

## **The Role of Air Power in Networked Security**

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*Abstract: The concept of “Networked Security” has become the German governmental concept response to the nature of an altered security situation. It is the overall framework for the future conduct of German security policy and rests on a comprehensive understanding of security aimed at preventing crises, combating them once they have escalated, mitigating their impacts, and providing stabilization in their aftermath. Within this context, air forces operate as part of a joint, multinational, and interagency team. This understanding drives the Luftwaffe’s Flight Plan for Transformation. The past decade has underlined that air power’s inherent properties – speed, range, and flexibility – are very supportive to key enablers of networking such as sensors, information and communication technology. Capitalizing on those strengths is an obligation to the Luftwaffe – particularly whilst facing the asymmetrical challenges posed to NATO and its partners.*

### **1. Networked Security**

In October 2006 the German coalition government published its White Paper 2006 on German Security Policy and the Future of the Bundeswehr.<sup>1</sup> Within a period of 12 years (the previous paper was issued in 1994), Germany has taken on a much more active international role. Today’s Bundeswehr has an international share with some 8,000 soldiers participating in eleven international operations mainly in the Balkans, in the Mediterranean Sea, in Africa and in Afghanistan. There is no better illustration for the fundamental change of Germany’s security and defence policy than the fact that contributions to the international fight against terrorism have become nowadays a key task of the German Bundeswehr.

The altered security environment has led to a paradigm change in the way to define security needs. Peace, security and prosperity are more interconnected than ever. Nations need to cooperate with other nations and organisations to prevent the decline of any state. There is a growing demand to contribute in time and effectively to peace and security, democracy and prosperity, development and the rule of law. Close cooperation and coordination between international organisations – particularly between the United Nations, the European Union and NATO – is of utmost importance with regard to their respective roles in crisis prevention and crisis management.

Obviously, former military concepts and capabilities no longer meet the new challenges to security. In the past, military components fought more or less independently of each other – under a command & control which was joint only at a comparatively high level. Unity of effort was predominantly achieved through coordination and deconfliction. A sequential planning cycle aimed at attrition. Targets were attacked more or less indiscriminately. Collateral damage was rather the rule than the exception. In contrast, today and in future a much stronger integration of effort, services and agencies is/will be needed. Of course this affects air forces as well. They need to adjust to operate as part of a joint, interagency, and multinational team. This understanding drives the Luftwaffe’s Flight Plan for Transformation.

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<sup>1</sup> White Paper 2006 on German Security Policy and the Future of the Bundeswehr (Berlin: Federal Ministry of Defense, 2006), <[http://www.weissbuch.de/download/White\\_Paper\\_2006.pdf](http://www.weissbuch.de/download/White_Paper_2006.pdf)> (access: 18 December 2006).

The new challenges demand better and different capabilities to guarantee security and stability. “*Asymmetrical*” threats by their very nature aim at the vulnerability of critical infrastructure and entire societies. A dramatically increased complexity in combination with strikingly reduced reaction times delivers a clear message: internationally orchestrated, interagency-based, network enabled capabilities are the answer to the upcoming asymmetric security challenges. This requires a government networking policy which is geared towards strengthening interagency leadership and which builds on the notion of network enabled, effects-based, and capability driven security management.

The concept of “*Networked Security*” as addressed in the White Paper has become the German Government’s conceptual response to the nature of the altered security situation. It is the overall framework for the future conduct of German security policy and rests on a comprehensive understanding of security aimed at preventing crises, combating them once they have escalated, mitigating their impacts, and providing stabilization in their aftermath. Networked security emphasizes the need for harmonized interagency action in order to provide integrated effects that build on the smooth interplay between military and non-military instruments of power. With this approach Germany follows NATO in advancing an effects-based approach to operations, envisaged by the 2004 Strategic Vision of NATO’s strategic military commanders and the NATO’s Heads of State and Government 2006 Comprehensive Political Guidance (CPG).<sup>2</sup>

## **2. Transforming Defence using Collaborative Networking**

Building lasting peace will only be possible when military capabilities are embedded into a grand strategy, an “*overall package*” of governmental and/or international measures. This has been clearly illustrated in the Balkans, Afghanistan, and Iraq. Military contributions need to be well harmonised with other governmental or international instruments. The application of military, diplomatic, and economic power in an effects-based approach to operations requires comprehensive concepts.

