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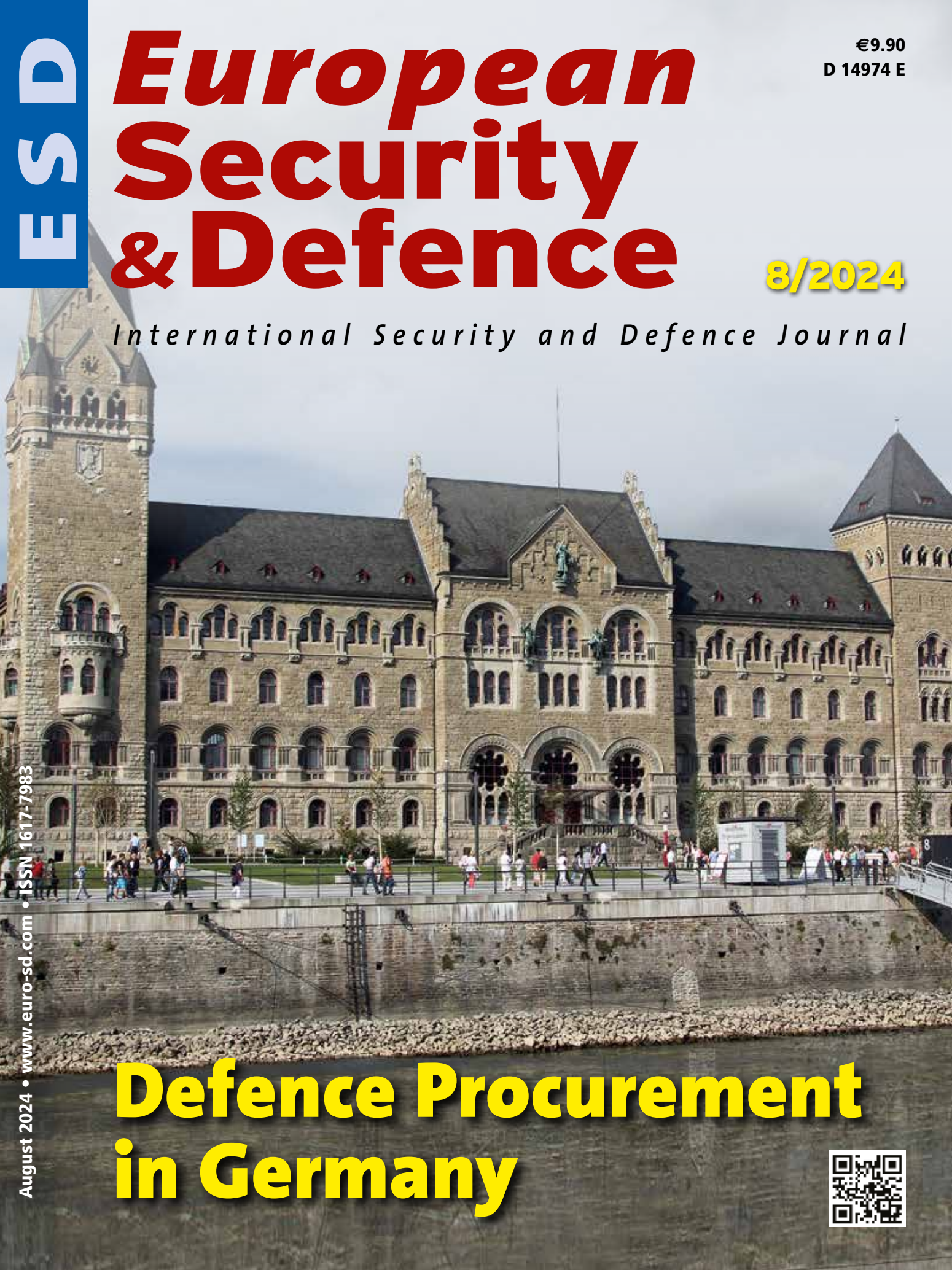

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The Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support

The Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support – abbreviated as BAAINBw – is a federal authority within the remit of the Ministry of Defence. The office is headquartered in Koblenz.

The BAAINBw celebrated its tenth anniversary in 2022. On 1 October 2012, the BAAINBw was established. It emerged from the former Federal Office of Defence Technology and Procurement (BWB) and the former Federal Office of the Bundeswehr for Information Management and Information Technology (IT-AmtBw). The impetus for founding the new office lay in the reorientation of the Bundeswehr that began in 2011.
On 1 January 2013, the responsibility for the operational readiness of materials was taken over from the military organisational areas. This encompasses all measures to maintain and restore operational readiness during the utilisation phase. To incorporate aspects and experiences from deployment and use even more efficiently into the development and procurement of military equipment, the new structures were to be implemented with a mixed civilian-military composition. Therefore, alongside civilian employees with expertise in armaments, experienced soldiers also serve in the BAAINBw. This collaboration promotes a shared understanding among Bundeswehr members for daily work and the common mission. In this context, different approaches, experiences, and views needed to be recognised and respected. This previously unusual situation has been mastered very well together with a culture of positive appreciation established in the BAAINBw and its offices. Colleagues work side by side, closely united in the common goal of equipping the Bundeswehr with the best possible materiel.
The BAAINBw is responsible for meeting the material requirements of the armed forces and for managing the use of equipment to maintain the operational readiness of materiel introduced in the Bundeswehr.
To fulfil its mission, the office has excellent specialist expertise, organised into ten departments. Additionally, task completion is supported by staff units closely aligned with management. If necessary, additional temporary working groups can be established to complete special tasks.

Credit: BAAINBw

With a ceremonial event, the then Federal Minister of Defence, Dr Thomas de Maizière, inaugurated the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support, or BAAINBw, in Koblenz on 2 October 2012.

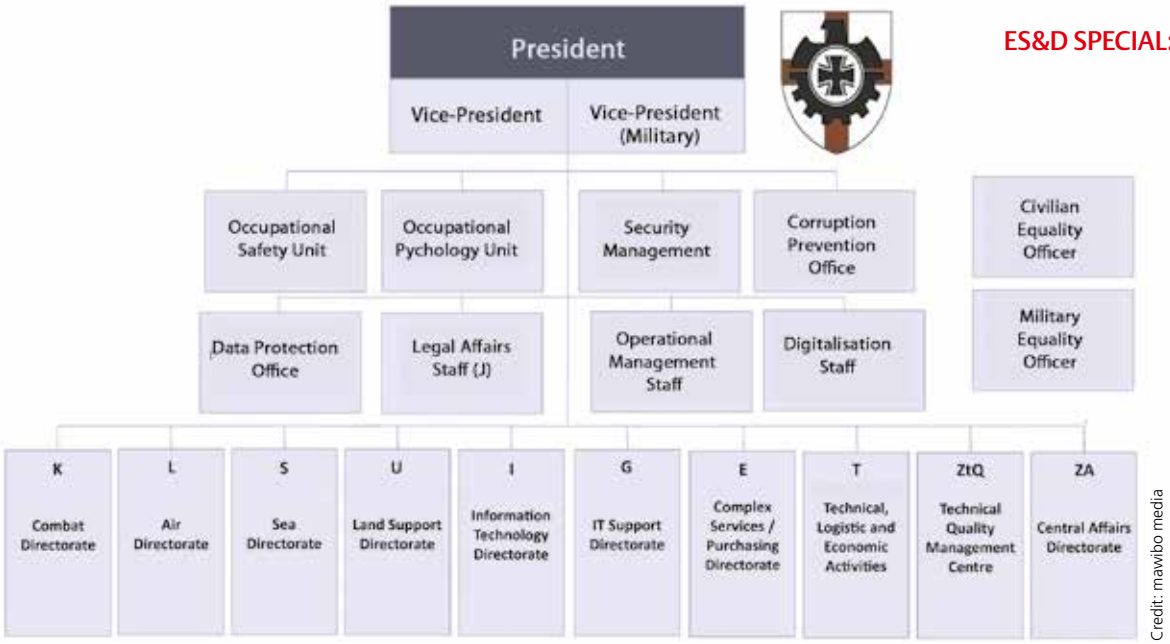
The subordinate area of the BAAINBw consists of six Defence Technology and two Defence Science offices, the Naval Arsenal, and the German Liaison Office for Defence Materiel USA/Canada.

Partner of the Armed Forces

The BAAINBw and its subordinate offices stand together with the armed forces as reliable partners. The core task of the BAAINBw is to ensure that the Bundeswehr is equipped with modern technology, effective and safe equipment, and armaments-related services under economic conditions, all in line with needs and requirements. This also includes the field of information technology. The focus is on the development, testing, procurement, and utilisation management of defence materiel. In light of the Russian war of aggression against Ukraine and the resultant turning point, a fundamental paradigm shift has been implemented to increase the operational readiness of the armed forces as quickly as possible, which now prioritises the factor of "time" in procurement. Market availability is the basic solution to be foreseen. Capability-related modifications to market-available solutions are only permissible if they are classified as "indispensable". Special further developments or new developments of defence materiel are suspended until the basic capability for potentially necessary national and Alliance defence is ensured. The product range the BAAINBw deals with extends from highly complex weapons and information technology systems, tanks, aircraft, ships to the equipment and clothing of soldiers.

Responsibility for the Entire Life Cycle

The possibilities for meeting requirements in the armaments sector are based on three main pillars within the framework of equipment and utilisation management: provision of material solutions and services according to Customer Product Management (CPM), covering operational needs of the Bundeswehr via the Bundeswehr Purchasing (EinkaufBw), as well as procurement and utilisation of complex services.



Credit: mawibo media

These three procurement variants differ in their suitability for different procurement objects, but also in the procedural sequences and requirements.

The CPM procurement procedure considers and supports products and services holistically throughout their entire life cycle. This integrated approach to the complete equipment and utilisation process requires, in addition to carrying out all procurement tasks, the assumption of so-called material responsibility for operational readiness. Thus, the comprehensive tasks from the analysis phase through the entire utilisation management of the material of all military organisational areas up to its decommissioning are brought together in one authority.

The EinkaufBw procures both commercially available, market-ready, as well as Bundeswehr-specific goods, services, and rights, especially spare and replacement parts to maintain service operations and preserve operational readiness. The focus here is on a variety of individual products, which are grouped into purchasing segments (based on product groups).

The focus of complex services (KDL) is on the procurement of a comprehensive solution. This involves the provision of products and associated services by or with a private partner. Complex services generally require longer-term contractual relationships. Particular consideration is given to public-private partnerships in this field. In addition, in-house companies are considered. ■

The management staff (LS)

The BAAINBw management staff, established in November 2023, which mainly emerged from elements of the former operational management staff, primarily supports strategic tasks and assists the office's management in its guidance function. The new management staff is led by an executive official and structured into four task-related sections.

Department LS1

Department LS1 is responsible for ensuring the concentrated functions of the management office, central order management including coordination, as well as the coordination of matters concerning the German Bundestag and the Federal Government.
In its function as a management office, it implements the direct orders of the President and the two Vice Presidents and ensures the primary secretariat functions.
Through central order management, the professional and timely processing of all orders directed to the BAAINBw is monitored. This ensures the desired administrative relief for the management.
Parliamentary information needs, such as minor requests, major requests, petitions, colour crossed processes, as well as correspondence with the Parliamentary Commissioner for the Armed Forces of the German Bundestag, require special attention. The inquiries of the Federal Government are also included among these demanding tasks. Similarly, the management's participation in meetings of the Budget or Defence Committee of the German Bundestag is to be prepared in terms of content and organisation. Department LS1's processing incorporates the technological competence of the BAAINBw and its business sector.
Another field of activity is the preparation of visits by parliamentarians and elected officials from federal, state, and local governments as well as foreign guests. The new Department LS1 therefore contributes significantly to the direct assistance and advice of the BAAINBw management.

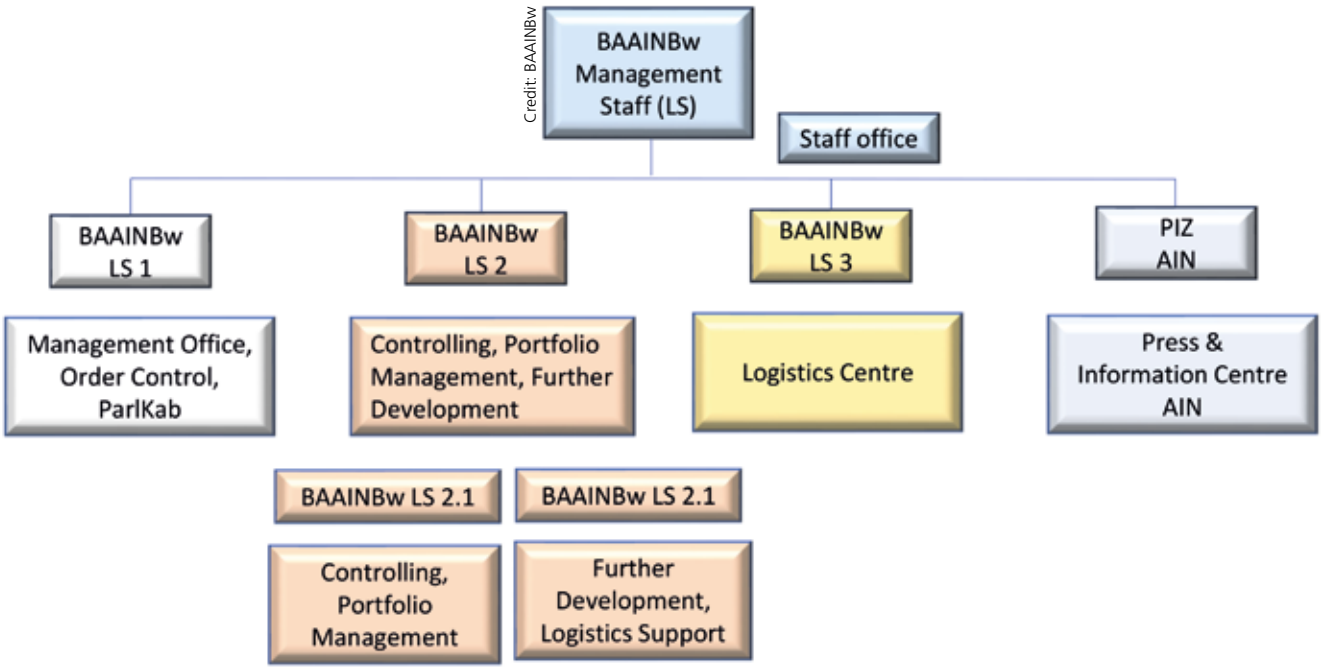
Group LS2

Group LS2 consists of the departments LS2.1 Controlling, Portfolio Management and LS2.2 Further Strategic Development, Situation Reports, and Management Cockpit. It supports the management of the BAAINBw in steering complex measures and projects as well as in the goal-oriented strategic management of the BAAINBw and its subordinate offices.

LS2.1
As the central office for controlling, LS2.1's focus is on managing the portfolio of projects and services based on risk management. The tasks are performed in a domain-related manner for the land, air/space, sea, and cyber domains and include in particular:

- Monitoring and evaluation of projects and measures for the BAAINBw management and development of recommendations for action;
- Overarching risk management and controlling, as well as consideration of systemic risk causes;
- BAAINBw-internal coordination of preparatory circles for the Management Board Armaments and order follow-up;
- In an advisory function, LS2.1 also ensures the uniform application of controlling and risk management methods in the departments and offices.

The group also coordinates cooperation with the planning organisation of the defence sector, primarily the Bundeswehr Planning Office, prepares analyses as decision-making aids, and performs the



function of the central element for portfolio management at the project/product/service level in the BAAINBw.
According to the central performance process "Conduct Integrated Planning" (IPD), the Planning Office is in charge of the Bundeswehr's capability situation and derives capability gaps from it. If these gaps are to be filled by material solutions or armaments-related services, LS2.1 initiates the processing of initiatives with the technical and economic assessment competence of the organisation and coordinates the activities of the representatives of the BAAINBw in the analysis phase part 1 of the CPM procedure.
Thus, LS2.1 supports the Bundeswehr Planning Office at the beginning of the equipment process in determining essential key data of a project and including these in the decision-making process as a fundamental contribution to the portfolio management of the Bundeswehr.
In the context of portfolio management, LS2.1 has a continuous overview of the status of current and already announced projects, products, and services as well as their interfaces and dependencies within the framework of sub-portfolios.

LS2.2
Department LS2.2 is responsible for further strategic development in the AIN organisational area. The task of the department is to initiate and attend to prominent measures for further development based on further development goals agreed with the BAAINBw management. This also includes the central management of the technical supervisions of the subordinate offices.
The following objectives are at the forefront:

- Faster and simpler provision of the required equipment for the Bundeswehr by optimising existing procedures and structures;
- Focus on project management as a core task/competence of the BAAINBw;
- Alignment with new requirements, including from the further development of the armed forces, the control processes, or from developments at the European level.

In addition, the department centrally provides situation reports and management overviews (Management Cockpit) for the BAAINBw management and controlling based on structured data syntheses and derives the need for action from this.

Press and Information Centre AIN

The Press and Information Centre AIN (PIZ AIN) is responsible for the communication of the Equipment, Information Technology and In-Service Support (AIN) area both internally and externally within the Bundeswehr's information work. The head of the Press and Information Centre is also the spokesperson for the President of the BAAINBw. The PIZ AIN is the first point of contact for the BAAINBw for inquiries from media representatives and citizens alike concerning the scope of tasks of the AIN organisational area. As part of the press work, media are actively informed about noteworthy and new information, the daily press is evaluated, and contributions for various trade journals are prepared in cooperation with the various in-house departments. In the area of public relations, the Press and Information Centre is responsible for BAAINBw's participation in external events and the creation of multimedia-prepared information. The online editorial team of the PIZ AIN is responsible for the maintenance of the BAAINBw websites on the intranet and internet as well as for the AIN's conceptual contribution in its online work.

The Digitisation Staff (Digit)

The topic of digitisation was and is associated with major challenges. Fundamental questions had to be addressed and answered, such as: 'What do we want? What should the digitisation of BAAINBw look like? How should it proceed and who is responsible for it? What could a further digital development of BAAINBw look like?'

Against this background and due to the central importance of digitisation for the Bundeswehr, the Digitisation Staff was established in November 2020.

Objectives

Fundamental to the acceptance of the staff and its work was that the Digitisation Staff initially forms a homogeneous unit. Without this unity, it is not possible to meet the challenges of digital transformation in the Equipment, Information Technology and In-Service Support organisational area (OrgBer AIN). The Digitisation Staff acts as the central point of contact for digitisation projects and questions for every employee in the organisational area.
The establishment of the staff further pursues the goal of also doing justice to the importance of digital transformation in the OrgBer AIN. This is an inward and outward sign that the topic of digitisation is given a prominent role. For this reason, the Digitisation Staff was established as an organisational element directly below the President of BAAINBw with direct reporting rights.
By bringing together and centralising the various areas of responsibility (e.g. Data Governance Office (DGO), Information Security Officer (ISB), Implementation and User Organisation, ENO), an acceleration and standardisation of digitisation in the organisational area is achieved.
At the same time, the continuous alignment with the digitisation requirements of the Ministry and the digitisation projects of other organisational areas takes place at a central point in the organisational area. This is intended to create a homogeneous and consistent digitisation landscape.

Organisational structure

The Digitisation Staff currently consists of the Head of the Digitisation Staff, a secretariat directly subordinate to him, and three groups (D1 to D3) with their respective departments.
Group D1 is responsible for the project-related technical supervision of the IT system architecture and IT service design in the organisational area, as well as for the procedural, organisational and content-related design of the cross-project and cross-programme components of the implementation of clusters in the Cyber/IT sub-portfolio.
Group D2 consists of three departments assigned to the areas of Information Security (D2.1), Data Governance Office (D2.2 DGO) and IT Coordination and Verification (D2.3). The head of Group D2 also assumes the role of Chief Information Security Officer (CISO Armaments) and deputy head of the virtual Data Governance Office of the Bundeswehr.
Group D3 pools all implementation and utilisation activities in the area of digitisation of administrative business processes in the entire AIN organisational area. The pooling includes, on the one hand, the introduction and use of Standard Application Software Product Families (SASPF), and on the other hand, the introduction and use of IT projects in the area of electronic administrative work as well as related processes and IT services in the organisational area. This division is reflected in two departments, D3.1 as SASPF Implementation and User Organisation (ENO) AIN and D3.2 as ENO Electronic Administrative Work (eVA).

Project developments

The positive project developments since the establishment of the digitisation team are presented below. This will be illustrated using selected projects/programmes in the various areas.

Digitisation platform

The digitisation platform is an indispensable element of the IT cluster logic of the departmental Chief Information Officer (CIO). Essentially, based on overarching IT architectures (system architectures and shares in the enterprise architecture of the business area) and intelligent, forward-thinking IT service design, the foundations for standardised and reusable IT services are created here. Group D1 thus represents a supporting pillar in BAAINBw of the effective network consisting of specialist departments in the Federal Ministry of Defence, the competence centres as well as the portfolio management in the Bundeswehr Digitisation Centre and BWI as a growing IT system house.
The pooling of the competencies of the IT architects and IT service designers in Group D1 under the leadership of the Digitisation Officer has already achieved a noticeable improvement in communication with the other areas of the effective network in the first few years.
After the establishment of Group D1, the initial capabilities of the various programme organisations of the nine IT services in the office were organisationally mapped. In order to achieve the long-term goal of the paradigm shift from the elaborate procurement of individual requirements to the use of pre-configured standard solutions, the designs of the programme organisations are being further planned and expanded.
Even in the shorter term, the work in the effective network on the digitisation platform reveals weaknesses and potential for improvement in the previous procurement of information technology. In the context of IT requirements and demand management, it helps to overcome previous project-related boundaries or to consciously propose abandoning elaborate requirements.
As the contact partner in BAAINBw, Group D1 is not only the technical supervisory authority in the AIN organisational area for the procedures, but also the point of contact in the future for all departments for the early assessment of any IT components of armament projects in the context of IT requirements and demand management.

Information security

Improving information security is one of the focus topics of the Digitisation Staff. The identified deficits in information se-

curity in the AIN organisational area are being consistently addressed through targeted measures. In a first step, it has been possible to strengthen Department D2.1 in terms of organisational structure and personnel. This makes it possible, among other things, to actively support the CISO Armaments, which for the first time is deployed at B2 level, in its extensive area of responsibility.

It has also been possible to develop an information security concept for BAAINBw according to current specifications in the shortest possible time, which - supplemented by annexes to be updated in each case - represents an essential basis for solid information security in the office. The focus here is on eliminating all identified deficiencies in the area of information security - also in the subordinate agencies of BAAINBw. The subordinate agencies are subject to a monthly reporting obligation to the Head of the Digitisation Staff on the basis of a specified catalogue of measures, whereby a positive development can be observed.

Implementation and User Organisation

With the establishment of the Digitisation Staff, Group D3 in BAAINBw, the pooling of existing ENO/EFO/IT management structures in the AIN organisational area has already found a concrete initial organisational implementation.

The area of change management could be greatly strengthened by pooling the corresponding expertise within Group D3. This has already been exceptionally demonstrated in the context of the mass rollout of Gw Bw (document management Bundeswehr/Outlook/Sharepoint) and the area rollout of SASPF IT-U CPM. Strengthening digital competence among managers and employees, e.g. through training, know-how events, Webex events, briefings, explanatory videos, tutorials, lessons learned, is a decisive success factor in the context of digitisation.

The expertise of digital possibilities to support collaborative working (available in ENO eVA/CDI - D3.2) has enabled completely new approaches in the rollout procedure of SASPF solution components. For example, an agile rollout approach in the area rollout IT-U CPM, in particular through digitally supported, collaborative working methods in the context of production-preparatory measures such as data preparation or planning/control of initial training, has halved the rollout time from five to two and a half years.

The pooling of ENO/EFO/IT management structures provides the basis for information management/building a content strategy in the AIN organisational area.

With increased digitisation, the danger of an information jungle grows. Questions such as "Which information is processed in which electronic specialist procedures? Where is information stored/provided and where can I find which information?" The expertise and overall view in Group D3 of the electronic specialist procedures used in the AIN organisational area, as well as the corresponding platforms for information provision, have already been able to provide initial approaches to an information management plan.

The Occupational Psychology Staff (BetrPsych)

Background of the team

Never before has the world of work been subject to faster change than at present: Digitisation, structural changes, demographic upheavals and the current pandemic situation repeatedly pose new challenges.

NOTE FOR ANDREA – PLEASE USE THE SAME TRANSLATED GRAPHIC FROM p10 OF ESD 8-23.

Credit: BAAINBw

Working models are changing, boundaries between work and private life are blurring, learning requirements are increasing, and flexibility is taken for granted.

Work can, and this also applies to employees of the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw), become a burden due to factors such as demographics, psychological stress, leadership style, mobility or the balance of different areas of life. This has consequences for well-being and health. Mental illnesses and the associated costs are increasing.

Leadership significantly influences the extent and quality of psychosocial stress, strains and resources. Therefore, it is the task of managers to take care of the employees in their leadership area as part of their duty of care. Only when there is physical and mental health can the performance of organisations be maintained in the medium and long term. If employees fall ill, not only is working time lost, but costs also increase. Stressed employees demonstrably make more mistakes and are often less productive, and they are also more susceptible to other illnesses.

With the establishment of the Occupational Psychology Staff in the AIN organisational area, BAAINBw is taking account of social change and creating a central point of contact for topics and questions with psychological relevance for managers at all leadership levels as well as all employees.

Initially, occupational psychology was anchored as an organisational element in the line organisation, and from March 2020 organisationally as a staff unit directly assigned to the management of BAAINBw. The Occupational Psychology Staff is a team of psychologists and is supported by psychologically trained civilian and military personnel.

With the establishment of occupational psychology, a remarkable offer was made available to civilian and military employees. Remarkable because the occupational psychology offer is not only directed at military personnel - as is known, for example, from troop psychology - but is available to all employees. In addition, the services of the Occupational Psychology Staff can also be used by "former employees", reservists as well as family members and bereaved persons.

Working methods and offers

The Occupational Health and Safety Act anchors the employer's duty of care towards its employees with regard to their health.

Human health can basically be divided into the categories 'physical' and 'mental'. For physical health, there were and are already offers for employees, e.g. in the area of occupational safety or occupational health management, while for the mental health of employees there have been no comprehensive offers or comprehensive care to date. In order to create an offer for all employees of BAAINBw or the AIN organisational area, the Occupational Psychology Staff was established.

