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Enhancing NATO's Operational Helicopter Capabilities

The Need for International Standardisation



**Joint Air Power
Competence Centre**

Cover picture  AVDD - Sgt Sjoerd Hilckmann

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Enhancing NATO's Operational Helicopter Capabilities

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All NATO Nations, Ministries of Defence and Relevant Organisations

The Iraqi and Afghan campaigns have highlighted the unique capabilities helicopters have contributed to the asymmetric environment. However it has become progressively obvious to commanders that the shortfalls within the international helicopter community are constraining the overall mission. With Member States' Defence budget cuts affecting the availability of helicopters, embracing NATO's Smart Defence initiative will play a vital role in combating this lack of availability. Thus, to pool and share capabilities, to set the right priorities, and to better coordinate our efforts will all contribute to the resourcing of future military operations in the multi-national environment and will be key to enhancing NATO's operational helicopter capability.

This document is designed to provide the reader with thoughts on enhancing the operational helicopter capability of NATO nations, including the 21 nations who also contribute to the EU. The document will focus on Air Force and Army Aviation helicopters in land operations with the intent to include Navy and Marines helicopters in future projects. It will not target logistic and maintenance topics however it will describe how international co-operation is vastly hampered by, amongst others, the absence of an implemented international operational standardisation for helicopters. It identifies that capabilities, Education and Training are not fully comprehended by a significant portion of NATO and associated EU members. There is also a corresponding lack in Education and Training structures.

The project team concludes that, whilst NATO has much to develop and implement, the Nations themselves must understand that many of the improvements are their own responsibility. Afghanistan has shown the Alliance that operational manoeuvre is being, and has been, restricted by a lack of tactical lift. NATO (and the EU) must grasp the initiative and reinforce interoperability amongst the helicopter community in order to enhance and develop comprehensive plans to improve future multinational helicopter operations.

We welcome your comments on our document or any future issues it identifies. Please feel free to contact my Combat Support Branch at JAPCC via E-mail: helicopters@japcc.de or Phone: +49(0) 2824 90 2258 or 2248. I would like to thank LtCol Wido Gerdson (NLD) for his contribution to the JAPCC helicopter project.

Joachim Wundrak

Lieutenant General, DEU AF
Executive Director

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In the last two decades multinational helicopter operations have intensified.

CHAPTER 1

Preface

1.1 Introduction

1.1.1 The recent Iraq and Afghanistan campaigns have highlighted the unique capabilities helicopters have contributed to the asymmetric environment. However, whilst playing a decisive part in successful operations, it has become increasingly clear to commanders that the shortfalls within the international helicopter community are constraining the overall mission as stated in the 2009 NATO BI-Strategic Commands Priority Shortfall Areas'.[1]

1.1.2 The mentioned priority shortfall area can mainly be attributed to three principal issues: specific nations that were unable to deliver platforms (political or economical driven), limitations in the capabilities of crews/helicopters and deficiencies in international standardisation. The absence of in-theatre standardi-

sation is symptomatic of the wider lack of international standardisation across NATO's helicopter community leading to inefficient use of this resource in joint and combined missions.

1.1.3 With member States' Defence budget cuts affecting the availability of helicopters, embracing NATO's Smart Defence initiative² [2] will be a vital part of combating this lack of availability. Thus 'Pooling & Sharing' of assets and better coordination of our efforts will be important methods for resourcing future military operations in a multinational environment and will be a key to enhance NATO's operational helicopter capability.

1.2 Aim

The aim of this document is to determine helicopter shortcomings in international standardisation, doctrine, and Education and Training (E&T) within the NATO environment; especially in Joint and Combined operations. This project will also provide

recommendations to enhance future NATO helicopter capabilities in land operations. This will also detail the current complexities of stand-alone national doctrines and national Tactics, Techniques and Procedures (TTP's). Finally, the study proposes enhancements necessary for a more collaborative approach.

1.3 Application / Project Description

1.3.1 After the publication of the Joint Personnel Recovery Primer in 2011, the JAPCC completed the initial phase of the Study on "Enhancing NATO's Operational Helicopter Capabilities". This Study reports that both the shortfall in operational capability in the international domain and the required Education/Training (including training structures) are not fully appreciated by a significant majority of NATO member states³. It describes how international co-operation is hampered by an absence of international standardisation. This document will also provide advice to military commanders and staffs on how to improve standards required for multinational co-operation and provide innovative ways to address the future training requirement. It is designed to present the reader with thoughts on ways to enhance the effective use of NATO helicopters in international environments, particularly in complex land operations.

1.3.2 The data in this study was gathered from the NATO staff in Brussels, Allied Command Transformation, Air Component (AC) Ramstein, Helicopter Inter Service Work Group and many other national and international helicopter organisations. Also, an important part of this study was a questionnaire [3] that was sent to the military staffs of a selection of NATO nations. In addition interviews with former International Security Assistance Force (ISAF) Regional Command commanders and the results of a JAPCC Air Forum⁴ [4] are used. Nations and agencies that contributed to this project via the JAPCC Questionnaire and/or the JAPCC Air Forum are: Belgium, Canada, Czech Republic, Denmark, France (Air Force), Germany (Army), Great Britain, Greece, Hungary, Italy, Poland, Romania, Slovakia, Slovenia, Spain, The Netherlands, Turkey, USA (Army), AC Ramstein, the European Defence Agency (EDA) and the European Air Group (EAG).

1.4 Scope and Limitations

1.4.1 The JAPCC is aware of helicopter initiatives within NATO, the EDA and EAG. This publication will mention recommendations for improvement in a broad area of subjects. Nevertheless, this publication is by no means prescriptive.

1.4.2 European Union (EU). When the EU is mentioned, it is in the context of the 21 EU nations that are in NATO. These NATO/EU nations possess 95% of the combined helicopter and personnel assets in Europe (less Russia) and must use this same equipment and personnel for both NATO and EU tasks. EU helicopter forces that are not part of NATO are not covered in this document.

1.4.3 NATO Nations addressed. Not all NATO nations are addressed but for future projects the JAPCC intends to include all NATO nations that operate military helicopters.

1.4.4 Standardisation. When standardisation is mentioned it is focused on International Operational standardisation only. This does not include 'national' standards that are not involved in multinational operations i.e. basic training, flight currency, etc...

1.4.5 Logistics and maintenance. Although logistics and maintenance are key factors effecting aircraft availability, helicopter logistics and maintenance are primarily a national responsibility. There are several multinational logistic and maintenance initiatives in development however, not yet in the scope of this publication; therefore this publication will not discuss helicopter logistics and maintenance.

1.4.6 Navy and Marines helicopters. For simplicity, this study does not include Navy and Marine helicopter organisations. It is the intent of the JAPCC to include these organisations in future projects because of their growing involvement in land operations.

1.4.7 Littoral operations. Recent campaigns like Operation UNIFIED PROTECTOR⁵, proved the effectiveness of helicopters in littoral operations but are not included in this document.

1.4.8 This is not an asset register. This document does comprise a limited⁶ catalogue of NATO Army and Air Force Helicopters. The intent is not to make an official register of all nations' helicopters because a register would simply list a nation's available military helicopter assets. The register in this study is used to indicate similarities between nations and give readers a basic comprehension of other nation's helicopter formations that could lead to possible opportunities for cooperation.

1.5 Appreciations

The JAPCC offers their special appreciation to LtGen de Kruijf (NLD)⁷, BrigGen Wolski (DEU)⁸, and Air Commodore (Ret.) van Hoof (NLD)⁹ for their explicit valuable input.

1. 'In-Theatre Airlift availability is a problem in ISAF where NATO operations are constrained by a lack of helicopter lift.'
2. The Smart Defence initiative indicates that helicopters are one of the ten critical capabilities for Allied Forces.
3. Conclusion from JAPCC questionnaire.
4. Held at 8th and 9th of May 2012 in Kalkar, with 11 nations present.
5. The NATO mission in Libya in 2011.
6. Only the nations that responded to the JAPCC questionnaire are mentioned.
7. Former Commander RC-S ISAF and currently Commander Netherlands Army.
8. Chairman Helicopter Inter Service Work Group (HISWG) and currently Director of German Army Aviation.
9. Former JAPCC Assistant Director Capabilities (ADC).



With the enlargement of NATO a multitude of helicopter types have been added to NATO's inventory.

CHAPTER 2

Background

"It is never very crowded at the front"

Creighton W. Abrams, Jr. (Former US General)

2.1 General

Up to and including the Cold War era, the primary military concept was focused on symmetric (typically nation versus nation) engagements with an adversary that was similar in strength, organisation and weaponry and with a relatively defined front-line. Since the end of the Cold War the international focus has moved towards an opponent that is significantly dissimilar in strength and also different in organisational identity and in the manner in which they operate. These military operations are typically conducted by nations comprising of a coalition of the able and willing. Coalition operations present a number of challenges in key areas such as Command and Control, Rules of Engagement, interoper-

ability, communication etc. and thus tend to increase the complexity of international military operations.

2.2 Changing Complexity

The past two decades¹ have witnessed a rise in the number and complexity of expeditionary operations, the majority of which forced significant demands upon the multinational helicopter community. A recent example is the helicopter collaborations² in the ISAF Regional Commands. With some exceptions, evidence³ from these NATO operations suggest that it takes several months, perhaps years, before the various contributing nations reach a sufficient level of common understanding and confidence to conduct complex joint and combined missions. There are some obvious complications in international standardisation like language problems, briefing standards, common doctrine, different phraseology/terms, an understanding of each other's capabilities etc. Some reasons for these deficiencies are the various interpretations of accepted common Standing Operating

Procedures (SOP's)/TTP's, not enough combined training opportunities, absence of implementation of the NATO evaluation system and the lack of knowledge of each other's capabilities/standards. In order to shorten the time required to conjoin forces and increase the effectiveness of multinational operations, NATO's helicopter capability framework (whether DOTMLPFI⁴ or otherwise) has to be further developed and invested in. Before we continue, two important NATO initiatives that are foundational to this helicopter study must be addressed, 'Smart Defence' and the 'Multiple Futures Project'.



NATO's Secretary General Anders Fogh Rasmussen on Smart Defence.