Consequently, armed forces can no longer focus primarily on traditional combat operations but need to become more flexible being part of a collaborative interagency-driven environment. This will enable them to deal with the whole spectrum of asymmetric challenges. The measures they can take to counter these challenges range from de-conflicting joint operations to integrated and even interdependent operations – the motto is: “*mass effects rather than forces*”. Some stabilisation operations have seen a shift from combat tasks to policing tasks. Capabilities for interagency and joint planning are required as well as command and coordination capabilities which ensure that the most appropriate means are employed.

How can the military be transformed for the critical and complex business of post-conflict stabilization, to cope with lawlessness, destruction of civilian infrastructure, or attacks on coalition forces? International conflict prevention and crisis management, including the fight against international terrorism, will dictate the structure and have a decisive influence on the capabilities, command and control systems, availability and equipment of armed forces. The structure of the armed forces needs to be consistently adjusted to keep up with operational demands. We need to look at improving operational readiness across the entire task spectrum but at a stronger interagency approach as well.

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<sup>2</sup> Strategic Vision: The Military Challenge (Mons/Norfolk: SACEUR/ACT, 2004), para. 25; Comprehensive Political Guidance endorsed by NATO Heads of State and Government on 29 November 2006, para. 17.

particularly whilst facing the asymmetrical challenges posed to NATO and its partners. The ability to conduct *Network Enabled Operations* based on respective capabilities will be an absolute prerequisite to play a successful part in multinational conflict prevention and crisis management. *Network Enabled Capabilities* are the core element of transforming armed forces as they significantly enhance the military capability profile. From a technical perspective they are mainly based on information processing means and communication technologies that have revolutionised commercial business. Leveraging these technologies for security purposes has not only altered the relationship between the military services and within the defence administration, but also significantly affects the relationship between the military and government, non-government agencies, supporting institutions and industry.

Command and control, communications and computers, surveillance and systems automation capabilities have increased by orders of magnitude in the past decade. Integration and coordination build the nexus of Network Enabled Capabilities. The network gives security forces the ability to better understand a situation, and it allows dispersed personnel to simultaneously and accurately evaluate and respond to each situation. The network improves communications, coordination, and collaboration to create greater operational efficiencies. Networked solutions provide the Luftwaffe with the essential technological capabilities of system engineering, installation, integration, operations, and maintenance. These will help the Luftwaffe reach an unprecedented level of synchronisation of security forces and supporting measures. Shortening the decision cycle will help own forces to operate faster and more efficient as compared to the adversary's decision cycle with respect to quality, quantity, and usage of dynamic mission-critical information.

Command and control under network enabled conditions guarantees a broad-scale, effective, and efficient “*management of the battle space*”. This is particularly true for stabilisation operations. Today's often asymmetric and challenging security environment calls for dramatically increased transparency. Nevertheless, own forces also have to be able to cope with information black spots which are characterised by their very low information density. To deal with that situation, flexibility, improvisation and mission-oriented decentralisation are needed. Flexible mobile systems must constantly adjust themselves to rapidly changing situations and move data rather than units. People and sensors identify and report what can be detected. Software-based decision support, modelling and simulation dramatically improve time and decision quality requirements, fill information gaps and facilitate rapid and adequate decision-making.

The use of networks reduces the significance of the location of sensors, decision makers and effectors. It leads to successful team cooperation and integration in a diversified environment. Virtual organisations bring together the participating governmental and non-governmental actors, with weapon systems and other instruments of power, sensors and decision makers for a specific task. Once the task has been completed these resources are available for new tasks. Virtual organisations support a comprehensive and shortened command and control process that enable forces to increase the operations tempo, which is the key element when it comes to obtaining a competitive advantage on the battlefield.