Source: BAAINBw

Credit: Bundeswehr/Volland

In the modern working world, a considerable amount of stress arises – the Operational Psychology Team supports the employees of OrgBer AIN with both personal and professional problems.

The areas of responsibility include, among others, individual counselling, leadership counselling and psychological crisis intervention as well as counselling on all topics and questions with psychological relevance. To this end, the Occupational Psychology Staff offers assistance with stress in the professional and private sphere in the form of relief and counselling sessions.
The offer includes, among others:

- Prevention and support in coping with stress
- Building up resources for resilience
- Counselling for burnout/boreout
- Counselling for mobbing and bossing
- Counselling for (stress-related) mental and psychosomatic and physical illnesses
- Addiction counselling
- Counselling in acute life crises (e.g. family problems)
- Referral within the Psychosocial Network (PSN) and to external psychotherapists

In addition, counselling oriented to individual needs is offered for (prospective) managers. Coaching for personal development is also among the services provided by the Occupational Psychology Staff.
In this context, superiors at all management levels can be advised and supported in a solution-oriented and forward-looking manner on all topics and issues with psychological relevance in the exercise of management tasks.
In detail, this can include support in the following areas:

- in decision-making
- in the further development of their leadership skills
- in solving conflicts in the team
- in the implementation of team-building measures
- in personal development

Furthermore, it is important to offer services within the framework of specialist counselling. Here, occupational psychology supports with psychological expertise, among other things, in employee surveys, in-company training and further education, change management processes, risk assessments regarding psychological stress as well as in occupational health management (OHM).
In summary, the Occupational Psychology Staff performs the following tasks, among others:

- Conducting:
  - Leadership counselling/coaching
  - Individual counselling
  - Process and organisational counselling
  - Psychological crisis intervention
- Collaboration in:
  - the psychosocial network (PSN)
  - support for in-company training
  - change management
  - employee surveys
  - risk assessment of psychological stress
- Support of occupational health management (OHM).
- Formation of the help network in BAAINBw.

It is also worth mentioning the absolute confidentiality of the conversations and their content. They are subject to statutory confidentiality according to § 203 of the Criminal Code - as with doctors, for example. It is very important to emphasise this again and again, as a trusting conversational atmosphere and a targeted solution strategy can only arise in protected conversations. Those seeking advice can be sure that their concerns will not be passed on. ■

Legal Affairs Staff (J)

The Legal Affairs Staff (Staff J) as a staff component in the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) makes a significant contribution to the ongoing modernisation of contract management in Bundeswehr procurement in addition to the quality assurance of tender documents for major projects.

It is subdivided into the departments J1 (Procurement Law Principles), J2 (Contract Principles), J3 (Intellectual Property Rights, Principles of Performance Specification) and J4 (Procurement of External Consulting and Support Services, Substitution and Legal Services).

Department J1 deals with all fundamental questions relating to procurement law. This includes in particular advising the project departments and the BAAINBw management on all procurement law issues, processing internal work instructions, reviewing individual decisions in the procurement process and representing the office before the procurement review bodies.

The fundamental processing of contract law falls to Department J2. In addition to contract review and advice for the individual contract departments of the office's divisions in the field of civil law, J2's fundamental work includes, in particular, the continuous updating of contract templates for contracts with an estimated contract value of less than EUR 25 million and their coordination with industry associations. Furthermore, Department J2 is responsible for handling civil law disputes with contractors and insolvency proceedings. In addition, there is price law contract advice and co-examination within the framework of quality assurance for projects with a contract value of over EUR 25 million.

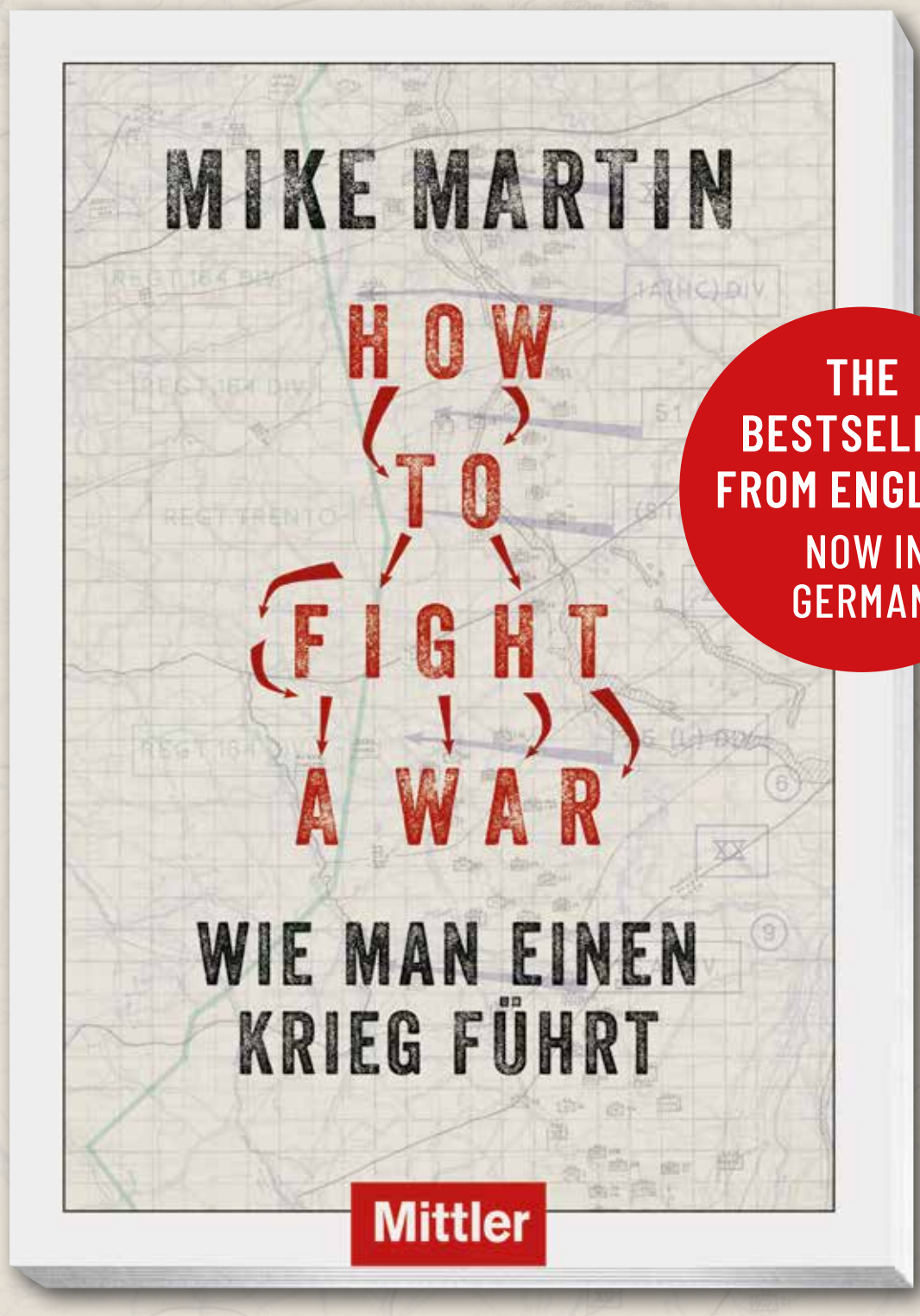
Department J3 is responsible for the area of intellectual property rights (IPR). In this context, the department advises in particular on licencing issues. J3 specifies regulations on rights of use, particularly for technical documentation, software or industrial property rights in BAAINBw contracts. It also conducts proceedings before the respective intellectual property authorities regarding the registration of federally owned industrial property rights. In addition to protecting federally owned technical know-how, the evaluation of third-party industrial property rights, if these influence the procurement process, is also part of the department's area of responsibility. The department is also responsible for principles in the preparation of performance specifications.

Department J4 deals with the procurement of external consulting and support services, substitution and legal services (so-called BURA services). As the contract-holding office, the department also manages all existing contracts in this category (contract processing, invoice processing) and coordinates necessary measures, for example if performance disruptions occur after conclusion of the contract. J4 is also responsible for checking calls from framework agreements of other departments in the field of information and communication technology.

In their respective specialist areas and in close exchange with each other, one of the essential tasks of the departments of Staff J is to conduct quality assurance (QA) for projects with an estimated contract value of over EUR 25 million gross (major projects).

This begins with the decision on the type of procurement and ends with the final negotiated contract. During this period, the Legal Affairs Staff continuously accompanies the contract preparation, the tender, the contract negotiations and the conclusion of the contract in different stages, supports the project legal advisors in their tasks and advises the project managers in the preparation of the performance specification as the core of the tender documents. Staff J is now especially focused on the quality assurance of contracts related to the Bundeswehr special fund.

In addition to quality assurance, Staff J is also entrusted with various other tasks that particularly concern fundamental and basic work in contract management. In this context, Staff J is particularly concerned with continuously modernising contract management in BAAINBw. An effective procurement process must ensure the timely availability of defence materiel and implement all necessary quality requirements for military equipment under economic conditions. This requires a restructuring of contracts that appropriately distributes risks and strengthens industry's own responsible implementation. In addition to topics of digitisation and simplification in contract processing, instruments of innovative procurement, for example performance-based contracting (PBC), are accompanied. Increasing availability rates and thus improving material operational readiness is the primary focus. ■



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Combat Department (K)

The armaments and usage management for the following weapon systems and their associated components make up the main focus of the Combat Department of BAAINBw.

Combat, recovery, engineering, bridging and transporting tanks, infantry systems, as well as the most diverse armaments, including air defence and artillery systems are located within the Combat Department.

Four clear project groups pool the expertise of BAAINBw for:

- ground-based air defence/territorial missile defence (K3)
- guided missiles (LFK) for ships and aircraft, drop ammunition, anti-tank defence (K4)
- armoured combat and transport systems (K5)
- tube weapon systems, ammunition and ordnance/ordnance disposal (K6)

supplemented with regard to fuzes and joint tactical fire support (K1).

In their task performance in project and usage management, as well as research and technology, these four groups are supported by the cross-sectional groups Economics/Technology (K1) and Economics/Law (K2).

In addition, KAS department staff and the control department KAC are available to the department management as support elements.

KAS performs central organisational and administrative tasks in the areas of personnel, education and training, infrastructure and organisation for the department.

As an essential element of command support, KAC determines and analyses key project and performance data to help formulate management decisions.

The department is supported by the Economics/Technology Group (K1) in all cross-project technical-economic and usage-related issues.

In particular, the following topics are addressed: use and logistics, ammunition safety, general technical supervision of the agencies (WTD 52 and 91), education and training, research and technology including bi- and multinational cooperation, systems engineering, fuze technology, master data maintenance and local implementation organisation SAS-PF, Interactive Electronic Technical Documentation (IETD), coordination of D-LBO integration in land platforms and overall coordination of Joint Tactical Fire Support (STF/JSF), as well as the implementation of projects for selected STF coordination elements.

Credit: Bundeswehr/Bannert

A drone takes off during the presentation of the ASUL system (anti-unmanned aircraft system).

The competencies of contract processing and procurement management are pooled together in five sections of the Economics/Law Group (K2). Contracts for the respective projects - including contracts for the usage phase - are processed there. In addition, the contract sections support the projects in concluding national and international agreements. Furthermore, issues of public price law and price negotiations are dealt with.

Group K3 Ground-based Air Defence/Territorial Missile Defence deals with projects for the defence against aerial targets - from very short range against small drones to very long range for missile defence - from the ground.

Section K3.1 manages the projects Ground/Air Long Range Patriot, Fire Control Post FlaRak Surface to Air Missile Operation Centre (SAMOC), Polygons, FlaRak simulation facilities, as well as the Satellite-Based-Missile-Detection (SBMD) project.

The Fire Control Post FlaRak is capable of connecting and leading national ground-based air defence forces, aerial and seagoing units, as well as Allied and partner platforms for multinational cooperation and displaying the insights gained in real time.

The Ground/Air Short Range Light Air Defence System (LeFlaSys) weapon system and the Stinger missile are located as usage projects in Section K3.2.

Additionally, the most recent short-range air defence systems are processed in real time by Section K3.2. The IRIS-T SLM firing units are to be delivered to the Bundeswehr from September 2024. For the mobile protection of land forces, the components of the Air Defence System for Close and Very Close Range Protection (LVS NNbS) are to be used in the future. The necessary contracts for this are to be concluded in 2023. In addition, in the area of defence against small drones (C-UAS Class 1), a project called HoW-iSM (high-precision and scalable effect against agile/low-signature targets in the near and closest range of floating system carriers of the Navy) is also being processed, which includes the development of a weapon laser for the Navy.

Section K3.3 focuses on the projects Weapon System Territorial Missile Defence (WaSys TerrFKAbw) and National Situation and Command Centre Territorial Missile Defence (NLFZ TerrFKAbw).

In the WaSys TerrFKAbw project, the ARROW weapon system for exo-atmospheric defence against long-range ballistic missiles is being procured as part of a DEU-ISR cooperation. The parallel NLFZ project is currently examining the need for complementary functionalities of a command post for TerrFKAbw as part of a study.

In the European Defence Fund (EDF) project European-Exo Atmospheric Interceptor

(EATMI), the concept selection by the EU Commission is technically accompanied by K3.3.
Section K3.4 is responsible for projects to defend against small drones, also known as counter-small unmanned air systems (C-sUAS). The capabilities and proliferation of such systems have increased significantly in recent years. They pose a serious threat not only in deployment but also to Bundeswehr facilities in Germany.
In addition, K3.4 processes cross-sectional tasks of air defence in the areas of mobility, power supply and communication systems, protection tasks and the IRIS-T SL missile system for ground-based air defence projects.
The K4 group is currently working on the air-to-air and air-to-ground armament of the F-35. Other focal points are sea- and air-based guided missiles, drop ammunition and anti-tank defence.
Section K4.1 deals with anti-tank systems and aircraft-based ammunition against ground targets, i.e. guided missiles and drop ammunition (guided and unguided bombs).
As new projects, the armament of the Light Combat Helicopter with rockets and a guided missile also suitable for anti-tank warfare is envisaged, as well as the maritime surveillance aircraft P-8A Poseidon, also with a guided missile and with depth charges.
In addition, a large number of introduced effectors from K4.1's area of responsibility need to be maintained and kept in use, e.g., the guided missiles Taurus, HARM, PARS 3 LR, HOT 2 and HOT 3, as well as the extensive portfolio of anti-tank handheld weapons.
In the area of air/ground-guided missiles, one of the main tasks is the 'SEAD capability maintenance' for the Tornado, i.e., the introduction of an improved version of HARM (high speed anti-radiation missile) in the form of AGM-88E AARGM (advanced anti-radiation guided missile), which is also planned for the Eurofighter EK. The introduced Eurofighter will receive a new capability with the Powered Short-Range Effector (air/ground-guided missile Brimstone) and the German Heron TP is also to be armed. It is also planned to equip the frigate's onboard helicopters with the Sea Target Guided Missile, Light for sea target engagement. In the area of drop ammunition, the procurement of the GBU-54 and the new bomb bodies for the GBU-48 in the Mk-83 TIP and Mk-83 IM variants continues to increase the sustainability and scalability of the introduced combat aircraft armaments.
The focus in the area of anti-tank defence is the MELLS guided missile, also in the new LR2 version in the future. It is fired by the infantry and from various land vehicles. The precision and range of shoulder-launched weapons is significantly increased by the 90 mm effector and the 1800+ effector in the future. In parallel, work is being carried out on the successor to the proven Panzerfaust 3 to meet future threats as well.
Section K4.2 deals with ship-based guided missile systems Rolling Airframe Missile (RAM), NATO Sea Sparrow Surface Missile (NSSM), Evolved Sea Sparrow Missile (ESSM), Standard Missile 2 (SM-2), Harpoon, Robot System 15 (RBS 15), Naval Strike Missile (NSM) and Future Naval Strike Missile (FNSM).
Additional activities deal with the active self-defence of submarines with guided missiles. For the first time, this will enable submerged submarines to directly and actively ward off attacks from the air.
A new field of activity is the equipment of the F127 class frigates with additional guided missile systems. The installation of the latest versions of RAM, ESSM, guided missiles from the Standard Missile family and long-range guided missiles for engaging sea and land targets is planned.

Credit: Bundeswehr/Maximilian-Schulz

The main focus in the area of anti-tank defence is the LFK MELLS.

In the RAM area, the procurement contract for the latest version (Block 2B) of the guided missile has meanwhile been concluded.
In the ESSM area, the procurement of the guided missile (ESSM Block 2) for equipping F124 and F126 class frigates has been initiated. On the F123 class frigates, the integration of the ESSM Block 1 guided missile system will be carried out from 2023.
The RBS 15 Mk 3 DEU guided missile system for engaging sea and land targets, which is equipped on the K130 corvettes, currently represents the main armament of the corvettes of class 130.
As part of the German-Norwegian armaments cooperation, the procurement of the NSM Block 1A has been commissioned to complement the introduced RBS 15 for long-range sea and land-target engagement by the frigate classes. To maintain this capability in the long term, a new guided missile development (Future Naval Strike Missile) is to be carried out jointly with Norway.
Section K4.3 deals with air-to-air armament for flying platforms. This includes the infrared-guided short-range guided missiles Sidewinder - AIM-9L with the LAU-7A launcher and IRIS-T. The more modern IRIS-T system has thrust vector control in conjunction with aerodynamic tail control, which allows the guided missile to perform highly agile flight manoeuvres and thus achieve a high hit probability.
The medium-range guided missiles include the RADAR-guided AMRAAM (AIM-120B) and the Meteor missile equipped with a variable, air-breathing solid-fuel ramjet engine. Meteor is a six-nation project with the UK as lead nation.
Group K5 Armoured Combat and Transport Systems consists of six sections.
Section K5.1 is divided into the project teams: Leopard 1-based vehicles - i.e. Dachs engineer vehicles, Biber armoured vehicle launched bridge, Bergepanzer 2 on the one hand and the Leopard 2 project team on the other. Currently, the following projects are being prioritised: the introduction of Kodiak 3 engineer vehicle, as successor to the PiPz 2 Dachs, the modernisation of Leopard 2 main battle tanks to the Leopard 2 A7V variant, as well as the integration of the active protection system into the Leopard 2 MBT (2 A7 A1).
Another K5.1 task is to chair the Steering Committee of the Leopard Users Community (LEOBEN), through which the use of Leopard-based systems is managed in an international community of 22 nations currently. For this purpose, the LEOBEN secretariat is set up at K5.1, which also organises the international working groups of Cooperative Logistics (CoopLog) for the joint procurement, provision and distribution of supply items.
Section K5.2 deals with the Puma and Marder infantry fighting vehicles. The Puma IFV and the Infantryman of the Future - Extended System (IdZ-ES) equipment,

Credit: KMW

The procurement of the second batch of the Leguan armoured vehicle launched bridge is pending.

which is also part of the Armoured Infantry System, have reached a decisive milestone on the way to full operational readiness through the successful realisation of the design status, which has been significantly improved with a view to VJTF. Based on the concluded contract for the retrofit of the Puma IFV, the progress achieved will be successively rolled out to the first batch of Puma IFVs. At the same time, the operational readiness of the Puma IFV could be significantly improved.

As part of the service life extension of the Marder IFV, extensive measures to eliminate obsolescence have been initiated. In addition, a digital command system is being installed in selected vehicles to ensure comprehensive operational capability for VJTF.

In Section K5.3, the armoured transport vehicle (GTK) Boxer, the Fuchs 1 armoured personnel carrier (APC), its successor and the heavy weapon carrier infantry are processed.

Section K5.4 deals with platforms for snow mobility, reconnaissance and air-transportable weapon carriers. In addition to the usage tasks in the Fennek/ M113/Wiesel systems and the generational change Bv206S/D → CATV (Alias Husky 3; protected all-terrain vehicle Collaborative All-Terrain Vehicle) & Beowulf (Alias Husky 4; unprotected variant of the CATV basic vehicle), the Air Mobile Weapon Carrier increases the effectiveness of the airborne troops and the New Generation Korsak reconnaissance vehicle clearly aligns the reconnaissance and communication capability of the Army with current and future challenges.

Section K5.5 Bridges and Crossing Equipment includes, in addition to bridges, ferries and light crossing equipment, the systems for improving ground traffic-

Credit: Bundeswehr

The Main Ground Combat System (MGCS) project, which is currently being conducted bilaterally with France, is set to replace the Leopard 2 (pictured) and Leclerc tanks from 2040 onwards.

Credit: BAE Systems

The Collaborative All-Terrain Vehicle (CATV), also known as Husky 3, is an armoured articulated all-terrain tracked vehicle.

ability that are related to them in terms of effect. The focus of work is on the Fast Amphibious Bridging and Ferrying System 2, to be procured in cooperation with the UK, which is to replace the M3 amphibious vehicle and the folding floating bridge, the procurement of the second batch of the Leguan combat bridge, as well as the successor system for the folding road equipment.

Section K5.6 deals with the outstanding issue of the successor to the classic main battle tank in the future form of a multi-platform system that also integrates unmanned elements. This Main Ground Combat System (MGCS) project, which is currently being conducted bilaterally with France, is intended to replace the Leopard 2 and Leclerc main battle tanks from 2040. For this purpose, the section is set up as a Combined Project Team (CPT), which also includes French employees.

All projects of Group K5 are also involved in the Digitalisation of Land-Based Operations (DLBO) project.

Credit: BAE Systems

Beowulf, also known as Husky 4, is the unarmoured variant of the CATV.

The range of tasks of Group K6 includes the small-, medium- and large-calibre tube weapons of the Bundeswehr, including the associated ammunition, as well as ordnance and ordnance disposal systems.

Section K6.1 deals with the PzH 2000 self-propelled howitzer, the MARS rocket launcher and mortars as weapon systems for indirect fire support of the Army.

The PzH 2000, the standard artillery gun, is also in service in seven other nations. With an extensive package of measures to maintain and enhance capabilities, the PzH 2000 is being prepared for use in the coming years. In parallel, work is underway on future systems for indirect fire at short/medium/long range.

Section K6.2 is responsible for processing hand-held and shoulder-fired weapons, the associated ammunition, pyrotechnic ammunition, as well as hand grenades and non-lethal effectors. The most current project in the section is the Bundeswehr Assault Rifle System, which will replace the G36 as the new standard rifle.

Section K6.3 deals with, among other things, the projects Heavy Machine Gun, 40 mm ammunition family for the grenade machine gun, 30 mm combat and practice ammunition (Puma IFV), 30 mm ammunition with reduced range (mvR) for training purposes, remote-controlled weapon stations as well as the naval tube weapon systems in the calibres 12.7, 27, 30, 76 and 127 mm.

A variety of engineer combat equipment and equipment for ordnance disposal form the range of tasks of K6.4. These include various explosives, remote-controlled manipulator vehicles, X-ray devices, metal detectors and protection against so-called improvised explosive devices (IED) and protective devices in the access area of military facilities. A new focus in the context of national and Alliance defence is being placed on projects concerning a new barrier system and an armoured mine clearance system.

The procurement of large-calibre tank, artillery and mortar ammunition is carried out in Section K6.5.

Currently, the introduction of guided artillery ammunition for the Army and Navy is being prepared. In the area of naval ammunition, this is ensured by the 127 mm Vulcano for joint fire support by the F125 frigate from sea to land. In addition, the unguided 127 mm standard ammunition is currently being qualified.

For the Army's capability to engage point targets at distances of up to 70 km, the Vulcano 155 mm GPS/SAL (Semi Active Laser) is intended for firing from the PzH 2000 self-propelled howitzer. ■

Interview

Credit: BAAINBw

With Brigadier General Jürgen Schmidt, Head of the Combat Department

ESD: The decisions for the heavy weapons carrier for the infantry and wheeled howitzer have been taken. What is the Bundeswehr's future orientation regarding the use of the Boxer platform, for example for the Army's medium forces? Examples here would be: wheeled infantry fighting vehicle, recovery equipment, bridge layer, air defence system IRIS-T or C-UAS, indirect fire/mortar, anti-tank guided missiles/N-LOS.
Schmidt: The decision for the wheeled howitzer is expected by the end of 2023. The wheeled infantry fighting vehicle based on the Boxer is under preparation. The heavy mortar will not be implemented on the Boxer. The short-range protection of the air defence system NNbS with the IRIS-T SLS guided missile will be implemented on the Boxer, and a timely contract conclusion is being vigorously pursued. The decision for the bridge layer is currently being prepared. We will then have the Boxer in use in over ten variants.

ESD: On 12 October 2023, the last of a total of 104 ordered Leopard 2 A7V main battle tanks were delivered to the Bundeswehr. Are further measures planned for the Leopard 2 tank fleet and how do you assess the current status of the MGCS (Main Ground Combat System)?
Schmidt: Permanent consideration is given to the Leopard 2 main battle tank, both with regard to particular further developments and the elimination of obsolescence. The latest variant, the Leopard 2 A8, is currently being manufactured as a replacement due to the transfers to Ukraine. Several nations have also expressed interest in the Leopard 2 A8.
At France's instigation, ministerial discussions are currently taking place regarding changing the previously planned project structure established by France with NGWS [Next-Generation Weapon System]. This is currently being prepared and is a prerequisite for having a combat-ready, superior ground combat system available for deployment by the middle of this century to fulfil missions within the framework of national and Alliance defence.

ESD: The use of mines has regained importance as demonstrated by the Ukraine war. What is the situation regarding capabilities both in terms of mine clearance and mine laying with various means (layers, launchers, artillery)?
Schmidt: Fire and movement - together with obstacles - have always represented the main elements of combat according to our operational principles. These elements are interrelated and complement each other. None of the associated capabilities can be done away with.
With the Bundeswehr's focus on national and Alliance defence, combat and thus the fight with and around obstacles is again in the spotlight. Obstacles in the form of constructed barriers help troops hold terrain, gain time and conserve forces. Mine obstacles are intended, among other things, to disrupt, guide, bind or intercept the enemy, but above all to restrict his movement potential and slow down his advance. For this purpose, the Bundeswehr has established capabilities for obstacle construction primarily in the Corps of Engineers, but also in the artillery branch.
After reactivating the Mine Laying System 85, the Engineer Corps have a product available for laying anti-tank mines (anti-tank laying mine DM31) to fortify the terrain. The technology that was first developed in the 1980s was made much more robust, fast, and logistically supportable with the addition of new towing and transport trucks for the mine layers in 2023.
Off-route anti-tank mines are available to the Engineer Corps for securing roads and paths. A framework contract was recently signed and a first delivery of refurbished off-route anti-tank mines is expected in 2026.
Parallel to the efforts outlined above, a project to acquire capabilities for constructing barriers is currently underway. The project is in the analysis phase and will be implemented in a modular fashion, building on existing obstacle systems. Within the project, multiple effectors, their deployment methods, and networking are likely to be realised. The project also aims to fill the capability gap for the rapid construction of situation-dependent scatterable mine obstacles by the Engineer Corps, which was created by the decommissioning of the Skorpion mine launcher.
To maintain the mobility of one's own forces on the battlefield, the Engineer Corps possesses the means to breach the enemy's obstacles. In addition to many stand-off firing and manipulation techniques in the explosive ordnance disposal forces, the Keiler mine-clearing tank is still in use and can directly support combat troops in battle. The mine-clearing tank can quickly and reliably breach enemy mine obstacles while on the move. Upon reaching the end of its service life, the Keiler is to be replaced by an armoured mine-clearing system. A project for this has already been initiated in the analysis phase.