2.3 NATO's Smart Defence

In order to counteract the significant budget cuts caused by the declining economy, NATO introduced the Smart Defence initiative. NATO Secretary General Anders Fogh Rasmussen indicated the importance of Smart Defence and multinational cooperation to the NATO leaders at the 2011 Munich Security Conference. Key portions of this address are highlighted in the text below:

"In times of austerity, every euro and every crown counts. We will have to find ways of sharing our resources, so we give our Alliance the capabilities it needs. However, we cannot ensure our security just by spending more money – because the money simply isn't there. We need a new approach: Smart Defence – ensuring greater security, for less money, **by working together with more flexibility.**

Yet, the crisis makes cooperation between nations no longer a choice. It is a necessity. Today, no European Ally on its own is able to develop the full range of responses to meet all security challenges. **I see three ways: to pool and share capabilities, to set the right priorities, and to better coordinate our efforts.** Pooling and sharing are vital if we want to develop our military know-how and capabilities. We also agreed on **ten critical capabilities for our forces – such as helicopter transport**, medical support, and countering road-side bombs. What we also need is overall coherence. This is how we get greater security for the money we invest in defence: pool and share capabilities, prioritise and coordinate better. Now, how can we better prepare for the future? Here, I see two priorities: investing in science and technology, and creating greater coherence within Europe. As we try to overcome the remaining political obstacles, **I sincerely hope that NATO and the EU will intensify their practical cooperation.** After all, NATO and the EU share 21 members – but each of those nations has only one set of armed forces and one set of capabilities. Let us get the most out of it. Let me make one final point. Smart Defence is not about NATO imposing anything on nations. It is about enabling them to work better more effectively and efficiently together. **NATO's role is to set the strategic direction, to identify possible areas of co-operation, to act as a clearing house, and to share best practices. Ultimately, it is all about making it easier for nations to develop and acquire capabilities** – alone, together as Allies, or even involving non-NATO countries, in NATO or in the EU. And indeed, European efforts are particularly welcome, because they strengthen both the EU and NATO".

2.4 NATO's Supreme Allied Command Transformation (SACT) Multiple Futures Project⁵

The Multiple Futures Project Report [5] is meant to inform and support a strategic dialogue on challenges the Alliance will face and their corresponding security and military implications. It does not predict the future or presume political decisions that will determine

future Alliance roles and required capabilities. Rather, it provides Alliance leaders with a broad set of ideas and information to help plan for future security environments. The Report states:

“The Alliance must develop flexible, adaptable, well-trained, well-equipped, deployable and sustainable expeditionary forces. These forces require an adaptable, comprehensive command structure that can integrate and work effectively with a range of other actors, using a comprehensive approach to deal with challenges and threats across the spectrum of conflict. **The common members of NATO and the EU have a single set of limited resources and capabilities**, which allow for neither duplication nor institutional competition with regard to force generation and capability development. **Interoperability, transparency of information and decision-making will be crucial in the face of a common threat, as will common standards and definitions**, the identification and elimination of gaps in capability development, cooperation on research and technology and the development of mutually reinforcing capabilities. To succeed in a range of demanding landscapes and climates, **future operations will emphasise the importance of multinational, joint and expeditionary capabilities**. Develop Alliance standards and procedures, along with national capabilities, to conduct security assistance missions and security sector reform, and to ensure cultural awareness among the forces of the Alliance. **Implement fully NATO’s partnership with the EU at the strategic, operational and tactical levels**. Improve the NATO-EU partnership on issues of non-proliferation and consequence management, with agreed terms of reference that delineate the role of each organisation in a crisis. **Enhance the capability (equipment and training) of NATO and the nations** to aid first responders and recovery efforts, as well as to survive and fight a war conducted with WMD/E (weapons of mass destruction/effect). **Establish training and education standards** that promote the development of highly educated, culturally aware forces, capable of operating within the rapidly changing tactical, operational and strategic environments”.



ACT is NATO’s leading agent for change, driving, facilitating, and advocating continuous improvement of Alliance capabilities to maintain and enhance the military relevance and effectiveness of the Alliance.

2.5 Foundation of JAPCC study

Both initiatives indicate that NATO members and the NATO Organisation must begin to develop programmes to foster more pooling & sharing, improve interoperability and achieve a common standard for future NATO and EU operations. Due to recent budget cuts helicopter numbers and flight hours have been reduced (see Figure 1, annual flight hours), but the level of ambition (operational necessity) remains high. Most nations are reducing their military and the expectation is that there are virtually no resources available for international cooperation because nations will initially spend their budget and resources on internal matters to keep their core competencies sharp. But conversely, reductions will increase the need for more international cooperation; therefore more Smart Defence initiatives are required. The JAPCC study is based on these NATO initiatives and austerity facts.

2.6 The Domain of NATO Helicopters

Throughout the study it became evident that the organisation and command structure of NATO’s helicopter forces is rather complex. Most traditional Air Force (AF) helicopter forces have very dedicated

missions like Combat Search and Rescue (CSAR) that support the Fixed Wing (FW) mission. Some nations also operate their Air Force helicopters mainly in support of land operations. Also, Air Force helicopters are not coordinated at the NATO level with the same oversight as FW forces. AC Ramstein does not evaluate or provide any coordination for NATO Air Force helicopters with the exception of some Personnel Recovery missions and exercises. Air Force helicopters are considered solely national responsibility. Army Aviation is even more complex because they are not only seen as national assets but are treated as the assets of individual army land units. There is no NATO body that coordinates Army Aviation on an international level. All this makes compiling solutions a

	Annual Flight Hours	Simulator
GBR	204 - 240	
FRA (AF)	180 - 200	
GRE	NATO standard (180)	
NLD	140 - 180	40
USA (A)	140 +	
DEN	160	
BEL	150	16
CAN	120 +	
SLV	100 - 140	
DEU (A)	110	30
ITA (A)	110	
SPA	100	10 to 30
CZE	80	
ROM	80	15
SLK	75	
POL	min 40	20
HUN	no info	no info

Figure 1: Planned annual flight and simulator hours by the Nations as indicated in the JAPCC Questionnaire. Most countries indicate that they will actually not reach these planned hours.

considerable challenge because it is not clear who specifically coordinates Air Force, Army Aviation (and Navy) helicopters on NATO level. This makes the determination of who in the NATO domain is responsible for helicopter enhancement and interoperability projects a very complex task.

2.7 Documentation on International Helicopter Shortfalls

It also became clear that available documentation in the NATO domain concerning helicopters and their shortcomings is very scarce. There is hesitancy to document (outside of the national domain) the challenges and lessons learned that exist with combined helicopter operations. An important reason for this is that there is an array of nations that have not yet conducted complex combined helicopter operations, to include NATO missions. Also some nations' helicopters are not sufficiently equipped for today's operations or crews have insufficient operational skills to conduct mission in today's complex battlespaces. Another reason for this lack of information is rooted in the fact that some nations consider their helicopters as a pure national asset and do not participate in combined operations with their helicopter forces. Some of this lack of participation is due to the fact that some nations deem that the limited speed and range of helicopters make it difficult to operate away from their main body of force. NATO has not actively pushed the sharing of helicopter information and documentation between allies. Despite the insufficient documentation of multinational helicopter shortcomings it is obvious that there are challenges that exist in the domain of multinational operations with NATO helicopters that need to be addressed.

1. For the study, operations after Desert Storm I are used with the main focus on ISAF.
2. Helicopters that are pooled and shared by many allies (not only national available). Transport helicopters are commonly available in a pool and attack helicopters in a Quick Reaction Force role.
3. From interviews and contacts with a multitude of NATO nations helicopter related personnel and used by JAPCC for the project.
4. DOTMLPFI — Doctrine, Organisation, Training, Materiel, Leadership, Personnel, Facilities and Interoperability.
5. Drafted in 2009 by ACT with the subject 'Navigating towards 2030'.



Large international exercise, 'Italian Call', organised by the EDA in conjunction with Italy at Viterbo Air Base is a good initiative but more multinational exercises should be arranged by NATO.

CHAPTER 3

Shortcomings

"About the time we can make the ends meet, somebody moves the ends"

Herbert Hoover (31st President of the United States)

3.1 Shortfall Effects

Looking at Afghanistan, it is noted that helicopters are critical for operations because they allow rapid transport of combat troops over the rugged terrain without leaving them vulnerable to improvised explosive devices (IEDs), which are the deadliest threat to soldiers in Afghanistan. Medevac and (re)supply helicopters conduct crucial missions as well for combat troops whilst attack helicopters are considered a valuable support in close combat and security missions by ground units and are highly sought out by ground commanders. However, the current helicopter shortfall means that operations are delayed or postponed, resupply is made more tenuous and soldiers are exposed to more risk. To understand

the current status of NATO Army and Air Force Helicopters in multinational land operations the JAPCC analysed operational data and noted several shortcomings. This chapter is not intended as an authoritative list of helicopter shortfalls within NATO but attempts to highlight some key limiting factors that have been observed during multinational co-operations¹.

3.2 Coalition Operations

As stated in Chapter 1, working in a coalition means more cooperation across all military areas. The last twenty years have forced most nations to work more and more intensely with other coalition partners and operate together in complicated missions. Experiences in ISAF have revealed that it takes several months to years before different nations build sufficient confidence in partner nations to conduct complex joint and combined missions. There are examples² of international helicopter forces that could plan and execute complex missions with other coalition partners within a relative short time but the majority of nations cannot achieve this.

3.3 Insufficient NATO Helicopter Coordination

The NATO Standardization Agency (NSA) is the Agency that produces the Allied Tactical Publication (ATP)-49³ document [7] (that contains Doctrine and TTP's) among others. Doctrine should generally be embedded in an Allied Joint Publication document but it was decided by the Helicopter Inter Service Working Group (HISWG) that Doctrine and TTP's should be published in the same document, namely the ATP-49. The NSA does not actively control the implementation of these standardisation documents. The implementation of these documents is considered a national responsibility by NATO but the nations' own interpretation leads to an approach that is different from the intended common international standards and thus limits interoperability. Nations with a lot of actual operational experiences are reluctant to accept a common international standard because they already have established a high⁴ standard of their own. There is also no cooperation between NATO organisations linked to helicopters like the HISWG (Army and Air Force), the HOSTAC⁵ (Helicopters Operations from Ships other Than Aircraft Carriers) for Navy/Marines and the NATO Special Operations Headquarter (NSHQ) for Special Operations Forces (SOF). NATO has no coordinating organisation with authority to ensure the practical application of international standards. All this contributes to an inconsistent level of international standardisation.

3.4 Implementation of Doctrine and TTP's

The implementation of the ATP-49 and correlated Standardisation Agreements (STANAGS) differs significantly within NATO, from operators who use it as their standard, to operators that sometime use it to enhance their own procedures and TTP's, to operators that do not use it at all. Some nations' Air Forces consider ATP-49 a land domain document⁶ and thus tend to follow Air Force produced documents and procedures. It is puzzling why there are so many differences given that most nations have ratified and implemented⁷ the ATP-49. There is also a significant

experience gap between nations in developing doctrine and TTP's. Nations that actively participated in operations like ISAF, Operation ENDURING FREEDOM⁸ and Operation UNIFIED PROTECTOR are understandably quicker in updating their tactics and procedures while others, that lack current multinational operational experience, develop doctrine and TTP's more slowly. Implementation of the ATP-49 and related documents are not actively controlled and checked.

3.5 International Education and Training

The major disadvantage to attend international E&T is the limited range of helicopters, however there will be an increased necessity for multinational training in the future. The EDA and the EAG are the only organisations in Europe that organise international military helicopter training events. NATO is not organised to prepare and execute international helicopter exercises and this causes a problem because there is a deprivation of high quality international training. An additional challenge comprises that there is no insight into the separate nations' E&T capabilities. This is mainly because the nations are not aware of each other's E&T possibilities⁹. NATO conducts international training at the Joint Warfare Centre in Stavanger, Norway and the Joint Force Training Centre in Bydgoszcz, Poland; however, this training is at the operational/strategic staff level and tactical component command level. No direct/specialised helicopter training or standardisation is covered at the Joint Warfare Centre or the Joint Force Training Centre.