### **3. Effects Based Approach to Operations**

Given the multi-faceted character of current security challenges, an effects based approach has become the key philosophy. This approach involves the comprehensive, harmonized and therefore efficient application of all instruments of joint, multinational and interagency-based power – including military and non-military instruments – to create effects and actions that will help to achieve the desired outcomes. The *Effects-Based Approach to Operations* (EBAO) is closely related to the concept of network-enabled capabilities. It is the emerging

NATO concept for dealing with all aspects of security operations. This approach includes an enhanced situational awareness, timely operational planning and decision-making, an improved use of modern means of command and control, sensor fusion of multiple sources, and coordinated application of all instruments of power.

Although elements of EBAO have already been used in the past, a much more comprehensive framework for integrating all elements of the military—as well as multinational and governmental agencies—into a coherent campaign philosophy can be achieved. Legacy methods focus on the destruction of targets. EBAO moves beyond narrow tactical viewpoints. The challenge for the military planner will be to use superior knowledge to apply force at the right place and time to achieve specific operational and strategic effects. EBAO promotes greater planning agility; it is also less plodding and more adaptive to the achievement of specific effects.

These features become visible at the tactical, the operational, the strategic and the political level through a *Common Relevant Operational Picture (CROP)*. Cross-functional information sources and services like meteorological and geodetic data, intelligence and open-source information will feed an information pool that holds all available data and information for operations. At the tactical and operational levels functional services select the various products from networked databases with regard to clearly selected criteria and route them to a *Role-based Operational Picture* that displays all relevant information for a given mission on demand. Through linking military leaders and decision makers with respective units and weapon systems, the available information and knowledge can be used for battle management, command, control, communications and computers, intelligence, surveillance, and reconnaissance, and engagement missions. The capability to conduct a system of systems analysis helps to collect, store and display information and assessments needed at the strategic and the political level for their respective awareness, but it also provides the necessary information for the tactical and the operational levels.

EBAO incorporates effects of military action into a “*grand strategy*” carefully reflecting its intended overall results. Based on an integrated politico-strategic guidance, a coherent plan with military and non-military elements of *International Governmental Organisations (IGO)* and *Non Governmental Organisations (NGO)* is developed. A subsequent strategic framework provides a proper structure for the effects-based approach to operations of all actors involved. The elements to be considered include common and updated documentation, multinational training, closing of interoperability gaps, an awareness of cultural sensitivities, and a standardised terminology.

The core capability of EBAO is a superior command and control process that is based on a network of governmental and non-governmental expert knowledge and instruments of power. In order to achieve a maximum effect, the process is designed to project those available instruments of power at an early stage and in an integrated fashion. As a rule, this effort will employ the means best suited for attaining an objective. Objectives need to be clearly defined well in advance. The effects-based approach amalgamates planning and decision-making, which used to be independent processes, into a single coherent, simulation-based process.

Effects can be defined as outcomes resulting from the deliberate use of a coordinated set of actions involving all relevant state and non-state capabilities, primarily those based on measures in the fields of diplomacy, information, economy and the military. The aim is to shape the behaviour of actors and to influence conditions with a view to the overall goal to be achieved. Minimising damage caused by military operations as well as avoiding collateral

damage as far as possible facilitates reconstruction in the post-conflict phase. Consequently, the effects-based approach envisages close civil-military interaction.

In order to create the desired effects, a system of systems approach is necessary. In such an approach, the key actors are analysed from various perspectives, with particular attention paid to political, military, economic and social, information and infrastructure aspects. Effects-based thinking is about increasing coherency by integrating the various instruments of state power and non-governmental capabilities. This cannot be done without integrated strategies. However, coming up with strategies that are genuinely joint, combined and interagency based is not an easy job.<sup>3</sup> It requires a common understanding of and agreement on the risks and challenges to be met, the tasks to be accomplished and the contributions to be delivered together and by each individual department and service. Networked and integrated strategies require parallel planning processes and cycles.

