for all the activities of his command and the whole staff must work together as a team. The Air Commander needs to have the confidence in his staff to do as he asks them, even from afar. That said, in something as complex as operational level planning, misunderstandings do occur. Sometimes it will be necessary for the Air Commander to take an aircraft to fly to his ACC HQ, his CAOC or even a Forward Operating Base (FOB) to explain what he needs. He should, however,

anticipate that 90% of his time will be spent alongside the JFC looking forward. He does not need many people around him to support the JFC; two targets experts from A2 and a representative from A5 Plans will most often be enough. For me, small is beautiful here.



Question: Deployed operations with NATO's CJFACC have clearly shown that communication between split elements of an Air HQ requires massive bandwidth in order to handle the vast data transfer requirement. Has this been a

limitation in your experience with operating the French Deployable CAOC facility and, if so, what have you put in place to overcome the difficulties?

Answer: This is a significant challenge. During AA05, real communications problems arose aboard the USS Mount Whitney [where the JFC and CCs were operating afloat] in rough seas. Moreover, in this exercise, we were not playing with UAV, which would massively increase the bandwidth requirements. We have found that the provision of adequate communications is easier to manage in a national context than within NATO. Nations have national assets, which are not declared to NATO, and it is easier for Nations to procure time on national commercial satellites in much the same way as shipping or airlift would be procured from industry in times of crisis. In even a small operation, the data transfer requirement will be very large. In order to accomplish NATO's ambitions to provide deployable C2, the CIS requirement is fundamental to success. Without



Direction: General Gaviard meets NATO personnel on Exercise ALLIED ACTION 05

it, the Commander must deploy his entire staff, with attendant life support and vulnerability costs or he will be blind and the whole deployability concept will be flawed. Therefore, in my view, provision of a reliable, deployable CIS capability with sufficient bandwidth to handle the full spectrum of deployed operations is of paramount importance. A gateway facility, which enabled the automatic direct interconnection of classified national systems with NATO, was successfully used during AA05.

Question: There appears to be a difference between NATO and national doctrine on whether the Air Commander needs constant access to the Recognised Air Picture at the air operational level. What is your position on this?

Answer: I believe there is a difference between training and reality here. During our recent experience in AA05, the RAP was available to me throughout but I

hardly used it. However, there will be infrequent strategic occasions when the JFC will want to see the RAP; Time Sensitive Targeting (TST) is a good example of this. The Air Commander will need the RAP

“There can only be one boss.

He must retain control and responsibility for all the activities of his command and the whole staff must work together as a team”.

simply to show the JFC in real time what is going on. However, at no time should the Air Commander use the RAP to involve himself at the tactical level; he must rely upon his CAOC Commander to

perform this function on his behalf such that the Air Commander's thoughts and activities can be directed towards the long term and not the short term future.

Question: I understand that you will be leaving your post as the French Chief of Air Defence in the near future. Hypothetically, if you were starting from a blank piece of paper now, how would you design NATO's future Air C2 Architecture?

Answer: Very interesting question. Firstly, I must stress that my answer to this question will represent my military solution; it may not be politically acceptable to either NATO or the EU. Secondly, we should note that only air uses the NATO CC level of command in NRF rotations; both Land and Maritime CCs have used national assets as their NRF CC contributions; the Italian and Spanish NATO Rapid Deployable Corps (NRDCs) and

In action: Two Mirage 2000-5 take off at Darwin, Australia, during Exercise PITCH BLACK 2004



Photo by Royal Australian Air Force



In discussion: General Gaviard talks to Exercise ALLIED ACTION participants

UKMARFOR are examples. I have been very impressed by the way in which both CC-Air Ramstein and CC-Air Izmir have prepared for and stood up their respective deployable C2 capabilities, as demonstrated very successfully recently in Exercise CLEAN HUNTER. Moreover, I see a useful future for the two NATO ACCs in developing doctrine and air policy issues. However, the two NATO ACCs must rely on Nations to fill a Combined Joint Statement of Requirement (CJSOR), to provide logistics support to flying operations and to provide operations, fire and medical support on FOBs. NRFs 5 and 6 have used the French and UK JFACCs as their ACCs.

Increasingly, other nations are also developing their own JFACC capabilities; JFACCs in Italy, Germany, Spain and Denmark are well advanced. Nations could assign not only their JFACC (to provide air C2) but also air forces, their own logistics support and a full suite of FOB support as a complete package.

Therefore, in preference to NRF ACC leadership by the two NATO ACCs, in the medium term, I should like to see national

“I should like to see National JFACCs increasingly taking responsibility for providing the complete ACC, their air forces and support to NRF air operations”.

JFACCs increasingly taking responsibility for providing the complete ACC, their air forces and support to NRF air operations.

Question: As the architect of the French JFACC, you made the brave decision that the chosen operational language in training, exercise and operation would be English. Could you please explain your reasoning for this decision.

Answer: This is a mischievous

question to which I think you know the answer. In Afghanistan, currently there are representatives of 37 different nations. Communication without a common language would be very difficult. In the future, I see more rather than fewer combined operations in which a common language will be needed. Therefore, the ability to communicate across nations will be increasingly fundamental to military credibility.

Personally, I find the ability to converse in English and Spanish, as well as my native French (also a principal language of NATO) is a huge asset, which breaks down many barriers both professional and social. It is my view that organisations like NATO and the EU do not do enough to train foreign language skills. Native English speakers, in particular, could do much more to improve their language abilities, which would be of benefit not only to themselves but also to the organisations in which they work.

Sir, thank you for the interview. ■



New Challenges for NATO

Some Political and Security Considerations

By Dr. Pietro Battachi, University of Florence



Sixteen years after the fall of the Berlin Wall, NATO still seems in search of its identity. There is a rivalry within NATO on whether it should concentrate as an organization for collective defence or should it be an enlarged forum for international security. The priority for NATO is the redefinition of its own spheres of mission and intervention.

From containment to projection

During the Cold War, the Alliance nations shared, under American leadership, the common Soviet threat. It was a defensive organisation, formed to contain the USSR's political aspirations, with any offensive initiatives being very limited and usually in response to Soviet actions. The strategic interaction recalled a common prisoner dilemma: two players with two strategies, cooperation or defection? NATO's options were interdependent, only the lead actor on each side of the opposite block could take decisions, while the others, on the periphery of the international system, were subordinate to one or the other major player.

Today the simple features of the bipolar competition have definitively faded. NATO no longer has to cope with a static threat, but a spectrum of risks including Weapons of Mass Destruction (WMD) proliferation,

terrorism and failed states' proliferation. The old game with only two major actors has been replaced by a multilateral environment composed of world powers, medium powers together with regional interests and political entrepreneurs - producers of organized violence to name a few, all capable of implementing various strategies different from cooperation or defection.

Milestone: NRF - a new era for NATO



NATO's objectives changed from containment of the Soviet Union to the creation of conditions of stability and security outside its own borders. Crisis Response Operations, the non-Article 5 missions, not contiguous to NATO nations' borders, have become the core mission of the new enlarged NATO Alliance as opposed to the more traditional defence of NATO sovereignty embedded in Article 5.

In an increasingly unstable and turbulent international system, NATO represents one of the most important agencies capable of providing resources to fulfil international security concerns. From the military perspective, a transformation process inside the Alliance has been established. Transformation is the process of combining new concepts, capabilities and organizational models in order to exploit or maintain a strategic advantage. The new concepts include the NATO Response Force (NRF) and the capabilities outlined within the Prague Capabilities Commitment.

Extended reach: NATO Response Force

The NRF is the key element of the transformation process, a force maintained at a high operating readiness, flexible and capable of responding rapidly to contingencies anywhere on the globe. Unlike the European Reaction Force, the NRF will be capable of operating throughout the spectrum of conflicts up to high intensity combat. Each NRF is a force package, shaped by contributions by individual member states. It must be able to conduct a forcible entry operation in theatre and be self-sustainable for one month while preparing for the arrival of the follow-on forces.