3.6 Intercontinental Standardisation

A further challenge is that US helicopter units (the majority of contributing forces) do not consistently implement NATO standards. This difference is most evident between Continental USA (CONUS) based and European Command based helicopter units. NATO has limited influence over the implementation of international standards in CONUS units.



© SSgt Dean Wagner

The US is the main contributor of helicopters to campaigns.

3.7 Communication and Planning Equipment Standards

Most notably, the lack of standardisation/interoperability of helicopter communication and planning equipment is a problem in multinational operations. While most countries indicate in the JAPCC questionnaire that they have the required minimum communication suite and basic secure capabilities, it is still a challenge to have an effective communications setup in multinational operations. This produces time delays, safety concerns (no secure communications) and/or even cancelation of missions. The same lack of standardisation is also apparent in planning systems. Several participants have to convert allied planning products into their own planning/map system. This can induce delays and mistakes.

3.8 NATO Standard for Russian Built Helicopters

The lack of standardisation/compatibility becomes even more critical with the expansion of NATO into nations that operate Russian built helicopters. The challenge to convert these helicopters to NATO standards is even greater than integrating existing Western helicopters. This was highlighted by the the Czech Republic led 'HIP initiative' created in February 2009. The HIP Helicopter Task Force is responsible for the development of a NATO transport helicopter programme that

assists several nations with Soviet-era technology with resources to deploy and sustain a transport helicopter operation. This multinational initiative was intended to facilitate the in-theatre deployment of transport helicopters by NATO and Partner nations through the collective support of Allies. Assistance ranges from the provision of operational pre-deployment training; command and control capabilities; base support or financial aid. The Declaration of Intent was signed by the Czech Republic, Albania, Hungary, Norway, Poland, Slovakia, Spain, Turkey and the UK. This programme provided the necessary political mandate to start mitigating critical utility helicopter shortfalls, particularly in the conduct of ISAF operations in Afghanistan, but unfortunately, this programme is temporary halted due to financial and air worthiness issues¹⁰.

3.9 Cooperation between NATO and EU

With an overlap of 21 member states that are in NATO as well in the EU, it is essential that both the EU and NATO cooperate in the development of their helicopter concepts and procedures. There is the NATO/EU Berlin Plus Agreement¹¹ that agrees on the use of NATO assets and capabilities for EU-led operations and therefore standardisation should be common. However, it should be noted that the Berlin Plus Agreement is not a public document and has never been ratified by national parliaments. In fact the cooperation between

NATO and EU on helicopter subjects is very limited and no official helicopter liaison is established between these organisations. The EDA is understandably pushing ahead with its own ambitious Helicopter Training Programme and at this phase is not waiting for NATO to catch up. Although the EDA generally applies common NATO regulations within their helicopter framework, there is no official coordination between NATO and the EDA. Ultimately this could lead to a diversion of standards, confusion and flight safety related issues.

3.10 International Evaluation System

NATO developed a Tactical Evaluation (TACEVAL) system for the FW community to improve the compatibility of FW units participating in joint and combined operations. The FW world is still reaping the benefits of insuring all participating nations adhere to the NATO FW standard. The NATO helicopter community has no similar NATO evaluation system; consequently helicopter units are not actively checked by a NATO TACEVAL. The lack of an actual NATO TACEVAL is one of the prime reasons that the helicopter community encounters problems in establishing a common international standard.

3.11 Tactical Leadership Programme (TLP)



In the FW community the Memorandum Of Understanding (MOU)¹² based TLP [9] has been an effective way to educate element, flight and Composite Air Operation leads in an international environment. There exists no identical MOU based TLP for helicopters. Most nations indicate that they are interested in a TLP for helicopters but are still reluctant due to budgetary uncertainties¹³ and manning challenges.

3.12 Sharing of Lessons Learned and Tactics

The exchange of lessons learned and development of new tactics between nations is very limited¹⁴. There are few examples¹⁵ of this exchange of information between nations, however with the increase of joint and combined operations there is a growing necessity to share information. Most nations consider their Lessons

'HIP initiative' focused to standardise several nations MI-17 helicopters to be able to conduct missions in Afghanistan.



Identified (LI), Lessons Learned (LL) and the derived solutions nationally restricted¹⁶ and consequently do not share this information. The NATO Joint Analysis & Lessons Learned Centre (JALLC)¹⁷ in Monsanto, Portugal is an organisation that collects Lessons Identified and Lessons Learned (see Annex B) however most nations indicated in the JAPCC questionnaire that they have no dealings with the JALLC in regard to helicopter LI/LL. The JALLC does very limited analyses and development of solutions for LL/LI in the helicopter domain.

3.13 Mission Simulation

With ever increasing restrictions placed on flight training, the Synthetic Training Environment (STE) is increasingly being utilised for flight training, mission training and mission rehearsal. The principles of standardisation and interoperability apply equally to the synthetic environment, hence the requirement to use

compatible technologies and implement existing common protocols in distributed simulators and mission training devices, is equally important. There is still an underdeveloped utilisation of mission simulation and multinational cooperation in the helicopter Synthetic Training Environment.

3.14 Pilot Exchange Programme (PEP)

Nations with PEP's have learned that these programmes expose their forces to different tactics and procedures and thus expand their knowledge base. These programmes are also critical for establishing an international network to share information. It is noteworthy that many nations do not have a PEP even though there are many NATO countries that have proven the value of these programmes (see Figure 2, Pilot Exchange Programmes). It is reality that some of

PEP with	GBR	BEL	USA	CAN	FRA	DEN	NLD	DEU	POR	AUS	JOR	N Zld
NLD												
GBR												
DEU A												
USA A												
CAN												
BEL												
DEN												
FRA AF												
SPA A												
SPA AF	No PEP Exchange Programme											
ITA A												
POL												
SLV												
SLV												
GRE												
HUN												
ROM												
CZE												

Figure 2: Current Pilot Exchange Programmes.



AVX company Joint Multi-Role ideas; an example of a programme that will compete in the JMR Rotary Wing competition in the USA.

the traditional NATO nations do not actively seek the initiative to establish a PEP with new NATO members and there seems to be a reciprocal reluctance of former PFP nations to establish a PEP with traditional NATO nations.

3.15 Multinational SOF Cooperation

The SOF mission is an important mission within the helicopter community and is developing very fast. The NATO Special Operations Headquarters (NSHQ [10]) is developing, amongst others, initiatives for the use of helicopters in SOF operations. The first phase of this initiative was built on the success of the existing NSHQ ground and maritime SOF training programmes by adding SOF air curriculum and developing SOF air doctrine, procedures, and standards for Allied and Partner SOF air components. Their second phase would consist of an operational training element comprised of rotary wing aircraft that would focus on

the development and training of NATO SOF aircrews through practical applications. The third phase would include maturing the training element into a deployable expeditionary NATO SOF air capability. The final phase would be a multi-platform aviation unit that could include training and deploying rotary-wing (RW), fixed-wing and Intelligence, Surveillance, and Reconnaissance (ISR) aircraft. The SOF community by nature tends to work in a vacuum or on their own, so their development of helicopter standardisation should be coordinated with the NSA to avoid a diversion in standards.

3.16 Development of Rotary Wing Prototypes

Developments in modern technology have increased the scale and tempo of military operations. It has proven difficult for military development of new procedures and doctrine/tactics to keep pace with the

rate of technological developments. It appears that the rate of innovation has resulted in the military being reactive to development instead of being able to smoothly blend new technologies with new ways to employ these technologies. The US's Joint Multi-Role (JMR) rotary wing programme is the exception to this trend and is in sharp contrast to its European counterparts, to include the European heavy-lift programme¹⁸. The US plans to build a tilt rotor or a rotary wing aircraft able to sustain speeds in excess of 170 knots, achieve an overall combat range greater than 432 NM and hover with a full combat load under high/hot conditions (6000 feet and 35 degrees C)¹⁹. [11] The over-arching efforts span a range of four classes of future aircraft, ranging from light helicopters to medium and heavy-lift variants and an ultra-class category designed to build a new fleet of super-heavy-lift aircraft. The ultra-class aircraft will be designed to lift, transport and maneuver large vehicles such as Strykers²⁰ and mine-resistant, ambush-protected vehicles known as MRAPs²¹ around the battlefield. The ultra-class variant, described as a C-130 type of transport aircraft, is part of an Air Force led, Army-Air Force collaborative Science & Technology effort called Joint Future Theater Lift, or JFTL. The European introduction of the NH-90, Tiger and a future basic concept for a heavy, single or tandem rotor helicopter differs significantly from the US. The

difference between speeds and ranges of future US and European developed rotary wing aircraft will drive a wedge between the operators of these diverging systems. As a result, joint operations standards between future US rotary wing aircraft and users of European type helicopters will diverge.

1. Obtained from several interviews with ISAF personnel; from the JAPCC questionnaire and from own experiences of JAPCC SME's.
2. Examples are the GBR and US Marines in Helmand; the NLD, AUS and GBR helicopter pool in Kandahar. To reach a sufficient trust level it still took several months before these units conducted complex combined operations.
3. Use of Helicopters in Land Operations – Doctrine and TTP's.
4. Due to a quick experience build-up in on-going operations, nations change their TTP's relative fast.
5. Helicopter Operations from Ships other Than Aircraft Carriers.
6. Conclusion from JAPCC questionnaire and Air Forum.
7. Analysis from NSA website on ratification and implementation of the ATP-49E.
8. OEF, official name used by US government for the war in Afghanistan.
9. There is no central database in NATO for E&T.
10. Russia did not approve certain foreign equipment in Russian made helicopters.
11. A joint declaration issued on 16 December 2002 on the establishment of a strategic partnership between NATO and the EU in crisis management. The permanent arrangements were finalised on 11 March 2003 and became known as the Berlin Plus arrangements after the 1996 Berlin summit which saw the official start of WEU-NATO cooperation.
12. Belgium, Denmark, France, Germany, Greece, Italy, Netherlands, Spain, United Kingdom and United States of America with academic courses on, Composite Air Operations, Electronic Warfare, Intel support to COMAO, Net Enabled Warfare and Personnel Recovery.
13. Many Nations indicate that they would like to know what the personnel investments and costs would be of such a programme.
14. Some exchanges take place in areas of operation and some bi-national initiatives exist between i.e. the USA, GBR, NLD amongst others.
15. Examples like UK NLD Apache; the CZE UK and NSHQ data base initiatives.
16. It is quickly considered restricted assuming that it is not allowed for others to know what the weaknesses are in their nations' operating procedures.
17. The Joint Analysis and Lessons Learned Centre (JALLC) is NATO's centre for performing joint analysis of operations, training, exercises and Concept Development and Experimentation collective experiments, including establishing and maintaining an interactive managed Lessons Learned Database (LLDB).
18. The development of a single rotor helicopter with a 10 tonnes+ load capacity.
19. According www.army.mil, the official homepage of the United States Army.
20. Eight wheeled armoured fighting vehicle weighing up to 20 tonnes.
21. Family of armoured fighting vehicles weighing up to 24 tonnes.