Questions were asked by Michael Horst.

The Land Support Department (U)

The Land Support Department (Department U) is divided into seven groups and two staff units. The portfolio of the five project groups ranges from the procurement of personal equipment for special forces to field camps, security technology, NBC protection, military wheeled vehicles, special vehicles/equipment, electronic warfare, reconnaissance and effect, space, air traffic control, as well as robotics and training/ simulation, to military pharmacy, medical facilities and medical equipment.

These project groups are supported by the cross-sectional areas of Economics/Technology and Economics/Law, as well as the controlling department and department staff.
The projects described below are representative of the department's diverse work.

Editorial booths for operational communication

The editorial booths of the Centre for Operational Communication needed to be overhauled and updated to the latest technological standards as part of a fundamental refurbishment in order to take the first step towards digitalising operational communication capabilities.
The booths of the Mobile Editorial Team are the central element of a PSYOPS(Psychological Operations) task force. They not only serve as editorial workstations but also control the entire process of creating media products for operational communication. From the initial idea of a product to its final acceptance and publication, all information converges in the Mobile Editorial Team: planning, coordination and control from a single source.
As part of ensuring the system's operational readiness, the cabin was completely overhauled, with only the shell, an Fm II A cabin, being retained. The contractor redesigned the entire interior: new furnishings such as chairs, tables, cupboards etc. come from the modular system and form the installation kit. The new IT equipment is integrated into this. The equipment consists of three high-performance IT workstations (including media software), a high-performance printer and the necessary storage and server capacities to operate a network. Before the general overhaul, the Centre for Operational Communication operated the editorial booths and all operational communication media elements as stand-alone solutions. Networking was neither conceptually nor technically envisaged. Data exchange was carried out via manual data transfer. With the new IT equipment, the Mobile Editorial Team can now network with all media (audio, video, print, new media). This allows media products to be created and processed more quickly.

Credit: BAAINBw

The interior space of the cabin was well-utilised.

Virtual shooting training

Soldiers' shooting training is getting more and more advanced, with virtual alternatives progressively taking its place. Through three versions, the BT33 shooting range is adapted to the different training needs of the troops and, due to its modern virtual training environment, enables mission-oriented and at the same time resource-saving training of soldiers. The training can be carried out as individual or classroom training.
The BT33 Standard system, which is already in use, is the largest system of its kind and has 20 workstations for training participants. This system has the largest field of view at six metres wide. The smaller BT33 light comprises six workstations with a three-metre-wide field of view.
With the new BT33 mobile version, the equipment is now relocatable. This system has four workstations.
All system variants consist of so-called COTS (Commercial off-the-shelf) components, i.e., commercially available products. These include computers, network components, projectors as well as simulation and operating system software.
The BT33, BT33 light and BT33 mobile shooting training systems are used for training artillery units. The training area and the actual targets such as tanks, transport vehicles or infantry are displayed using a projection system.
The training scope includes reconnaissance and determination of exact target coordinates. Additionally, training is provided for the planning, implementation, and oversight of the engagement process using artillery, mortars, drones, and fixed- and rotary-wing aircraft.
Using range-adjusted binoculars, the trainees determine the position of the target using various correction procedures and using a terrain map, and pass it on to the trainers. These then initiate the engagement. With the BT33, command chains and firing procedures can also be taught and tested.

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Credit: Bundeswehr

The facility for aptitude testing is to be operated at the German Aerospace Centre in Cologne.

Flight simulator for aptitude assessment

The procurement of a new and modern simulator for aptitude assessment for the Aviation Service and Flight Control Service of the Bundeswehr will support the future selection of prospective Bundeswehr pilots.

As part of the selection process to become a pilot, applicants must complete a series of diverse flight assignments on the simulator in a flight psychological learning and work sample to demonstrate their basic aptitude. In addition to basic flight tasks, realistic scenarios must also be mastered. By using simulation-based testing procedures, this is done independently of flight region, time of day, weather or other external influences.

The new simulator includes a simulated cockpit of a fixed-wing aircraft, as well as various consoles for preparing and debriefing the various procedural components. The facility is to be operated at the German Aerospace Centre in Cologne.

Innovative power supply

In addition to generators in the 200 and 50 kW power classes, the Bundeswehr is due to receive further innovative and mobile power generator units (SEA) in the 20 kW power class.

The generators designed for mobile use are intended to be as environmentally and climate-friendly as possible. To this end, engines with state-of-the-art exhaust aftertreatment are used, among other things, and supplemented with energy storage modules. These are designed to absorb any current fluctuations in local networks and load peaks as well as to avoid underloading of the units when power demand is too low. In the long term, this protects the diesel engines, reduces CO_2 emissions through lower fuel consumption and thus extends the life cycle of the units. In normal operation with diesel fuel, they comply with the relevant standards and emission limits of EU emission Stage V.

If required, for example in the context of a foreign deployment, regionally available diesel fuel or kerosene can also be used. The emission downgrade technology allows even highly sulphurous or watered-down fuels to be used in accordance with applicable environmental standards. In conjunction with photovoltaic modules, the generators can also be used as a backup option for otherwise emission-free operation.

The robust generators can also be used under adverse environmental conditions such as high temperatures, sand and dust, and can therefore reliably supply power to command posts or mobile rescue centres at potential deployment locations worldwide.

The first test model of the 20-kW units is to be delivered to the Bundeswehr at the end of 2024.

Aerodrome surveillance radar ASR-S

As a replacement for the ASR-910 type radar system, the new ASR-S type is being put into operation at 17 Bundeswehr sites and the NATO air base in Geilenkirchen. ASR-S stands for Aerodrome Surveillance Radar-Selective and has a detection radius of 110 km up to a height of about 8 km around the airfield.

The new radar system allows local military air traffic control to monitor military flight operations and is at the same time an integral part of the national and international air traffic control system.

The aerodrome surveillance radar ASR-S has both a primary radar and a secondary radar. The primary radar processes high-frequency electromagnetic transmit pulses reflected from the target, so-called passive echoes. This form of radar captures data such as direction and distance of an object. This allows the exact position of an aircraft to be determined.

The secondary radar, on the other hand, works with active response signals from a target, which are emitted by a transponder. The data captured here includes, inter alia, the identification of an aircraft. This means that in addition to the position of an aircraft, the aircraft itself can also be determined. The flight altitude and speed are also recorded by the secondary radar.

By coupling a primary and a secondary radar, the advantages of both systems are combined. For example, if the transponder on the aircraft fails, it can still be detected via the primary radar.

The secondary radar requires less transmitting power because by using active response signals only the outward path of the transmit signal has to be overcome, while for the primary radar both the outward and return paths of the signal are relevant. ■

Credit: Bundeswehr/Meysing

Helicopters pass the towering structure of the ASR-S.

Interview

Credit: BAAINBw

With Director BAAINBw Dipl.-Ing. Jan Gesau, Head of the Land Support Department

ESD: Do you see opportunities/necessities for cooperation with NATO partners in your area of responsibility, especially regarding wheeled vehicles and equipment for special forces?
Gesau: The possibilities for cooperation with NATO partners are considered and pursued in Department U during project implementation wherever possible. Harmonising the criteria for these systems beforehand is always the most important prerequisite and greatest challenge to successful international collaboration with our NATO partners.
An example of successful cooperation is the "Airborne System" project (EinsSys LLPlattf), which we are realising in cooperation with The Netherlands, with Germany in the lead. I will elaborate on this example in the context of the next question.

ESD: What is the status of the LL-Platform, Airborne Weapon Carrier, and New Generation Reconnaissance Vehicle projects?
Gesau: The Airborne System (EinsSys LLPlattf) will be used as a modular, versatile capability, mobility, and weapon carrier in airborne operations worldwide. The deployment of the system is required both as an internal and external load on the Heavy Transport Helicopter. The implementation is taking place as a wheeled vehicle in four different variants (personnel/material transporter, medical vehicle, group transporter, and material transporter) with different mission-specific equipment and capabilities.
The realisation of D-LBO-capable command and communications equipment is being implemented as a so-called backpack solution. In 2022, the possibility of bilateral cooperation for joint procurement with The Netherlands was examined.

ESD: Robotics is a future topic. The use in ground reconnaissance and support for ground troops is a topic proactively addressed by NATO partners. Where do we stand in the field of robotic applications in your area of responsibility?

Gesau: The Bundeswehr's concept assigns a prominent role to the use of unmanned systems. The use of these systems enhances the capabilities of the troops, especially in the so-called 3D tasks (dull, dirty, dangerous). Therefore, the further development and adaptation of existing and future technologies in this area are actively being advanced in Department U. With the reconnaissance system RABE (robot for reconnaissance, observation, and exploration), the Bundeswehr has a corresponding system for ground reconnaissance already in use. Currently, another robotic reconnaissance system, MoSeS (mobile sensor system), is in the project planning stage. Additionally, the procurement of unmanned systems to support infantry and logistical tasks is being planned. However, the Bundeswehr also faces challenges in certifying and approving these systems. This applies to unmanned systems with automated driving functions and purely teleoperated systems.

ESD: What solutions for mobile energy generation are being pursued for the future?
Gesau: Department U is currently procuring future cross-sectional power generator units in five distinct performance classes to meet troop energy demands. The most powerful has an output of 200 kW and is integrated into a 20 ft container, while the smallest with an output of 2 kW is the size of a refrigerator. For deployment worldwide, the generators have the capability to switch to Emission Down Grade (EDG) for the use of alternative fuels, such as regionally available diesel fuels with a maximum sulphur content of 5,000 ppm, F-63, and F-34. The generators can be used both individually and in network operation. An energy storage module allows different energy sources (public grid, any power generator, photovoltaic systems, etc.) to be fed into the network. An easy-to-use energy management system ensures energy efficient, environmentally friendly, and flexible operation.

Questions were asked by Michael Horst.

Air Department (L)

The development, procurement, and operation of the Bundeswehr's flying weapon systems are managed in the Air Department of the Federal Office of Bundeswehr Equipment, Information Technology, and In-Service Support (BAAINBw)

The department is divided into ten groups and three staffs; with nearly 1,100 positions, it is the largest BAAINBw department. The groups implement all projects according to the Customer Product Management (CPM) procedure, which regulates the framework for the development, procurement, and usage management of the products until their decommissioning. The department also exercises technical supervision over the Defence Technical Service 61 (WTD 61).

The project portfolio of the Air Department includes, in addition to combat aircraft:

- Transport and special aircraft
- All helicopter systems
- Unmanned aerial vehicles
- Tactical drones
- Rescue and protection systems for crews
- Simulators and training equipment

Space-based reconnaissance and electronic warfare capability is also included in the project portfolio, an area which is gaining importance.

Almost all major projects of the department are embedded in multinational, predominantly European partnerships and management agencies. The Air Department is responsible for the material operational readiness of the assigned flying weapon systems throughout their entire lifecycle before realisation and during the implementation and usage phase. The project offices are supported by the cross-sectional areas Economy/Technology, Basics Aircraft, Aircraft Equipment and Accessories (LLZ), Economy/Law, as well as by department staff and the controlling department.

Additionally, the project and usage management are supported by the 'Airworthiness' staff and the User Representative (BeaNu) at the level of deputy department head.

Current and future challenges

The fundamental paradigm shift resulting from Russia's war of aggression against Ukraine has triggered a swift increase in the operational readiness of the armed forces. This acceleration is particularly urgent regarding the processes and procedures in the area of procurement. With the directive issued by State Secretary Zimmer in April 2023 to accelerate procurement, numerous options have been created to respond more flexibly to the specific requirements of project work. Therefore, all measures focus on the task of meeting the material needs of the armed forces more quickly, effectively, and in an unbureaucratic manner. Special attention in the short and medium term is given to projects that simultaneously provide an insight into the extensive task portfolio of the Air Department.

Eurofighter EK

From the late 2020s, the Eurofighter will ensure another core NATO competence. Following the speech by our Chancellor on the paradigm shift on 27 February 2022, it will be upgraded with key capabilities in electronic warfare (EK). The project is based on considerations of maintaining electronic warfare capabilities in light of evolving threat scenarios and the foreseeable end of the operational life of the Tornado weapon system, which previously covered essential capabilities in its Tornado ECR variant.

Credit: Helsing GmbH

Eurofighter EK

The central elements include a system for locating and identifying radar positions, an effector to combat them, and improved self-protection. The procurement process already underway will fully equip the Air Force with all new capabilities in the shortest possible time and ensure its operational readiness. Therefore, the BAAINBw only considered market-available products that can be integrated into the weapon system with minimal effort and risk. IABG mbH and Airbus Defence and Space GmbH provided significant support for the procurement of this highly complex technology in the market review, integration studies, and risk assessments. The process was conducted at all levels unbureaucratically and efficiently, with quality and time being the determining factors. Just seven months passed from the idea to product selection. A new partner was added with the consortium of Saab Deutschland GmbH and Helsing GmbH with their product Arexis. Accordingly, important key technologies for enabling the Eurofighter for electronic warfare and their further development remain in Germany. The first finalised contract for adapting the new components to the Eurofighter is currently under parliamentary review. It is expected to be concluded soon by the international agency NETMA (NATO EF 2000 and Tornado Development, Production & Logistics Management Agency).

Combat aircraft F-35

While the Eurofighter ECR variant is intended to take over the Tornado's capability profile in electronic warfare, the project "Successor Tornado, Part Procurement F-35 including armament" anchored in the Bundeswehr's special fund guarantees the capacity to share nuclear weapons and other components of air attack capability considering the end of the Tornado weapon system's operational life in 2030.

Credit: F-35 Joint Program Office

F-35A

Following the decision in March 2022 to select the F-35A Lightning II as the first component of a Tornado successor solution, all preparatory measures for its realisation have already been completed at the BAAINBw. With parliamentary approval of the project granted in December 2022 and the signing of the Foreign Military Sales (FMS) contracts with the US Government, the procurement of 35 F-35A aircraft was agreed upon in a total package approach. This includes the delivery of aircraft with

350

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mission equipment, documentation, logistical support, participation in the global spare parts supply, initial training of necessary personnel at US training locations, industry support for initial operations at Tactical Air Force Wing 33, and an initial requirement for armament and munitions.
To ensure the timely reception of the first aircraft in Germany, the project at the BAAINBw works closely with the future user Air Force and the Federal Office for Infrastructure, Environmental Protection and Services of the Bundeswehr (BAIUDBw), responsible for the F-35 infrastructure project at the Büchel site. The aim is to deliver, take over, and achieve operational readiness of the weapon system by the end of this decade.

Heavy transport helicopter

The long-awaited procurement of a new heavy transport helicopter (Schwerer Transporthubschrauber or STH) to replace the almost 50-year-old helicopters of the CH-53G family is gaining momentum. The project currently has a new financial and policy basis thanks to the inclusion of "Procurement of heavy transport helicopters" in the Bundeswehr's special fund.
With the STH, the capabilities currently covered by the CH-53G in operational, tactical air transport concerning the air mobility of land forces/airborne operations, air transport and qualified casualty air transport will be ensured and secured. From the Bundeswehr's operational experience and the Bundeswehr's capability profile, the STH is also intended to fill capability gaps in range, endurance, and payload in the areas of personnel rescue and repatriation (including armed search and rescue), direct tactical support of special forces from the air, and national risk and crisis management.

Credit: Boeing

CH-47F

Credit: Boeing

P-8A Poseidon

In June 2022, the Bundeswehr decided to procure 60 CH-47F Block II standard range helicopters with air refuelling capability, the so-called Chinook from Boeing. The procurement is also conducted through a government-to-government transaction (FMS) with the US Government. In addition to the helicopters, the initial industry support (logistics, tools, ground support equipment, training and training equipment) is included to start flight operations at the Schönewalde site. With the parliamentary approval of the procurement granted at the beginning of July 2023, the US Government was commissioned to initiate the procurement.
The German requirements for the aircraft are aligned with the US Army's configuration and the already available market options to minimise technical and certification risks. The Bundeswehr will be the first armed force to receive the helicopters in the standard range version with air refuelling capability (AAR – air-to-air refuelling). The first helicopters are scheduled for delivery in 2027.

Maritime patrol aircraft P-8A Poseidon

Maritime patrol aircraft (MPA) offer a significant contribution to the long-range reconnaissance capability over the sea and the wide-area anti-submarine warfare from the air and remain indispensable for the German Navy. Therefore, following parliamentary approval in June 2021, the Bundeswehr signed a contract for the procurement of five P-8A Poseidon aircraft from American manufacturer Boeing. The need to expand the portfolio to eight aircraft was ministerially acknowledged with the signing of the phase document in August 2023.
The BAAINBw is also procuring the aircraft through the FMS procedure with the US Navy. The aircraft, developed since 2004 based on a comprehensively modified Boeing 737-800, have been gradually replacing the US Navy's P-3C fleet since 2013. More than 160 P-8A Poseidon aircraft are now in operation worldwide.
The core capability of the weapon system lies in anti-submarine warfare. Using state-of-the-art equipment such as sensors, sonar buoys, and Mk54 torpedoes, submarines can be detected and subsequently countered (anti-submarine warfare). The sensor system consists of advanced computing systems for acoustic processing, radar with inverse synthetic aperture, synthetic aperture radar, and other electronic support measures. Additionally, the weapon system is equipped for locating, classifying, and engaging surface targets with guided missiles (anti-surface warfare). The capability for optical reconnaissance using high-resolution camera systems, which also cover the infrared range, contributes further to comprehensive situational awareness. The P-8A Poseidon can also rely on modern communication and data link systems for combat command, playing a special role in the command of combined forces in combat.
Furthermore, MPAs contribute significantly to Search and Rescue (SAR) operations due to their long range, which can be further extended through air refuelling and modern sensor systems. They can search large sea and land areas from high and low altitudes and coordinate the rescue from the air. This includes dropping the UNI-PAC survival package for SAR operations.
The delivery of the first five aircraft is planned for 2025. ■

Interview


Credit: BAAINBw

With BAAINBw Director Elmar Günther, Permanent Deputy Head of Air Department and Group Leader L1

ESD: What is the status of the two major FMS projects, F-35 and Heavy Transport Helicopter?
Günther: With the decision to procure the F-35A as part of a successor solution for the Tornado in March 2022 and the signing of the Letter of Offer and Acceptance (LOA) in December 2022, the F-35A procurement project has been in the realisation phase for almost a year. The Foreign Military Sales (FMS) government purchase process with the US in a "Total Package" approach ensures that, in addition to the 35 aircraft, the conditions for successfully starting flight operations and achieving initial operational capability by 2029 are in place. This includes participation in the global logistics support for the F-35 and the associated shared spare parts inventory, mission equipment, and the necessary ground support, auxiliary, and test equipment, as well as the training of Air Force personnel at US training sites and support by industry personnel at Tactical Air Force Wing 33 during the initial operation. The greatest challenges stem from the need for coordination and alignment with the parallel project to establish the necessary infrastructure for the F-35A weapon system at Büchel Air Base, as well as the timely availability of suitable personnel to fulfil tasks in the areas of security, IT services, and cybersecurity by the future user, namely the Air Force.
On 1 June 2022, the then Federal Minister of Defence informed the parliamentary committees for budget and defence about the decision to procure 60 CH-47F SR Block II helicopters as a successor solution for the CH-53G. With this announcement, steps were taken to procure the helicopters as quickly as possible, also through the FMS programme. By the end of August 2022, the coordinated Letter of Request (LOR) was submitted to the US government agency. The parliamentary handling and approval of the EUR 25 million proposal took place on 5 July 2023. The LOA was signed by the BAAINBw in July 2023. The agreement has now been confirmed by the US side and has come into force. The US Government has been commissioned to initiate the procurement. The delivery (transfer of ownership) of the first aircraft is expected 44 months after signing the LOA, meaning from mid-2027.

ESD: How is the implementation of the Future Combat Air Systems (FCAS) progressing? What are the challenges in the upcoming project phases?
Günther: With the agreement between Germany, France, and Spain on the next FCAS programme phase, industry companies from the three countries are now set to jointly develop and test technologies for a flight demonstrator. This marks the entry into the so-called work phase 1B, which has been in implementation since March 2023. Moreover, we have concluded complementary national research and technology contracts in parallel. Different objectives of the partners continue to pose challenges, which are being resolved through close cooperation and coordination. It is increasingly evident which technologies can be matured and demonstrated in the upcoming phases. The concept selection of the flight demonstrators, such as the New Generation Fighter Demonstrator (NGFD), is entering the crucial next phase. We are approaching the planned first flight of the demonstrators in 2029 in great strides. Both in this trinational programme and in our national activities, absolute technological ground is being broken, which is laying the foundation for a powerful and adaptable System-of-Systems.
The largest innovation programme to date in the field of military aviation technology development programme, involving a broad German industrial and research landscape has created the basis in the future in decisive fields of technology on an equal footing with the rest of Europe.

ESD: Drones are playing an increasingly important role in current conflicts, such as the war in Ukraine. Is this reflected in the projects of your department?
Günther: The illegal war of aggression by Russia against Ukraine highlights the military utility of drones, which are being used intensively by both parties to the conflict. Ukraine relies very heavily on tactical drone systems. In this context, it can be seen that the number of procurement initiatives for tactical drone systems to be evaluated in the Air Department has increased significantly since the Ukraine war began.
A comparison of drone system procurements by Ukraine and the Bundeswehr shows that Ukraine relies heavily on small drones in large numbers. The relatively low procurement costs and high availability of these small drones certainly contribute to this. Drones in this class provide high-quality optical and infrared images and videos. Some are even used to deploy effectors. Due to the low unit price, the loss of these drones is more bearable than the loss of expensive and complex drone systems. In some cases, logistical support is entirely dispensed with. A disadvantage, however is the transmission of data over the Internet and remote identification, where the position of operating personnel or the drones themselves can be determined relatively simply. As a result, software changes are sometimes made to avoid this. It is understandable that Ukraine largely foregoes comprehensive modifications to drone systems, such as hardening measures, information security, or safe flight operations, in favour of very rapid coverage.
This approach cannot be transferred 1:1 to a nation like Germany. The BAAINBw, as the procurement authority, is subject to different conditions. The approval or type certification of drones is carried out according to the approval regulations of the Bundeswehr Aviation Office (LufABw). Information security also plays an important role in national and Alliance defence. The drone systems previously used by the Bundeswehr are and will remain important components of the reconnaissance and effect network. The enormous potential of commercial small drones has been recognised. It is necessary to reduce the adaptation effort for military flight operations to participate in the short innovation cycles in the field of unmanned systems.

ESD: What is the status of the Pegasus project?
Günther: About two and a half years ago, HENSOLDT was contracted as the responsible general contractor to deliver an airborne electronic signal reconnaissance system based on a Bombardier Global 6000 business jet. Lufthansa Technik, as a subcontractor, has since coordinated the procurement of the aircraft from the manufacturer Bombardier and is responsible for adapting the aircraft and installing and integrating the reconnaissance system developed by HENSOLDT. The three business jets have since been delivered and have been in the first phase of modification to accommodate the mission equipment since mid-year.
This year, we completed a crucial project phase in the Pegasus project with the so-called Critical Design Review. This now allows the implementation of the system design proposed by the industry to begin. The first ground and flight tests with modification components based on the new system design are already planned for the coming year. The first components will be delivered next year, which will then be subjected to an extensive test programme.

The questions were posed by Lars Hoffmann.

Sea Department (S)

The Sea Department (S) is responsible for the procurement and operation of ships and boats for the Navy, naval-specific land, communication, and training facilities, and other specific naval equipment.

Current status of selected projects from the Sea Department:

Civilian ocean-going tugs as an interim solution

The sea and salvage tugs in the720 and 722 classes could no longer be operated economically due to their age and maintenance needs. To offset any capability gap, an interim solution was chosen to bridge the project planning period for the successor solution by purchasing two used vessels and subsequently adapting them to the Navy's needs as a pilot project in the Procurement Task Force. The first vessel, *Rota Endurance*, was commissioned by the Navy as the Rügen in August 2023. The purchase of the second vessel is currently in the procurement process.

With this procurement variant, new ground is being broken. Existing processes must therefore be approached flexibly and in a result-oriented manner: maintenance requirements due to previous use, product changes or improvements due to legal requirements (e.g., change of flag state), and integration with the Navy's communication and command systems on a platform previously operated exclusively in a civilian environment pose special challenges.

Frigate Class 125 Project

The four frigates of the Class 125 (F125) are designed for multinational, joint military operations of low and medium intensity with long deployment durations. The first

Credit: Bundeswehr

F125 during the testing of the Buster boat type in the Kattegat sea area.

Credit: Bundeswehr

Rota Endurance on her last towing mission before being taken over by the Bundeswehr.

Credit: Damen Schelde Naval Shipbuilding B.V

Artist's impression of the Class 126 frigate.

frigate to reach technical operational readiness and participate in an operational deployment was the frigate *Baden-Württemberg* in October 2023. Following its participation in the UNIFIL mission from May 2024, it will complete the Indo-Pacific Deployment 2024, including participation in the major exercise RIMPAC 2024, mostly with the replenishment ship *Frankfurt am Main*.

After a total of 14 months of deployment, the *Baden-Württemberg* is expected to return to Wilhelmshaven in December 2024. At this time, its sister ships *Nordrhein-Westfalen* and *Sachsen-Anhalt* will have completed their scheduled maintenance and will be available for training and deployment. The newest F125, Rheinland-Pfalz, will begin its maintenance phase in January 2025, during which the new onboard helicopter MRFH Sea Tiger will be integrated into an F125 for the first time.