The shape of the force varies in accordance with the type and the

Photo by Defensiekrant



Flexible: NRF has to be able to react to escalating situations

intensity of the mission; great flexibility is required to tailor the force package to the specific mission and to be able to respond to typical contingencies. The mission spectrum can run the gamut from humanitarian relief operations to peace support operations (PSO). In the first case, the force has to guarantee the necessary security framework, which includes reconstruction and other assistance activities. The forces will not be equipped for high intensity combat, but would be capable of maintaining a secure and safe environment, while preventing the escalation of violence.

In the PSO case, the objective is similar to Operations DELIBERATE FORCE and ALLIED FORCE; to modify the political conduct of an antagonist forcing him to accept externally and internationally agreed (UN or NATO) conditions. It requires the capability to insert a ground force in theatre capable of achieving the defined political objective and the ability to carry out air and maritime operations appropriate to support the land operations. During PSO, the NRF will be an instrument aiming to maintain the status quo on the field while, during peace enforcement operations, it will become a coercive instrument able to modify the status quo to its own advantage. The new transformation process raises questions about NATO's political decision-making

process, particularly if it is still up to the task. The Alliance must be capable of making rapid decisions; therefore a fast and easy procedure needs to be developed to allow for short notice employment of the NRF. This requirement needs to be understood by all the member nations including new ones, who might have joined the Alliance for different reasons and might see the security challenges in a slightly different way.

Improve consensus development process

On the one hand, each member nation will have to speed up its national procedures allowing military contingents to be sent abroad. On the other hand, NATO needs to find a common more effective agreed procedure to authorize the NRF employment. This latter issue must balance the national need of each nation being part of the decision-making process with NATO's ability to efficiently and effectively authorise the NRF deployment.

NATO's decision-making process is ruled by the "consensus principle", which in the past guaranteed Alliance cohesion and a harmonization of points of view through a single policy. Today NATO must progress beyond using only the consensus principle. While not abandoning the consensus

principle, NATO must find a way to relax its use in order to avoid not making appropriate decisions. At the substantial level a kind of "double standard" inside the North Atlantic Council (NAC) could be created; having Article 5 decisions (typically cases of collective defence) decided by the consensus principle and a different approach used for non-Article 5 cases.

Each solution implies that a review of the voting criteria inside the NAC is needed. It may be possible to achieve a modality similar to the EU, one based on the so-called reinforced cooperation principle. This principle enables the EU to progress in a specific field in which some of the member states cannot temporarily participate. The process requires all the members to agree on the basic issue of the policy (for NATO this would be an initial NAC level decision) then some nations, for national reasons, would not participate in the operation. The members not participating with their troops would not delay mission preparation once it has been approved by the NAC. The only other solution is the formation of a coalition of countries with a common agreed interest in a specific mission. This coalition could not carry out the mission on behalf of NATO, but it might seek the participation of other NATO nations (coalition of the willing).

It's not yet clear if a review of the NATO decision-making process will take place and, if it does, what shape and manner it will assume. However, it is imperative that, if NATO wants to continue to influence the international scene, the "consensus principle" is revised. Only when NATO achieves a balance between the "great numbers" of enlargement and speedy and effective decision-making, can it be said to have overcome this difficult challenge. ■

Deployable Operations Capability

The NATO Air Command and Control System

By Kenneth Nesbitt, ThalesRaytheonSystems

Deployed operations will be a central feature of future NATO real-world operations and training activities, particularly those associated with the NATO Response Force (NRF). The



Photos (2) by ThalesRaytheonSystems

NATO Air Command and Control System (ACCS) will provide unified air C2, which will enable NATO's European nations seamlessly to manage all types of air operations over their territory and beyond.

The system will enable the integration of air traffic control, surveillance, air mission control, airspace management and force management functions. ACCS is designed to update NATO Air C2 capabilities with a modern, flexible system, which includes the ability to support deployed operations worldwide, with reach back into the NATO static air C2 system.

The first phase of the ACCS Programme will field two types of entity in both static and deployable configurations. In Combined Air Operations Centres (CAOC) and Deployable CAOCs (DCAOC), ACCS will provide the capability for planning, tasking, coordination,

monitoring, supervision and reporting of all assigned resources and air operations. Tactical ARSs (Air Control Centre, RAP Production Centre, Sensor Fusion Post) will provide the coordinated surveillance, identification, air mission control and air traffic control inputs. The Deployable ACCS components (DAC) will have the same operating software and the same capabilities as the fixed ACCS sites. However, the deployable units offer the advantage of being scalable in size and composition to match the level of activity of the specific operation.

The DCAOC will have identical functionality to a static ACCS CAOC. The DCAOC will also provide interoperability to other C2 systems such as the Interim CAOC Capability (ICC) and Theatre Ballistic Missile Control System (TBMCS). The deployability concept configures the DCAOC equipment to be packed in transit cases, which can be rapidly transported by air, land or sea. There will be two Deployable CAOC Units, one based at Udem, Germany, and the other at Poggio Renatico, Italy.

The Deployable ARS (DARS) receives and integrates the sensor and data link picture from all contributing sources to form and distribute the Joint Environment Picture (JEP) to C2 participants. A full DARS configuration will comprise 11 ISO containers, comprising 7 Ops Shelters (OS), 2 Link Support Shelters (LSS) and 2 Transport Shelters (TS) for equipment and logistics support. The 7 OS's together can provide a

total of 56 operator work positions and a capability to execute an Air Tasking Order (ATO) of up to 1000 sorties a day. However, as mentioned already, the number of shelters and thus available work



positions, can be adjusted to suit the planned scale of operations.

Use of the same hardware, software and procedures in the DAC as those used in the static ACCS units will greatly reduce the training requirements for staff manning the deployable units. Moreover, the ability to quickly augment the DAC with internationally mixed crews will be simplified.

The DARS implementation for NATO is well advanced and the initial contract phase, called DARS First Article, is nearing completion with testing scheduled to be finished in Dec 2005. DARS First Article will deliver 5 shelters, one of each type, 1 OS, 2 LSS (comms and data links), and one Transport Shelter for logistics. Once NATO accepts the DARS First Article shelters, the six remaining Operations Shelters will be completed and the full DARS system will be delivered. ■



Preparing the Warfighter: The Work of the Joint Warfare Centre

By Air Marshal Peter Walker, GBR A
Director Joint Warfare Centre

This is an important time for the whole subject of operational training, not least because of the advent of the NRF. The new NATO structure reflects the importance of training and both the Joint Warfare Centre (JWC) and its sister organisation, the Joint Force Training Centre (JFTC), have key roles in mission training. As we work to develop our collective responsibility to see how we can improve our contribution to NATO and to share knowledge of best practice where we see it, we must work together across Allied

Command Transformation, the Centres of Excellence (COEs), the JFTC, the JWC and the Operational Commands to do what we can to improve the performance of those Staffs that support the Command of Operations.

The reality of sustained operations

As NATO becomes more involved with sustained operations, such as the ISAF mission in Afghanistan, and continues to develop new capabilities such as the NATO NRF,

we can relieve the Operational Commands and the supporting Components of the demands of training and the development of new concepts. This is the primary role of the JWC. The NATO site at Jättå, Stavanger is the home of the JWC. A temporary 2-storey building is being erected on the upper car park to accommodate the JWC staff whilst the current building is extended into the new training and experimental centre. The terms of reference for the JWC, issued by the Military Committee, require the Director to:



Photo by German Armed Forces

Joint Exercise: C2 aboard HMS Invincible during Exercise NOBLE JAVELIN 05

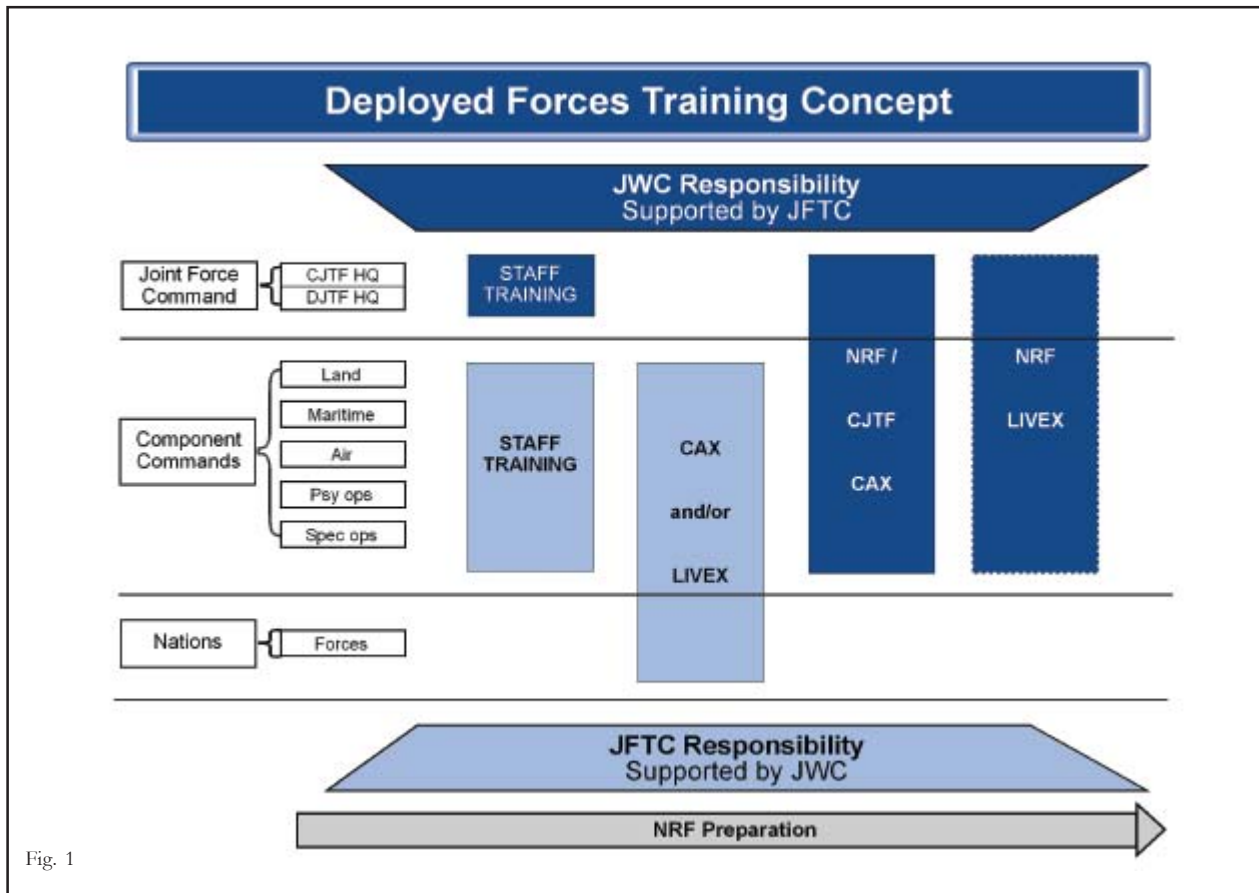


Fig. 1

- Promote and implement NATO's joint and combined experimentation, interoperability and doctrine development process.
- Conduct and enhance joint and combined training at the operational level in support of the operational commanders.
- Assist Allied Command Operations (ACO) in conducting the evaluation of collective Battle Staff Training.

The Director of the JFTC serves as the focal point and centre of expertise for NATO Joint Operations and Warfare at the tactical level and, as a priority, provides support to the NRF component commanders in the training and exercising of the NRF. JWC's and JFTC's responsibilities complement each other: whilst JWC concentrates at the Joint Force command level, the preparation of components to operate within a joint environment is a JFTC responsibility. During

the NRF training, when components operate under a joint HQ, JFTC will support the JWC by providing EXCON support at the Component level as shown in the Figure 1 above.

If that is our mission, how is it executed? The short answer is through the exercise and training programme. At the JWC we have been working hard to establish our reputation as the first port of call for training and this year we have successfully conducted exercise ALLIED ACTION to qualify Joint Command Lisbon for the NRF command. The JWC played host to both Strategic Commands at their annual Strategic Conference, ALLIED REACH. We have conducted training for Iraqi key leaders and hosted, for Joint Command Brunssum, pre-deployment mission rehearsal training for the ISAF headquarters.

As I look to the autumn programme of work we will host another Iraqi training event and we

will conduct the next NRF exercise with JC Lisbon, Exercise ALLIED WARRIOR. At the same time we will be assisting JC Brunssum in the preparation for next year's exercise round, which will include an out of area exercise for the NRF and further work on the ISAF mission, as NATO looks to the further expansion of the ISAF Area of Responsibility.

The JWC Training Delivery Model, showing the different elements that interlock to provide a coherent and complete exercise organisation in support of the operational commander's training objectives is shown in Figure 2. Where possible HICON and LOCON will be provided by the real organisations – by SHAPE, from within the components and, for example, the International Committee of the Red Cross and the United Nations Assistance Mission in Afghanistan. I am quite confident that the JWC and the JFTC cannot do all this work by themselves; we will have to draw

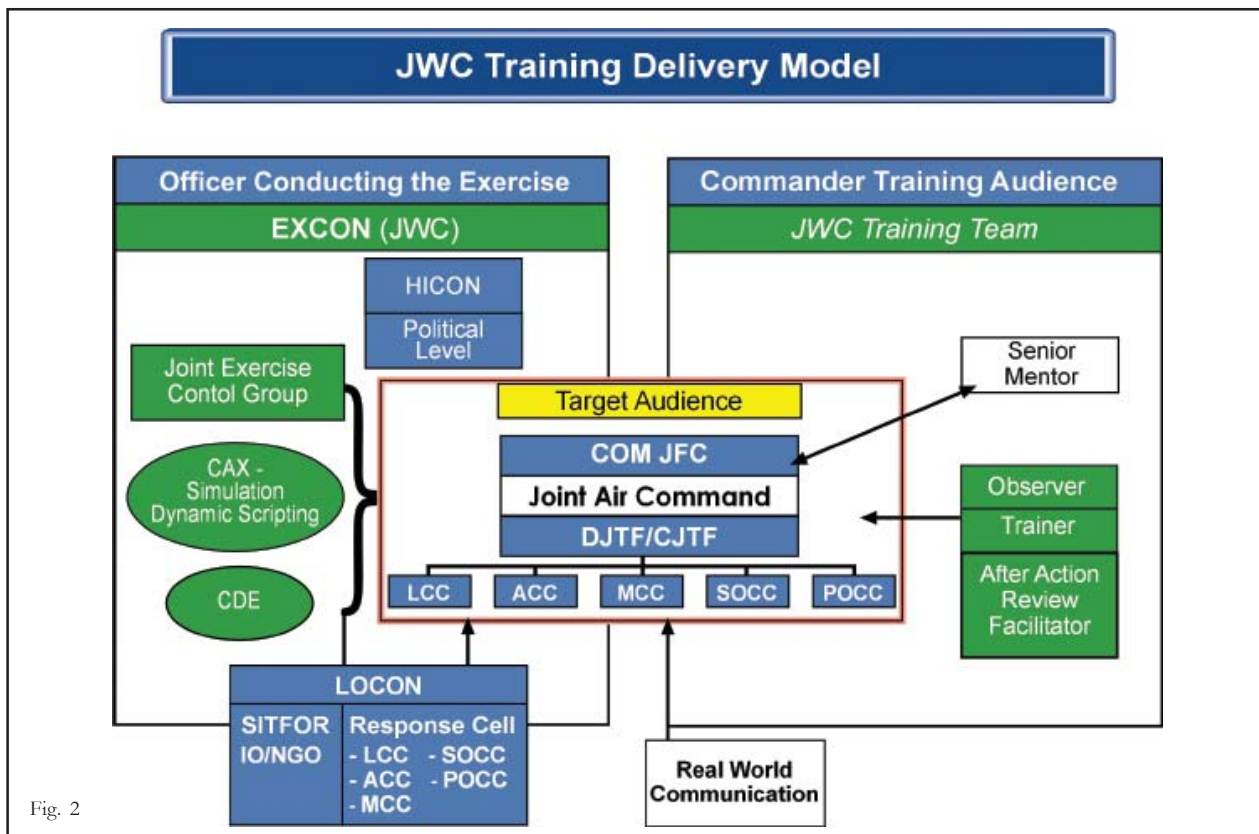


Fig. 2

on the experience of staff from across the Alliance in order to continue to deliver a quality product. We have to encourage a supported-supporting mindset that looks for subject matter expertise for our mutual gain. The JAPCC can contribute to this work and make a mark on the Transformation of the Alliance. We are clear in both the JWC and the JFTC that we must have a relationship with the COEs and in our terms of reference we are encouraged by the MC to develop these relationships.

