

European Security & Defence

€9.90
D 14974 E



8/2023

International Security and Defence Journal

Defence Procurement in Germany



The Future **of European Land Systems is Here.**

MISSION SOLUTIONS

NEXT MAIN BATTLE TANKS

ARTILLERY

TRACKED ARMoured VEHICLES

WHEELED ARMoured VEHICLES

BRIDGES

ANTI-AIRCRAFT SYSTEMS

AMMUNITION

ROBOTICS

SERVICES & SUPPORT

TRAINING

SIMULATION

Contents

■ ES&D SPECIAL: BAAINBw

- 2 The Federal Office of Bundeswehr Equipment,
Information Technology and In-Service Support
- 4 Operational Management Staff
- 8 Digitalisation Staff (Digit)
- 10 Introducing the Industrial Psychology Staff
- 12 Legal Affairs Staff
- 13 Combat Directorate (K)
- 19 Land Support Directorate (U)
- 26 Air Directorate (L)
- 30 The Sea Directorate (S)
- 37 The Information Technology Directorate (I)
- 39 Directorate G – IT Support
- 43 Complex Services/Purchasing Directorate (E)
- 47 Directorate T – Common Technical,
Logistic and Economic Activities
- 52 Technical Quality Management Center (ZtQ)
- 54 Central Affairs Directorate (ZA)
- 56 The BAAINBw Agencies
- 67 German Liaison Office for Defence Materiel, USA/Canada

Index of Advertisers

Abeking & Rasmussen	33
DNV	35
DSA	11
Embraer	5
ESG	27
Eurosatory	17
FHF	21, 24-25
GDELS	43
Hagenuk	3
Kallmann	41
KNDS	2 nd cover
Koehler	3 rd cover , 51, 67
Lirotech	55
Litef	45
MTG	57
Nexter	4 th cover
ODU	49
Raytheon Elcan	15
Taurus	7
Vincorion	31
WB Group	9
Weibel	36

Masthead

European Security & Defence

Issue 8/2023, August 2023

ISSN 1617-7983 · www.euro-sd.com

Published by



Mittler Report Verlag GmbH

A company of the TAMM Media Group

Office Address:

Mittler Report Verlag GmbH

Beethovenallee 21, 53173 Bonn, Germany

Phone.: +49 228 35 00 870, Fax: +49 228 35 00 871

info@mittler-report.de, www.mittler-report.de

Managing Director: Peter Tamm

Editorial Team

Publisher and Editor-at-Large: Stephen Barnard (sb)

Editor-in-Chief: Mark Cazalet (mc)

News Editor: Peter Felstead (pf)

Editorial Staff: Waldemar Geiger (wg, Infantry, Industry), Wolfgang Gelpke (wge), Gerhard Heiming (gwh, News, Land Forces), Ole Henckel (oh), Rolf Hilmes (rh, Army Technology), Lars Hoffmann (lah), Hans-Uwe Mergener (hum, Naval Forces)

Copy Editor: Christian Kanig (ck)

Regional Correspondents

Belgium/EU/NATO: Joris Verbeurgt (jv), **Brazil:** Roberto Guimarães de Carvalho (rgc),

Denmark: J. Bo Leimand (jbl), **France:** David Saw (ds), **Georgia:** Beka Kiria (bk),

India: J C Menon (jcm) **Israel:** Tamir Eshel (te), **Italy:** Luca Peruzzi (lp),

Japan: Shinichi Kiyotani (sky), **The Netherlands:** Jaime Karremann (jk),

Poland: Grzegorz Sobczak (gs), **Portugal:** António Brás Monteiro (abm),

Spain: Esteban Villarejo (ev), **Taiwan, North & East Asia:** JD Kitsch (jdk),

Turkey: Korhan Özkilinc (kÖ), **UK:** Christopher Foss (cf), Tim Guest (tg),

Ukraine: Alex Horobets (ah) **USA:** Sidney Dean (sd), Chet Nagle (cn)

Layout:

AnKo MedienDesign GmbH, Germany

Production:

Lehmann Offsetdruck und Verlag GmbH, 22848 Norderstedt, Germany

Advertising, Marketing and Business Development

Achim Abele

Phone: +49 228 25900 347

a.abele@mittler-report.de

Stephen Barnard

Phone: +49 228 35 00 886, Mobile: +44 7984 033154

s.barnard@mittler-report.de

Stephen Elliott

Phone: +49 228 35 00 872, Mobile: +49 1590 173 0346

s.elliott@mittler-report.de

Exhibition Management and Advertising Administration: Renate Hermanns

Advertising Accounting: Florian Bahr

Subscription/Reader Service:

PressUp GmbH, PO Box 70 13 11,

22013 Hamburg, Germany

Phone: +49 40 38 66 66-319, Fax: +49 40 386666-299

Email: mittler-report@pressup.de

European Security & Defence, ©2023 Mittler Report Verlag GmbH

All rights reserved. No part of this publication may be reproduced without prior written permission of the publisher in Bonn.

Cover Photo: ESD archives

Annual subscription rate: €113.00 incl. postage

Reduced annual subscription rate for distribution in Germany:

€95.00 incl. postage

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

The Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support – or BAAINBw for short – is a higher federal authority within the sphere of the Ministry of Defence. BAAINBw has its official seat in Koblenz, Germany.

BAAINBw had its tenth anniversary in 2022. The BAAINBw was founded on 1 October 2012. It evolved from the former Federal Office of Defence Technology and Procurement (BWB) and the former Federal Office of Information Management and Information Technology of the Bundeswehr (IT-Amt Bw). The starting point for the establishment of the new office was the reorganisation of the Bundeswehr that began in 2011. On 1 January 2013, material responsibility for operational readiness was taken over by the military organisational units. This includes all measures for maintaining and restoring operational readiness during the in-service phase.

In order to incorporate aspects and experiences from deployment and in-service use more efficiently into the development and procurement of military equipment, the new structures were to be mixed civil-military. Therefore, in addition to civilian employees with armament expertise, experienced soldiers are also on duty at BAAINBw.

This cooperation promotes a common understanding among Bundeswehr service personnel of their day-to-day work and common mission. Different approaches, experiences and views had to be identified and respected. This hitherto unusual situation has been mastered very well together, and there is now a culture of positive appreciation in the BAAINBw and its branches. Colleagues work alongside their comrades in close cooperation to achieve the common goal of equipping the Bundeswehr in the best possible way.