Frigate Class 126 (F126)

The existing procurement contract for F126 includes four vessels with an option for two additional units. The frigates will be capable of global deployment across the full intensity spectrum of three-dimensional naval warfare. The first vessel is expected to be delivered in 2028, with subsequent units following by 2032. As a modular maritime capability carrier, F126 has basic capabilities that meet continuous operational commitments. These include command capabilities within a maritime task force and the ability to engage sea and air targets.

The F126 class of frigates will provide a platform with a focus on large-area anti-submarine warfare designed to protect task forces and sea areas. The modular mission capabilities also allow for other operational and mission needs to be met. Two onboard helicopters and an unmanned aerial vehicles, special forces, an onboard medical team, or personnel for communication and electronic reconnaissance can be embarked. The official start of construction of the first unit will take place in December 2023.

Credit: ARGE K130

The corvette Köln during shipyard sea trials.

K130 corvette supplementary procurement

The construction and outfitting of the K130 corvettes' supplementary procurement (second batch) is currently underway, which includes boats 6 to 10. The seventh boat, the corvette Emden, was christened during a ceremonial event in Hamburg in May 2023. The commissioning of boats 6 to 10 is scheduled to begin in 2025.

U212CD

The first new U-boat U212CD is scheduled for delivery to Norway in 2029. The respective contracts between the parties BAAINBw, NDMA, and tkMS cover the procurement of a total of six identical U-boats – four for Norway and two for Germany, with the first German boat expected to be delivered in 2032. The design underwent a Preliminary Design Review in 2022 and is set to complete its Critical Design Review (CDR) in 2024. Parallel to the process initiated in August 2023 for the CDR, the newly constructed shipyard hall for boat production was inaugurated, and the official production start of the first boat took place in September 2023 with the participation of both nations' defence ministers. The two procurement offices will closely follow the industry's work through the Joint Programme Office (JPO) established in Kiel, Haakonsvern, and Lahnstein, thereby deepening and intensifying bilateral cooperation.

Credit: thyssenkrupp Marine Systems

Artist's impression of the U212CD design.

Class 123 Frigate – operational until 2035

In order to maintain and adapt the capabilities within the framework of 'Ensuring Operational Availability (SdEV)' of operational, effective Class 123 frigates, extensive measures to eliminate obsolescence and implement outstanding product changes are being carried out. This ensures that the Brandenburg class units remain operational until 2035. A comprehensive, system-wide measure for the Class 123 frigate 'Ensuring Operational Availability' (F123 SdEV) will in-

Credit: Bundeswehr

The frigate F123 Schleswig-Holstein during a trial voyage in the Skagerrak.

clude renewing the tactical radar systems and the command and weapon deployment system, additional sensors and data links, missile systems and the ASW system, as well as the communication system. In parallel, a Performance-Based Logistics (PBL) contract will be concluded, including efficient obsolescence management to ensure optimal system availability during the remaining operational period.

Marine Operations Supply Vessels

The new ships, capable of speeds up to 18 knots, have a supply capacity of 11,000 m³ of diesel fuel and at least 500 m³ of aviation fuel. The capability profile is supplemented by the ability to land helicopters and the capacity to store and handle up to ten containers independently. Under the overall responsibility of NVL, the two vessels are being built at the Neptun shipyard in Rostock, part of the Meyer shipyard. The start of construction and keel laying of the first ship took place in 2023. The new operations supply vessels are expected to be delivered in March 2025 and March 2026 respectively.

Credit: NVL

Preliminary ship design for the Class 707 naval operational supply vessel.

Fleet service boat class 424

The procurement of three fleet service boats of Class 424 plus a training and reference facility for signal reconnaissance ensures the seamless maintenance of seaborne signal intelligence capabilities. The project is characterised by its special requirements for above and underwater reconnaissance components for worldwide deployment, in conjunction with specific military demands such as self-protection and command capability.

Outlook

In addition to the abovementioned projects, many other large and small projects and product changes are currently being developed in the Sea Department in close cooperation with and with significant support from WTD 71, the Navy Arsenal, the Navy, and other areas. These range from the modernisation and obsolescence elimination of the U212A and F124 combat vessels to the procurement of cross-sectional electronic warfare systems and other navy-specific systems and equipment (electro-

Credit: Bundeswehr/NVL

Artist's impression of the Class 424 fleet service boat.

optics, radar, navigation) to the modernisation of our WTD71 fleet and various exciting future technology topics. Finally, four selected examples provide a glimpse into the order book of the Sea Department.

Connected sea mine countermeasure capability (FvSma)

The need to maintain the capability for sea mine countermeasures and the deployment of sea mines was documented with the approval of the phase document 'Capability Gap and Functional Requirement Capability Carrier Connected Sea Mine Countermeasure – FFF FVSma' in January 2021. This marked the completion of the first part of the analysis phase under the responsibility of the Bundeswehr Planning Office. The project responsibility for the second part of the analysis phase has now been transferred to BAAINBw. Led by a project team in the Sea Department, a solution proposal was submitted to the BMVg in October 2023. The goal is a seamless transition from the current capability-enabling units of the MJ332 class to the new capability carriers, which can be commissioned depending on the Bundeswehr's medium-term financial planning. For a transitional period until 2040, the MJ332 class will be further modernised and expanded with a so-called toolbox of unmanned systems. This interim step will lead to an improvement in the quality of the data obtained during mine hunting and the area search performance of the system network sea mine countermeasure. In order to handle anticipated scenarios, the toolbox integration concept for the MJ332 class will use a strongly modular approach.

Next generation frigate – air defence (NGFrig-AD), frigate class 127

Following the approval of the FFF by the Inspector General of the Bundeswehr in February 2023, a solution proposal is currently being developed in the second part of the analysis phase, 'Procurement of a US Aegis/BMD Combat System and its integration into an existing national ship design,' to make a selection decision (AWE) by early 2025. The project realisation is to be anchored in the 2026 budget. The goal is to have the first operational ship (F127) ready from 2034 for the timely decommissioning of the F124 class vessels, thus ensuring an uninterrupted maritime capability for task force air defence, including ballistic and hypersonic threats.

Credit: BAAINBw

A design draft of MUsE

Combat boats for the Naval Battalion and the Special Forces Command

New combat boats are being procured for the Naval Battalion and the Marine Special Forces Command (KSM) for their respective requirements and operational scenarios. The goal is to procure market-available boats without development shares. The project 'Tactical Mobility on Water (Subproject 2)' is in the realisation phase, aiming to procure fast rigid inflatable boats (RHIBs) to replace the RHIB 1010 currently used by the KSM. Up to 21 boats will be procured through a framework contract with a specified initial equipment and a call-off quantity. Contract conclusion is planned for 2024, with the first boats expected in 2025. The project 'Tactical Mobility of Maritime Task Forces on Water (TP1)' is also in the realisation phase. The boats for the Naval Battalion are intended for the transportation of personnel and equipment in all operational areas of the Bundeswehr, as well as for harbour protection.

The transfer of personnel and materiel is made possible across the high seas, in the territorial sea, in estuaries and from sea to land. Up to ten boats will be commissioned via a framework agreement with a fixed initial equipment and a call-off service. The contract is scheduled to be concluded in 2024 and the first boats are due to be commissioned in 2025.

The third sub-project, 'Tactical mobility on inland waterways', was taken over by the Maritime Division in August 2023. The aim is to procure 12 boats for the Special Naval Forces in an initial phase to enable operations in inland waters. A solution proposal will be developed for this by the beginning of 2024. The contract is expected to be concluded at the end of 2024, with the boats being delivered in 2025 and 2026.

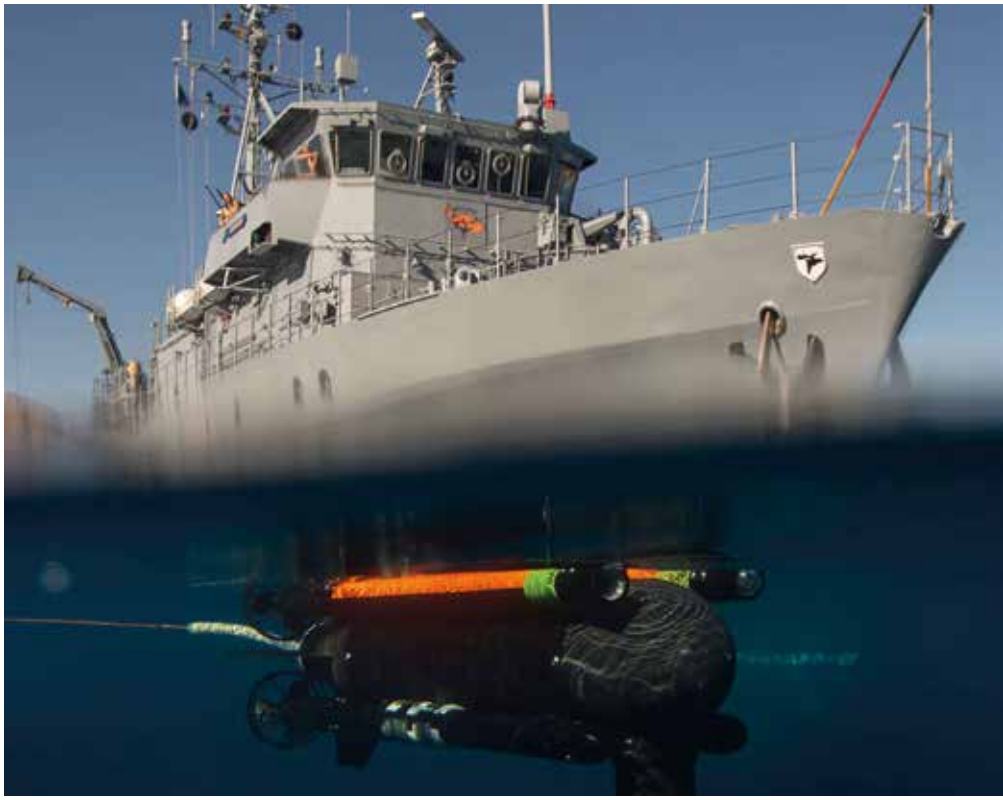
MUsE – Medium Support Floating Units

The Medium Support Floating Unit (MUsE) will meet the German Navy's requirements for 2035+ as a needs-based supply, support, and command unit at sea. The multifunctional design, with a flexible RoRo (Roll-on Roll-off) cargo space, an internal stern boat ramp, and a helicopter landing deck, enables not only the core task of supplying units but also the transport of soldiers and vehicles of the Naval Battalion when required. Additionally, special and specialist forces can be deployed, and larger-scale patient transports can be carried out.

What is equally groundbreaking is the capability to serve as a floating command platform for unmanned systems – in the air, on water, and underwater. This will make current and future capabilities of unmanned systems in the areas of reconnaissance, communication, and combat available worldwide from the sea.

The design is currently being developed with external expertise and continuous Navy involvement. With timely financing, the first unit could be operational by 2030. ■

Credit: Bundeswehr



For a transitional period until the year 2040, the MJ332 class will be modernised once more, here with Seefuchs.

Information Technology Department (I)

IT specialists at BAAINBw are based in Koblenz/Lahnstein and Dresden. The employees are all experts in their respective fields, whether as technical experts in one of the five project groups (I3 to I7), in the cross-sectional group I1, or as administrative officers in group I2.

Additionally, the department also has its own departmental staff (IAS) and departmental controlling (IAC) at its disposal. The departmental staff is responsible for organisational and support tasks in the areas of infrastructure, personnel & organisation, and for further training.
Departmental controlling carries out tasks in the areas of situational assessment and evaluation (currently, particularly in relation to the special fund), decision-making and process consulting. It is, so to speak, the driving force of the department management, consisting of the head of department and a deputy.

I1

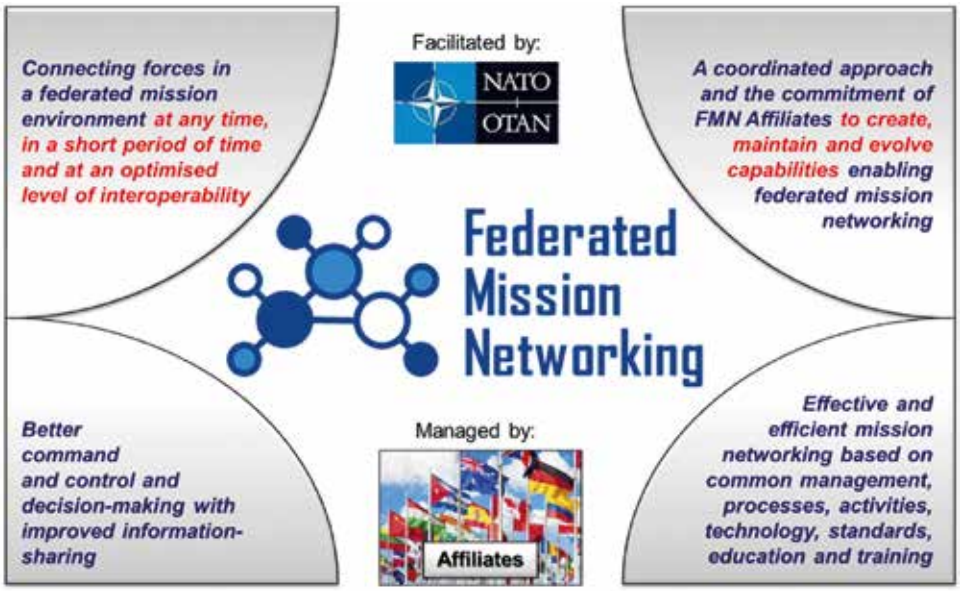
In the 'Economics and Technology' group, fundamental cross-group topics are primarily dealt with. In addition to the interface with the R&T organisation (Research and Technology), the topics include internal departmental education and training, central frequency management for all Bundeswehr projects, management of training at the IT competence centres, central address and directory management for the Bundeswehr intranet, software licence management for the BAAINBw as well as logistics, technical documentation and the SASPF implementation organisation for Department I.
In addition, service-oriented duties are performed outside the department via access to the Bundeswehr's IT System database, assessment planning for international and national interoperability exercises and tests, and operation of the GB BMVg process portal as part of process management. Furthermore, the role of Analysis Phase Part I coordinator has been formed in this group to examine new projects from an IT standpoint as early as the initiative stage and offer appropriate advice to requirement sponsors and potential users.
The FMN (Federated Mission Networking) team, as a NATO-initiated multinational organisation aimed at standardising IT services for mission networks, is also organisationally located in I1.

I2

The 'Economics/Law' group (I2) consists of four contract sections and one price negotiation section. The lawyers and administrative officials of group I2 are responsible for the comprehensive handling of all legal and pricing issues of the department.
The four contract sections I2.1 - I2.4 are responsible for the contractual and legal processing of projects. The procurement and contract law experts work together with the project sections to draw up contracts for the proper implementation and execution of individual projects. This includes, inter alia, preparing decisions on the type of procurement, issuing and evaluating tenders, negotiating and drawing up contracts, and handling contracts. Particular attention is paid to the so-called EUR 25 million submissions. For these projects, approval by the Budget Committee of the German Bundestag is necessary due to the expected contract value of over EUR 25 million. Such submissions are processed in close cooperation with the BAAINBw's Legal Department. The number of these submissions is increasing, especially due to the increase in budget funds as a result of the special fund.
The price negotiation section I2.5 operates across the board within group I2 and is responsible for the price law evaluation of offers and price negotiation. Contract design includes complicated talks with industry representatives to ensure the economic effectiveness of the services to be commissioned.

I3

Various IT projects fall within the remit of group I3. The most extensive project is the Herkules follow-up project (HFP), which is implemented in close cooperation with the federally owned IT service provider, BWI GmbH, to provide adequately equipped office workstations for daily operations throughout the Bundeswehr. The HFP currently has an annual financial volume of approximately EUR 1.7 billion. Group I3 provides the majority of the HFP client management and handles cross-sectional tasks such as requirements, portfolio, programme, regional, infrastructure and financial management, as well as information security and data protection. It also performs technical tasks in the areas of data centres, the Bundeswehr's private cloud, network technology (WAN, WLAN, LAN), telephony, file services and other central services.
In addition, group I3 is responsible for various IT armament projects according to the



CREDIT: NATO

The Federated Mission Networking Team, responsible for standardising IT services for mission networks, belongs to Department I.

specifications of Customer Product Management (CPM), such as the Bundeswehr extranet, the new crisis prevention information system of the Federal Government and the modernisation of Bundeswehr educational institutions.

I4

Group I4 is primarily responsible for the Bundeswehr's command and control information systems; at the core of group I4 is the 'German Mission Network' (GMN) programme.
The GMN programme - formerly HaFIS - was established in 2017 to combine and efficiently manage the numerous individual projects in the field of command and control information systems. The individual projects procure IT hardware and provide IT services in stationary and deployable data centres, among other things. The heart of GMN is a uniform IT platform through which information can be exchanged and processed up to the classification level SECRET - or comparable internationally. Access to this system can be made with various end-devices, theoretically from anywhere in the world. GMN also provides the possibility to exchange information with partner nations and thus makes a valuable contribution to Germany's international commitments.
Other projects such as the IT equipment for special forces are also handled by group I4.

I5

The group I5 'Command and Control Information Systems, Command and Weapon Employment Systems mobile/seagoing/specific, Cyber Defence Technology and Crypto Systems' consists of five sections that handle various command and control information systems, but also command and weapon employment systems, structured by dimensions. In addition to providing software, the initial provision and continuous regeneration of hardware plays a major role in this group. The product portfolio covers the land, air, sea and space domains.
Another focus is the topic of crypto modernisation. With this programme-like project, the Bundeswehr will be provided with the capability of modern, encrypted information exchange, taking into account quantum computer resistance.

I6

The ('yellow') signals specialists of Department I are mainly concentrated in group I6. With its eight sections, this group covers information transmission across the entire electromagnetic frequency spectrum, ranging from the longest waves for communication with submerged submarines to the Ka-band of satellite communication. Thanks to a double-digit billion euro amount from the Bundeswehr's special fund, the employees of group I6 can realise a complete system and generation change in large areas of radio communication.
For the command and control capability of the armed forces, this means not only a quantum leap to a top position within NATO, but also, in keeping with the Zeitenwende (turning point), a modern and above all, threat-appropriate equipment for the first time in many years. The majority of group I6's projects are highly complex with varying degrees of system and platform integration in the design.
The comprehensive renaissance of shortwave radio, the massive expansion of NATO-interoperable radio communications, tactical data links (Link 16, Link 22), the procurement of new satellites, the complete and continuous digitisation of the mobile command and control capability of the land forces (D-LBO), the procurement of up to 191,000 speech sets with hearing protection, the generational change in military mobile radio networks (deployable and mobile), radio-based command post networks, the new deployable and mobile directional radio network, the complete replacement of old troop radio equipment with modern, digital software defined radios, but also not forgetting the cable construction teams represent just a selection of current topics.
The sheer number, volume and contents of this project selection illustrate that the daily business of the 'signals specialists' in group I6 is the practical realisation of the Zeitenwende. Currently, the employees of group I6 are undoubtedly experiencing the most exciting but also most challenging and above all busiest time in decades!

I7

Group I7, located in Dresden, is responsible for IT projects which, among other things, ensure the cross-sectional usable IT equipment in the context of the HERKULES contract, but also in the areas of deployment and exercise. The group's primary focus is on project planning of IT services for the Bundeswehr. This includes collaborative IT services such as DokMBw, GroupwareBw and BwMessenger, which are used nationwide in daily service operations. In the area of end-devices, the SINA service of the Bundeswehr, which establishes IP-based encryption of communication in the IT system of the Bundeswehr up to the classification level SECRET - or internationally comparable (with the exception of telephony and radio communication) is established in group I7. Further areas of responsibility include the support of different end-devices such as mobile workplace equipment, smartphones, tablets, the Bundeswehr's video conferencing service, as well as IT equipment and its operation for Bundeswehr offices abroad.
This group also manages and maintains cross-sectional procurement framework contracts for IT equipment that may be used within the BMVg's entire area of responsibility.

Credit: Elbit Systems

Thanks to the Bundeswehr's special fund, a complete system and generational change in many areas of radio communication could be realised.


Credit: BAAINBw

With Brigadier General Dr Volker Pötzsch, Head of the Information Technology Department.

ESD: General, you took over the leadership of the Information Technology Department at BAAINBw in February this year. Please share your impressions with us.
Pötzsch: Despite having had the opportunity to work more or less closely with BAAINBw over the past years and decades, I have found the first months in my new role to be extremely instructive. The true extent of the daily tasks and the complexity of project work – especially in the IT sector – can only be fully understood when one has had the chance to look intensively behind the scenes. The knowledge, skills, and dedication with which the team in Department I tackles these tasks on a daily basis have impressed and inspired me from day one. Particularly in the very intensive and often extremely time-critical work on various projects funded by the special fund, I repeatedly witness the strong identification of my team members with their core mission: to equip the troops with the means to make them capable of contemporary digital command. Questions such as "What really helps the troops technically?" and "How can we implement these things as quickly as possible?" are constantly being asked and answered. I find that truly remarkable!

ESD: Besides D-LBO as a large-scale programme, which projects do you consider particularly noteworthy and what added value do they generate for the troops?
Pötzsch: It is hard to know where to start and where to end. It is important to understand that we must consider the entire functional chain of various IT services and projects to ensure seamless command capability over virtually any distance in all phases of peace, crisis, and war, from the highest level of the Ministry of Defence down to the individual soldier. This means that while individual projects, such as TaWAN, SATCOMBw, or others, stand out due to their financial volume and technical complexity, they can only be effective if a multitude of smaller, less conspicuous projects are also implemented properly and on time. Command capability is a real team effort, even technically!

ESD: How do the projects in your department benefit from the Bundeswehr's special fund? Approximately EUR 20 billion are earmarked for the command portion.
Pötzsch: The special fund represents a real quantum leap for us – as it does for many parts of the Bundeswehr. The projects funded by the special fund will significantly improve the entire command capability chain described earlier, and in some cases, establish digital capabilities for the first time. This starts with "simple" things such as headsets with hearing protection for every soldier, includes our flagship D-LBO, and extends to innovations like future radio relay systems, where we want to introduce systems that can be carried and operated by individual personnel for the first time. I believe it is not an exaggeration to speak of a quantum leap here.

ESD: What special challenges do you foresee for your department?
Pötzsch: The special challenge lies in continuously coordinating the generally isolated projects in terms of their timing and especially their technical-functional processing so that the command capability chain truly functions seamlessly afterward. It is repeatedly evident that despite all the technical expertise of my team and the involved industry, we regularly encounter (technical) surprises that require short-term reactions. As I mentioned earlier, it impresses me almost daily how well this consistently works.

ESD: Looking into the future: The terms "artificial intelligence" and "software defined defence" are on everyone's lips. What significance do these topics have in your department?
Pötzsch: Enormous. While artificial intelligence (AI) seems to have reached the general public at least since ChatGPT, we still have several steps to take. This is not surprising, as everyone can probably understand that AI applications in the military environment must be selected, developed, and ultimately deployed with great caution. At the same time, there are a large number of different application areas and cases that are conceivable. For us as an office, this means that we need and want to engage particularly intensively with this issue. The leadership of BAAINBw has therefore tasked Department I with acting as the central body to coordinate questions and tasks related to AI, as well as other future technologies from the IT field, for our office. This is a really exciting task, which I am very pleased about.
Software defined defence, in other words, the intention to retrofit or newly equip current and future platforms and weapon systems in such an IT-centric manner that maintaining or enhancing the operational capability of these systems can be achieved quickly and agilely through IT solutions, is also a central task. For Department I, this means that we will increasingly have to act as consultants for the traditional platform-equipping departments. At the same time, we will also be required to provide innovative IT solutions for improvements to these systems. Both are highly exciting but also challenging and demand flexibility from my employees. However, I am more than convinced that they will accept and overcome these challenges. In the team, or as we like to say, I-Together!

The questions were asked by Lars Hoffmann.

IT Support Department (G)

Project diversity from data protection to interactive documentation

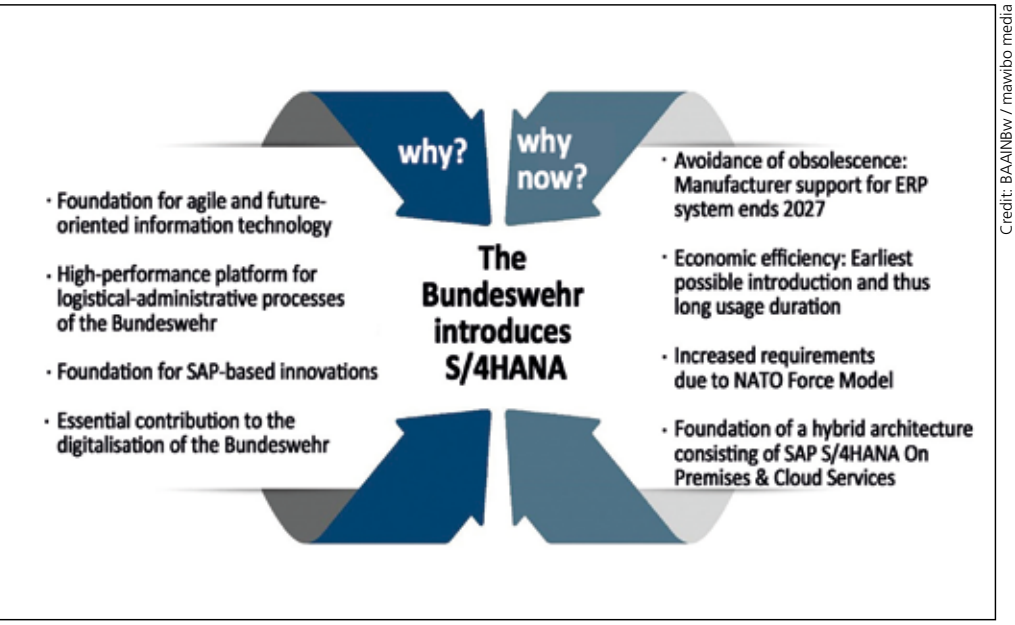
The IT Support Department (G) in the Federal Office for Equipment, Information Technology and Use of the Bundeswehr (BAAINBw) is the central service provider for IT support of the administrative and logistical processes of the Bundeswehr.