We see a number of mutual areas of interest and coherence: we look to the COEs, as a resource for expertise, to augment our own observer trainers who may not have the relevant experience or training in air matters. This role requires staff who can watch a headquarters staff in action and provide advice, guidance and if necessary some training, in order to improve performance. The JAPCC will have a key role in identifying areas where our doctrine is out of date or not relevant to the new world we live in. We will look to the

COEs to develop this doctrine for advancement through ACT. The JAPCC should also look for opportunities to test and integrate new concepts into the

"The JAPCC will have a key role in identifying areas where our doctrine is out of date or not relevant to the new world we live in.

We will look to the Centres of Excellence to develop this doctrine for advancement through Allied Command Transformation".

training environment, through close cooperation with the JFTC. It will have a valuable role to play in identifying best practice amongst the Air C2 community and then promoting and publicising best practice for the benefit of all practitioners. There

will be other tasks as the relationships between the organisations develop and I see a role for the JAPCC in enhancing the air element of our ISAF training, by drawing on the experience of those who have served in the Tactical Air Operations Centre. Other tasks could include writing a guide for the air liaison officers, who are often augmentees, so that, as they deploy in support of a particular commander, they have a point of reference for their work.

These are all ideas that will develop over time and will require work to address tertiary issues such as funding responsibilities, but we should not see these as impediments. This is an interesting time to be in NATO: we have never been busier and we have never lived in a time when the enthusiasm for development and change has been greater. The JAPCC is an integral part of this new paradigm and we and the JFTC look forward to a mutually rewarding relationship as we all take the training of deployed NATO forces forward. ■

The Joint Air Power Contribution to the NRF: A Land Perspective

By Lieutenant General José Javier Arregui Asta
Commander NRDC-SP & NRF (5) LCC

Photo by SPAF

The NATO Response Force is a high readiness, joint and combined force, capable of performing certain missions on its own, of deploying as an initial entry force that prepares the theatre for follow-on forces, or providing a show of force. In all of these missions the strength of the NRF must be proportional to the scenario. The NRF may be deployed as a stand-alone force for crisis response such as Non-combatant Evacuation Operations (NEO), Consequence Management (Chemical, Biological, Radiological

Nuclear (CBRN) events or humanitarian crisis situations), Crisis Response Operations (CRO), including Peacekeeping, Counter Terrorism (CT) operations and embargo operations.

The NRF could be deployed as an initial entry force to facilitate the arrival of follow-on forces in a Joint Operations Area from a benign up to a hostile environment, with or without host nation support, (e.g. peace enforcement), or as a demonstration force package, in order to show the resolve of member

nations (quick response operations to support diplomacy, as required). Spain's NATO Rapid Deployment Corps is commanding NRF 5 (L), after successfully achieving a demanding certification process culminating last May in Exercise ALLIED ACTION 05. During this period, we had the opportunity to train with different components in a real joint team and to gather important lessons to set the conditions to maximize joint planning and campaign execution in the complex theatres where the NRF will be deployed.

Wide range: NRF can be deployed as an initial entry force or as a demonstration force package



Photo by Defensiekrant

Demanding: Projection of force - a complex task



For the purpose of this article, I will focus on Air/Land cooperation, sharing my Land Component Command (LCC) Commander thoughts in order to enhance the contribution of Joint Air power.

The NRF theatre of operations could vary from semi-hostile to permissive; possibly from well-found bases to bases with little Host Nation Support (HNS). Such operations could also face asymmetric threats and a non-linear battlefield. Nevertheless, the key point is that the projection of the force will always be complex and truly demanding, due to distance, the availability of Sea Ports of Debarkation (SPOD) and Air Ports of Debarkation (APOD), and the amount of equipment to deploy.

Strategic airlift will be needed to deploy quickly and the current shortfalls in the CJSOR will clearly create constraints to the NRF deployment. We all know that NATO should address these shortfalls, but they must be considered as a major problem to the capability to react quickly against the emerging threats of our times.

During AA 05, within the Zoran Sea scenario, in order to deploy the NRF Land (L) light forces package that was required to open and secure one APOD and one nearby city (three battalions and some combat support units), the

planners raised the need for ten strategic transport and fifteen tactical transport planes. These were not listed in the CJSOR. This will represent a key challenge for NATO. Rapid response implies enough airlift assets. The nature and size of the NRF (L), a light-medium Brigade plus LCC units, must be recognized by the Joint Command and the other



Joint: Ground manoeuvre and close air support

components as a vulnerable force at the initial stage of the projection, with limitations to conduct combat operations as a stand alone force, thus requiring full support from the other components, with the ACC playing a major role. Shaping the battlefield by securing no fly areas, providing air superiority, controlling the Joint Operations Area (JOA) airspace and contributing to Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR), will be critical JFACC tasks in support of the NRF(L) during

initial entry and the arrival of follow on forces. During AA 05, the majority of incidents gave all components the impression that these types of operations will be land-centric, with the main effort overburdening the NRF (L), from securing APOD and land lines of communication (LLOC), to protecting humanitarian relief and supporting HN security forces. Only an understood designation of the LCC, as the supported command and a flexible, and perhaps, collocated air land structure, can overcome the challenges of developing a clear and fast decision making process and execution of air support.

The synchronization of ground manoeuvre with close air support, although a LCC responsibility, will also raise new challenges in this new NRF framework. Many possible targets will be blended with the population and located in urban terrain, they may present a low signature and be protected by Man Portable Air Defence Systems (MANPADS) and Rocket Propelled Grenades (RPG). Close Air Support (CAS) requests and execution will demand positive control by Forward Air Controllers (FAC)/Tactical Air Control Personnel (TACP), embedded with ground units, to avoid collateral damage and fratricide. The LCC staff, mainly the fire support element, will integrate all lethal and

non-lethal fires needs and will send them to the Joint Targeting Working Group (JTWG) for approval. The execution of this Air support will be coordinated through the joint fires and air space management cell (JFASMC) inside the LCC Operation Centre, where Air Operations Coordination Centre (AOCC)/G3Air/FSE representatives will de-conflict airspace and clear the air support missions. Enhancing AOCC/LCC coordination and clearance of CAS, through fast and shared Computer Information Systems (CIS) assets with the Combined Air Operations Centres (CAOC), will improve reaction time and create safe routes to hit those sensitive targets that threaten the NRF land units.

The laws of modern warfare have brought new constraints to Commanders. The Rules of Engagement (ROE) will always be reactive to the opposing forces' actions and limit the deterrence capability of the Joint Commander. Joint Air Power will be one of the most important factors for deterrence, but the ROE will create additional problems for clearance of the fires in support of the NRF(L).

Non lethal-fires will assume a major role in these scenarios, and the main effects will no longer be achieved by the use of massive or precision fires, but by the synchronization of a joint information operations campaign. The challenge will be to smooth and speed up the process of changing or putting into effect a new ROE in order to be executable within the possible timeframe. In the modern battlefield, targets will appear and will threaten vital assets and disappear or assume passive modes very quickly. ROE changes should react accordingly to sustain Joint Force credibility and our force protection. Another key issue is,

without doubt, the interoperability between the different Joint Force Air Component Command (JFACC)/CAOCs and the LCC/AOCC, through the sharing of CIS tools like the NATO SECRET (NS) (ICC) and MISSION SECRET (MS), like the one implemented to command and control LCC units in NRDC-SP. This issue, although under study, is creating real constraints to the maintenance of the reach back, due to the problems of sharing information between the two CIS platforms. With the JFACC deployed far away from the CAOC, and the NRF/AOCC also deployed, the sharing of a common picture will be paramount to

Continuity: Information-flow from planning to realizing joint and combined operations worldwide



Photo by Defensiekran

provide accurate air support to land operations. We must solve this issue, case by case, on each NRF, due to different MS platforms currently in use by the different NRDCs.