The BAAINBw is responsible for meeting the material requirements of the armed forces and for utilisation management to maintain the operational readiness of material introduced into the Bundeswehr. In order to fulfil its mission, the Office has outstanding technical expertise at its dis-

Photo: BAAINBw



BAAINBw – Raunatal premises

posal, which is divided into ten branches. In addition, the performance of tasks is supported by staffs located close to the command. If necessary, additional temporary working groups can be set up to deal with special tasks.

The subordinate area of the BAAINBw consists of six Defence Technology and two Defence Science Offices, the Naval Arsenal and the German Liaison Office of the Armaments Division USA/Canada.

Partner of the Armed Forces

BAAINBw and its subordinate agencies assist the Armed Forces as reliable partners.

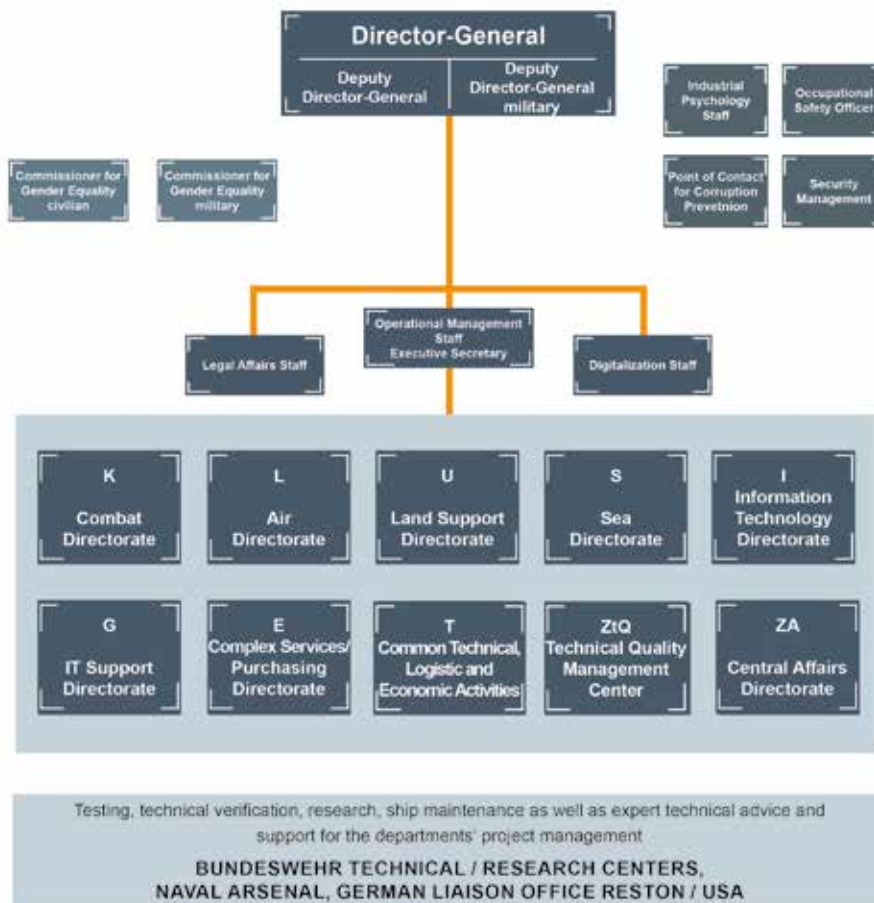
BAAINBw's core task is to ensure that the Bundeswehr is supplied, at economic conditions, with state-of-the-art technology, efficient and safe equipment as well as defence-related services, in line with what the armed forces need and request. This also includes information technology. We focus on the development, testing, procurement and in-service support management of materiel. Although in some cases commercially available equipment may be used, it is often necessary to initiate a specific advancement

or new development of military materiel. BAAINBw handles a broad range of products, including highly complex weapon and IT systems, tanks, aircraft, vessels as well as clothing for service personnel.

Responsibility for the Entire Life Cycle

BAAINBw bases its procurement and in-service management on three main pillars:

- providing materiel solutions and services in accordance with the Customer Product Management (CPM) procedure;
 - satisfying Bundeswehr non-project needs through Bundeswehr purchasing;
 - procuring and using complex services.
- These three procurement alternatives differ in their suitability for various procurement items, but they also differ in terms of procedures and requirements. The CPM procurement procedure deals with and supports products and services throughout their entire life cycle in a holistic way. Apart from fulfilling all tasks related to the procurement system, this integrated approach to the entire procure-



ment and in-service process also requires taking over materiel responsibility for operational viability. Thus, these comprehensive tasks, starting with the analysis phase and covering the entire in-service management of the materiel of all military organisational areas until its disposal, are covered by one agency.

The Bundeswehr Purchasing Department procures both commercially available and Bundeswehr-specific material goods, services and rights, in particular spare and replacement parts to maintain service operations and to ensure operational readiness. The focus here is on a large number of different individual products, which are combined into purchasing segments (based on commodity groups).

The focus of complex services (KDL) is the procurement of a comprehensive solution. This involves the provision of products and related services by or with a private partner. Complex services generally require long-term contractual relationships. Public-private partnerships are particularly taken into account in this field. In addition, in-house companies can also be taken into consideration.

Integrated Communication Systems by Hagenuk Marinekommunikation

SUCCESSFUL NAVAL SECURITY CONCEPTS REQUIRE FAST AND RELIABLE COMMUNICATION



ERX 3003 - HF SDR with 24 kHz Wideband Capability

When it comes to communication onboard of their sea-going vessels, for almost 50 years the German Navy trusts in state-of-the-

art HF technology and highly integrated system solutions from Hagenuk Marinekommunikation GmbH.

Hagenuk Marinekommunikation GmbH

Hamburger Chaussee 25 | 24220 Flintbek | Germany

Phone: +49 4347 714-101 | Fax +49 4347 714-110

info@hmk.atlas-elektronik.com | www.hmk.atlas-elektronik.com

Hagenuk Marinekommunikation
A company of the ATLAS ELEKTRONIK Group

Operational Management Staff

The Operational Management Staff comprises four divisions plus the AIN Press and Information Centre (PIZ AIN). It is headed by an Executive Secretary and structured as follows for its various tasks:

Division OS1

Division OS1 is in charge of the central task management at BAAINBw and of the coordination of all tasks related to parliamentary/cabinet affairs. OS1 is also the control office for German Audit Office affairs and serves as POC for all internal auditing affairs.

The contributions to federal government and parliamentary inquiries (e.g. major and minor interpellations, petitions (regular and political), correspondence with the Parliamentary Commissioner for the Armed Forces) are handled and coordinated here in cooperation with the respective competent elements within BAAINBw and its area of responsibility. Division OS1 also prepares the contents and the execution of visits by members of the German Bundestag and the parliaments of the Länder to BAAINBw and its agencies. This division furthermore compiles all pertinent information and documents (agendas, committee publications, etc.) needed by the BAAINBw Executive Group to prepare for its participation in Defence and Budget Committee meetings. The division also performs a coordinating function for part 1 of the bi-annual armaments report to parliament.