An effects-based approach to operations requires a new quality of emerging knowledge concerning the target to be addressed. To create this knowledge, data and information need to be collected and analysed using holistic means. Results have to be adequately incorporated in the decision cycle. All this leads to a profound and broad knowledge base that enables planners to include all aspects of an adversary system in own planning and decision-making processes. The inclusion of relevant expert knowledge must be ensured. Providing relevant insights requires intensified cooperation with academic disciplines in terms of social, cultural, and regional studies – in particular those disciplines which are not part of the normal intelligence process. In addition, there is a serious need to professionally manage open sources. In this context, it is essential to take account of the knowledge requirements of all stakeholders in the broadened spectrum. Today, the primary hurdle is the question of how to collect, analyse and disseminate intelligence data – at an interagency level within the respective governments, at an allied and NGO level.<sup>4</sup>

#### **4. Bundeswehr Transformation**

Security in the 21<sup>st</sup> century demands a degree of excellence higher and broader than ever before. As armed forces need to contribute to networked security, their ability to cooperate and interact with other agencies becomes a fundamental requirement. Therefore, interoperability needs to be a focal point of the armed forces development, along with agility, flexibility, responsiveness and effectiveness. But the armed forces are not going to act by themselves. The orchestration of all available civil and military, governmental and non-governmental capabilities in the transatlantic and European context is critical to European security. De-confliction and coordination are necessary first steps on the roadmap of transformation. But these steps will not be enough. Integration and even orchestration of these capabilities are essential. Not all of the involved instruments need to be new and front-end, but they need to be able to “*plug to operate*” and produce the desired outcome in a synergistic manner.

Today’s spectrum of German foreign and security policy ranges from humanitarian and economic assistance to a proactive and preventive behaviour. This policy deliberately aims at shaping foreign and security issues together with the international community in its manifold forums, organizations and bodies, and proactively using its diplomatic, political, economic and military instruments for security and stability in and for Europe and beyond. Within this context, the Bundeswehr must be capable of making a sustainable contribution to the tasks of

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<sup>3</sup> Donald Drechsler, “Reconstructing the Interagency Process after Iraq”, *The Journal of Strategic Studies*, 28:1 (February 2005), pp. 3-30.

<sup>4</sup> Heiko Borchert, “Die unterentwickelte Beziehung: Zur Zusammenarbeit von Wirtschaft und Nachrichtendiensten“, in: Heiko Borchert (editor), “*Verstehen, dass die Welt sich geändert hat*”, 2005, pp. 113-121.

international crisis management and defence for NATO, EU and United Nations – in accordance with and appropriate to the interests and importance of Germany.

The purpose of the Bundeswehr transformation is to improve and maintain its operational capabilities on the long term – in a multinational context and with a robust sustainability. During the supportive process of continuous change, the overall capabilities of the Bundeswehr have to take precedence over the capabilities of individual services and organisational areas. It will be important to apply a capability-based approach when making decisions about organization, concepts, and system procurement. The objective of the approach is to significantly improve the capabilities of performing joint missions within a multinational framework on the one hand and making best use of network enabled capabilities on the other hand.

The growing and urgent demand for transformation actions is particularly linked to the international obligations and national requirements.<sup>5</sup> Germany's (homeland) defence against external threats remains the core mission of the Bundeswehr – especially with regard to its political and constitutional foundations. This includes the protection of the population and of critical infrastructure. Nevertheless, contributions to the defence of Allies and to stability in Europe and the world have always been part of the Bundeswehr mission. This includes the safeguarding of Germany's capacity to act in the field of foreign policy and the promotion of multinational cooperation and integration. The task spectrum is accordingly broad.

Within this context, the Bundeswehr is prepared to deal with the most probable tasking, i.e. international conflict prevention and crisis management. With special emphasis on the fight against international terrorism, operational requirements come into place to guarantee the needed military capabilities – due to the above mentioned international obligations and national requirements, Germany must be able to provide adequate force contingents to participate in peace enforcement operations, peace stability operations and subsidiary assistance measures as well as protective measures, with all these operations and measures being inter-linked and usually being conducted in an interagency and multinational context.