All these points must be embedded in the planning process by joint commissions and boards, at all levels, interchanging and developing the OPLAN and the related Components' supporting plans with a common picture and the vision of the Joint Commander.

A strong LCC liaison team, with clearly delegated authority, the correct rank and fully aware of the land component commander's intention, deployed to the JFC, JFACC and CAOC, and the proper Air Liaison Element (ALE) and AOCC deployed to the LCC/NRF, will set the conditions for success. During AA 05, the deployment of a flag officer to the Joint Coordination Board (JCB) and a Ground Liaison Element (GLE), supported by LCC/CIS, both to the JFACC and the CAOC, was the right way to have a common Land and Air picture and to speed up the time between request and support.

In summary, the NRF LCC needs Joint Air Power from the beginning of the operation: initially to rapidly project the ground forces to a distant Theatre of Operations (TOO); subsequently, to support the forces during the land-centric operations, in an economy of land forces scenario. To attain the best result, land and corresponding air staffs must work in close coordination and share a common understanding of the situation; jointness is a must to achieve success in the NRF. We have the right tools to do this, through our liaison teams and boards, such as the GLE, ALE, AOCC, JFASMC and others; our main asset is the will to plan and fight as a team.

Finally, I must conclude that NRF(L) will need support from other component commanders when deployed to a distant TOO and within the short notice to move. Joint Air Power will play a key role to overcome the challenges of deploying the force. As the doctrinal concept of the NRF develops, the major way ahead to maximize air power will certainly be through joint and combined training and by finding new solutions to improve the way we fight the new threats anywhere in the world. ■



Photo by Royal Air Force

By Air Commodore Martin Halsall GBR A JAPCC

Distributed simulation has attracted many acronyms: Distributed Mission Operations (DMO); Mission Training through Distributed Simulation (MTDS); Networked Operations in a Virtual Environment (NOVE); and now NATO SMART, Simulated Mission And Rehearsal Training.

Significant advantages and low risks

However, regardless of the tag applied to it, the linking of mission simulators of various types, located in different countries often separated by thousands of miles, in a virtual air battlespace, is a hugely impressive concept. Furthermore, it has highly significant operational, financial and environmental advantages and, given the extensive experience already gained nationally and through multilateral arrangements, is relatively low-risk and cheap at the price! Whilst unashamedly for this journal, I am focussing on the applicability of NATO SMART to the Air Component Command (ACC), I should point out right at the start that our land and maritime colleagues have also made great

strides in this area. Only recently, a 3-star Admiral encapsulated the impact of his latest DMO exercise by stating that... "On the evidence of what I have seen over the past few days, it is conceivable that the Fleet will no longer have to put to sea to train, we can now do that effectively whilst tied up in harbour. We will go to sea either to validate or to fight." Armies too have rapidly adopted the DMO concept and the sophistication of the Land Component Commander's virtual battlespace on the ground and in the air is evolving at a startling pace. This is no time to sit back and trot out the "air forces alone are at the cutting edge of military technologies" maxim.

That said, the air environment has been selected by Headquarters Strategic Allied Command Transformation (HQ SACT) to be the lead environment for the NATO simulation project, NATO SMART. The initial idea of developing a NATO capability in this area was advanced by the NATO Research and Technology Organisation (RTO), which initiated a seven nation Technology Demonstrator (TD) Exercise

FIRST WAVE, which took place in November 2004. This TD proved the concept: air simulation systems from 5 nations operated successfully in a virtual environment, controlled from a Distributed Mission Operations Centre in Scotland.

Enormous challenges and many traps

The challenges were enormous, even though, in theory, there were no technological showstoppers. After all, the Americans had been practising DMO for at least six years and were getting more and more adventurous in their level of ambition. However, as a first NATO effort, the traps were there, not least the challenge of security. Once linked to the system, nationally protected information held within the simulators database could be exposed to all other users and would have to be sanitised. Obviously this raised fundamental concerns amongst some nations, but unfortunately too late in the planning to allow a solution to be found or to avoid the withdrawal of two nations' simulators. This remains a difficult area. In most other respects, FIRST WAVE was

a success and satisfactorily proved that the concept was worthy of further development.

Significant operational flexibility

Since then though, transitioning the project from the RTO (research and development) environment to a more focussed operational concept has been challenging and SACT needed the assistance of a knowledgeable partner. At about the same time, the JAPCC was forming and as one of its first tasks assessed that this was a transformational development that had huge potential. Not only did it seem to offer great operational flexibility and value for the new NRF concept, but also it had significant positive financial and environmental implications too.

The operational flexibility offered by NATO SMART covers many aspects of the application of Alliance air power. It will, for example, permit a realistic, complex air scenario to be practised which could involve all the elements of, say, a Time Sensitive Target (TST) engagement: detection by Intelligence, Surveillance, Tracking and Reconnaissance assets, air C2

through a Combined Air Operations Centre and/or an E3, engagement, using Special Operations Forces or a Forward Air Controller, and post-attack assessment; the command group role in the decision making process could also be exercised if required.

A simulated information exchange system (eg Link-16) could be used routinely in a way that would be almost impossible to create in a LIVEX because of frequency and other restrictions. The scenarios used could be specifically tailored to both air-centric (RENEGADE) and joint mission rehearsal, and it is here that the JAPCC sees huge potential for the preparation and accreditation of mission-ready air forces (and air support to the LCC) for the NATO Response Force (NRF).

Financial benefits from many sources

Similarly, this is where the first tangible financial benefit can be identified. Experience to date would seem to suggest that nations are unwilling adequately to meet the requirements of the Combined Joint Statement of Requirement (CJSOR) for future NRF

commitments because of the prohibitive costs of preparation, certification and rehearsal training – much of which could be achieved through the sophisticated simulation networks that SMART provided.

Other financial benefits would accrue from using live flying only for core tasks and/or reduced training deployments, once nations (and more importantly, the aircrew) were convinced of the validity and value of SMART training. Environmental benefits are obvious and would also be a useful bi-product of a measurable shift from real to simulated sorties, to be exploited whenever the military came under pressure from environmental lobbyists.

Direction and guidance to new operations

The first NATO SMART Steering Group meeting took place in late August 2005 at the JAPCC, chaired by the author of this article. This allowed direction and guidance to be given to the new operations and training working group, also chaired by a JAPCC staff officer, to start its crucial work in developing the users' needs and in planning the finer detail of the SMART event planned for late 2007 or early 2008. In this way, I hope that some momentum has been injected into a very worthwhile project that, for various reasons, had begun to lose its way.

NATO SMART will offer operational flexibility in a cost-effective and environmentally friendly way. It will allow mission rehearsal, particularly for the NRF, on a scale and complexity almost impossible to replicate on a live basis, which will revolutionise the way we train and result in an operationally "smarter" NATO air community, more effective, more responsive and better prepared for the complexities of today's world. ■

Opportunity: Simulation offers great mission rehearsal

Photo by US Air Force





Do we still need *“the man”* in the cockpit?

By Colonel Hans Wolf DEU A, JAPCC

Photo by US Air Force

Once upon a time, in the part of the world NATO calls “The Southern Region”, an ingenious man named Daedalus and his son Icarus tempted the gods of their era by strapping on a glued contraption of artificial wings and taking to the air in good faith. They believed that flying would be the only way to get them away from Minos in Crete. Icarus grew exhilarated by the thrill of flying (which most flyers will understand), got too close to the sun-god Helios when his wings disintegrated and he crashed into the deep blue sea.

Trial & error brought success

With regard to effects-based operations, this cannot really be called a success story but it certainly inspired followers to find safer ways of getting airborne, staying aloft, and making landings one can walk away from. The multi-talented Leonardo da Vinci was one of the genius proponents of flying some centuries later, devising numerous plans for flying machinery, albeit all designed for human beings in control onboard and never flight-tested. After a

painful period of extensive trial and error, aerodynamic and space flight operations eventually became a successful routine with the exception of some inherently residual risks, most of which are under-estimated, negligently disregarded, or not recognised early enough by the operator himself or by his designated maintainers. Manned space flight seems to have passed the apex of its importance, so it seems, pending far-reaching technological and physiological developments to explore and use the deeper solar system (and beyond) in the future.