In addition, OS1 coordinates all audit matters of the German Supreme Audit Institution (Bundesrechnungshof) that fall in the area of responsibility of BAAINBw and also all internal auditing matters. In particular, OS1 assumes lead responsibility for preparing BAAINBw's comments on the individual audit reports.

Division OS2

Division OS2 coordinates the cooperation with the FMOD planning organisation, particularly with the Bundeswehr Office for Defence Planning, develops analyses as decision-making aids, and is the central authority in regard to the portfolio management relating to projects, products and services.

In accordance with the central performance process called "Executing Integrated Planning", the Bundeswehr Office for Defence Planning draws up the capability situation of the Bundeswehr

to identify capability gaps on this basis. If these gaps are planned to be closed by means of material solutions or defence-related services, Division OS2 will start the work on initiatives, making use of the technological and economic assessment competence of BAAINBw. This will include coordination of the activities of the respective BAAINBw representatives in the Analysis Phase Part I of the CPM process. Division OS2 thus supports the Bundeswehr Office for Defence Planning right from the beginning of the procurement process in determining the key data of a project and in integrating these data into the decision-making process as a fundamental contribution to portfolio management in the Bundeswehr.

In the framework of portfolio management, OS2 provides a continuous survey of the status of current and already scheduled projects, products and services including their interfaces and interdependencies. For this purpose, the division analyses information on projects, products and services from all directorates and compiles them into situation pictures. Depending on the objective and concrete problem, a relevant selection of projects, products and services is made available in a sub-portfolio. This sub-portfolio is analysed in order to propose alternative courses of action, which are then harmonised with the Bundeswehr Office for Defence Planning and/or other organisational entities or requesting entities involved, before they are implemented on the basis of the decisions that may have to be taken.

This task package is complemented by specific and focused project monitoring activities as far as the contributions to NRF 2022-2024 are concerned in order to ensure a consistent synchronisation of the procedural steps regarding planning, operations, satisfaction of demands and budgeting so as to be able to meet the VJTF's procurement needs in due time. Working in close cooperation with the BAAINBw project directors, OS2 is continuously monitoring the respective status of all projects and products relevant to VJTF, subjecting them to an economic and technical 'reality check', introducing them to the VJTF capability development

bodies in a proactive and prompt manner, providing recommendations for action.

Division OS3

Division OS3 is responsible for central controlling as interdepartmental and interagency controlling in the BAAINBw as well as for strategic development in the AIN organisational area.

As the central controlling unit, OS3 supports BAAINBw management in controlling complex tasks and projects as well as in the goal-oriented strategic control of the BAAINBw and its subordinate agencies. Due to the relevance of risks for controlling, OS3 is also the central staff unit for risk management in the BAAINBw.

The tasks are performed in a dimension-specific approach for the dimensions land, air and sea and include in particular:

- Monitoring and evaluation of projects and measures for the BAAINBw management and development of recommendations for action;
- Comprehensive risk management and controlling as well as consideration of systemic risk causes;
- BAAINBw-internal coordination of preparatory circles as well as order follow-up;
- Support in agreeing on objectives to support strategic control;
- Further development of controlling and risk management in the BAAINBw and subordinate agencies.

In an advisory capacity, OS3 also ensures the uniform application of controlling and risk management methods in all departments and offices.

The task of the central control element for strategic further development is to initiate and support outstanding measures for the further development of the AIN organisational unit on the basis of development goals agreed with the BAAINBw management.

The following objectives are the main focus:

- Faster and simpler provision of the required equipment for the Bundeswehr by optimising existing procedures and structures;
- Focusing on project management as a core task/competence of the BAAINBw;

KC-390 MILLENNIUM

MISSION ACCOMPLISHED

**AFTER AN EXTENSIVE TEST CAMPAIGN
THE KC-390 MILLENNIUM IS CERTIFIED
FOR FULL OPERATIONS.**

From the outset, the KC-390 Millennium was designed to set a new benchmark in the medium-size military transporter segment. Developed with support from the Brazilian Air Force (FAB) and Brazilian Government, the largest and most complex aircraft ever built in the southern hemisphere has gone through a rigorous and challenging testing program, including 3,500 prototype flight test hours and close to 85,000 hours of lab tests. In March 2023, it received the coveted Full Operational Capability certification from the Brazilian Military Certification Authority (IFI – Institute of Industrial Development and Coordination), with the platform meeting or exceeding all requirements. This seal of approval, which is extremely difficult to attain, confirms the KC-390 Millennium is ready for full operational duties in all missions and showcases to the world its class-leading reliability, flexibility and performance.

#C390UnbeatableCombination
embraerds.com



CHALLENGE.
CREATE.
OUTPERFORM.





Customer Product Management

- CPM policy matters
- CPM decision-making element
- CPM performance process manager
- Preparation and maintenance of CPM performance processes



Center of Expertise for Project Management

- Fundamentals
- Advice
- Training
- BAAINBw knowledge management

Graphic: BAAINBw

Tasks of the Center of Expertise for Project Management

- Orientation towards new requirements, including those arising from the further development of the armed forces, control processes and developments at the European level.

Within the framework of the current Be-We task force, the procurement system and in particular the various processes in the procurement channels are being further developed. This means that the main input from the BAAINBw is the technical responsibility of the OS4 group.

the main tasks within the scope of the direct cooperation with journalists and media representatives. Answering citizens' inquiries and coordinating the cooperation with Defence-related publishing houses, are also central tasks of the AIN organisational element, such as organising Bundeswehr participation in public relations events. For major events such as the 'Bundeswehr Day' as well as for regional events, trade fairs or exhibitions, the AIN Press and Information Center organises the involvement of BAAINBw or the agencies of the major organisational element.

In addition, the AIN Press and Information Center is responsible for the 'equipment' section on the Bundeswehr internet site, makes contributions to all social media channels of the Bundeswehr and manages its own Twitter account as part of active information work.

By maintaining a comprehensive own intranet presence of BAAINBw and by supporting and implementing a variety of measures, the AIN Press and Information Center takes its responsibility for internal communication and its further development seriously. ■

Division OS4

Division OS4 is the central point of contact regarding Customer Product Management (CPM) and project management at BAAINBw. The division develops procedural regulations for the implementation of the CPM requirements at BAAINBw and, as part of the CPM decision-making element, takes final decisions on project-specific deviations from the CPM procedure. Regarding the output process called "Provision of Material Solutions in accordance with CPM", OS4 is responsible for modelling this process and for developing it further.