Hungarian, Turkish and Slovakian helicopters during an international training event.

CHAPTER 4

Recommendations

“Millions saw the apple fall, but Newton was the one who asked why”

Bernard Baruch (US Presidential advisor, Statesman, Philanthropist)

4.1 Responsibility of Organisations

This chapter of the study proposes possible solutions for the majority of the shortfalls mentioned previously in the study. The study recommendations are in line with current and future ‘Smart Defence’ initiatives and should ultimately enhance mission effectiveness and improve flight safety. Proposed solutions are grouped by the organisation that would most logically be responsible for their implication: NATO, the nations themselves or an MOU based cooperation.

4.2 NATO

4.2.1 A NATO Helicopter Coordination Cell (NHCC)¹. As indicated in Chapter 3, a practical NATO coordination level for helicopters does not exist. There is a need for a different approach to coordinate international standardisation. NATO and the nations must realise that new methodologies to establish international standards are required. It can no longer be the exclusive responsibility of individual nations to manage the creation, implementation and evaluation of international helicopter standards. NATO, in close cooperation with the EU, must conduct a study to determine the viability, location and scope of an organisation like this. This helicopter coordination cell must be able to validate the doctrine and TTP’s produced by the NSA and ensure this doctrine and TTP’s are commonly understood and employed by allied nations. NATO is currently not equipped to coordinate evaluations, exercises, international training programmes, etc. for helicopters. Within Allied Command



Nations could explore more opportunities for special training opportunities like mountain, desert, arctic, gunneries and SERE at other nations' training areas.

Operations (ACO), AC Ramstein is in charge of conducting FW standardisation/evaluation, but is not doing the same for Air Force helicopters. Army Aviation has no NATO organisation that coordinates international standardisation/evaluation either. To establish an effective common international standardisation, an overarching Joint NATO Air Force and Army coordination cell must be established that oversees the implementation and employment of international standards. Navy and Marine helicopters should also be included in this NHCC. A NHCC could also be used to collect helicopter Lessons Identified in coordination with the JALLC and deliver timely solutions², as Lessons Learned, back to the user community. Unfortunately since NATO reorganisation will be completed in 2012, any personnel and resources for the creation of a NHCC will have to come from existing NATO or national organisations.

4.2.2 Cooperation between NATO and EU. With an overlap of 21 member states that are concurrently in NATO and the EU, it is essential that they cooperate in the development of concepts, procedures and use of assets. There are no known helicopter standardisation agreements between NATO and EDA. Since there are no NATO helicopter training initiatives and there was a time sensitive need for this training, the use of UK

training syllabus/courses by the EDA is understandable. Liaison is required to ensure constructive talks between NATO and EDA and avoid a diversion in international standards.

4.2.3 Education, Training & Exercises. With the current deployment ops tempo there is an understandable tension between focusing on on-going operations vs. training commitments. With this, multinational training tends to get the lowest priority. Even when multination exercises receive priority, there are many challenges and they are not as effective or efficient as they should be. When an international exercise is conducted pilots and planners must spend valuable time to work out what standard operating procedures they will use for that specific exercise. This is necessary because individual nations have their own limitations and standards and a common ground must be reached before they can safely operate. These diverse national standards cover a multitude of areas to include: environmental/weather limitations, phraseology/terms, briefing formats, formation procedures, evasive manoeuvres, crew rest limitations etc. There should be one NATO/EU standard for all helicopter operations and specifically also one standard in the SOF domain. The EDA is very active in organising international training and exercises and have several courses and initiatives in

their Helicopter Training Programme (HTP). They conduct the Operational English Language Course, Helicopter Tactics Course, Helicopter Tactics Instructor Course, NH-90 (Training, etc.), Distributed Simulation (Concept Demonstrator/Study) and AHWG Basic Flying Training. The EDA should be consulted in the development of a centralised NATO organisation (NHCC?) that plans, coordinates and promotes exercises and training opportunities for NATO and EDA. High quality exercises/training capabilities should be collated, centrally coordinated, and accessible via the Web. Possibilities for common training between countries to include quality

exercises³, gunneries, Advanced Weapon Schools⁴ and Survival, Evasion, Resistance, and Escape (SERE) schools must be made known to the international helicopter community. Figure 3, indicates where the Nations conduct their mountain, desert and arctic training. Army and AF ground forces and the Marines should be included more in these exercises and training events. Nations would be more able and willing to conduct international E&T if there was a centralised database where they could go to find and plan international training and education in a more systematic manner. Nations are more likely to cooperate and jointly

Special training	Mountain	Desert	Arctic	Electronic Warfare (EW)	Gunnery
NLD	Italy	Spain, in theatre	Norway	GBR Spadeadam	Germany Bergen-Hohne
ITA	Italy	Italy			Italy, Viterbo and Sardinia
GBR				Spadeadam	
DEU	Germany Switzerland Austria	Sardinia, in theatre		DEU Polyphone	
CAN	Canada		Canada		
BEL	France				
DEN	Canada Norway		Norway		
FRA AF	France	France Djibouti	France		
SPA	Spain	Spain			
POL	Poland Germany				
CZE	France	Spain Portugal			
SVK	Slovakia		Slovakia		
HUN	Slovenia	In theatre			
SLV	Slovenia	Spain			
ROM	Romania				
GRE	Greece	Greece			Greece
USA (A)	USA	USA	USA		USA

Figure 3, Nations' mountain, desert and arctic training. When indicated, EW and Gunnery are added.



NH-90 is introduced in many countries and an increased international cooperation should be beneficiary due to similarities in type.

participate in other nations E&T when they know more about what the host nations' E&T incorporates⁵. To achieve the highest level of standardisation, nations should strive to participate in and conduct very complex joint exercises; the pinnacle of which should focus on multinational night air assault missions[12]. This type of mission is preferred because it encompasses most subsets of helicopter missions.

4.2.4 Sharing tactical information. Sharing tactical information between nations is very limited. There will always be tactics and other topics that are nationally restricted but there is still a significant amount of important information that can be exchanged. Nations need to get 'out of their comfort zone' and change their dogmatic approach on information exchange. One effective way of sharing lessons learned and ideas on tactics is to assemble each nations' leading tactics and evaluation crews (for this study called Weapon Instructors (WI)⁶) together in one annual Working Group⁷. In this Working Group they can share innovative tactical

procedures, employment methods, LL and other helicopter related ideas that are not national secret. Additionally, off-site meetings with nations that operate similar equipment should be encouraged. It can be expected that such a Working Group will initially be viewed with skepticism due to the sensitivity of the topics but when the content produces relevancy and value, more nations would be willing to participate. Participation of the USA and the UK in these Working Groups is essential because of their amount of resources and level of experience in current operations.

4.2.5 TACEVAL system. Even if NATO agrees on an international standard this will do little to ensure international standardisation unless a NATO TACEVAL system is also agreed upon and implemented to ensure nations adhere to and correctly apply these standards. Most nations use a national evaluation system based on national guidelines and some even enhance this with NATO's Supreme Headquarter Allied Powers Europe (SHAPE) Tactical Evaluation Manual (STEM).

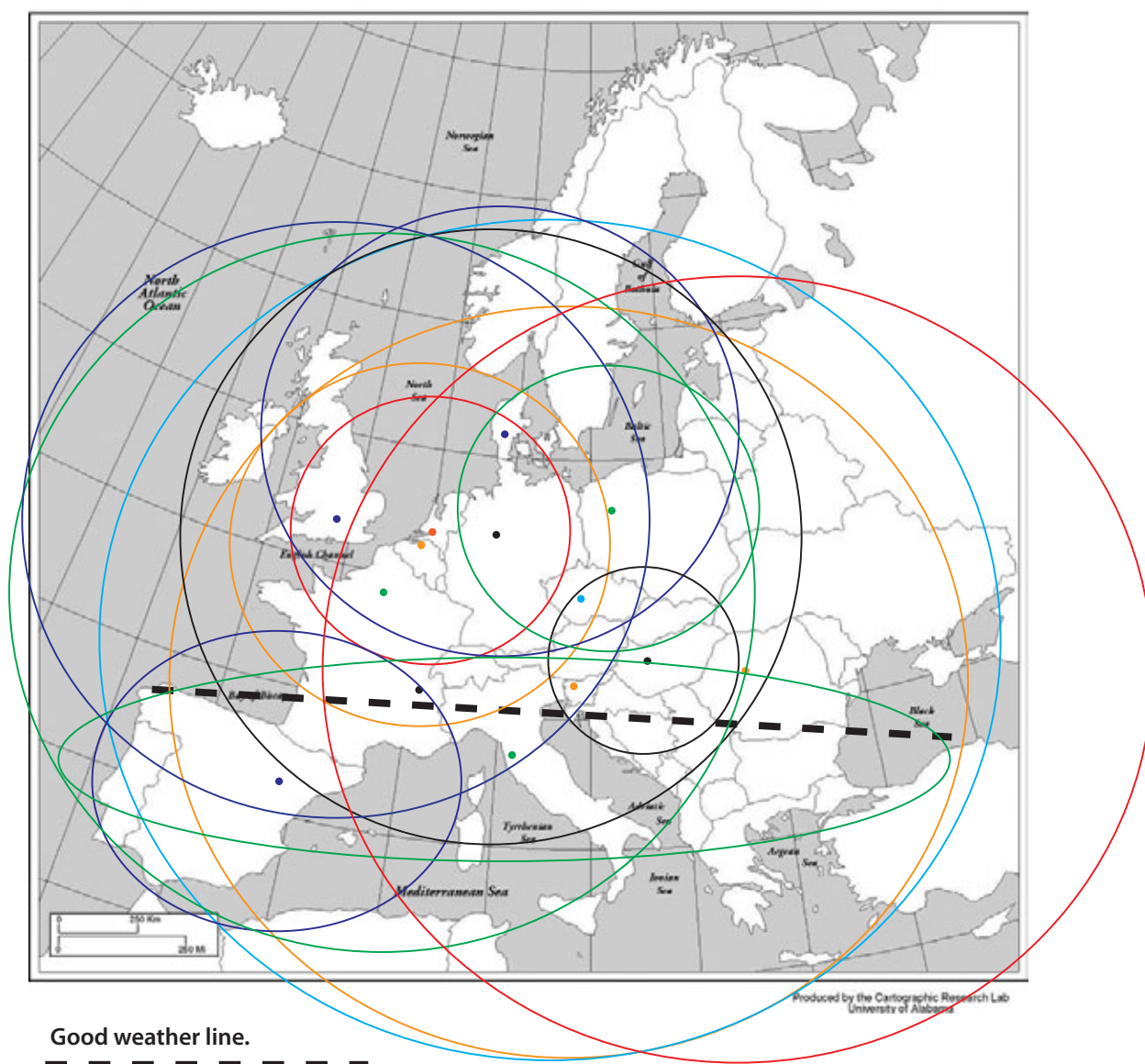


Figure 4: Ferry ranges that countries have indicated in the questionnaire acceptable for quality multinational training and exercises. Canada and Continental US units are not shown as their training areas are mostly in North America.