The current vehicles must be replaced to achieve future objectives in space at a lower risk, as we all have witnessed during the most recent space shuttle flight to the International Space Station in orbit and back to earth. But why are we talking about “manned flight”? The other sex has come a long way and women have also found their way into cockpits of aeronautical and space vehicles. Their successful employment as space shuttle commanders or as civilian and military aircraft commanders is not unusual

anymore and will inevitably become more common. The time is here when not only flight attendants may become pregnant, but pilots too (my sincere apologies to women’s lib for this politically incorrect notion).

When we talk about “unmanned flight”, we do not refer to a previously unknown gender, but rather want to express that no human being is involved. However, this is not entirely true, if one considers remotely controlled flying machines where a human operator makes control inputs while staying on terra firma. Future levels of automation might enable us to sit back, relax, and observe vehicles to launch, fly, and land autonomously, i.e. without any controlling action by a human being.

Exotic visions of future technology

This article focuses on UAV-technology developed to remove the human being from the cockpit. The advancements in the area of miniaturisation, micro electro-mechanics, and morphing

technology are another exciting domain of the future and deserve special consideration in subsequent publications. The existence of even more exotic visions such as mote technology (e.g. SMART DUST) are acknowledged but must be reserved for future articles in this journal. This article assumes further that the reader appreciates the inherent qualities and characteristics of air and space operations in general and their value for military applications in particular.

Just to make sure we are singing from the same sheet of music, the following definition of UAV is offered for convenience:

- UAVs are vehicles sustained in flight by aerodynamic lift and controlled without an onboard human being.
- UAVs may be recoverable or expendable.
- UAVs may be operated autonomously or remotely.

This article examines the advantages of removing the human from onboard control of aerial vehicles.

The answer might be found by looking into the following areas of key interest:

- Less risks for humans whilst airborne.
- Less flight-physiological limitations for humans.
- More effects-based effectiveness.
- More effects-based efficiency.

The airborne/spaceborne human will always be exposed to risks stemming from technical failures, flight physiological limitations of the human body, and most importantly, late or no recognition of imminent risks in conjunction with flawed decision-making processes in critical situations.

Risks & threats affect the safety

Specifically in military operations, the risks or even threats created by opponents affect directly the safety of airborne/spaceborne human beings. To a certain degree, acts of terror fall into the same category,

albeit under a different combination of factors. Nevertheless, the detrimental effects are identical for the individual human being, i.e. being a matter of life and death. The possibility of being killed during air/space operations will influence the human being in onboard control of such operations and dilute the effectiveness. This can range from complacency to somewhat reduced aggressiveness or even to complete refusal, unless the mindset is that of a kamikaze pilot or suicide bomber.

Unquestionably, the use of UAVs will eliminate the risk of being killed whilst airborne/spaceborne. However, mental and physiological consequences of controlling UAVs from the surface may result from trying to control the mission under adverse circumstances. Stress will probably have the main distracting influence on operators sitting in front of a remote control console without any seat-of-the-pants feedback. This factor can only be eliminated by fully automated, autonomously operating UAVs following a predetermined mission plan with no or very limited capabilities to respond automatically to external influences or to be dynamically re-tasked.

UAV technology delivers constant improvements in sophistication, thus providing better effects-based results by progressing from sensor-focused to delivery-capable systems, composed of a ground station, appropriate communications architecture and usually multiple air platforms. Payload packages offer a variety of tactical applications, only limited by weight, size, and power supply requirements.

UAVs provide extended on-station times, i.e. long loiter

Supremacy: UAVs can be operated remotely, reducing human risk



Photo by Boeing Company

Painting by Carlo Saraceni
"Caduto di Ikaros"



Development: Growing sophistication from Icarus.....

and long endurance. UAVs are perfectly suited for the dull, dirty, and dangerous tasks. Quickly advancing developments make UAVs also a first choice for the glamorous and glorious tasks as well.

Growing sophistication drives costs of acquisition, operation, maintenance and repair up to a point where UAVs lose one of their original attrition-related advantages. Modern, state of the art UAVs are not necessarily disposable or easily replaceable, especially when being configured as integrated sensors, as laser designators, as tankers or as weapons platforms, for example.

It seems that a modular family of complementary UAVs can provide the affordability, together with the combined and joint usability needed by the military. The military domain must stay away from being a technology-maturing agency and refrain from prematurely employing nice-to-have but technologically unstable systems. This risk must remain with the developing defence industry.

Will the employment of UAVs reduce the requirement for "the man-in-the-loop"? Our assessment is that "the man" will always be in the loop, albeit in a

different place with different functions and different challenges to be mastered.

However, the actual employment of UAVs must be closely coordinated with other air and space movements, not only within a limited operations area but also for transit to and from their operating bases and areas, which could be quite far away, where they might be operating "pilotless" in non-military airspace.

The civil air traffic control organisation has some very specific concerns with mixing piloted and remotely controlled or fully automated systems in the same airspace. These must be resolved quickly in order to ensure a fail-safe operational air environment. The military community has the

leading responsibility for that and must provide robust, reliable concepts to other airspace users. Talking about the civil world, they are the majority out there and will definitely develop into UAV customers in the future. This could accelerate the further developments much faster than expected by some senior planners. It may also develop into a very competitive market, making UAVs more affordable but high-tech payloads more expensive.

UAVs have begun to earn their widely acknowledged place in the world of aviation and are a most welcome complementary capability for a broad arena of future applications – they deserve growing attention, even if they just do the dull, dirty, and dangerous jobs for us. And yes, we do need "the man" in the cockpit for some time to come, until technology delivers computers that are capable of taking the right (or wrong) on-the-spot decisions in flight. But will computers ever be able to enjoy the sentiments expressed by John G. Magee, Jr.'s poem "High Flight"?

Everybody should be privileged to enjoy such an almost religious experience. Since the JAPCC is a future-oriented, transformational, non-profit agency, we are currently considering offering free seats on the first unpiloted A380 passenger flight from Weeze to London Stansted.

Welcome aboard, you all! ■



... to FILUR: Sweden's stealthy UAV demonstrator

Photo by SAAB Technologies

‘High Flight’

by John G. Magee Jr.

*Oh! I have slipped the surly bonds of earth
And danced the skies on laughter-silvered wings;
Sunward I've climbed, and joined the tumbling mirth
Of sun-split clouds - and done a hundred things
You have not dreamed of - wheeled and soared and swung
High in the sunlit silence. Hov'ring there,
I've chased the shouting wind along, and flung
My eager craft through footless halls of air.
Up, up the long, delirious, burning blue
I've topped the wind-swept heights with easy grace
Where never lark, or even eagle flew -
And, while with silent lifting mind I've trod
The high untrespassed sanctity of space,
Put out my hand and touched the face of God.*

NEWS

Overview of current topics

Over the last six months the JAPCC has gone from strength to strength and has been engaged in a wide series of tasks in support of both NATO and its individual nations. These tasks have ranged from looking at current capabilities and making recommendations for improvements to looking at some longer term and more visionary air power concepts and projects. Although still not a year old, the JAPCC has already developed a strong capability across a broad spectrum of air power issues. This article provides brief information on some of the current topics and what the JAPCC hopes to tackle in the future.

The SACT/JAPCC programme of work

In June 2005, Vice Admiral Stricker (Deputy Chief of Staff, SACT) signed a Letter of Agreement with Lieutenant General Schubert, the Executive Director of the JAPCC. The letter set out an agreed programme of work and spelt out how the JAPCC will support SACT in achieving its transformation goals, setting out a range of JAPCC projects that will be tackled over the coming months. Among the JAPCC projects are work on expeditionary air logistics, airlift, force protection, future SEAD, the air concept for joint strike and the SMART project. The JAPCC sees the SACT Programme of Work as a key vehicle for further developing the effective and efficient use of joint NATO air power. We also anticipate that further tasks will be added to the programme as the

New frontiers: JAPCC support to the African Mission in Sudan



Photo by JAPCC

JAPCC gets itself closer to full operating capability.