In its role as the Center of Expertise for Project Management, OS4 defines the project management standard at BAAINBw and provides standardised tools. The Center of Expertise for Project Management provides advice to the project team members on the use of these tools and supports the projects through comprehensive knowledge management. OS4 develops the initial and advanced training in the area of project management further on a continuous basis. Part of the training is carried out by this division itself.

AIN Press and Information Center

The AIN Press and Information Center is part of the Operational Management Staff and is responsible for all internal and external communication of the AIN major organisational element. It cooperates directly with the Federal Ministry of Defence Press and Information Office.

The management and coordination of press, public relations and media work for BAAINBw as well as for the ten agencies subordinate to it are core tasks of the AIN Press and Information Center. It is the first point of contact for the entire major organisational element regarding questions by the public, media representatives and citizens. Furthermore, the centre is responsible for the involvement of BAAINBw and its agencies in trade fairs and events enhancing the public image as well as for the production of multimedia information material.

Within the broad spectrum of tasks, press releases and information on events, press kits or the preparation of ministerial trips, reports and interviews belong to

Download of the BAAINBw Directorates' organizational charts at:

<https://www.bundeswehr.de/en/organization/equipment/downloads>



TAURUS KEPD 350

PERFORMANCE MATTERS!



F-15



JAS 39 GRIPEN



TORNADO



EF TYPHOON



F-18



Digitalisation Staff (Digit)

BAAINBw uses agile migration strategy as part of SAP implementation

In September 2022, the Digitisation Staff of the AIN organisational unit successfully carried out the mass rollout of Bundeswehr groupware (GwBw) with its Outlook/Sharepoint components.

In this context, extensive expertise in the digital possibilities for supporting collaborative working has been built up. This expertise also facilitates new approaches for the introduction of IT services, for example in the rollout of SAP solution components in the organisational area of AIN. Thus, an agile rollout procedure in the area rollout IT-U CPM, in particular through digitally supported, collaborative working methods in the context of production preparation measures such as data preparation or planning/controlling initial training, was able to reduce the rollout time by half from 5 to 2.5 years.

With the project 'IT Support for Customer Product Management' (IT-U CPM), various obsolete systems in use at the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) are to be replaced by the SAP Portfolio and Project Management (SAP PPM) module for the IT support of project management and the management of armament projects.

The goal is a modern and future-proof tool for continuous, integrated and efficient programme and project management within the SAP solution Bundeswehr (Standard Application Software Product Families - SASPF), taking into account the new equipment and utilisation process (Customer Product Management - CPM 2018).

The introduction of the SASPF solution IT-U CPM in the BAAINBw represents a major challenge. More than 600 armament projects with over 20,000 contracts, ranging from the purchase of combat boots to the complex development and procurement of an aircraft, have to be transferred from the existing data processing procedures to SASPF.

Initial plans envisaged a stringent migration scenario built up in waves and stages. Over a period of five years, the projects were to be migrated within a fixed schedule for data preparation and migration.

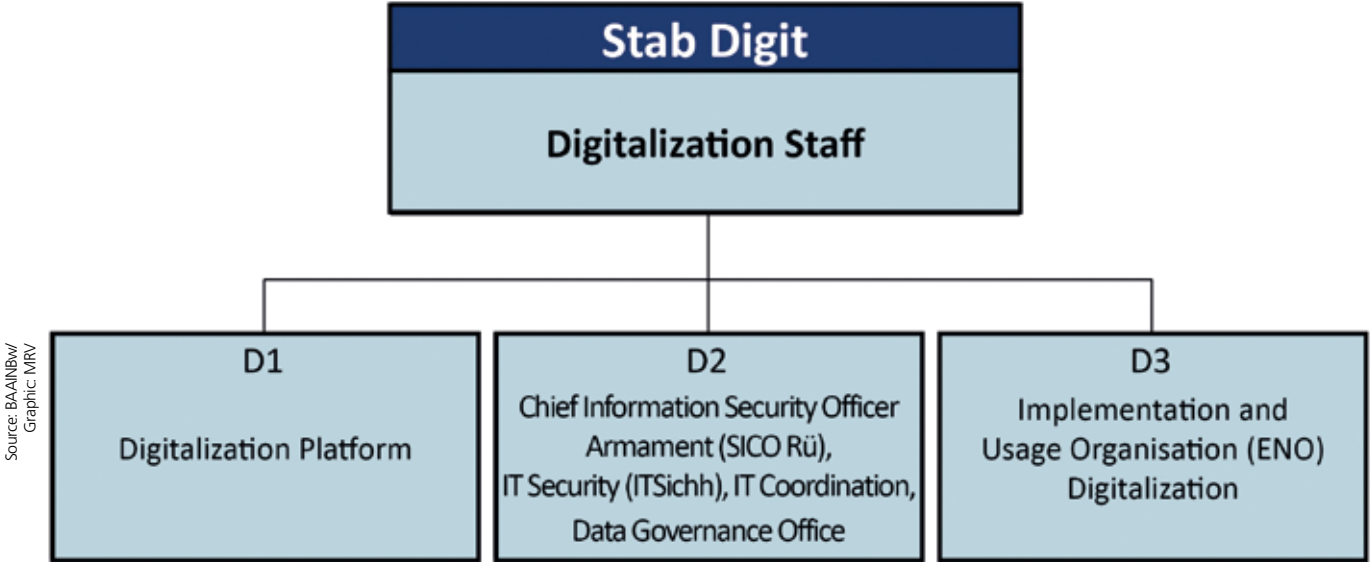
A validation carried out by the Digitisation Staff of the BAAINBw within the framework of pilot migrations led to a rethink in the rollout procedure - away from a fixed scheduling of individual projects and towards an agile form of data preparation and migration scheduling. As a result, it will be possible to halve the rollout period from 5 to 2.5 years. With the acceleration of the rollout, the constantly growing technical operating risks of the old procedures to be replaced can be sustainably eliminated.