This means: For business processes such as payroll, material management, maintenance, transport and health care, qualified and reliable IT services are provided and operated by Department G for deployment and deployment-like commitments of the Bundeswehr.
With complex IT projects, Department G continuously digitalises the Bundeswehr's processes, thus enabling, among other things, the evaluation of data in real time and thus making a significant contribution to the ability to control and make decisions at all levels.
Department G consists of various groups whose sections are organised according to the main business processes and interlock like cogwheels. The groups are supported by the work of the Department Staff (GAS) and Department Controlling (GAC), as well as the Programme Organisation ERP/SASPF (ProgOrg ERP/SASPF), which is currently unique in this form in the BAAINBw.

The Department Staff GAS is responsible for personnel, security and infrastructure matters. GAC deals with the overarching controlling tasks of Department G and derives recommendations for action from the reporting system. The Programme Organisation ERP SASPF performs the operational tasks of programme management for the SASPF Programme Manager and, with the help of the SASPF overall planning in connection with the preparation of the budget-justifying documents, lays the basis for meeting the requirements assigned to the ERP SASPF cluster.
The clusters are the essential basis for holistic and cross-organisational management of the Cyber/IT sub-portfolio within the framework of the digitalisation platform of the Federal Ministry of Defence's area of responsibility.
Group G1, as a cross-sectional business/technology group, has various tasks in the areas of IT service management, technology and application support services, among others. The fields of activity of Group G2 Business/Law lie in the implementation of award procedures (SASPF and systems in use), contract conclusions, billing and legal matters. The processes of personnel/organisation/individual training belong to the fields of activity of Group G3. Group G4 is responsible for IT support of the main/business processes of armaments, logistics, infrastructure and environmental protection. This is also where the area of technical innovations and data management lies. The task spectrum of Group G5 includes, inter alia, planning and controlling components, accounting and projects in the field of health care.

Current projects

SASPF Retrofit
The SASPF system landscape of the Bundeswehr is a highly complex and integrative operational network consisting of a



Credit: BAAINBw / mawibo media

Reasons for the introduction of S/4HANA in the Bundeswehr.

multitude of individual, interconnected IT solutions. The Bundeswehr's major specialist information system, known by its acronym SASPF (Standard Application Software Product Families), is where all the key IT strands supporting logistical-administrative activities converge.

The ERP (Enterprise Resource Planning) modules for procurement, maintenance, infrastructure, controlling, accounting or personnel management are an integral part of the Bundeswehr's SASPF system landscape.

This system network extends not only to central IT systems of the domestic base, but also to autonomous and decentralised IT systems, which are successfully used on the Bundeswehr's ships and boats.

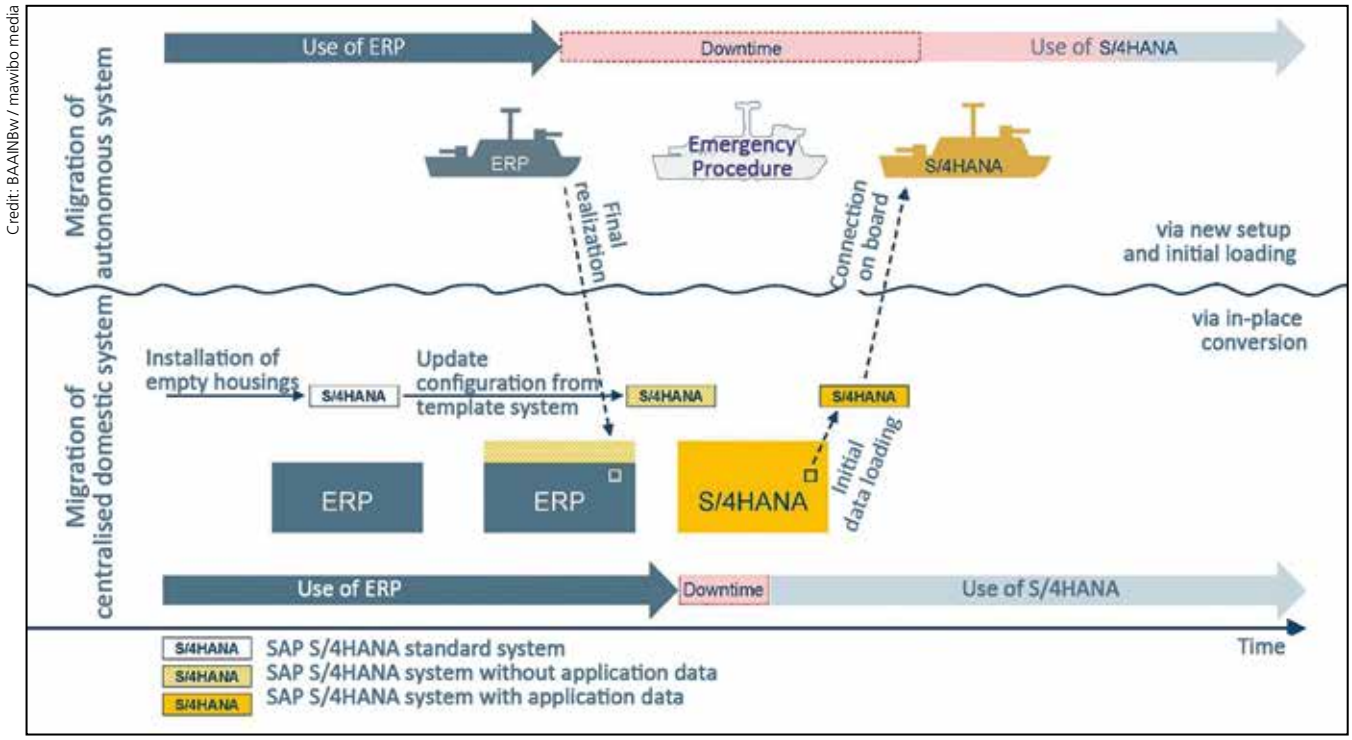
Currently, the Bundeswehr is converting the SASPF system landscape to the ERP successor solution SAP S/4HANA - SAP's next-generation product. With the switch to S/4HANA, the Bundeswehr is building a powerful and innovative platform for its business processes, which opens up innovative access to new digital functionalities and processes.

The 'SASPF Retrofit' project is responsible for converting a significant portion of the SASPF system landscape to S/4HANA. The mission for the project with the highest prioritisation in Department G at BAAINBw is: Migration of the central domestic system including the decentralised systems to S/4HANA by the end of 2025.

The transition of the existing SASPF system landscape marks a central change of course. Based on this powerful platform, the Bundeswehr will not only be able to maintain important capabilities but also develop them consistently and rapidly. The project thus makes an indispensable contribution to future-proof and sustainable logistical and administrative supply for the Bundeswehr - whether in the domestic base, in the context of national and Alliance defence or in deployments and exercises of the armed forces.

In order to meet the 2025 target date and manage the complexity associated with the S/4HANA conversion, the focus of the SASPF Retrofit is clearly on the technically necessary implementation measures. Only the procedural measures necessary for this are part of the project scope and are incorporated into the migration planning. A brownfield approach is being pursued. This means: The conversion of the Bundeswehr's existing central ERP system into an S/4HANA system.

The 'SASPF Retrofit' project focuses on the successful conversion of the Bundeswehr's SASPF ERP system for IT support of the



Credit: BAAINBw / mawibo media

The 'SASPF Retrofit' project converts the central domestic system and the autonomous systems to SASPF S/4HANA Defence & Security.

main processes of accounting, logistics, organisation, infrastructure, environmental protection and armaments. The decentralised systems that exchange information with the central system will also be converted to the new technology.

The technology under S/4HANA for the decentralised systems is the new industry solution SAP S/4HANA Defence & Security (D&S). D&S is to replace the currently used industry solution Defence Forces & Public Security (DFPS) by 2025 at the latest.

Accordingly, the SASPF project's mission also includes migrating the central system and decentralised systems to Defence & Security. The aim is to maintain the current range of functions as completely as possible. At the time of migration, about 30 to 40 decentralised systems will be in use. These exchange data with the central domestic system.

Credit: BAAINBw

Screenshot overview page with sanitised data.

To maintain the consistency of the master data underlying the data exchange, the decentralised systems cannot simply be brought to S/4HANA by system conversion, but must be rebuilt from a template system based on S/4HANA.

This means that the central domestic system communicates with decentralised systems only on the basis of ERP DFPS before its conversion. After the conversion, communication will only be on the basis of S/4HANA D&S. This means that the final data replication of each decentralised system based on Enterprise Resource Planning must be completed before the start of the business downtime of the central domestic system. The initial data loading of the decentralised systems can only begin after the conversion of the central domestic system is complete. After that, the systems are deployed on board the ships and boats of the Bundeswehr.

The conclusion is that the S/4HANA platform allows for shorter innovation cycles and makes a significant contribution to the digitalisation of the Bundeswehr. It will thus make a significant contribution to the oper-

ational capability and striking power of the Bundeswehr - factors that are more crucial than ever in view of the current world political situation.

Strategic Steering Dashboard

For the implementation of the Zeitenwende (turning point), the strategic steering capability of the Federal Ministry of Defence's area of responsibility is of decisive importance. To support strategic steering, leaders need valid figures, data and facts as a reliable basis for decision-making.

Until now, this information has been collected, compiled and prepared manually on an ad hoc basis by querying responsible specialist departments or using SASPF, internal databases and other systems. The aim of the Dashboard for Strategic Steering (DSS), a modern application of the 'IT Support Controlling' project from BAAINBw Department G5.2, is to simplify and accelerate this process.

Originally conceived and developed as a source of information for the Head of the Cyber/Information Technology (CIT) Department, further information needs were identified by other departments in the Federal Ministry of Defence, which are now reflected in the dashboard. To this end, the dashboard offers 13 content areas, e.g., budget, Bundeswehr special fund, portfolio management, capabilities, companies, programmes/projects, material, organisation and personnel, procurement and information security.

As an entry point, users have access to a customisable key performance indicator (KPI) overview page. The dashboard is automatically supplied with data from SAP ERP (e.g., federal budget, cash and accounting procedures, IT support controlling customer product management, purchasing data), SAP BI (e.g., digitalisation of material operational readiness reporting) as well as systems in use and other proprietary databases (e.g., EUR 25 million template database) and presents this data as a single source of truth in prepared form as key figures, graphics and detailed analysis views.

Modern analysis tools such as predictive analytics support the evaluation of data sets in order to determine and display AI-supported forecasts and future developments (e.g., expenditure forecasts for budget funds, material stocks).

For further complex detailed analyses, the dashboard also offers comprehensive self-service on the entire data inventory of the Strategic Steering Dashboard, which enables data from the connected IT systems to be linked. In total, 15 previously isolated IT procedures are thus combined under one application. This significantly expands the previous data potential. The results of this data compilation are also used for ministerial reporting. With the help of comprehensive export functionality, it is possible to create individual report formats in MS Word format and to generate these at any time automatically with (daily) current data. This saves time and resources and thus contributes to efficient administrative action.

The dashboard already offers Bundeswehr users a wide range of information and evaluations. After completion of the implementation phase, which was on time and within budget, the focus is now on validating the quality of the displayed data during use in order to ensure the reliability of the decision-making bases. Data quality is the essential prerequisite for providing leaders with reliable information and enabling them to make informed decisions. Thus, efficient support for strategic steering also directly contributes to the fulfilment of the Bundeswehr's mission.

IT equipment for translation services of the Bundeswehr

In addition to SASPF solutions, Department G projects include the complementary product IT Equipment for Translation Services of the Bundeswehr (ITAÜLBw). The core of the project in BAAINBw Department G5.4 is software that serves as a central translation environment for the Bundeswehr's language mediation service. Source texts, target texts, translation suggestions and all relevant translation sources are integrated on a clearly arranged work surface. All translations made are stored in databases. The software thus enables maximum reuse of already translated text passages, which increases the translation speed compared to pure text processing solutions and allows the translation results to be kept as consistent as possible. A large number of commercial electronic dictionaries are integrated as translation sources.

With the addition of Neural Machine Translation (NMT), the project has had a trainable AI since 2020. This modern machine translation solution already provides a fast, qualitatively sufficient translation for the first content development for the Bundeswehr's language mediation service. This allows the Federal Office of Languages to translate and deliver large volumes of text in the shortest possible time when compromises in quality can be accepted. Thanks to the translation resources (translation memories and Bundeswehr terminology) available at the Federal Office of Languages, the system can be trained with department-specific data and thus optimised for Bundeswehr-specific texts.

At the same time, the introduction of AI is accompanied by a change in the translation process, as the translating and reviewing staff of the language mediation service integrate the new translation technologies into the professional processing of translations, not only keeping an eye on the quality of individual translations but also driving forward the further optimisation of the technologies with the high-quality data. After all, an AI is only as good as the data it is trained with.

Since the expansion of the terminology in 2022, the IT equipment for translation services of the Bundeswehr has also provided the successor solution to the lexicographic information system (LEXIS), which offers a platform for maintaining and providing Bundeswehr-specific foreign language terminology. The LEXIS terminology is available to all IntranetBw users.

In 2023, numerous steps in the AI translation process were digitalised by implementing process automation software. This software reduces the need for manual steps to a minimum. As a side effect, this software can be used to automate the connection to the order management system (AVS) for translation orders in 2024.

The IT equipment for translation services of the Bundeswehr is operated and provided by BWI GmbH. This ensures stable operation and support for the Bundeswehr's language mediation service and all Bundeswehr members.

The projects presented are, alongside more than 30 other current projects in Department G, a good example of the digitalisation strategy in the Bundeswehr, especially with regard to accelerating processes and efficiently using available resources. ■

Key milestones	
July 2018	Start of the implementation of the Chief Information Officer Dashboard (Department Head CIT) (CIO Dashboard).
October 2019	Further development of the Department Head CIT/Department Head Dashboard A.
February 2022	Further development of the Strategic Management Dashboard.
November 2023	Completion of further development – start of the operational phase.

Department of Complex Services/Procurement (E)

The scope of Department E - Complex Services/Procurement encompasses all three pillars of equipment and usage management: The Bundeswehr Procurement (EinkaufBw), demand coverage through Complex Services (KDL) and, in part, the procurement of materiel solutions according to Customer Product Management (CPM), soon to be Project-Related Demand Coverage and Usage (PBN).

The tasks are carried out at the Lahnstein and Koblenz locations in three groups with 13 sections.

Groups E1 and E2 – part of the Bundeswehr procurement

The EinkaufBw encompasses both operational and strategic procurement of products, rights, and services relevant to the Bundeswehr for use and operation within the portfolio of the Federal Ministry of Defence (BMVg), as well as commercial and market-available items.

Approximately 1,000 procurement offices cover the subsequent spare parts requirements for weapon systems and equipment in the usage phase, as well as requirements within the framework of joint departmental procurement (e.g., Kaufhaus des Bundes [KdBund]).

The core tasks of the EinkaufBw are timely or punctual demand coverage (security of supply), demand coverage with due regard to economic efficiency, as well as consideration for sustainability and service quality. In doing so, the EinkaufBw considers the procurement process from the purchase requisition to delivery.

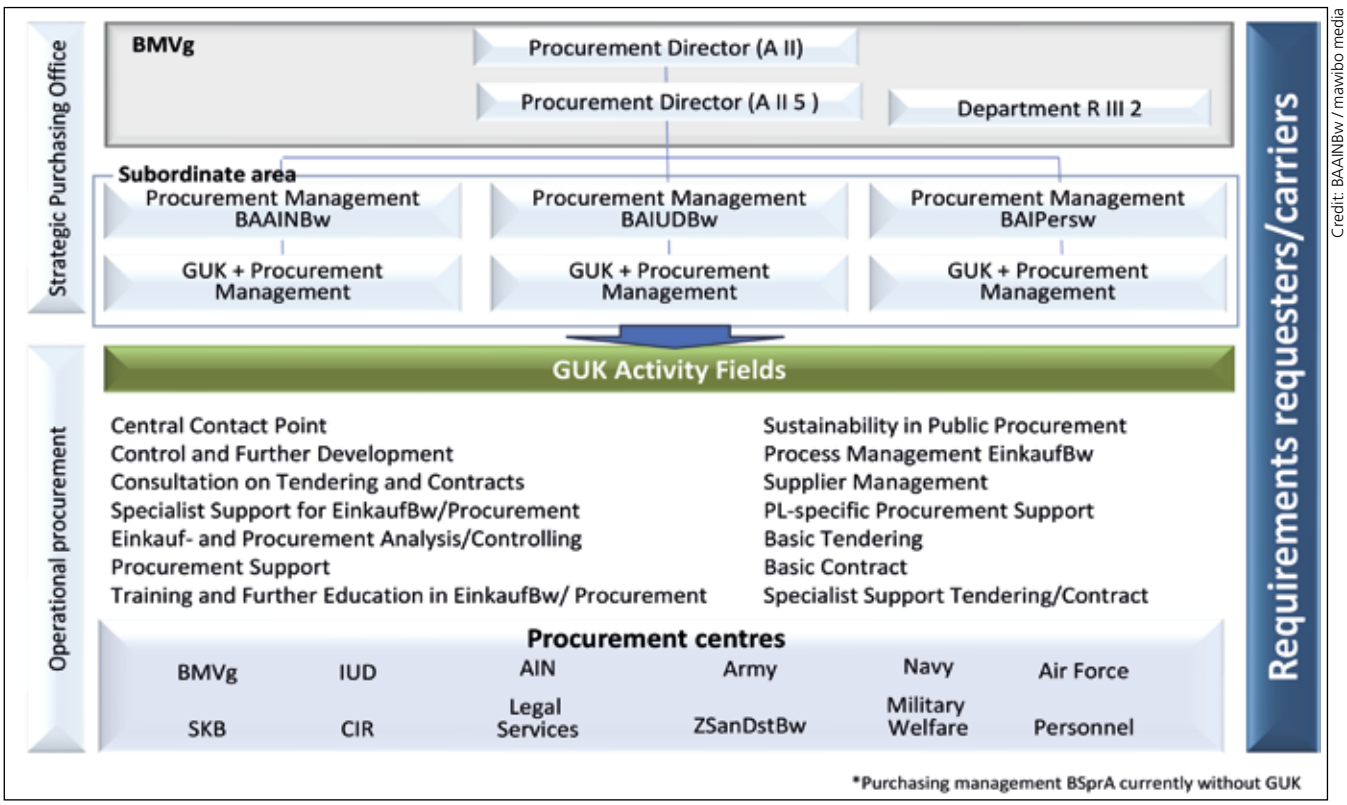
Department E consists of an operational and a strategic procurement level. The overall responsibility and technical supervision for the procurement process lies with Sub-department A II (future Rü I) of the BMVg as the Procurement Directorate. There, the EinkaufBw's organisational structure is established, the procurement strategy is approved, and related guidelines are published.

An essential element of the EinkaufBw system is strategic planning and control through independent segment management in cooperation with the requisitioning department; this is the responsibility of the procurement managers at the office level. Through the establishment of the strategic procurement process and the resulting optimisation of demand planning in cooperation with the requisitioning department, lasting success has already been achieved. The main focus is on a concluding framework and successive delivery contracts with suppliers of the Bundeswehr with a multi-year term, thereby securing medium and long-term demand coverage.

The strategic control and planning of EinkaufBw is carried out with the help of an annually approved dynamic procurement plan, aligned with the procurement strat-

Einkauf der Bundeswehr

Credit: BAAINBw



Credit: BAAINBw / mawibo media

Organisational classification (on of the policy and support component.

egy. In addition, the procurement managers and Procurement Directorate are supported by a
target and performance indicator system.. This allows obstacles and difficulties to be identified early, analysed and eliminated with targeted measures.
Procurement in the Bundeswehr is subject to constant evaluation with the aim of identifying and implementing potential optimisation. This is intended to result in an (even) faster provision of the required supply goods.
Concrete progress is made, for example, through the organisation according to procurement segments, the improvement of preliminary processes and the adaptation of SASPF processes for the automation of demand coverage of commercial material (electronic catalogues, electronic procurement files, electronic marketplaces).
A Basic and Support Component (GUK) has been set up for EinkaufBw to specifically support procurement management. Within the context of EinkaufBw's established information and communication model, procurement information and action aids can quickly be given centrally to all role holders.
Department E is a key player in the AIN portfolio, both in the area of strategic control and in the operational coverage of the Bundeswehr's operational requirements. The resulting tasks in the Bundeswehr's procurement are handled by the strategic, operational and supporting elements in Groups E1 and E2.

Group E1 comprises three sections. It performs tasks particularly in the area of the Basic and Support Component:
Section E1.1
- Principles, procurement development and planning
- Further development of EinkaufBw
- Manage EinkaufBw performance process, procurement business process
- Procurement analysis and statistics
- Catalogue management (KdBund)
- Sustainability in procurement

Section E1.2
- Service master records, contract recording and framework agreement database
- Order information, contract statistics and creditor data management
- Investment audits (Foreign Direct Investments)
- Economic information and register information
- Bundeswehr reporting office for European statistics on complex central armament projects and the Contract Statistics Ordinance

Section E1.3
- Examination and control of demand requirements, technical coordination
- SASPF coordination
- Drawing and design office, drawing management
- Offer collection point, preliminary receipt

Group E2 is divided into five sections and, as part of EinkaufBw, performs both strategic segment planning in procurement management and operational tasks at the procurement segment-specific level. To achieve the primary goal of improving materiel operational readiness of the Bundeswehr, the BAAINBw is focusing more on its core competencies in the armament and utilisation process and is therefore transferring the procurement of commercial materiel without weapon system reference to the Federal Office for Infrastructure, Environmental Protection and Services of the Bundeswehr.
The procurement segment-specific orientation enables, in particular, the targeted demand for requirements on the procurement markets through the development and implementation of specific procurement strategies for each procurement segment. With the support of procurement analysis (BAAINBw E1.1) for all procurement segments, uniform procurement throughout the Bundeswehr is made possible in the procurement segments.
In addition to the already transferred responsibilities for the procurement segments Construction Technology and Office Materials, Office Equipment, Office Technology and Stationery, Heating Oil and Pellets, Packaging Materials, Occupational Safety and Accident Prevention, as well as Auxiliary Materials and Additives, the procurement segments Medical Materials, Operating Equipment / Workshop Equipment / Tools, as well as Machine Elements, Fasteners, Fittings will follow soon.
The strategic tasks for the procurement segments in weapon system-specific and cross-sectional areas are combined in Section E2.1. Section E2.4 takes over the strategic consideration for the Petrol, Oil, Lubricants (POL) area to ensure the supply of operating materials for the Bundeswehr at home and abroad. In addition, E2.4 procures the total requirement for single-use goods in the field of medical materials such as medicines, vaccines, blood products, personal protective equipment and thus also takes on operational tasks.
Sections E2.2, E2.3, E2.4 (in transition) and E2.5 focus on operational tasks that deal with the concrete procurement of products for operational needs via the EinkaufBw demand coverage variant. These mainly include the following tasks:
- Implementation of specified procurement strategies and standards
- Conducting award procedures
- Order processing including assertion and enforcement of warranty rights
- Legal assessment of performance disruptions and assertion of corresponding claims
- Incoming inspection of deliveries and invoices

The four abovementioned sections procure almost the entire subsequent spare parts requirement of the armed forces in connection with the weapon systems in the operational phase.
Since December 2023, the subject areas in the sections have been aligned according to weapon systems, so that the subsequent spare parts requirement is covered here in a weapon system-specific manner. This combines the weapon system-specific competence and promotes cooperation with the corresponding projects. Sections E2.2, E2.3, E2.4 and E2.5 thus largely reflect the new procurement segments (Air, Land, Sea, Cyber/IT and cross-sectional elements).
As part of EinkaufBw, Group E2 is in a constant process of optimisation. The regular aim is to improve service quality and performance as a contribution to ensuring the supply of the armed forces through timely coverage of operational requirements.
Essential instruments for this are the stronger focus on weapon systems and products in use by the Bundeswehr as well as sustainable strategic planning with clear responsibilities.

Group E3 –
Public-Private Partnerships / Complex Services
Public-Private Partnerships / Complex Services represent the third pillar of the equipment and utilisation process. This is a form of demand coverage that can occur in all areas of responsibility and processes of the Bundeswehr and cannot or should not be fully covered by its own forces. In contrast to procurement according to CPM or via EinkaufBw, the focus here is not on the product, but on the service itself.
Sections E3.2 to E3.4 are each set up as organisational elements for the project management of KDL projects, which takes over both the technical-logistical and overall management of the projects. Here, complex service projects are

systematically developed, realised and further developed. The scope of tasks of Section E3.5 mainly comprises the contract and price negotiation responsibility for the projects Bw-Fuhrparkservice GmbH (BwFPS), Heeresinstandsetzungslogistik GmbH (HIL), Needs-Based Warehousing and Clothing Management. Extensive service or framework contracts exist with each of the three federal companies in the BMVg's portfolio, BwFPS, HIL and Bundeswehr Bekleidungsmanagement GmbH (BwBM). With regard to the KDL HIL, corresponding adjustments to the contracts have now become necessary.

The future-oriented alignment and further development of HIL GmbH into the target structure 2031 follows the rationale of state security provision and takes into account, in particular, the security policy and planning-guiding requirement for the capability of national and Alliance defence. This future-oriented alignment is intended to increase the agility, flexibility, resilience and especially the performance of HIL GmbH in order to ensure a decisive contribution to the materiel operational readiness of the land forces. The owner strategy developed for this describes what HIL GmbH should be able to do and achieve in the future in order to meet the maintenance needs of land systems for the Bundeswehr. The contractor's corporate strategy with eight specialist concepts describes how the goals set with the owner strategy are to be achieved for a target structure in 2031.

A core element of HIL GmbH's future-oriented alignment is, among other things, the significant increase in the service portfolio to around 5.8 million maintenance hours annually. The 2031 target structure also envisages a significant additional personnel requirement. In addition, technical qualification is being advanced in breadth and depth in order to keep pace with the advancing digitalisation of land systems. Last but not least, the necessary infrastructure must also be provided. Among other things, the plants in Sankt Wendel and Doberlug-Kirchhain will be expanded and further developed into competence centres for 'tracked vehicles' and 'wheeled vehicles' respectively. The Darmstadt plant will be transferred to a newly constructed service centre of the branch organisation close to Darmstadt.

After two years of work by the project section E3.3 together with the contract section E3.5, the shareholder BMVg A II 3, and many other participation committees, these and other measures have been incorporated into the service description and the new service contract (8th amendment agreement and at the same time new version). With the parliamentary procedure and approval in the Budget Committee of the Bundestag in November 2023, not only has a considerable step towards the 'Future of HIL' been achieved, but budget funds amounting to EUR 13.4 billion have also been approved until 2034 for the realignment of HIL GmbH.