In all, the German transformation is consistently geared towards an improved Bundeswehr mission performance in the most probable operational scenarios: conflict prevention and crisis management, including international anti-terror operations. To this end, the tasks, capabilities and equipment have to be harmonised with the available financial resources. Bundeswehr transformation is designed as a continuous proactive process – a process of continuous renewal, a process toward structural flexibility and learning abilities.

## **5. Aiming higher – the Luftwaffe Flight Plan for Transformation**

The Luftwaffe has developed a flight plan to ensure significant contributions in an altered security environment and to make the Luftwaffe an indispensable partner. Particularly with its capabilities to deliver effects in and from the air, including space, the Luftwaffe contributes to German and international security.

Operational flexibility, considerable responsiveness and the capability to deliver effects over long distances are key features of particular importance for present and future contributions of air forces in order to efficiently contribute to networked security. By demonstrating timely presence and/or delivering graduated effects, it is possible to react to situational developments in an escalatory or de-escalatory manner. By safeguarding air sovereignty, the protection of our citizens and own territory against air attacks is ensured at any given time. These capabili-

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<sup>5</sup> Cf. General Wolfgang Schneiderhan, "Die Transformation der Bundeswehr" (Transformation of the Bundeswehr), in: "Revolution, Reform, Transformation", (Editor) Dr. Eberhard Birk, "Gneisenau Blätter", Volume 4, 2006, pp. 59.

ties underline the significance of the Luftwaffe in contributing to political and military freedom of action in the context of international crisis management, conflict prevention and security anywhere within or beyond German borders.

The Luftwaffe provides direct support to land and maritime forces and it contributes to protecting own and allied forces against attacks from the air. On account of their specific characteristics and capabilities, air forces also have an important political role. Their capability to carry out strategic, operational and tactical airlift of personnel and equipment enables rapid deployment of force contingents and their reliable sustainability in crisis areas. The procurement of mobile operations centres and the modernisation of both airborne and ground-based weapon systems will result in a greatly improved operational capability.

With the EUROFIGHTER, the Luftwaffe operates a highly agile and extremely efficient combat aircraft for ensuring the integrity of German airspace, as well as for conducting operations in the context of international crisis management. Superior-performance air-to-air missiles optimised for different ranges will be integrated in the EUROFIGHTER to provide this capability. For the air-to-ground role, the EUROFIGHTER will be equipped step by step with laser- and GPS-guided precision weapons for various ranges, as well as with a modular standoff weapon. Procurement of the highly mobile tactical Medium Extended Air Defence System (MEADS), a transatlantic development, will enhance the ballistic missile defence capability, in particular. Together with an upgraded PATRIOT weapon system, this will constitute a significant contribution to national risk prevention.

In future, the capabilities of airborne, standoff and all-weather surveillance and reconnaissance are to be ensured by means of Unmanned Aerial Vehicles (UAVs) operating at medium and high altitudes. The AIRBUS A400M transport aircraft with its air refuelling capability will add considerably to existing air lift capacities; aircraft range and endurance in the mission area can be increased substantially. AIRBUS A310s are being converted to tanker aircraft to provide an initial national air refuelling capability. The new NH-90 transport helicopter will considerably enhance short-range airlift capabilities and greatly improve the capability to guarantee the survivability and protection of German soldiers in operations. For strategic aeromedical evacuation, the Luftwaffe provides A310 AirMedEvac aircraft.

The Luftwaffe and its assets make a key contribution to the capability profile of the Bundeswehr, given the wider set of tasks. It thus makes valuable political options available in the context of conflict prevention and crisis management, as well as the capability for national and Alliance defence and, with its special capabilities, guarantees the safety of the population at home and of forces abroad during joint operations.

To sum up, today's Luftwaffe is facing numerous challenges in achieving the critical capabilities necessary for the vision of networked security as laid out in the White Paper. The Luftwaffe provides substantial capabilities in air superiority, precision engagement, rapid and global mobility, information superiority, and combat support. In doing so, the Luftwaffe makes an important contribution to the broadened joint, interagency, and multinational mission spectrum of the 21<sup>st</sup> century.