The basis for the agile rollout procedure is the development of a rollout control database. This provides all actors involved in the process with access to the migration-relevant data of the respective projects. In particular, the progress of data

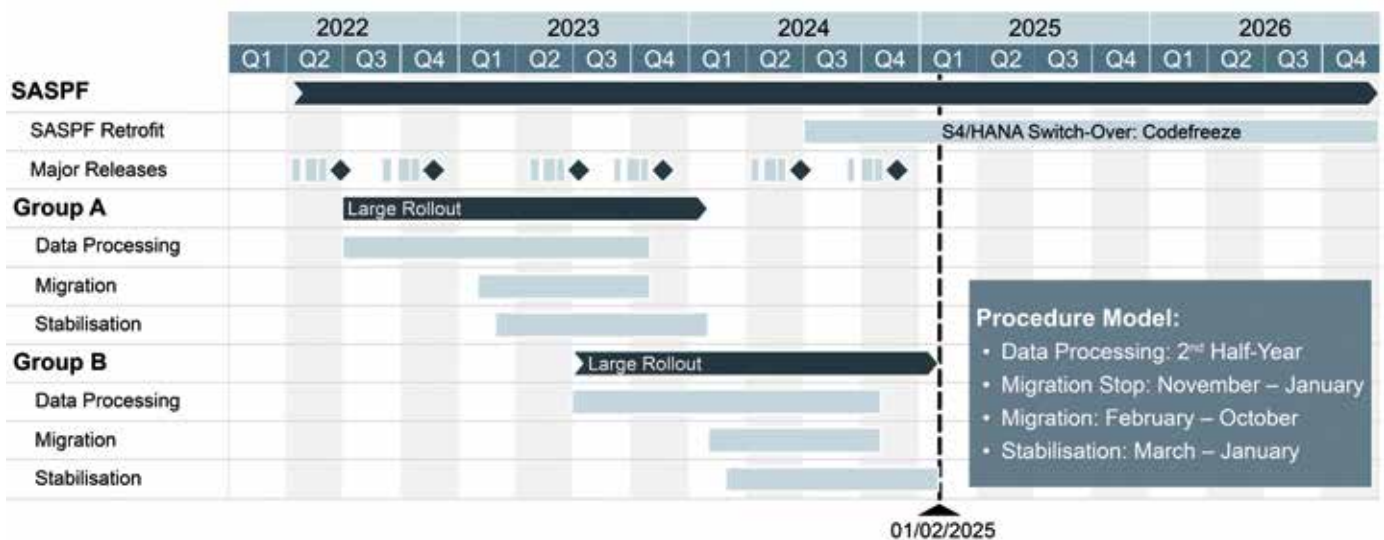
preparation can be documented in the rollout control database. This enables the 'central migration team', which has overall responsibility for the rollout of the SAP solution IT-U CPM, to monitor and check this progress, and to intervene where necessary.

Based on the documented data preparation progress of the projects, these can - after the status 'migration ready' has been reached - be quickly scheduled for systemic migration in corresponding migration time slots.

The change from a pre-planned rigid to an agile rollout approach has resulted in significant changes to the originally planned process. Instead of eight successive rollout waves, the more than 600 projects are now divided into just two groups. Instead of starting data preparation wave by wave and stage by stage, all projects in each group now have a common start date for data preparation. The responsibility for the timely completion of the preparatory measures is thus largely shifted to the project level. The agile approach can optimally take into account the different efforts as well as the different qualitative starting positions of the projects to be transferred. However, a decisive success factor of the agile rollout procedure lies in the intensive monitoring by representatives of the 'central migra-



Source: BAAINBw/
Graphic MRV

Source: BAAINBw/
Graphic: mawibo media

Rollout IT-U CPM: Rollout IT-U CPM: Illustration of the agile approach to migration

tion team' as part of the data preparation using the rollout control database. Another major challenge in the rollout of the SAP solution IT-U CPM is the qualification of the users. The complexity of the rollout is particularly evident here, as a total of approximately 3,000 employees from the project departments of the BAAINBw have to be trained in the use of the new SAP module PPM.

Therefore, an agile and IT-supported approach was also implemented for the management of initial training. On the one hand, this allows for a targeted prioritisation of the success-relevant target group 'multipliers'. On the other hand, the qualification of the users can be achieved within the framework of the agile, IT-supported training management according to need, close in time to the productive

implementation of their projects, through prioritised allocation of corresponding booking time slots.

The agile rollout approach within the framework of SAP introduction is being applied for the first time at the BAAIN-Bw. We are confident that the flexible strategy will prove beneficial and that the acceleration of the rollout can be achieved.

We set standard with **FONET**
now watch what we do with
FONET Mk2



Designed to support command, control, communications, computers, cyber-defense, and combat systems integrations.



Complete system integration on a wide range of platforms.



Scalable and modular to support C2 framework system deployment from small units to battalion level and higher.

WB GROUP

FONET Mk2 - Tactical Vehicle Integration Platform

Introducing the Industrial Psychology Staff

Background of the Institution

Never has the workplace been subject to faster change than nowadays: Digitalization, structural changes, and demographic changes repeatedly pose new challenges.

Working models are ever changing, the boundaries between work and private life are becoming more and more blurred, learning requirements are increasing, and flexibility is taken for granted.

Work can become a burden due to factors such as demography, psychological stress, inadequate leadership styles, requirements on mobility or a lack of work-life-balance; this also applies to employees of the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw). And all these aspects mentioned above have an influence on well-being and health. Psychological disorders and costs associated with them are on the rise. Leadership styles have a significant influence on the extent and quality of psychosocial stress, strains and resources. It is therefore the responsibility of executive personnel to pay attention to their staff as part of their duty of care. The medium- and long-term

efficiency of organizations can only be maintained on the basis of the physical and mental wellbeing of its individuals. If individuals are absent from work due to health issues, this does not only result in a deficit of working hours, but also in an increase of costs. Additionally, stressed employees are proven to make more mistakes and often to be less productive. On top of everything else, they are more prone to other diseases. With the establishment of the Industrial Psychology Staff as part of the AIN organizational area, BAAINBw reacts to the social change and creates a central point of contact for executive personnel at all levels of command and for all employees regarding topics and questions of psychological relevance.