Establishing contact across NATO

In the last few months the JAPCC has been busy establishing strong relationships with a variety of NATO and external organisations which we believe can help us achieve our transformational air power mission. We have recently completed a series of visits and briefings to major NATO HQs, which has enabled us to establish an effective network of contacts across the whole NATO community, including the NATO Consultation, Command and Control Agency. We were also delighted to hear recently that Romania have agreed to join the JAPCC, bringing the JAPCC international community to a total of 17 nations.

In addition, we have also established good contacts with appropriate national centres of excellence, including a recent series of visits to five US Battlelabs. This JAPCC programme has also generated enquiries from nations, including a request for JAPCC support to lecture at the Belgian Defence College and an invitation to provide a briefing on NATO transformation at the US National

Defence University. The JAPCC has also established good contacts with branches of industry and academia, which we see as important partners in the development of future JAPCC project work.

Transforming Air Power - future deployability

The JAPCC has recently published two important studies, namely the Deployable Airfield Activation Wing (DAAW) concept and a study on Strategic Airlift Support to NRF deployments. Both of these studies are transformational in nature and are currently being incorporated into SACT Integrated Capability Team work.

Improving NATO Air C2

The JAPCC fielded a team of evaluation staff on Exercise CLEAN HUNTER 05, which was held at Soesterburg, in the Netherlands. A key aim of the exercise, and the purpose of JAPCC's involvement, was to examine the underlying assumptions for the Deployable CAOC, including its concept of operations, and to test the capability of the current organisation to meet the laid down requirements.

The JAPCC report provided recommendations on strengthening

the DCAOC capability and also set out actions which should lead to NRF certification in time for NRF 7, and a fully deployable CAOC in 2008.

ALLIED WARRIOR 05

JAPCC staff participated as observers in Exercise ALLIED WARRIOR 05, which was a NRF 6 planning exercise to test the JFACC-JFLC-JFMC lines of communication. Such exercises provide a useful hands-on experience to JAPCC officers on current NATO procedures and working methods and also give invaluable “real time” practical feedback to us which we can then use to inform our project work.

JAPCC support to exercise in Africa

Two members of the JAPCC recently deployed in support of the African Mission in Sudan (AMIS). Wg Cdr Andy Ingham and LTC John Fletcher spent what was a busy but very productive month on the exercise, alongside a number of other NATO personnel. The aim was to support the African Union and the UN in running a CPX in the Darfur region of Sudan for the AMIS force HQ and the eight deployed sector HQs.

The exercise was considered a great success and has paved the way for further capacity building to start in the near future. The two JAPCC officers also felt it was invaluable to see some of the practical issues of such a deployment at first hand and felt it had been a good learning experience for all parties.

UCAV developments

The JAPCC have initiated work to develop a firm foundation in UCAV subject matter expertise

capability. In recent months we have established links with nations who have a strong background in this area, together with other associated centres of excellence, industry and academia involved in research on UCAVs. Beside participating in various NATO UCAV related panels we aim to identify and develop appropriate UCAV projects in the coming months.

C4ISTAR matters

Within the JAPCC C4ISTAR Branch, the build up of ISR/JISR experience is now progressing quickly. Subject matter experts in airborne early warning, air ground surveillance, space operations, Air C2 data links and communications are now in place. Initial contacts with the main NATO C4ISTAR stakeholders have been established and the JAPCC has also begun contributing to some of the NATO C4ISR framework documents, such as the Joint ISR concept and the Alliance Ground Surveillance Concept of Operations. The JAPCC is also making a strong contribution to various NATO working groups, including the Ground Surveillance Operational Users Group, the Joint UAV panel and the Deployed Forces CIS working group.

NATO Air Defence 2020

JAPCC has been asked by SHAPE and SACT to develop a paper concerning NATO's medium to long term requirements for integrated air defence. The paper is seen as a key transformational issue and it will take account of the planned introduction of the new NATO Air Command and Control System. It will also undoubtedly drive future concepts and requirements, including doctrine. We aim to complete this ambitious but vital project by late 2006.

JAPCC Air Power Conference

As the JAPCC Journal goes to press, arrangements are now well advanced for the JAPCC Joint Air and Space Power Conference, to be held at the end of November. The theme of the conference is “How do we ensure that NATO air power remains relevant?”

We expect over 200 senior officers to attend from across the NATO community, together with leading academics and key industry leaders. The key note speech will be given by the Chairman of the



NATO Military Committee. We will provide a full report of the conference proceedings in the next edition of the JAPCC Journal.

JAPCC future work and priorities

JAPCC's efforts in the coming months will be concentrated on the delivery of our SACT programme of work, together with our focus on the NRF, in particular the value that improved, integrated and deployable Air C2 can bring to it. We also see UAVs as critical to expanding the Alliance's capabilities and we will develop a series of workstreams in this area. Air logistics will also continue to be a key priority.

The important point that we would stress to all readers is that the JAPCC is here to provide support to both NATO and its individual nations – if you would like us to help you with a joint air power topic, please contact our Director of Staff via journalads@online.de or telephone +49 (0) 2824 90 2225. ■

Bios



Air Marshal Peter B. Walker, Director Joint Warfare Centre, GBR A, has flown Phantom and Tornado F3 aircraft. He commanded No

111 (F) Squadron, converting the Squadron to the Tornado F3. He completed a tour as the Officer Commanding RAF Mount Pleasant, the Falkland Islands. He has held a number of senior national staff positions including Deputy Director of Operations at the Joint Headquarters (HQ) at High Wycombe and the UK's Director of Operational Capability, later the Assistant Chief of Defence Staff (Ops) where he was responsible for the UK lead of Task Force HARVEST in Macedonia, the initial UK response to the September 11th terrorist attack and for the UK-led ISAF mission to Afghanistan. AM Walker has served previous tours in NATO, in HQ AIRCENT as ACOS Ops and in SHAPE as ACOS Policy & Requirements. He took up his present appointment of Director Joint Warfare Centre in 2005.



Lieutenant General Jean-Patrick Gaviard FRA A, graduated from the French Air Force Academy in September 1971 and was awarded his

pilot's wings in 1975. He has accumulated 4000 flying hours as a fighter pilot on SQN 2/13 at Colmar and on SQN 3/33 at Strasbourg. General Gaviard attended a training course at the Advanced Air Studies Centre in Paris from September 1989 to February 1991. During Operation ALLIED FORCE, the Kosovo Campaign, General Gaviard served in Naples as the French assistant to the Commander Allied Air Forces Southern Europe. Since September 2003 he has been Commander of the Air Defence and Air Operations Command in Taverny. He now works as a defence advisor to the French government.



Major General M Veysi Agar, TUR A, is the Chief of Staff in Component Command - Air Izmir. He graduated from the Air Force Academy in 1974

and was awarded his pilot's wings in 1976. He has accumulated more than 3500 flying hours mainly in training and KC-135 tanker aircraft. General Agar completed the Air Force Staff College in 1973, the NATO Defence College in 1988 and the Armed Forces Defence College in 1997. Amidst many other high level appointments, General Agar has served as the Commander of the 10th Tanker Air Base and Co-Commander of Operation NORTHERN WATCH at Incirlik Air Base, Adana, Turkey.



Air Commodore Martin W. Halsall, GBR A, is the Assistant Director Transformation of the JAPCC. He is a fast jet navigator and has over 2500

flight hours in F4 Phantoms and Tornado F3 aircraft. He previously served as Chief Policy Branch, NATO HQ Allied Forces North Western Europe; Commander British Forces Italy (Air) and Duty Commander in the NATO CAOC at Vicenza; Commander Western Sovereign Base Area and Station Commander RAF Akrotiri, Cyprus, being responsible for the preparation and operation of the Base for the 2nd Gulf War, and Deputy Commander NATO CAOC 3, Reitan, Norway. Air Commodore Halsall is a graduate of the Advanced Staff College in Toronto, Canada. He has recently decided to leave the RAF and will be replaced by Air Commodore Ian Dugmore in early 2006.



Lieutenant General José Javier Arregui Asta - ESP L - joined the Spanish Army as a voluntary soldier in 1960. He has held a range of command and staff

appointments, including with Anti Aircraft Artillery Regiments, the Combined Group I SAM and at the Spanish Military Academy. He was also one of the military instructors for HRH Principe Felipe, Prince of Asturias. He has also completed a tour with the US Army TRADOC. More recently, he has been Commander of the Spanish Canary Island Command. In May 2004, he took up his current appointment as Commander of the Spanish Manoeuvre Forces and NATO Rapid Deployable Corps Spain.