Section E3.6 handles the contract and procurement law processing for the projects it is responsible for. In addition, this section is responsible for the award and contract processing for the Bundeswehr's transport system (modes of transport: road, rail, air and sea). The section is thus the central awarding office for ensuring the Bundeswehr's transport requirements for both basic operations including exercises and for deployment.

Department of Technical, Economic, and Logistical Cross-sectional Tasks (T)

The main technical, logistical, and economic cross-sectional tasks of BAAINBw are concentrated in Department T.

Department T thus has a very broad portfolio of tasks:

- Management: R&D projects, official assistance, capacity-building projects
- Coordination: operational evaluation, immediate initiatives for deployment
- Support: BAAINBw management, projects, other departments, in all logistics processes as well as product-related protection tasks, technical ergonomics and the utilisation of Bundeswehr materiel
- External representation: other organisational areas, agencies, departments, partner nations and international institutions
- Authorising body: transport authorisations, expert activities: accident investigations, price audits

Department T combines cross-sectional specialist tasks and is an essential cog in the operations of BAAINBw. Furthermore, the department is heavily involved in topics of strategic R&D management and the Utilisation Agenda. Thus, Department T also plays an important role in efficient armaments and utilisation management.

Group T1

The following tasks are combined in Group T1: operational matters, overall coordination of R&D, international cooperation, project-related international departmental agreements, official and capacity building assistance.

Group T1's portfolio is complemented by the tasks of modelling and simulation (M&S), Concept Development and Experimentation (CD&E), geoinformation systems, military equipment of other states, national and international standardisation, and technical delivery conditions.

In addition to other tasks, Section T1.1 is the central contracting section for Departments ZA, T, ZtQ, as well as the Management Staff and Staff J. It is responsible for official and equipment assistance and concludes necessary disposal or disposal contracts and country transfer contracts in the case of transfers to other states for the utilisation of decommissioned military equipment. The coordination of the task of capacity-building programmes is also carried out in this section. The aim of capacity-building assistance is to strengthen partner nations and allies to enable them to consolidate peace, deal with post-crisis situations, but also to prevent and manage crises on their own in a sustainable manner. In individual cases, T1.1 also draws up mandate contracts to support partner states.

Section T1.2 takes the lead in negotiating and concluding project-related international armaments cooperation with other nations - also within the framework of cooperation with various international organisations and agencies (e.g., NATO, EDA and OCCAR). In addition, T1.2 supervises the US Department of Defense's "Foreign Military Sales" (FMS) programme on the German side. The area of armaments cooperation includes drafting and negotiating agreements such as Memoranda of Understanding, Project Arrangements and Data Exchange Arrangements (DEA). In the FMS procedure, contracts are concluded with the US government for the procurement of weapon systems and associated spare parts as well as training contracts.

Section T1.3 coordinates and manages international cooperation in the field of cross-sectional, non-project-related armaments technology cooperation. It is the central point of contact for BAAINBw in general matters of OCCAR, EDA and for joint Bundeswehr liaison. In addition, the section is responsible for processing technical delivery conditions and for managing and coordinating standardisation work in the Bundeswehr and NATO standardisation work in the AIN organisational area.

Section T1.4 performs coordinating and controlling functions in various deployment-related subject areas. On the one hand, these are tasks within the framework of procuring operationally necessary and urgent requirements, the so-called immediate initiatives for deployment; on the other hand, these are tasks within the framework of operational evaluation. The findings gained flow directly into the further development of the materiel or into the provision of services. In addition, the section centrally coordinates co-reviews of decrees and orders in the area of deployment/exercise and civil-military cooperation to ensure that BAAINBw is appropriately considered in these documents. Furthermore, on deployment, specialist BAAINBw personnel are technically coordinated and supported here. These personnel serve as a catalyst between the troops on site and the project managers in BAAINBw for the rapid solution of problems that arise with equipment and clothing.

Section T1.5 coordinates all BAAINBw activities in the field of defence technology research and technology. On the national side, this involves ensuring the department's own analysis and evaluation capability outside of projects and providing scientific and technological knowledge in all relevant technologies for appropriate, intelligent and economical equipment decisions. In the international arena, the focus is on targeted networking with international partners in Europe, within the framework of the NATO Science & Technology Organization and beyond.

In addition, Section T1.5 coordinates the evaluation of military equipment from other countries, thereby providing valuable bases for the analysis of capability gaps and the threat-appropriate technical adaptation of systems introduced into the Bundeswehr.

Section T1.6 is responsible for modelling and simulation, concept development and experimental verification (CD&E) as well as GeoInfo consultation for projects in BAAINBw. The M&S control centre in the section coordinates existing and new M&S standards of the Bundeswehr in the national and international environment (NATO, EDA). It conducts numerous R&D projects with regard to the application and use of M&S for the further development of the simulation infrastructure and the networking of simulation and real systems for experimental and training purposes. Current topics include the use of artificial intelligence and Virtual, Augmented and Mixed Reality (VR/AR/MR) or XR for short. The Bundeswehr Simulation Data Coordination Centre, which is currently being established, is intended to provide future simulation systems with models of weapon systems.

The CD&E control centre is the Single Point of Contact for CD&E in BAAINBw. Currently, topics such as the use of 5G technology, optimisation of operational management for the Territorial Command and Control Command of the Bundeswehr and tapping the potential of open data sources for military intelligence are being addressed.
The BAAINBw GeoInfo element advises the project sections in BAAINBw, and acts as the point of contact for the provision and requisition of GeoInfo data and products in the AIN organisational area and coordinates the provision of GeoInfo simulation data to optimise the supply of all Bundeswehr systems with quality-assured simulation data.

Group T2

Group T2 is responsible for product-related protection tasks, technical ergonomics, utilisation of Bundeswehr materiel and the Defence Technology Study Collection. The project managers are responsible for compliance with regulations and specifications for occupational safety, environmental protection and ergonomic design of workplaces as well as weapon system and ammunition technical safety when procuring and using military equipment. Furthermore, the activities of the Bundeswehr, e.g., in training operations, deployment and maintenance, must not result in any inadmissible impairments to the environment. When determining and establishing suitable requirements for the weapon system, the project management is advised and supported by the experts of Group T2 Product-Related Protection Tasks.
It is not always possible to reconcile military requirements with the technical rules and standards of occupational safety, environmental protection and ergonomics. In such cases, alternative solutions must be sought and evaluated to determine whether these measures can still sufficiently guarantee the protection of employees or the environment. The evaluation of proposed solutions that may lead to exceptions and deviations from occupational health and safety and environmental protection regulations is also carried out by Group T2.
In addition to the classic areas of occupational safety, functional safety and software safety are increasingly coming into focus when assessing system safety due to the progress and dominance of intelligent components in weapon systems.
Additionally, the tasks of accident investigation when handling weapons and ammunition as well as the function of the representative for ammunition technical safety and shooting safety in BAAINBw are located in Group T2.
Another task of Group T2 is to relieve the Bundeswehr of military equipment that is no longer needed or used. The employees in this area of responsibility manage and monitor the utilisation and disposal of Bundeswehr materiel. They ensure that the costs incurred are minimised and that the highest possible utilisation proceeds are achieved. Particular attention must be paid to compliance with the War Weapons Control Act, weapons laws and environmental law. Suitable materiel is sold to third parties via the federally owned VEBEG GmbH, handed over for materiel support to friendly states or given to authorised organisations.
The Defence Technology Study Collection (WTS) contributes as an archive of the office and defence technology documentation arsenal with functional demonstrators to the preservation of know-how in the armaments sector and supports the career training of civil servants as well as the predeployment training of troops on foreign weapons. Interested citizens can trace the main lines of development in military technology from the late 19th century to the present day in the public part of the exhibition in Koblenz-Lützel with 2,500 exhibits.

Group T3

Group T3 is divided into the sections Cost Competence Centre (T3.1), Price Audit Principles/Cross-Section (T3.2), Price Audit Cell/Engine (T3.3), Price Audit Materiel Maintenance of the Armed Forces, Missiles, Other Aircraft Equipment (T3.4), Price Audit Electronics, Sensors (T3.5) and Price Audit Weapons and Ammunition, Wheeled and Tracked Vehicles, Ships and Boats, Miscellaneous (T3.6).
The support in the implementation and realisation of projects and programmes with regard to economic aspects in all phases of

Examples of requirements for safety, ergonomics, and environmental protection in weapon systems.

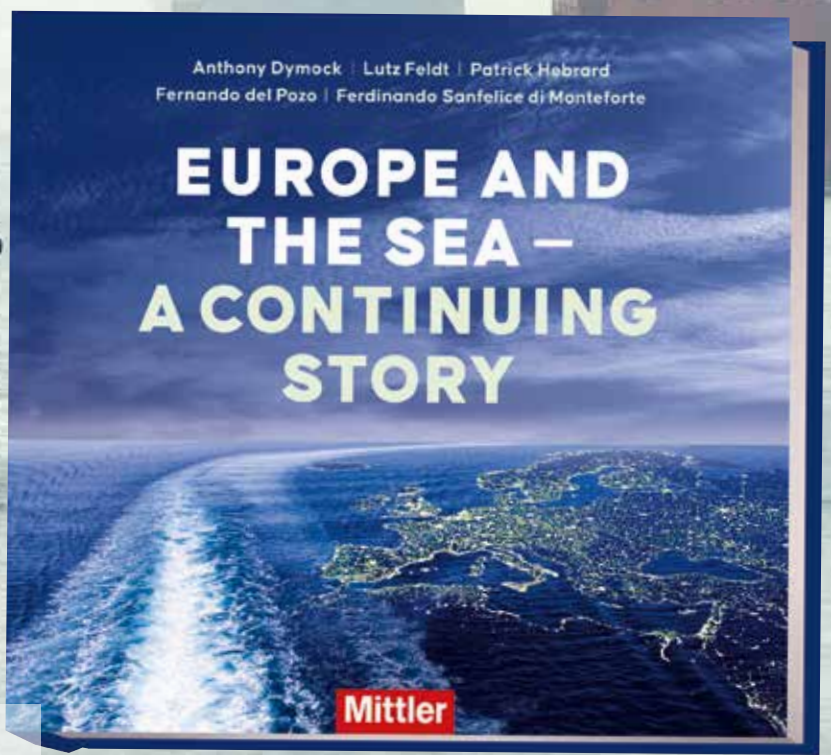
the CPM or the successor document is the task of the Cost Competence Centre. This is achieved through professional advice in carrying out cost estimates in all project phases as well as carrying out parametric cost estimates, professional advice and support in carrying out economic efficiency studies as well as IT economic efficiency studies for armaments projects, the evaluation of alternative forms of meeting requirements and the review and co-signing of phase papers.
The task portfolio of T3.1 is rounded off by supporting economic efficiency studies within the framework of external consulting and support. In addition, T3.1 is the central point of contact within the office for Life Cycle Cost Management issues and provides the spokesperson in the NATO Working Group WG/3.
The tasks of Section T3.2 range from central order management of price auditing and cooperation with the price offices of the federal states to answering inquiries on price law, business management and cost auditing issues of principle, the preparation of work instructions and guidelines for the price auditing sections of BAAINBw and price negotiation and the development of model contractual price and cost regulations to support multinational organisations as well as NATO programme offices and the processing of requests for administrative assistance from foreign governments in the area of price auditing.
The task of the operational audit sections T3.3 to T3.6 is to prepare technically and economically sound expert opinions on the price law adequacy of cost-plus prices by means of an assessment of the quantity and value approaches at contractors within the framework of price audits.

Group T4

Group T4 Cross-sectional Tasks Equipment/Utilisation/Logistics largely combines related cross-sectional technical, economic and logistical areas of responsibility. These aspects have been complemented by fundamental issues of utilisation since mid-2023.
The main task of Group T4 is to support the project management departments in planning and designing the logistics project element.
In this context, Group T4 is also the link to the Bundeswehr Logistics Command and as such a major service provider in the implementation of product-related logistics processes. In cooperation with the Logistics Command, BAAINBw makes a significant contribution to shaping and further developing the Bundeswehr's Logistics System. Accompanying this, the concerns of utilisation are also centralised by Group T4 and, in the case of process-wide needs for action, are purposefully represented.
Section T4.1 implements basic tasks of equipment and logistics and essentially advises the project management within the framework of technical responsibility on all matters concerning the logistics project element. Section T4.1 is also involved in a leading capacity in various special logistics projects for the Bundeswehr.
Sections T4.2 to T4.6 are separate from this section, whose tasks are to support the project management departments and agencies and overarching utilisation issues.
Section T4.2 provides technical support to the project departments on almost all matters of materiel management with the exception of consumables, e.g. processing and forecasting follow-up spare parts requirements as well as monitoring budget planning, processing guideline value overruns in the context of procurement processes, processing HIL annual requirements for spare parts in cooperation with the project departments, implementation and monitoring of provisions in the context of armaments measures, including ammunition.
In addition, T4.2 supports the project departments on all issues relating to the decommissioning of military equipment and coordinates the decommissioning activities in BAAINBw. The appointed decommissioning officer makes the final decision on all decommissioning.
Section T4.3 maintains the catalogue of materiel planning objects across organisations for the Bundeswehr and thus provides the basis for materiel target planning in all Bundeswehr agencies. In addition, the section advises and supports the project departments of BAAINBw in the cataloguing of materiel (on individual application and in the event of changes to the supply article concept), project identifications and determines the technical responsibility for supply articles.
Section T4.4 supports the subordinate area of BAAINBw with the Defence Technology Departments, the Defence Science Departments and the Naval Arsenal.
T4.4 exercises technical supervision in the following areas and is also responsible for the following areas with regard to logistical tasks: order processing, materiel management, maintenance and equipment planning.
In this context, T4.4 ensures the standardisation, harmonisation and optimisation of procedures, processes and organisation in order to establish uniform and binding processes at all agencies in the business area.
T4.4 not only performs the tasks of the Authorised Representative in the AIN organisational area in accordance with CPM, but also those of the Operations and Supply Manager for the AIN area. For this purpose, T4.4 also exercises the aforementioned technical supervisory tasks.
In addition, T4.4 provides the personnel for the Bundeswehr Materiel Management Audit Group for the Equipment, Information Technology and Utilisation area, which, on behalf of the Bundeswehr Logistics Command, ensures the monitoring of process flows and procedures of materiel management through process-oriented audits of the agencies subject to verification.
The processing of imports based on procurement contracts of BAAINBw and its subordinate agencies, the Federal Office for Infrastructure, Environmental Protection and Services of the Bundeswehr, the Bundeswehr Universities and the Office for Geoinformation of the Bundeswehr is the responsibility of Section T4.5. It is responsible for processing exports/transfers within the framework of the utilisation and country transfers of Bundeswehr materiel, including the application to the Federal Office for Economic Affairs and Export Control and customs clearance as well as export control in BAAINBw. Transport measures, basic issues of transport as well as loans of Bundeswehr materiel, free-of-charge transfers and final destination of military equipment, as well as maintenance processing for loan equipment of HIL GmbH are also processed and accounted for.
Since the beginning of 2023, the newly established Section T4.6 is carrying out tasks within the framework of cross-project utilisation matters in BAAINBw. The focus is on supporting the improvement of the performance of tasks of the Materiel Manager for operational readiness in the utilisation phase. In addition, Section T4.6 coordinates internal BAAINBw measures for the creation of a 30-day operational reserve for spare and replacement parts.
Additional core tasks include creating and refining training management for application and making contributions to knowledge management application. T4.6 also updates the central directive on the performance of tasks in the utilisation phase. In addition, the central point of contact for the topic of Performance Based Logistics in BAAINBw is located at T4.6.
In addition to these original tasks, Group T4 is involved in various special organisations and task forces, such as the restructuring of stationary logistics facilities. ■

EUROPE AND THE SEA

A CONTINUING STORY



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Department of Central Affairs (ZA)

Within the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw), the Department of Central Affairs (ZA) is responsible for central administrative matters, operational tasks, and process management. It comprises five groups with a total of 23 divisions. The group consists of divisions ZA1.1 to ZA1.4.

Group ZA1

Division ZA1.1 is responsible for the organisational and operational structure of the BAAINBw and its offices in the department. Furthermore, tasks within the framework of service supervision, as well as military complaints and enquiries under the Freedom of Information Act are processed.
Organisational consulting (organisational analysis and personnel requirements assessment), process analysis and optimisation, cost and performance accounting (KLR), as well as the Continuous Improvement Programme (KVP) in the BAAINBw are tasks of Division ZA1.2.
Division ZA1.3 is responsible for all matters of military security as well as industrial security and visitor control procedures, and for the technical supervision of the subordinate area for the abovementioned tasks. The Security Officer of the BAAINBw and the Senior Officer for Military Security work here.
Division ZA1.4 is the technical information centre of the BAAINBw. The Division researches, acquires, develops and archives technical information required for official purposes and makes it centrally available to members of the BAAINBw and its offices. Contractors of the Bundeswehr receive technical information and regulations on the basis of contractually guaranteed provisions. Bundeswehr units on foreign deployment are supplied with regulations via the "Dv-Web" portal on the internet, similar to the supply of contractors. Furthermore, the administrative tasks in the area of technical regulations are carried out centrally for the Bundeswehr. The Active Regulatory Management task area supports the Central Regulatory Management Office set up in the Bureaucracy Reduction, Regulatory and Working Time Management Division of the Federal Ministry of Defence and the Regulatory Management and Bureaucracy Reduction Group of the Bundeswehr in the Armed Forces Office in implementing regulatory management in the BAAINBw and its area of responsibility.

Group ZA2

The structure and distribution of tasks of Group ZA2 Financial Management are shaped by the special task of the BAAINBw, which is not only a major procurement agency of the Federal Republic of Germany and thus an important public client, but also bears materiel responsibility for the operational readiness of military equipment. Moreover, the group manages the budgetary funds necessary for the administrative requirements of the authority. Group ZA2 combines the tasks of financial planning and budget implementation as well as all aspects of the main accounting process in the BAAINBw. In addition, tax, Federal Audit Office and audit matters are processed.
Group ZA2 is divided into the following divisions: ZA2.1 Budget Principles and Tax Matters, Federal Audit Office and Audit Matters, ZA2.2 Financial Requirements Analysis / Financial Requirements Planning and Budget Management Invest, ZA2.3 Financial Requirements Analysis / Financial Requirements Planning Materiel Maintenance, Budget Management Materiel Maintenance, ZA2.4 Financial Requirements Analysis / Financial Requirements Planning and Budget Management Other Operations, Information Technology and Administrative Titles, ZA2.5 Contract Settlement, ZA2.6 Co-signing of all grants intended in the area of responsibility of the Federal Ministry of Defence, Basic Principles of Grant Law; Technical Supervision of Grants from the Subordinate Offices of the BAAINBw, Examination of Proof of Use, ZA2.7 Main Process Officer Accounting, Project Accountants AIN, Technical Supervision Accounting for the AIN Organisational Area, ZA2.8 Bundeswehr Tax Competence Centre.
In addition to processing fundamental questions on tax and budgetary law, Division ZA2.1 is involved in the examination and consultation of contracts in accordance with Sections 58, 59 and 63 of the Federal Budget Code (BHO). In addition, all ongoing claims of the federal government (reclaims, contractual penalties, interest, etc.) are monitored and booked accordingly, and the taxes incurred for the BAAINBw and its offices are paid centrally. The central ordering of all payments for the office is also one of the division's tasks.
Since 1 November 2023, ZA2.1 has also been the central office for matters relating to the Federal Audit Office (BRH) and the Bundeswehr Audit (RevBw). This office is responsible for the final processing of BRH / RevBw matters.
The main task of Division ZA2.2 is the management of financial resources for research and technology as well as for the development and procurement of military equipment. This includes the special fund for the Bundeswehr set up in 2022, which provides for additional investment procurements amounting to EUR 100 billion.
In addition to budget management, the division handles title management for non-individually budgeted investment chapters / titles for in-year procurements up to EUR 500,000. Central tasks of financial requirements analysis are also carried out.
The main task of Division ZA2.3 is the management of financial resources to ensure materiel maintenance within the framework of materiel responsibility for operational readiness in the Bundeswehr. This includes tasks in the areas of financial requirements analysis, budget management and budget funds management. In this area of responsibility, both the budgetary requirements for systems already in use and the planning for future projects are considered. In cooperation with the project managers of the BAAINBw and the subordinate offices, the division thus makes a significant contribution to ensuring the materiel operational readiness of the Bundeswehr.
The tasks of Division ZA2.4 include the planning and management of financial resources necessary for maintaining and carrying out the service operations of the BAAINBw and the offices of the subordinate area. Furthermore, the funds for information technology and the Bundeswehr's

information and communication system as well as for operator solutions are planned and managed.
In addition to the settlement of contracts concluded by the BAAINBw, the tasks of Division ZA2.5 include the agreement of final self-cost reimbursement prices and the reclaiming of any overpayments after price audits have been carried out.
Division ZA2.6 is responsible for the co-examination / co-signing of all federal grant notices intended in the Federal Ministry of Defence (BMVg) and the BMVg's area of responsibility in accordance with Sections 23 and 44 of the Federal Budget Code (BHO), as well as the in-depth examination of proof of use of completed grants in accordance with Section 44 of the BHO. Furthermore, the division has technical supervision over the processing of grants by the subordinate offices of the BAAINBw and is responsible for processing fundamental issues of grant law.
The Process Officer for Accounting SASPF in Division ZA2.7 is responsible for all aspects of the main accounting process in the BAAINBw. In addition to the conceptual further development of accounting in the AIN organisational area, the requirements and usage management tasks of the EMIR process parts budget, the advice / support of project management in business-related processes of armaments investment projects (project accountants) and the technical supervision in accounting for the AIN organisational area are carried out.
The newly established Division ZA2.8 takes on the tasks of a tax competence centre for all Bundeswehr offices as a ministerial "workshop" of Division BMVg R III 6 and is responsible for tax issues of importance to the entire BMVg area. It mainly covers three areas: value-added tax, income tax as well as IT support and an internal tax control system (ICS).

Group ZA3

Group ZA3, consisting of five divisions, is responsible for requirements management tasks for personnel, technical supervision of procurement by offices, and cross-sectional legal matters, among other things, and performs the tasks assigned to the BAAINBw for civilian and military personnel.
Division ZA3.1 is responsible for coordinating the concerns of the civilian personnel of the BAAINBw and is thus the central point of contact for the Bundeswehr offices responsible for personnel management. Its responsibilities extend in particular to the performance of the BAAINBw's personnel tasks as an employing office.
The division is also responsible for tasks within the framework of participation or cooperation for the Federal Ministry of Defence, the Federal Office for Bundeswehr Personnel Management and the Bundeswehr Service Centres in personnel matters.
Division ZA3.2 has three main tasks. First, it is responsible for decentralised personnel management, dealing with the military service personnel matters of the military personnel in the AIN organisational area; second, it is responsible for the requirements management tasks in military personnel management; and third, the head of Division ZA3.2 performs the tasks of the Commissioner for Military Personnel Affairs and thus of the disciplinary superior in accordance with Section 3 of the Superiors Ordinance (VorgVO) for all officers up to level A15 in the BAAINBw, as well as the deputy of the Commissioner for Reserve Affairs of the AIN organisational area. The head of section ZA3.2 Internal Leadership is also the disciplinary superior according to Section 3 VorgVO of all non-commissioned officers of the BAAINBw.

For the military personnel of the BAAINBw, Division ZA3.2 is thus the central link to the personnel management offices.
The general and cross-sectional personnel matters (civilian and military) are combined in Division ZA3.3. In addition to the support function in the area of basic personnel work of an employing office, this mainly includes tasks of user administration and user support SASPF, time recording and absence processing, teleworking and mobile working as well as occupational health care for all employees of the office.
Division ZA3.4 Strategic Planning of Training and Further Education of AIN Personnel, Attractiveness Agenda coordinates the concerns of training and further education of civilian and military personnel of the BAAINBw and its offices. The division also participates in personnel recruitment measures of the Federal Office for Bundeswehr Personnel Management.
The tasks of Division ZA3.5 include a broad portfolio of cross-sectional legal matters. These include civilian disciplinary matters and the implementation of damage and liability review procedures, as well as the fundamental processing of and advice on equality, staff representation and severely disabled persons' law, as well as the co-examination of changes to laws concerning allowances, but also the exercise of procurement and contractual technical supervision over the procurement of the subordinate offices of the BAAINBw. In addition, the division is responsible for matters relating to the compatibility of family and service/career, in particular the establishment and support of childcare facilities for the BAAINBw at the Koblenz and Lahnstein locations, as well as certification within the framework of the "audit berufundfamilie" for the strategic design of the BAAINBw's family and life-phase-conscious personnel policy. Furthermore, the Process Officer for the Main Personnel Process in the AIN organisational area and the Administrative Data Protection Officer of the BAAINBw are assigned to Division ZA3.5.

Group ZA4

Group ZA4 IT Manager BAAINBw, Infrastructure Affairs OrgBer AIN, Internal Service and User Representative Tasks BAAINBw comprises three divisions.
Division ZA4.1 is responsible for the entire IT service in the BAAINBw, including the office's own IT operations. The classic tasks of IT service management for user support with the provision and administration of IT hardware and software as well as the provision of central IT services and special applications for armament projects via the operation and administration of its own server farms for server and web applications in the BAAINBw's data centre are located here. Thus, officially required IT needs of users in the BAAINBw are provided either as standard via the federal government's own IT service provider BWI or within the framework of its own IT resources. Another focus in Division ZA4.1 is the coordination, control and commissioning of IT relocations in the BAAINBw together with the IT service provider BWI.
In the Equipment, Information Technology and In-Service Support organisational area (OrgBer AIN), Division ZA4.2 handles the pre-infrastructure area in line with the stipulations for the armed services. At its core, this includes determining and examining infrastructure requirements as well as further administration in the infrastructure process for the entire organisational area, including the infrastructurally assigned in-house companies of the federal government in the BMVg's area of responsibility (HIL GmbH, BwBM GmbH, BwFPS GmbH, BWI GmbH and GEKA mbH) as well as the Fraunhofer-Gesellschaft. The technical infrastructure support in the BAAINBw's area of responsibility and at the companies will primarily shape the year 2024. The division performs the tasks of the Infrastructure Officer for the BAAINBw.
The User Representative Tasks BAAINBw area is organisationally assigned to Division ZA4.2 and coordinates the location, property and accommodation matters of the BAAINBw in Koblenz, Lahnstein and Bonn, including relocation measures and the provision of property equipment in direct cooperation with the responsible Bundeswehr service centres. In addition, office-owned and externally rented meeting rooms are allocated here.
Division ZA4.3 Internal Service is responsible as a service division for ensuring the general service operations of the BAAINBw. It consists of the sub-areas postal services, messenger services at the Koblenz-Lahnstein and Bonn locations, printing, classified information registry, old file management, procurement of the office's own requirements, budgetary matters, logistics and materiel supply, driving service as well as sustainable organisation and materiel and personnel support for events.