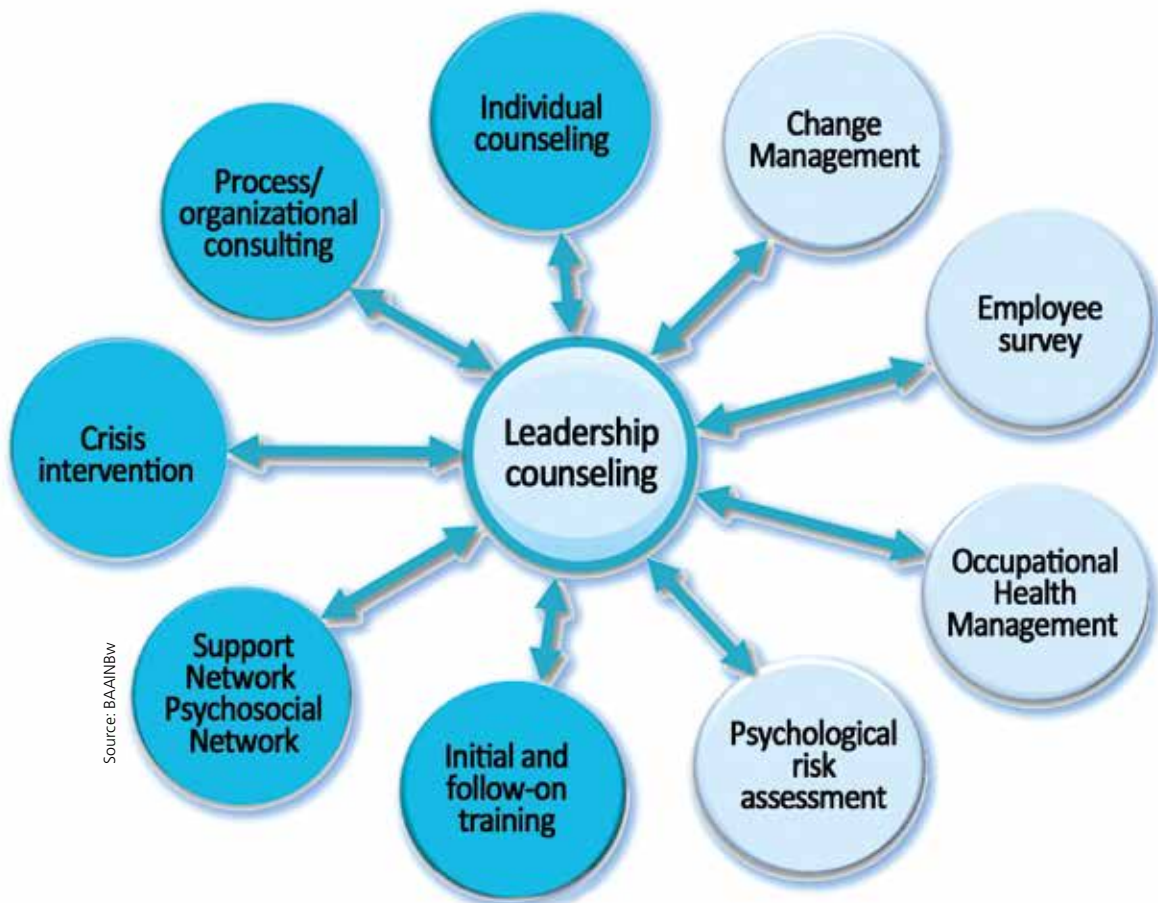
Industrial psychology as an organizational element was initially established in the line organization and has been directly assigned to the BAAINBw executive group as a staff unit since March 2020. The Industrial Psychology Staff consists of a team of psychologists supported by civilian and military personnel trained in the field of psychology. The establishment of the Industrial Psychology Staff offers unique services to civilian and military personnel. The unique feature

of this offer is that it is not only aimed at military personnel – like military psychology – but is available to all employees. Additionally, former employees, reserve duty personnel as well as family members and surviving dependents also have access to the services offered by the Industrial Psychology Staff.

Working Methods and Service Offers

The Occupational Safety and Health Act establishes the employer's obligation to take care of the health of its employees.

In essence, human health can be divided into the categories of physical health and mental health. There have been – and still are – programs regarding the physical health of employees, for example in the field of occupational safety or occupational health management (Betriebliches Gesundheitsmanagement, BGM), while there have been no comprehensive programs or comprehensive support regarding the mental health of employees. The Industrial Psychology Staff has been established in order to offer services in this context for all BAAINBw and AIN organizational area employees.



Among other tasks, the services include individual counselling, leadership counselling and psychological crisis intervention as well as advice on all topics and issues of psychological relevance.

To this end, the Industrial Psychology Staff offers assistance in the event of strains and burdens at work and in private life by conducting personal talks with the aim to relieve stress and offer advice. The assistance offered by the staff includes, among other things:

- Prevention of stress and support in stress management,
- Development of resources for improving resilience,
- Advice on burnout/‘bore-out’,
- Advice on bullying,
- Advice on (stress-related) mental and psychosomatic as well as physical disorders,
- Addiction counselling,
- Counselling in acute life crises (e.g. in case of family problems),
- Establishment of contact within the Psychosocial Network (PSN) and with external psychotherapists.

Additionally, (prospective) executive personnel are offered advice tailored to their individual needs. Coaching on their person-

al development is also part of the services offered by the Industrial Psychology Staff.

This includes advising and supporting superiors at all levels of command in a solution-oriented and proactive manner on all topics and issues of psychological relevance. In detail, this may include support in the following areas:

- in decision-making,
- in the development of their leadership capability,
- in the resolution of conflicts in their team,
- in the implementation of team-building measures,
- in their personal development.

In addition, the Industrial Psychology Staff is expected to offer expert advice. In this context, it provides psychological expertise regarding – among other things – employee surveys, in-company training and follow-on training, change management processes, risk assessments regarding psychological stress, and occupational health management (BGM).

In summary, the Industrial Psychology Staff offers the following services, among others:

- Performing:
 - Leadership counselling / coaching, –
 - Individual counselling,

– Process and organizational consulting,

– Psychological crisis intervention,

• Participating in:

– Psychosocial Network (PSN),

– In-house training support,

– Change management,

– Employee surveys,

– Risk assessment of psychological stress,

• Supporting the Occupational Health Management (BGM),

• Establishing the Support Network (“Netzwerk der Hilfe”) in BAAINBw.