However, the international helicopter community has a long way to go toward establishing a common evaluation system like the FW community has used for years with great success. ACO dictates that all Air/Aviation units assigned to support NATO must adhere to ACO Forces Standard Volume I, *General* [13] and Volume III *Air Forces* [14] which directs the conduct of evaluations within the ACO Tactical Evaluation (TACEVAL) programme through ACO Forces Standards Volume VI (STEM)[15]. Volume I states clearly that

Volume III includes standards for **all** attack and support helicopter forces declared as available for NATO-led operations regardless of service. Many Army Aviation units are not aware of this link and do not implement ACO FS Volume III information. To improve the effectiveness of joint and combined operations the NATO helicopter community must implement the TACEVAL System. Even if it is agreed to have a NATO TACEVAL system, what organisation will be responsible for executing this system in a Joint environment



NATO should start to organise multinational exercises, especially with the expectation of increased future combined helicopter operations.

(Army, Air Force and Navy)? Implementing a NATO helicopter TACEVAL system will not be easy, due to the joint nature of the evaluating organisation, but it must be accomplished.

4.2.6 Organising multinational exercises by NATO. With the exception of the US, no other nation has the dedicated assets to conduct the full spectrum of helicopter training and operations on their own. That's why NATO should organise multinational exercises where participating nations can bring the helicopter capacities they have and pool them with the other nations to achieve a full spectrum exercise that mirrors current combat operations. This should be in addition to the less complex exercises which EDA currently holds. Currently, large international exercises tend to focus on basic tactical skills. A better approach would be to expand current national helicopter exercises to integrate international participation. This would be beneficial for the ground and helicopter forces of the host and guest nations by providing more helicopter assets to the exercise and demonstrate to each nation how their ground and helicopter forces operate together. This coordination could be handled by a NHCC. Figure 4 indicates the ferry distances that nations are willing to accept⁸ to participate

in quality training/exercises. There are indications that many nations would accept a longer ferry distance for high quality training/exercises. These indications could be used to determine the most desirable/accessible areas for multinational training.

4.2.7 Minimum NATO standard for helicopter crews. The NATO Helicopter Inter Service Working Group started an initiative to develop a matrix [17] that can be used to indicate the current operational readiness level of a crews or units. The need for such a matrix is evident because commanders in multinational operations or training events have limited knowledge on helicopter force readiness levels they are allocated. The intent of this matrix is to indicate the minimum requirements that a crew must accomplish to be at required operational level to conduct certain NATO missions. There will be no minimum hours, but the emphasis is put on the specific amount of flying events/sequences required within a certain time frame. A matrix like this would shorten the time it takes to build confidence in the abilities of allied units and would increase the effectiveness of combined planning and execution.

4.2.8 Mission Simulation. Multiple (type and number) simulators can be linked together to simulate

multi helicopter missions. The Canadian Aviation Electronics (CAE) Medium Support Helicopter Aircrew Training Facility (MSHATF) simulator complex in GBR at RAF Benson is a first-rate example of this. GBR conducts so-called 'Thursday Wars'[16] in which they run complex joint helicopter scenarios with up to 6 full-motion simulators (EH-101, CH-47 and Puma simulators). Additionally, Apache simulators from other GBR bases can be linked in, to form an even more complex mission simulation. The US does something similar but in addition they use the Aviation Combined Arms Tactical Trainer (AVCATT) system. This is a modular system with 6 non-motion reconfigurable cockpits that can be configured as AH-64, CH-47, OH-58D and UH-60 helicopters to conduct effective combined arms mission simulation. Unfortunately these (mission) simulators are expensive and most countries' do not have much room in their budgets for this level of mission simulation, thus innovative alternate initiatives are required. Mentionable is the EDA initiative with Synthetic simulators in RAF Linton-on-Ouse where they use crude non-motion simulators to enhance their Helicopter Tactics and Helicopter Tactics Instructor Courses. This initiative can be compared with the USA SimNet⁹ initiative in the 1980's/90's that started with common helicopter cockpits and developed on to more sophisticated mission simulators¹⁰.

At the April 2012 Army Aviation Association of America Convention¹¹ in Nashville, Tennessee, it was evident that Industry is seriously investigating cheaper concepts for simulation for the (near) future. Industry understands that the costs of simulation must decrease and must be globally compatible. Additional capabilities to connect helicopter simulators to Aircrew/Loadmasters simulators and ground units are quickly developing. While Industry is showing robust initiatives, it is now up to the nations to recognise the importance/efficiencies of mission simulation in this time of austerity. More and more nations link their own simulators to conduct simulator training but the ultimate aim is to link/network simulators of different nations to enhance international training and standardisation.

4.2.9 Cooperation HISWG, HOSTAC and NSHQ. The HISWG covers Army Aviation and Air Force helicopters while the HOSTAC covers Navy and Marine helicopters. There is no clear connection between these organisations while cooperations do increasingly emerge in our Area of Responsibility (AOR's). SOF is a quickly developing area that use helicopters heavily but is not yet connected with these two main NATO organisations. To avoid duplication of effort and improve mutual knowledge/standardisation, cooperation between these three important NATO organisations should be



AVCATT, a good example of a very flexible mission simulator used by US Army Aviation.



NLD AH-64D Apaches in Afghanistan, a good example of pooling and sharing of helicopters in ISAF.

established starting with liaison participation at the main HISWG, HOSTAC and NSHQ meetings.

4.3 National

4.3.1 Pilot Exchange Programme. An expanded PEP is a key to enhance national knowledge on tactics and procedures and to establishing an international network. This is precisely why many traditional NATO helicopter forces place such a high value on their PEPs. Nations with no PEPs are encouraged to develop one so they can exploit the benefits of these programmes as well. Nations that already have very robust PEPs should look for opportunities to expand PEP's with additional nations; preferably it would be a two-way exchange but a one-way would still have value. Finally, nations should also investigate the merits of adding a maintenance technician exchange programme. It would be very beneficial if there was a centralized PEP coordination system that provides information on and promotes exchange programmes.

4.3.2 USA equipment compatibility/interoperability. Much importance has been placed on ensuring nations' equipment is compatible/interoperable with allied nations' equipment. However, it is very difficult to balance the nation's desire for technological advancement with the fiscal reality; therefore some nations can only maintain the status quo. The USA is generally first to field new equipment and technology

within NATO. It takes several years before other nations are allowed to procure and use this equipment even if they have the budget to procure it. This leads to interoperability problems. The USA will proceed with improving and updating their equipment but it needs to consider making its new equipment interoperable with current existing capabilities. This would enable their equipment to be interoperable with older equipment fielded by allies.

4.3.3 English language standards. Most nations indicated in the questionnaire that all their crews are able to communicate the English language in accordance with NATO STANAG 6001 Standard Language Profile [18] 3322¹². In multinational operations, the use of the English language can be a limiting factor due to the misunderstanding of terms, dialects of native speakers and lacks in proficiency. All non-native speaker nations should put more effort in enhancing their English level by conducting their home station morning briefings, flight briefings and other common briefings that are used both in their national and NATO settings in the English language. The EDA responded to this lack in proficiency and now provides English Language courses for helicopter crews. However, there are language difficulties with native speakers in operations as well. During briefings and real flying operations misunderstandings due to dialects are common, especially in stressful situations. It is important to explain to native speakers that when they operate with non-native speaking coalition



Viterbo Italy could be an applicant for a future location for a helicopter TLP.

members, they must be aware that the speed of their speech and use of dialects can severely hamper international cooperation and mission effectiveness.

4.3.4 Reducing reluctance amongst Army Aviation.

Several Army Aviation organisations seem reluctant to open up to more international cooperation¹³. Their roots are in a 'protected' Army organisation where they are 'owned' by their Brigade or Corps. Some indicate that the international helicopter air domain is not aimed enough at land operations and do not consider that their rotary wing aviation assets are part of the air domain as well. This means that they don't think interactions with NATO Joint Air organisations like AC Ramstein or the JAPCC are beneficial to them. Most AF organisations answered the JAPCC questionnaire very openly and are very willing to implement 'Smart Defence' initiatives. When possible, more interaction and information on international initiatives must be provided to Army Aviation and Air Force organisations by NATO.

4.4 Other

4.4.1 Proposal to develop a TLP. Another potential enhancement to international helicopter standards and interoperability is the inclusion of a Tactical Leadership Programme. Most NATO nations show an interest in a TLP for helicopters. A helicopter TLP could cover a combination of five areas; concept development, document management, education & training, advice & assistance and 'evaluation'. The TLP may be tasked to develop operational concepts from the tactical to the strategic level. Particular attention should be paid to integrating existing (multi)national concepts, lessons identified and emerging technologies into the new concepts. These conceptual developments could be briefed during conferences and taught during TLP.

The first TLP initiatives have already been made by the EDA and it is essential that NATO nations as a whole consider such an opportunity. A lot of nations are initially interested in a TLP but indicate that a thorough business case must be developed, to include costs and personnel involvement. Also a link to a Joint NATO organisation must be realised similar to the FW connection to AC Ramstein with a Letter of Agreement. The participation of the USA, GBR and Turkey is crucial to ensure the full potential of this TLP effort is realised. A TLP would ideally be located in Europe. A TLP in the South of Europe is preferred due to the better weather in the South but on the negative side a southern site would mean longer travel distances for northern countries. An alternative would be to have two TLP sites; one in the South and one in the North. This would be a compromise between travel time and good weather but the challenge to preserve standards between the two sites and an increased commitment on personnel and resources make this option less attractive. A TLP would not have to be a standalone entity; it could be co-located with another installation, preferably one that already operates helicopters.

1. This is a proposed name by the JAPCC for such an organisation.

2. Gen Welsh III, C-AC Ramstein's comment on bad LL/LI returns to the operational users; it's to slow or non-existing.

3. Including Air Assaults, day and night.

4. Like the NLD HWIC, US Marines MAWTS1 and UK QWI schools.

5. Derived from JAPCC interviews.

6. The term Weapon Instructor is derived from the Air Force. They are crew that are extra trained in tactics and weapon deliveries incl. doorgunners. When a nation does not have these extra trained crew then it's their top experienced operational crew that can deliver knowledge back to their helicopter community.

7. An example of a gathering of specialists is the Fort Rucker Army Aviation Gunnery Work Group.

8. Information from the questionnaire.

9. SIMNET was a wide area network with vehicle simulators and displays for real-time distributed combat simulation: tanks, helicopters and airplanes in a virtual battlefield. SIMNET was developed for and used by the United States Military. SIMNET development began in the mid-1980s, was fielded starting in 1987, and was used for training until successor programs came online well into the 1990s.

10. Example is the Air Maneuver Battle Lab at Ft Rucker, AL, USA.

11. AAAAA organises once a year a large convention where the USA Army Aviation community is informed on future plans and where US and rest of the world Industry can show there helicopter related programmes and products in a large exhibition. It draws many military guests from all over the world.

12. According NATO STANAG 6001, Listening level 'professional'; Speaking level 'professional'; Reading level 'functional' and Writing level 'functional'.