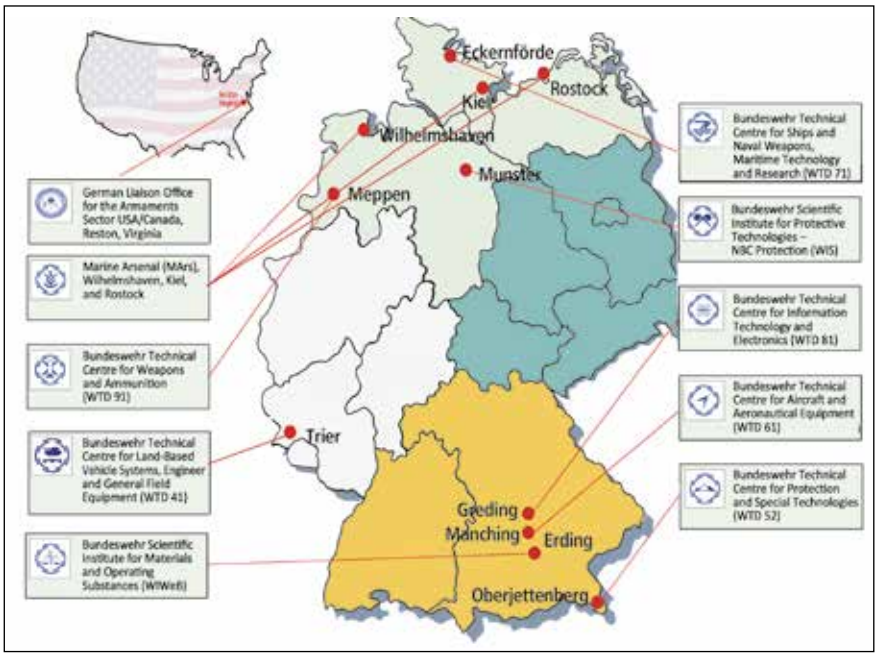
Group ZA5

Group ZA5 Process Management was founded in November 2023.
The further development of the Bundeswehr, whether with the aim of mission orientation or with the current demand for an alignment with national and Alliance defence, requires continuous analysis and goal-oriented processing of all processes. The BAAINBw participates in this not only with its own processes, but also as part of the overall Bundeswehr organisation in cooperation with other involved Bundeswehr offices in different roles. The management of processes includes their identification, design as well as the documentation and further development of the relevant processes with responsibilities and dependencies.
The task of the new Division ZA5.1 is the methodical analysis and optimisation of processes in the BAAINBw. To this end, process mining is used to determine the metrics and maturity levels of processes, which are subsequently further analysed using scientific methods such as Six Sigma. To obtain the necessary data, the division also uses methods such as data mining in IT systems, data preparation and data analysis.
Division ZA5.2 is the central point of contact for the CPM procurement procedure and for project management in the BAAINBw. The division creates organisational regulations for the implementation of the procurement procedure, is responsible for modelling and further developing the associated performance process and makes final decisions on project-specific procedural deviations as part of the decision-making body. As a project management competence centre, ZA5.2 specifies the project management standard in the BAAINBw and provides the necessary tools. The competence centre advises project staff on the application of methods and tools and supports the projects through comprehensive knowledge and change management. The division is continuously developing training and further education in project management and also conducts some of this itself.
Division ZA5.3 is responsible for the main process management of armaments. Within the Bundeswehr's process network, the main armaments process designs and optimises the core process components that are required for the provision of equipment-related materiel requirements in technical, economic and temporal terms, independently of the organisation. The focus is thus on shaping the processes in the business processes for the procurement (purchasing) of products and services (SAP MM-PUR and AI procurement manager), supporting Bundeswehr project management (SAP PS/PPM), Bundeswehr quality management (SAP QM) and the exploitation and distribution of products and services (SAP SD and GTS) and coordinating them with the other main processes (e.g., logistics and accounting).

The offices within the BAAINBw's area of responsibility

In total, the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) oversees six Defence Technical Offices, two Defence Science Offices, and the Naval Arsenal.

Additionally, the German Liaison Office for Armaments USA/Canada (DtVStRüUSA/Ka) in Reston, Virginia, USA, is also part of the BAAINBw's area of responsibility.



Credit: mawibo media

Bundeswehr Technical Centre for Land-Based Vehicle Systems, Engineer and General Field Equipment (WTD 41)

Based in Trier, WTD 41 is the Bundeswehr's competence centre for the technical evaluation of land-based vehicle systems, as well as engineer and general field equipment. While the expertise for the evaluation of wheeled and tracked vehicles, including their components, is concentrated in Trier on the Grüneberg, the focus of the external sites in Koblenz is on the investigation of engineer and general field equipment, particularly engineering machines, fuel supply and field camp systems, and water crossing systems up to robotics.

To fulfil its tasks, WTD 41 has highly qualified personnel and unique infrastructure at both locations. The following section provides an exemplary overview of the project 'Capability to Reinforce and Make March Routes Passable' (VGMw), which is currently being investigated at the external site 1 in Koblenz-Rübenach.

The VGMw project

In the VGMw project, two proposals for solutions are being examined in Analysis Phase II as part of F&T (Research & Technology) Stage 3:

1. Examination of two commercial unrolling road-laying systems
2. Modified mat sets for the already introduced folding road-laying system

Road-laying systems

The main components of the commercial road roll systems, each consisting of an autonomous platform (laying system) with 50 m of road surface and a static platform (spare roll carrier) with 50 m of road surface, were tested for their performance as part of the investigation process. For this purpose, the personnel were trained by the respective manufacturers at the beginning of the year and instructed in the different systems. In addition to the functional and compatibility tests mentioned in the implementation programme, the temporary roads were subjected to a load test. The roads were laid on a defined test track and driven over more than 300 times by vehicles of various military load classes (MLC); wheeled: 5 t to 39 t, tracked: 4 t to 45 t.

Credits: Bundeswehr/Niederelz

Evaluation of two commercially available unrolling road layer systems.

Credit: Bundeswehr/Wilke

Modified mat sets for the already introduced folding road system.

Modification of the folding road system

The future viability of the introduced folding road system depends on two essential prerequisites: a modular design of the laying device and an increase in the load-bearing capacity of the aluminium hexagonal plates. The laying device of the folding road system and its carrier vehicle are currently firmly connected in their current construction. A rough concept for a modular construction was developed, resulting in the assessment that the laying device can be retrofitted with manageable risk. Increasing the load-bearing capacity of the folding road is essential when using protected vehicles and considering the many vehicles now deployed with MLC 50 or higher. In Analysis Phase I, as part of F&T Stage 2, the modification and optimisation of the aluminium hexagonal plates were initiated, which will be delivered to WTD 41 in early 2024. These partial mat sets will then also be tested for their performance.

Implementation programme

The following investigations were planned in late 2023:

Functional and Compatibility Tests:

- Determining basic and static parameters on the tipping plate of WTD 41
- Interface investigations between carrier vehicle and system components

Investigation of unrolling/folding roads (Tests):

- Laying, driving on, and picking up the roads
- Laying the roads on a test track with a defined subsoil
- Driving on the roads with various load vehicles
- Recording damage, deformation measurements, and picking up the roads
- Determining the total mass and axle loads

Tests of all laying systems were scheduled for completion by June 2024.

Challenges with soil types, support from the Soil Mechanics Laboratory

The subsoil of the test track, on which the roll/fold roads are laid, is prepared based on the folding road investigations previously conducted at WTD 41. The soil bearing capacity 'Cone Index 60 (CI 60)' on the existing soil type 'slightly gravelly, sandy, clayey silt' of the excavation site was determined. The staff of the Soil Mechanics Laboratory ensures that the soil of the test track to be driven on is prepared accordingly.

Bundeswehr Technical Centre for Protection and Special Technologies (WTD 52)

The Bundeswehr Technical Centre for Protection and Special Technologies (WTD 52) in Oberjettenberg provides military technical expertise in various protection technologies for the Bundeswehr. This includes original tasks of the Equipment, Information Technology and In-Service Support (AIN) organisational area, such as infrastructure protection against weapon effects and improvised explosive devices (IED), ammunition storage safety, numerical simulation of protection and effectiveness using computer simulations, indirect protection (camouflage and deception), non-lethal weapons (NLW), and the physical detection of IEDs.

WTD 52 also handles special technical topics, such as aerodynamic load tests of pilot equipment, nuclear blast protection, underwater ballistic and detonation tests, and investigations of antenna structures. The unique infrastructure of WTD 52 is significantly influenced by its tasks and its location in the Bavarian Alps. This results in the division of the facility into three major infrastructural areas. In addition to the administration, laboratory, and office buildings in the valley area with verification facilities and workshops, the underground facility in the Reiteralpe massif and the high mountain test sites at about 1,600 m offer various possibilities for research and verification. The facility's own cable car connects the valley and mountain areas, overcoming a height difference of about 1,100 m.

Type 146

One of the main tasks of WTD 52 is to further develop the safety of ammunition storage. Germany and the Bundeswehr, as part of the European pillar within NATO, assume responsibility and prepare for extensive tasks within the framework of national and Alliance defence. These tasks lead, among other things, to an increased demand for ammunition, which must be stored in compliance with regulations. For this purpose, the Bundeswehr operates different types of ammunition storage houses (MLH). Looking to the future, the existing storage capacities in

Credit: WTD 91

Test campaign CUIRA in Älvdalen, Sweden.

Credit: Bundesbau Baden-Württemberg

Model planning for the Type 146 munitions storage facility.

Germany are not sufficient despite the utilisation of expansion and densification potentials. Therefore, it was necessary to develop a new standardised ammunition storage house.

Involving all relevant authorities within and outside the Bundeswehr, the functional requirements for the new storage house were established. These concern, among other things, ammunition safety, structural safety, fire protection, structural-technical security, occupational safety, and lightning protection.

The gate construction, as with all structural facilities for ammunition storage, is a safety-critical component. It must meet particularly high requirements. It should protect the stored ammunition from external impacts such as shock waves or fragments and simultaneously serve as a vent opening in case of an unintentional detonation of the stored ammunition. The basic gate construction was determined by WTD 52 and designed using numerical hydrocode calculation methods.

An experimental verification of resistance against shock wave loading was carried out using decommissioned storage house gates in the large universal blasting facility of WTD 52. For fragment resistance verification, investigations were conducted on generic test objects with different fragment-forming types of ammunition.

After completing all the work, the Competence Centre for Material Safety – Infrastructure Command Centre for Ammunition Handling, on behalf of the Federal Office of Bundeswehr Infrastructure, Environmental Protection and Services, created a binding planning specification and a model plan. This provides the Bundeswehr with a standardised, modern, and future-proof type of ammunition storage house.

As part of the infrastructure requirement assessment and planning in connection with the expansion plans of the individual ammunition depots, the maximum expansion potential must now be determined. A crucial factor in the spatial arrangement of the individual ammunition storage houses is maintaining specific safety distances to prevent the transfer to adjacent storage houses in case of an unintentional detonation of the stored ammunition. These safety distances are specified in national and international regulations. The international test campaign CUIRA in 2022 aimed, inter alia, to validate these regulations in the relevant data range. WTD 52 participated in this test campaign together with WTD 91 in terms of measurement technology and evaluation.

For the newly developed ammunition storage house of the Bundeswehr, experimental investigations with international participation are also planned by the Bundeswehr Territorial Command and WTD 52. These will quantify the required safety distances with maximum storage house occupancy to subsequently adjust the relevant regulations. Ideally, this would lead to a reduction in the required safety distances, positively affecting the spatial arrangement of the new houses within the ammunition depots. This would make it possible to build more storage houses on the same available area.

Bundeswehr Technical Centre for Aircraft and Aeronautical Equipment (WTD 61)

The Bundeswehr Technical Centre for Aircraft and Aeronautical Equipment (WTD 61) in Manching, Bavaria, is the Bundeswehr's technical competence centre for all airborne equipment. WTD 61 plays a crucial role in ensuring that only safe and operationally ready aircraft are used in the Bundeswehr.

An independent ability to judge and advise, separate from the manufacturing companies, is essential. With the necessary expertise and infrastructural equipment, WTD 61 qualifies all airborne systems developed by the industry on behalf of the Bundeswehr and assesses modifications to existing systems from a technical performance and airworthiness perspective. This is done through complex ground and flight tests according to internationally recognised standards, for which a dedicated test airspace is available. WTD 61 operates its own test airfield, equipped with all necessary measuring instruments, and representative, mission-relevant aircraft as instrumented test carriers. Unique features also include the personnel trained and qualified for flight testing. The tasks are predominantly complex, specifically military, and mission-relevant.

A key focus is the integration of airborne weaponry and effectors. In 2023, modified decoy targets were tested for aircraft compatibility with the CH-53 transport helicopter, and flare systems were evaluated to create larger deception areas. Further decoy tests and weapon tests with the newly acquired light combat helicopter and the NH90 are planned

Credit: Bundeswehr/Hufnagl

EPC: Loading masters of WTD 61 prepare EPC-equipped dummies for the drop procedure from the agency's A400M.

for 2024. The operation of the in-house A400M at WTD 61 has been established. A milestone for the facility was the certification of technical operations according to DEMAR 145, which provides greater autonomous operational scope. 2023 was marked by support services and the qualification of airdrop systems on the A400M. The large number of various airdrop projects highlights the troops' need for these capabilities. The Container Delivery System (CDS) for supplying troops with so-called consumables is based on a system introduced by the US Army. This base system was evaluated in flight tests by WTD 61, meeting German aviation regulations and supplemented with materials already in use by the Bundeswehr. Tests for further development into a two-stage airdrop system for Bundeswehr special forces, requiring the capability to drop equipment from great heights, were also conducted. During extensive flight tests over the Eckernförde Bay, the compatibility of inflatable boats in various load configurations with a new airdrop platform was tested in close cooperation with special forces. The findings are directly incorporated into a new vehicle airdrop system based on the same basic platform. Similar tests are planned for dropping high-value weapon systems such as anti-tank weapons. Flight tests for the procurement of the French personnel parachute EPC were also conducted in Manching.

The collaboration with Airbus Spain's Flight Test Team as part of the A400M Flight Test & Evaluation Centre (AFTEC) has been expanded. With a mixed crew, follow-up tests as a UAV launcher were conducted. After a successful Safe-Separation demonstration in 2022, the second stage, Launch & Operate, demonstrated the functional capability of a drone and the start of its engines in the air. Important insights were gained regarding departure behaviour, control, and navigation. In Manching, a test team from Spain conducted further tests to validate the improved closing behaviour of the A400M ramp and door at high altitude. The experience gained from flights with an unpressurised cabin and using oxygen for the crew provides a good basis for future high-altitude drops.

In September 2023, WTD 61 participated with four helicopters in the 'Timber Express' exercise in Schleswig. The aim of the exercise was to integrate various platforms into the armed forces' digital command network. A unified situational picture was to be created from different data link connections. In this context, the functionalities provided by modifications to the UH Tiger, CH-53, LUH SOF, and NH90 TTH were comprehensively tested. It is currently being examined whether the follow-up exercise in 2024 can be conducted at the Manching airfield.

Before the introduction of the new multipurpose naval helicopter NH90 Sea Lion, the Ship Helicopter Operating Limitations were determined in March 2023. For a week, a test team from WTD 61, together with naval aviators from Naval Air Wing 5, determined the limits within which the Sea Lion can safely and reliably take off and land on a combat support ship in difficult weather conditions.

With high-energy lasers, the LAIRCM (Large Aircraft Infrared Countermeasures) missile defence system disrupts the seeker head of a missile to counter it. The self-protection system LAIRCM is being gradually integrated into the aircraft of the BMVg flight service. A test team from WTD 61, together with flight service personnel, was responsible for the necessary test and acceptance flights to obtain approval. A launch of the HARM successor missile AARGM (Advanced Anti-Radar Guided Missile) is planned for the Tornado weapon system. This requires the completion of all software cycles of the ASSTA 4.2 software (Avionics System Software Tornado in Ada). The project to replace the head-up display used in the Tornado has entered the project phase. The new national software IMPACT 2.1 is being implemented and tested in selected Eurofighters at WTD 61. In close cooperation with the Air Force, a test firing with the AMRAAM (Advanced Medium-Range Air-to-Air Missile) and Meteor missiles is planned.

In the field of unmanned systems, WTD 61 is well-positioned. The National Competence Centre is a technical point of contact and is involved in F&T activities (Research and Technology). The Drone Innovation Hub evaluates ideas from start-ups, innovation actors, and companies for military suitability and applicability to enhance the Bundeswehr's operational and performance capabilities by leveraging new ideas and quickly implementing them into products. Thus, WTD 61 makes a significant contribution today and in the future to maintaining and improving the operational readiness of the Bundeswehr's flying weapon systems within the European security network and worldwide.

Credit: Bundeswehr/Kleu

SHOL: An NH90 Sea Lion approaching the combat support ship Bonn.

Bundeswehr Technical Centre for Ships and Naval Weapons, Maritime Technology and Research (WTD 71)

Headquartered in Eckernförde, WTD 71 works in all areas of maritime defence technology and research. It is spread across nine locations with measuring and testing sites throughout Schleswig-Holstein and currently employs around 700 staff. In addition to its specialised infrastructure for various research and testing tasks, the centre operates the research vessel *Planet* and other test boats, which are currently being gradually replaced by new units as part of modernisation measures.

The specific infrastructure and sea operations of the centre are prerequisites for fulfilling WTD 71's mission to equip the Navy with powerful systems and devices. The centre's core business rests on three pillars: verification, technology investigations, and research tasks. The following section will focus on the last pillar.

Credit: WTD 71

Research vessel Planet in the Sognefjord deploying the towed body FLAME II for acoustic self-noise investigations.

The applied maritime research at WTD 71 is conducted by approximately 26 scientists and about the same number of support personnel under a research programme approved by BAAINBw, making WTD 71 a departmental research institution.

Furthermore, WTD 71 is responsible for two technology fields in the F&T Task Area 40 'Sea-Based Platforms' in the area of extramural research. Studies and grants are awarded to universities, institutes, and the commercial sector in the technology fields 1 'Cross-Sectional Maritime Technologies' and 2 'Technologies for Maritime Capability Carriers.'

The aim of the research is to build analytical and evaluation capabilities and to identify technological trends regarding future naval capabilities. A possible transfer of research results to the Navy is always considered, following the self-imposed motto 'From Research to Fleet.'

The following contributions to the major projects 'F126' and 'U212CD' underscore this.

The research results on 3D-ASW procedures (capabilities for three-dimensional anti-submarine warfare) have demonstrated the potential of bi- and multi-static arrangements of transmitters and receivers during national and international naval exercises in which WTD 71 participated with Germany's only active, low-frequency towed sonar.

The algorithms developed at WTD 71 and procedures for deploying a submarine or a second frigate with appropriate sensors as a bi-static receiver are now being implemented in the ASW module of the F126 frigate and the sonar system of U212CD. The same will be realised in different forms on the U212A class boats.

Example: Self-noise investigations on acoustic antennas

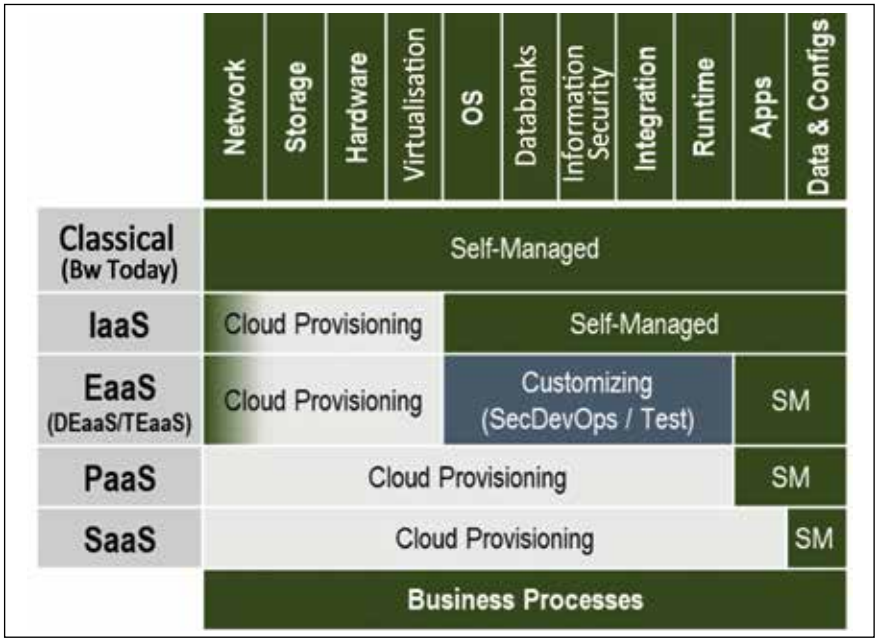
Another example of application-oriented research in the field of sonar is the investigation of flow-induced self-noise levels of antennas. Any flow around an antenna leads to the formation of a turbulent boundary layer, which represents a pressure fluctuation but can also stimulate the hull or the structure of the antenna to disturbing vibrations. This self-noise level generated by the flow inside the antenna can mask the target signal and limit the antenna's performance, i.e., the detection range. WTD 71 has developed methods to measure this self-noise level and separate it from underwater sound. These methods have been used internationally, such as in the EDA project 'Evaluation of Thin Line Array Technology' (ETLAT), to gather extensive knowledge on different thicknesses of linear towed arrays.

A particular challenge is the construction of a low-self-noise planar side antenna, as found on the U212A 2nd batch submarines. To minimise risk, extensive investigations were conducted for the U212A 2nd batch, with part of the antenna mounted on the towed body Flow Noise Analysis and Measurement Equipment (FLAME), and the self-noise level determined for different speeds. Using these findings, an extremely powerful antenna was developed.

For the German-Norwegian submarine project 'U212CD,' even greater challenges are being faced in designing an antenna with low self-noise levels. Due to the size of the boat and its special stealth shape, a completely different installation situation arises. To avoid the risk of high self-noise levels here as well, WTD 71 conducted corresponding investigations with a much larger towed body FLAME II and the quiet research vessel *Planet*, whose results help the project and ultimately the manufacturing company in the field of key submarine technologies.

Bundeswehr Technical Centre for Information Technology and Electronics (WTD 81)

Based in Greding, WTD 81 is the competence centre for information tech-



Credit: BAAINBw / mawibo media

Cloud service models.

nology and electronics in the field of Bundeswehr equipment. Its core tasks are project support and assistance, the handling of technical tasks, and the management of research and technology initiatives. Core tasks also include project management for navigation devices, cross-sectional measuring and testing equipment, and the IT security test centre for the Bundeswehr.

WTD 81 possesses extensive technical expertise in the areas of information acquisition and processing, reconnaissance technology, electromagnetic compatibility, electronic warfare, unmanned systems, interoperability of command information and weapon deployment systems, radar and identification technology, communication, intelligent weapon systems, fire control technology, modelling and simulation, navigation, and IT security.

To fulfil its tasks, the centre has highly qualified personnel, modern, high-quality technical equipment, and unique infrastructure.

The following section illustrates two ongoing projects as examples.

Multi-Domain Operations – Command Capability in the Cloud

Multi-Domain Operations (MDO) is becoming a leading topic at WTD 81. At the end of 2022, the project management for the 'European Defence Operational Collaboration Cloud' (EDOCC) project of the European Defence Fund was transferred here. Currently, a cooperation with BWI is emerging within the framework of the pCloudBw project (private cloud of the Bundeswehr).

NATO defines MDO as 'the orchestration of actions in all dimensions and domains, synchronised with non-military measures and directed towards a common goal with the required speed.' Dimensions/domains include the branches of the armed forces, the operational domains of land, sea, air/space, and cyber, the mobility areas of stationary (core), deployable (fog), and mobile (edge), the partners in coalition operations, and the security areas from OPEN/UNCLASSIFIED to TOP SECRET/NATO/EU SECRET.

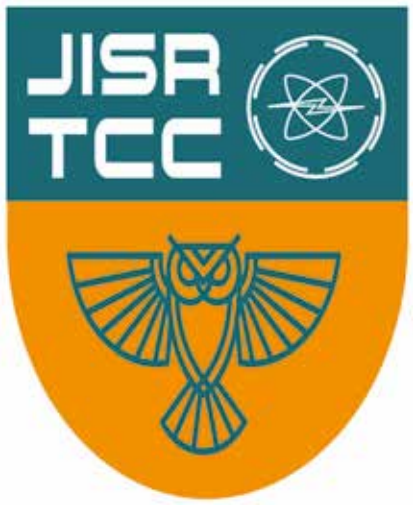
The cloud is the technological solution for agile IT service management and provides the ecosystem for development (Development) and operation (Operations) of IT services. The continuous interaction cycle of Development Operations (DevOps) is the optimal way to effectively and efficiently adapt IT support to operational requirements.

The term cloud encompasses three deployment models: Infrastructure-as-a-Service, Platform-as-a-Service, and Software-as-a-Service (IaaS/PaaS/SaaS), which are to be provisioned across core, fog, and edge. Within the framework of the BWI cooperation, a development and test environment is also to be established in Greding. Current challenges include sizing Infrastructure-as-a-Service for the edge, the interaction of distributed service providers and consumers over unreliable, narrowband communication means, and data management in an infrastructure/platform environment with varying protection needs.

In the EDOCC project, the service accompanies the activities of a consortium (35 companies, ten nations) that aims to develop a business blueprint for a European cloud federation for military operations. In a proof of concept, a harmonised solution is to be demonstrated, considering as many national MDO initiatives and established NATO standards as possible.

Current WTD 81 activities include professional contributions to the Bundeswehr Planning Office's working group 'Operationalisation of Multi-Domain Operations,' the project 'Multinational Multi-Domain Command & Control' (M2C2) of the Multinational Capability Development Community (MCDC), and the Cloud Task Force of BAAINBw, which also involves work on the Bundeswehr's cloud strategy.