It should be noted that consultations with psychologists and their contents are strictly confidential. As with physicians, the contents of the consultations are subject to legal confidentiality in accordance with Section 203 of the German Criminal Code (Strafgesetzbuch). This is an important aspect because these conversations must be regarded as a safe space in order to establish a trusting atmosphere and develop targeted solution strategies. Those seeking advice can be sure that their concerns will be treated with the utmost confidentiality. ■



NATSEC
ASIA 2024
THE 18th INTERNATIONAL EXHIBITION ON NATIONAL SECURITY FOR ASIA

6-9 MAY 2024
MITEC, KUALA LUMPUR



**BUILDING
RESILIENT NATIONS
FOR THE NEXT
GENERATION**



scan QR code
to know more

Email: enquiry@dsaexhibition.com
www.dsaexhibition.com

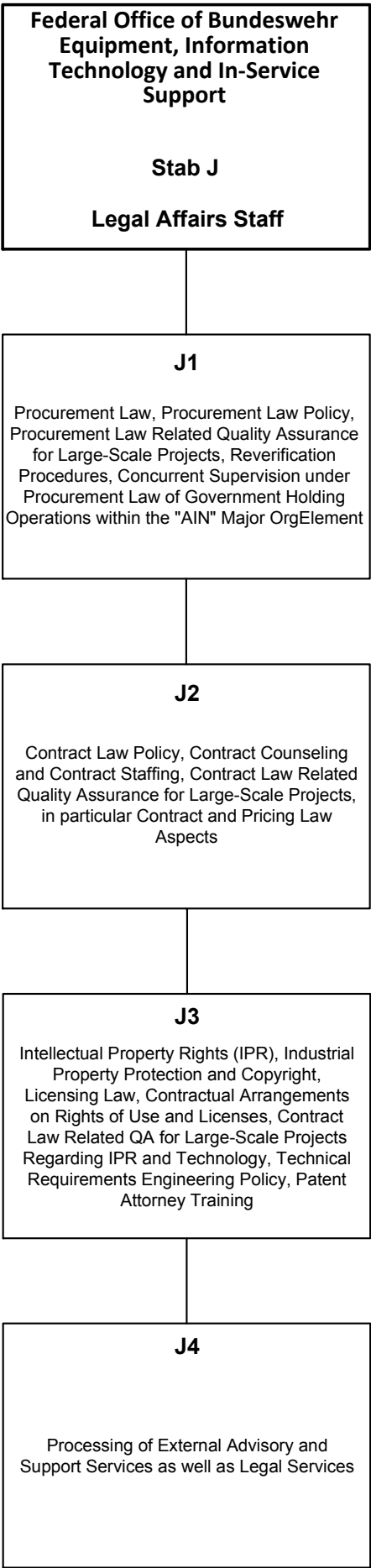


Legal Affairs Staff

The Legal Affairs Staff, a staff element within the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw), is in charge of quality assurance for contract award documents of major projects and also plays an essential role in the continuous modernisation of contract management as part of the Bundeswehr procurement system.

It is subdivided into the Branches J1 (procurement law), J2 (contract law policy), J3 (intellectual property rights, statement of work policy), and J4 (acquisition of external advisory and support services as well as substitution and legal services). Branch J1 is responsible for all general matters regarding procurement law. In particular, this includes advice on all procurement law matters for the project directorates and the BAAINBw executive group, the processing of internal work instructions, the review of individual decisions in the procurement process as well as the representation of the Office before the procurement review bodies. Branch J2 is responsible for contract law policy matters. Besides contract review and contract counselling for the individual contract branches of the Office's directorates in the field of civil law, J2's policy development work especially involves the continuous updating of model contracts for contracts with an estimated contract value of less than EUR 25 M. Branch J3 is responsible for the area of Intellectual Property Rights (IPR). In this context, the Branch provides advice in particular on issues relating to licensing rights. Regulations on rights of use, in particular with regard to technical documentation, software or industrial property rights, in BAAINBw contracts are specified by J3. Furthermore, it is responsible for conducting the proceedings before the competent intellectual property authorities with regard to the notification of federal industrial property rights. The Branch's responsibilities include, in addition to the protection of federal technical know-how, the evaluation of third-party industrial property rights in cases where such rights influence the awarding process. Moreover, J3 is responsible for principles regarding the preparation of statements of work. Branch J4 deals with the procurement of external advisory and support services as well as substitution and legal services. In addition, as a contract management authority, the Branch supervises all existing contracts in this category (contract administration, invoice processing) and coordinates necessary

measures, for instance if performance problems occur after contract conclusion. J4 is also responsible for reviewing requests under framework agreements of other ministries in the field of information and communication technology. One of the main tasks of the Legal Affairs Staff and its individual branches, which work in close cooperation with each other, is to perform quality assurance in their respective areas of expertise for projects with an estimated contract value of more than 25 million euros (gross) ("major projects"). This task begins as early as with the decision on the contract award procedure and ends with the finalised contract. The Legal Affairs Staff closely accompanies the various stages of this entire process, such as contract preparation, invitation to tender, contract negotiation and contract conclusion. Further, it supports the project legal advisors in their tasks and advises the project managers on the preparation of the statement of work as the centrepiece of the contract award documents. At the moment, Staff J is focusing in particular on the quality assurance of contracts in connection with the Special Fund. The Legal Affairs Staff is not only responsible for quality assurance of contract documents but also for other tasks, especially with regard to general contracting policy matters. In this context, the Legal Affairs Staff's main task is to continuously modernise contract management within BAAINBw. An efficient procurement process must be able to guarantee timely availability of defence materiel and comply with all the quality requirements applicable to military equipment at economic conditions. Contract restructuring is therefore required to ensure adequate risk distribution and promote autonomous implementation by industry. In addition to handling issues of digitalisation and simplification in contract processing, the Legal Affairs Staff deals with instruments of innovative procurement, such as Performance-Based Contracting (PBC). The main goal, in particular, is to improve availability, thereby promoting materiel readiness.



Combat Directorate (K)

The main task of the BAAINBw Combat Directorate (K) is the armaments and in-service support management for the following weapon systems and the associated components. Directorate K is responsible for main battle tanks and armoured transport vehicles as well as various armament, air defence and artillery system projects. The Combat Directorate's task spectrum also comprises infantry and engineer systems.

Four project divisions comprise the expertise of BAAINBw in the following areas:

- ground-based air defence / Territorial anti-missile defence (K3),
- Guided missiles for ships and aircraft, air-dropped ammunition, anti-tank defence (K4),
- Armoured combat and transport systems (K5) as well as
- Barrel weapons, ammunition and ordnance/ordnance disposal (K6),
- Two sub-units within K1 are responsible for Fuzes and force joint tactical fire support

the departmental controlling (KAC) are supporting the departmental management.

The Division Staff performs central organisational and administrative tasks for the Division concerning personnel, training and continuing education, infrastructure and organisation.

To support the management of the department, departmental controlling determines and analyses essential project and performance data to prepare management decisions. Key tasks are strategic controlling, project, budget and resource controlling.

The department is supported by the Economy/Technology Group (K1) in all

ordination of the Armed Forces Joint Tactical Fire Support/Joint Fire Support (STF/JSF) as well as the implementation of projects of selected coordination elements STF.

The competencies of contract processing and contract award management for the Combat Division are bundled in the five units of the Economy/Legal Group (K2). Contracts for the respective projects from the division's area of responsibility are processed there. This also includes contracts for the utilisation phase of defence material. In addition, the contract units support the projects in concluding national and international agreements. Furthermore, questions of public price law and price negotiations are dealt with.