13. Analysis from JAPCC questionnaire.



More multinational training is crucial to enhance future combined missions.

CHAPTER 5

Conclusion

“Good ideas are not adopted automatically. They must be driven into practice with courageous impatience”

Hyman Rickover (four-star Admiral ‘father of the US nuclear Navy’)

5.1 Conclusion

Due to the complexity of how Air Force and Army Aviation units are organised in NATO it is not clear what organisation should be assigned the task of implementing or managing existing solutions. It is also clear that many nations do not yet comprehend the challenges that exists in future multinational helicopter standardisation. The aim of ‘Smart Defence’ does not release nations from their responsibility

to provide the necessary capability to support the NATO mission but provides tools for nations to work together to accomplish the mission. The JAPCC reasons that the improvements intended to enhance international helicopter standards detailed in this study will be difficult to realise due to reorganisations and budget cuts but an attempt must be made despite the complexity of the problems. In order to enhance NATO’s Operational Helicopter Capability, it is important that nations and NATO staffs first concur that the deficiencies listed in this study are valid, and then take ownership of these initiatives and assign responsible organisations to implement them. Also duplications with the EDA initiatives should be avoided. The JAPCC will consult with ACO/ACT to organise an initial NATO Helicopter Conference in 2013. The Conference is focused on future international cooperation and nations’ helicopter decision makers and ACO/ACT staff will be invited. This conference must set the foundations



More effective multinational operations shape future operations.

for follow-on projects like Joint International Helicopter Standardisation, a NATO Helicopter Coordination Cell, a TLP, a Joint International Evaluation System, Joint Mission Simulation, a Helicopter Weapon Instructors meet, Joint NATO/EU Exercise and Training Programmes, and Pilot Exchange

Programmes. Although it may seem impossible to realise these initiatives in this age of austerity, these initiatives will better utilise the scarce helicopter resources NATO has while enhancing international standards and thus ensuring the success of future NATO operations.



© SSgt Sarah Bleistein (101st Airborne)

OH-58D Kiowa Helicopter, small but very lethal.

ANNEX A

Helicopter Organisations of NATO and EU Nations Associated to NATO¹

"What counts is not necessarily the size of the dog in the fight, it's the size of the fight in the dog"

General Dwight D. Eisenhower

General Information

It is important for the readers of this study to have an insight on international initiatives in NATO and how NATO nations' helicopter forces are organised. This chapter first describes the various international initiatives for helicopter cooperation. Then it will detail the national organisation of most NATO countries'

helicopter forces. This will give the reader an idea of the possibilities that are available for cooperation with other nations. This information is derived from the JAPCC questionnaire. In Annex C there is a list of national helicopter community and staff points of contact that approved the publishing of this data. Although it is true that helicopter units and staffs need to officially contact each other via their International Military Staff (IMS) system, making initial horizontal contact with sister helicopter staffs and units about E&T possibilities will make for better requests for cooperation and will make it easier for these requests to move more quickly through the IMS system.

International Initiatives

The three existing organisations that provide helicopter related support in Europe are NATO's Helicopter

Inter-Service Working Group, the European Defence Agency and the 7-nation² European Air Group.

HISWG. The NATO Helicopter Inter-Service Working Group is part of the NATO Standardization Agency (NSA) under ACT and works with NATO countries to jointly develop doctrine and TTP's. The most important product from the HISWG is the ATP-49³.

EDA. The European Defence Agency and their Helicopter Training Programme, which aims to provide the users with training opportunities through a series of live, flying exercises and tactics symposia, are the owners of important initiatives to improve international helicopter training events among European member nations. International exercises like GAP 2009 (France), AZOR 2010 (Spain), Italian Call 2011 (Viterbo), Hot Blade 2012 (Portugal) and respectively Green Blade (Belgium) are examples of their ability to create and execute large international training exercises. EDA is also an important player in the endeavour to improve helicopter interoperability including their Multinational Helicopter Wing (MHW) initiative. The EDA stated:

"Despite having significant numbers of helicopters within the European inventory, successive operations have been short of vital helicopter support. Many of the more than 1700 helicopters in the military inventories in Europe are not available for crisis management operations for three reasons: firstly, some crews are not trained to fly in more demanding environments (for example over deserts or in mountainous terrain); secondly, some helicopters are technically not equipped for these environments and thirdly, costs of deployment are beyond national means. EDA is mainly addressing the training element. Initial training capacity has already been delivered in 2009 to Czech pilots, deployed to Afghanistan before the end of the year. In 2010 a Helicopter Training Programme was launched. This programme trains helicopter crews at the European level in a structured manner to fly in challenging environments, respectively deals with the requirements of multinational, operational scenarios. Additionally, the lessons learned are being discussed in a yearly tactics symposium, the first one has been held in Luxembourg in

AZOR, a large international exercise organised by EDA in 2010 in cooperation with Spain.



December 2010. More specific training is being facilitated through a commercial sourced helicopter tactics course – currently 6 nations are part of this project - and the first course has been held in Luxembourg in December 2010”.

EAG. The European Air Group is an MOU organisation composed of 7 NATO countries that organises an annual Joint Personnel Recovery Standardisation Course. In this course they bring together several nations to participate in a 3 week course on Joint Personnel Recovery and include specialised ground troops, fighter escorts and AWACS in their training.



Organisation of National Helicopter Forces

The answers to the JAPCC questionnaire showed that budget cuts are having a significant effect on the operations of national helicopter forces. The following

are short descriptions of nations’ organisation of their helicopter force. Known changes in the near future are noted. These descriptions should give readers ideas on opportunities for cooperation. In figure 5 opportunities for E&T and possibilities for international participation, as indicated by the individual nations, are mentioned.

BEL. Belgium will have 20 x A-109 and 8 x NH-90 helicopters after phasing out their Sea Kings. Their two joint structures are organised under the Air Force. From 2014 on, their helicopters will be organised into squadrons under one Wing. Their basic helicopter training is in France while further combat readiness training is conducted in Belgium at the operational units. They conduct mountain flying training in Saillagaise, France. For foreign nations, there may be possibilities for low level helicopter training in the Ardennes.

CAN. The The Royal Canadian Air Force (RCAF) helicopter inventory consists of: 27 x CH-124 Sea King, being replaced by 28 x CH-148 Cyclone (H-92) commencing within a year, 85 x CH-146 Griffon, 14 x CH-149 Cormorant and, commencing in 2014, 15 x CH-147F Chinooks. RCAF owns and manages all

Belgium Agusta A109.



E&T possibilities for Allies**	Mountain	Brown-out	White-out	Gunnery	Other
NLD					Weapon Instructor (limited)
ITA					Large exercises with Air Assault
GBR					EW in Spadeadam, Aviation Mission Rehearsal Exercise (MRX) at Salisbury Plains Training Area (SPTA)
DEU					EW Polyghone, Sim NH-90
USA A					
DEN					SOF (Ex Night Hawk)
FRA					
SPA					
CZE					
SVK					MI-17 Simulator
HUN					SERE
SVN					
ROM					
GRE					

** Costs could be involved

Figure 5: E&T possibilities for international participation as indicated by the individual nations.

helicopters that are flown by the Canadian Forces. RCAF fleets are part of a single service but are formed into three main communities: Maritime Helicopter support to the Royal Canadian Navy, Tactical Aviation support to the Canadian Army and SAR (National Asset). All helicopter pilots are trained to a basic level at Portage La Prairie, Manitoba through a contracted pilot training plan on the CT-156 Harvard II fixed wing aircraft and the CH-139 Jet Ranger. They are then sent to their Operational Training Units (OTU) for tactical training on specific aircraft type and environment. They conduct all their training in North America. Canada has Pilot Exchange Programmes with the USA and GBR.

CZE. The Czech Republic has Mi-24/35, Mi-171Š and Mi-17 helicopters. They are currently organised within a Joint Force command with a chance it will change

to the Air Force in the future (2013?). They operate from two Air Bases; 22 AB with 1 squadron and 23 AB with 2 squadrons. Their academic study is done at the military college and basic pilot training at training centre CLV Pardubice. Some training programmes are conducted under EDA (HTP, ISHTC, etc.). Mountain flying is accomplished in France and desert training during EDA exercises. They join NATO Tiger Meet exercises. They can offer gunnery sites.

DEN. Denmark has 14 x EH-101 Merlins, 8 x AS-552 Fennecs and 7 Lynx helicopters. All helicopters are Air Force and the 3 squadrons are organized in one helicopter wing at AFB Karup. Their basic helicopter training is conducted at Ft Rucker, Alabama and Pensacola, Florida, USA. Mountain and arctic training is accomplished in Canada and Norway. For foreign units they offer attendance at exercise 'Night Hawk',



Canadian BELL CH-146 GRIFFON and CH47.

UK EH-101 Merlin.



which is a large national SOF exercise which incorporates foreign helicopters which are tasked as combined units mainly working with infiltration/exfiltration of SOF units, both day and night. Denmark has a Pilot Exchange Programme with GBR.

DEU. The German Army have Tigers, UH-1 (till 2017), Bo-105 (till 2016), EC 135 and NH-90 helicopters in their inventory. The AF has CH-53's. German helicopters are organized in the 3 separate Army, AF and Navy commands. Most of the German basic training is conducted in Bückeburg at their helicopter Training Centre where Sweden, Switzerland, Austria and Greece also accomplish initial training. Some crews receive their basic training at Ft Rucker, Alabama, USA. The type conversion training is conducted at Le Luc-le-Cannet, France (Tiger) and Bückeburg itself. Foreign training is possible at the Polygone EW range and the NH-90 simulators.

FRA. The French have Tigers, Cougars, Puma, NH-90, Gazelle, Lynx, Dauphin, Al III and Panther helicopters.



Polish W-3 Sokol.

French helicopters are organized within the 3 separate Army, AF and Navy commands. In the French Air Force helicopters are embedded in two services. The initial pilot training is common with the Army, the Navy and the gendarmerie. It takes place in joint training centers in Dax and Le Luc (Army) for basic training and for instrumental flight. Then the specific training for Air Force pilots continues in Orange. After basic training, follow-up training is conducted at the operational squadrons for combat ready qualification. They accomplish mountain flying in the Pyrenees and the Alps during summer and winter (white out landing); they have the opportunity to train in desert condition (hot temperature) in Djibouti and train brown out in sandy areas in Cazaux. They organise training over sea and gunneries in Cazaux and Solenzara. France exchanges expertise about SAR with Singapore, China, Brazil, India and Switzerland, CSAR with Malaysia, MASA (Artificial Intelligence-based Modeling & Simulation) with Brazil (in Guyana) and India, RESCORT/CSAR with The Netherlands, and mountainous flight



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with Switzerland and India. The French Air Force has Pilot Exchange Programmes with the USA and Germany.