Colonel Hans-Jürgen Wolf, DEU A, is the head of Future Capabilities Branch at the JAPCC. He is a qualified F-104

Starfighter and F-4 Phantom instructor pilot, having a total of 3500 flying hours. He has commanded 74 Fighter Squadron in 1980 and then the GAF F4 Training Squadron in George AFB California. On his return to Germany he commanded the Flying Group of the Fighter Wing Richthofen. He has also served the German Air Staff in Bonn in a variety of air defence related posts, including the acquisition of air to air missiles and the EF2000 Typhoon aircraft. In NATO, he has held air staff posts at both operational and tactical levels. He also had two assignments in the Balkans as Chief of Staff German Military Representative IFOR Zagreb and Sarajevo and Chief JVB and Protocol HQ SFOR, Sarajevo.



Lieutenant Colonel Claudio Icardi - ITA A - is employed in the JAPCC as the Joint Interoperability and Doctrine staff officer. He has a

total of 2000 flying hours mainly as a navigator and flying instructor on the Tornado. He has spent most of his flying career at the 6th Wing Ghedi where he became a combat ready navigator, a package commander and flying instructor. He served as an instructor at the Tornado TTTE in Cottesmore in the UK and later was a founding member of the Italian Air Force Tornado Conversion Unit where he became a flight examiner and standardisation chief. In 2002 he joined the former Reaction Force Air Staff. He was deployed to Pristina – Kosovo as Chief of the Airfield NATO Cell in 2003.



Squadron Leader Tim Harrison, GBR A, was commissioned into the Royal Air Force in 1989. He completed his RAF Regiment

professional training at the RAF Regiment Depot, RAF Catterick. His diverse career has so far included work as a Vehicle Commander, a Ground Based Air defence expert, a Combat Survival specialist instructor and a Close Air Support Advisor to the Army. He has been involved in many operations and exercises, including Operation GRANBY (Gulf War I), in Macedonia during Operation ESSENTIAL HARVEST, in Afghanistan and latterly in Operation TELIC in Iraq.

Photo
unavailable

Major Allen Pennington USA A, is an expert on all matters concerning targeting. He has just completed a tour as the Component Command - Air

Izmir Joint Targets Branch Head and is now a current intelligence analyst with Joint Force Command Naples J2. He is a graduate of the USAF Combat Targeting Course and his background includes tours with the 497th Intelligence Group, the Air Force Information Warfare Centre and most recently as the Target Intelligence Chief and Intelligence Flight Commander for the 4th Fighter Wing during Operation IRAQI FREEDOM.



Colonel Carlo Massai - ITA A - is a member of the Combat Support Branch at the JAPCC. He graduated from the Air Force

Academy in 1982, receiving his wings in 1983. He has spent almost his entire flying career as a pilot of the Italian Special Air Transport Wing, where he occupied the positions of Squadron Commander and Chief Officer of Operations in Ciampino (Rome). In 1998 he was assigned to the IAF Operational Centre becoming Planning and Tasking Section Chief. In 2003 he became a member of the former Reaction Force Air Staff in Kalkar, at which time he was in charge of airfield monitoring activities for SHAPE. Promoted Colonel in July 2004, he is the JAPCC subject matter expert on all military airlift matters.



Dr Pietro Batacchi (MA, PhD) is currently the chief editor of the magazine “Panorama Difesa”. He has a doctorate degree in political science

(University of Florence); a master's degree in international strategic studies (Italian Joint Supreme Military Institute) and is a research fellow doctorate in political sciences (University of Florence). He has contributed to various Italian defence editions like “Analisi Difesa”, “Informazioni della Difesa”, “Rivista Marittima” and portals like “Equilibri” and “Politica Estera”. He has been a research fellow for the Centre of Defence Studies and Security and the Centre of Military Strategic Studies.

Photo
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Mr. Kenneth Nesbitt is an operations advisor and Director of Business Development for Air Command Systems

International (ACSI), a Thales Raytheon Systems company based in Paris. ACSI currently manages the development, integration and installation of the NATO Air Command and Control System (ACCS). Ken Nesbitt spent more than 27 years in the Canadian Air Force as a specialist in Command and Control of air operations and Air Battle Management, in both ground based and airborne C2 systems. A total of nine years were spent in operational flying with NATO AWACS in Germany, accumulating over 2200 flying hours and participating in Gulf War I, Bosnia, UN Operations, Anti-terrorism contingencies and the Iraq War.

Book Review



Space Security 2004

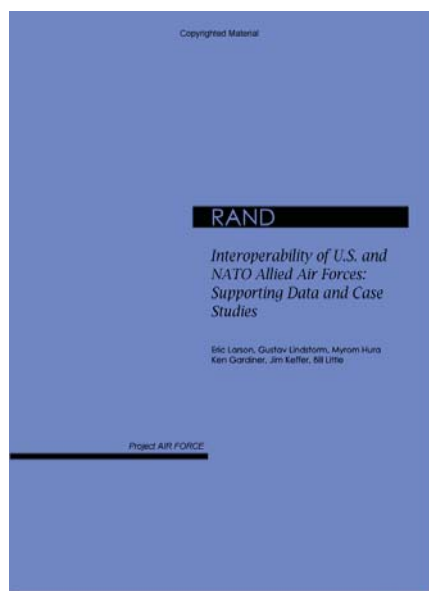
by Simon Collard-Wexler, Jessy Cowan-Sharp, Sarah Estabrooks, Ambassador Thomas Graham Jr., Dr. Robert Lawson, and Dr. William Marshall.

Northview Press Ltd., Toronto Canada, June 2005, 189 pages.

Available at www.securityspace.org (free)

Space Security 2004 offers a good summary of current space issues. It combines survey results from space professionals around the globe with facts on space developments in 2004. The final product is an assessment of the “security of space”. To aid readers, an executive summary is in the book and on the web site. The eight chapters focus on the space environment, commercial space, civil space, space law, and four chapters are on military space developments. Twenty eight trends in space security are also identified. In general terms, space developments in 2004 aided the security of space and decreased the security of space. As an overall summary of the security of space, most of the US Space Security Working Group (71%) felt “that space security had been somewhat reduced in 2004”. NATO personnel should keep in mind that the authors’ definition of space security assumes that space-based threats will reduce space security. One should think twice about that assumption. Does an armed police force increase the security of a region, or does an un-armed police force increase the security in an area? Regardless of the question, this book does an excellent job of summarizing space issues and developments. It is a recommended must reading for all NATO space decision makers.

Reviewer: Daniel Lewandowski, Lt Col, USAF



Interoperability of U.S. and NATO Allied Air Forces: Supporting Data and Case Studies

by Eric Larson et al

RAND Corporation, 2003. Paperback, 136 pages. ISBN: 0-8330-3287-9.

Available at: www.rand.org/publications/MR/MR1603 (free)

Interoperability can be defined as the capability of different forces to accept and provide services in order to operate effectively together. The report provides an insight into interoperability, analyzing the data from a number of recent operations. Interoperability at air forces level is assessed not only from the systems, but also from the doctrinal, organizational and procedural perspectives. The answers to “for what mission?”, “for what capabilities?” and “with whom?” are obvious after Larson’s analysis: interoperability is essential for the entire spectrum of multi-national missions and capabilities. The report reveals the challenges of coalition operations at the strategic, operational, tactical and technological levels. Unity of purpose, effort and command is crucial for interoperable forces, although political needs are often mirrored in the way the national forces support the operation. The “standing-up period” for coalition forces is a strategic challenge. National and coalition security provisions and the resizing of the forces are key issues at the operational level. Force integration, especially in cases with scarce air capabilities, can add complexities at the tactical level. Interoperability challenges at the technological level could hamper the effectiveness and efficiency of the operation. The author provides a strong justification for the NATO Response Force concept and its further development.

Reviewer: Panagiotis Akinosoglou, Major, Hellenic AF

Joint

Air

Power

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