MDO will continue to be the defining interoperability topic in the future, within which technical solutions for a variety of issues will need to be realised, especially for the implementation of a zero-trust architecture using not just network-centric but data-centric security. Ultimately, only the cloud provides the 'space' for information environments in which machine learning and artificial intelligence can fully exploit their potential in achieving information and operational superiority.



Credit: WTD 81

Interoperability Test of CSD Systems at the JISR Test Centre

The exchange and management of data is becoming increasingly important. Whether in operations, exercises, or daily operations, extensive and above all structured data sets are indispensable. To work in a multilateral environment, it is necessary for there to be interoperability between the database systems of the individual participants. In the field of reconnaissance technology, this particularly concerns the Joint Intelligence Surveillance and Reconnaissance Cycle (JISR process). This is one of the drivers for the development of the Coalition Shared Data (CSD) concept and its technical implementation. The standard essentially consists of three parts. One part is for static products such as reports, aerial images, or video clips. Another part deals with the provision and reception of video, Link 16, and data streams of the Ground Moving Target Indication (GMTI). The third part creates the software framework for implementing the workflow, which consists of the individual steps of the JISR process. WTD 81 serves as the custodian of the Standardization Agreement 4559 (STANAG), which is responsible for the further development, maintenance, and review of the standard. Additionally, it reports to the higher bodies within NATO.

To facilitate the achievement of interoperability between the CSD systems of different nations and manufacturers, WTD 81 operates the so-called JISR Test Centre. Interested system manufacturers/nations from the NATO environment can apply for a connection to the test network via a Virtual Private Network (VPN). Once the connection is established, a series of automated tests is carried out, and a test report is generated. The compilation of the test cases conducted in close coordination with the developer teams of the systems to be tested. This usually results in an iterative process where the systems are tested, adjusted based on the test report, and retested until a satisfactory level of interoperability is achieved. Furthermore, it is possible to participate in international exercises with a mobile version of the test centre.

To keep up with the further development of STANAG 4559, the JISR Test Centre is continuously being expanded. By locating the custodian of the STANAG and the test centre in the same organisational unit, WTD 81 is well prepared for future challenges.

Bundeswehr Technical Centre for Weapons and Ammunition (WTD 91)

The Bundeswehr Technical Centre for Weapons and Ammunition (WTD 91) is the Bundeswehr's competence centre for weapons and ammunition, protection of mobile platforms, and reconnaissance. It plays an outstanding role as a competence centre for weapons and ammunition worldwide. It is responsible or has an advisory role in all phases of the development, procurement, and use of defence materiel and activities in the field of research and technology (F&T). The core tasks include project support, integrated verification, technical advice, operational analysis, and F&T.

Meppen in Lower Saxony, near the Dutch border, is home to WTD 91. Its area of almost 200 km² stretches over 32 km in length and up to 7 km in width. On this area, WTD 91 has more than 500 buildings for all types of testing and laboratory investigations. This makes it the largest fully instrumented firing range in Central Europe. Weapon systems with a range of up to 28 km can be tested here. The site of today's WTD 91 was first put into operation in 1877 as the 'Krupp Firing Range' by the industrial magnate Friedrich Krupp for testing army and naval guns. After temporary use by the Allies and the civilian population, the Bundeswehr finally took over the site in 1957.

WTD 91 employs around 800 people to cover operations and its extensive range of tasks. This includes approximately 250 scientists, engineers, and technicians.

Within the networked approach of the technical and scientific centres, WTD 91 is the technical partner for the overarching topics of effectiveness, protection, and reconnaissance. It leads the following areas: qualification and testing of protection, weapons and ammunition, optronics, simulation methodology, operational analysis (ETAV), laser technology, and counter-unmanned aerial systems (C-UAS).

In the wake of the Zeitenwende (turning point), WTD 91 has already taken numerous steps to address the time factor, in particular.

Starting from the analysis phase and ending in the usage phase with decommissioning and recycling, the centre supports and assists project management in all phases of the procurement process. This includes planning, coordination, and evaluation of integrated verification, as well as creating technical parts of performance descriptions and the creation and maintenance of technical delivery conditions. Additionally, WTD 91 supports purchase solutions by evaluating the fulfilment of requirements and the opportunities and risks of purchase solutions. It also assesses whether systems are truly ready for procurement or what measures need to be implemented.

In integrated verification, which is often referred to as testing, military technical systems and components are examined to determine if they meet the specified requirements of the future users. Experts at WTD 91 thoroughly test potential Bundeswehr materiel. No ammunition, rifle, or tank is introduced to the troops unless it can be safely used by the soldiers. WTD 91 has already taken several measures to accelerate qualification.

As part of technical and scientific advice, WTD 91 conducts market analyses, reviews military technical systems, and assesses the general suitability of systems, technology, and techniques for specific tasks. Due to foreign deployments and current crisis situations, WTD 91 also conducts operational analyses to significantly support the Lessons Identified/Lessons Learned process. WTD 91, in cooperation with other technical and scientific centres, has the only national capacity in Germany for evaluating incidents from deployments. In addition to incidents, findings, plans, and concepts are evaluated to derive technical, tactical, and organisational recommendations. Threat analyses are also conducted. Current wars and crises are gaining increasing importance in operational analysis compared to previous foreign deployments.

The R&T tasks include the responsible realisation within the framework of departmental research and the coordination and management of R&T projects. In addition, the WTD supervises 91 scientific institutes. Due to developments in recent years, the department has created additional specialised focal points. Thus, topics such as loitering ammunition, hypersonic weapons and defence against drones have returned to the focus.

The development of the Wehrtechnische Dienststelle 91's framework has seen a shift in priorities, necessitating the implementation of new and optimised processes.

Bundeswehr Scientific Institute for Protective Technologies – NBC Protection (WIS)

As a departmental research institution, WIS is dedicated to protecting soldiers from the effects of nuclear, biological, and chemical (NBC) weapons of mass destruction. Other focal points include fire protection technology, protection against strong electromagnetic fields, and mobile water supply and disposal. For this purpose, the institute develops the necessary technical and scientific foundations and contributes to meeting the equipment needs for NBC and fire protection. As a service provider for politics and society, WIS ensures the ability to assess NBC weapons.

Protecting soldiers from NBC threats through optimal equipment is crucial given the Bundeswehr's military deployments globally. The current security environment requires a consistent focus of the Bundeswehr on national and Alliance defence within the overall state context.

Credit: WIS/Lamm

Ship filter testing.

Its contribution to comprehensive defence is a prerequisite for the federal government's ability to act and thus for the comprehensive protection of the population in crises, wars, and against hybrid threats. Deterrence capability, combat readiness, and effectiveness in operations are the demands for a future-proof, fully equipped, and permanently operational and combat-ready Bundeswehr. With its expertise and capabilities, WIS makes valuable cross-departmental contributions. As a designated testing laboratory of the Organisation for the Prohibition of Chemical Weapons, WIS also contributes its technical expertise to monitoring the Chemical Weapons Convention.

Research and development on topics such as the rapid and safe identification of agents in the context of ordnance disposal, the examination and evaluation of unknown substances using chemical-analytical methods, decontamination, drinking water purification, and the handling of contaminated wastewater are essential for ensuring the health and operational capability of troops moving in war zones and preparing for the use of unconventional weapons. In addition to classical protection against the effects of nuclear weapons, the detection of high-power electromagnetics (HPEM), which can disrupt or even damage Bundeswehr electronic systems, and the development of appropriate protective measures are current research tasks of WIS.

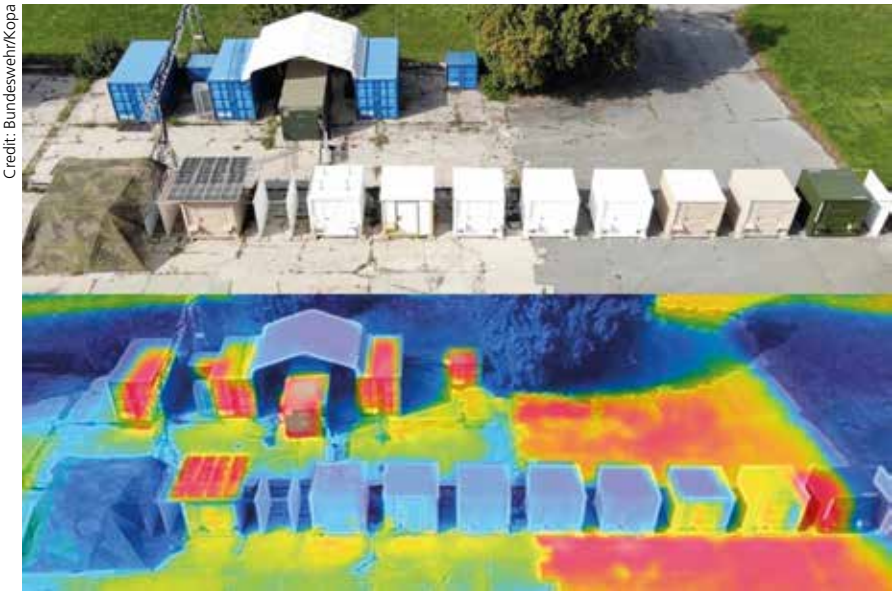
Currently, the specific questions addressed by approximately 200 predominantly scientifically qualified employees are divided into six research areas:

I. Detection of NBC warfare and hazardous substances
II. Decontamination of NBC warfare and hazardous substances
III. Protection against the effects of nuclear weapons and electromagnetic effects
IV. Protection against NBC warfare and hazardous substances
V. Military fire protection technology
VI. Mobile water supply and disposal

Identifying specific research topics occurs in a strategic planning process that implements the Bundeswehr's planning requirements within the framework of a departmental research institute. WIS relies on a network of diverse international cooperation partners when conducting its own research.

WIS is accredited as a testing laboratory according to ISO 17025 and is involved in testing as part of integrated verification during the procurement of defence materiel. This includes various laboratories, technical facilities, and large-scale test facilities that can realistically simulate the full range of NBC threats to equipment and systems in experiments.

Credit: Bundeswehr/Kopa



Field test for the evaluation of passive cooling technologies: The containers with the cooling technologies (centre, bluish in colour) show significantly lower surface temperatures compared to the two reference containers on the right side.

All platforms such as aircraft, ships and land vehicles of the Bundeswehr undergo the necessary tests in the areas of fire protection technology, EMP protection, decontamination capability and protective ventilation systems. The WIS is therefore an indispensable and competent partner in the process of introducing new platforms into the Bundeswehr.

In addition, it already fulfils project management tasks in the areas of fire protection technology and NBC laboratory equipment.

'Researching – Testing – Advising – For the safety of our soldiers' – true to this statement, the WIS makes its contribution to future-orientated, practical equipment for the Bundeswehr with a wide range of key tasks. By providing science-based services from a single source, the Wehrwissenschaftliches Institut makes an important contribution to NBC protection through findings from research, modern technical capabilities and a coordinated range of services for various stakeholders.

Bundeswehr Scientific Institute for Materials and Operating Substances (WIWeB)

Research and Service for our soldiers

The Bundeswehr Scientific Institute for Materials and Operating Substances (WIWeB) in Erding is the Bundeswehr's competence centre for safety, technology, and chemistry of materials and operating substances. Additionally, WIWeB deals with clothing and personal equipment for soldiers and issues of occupational and environmental protection. It develops technological and scientific foundations for the safety and reliability of defence materiel.

WIWeB observes technological trends and the potential use of new technologies for the Bundeswehr and maintains short-term accessible scientific expertise as a departmental research institute. The institute evaluates the properties of materials and operating substances in the system context, works in an interdisciplinary manner, and is well-networked with all parts of the Bundeswehr, the research landscape, the defence industry, and international partners.

The goal is always to provide the best possible, safe, and reliable products for use. The tasks are of great importance to the Bundeswehr, as materials are the basis of all weapon systems and the starting point for innovations, operating substances ensure mobility and are subject to significant changes as part of the energy transition, and clothing and personal equipment offer functionality, protection, and safety.

The WIWeB includes the Bundeswehr's 3D printing centre, the Bundeswehr's welding and adhesive technology centre, the Bundeswehr's hazardous materials measurement station South, and the Soldier System Innovation Laboratory.

Credit: MArs

The accommodation boat Knurrhahn in the dry dock of the Naval Arsenal in Rostock.

Current affairs

In the course of the energy transition, a restructuring of energy supply is necessary. In addition to alternative possibilities for energy generation, opportunities for energy savings must also be considered. High energy expenditure for cooling is necessary, among other things, in hot operational areas or in rooms with temperature-sensitive equipment. The use of cooling coating systems can minimise heat input from the outset. One principle that can be used is passive radiative cooling. At WIWeB, such coatings have been investigated on a laboratory scale as well as directly on containers. The focus was on the achievable cooling performance, especially in comparison with other passive cooling technologies and shading. A cooling coating system, consisting of a porous polymer layer, stood out in particular. Here, the surface temperature of the containers could be lowered below the ambient temperature in direct sunlight. In ongoing investigations, the various coatings are now being examined in terms of aging, cleaning, and colour adaptation to create capability-based requirement profiles.

Marine Arsenal (MArs)

The new location of the Marine Arsenal in Rostock – *Quo vadis, Warnowwerft?*

Since its foundation in 1957, the Marine Arsenal (MArs) has been responsible for continuously maintaining all units of the German Navy around the globe, conducting scheduled and unscheduled maintenance, and performing necessary immediate repairs with its own personnel. As a reliable partner, it ensures the materiel operational readiness of the fleet in cooperation with partners within and outside the Bundeswehr.

Until mid-2022, it became increasingly difficult for MArs to meet this high demand given the resources available at the time. The speed of the urgently needed infrastructural upgrade of the Wilhelmshaven and Kiel locations and the largely frozen situation with personnel development, which had dropped to a historic minimum following the 2011 stationing decision, were no longer proportional to the increasing workload.

Looking ahead to the future rearmament planning of the German Navy, which envisages the provision of 50 units in the surface area alone as part of its Alliance commitments and national ambitions by 2032, it became clear that a turnaround in this development was required.

This turnaround began in 2022 with the decision by the then Federal Minister of Defence to acquire the mobile and immobile assets of the insolvent MV Werften at the Rostock location and establish another Marine Arsenal site on the Baltic Sea. This decision was accompanied by the determination to increase the number of posts at MArs by 482.

By 1 August 2022, the day the new MArs Warnowwerft location began operations, the materiel, infrastructural, and personnel prerequisites were in place to carry out the necessary repair and maintenance work on floating units in the future. This should substantially improve the operational availability of the German Navy's seagoing units.

With the help of numerous stakeholders across the entire defence department, MArs has succeeded in fulfilling all planning requirements for establishing the site, as outlined in a transition concept, since the start of operations.

The pilot project of self-maintenance of the accommodation boat *Knurrhahn* demonstrated the successful establishment of the underlying maintenance processes at the site. The self-performance shares contributed by the shipyard personnel of Warnowwerft were implemented on time and within budget.

Although the determination of the total costs of this maintenance is not yet fully completed, the already determined personnel costs for productive personnel and materiel procurement costs show that this maintenance project could be completed well below the cost ceiling of ten million euros. This cost ceiling represented a benchmark that quantified maintenance costs based on comparative values if the services were awarded to industry.

In addition to completing the pilot project *Knurrhahn*, the Rostock Arsenal staff successfully carried out the unscheduled repair of the fleet service boat Alster, which is also an example of their remarkable technical performance, more than 70 immediate repairs, and the repair of three Royal Navy patrol boats as part of Host Nation Support. The list of measures completed so far can be supplemented by contributions to the repair of the task force supplier *Frankfurt am Main*, where the new MArs location in Rostock provided personnel support in the areas of freshwater fittings and the gyrocompass system, and the integration of the Vertical Launch System on the frigate F124 *Sachsen*.

The start of the training programme in the two apprenticeships for industrial mechanics and plant mechanics, which began on schedule in September 2023, and the area-wide rollout of SASPF, were also successful. Thanks to the support of the Digitalisation Staff at BAAINBw, the new arsenal location was able to not only provide full functionality of the SASPF system in exemplary time but also adapt it to the specific business processes of the location.

As a result, it is clear that the decision to strengthen the naval arsenal was consistent and correct.

Now, it is important to consolidate the previous successful path with smart strategic decisions and further develop it in line with the mission. ■

German Liaison Office for the Armaments Sector USA/Canada

The German Liaison Office for the Armaments Sector USA/Canada (DtVStRü USA/CAN) is a subordinate agency of the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw), located in Reston, Virginia, USA.

The agency represents the defence technology and armaments industry interests of BAAINBw to the armed forces and agencies of the United States of America and Canada, as well as to their respective industries. The transatlantic cooperation covers a wide spectrum of armaments-relevant technologies and various weapon systems from the land, air and sea domains.

The DtVStRü USA/CAN currently has 51 posts:

- 29 for engineers and scientists
- 11 for non-technical administrative officers
- 7 for military officers
- 4 for locally employed staff

More than half of the posts are located in the following project offices and liaison offices at US Army and US Air Force sites:

- Rolling Airframe Missile Project Office (RAMPO) in Arlington, VA
- NATO Seasparrow Project Office (NSPO) in Arlington, VA
- F-35 Lightning II Joint Program Office (F35 JPO) in Arlington, VA
- German Patriot Office (GEPO) in Huntsville, AL
- Multifunctional Information Distribution System International Program Office (MIDS IPO) in San Diego, CA
- NATO Improved Link 11 Project Management Office (NILE PMO) in San Diego, CA

For personnel from the Equipment, Information Technology, and In-Service Support (AIN) organisational area deployed in several programme offices across the North American continent, the DtVStRü USA/CAN acts as the home agency for general service issues.

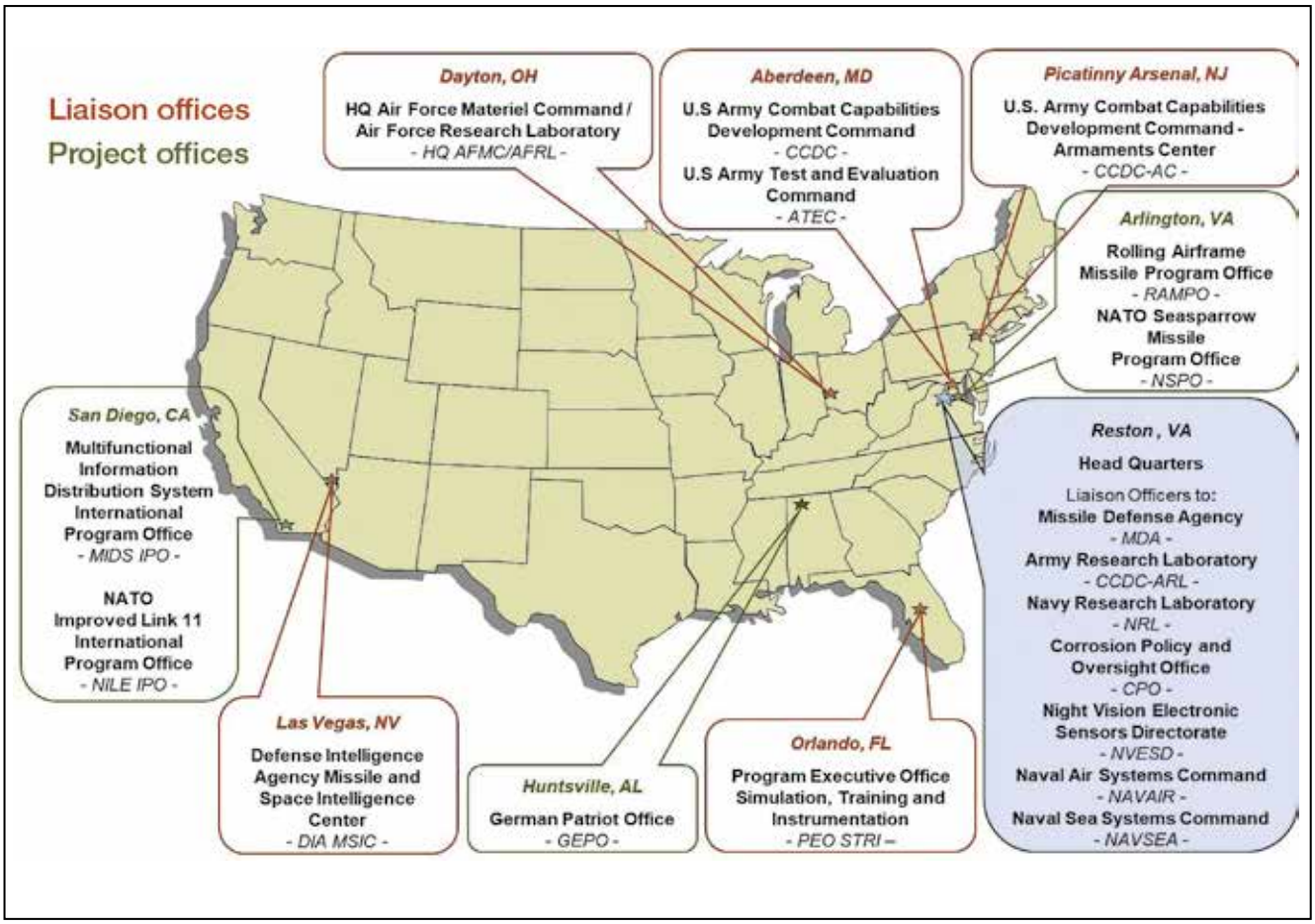
However, the German positions on the projects are determined solely by the responsible project management teams in Germany in technical terms. The agency has no independent role or decision-making authority in this regard.

The aim of the work is to strengthen national military and industrial capabilities and to promote the development of common standards and interoperable solutions for mission-oriented equipment for the armed forces.

The liaison office is the point of contact for initiating and coordinating armaments cooperation with the USA and Canada in the field of research and technology, as well as joint development and procurement programmes up to the utilisation of the procured armaments. It contributes to maintaining and further developing the capabilities of the national defence technology industry.

Other key areas of work include the procurement and repair of US and Canadian armaments for the Bundeswehr, the management of personnel exchange programmes for defence engineers and scientists (Engineers and Scientists Exchange Program, ESEP) and administrative personnel (Administrative and Professional Personnel Exchange Program, APEP) of both nations, as well as representing German interests in international

Credit: BAAINBw / mawibo media



Locations of the German Liaison Office for Armaments USA/Canada and its branch offices.

FMS (Foreign Military Sales) working groups.
The agency also takes on tasks in the field of official quality assurance for products ordered in the USA and Canada. For this purpose, there is close cooperation with US and Canadian quality control services.

Current affairs

Personnel exchange programmes
The established exchange programmes with the USA and Canada have maintained their proven format. The programme for defence scientists and engineers with Canada has now been in existence for 40 years, and the one with the USA for 60 years. At the respective anniversary celebrations in Ottawa and Washington D.C., high-ranking representatives from both sides emphasised the great importance of these measures for empowering participants and fostering cooperation between the countries.
In addition to the long-standing programmes supported by DtVStRü personnel, such as the Multifunctional Information Distribution System (MIDS), NATO Improved Link 11 (NILE), Rolling Airframe Missile (RAM), NATO Seasparrow Missile (NSM/ESSM) and Patriot, further FMS procurement projects have been added. A new project office with two posts has been established in Arlington, VA for the procurement of the F-35A Lightning II fighter jet. The agency also supports the procurement of the P-8A Orion and the CH-47 Chinook.

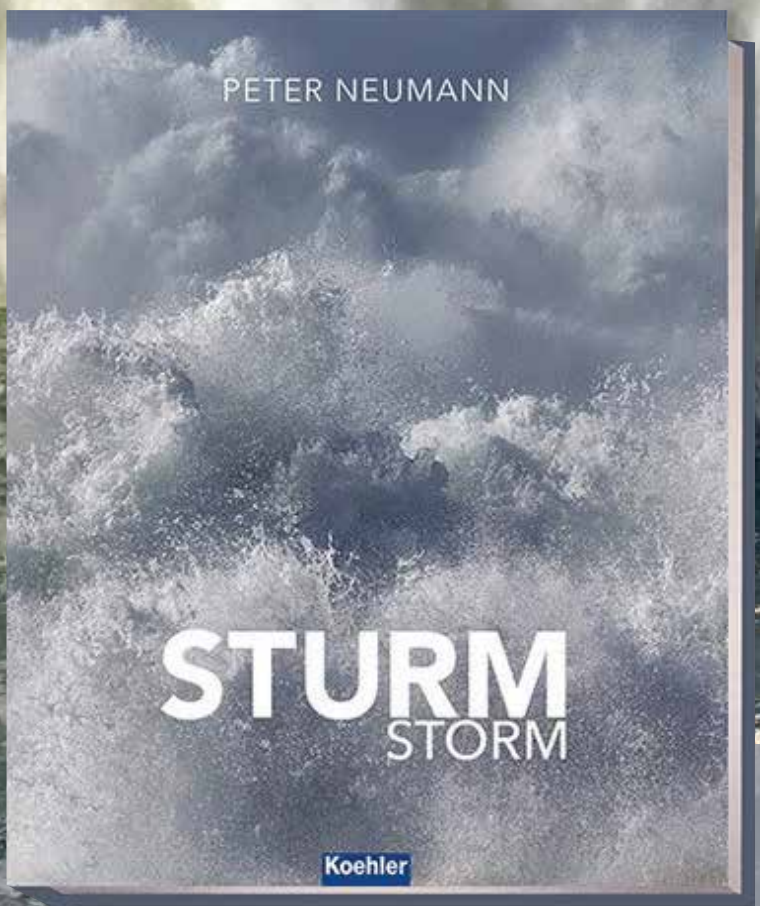
Official quality assurance
In addition to the regular procurement of spare parts for all technical systems of the Bundeswehr, the procurement of new corvettes continues to determine the day-to-day business of official quality assurance. Both the Integrated Monitoring and Control System (IMCS) ship automation system and the RAM close-range defence system are sourced from the North American continent.

Data exchange agreements
Agreements that regulate the legal framework are needed, particularly for the exchange of information and data, for example from the field of defence research and technology, as well as for planning and implementing joint projects in this area. The German Liaison Office provides onsite support for the preparation and negotiation, conclusion and continuation or amendment of the necessary agreements with the USA and Canada.

Technology monitoring
Technical events on the North American continent are again taking place in person with significantly increased attendance. Experts use these opportunities to discuss the military and technological challenges arising from current global political conditions. Outstanding topics include digitalisation, artificial intelligence, autonomy, drones, hypersonic technology, space, model-based approaches using open standards in capability planning, system development, production and use, interoperability and interchangeability. The ability to cooperate with partners and allies at all levels is becoming increasingly important.

STURM

STORM



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