GBR. The United Kingdom has WAH-64 (AH-1) Apaches, CH-47 Chinooks, EH-101 Merlins, Pumas, Gazelles, Lynx and Sea King helicopters. UK RW is organised environmentally, with maritime helicopters commanded and operated by the Royal Navy and battlefield helicopters commanded by the Army under a Joint Helicopter Command (JHC) model but operated by all 3 Services. Basic Rotary Training for all 3 Services is delivered at the Defence Helicopter Flying School, RAF Shawbury. Advanced Rotary Training is split with RAF conducting initial mission training on the Griffin and then progressing to type for Operational training. Army Air Corps and Royal Navy progress direct to type from initial training. Specialised training involves the Qualified Helicopter Instructor course at RAF Shawbury, a Qualified Helicopter Combat Instructor course at RAF Benson and a Helicopter Weapons Instructor course at Wattisham. GBR indicates that, however while committed to Afghanistan, it is difficult to identify

combined multinational training possibilities. Possibilities for foreign nations training are: EW Training at Spadeadam (NE England); Ex JOINT WARRIOR (W & SW Scotland) and the Aviation Mission Rehearsal Exercise (MRX) at Salisbury Plains Training Area (SPTA). There are also possibilities for joining Staff Training Exercises or CALFEXs (neither 'owned' by JHC). They indicate that close links are established with USA and FRA. They support EDA programmes with SME's. They have established an extensive Pilot Exchange Programme with the USA, Canada, France, Denmark, The Netherlands, Australia and Jordan.

GRE. Greece has AH-64D, CH-47D, Puma's, NH-90, S-70, AB-205, B-206, B-212, UH-1, Al III and Schweizer 300 helicopters. The Hellenic Air Force will retire their AB-205 and B-212 fleet in 2012. Hellenic helicopters are organized within the 3 separate Army, AF and Navy commands in Aviation Brigades or separate Squadrons. The initial training of the helicopter pilots is for Army Aviation performed in the army aviation school, based at Stefanovikio airport. Its duration is 44 weeks and it is divided in 3 stages. the first (basic) stage, is performed with NH300c helicopters. The other 2

French Tiger with cannon.



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Hungarian MI-24 Hind.

stages of the training are performed with UH-1H helicopter and they include advanced training, day and night, instrument flight training and tactical training. The Hellenic Air Force conducts their initial training in the 112 CW and after completion has flown around 280 flight hours in various light/medium a/c. They have an Air Tactics Centre in Andravida AFB. Mountain, desert and maritime training are all accomplished in Greece. They offer training possibilities for foreign units in mountain, brown-out, maritime surroundings and gunneries.

HUN. Hungary has 12 x MI-24 Hinds, 11 x MI-17, 7 x MI-8's and are organised in one Joint Force (Army and Air Force) regiment with 2 battalions. At the very beginning of the process, the 1st selection phase of the applicants is made at the 86th Szolnok Helicopter Base. Hungarian Defence Forces send most of the student helicopter pilots to Moose Jaw Training Centre (Canada) where they get theoretical knowledge and fixed-wing flight training. After completion of the basic fixed-wing training in Canada, student pilots selected for helicopter return to Szolnok

Helicopter Base where they receive their helicopter theoretical and simulator training. Afterwards (and because there is no basic flying training course designed for helicopter pilots), student pilots join the operational units (combat and transport helicopter battalions) where they start their practical helicopter training. Hungary attends several EDA training events. Mountain training is conducted in Slovenia. Hungary can offer SERE A, B and C training.

ITA. Italy has A-129 Mongoose, A-109, CH-47 Chinooks, EH-101, NH-90, UH-90, OH-6, UH-212, UH-412, UH-1, AW-139, Sea King helicopters. They are organized within 3 separate Air Force, Army and Navy commands. Initial helicopter training is conducted in Frosinone, Italy or Ft Rucker, Alabama, USA. The Army does its initial tactical training at Viterbo and further combat ready training is conducted at their operational units. AF crews do their operational training at their operational units. They accomplish mountain flying, brown-out training and gunneries in Italy (Sardinia and Viterbo). They offer Mountain flying, brown-out training and larger multinational exercises to foreign nations.



Italian A-129 Mongoose.

NLD. The Netherlands will have 29 x AH-64D Apaches, 17 x ICH-47 D/F Chinooks, 20 x NH-90 (12 are Navy specialised) and 17 x AS-532 Cougars. The AS-532 Cougars will be reduced from 17 to an interim of 8, to full out of service in 2018. They are organized within one Air Force Defence Helicopter Command with Air Force helicopters on AB Gilze-Rijen and Navy helicopters at AB de Kooy. Basic AF helicopter training is performed in Ft Rucker, Alabama, USA (Flight School XXI). First basic operational training is in Ft Hood, Texas for AH-64D and CH-47D/F⁴. AS-532 Cougar crew accomplish basic operational training in the Netherlands. The Netherlands conduct mountain flying in Frosinone (ITA) and perform winter training mainly in Norway. EW training is conducted at Spadeadam, GBR. They run (joint) helicopter gunneries in Europe in Bergen-Hohne, Germany and in Ft Hood. Specialized NLD helicopter training: a Helicopter Weapon Instructor Course (HWIC) from AB Gilze-Rijen and they train their

Apache and Chinook flights annually in Ft Hood. The Netherlands have established a Pilot Exchange Programme with USA, GBR and Belgium.

POL. Polish helicopter forces are single service organised in mostly aviation brigades. They have 4 x SH-2G, 10 x Mi-14, 20 x Mi-17, 69 x Mi-2, 29 x Mi-24, 26 x Mi-8, 24 x SW-4 'Puszczyk' and 65 x W-3 'Sokół'. Their national military basic training helicopter programme is conducted at the Air Force Academy Dęblin. Advanced weapon training is provided in combat units i.e. 49 Flight Combat Regiment, 43. & 44. Most of the advanced training is accomplished in Poland itself. There are training opportunities for foreign forces.

ROM. Romania has IAR-330 SOCAT, IAR 330M, IAR 330L and IAR 316 helicopters. They are organised under Air Force and Navy commands. Their helicopter training is conducted at their Institutionalised system/ Air Force Academy (Brasov) and Air Force Tactical



The Netherlands Helicopter Weapon Instructor Course with their AS-532 Cougar, AH-64D Apache and ICH-47D Chinook.

School (Buzau). They accomplish mountain training in Romania itself. They consider possibilities for foreign units for mountain training and fire ranges at Bacau and Campia Turzii.

SPA. In Spain helicopters are organised within the 3 Army, AF and Navy commands. They have Tigers, CH-47 Chinooks, Cougars, Pumas, NH-90, UH-60, OH-6, UH-1, Sea Kings, S-76, EC-120 and EC-135 helicopters. All initial helicopter training is conducted in the Spanish Air Force helicopter school in Armilla AF Base (Granada) on Eurocopter EC-120B. After this initial training pilots go to their respective units in the Army, the Navy or the Air Force. Mountain and desert training is accomplished in Spain. For foreign forces there are possibilities for brown-out training, mountain training and the use of Bardenas Range. The Spanish Army has Pilot Exchange Programmes with France and Portugal.

SVK. Slovakia has 14 Mi-17 helicopters and is organised within the Air Force. All training is conducted at their helicopter wing. Mountain flying is accomplished in Slovakia at altitudes up to 3500ft and some limited training (due to nature protection) at altitudes up to 6500ft. Some arctic (white out) training is in SVK itself. They can offer Mi-17 simulator training in Presov.

SVN. Slovenia has 8 x Bell 412, 4 x AS 532 Cougars and for training 4 Bell 206 helicopters. Their helicopters are organised in a helicopter battalion that is part of the Air Defence and Aviation Brigade which is subordinate to the Force Command. Basic training is conducted in their Flying School (Bell 206). Further training is conducted by the unit. They plan to educate their crews on a tactical level in France (Le Luc) and United Kingdom. They accomplish Mountain training in Slovenia itself. They can offer mountain flying to foreign units (already for Hungary). Slovenia attends some EDA training events.



US CH-47F Cockpit.

US Army. The US Army and Army National Guard have UH-60, HH-60, AH-64, CH-47, UH-72 and OH-58 helicopters. Their helicopters are organised under (regular) Army Aviation commands in 12 Divisional and 2 separate Combat Aviation Brigades (CAB) and 8 CAB's with Army National Guards. A regular Army CAB can be 'Heavy' (48 AH-64, 38 UH-60, 12 HH-60 and 12 CH-47 = 110 helicopters) or 'Full Spectrum' (24 AH-64, 30 OH-58 Kiowa Warrior, 38 UH-60, 12 HH-60 and 12 CH-47 = 114 helicopters). The National Guard CAB consists of 24 AH-64, 32 UH-72 Lakota, 38 UH-60, 12 HH-60 and 12 CH-47 helicopters (total 118). Basic training for Army Aviation is conducted in Ft Rucker, Alabama under the 'Flight school XXI' programme where students will transition to their intended operational aircraft in the programme as soon as possible. Further 'Readiness Level' training is conducted at the

CAB units. The introduction of Unmanned Aerial Systems is in progress with many CAB's. They mainly accomplish mountain, desert and arctic training in the USA and in most other areas where they are stationed in the world. They can offer basic helicopter training and Master Gunner training (with some restrictions) in Ft Rucker, mountain flying in Colorado (among others), desert training in Ft Bliss, Texas and the National Training Center in California, arctic training in New York State and Alaska and advanced training in Ft Hood, Texas. The US Army Aviation has pilot exchange programmes (related to NATO) with the NLD and GBR.

1. Nations that contributed to the JAPCC questionnaire are mentioned.

2. Belgium, France, Germany, Italy, the Netherlands, Spain, the United Kingdom.

3. "Use of Helicopters in Land Operations – Doctrine". Apr 2012 is the new F-version was ratified. The next G-version will be a major change/upgrade to this document with updates from ISAF and OUP.

4. NLD have 8 AH-64D Apaches and 3 CH-47F Chinooks stationed in Ft Hood Texas.

ANNEX B

Joint Analysis & Lessons Learned Centre

Mission

The Joint Analysis and Lessons Learned Centre (JALLC) is NATO's centre for performing joint analysis of operations, training, exercises and Concept Development and Experimentation collective experiments, including establishing and maintaining an interactive managed Lessons Learned Database (LLDB).

Vision

"The JALLC will be recognised as NATO's leading agent for joint analysis with our efforts and products respected, thereby enabling our contribution to improve the capabilities of the Alliance."

Way Ahead

JALLC has taken a number of initiatives aimed at assisting NATO as a learning organization, improving the quality of the JALLC's products, and enhancing the outreach to NATO nations, partner nations and Third Country Nations (TCN) by: Supporting the IMS and International Staff (IS) in implementing the NATO Policy for Lessons Learned.

a. Increasing the understanding within NATO of the role of the JALLC and how to utilize the JALLC to conduct analysis on NATO's most important issues, using well-developed and carefully crafted analysis requirements.

b. Implementing a new internal project management methodology - PRINCE2 (Projects IN Controlled Environments).

c. Improving the internal training programme to ensure that staff officers posted into the JALLC are capable of producing high-quality analysis products.

d. Issuing a new LL newsletter; The JALLC Explorer, that will keep the NATO community updated on JALLC activities in the areas of Analysis, Lessons Learned, and Outreach.

e. Reaching out to NATO and partner nations, Troop Contributing Nation (TCNs), the Organisation for Security and Cooperation in Europe (OSCE), UN and the Military Staff of the European Union (EUMS).

In order to continue the positive development, the JALLC has a number of projects under way. In the short-to-medium term, the JALLC is:

a. Working with HQ SACT and SHAPE to make changes to the way that the JALLC Annual Programme of Work (POW) is compiled and executed, beginning with the transition to a rolling POW.

b. Working with NCSA (NATO Communications and Information Systems Services Agency) to further develop the existing NATO LLDb taking experience gained to date, user requirements and feedback, into account.

c. Gaining user feedback regarding the NATO LL Portal Prototype which in conjunction with NCSA, will be used in the development of the NATO LL Portal.

ANNEX C

List of Approved Helicopter POCs

Nations

CAN. Directorate of Air Strategic Plans, Royal Canadian Air Force, 101 Colonel By Dr. Ottawa, ON Canada K1A 0K2. E-mail: Trevor.campbell2@forces.gc.ca. Phone: +16139959822 and Fax: +16139958536.

DEN. Plans and Policy, Helicopters Branch, Tactical Air Command Denmark, E-mail: ftk-pkh007@mil.dk. Phone: +45 (0)99624950 or +45 (0)2573201.

DEU Army. German Army Aviation Standardisation Branch. E-mail: hflgwasdez4@bundeswehr.org. Phone: +49 (0)57229683895.

DEU AF. German Air Force Staff III 5, E-Mail: BMVgStablnspLIII5@bmvg.bund.de Phone: +49 (0)228 12 5989

GBR. JHC HQ Army HQ, Floor 1, Zone 4, IDL 417, Marlborough Lines, Monxton Road, Andover, SP11 8HT, United Kingdom. E-mail address: JHC-iHub-(Mailbox)@mod.uk. Phone: +44 (0)12643852 and Fax: +44 (0)1264381118.

GRE. Hellenic Air Force General Staff, Branch A'/A1 Directorate (Operations), 229 Mesogion Av. Zip:15561, Chologos, Greece. E-mail: a15.hafgs@haf.gr. Phone: +30 (0)21065911 and Fax: +30 (0)2106429187.

HUN. General Staff, Budapest, Ops Directorate, Senior Helicopter Advisor, Phone: +36 (0)302357298 or Joint Force Command, Szekesfehervar, Department of Training & Ops Helicopter section, Phone: +36 (0)307775134

ITA AF. Contact Address: Via di Centocelle 301, 0.1.5 Rome, Italy. ITA MOD JOHQ/J3 Air Ops. E-mail: j3.csoa@coi.difesa.it. Phone: +39 (0)6 4691 9056 and Fax: +39 (0)646919397.

NLD. Air Force Staff, Directorate of Operations, Helicopter Operations Branch (CLSK/DO/AHO). P.O. Box 8762 4820 BB Breda, The Netherlands. Phone: +31 (0)765445. or +31 (0)657567181.

ROM. RoAF Headquarters, Soseaua Bucuresti – Ploiesti, Km 10.5, Bucuresti, Romania. E-mail: ggoaga@roaf.ro. Phone: +40 (0)2139 60 86 and Fax: +40 (0)2139 40 33.

SVN. Slovenian Air Force, GSHQ J5, Vojkova cesta 55, 1000 Ljubljana. E-mail: bojan.brecelj@hotmail.com. Phone: +36 (0)14711003 and Fax: +36 (0)15683337.

SPA Army. Army Staff OPS Div, Cuartel General Del ET C/PRIM 6-8 2.0.4 Madrid. E-mail: aespgom@et.mde.es. Phone: +34 (0)9178022 and Fax: +34 (0)917803467.

SPA AF. AIR STAFF / OPS BRANCH, Romero Robledo, 8 Zip Code 2.0.1 Madrid Spain. E-mail: taboada75@ea.mde.es. Phone: +34 (0)91532491 and Fax: +34 (0)91534143.

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ANNEX D

Bibliography

[1] The 2009 BI- SC Priority Shortfall Areas document defined 50 prioritized Tier-2 capability shortfall areas. Bi-SC (ACT and ACO) agreed that these are the priority shortfall areas for NATO and the military committee acknowledges this document.

[2] Smart Defence: new NATO strategic concept that means pooling and sharing capabilities, setting priorities and coordinating efforts better as indicated on 4 February 2011 by NATO Secretary General, Anders Fogh Rasmussen, delivered in the keynote speech at the Munich Security Conference.

[3] JAPCC questionnaire, a 54 question document on helicopter doctrine, training, interoperability and standards was sent to a selection of NATO countries in March 2012. A significant majority of nations responded and that information is extensively used in the study.

[4] JAPCC Air Forum. On 8 and 9 May 2012, a helicopter Air Forum was conducted at the JAPCC in Kalkar Germany at which 11 nations attended. The intent was to discuss interoperability enhancements and solutions. The results of this Forum are used for the Study.

[5] Multiple Future Concept. Started on 1 May 2008 by SACT with the aim not to predict the future but to explore an array of potential futures and thus inform potential subsequent debates to determine implications in terms of military roles and missions to protect our populations. The intent of the MF project is to build upon the on-going work in HQ SACT and consider the contributions made by nations and experts in examining global trends to help identify 'plausible' future scenarios. The combination of the overarching trends, specific influencing drivers of interest to NATO and the plausible futures are the basis of the intellectual framework. Basic intents are used for the project.

[6] AAP-6. NATO glossary of terms and definitions (English and French). 22 March 2010.

CH-47 returning from a mission in ISAF.



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[7] ATP-49(E). Use of helicopters in land operations - Doctrine, STANAG 2999, 31 October 2008.

[8] N/a

[9] Fixed Wing Tactical Leadership Programme in Albacete Spain. Information gathered via TLP-info.org and direct contacts.

[10] NSHQ, information via JAPCC SME CS009 in the Combat Support Branch, involved with SOF and PR developments with helicopters.

[11] JMR, Maj. Gen. Tim Crosby, U.S. Army Program Executive Officer for Aviation, offered a vision for 'a 2030 aim point for a Joint Multi-Role kind of system in 2011 at the recent Association of the United States Army annual meeting and symposium.

[12] Interview with LtGen de Kruijf, Commander Netherlands Army, former commander ISAF RC-S on JAN 24 2012, in the Kromhoutkazerne, Utrecht, The Netherlands.

[13] ACO Forces Standard Volume I, General, dd 2009.

The overarching document that identifies areas for which forces standards must be developed and provides the framework for other volumes.

[14] ACO Forces Standard Volume III, Air Forces dd 6 Apr 2011. This includes standards for all attack and support helicopter forces declared as available for NATO-led operations regardless of service.

[15] ACO Forces Standard Volume VI, SHAPE Tactical Evaluation Manual, dd Nov 2008

[16] RAF Benson CAE MSHATF Simulator, experience from JAPCC SME CS008 in Combat Support Branch and CAE information.

[17] HISWG Matrix project. As stated in the April 2011 NATO HISWG Helicopter Operations Panel in Nashville, Tn, USA, a project team with Germany in the lead tries to get the approval from the NATO Land Board to conduct this project.

[18] STANAG 6001, Edition 3, 20 February 2009. Language Proficiency levels.

ANNEX E

Acronyms

AC	Air Command	COE	Centre Of Excellence
AAC	Allied Air Command	COIN	Counter Insurgency
AAP	Allied Administrative Publication	COMAO	Composite Air Operations
ACC	Air Component Commander	CONUS	Continental USA
ACO	Allied Command Operations	COTS	Commercial Of The Shelf
ACT	Allied Command Transformation	CSAR	Combat Search And Rescue
AF	Air Force	DHC	(Netherlands) Defence Helicopter Command
AJDH	Allied Joint Doctrine Hierarchy	EAG	European Air Group
AJP	Allied Joint Publication	EDA	European Defence Agency
AOI	Area of Operational Interest	EPP	Exchange Pilot Programme
AOR	Area Of Responsibility	E&T	Education & Training
ATO	Air Tasking Order	EU	European Union
ATP	Allied Tactical Publication	FW	Fixed Wing
AVCATT	Aviation Combined Arms Tactical Trainer	HISWG	Helicopter Inter-Service Working Group
BI-SC	Bi Strategic Command	HOSTAC	Helicopter Operations from Ships other than Aircraft Carriers
C2	Command and Control	HQ	Headquarters
CASEVAC	Casualty Evacuation	HWIC	Helicopter Weapons Instructor Course
CBT	Computer Based Training	IO	International Organisation
CRVAL	Combat Readiness Evaluation	ISAF	International Security Assistance Force
CJPRSC	Combined Joint Personnel Recovery Standardisation Course	ISR	Intelligence, Surveillance, and Reconnaissance
CMO	Crisis Management Operation	JALLC	Joint Analysis & Lessons Learned Centre
		JAPCC	Joint Air Power Competence Centre

JFC	Joint Force Commander	NCSA	NATO Communications and Information Systems Services Agency
JFTC	Joint Force Training Centre	NEC	Network Enabled capabilities
JFTL	Joint Future Theatre Lift	(N)GO	(Non) Governmental Organisation
JHA	Joint Helicopter Agency	NHCC	NATO Helicopter Coordination Cell
JHC	(UK) Joint Helicopter Command	NRF	NATO Response Force
JMR	Joint Multi-Role	NSA	NATO Standardization Agency
JOG	Joint Operations Guide	NSHQ	NATP Special Operations Head Quater
JPR	Joint Personnel Recovery	OEF	Operation Enduring Freedom
JWC	Joint Warfare Centre	OPLAN	Operation Plan
LCC	Land Component Commander	PEP	Pilot Exchange Programme
LI	Lessons Identified	PfP	Partnership for Peace
LL	Lessons Learned	POC	Point Of Contact
LOP	Local Operating Procedure	PR	Personnel Recovery
MANPAD	Man Portable Air-defence System	RAF	Royal Air Force
MC	Military Committee	RC	Regional Command
MEDEVAC	Medical Evacuation	SACT	Supreme Allied Command Transformation
MFP	Multi Future Project	SAR	Search and Rescue
MHW	Multinational Helicopter Wing	SERE	Survival, Evasion, Resistance and Extraction
MOU	Memorandum Of Understanding	SHAPE	Supreme Headquarter Allied Powers Europe
MRAP	Mine Resistant Ambush Protected	SLP	Standard Language Profile
MSHATF	Medium Support Helicopter Aircrew Training Facility	SME	Subject Matter Expert
NATO	North Atlantic Treaty Organization		

SOF	Special Operations Forces	TTPs	Tactics, Techniques and Procedures
SOP	Standing Operating Procedure	UK	United Kingdom
STANAG	(NATO) Standardization Agreement	US	United States
STE	Synthetic Training Environment	USA	United States of America
STEM	SHAPE Tactical Evaluation Manual	USAF	United States Air Force
TACEVAL	Tactical Evaluation	WI	Weapons Instructor
TLP	Tactical Leadership Programme	WMD/E	Weapons of Mass Destruction/Effect
TOR	Terms Of Reference		



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