Group K3 'Ground-based Air Defence/Territorial Missile Defence' was reorganised with effect from 1 June 2021.

Unit K3.1 'Ground/Air Long Range PATRIOT, GefStd FlaRak' manages the projects Ground/Air Long Range PATRIOT, Command Post FlaRak Surface to Air Missile Operation Centre (SAMOC), Polygone, Simulation Facilities FlaRak, as well as the project Satellite-Based Missile Detection (SBMD).

The air defence missile command post SAMOC is capable of connecting and guiding national ground-based air defence forces, flying and seaborne units as well as platforms of allies and partners for multinational cooperation and of displaying the knowledge gained in real time.

The weapon systems ground/air, short-range MANTIS NBS C-RAM and the Light Air Defence System (LeFlaSys) as well as the cross-sectionally used missile Stinger are located as utilisation projects in Unit K3.2. To be able to counter small drones (UAS Class 1), a special C-UAS weapon system called ASUL has been procured and deployed for missions such as MINUSMA.

This is also where the short- and very short-range air defence system is being managed, which is to replace the LeFlaSys and MANTIS weapon systems in the medium term. Furthermore, defence against small drones (C-UAS Class 1) is concerned with the protection of domestic Bundeswehr properties as well as deployed forces and mission-relat-



Photo: Bundeswehr/Stefan Petersen

Various armaments of the Eurofighter are under the project responsibility of the unit K4.1

The Economic and Technical Affairs (K1) and Economic and Legal Affairs (K2) Divisions support these four project divisions in performing their comprehensive tasks in the fields of project and in-service support management as well as research and technology.

In their comprehensive project and utilisation management as well as research and technology, these four groups are supported by the cross-sectional groups Business/Technology (K1) and Business/Legal (K2).

In addition, a departmental staff (KAS) and

cross-project technical-economic and in-service issues.

In particular, the following topics are dealt with: Utilisation and logistics, ammunition safety, general technical supervision of the Defence Technical Services (WTD 52 and 91), department-specific education and training, research and technology including bi- and multinational cooperation, systems engineering, fuse technology, master data maintenance and local implementation organisation SASPF, Interactive Electronic Technical Documentation (IETD), overall co-



The M3 amphibious bridge, due to be replaced in future by the 'Schnellschwimmbrücke 2' bridging system.

ed obligations, as is the project titled „Highly Precise and Scalable Effect against Agile/Low-Signature Targets in the Near and Close Range of Naval Floating System Carriers, HoWiSM“, which covers the development of a naval laser weapon.

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

The newly established project 'WaSys TerrFKAbw' is a ground-based weapon system to protect German territory against long-range ballistic missiles.

In the European Defence Funds (EDF) project European-Exo Atmospheric Interceptor (EATMI), K3.3 supports the concept selection by the EU Commission.

In addition, the project 'Integrated Battle Management System (IBMS)' will in future be processed as an in-service project in Unit K3.3.

Unit K3.4 is responsible for cross-sectional air defence tasks. This unit pools the expertise for cross-sectional equipment (e.g. vehicles, containers, power supply systems and installation kits), logistics, communication and information security as well as weapon system and ammunition security for air defence projects. Additionally, the unit handles the system components IRIS-T SLM and SLS for the SHORAD/VSHORAD project (NNbS). Group K4 deals mainly with sea- and air-launched missiles, air-launched munitions and anti-tank systems.

Unit K4.1 deals with anti-tank systems and air-launched munitions against targets on the ground, i.e. guided missiles and air-dropped munitions (guided and unguided bombs).

The main focus in the area of anti-tank missiles is the MELLs, which replaces the old MILAN and TOW systems. In future, it will be fired not only by infantry but al-

so by various land vehicles (e.g. Boxer). The precision and range of the anti-tank hand-held weapons will be significantly increased by Wirkmittel 90 mm and, in future, the Wirkmittel 1800+. The main tasks in the area of air/ground missiles are the 'capability preservation SEAD (Suppression of Enemy Air Defences)' which for the Tornado means introducing an improved version of the HARM in the form of the AGM-88E AARGM. Its seeker head technology can also be used in future on the TORNADO successor, the F-35A. The Eurofighter will soon receive a new capability with the 'Short-Range Propelled Effector' (Brimstone), and the German Heron TP is also to be armed. In addition, it is planned to enable the frigates' ship-board helicopters to engage sea targets with the 'sea target guided missile, light'. Current projects in the field of air-dropped munitions include the procurement of the GBU-54 (Guided Bomb Unit) as well as new bomb bodies for the GBU-48 in the Mk-83 TIP and Mk-83 IM variants, in order to increase the endurance and scalability of the introduced combat aircraft. In addition, a large number of introduced effectors from the K4.1 area of responsibility must be maintained and kept in use, e.g. the TAURUS, PARS 3 LR, HOT2 and HOT3 as well as a large number of anti-tank hand weapons.

Unit K4.2 deals with the ship-based missile systems RAM, NSSM, ESSM, SM-2, HARPOON, RBS15, NSM and Future NSM. Other activities deal with the active self-defence of submarines with guided missiles to be fired by the submarine. With this system, submerged submarines will for the first time be able to directly and actively repel attacks from the air.

For this purpose, the procurement of the long-range Naval Strike Missile (NSM Block 1A) to maintain or restore the sea target and

land target engagement capability by naval surface system carriers has already been commissioned in 2021 within the framework of the German-Norwegian armament cooperation. The new development of a Future Naval Strike Missile (FNSM) is also to be carried out jointly with Norway.

With regards to RAM, the development of the latest version (Block 2B) was completed in 2022 and the corresponding procurement contract was concluded.

Regarding ESSM, the international development of the latest version (ESSM Block 2) was successfully completed in 2021.

The ESSM Block 1 system will be integrated into the Type 123 frigates from 2023 onwards.

The RBS15 Mk3 DEU guided missile system armed on the K130 corvettes is a missile system for engaging sea and land targets and currently represents the main armament of the 130 class corvettes.

Unit K4.3 deals with air-to-air weaponry for airborne platforms. These include the short-range infrared-guided Sidewinder-AIM-9L with the LAU-7A launcher and IRIS-T. The more modern IRIS-T system has thrust vector control combined with aerodynamic tail control, which allows them to perform highly agile flight manoeuvres and achieve a high hit probability.

Medium-range guided missiles include the radar-guided AIM-120B AMRAAM and the Meteor, which is equipped with an air-breathing solid-propellant ramjet system. Meteor is a six-nation project with the UK as the lead nation.

The US-made Sidewinder and AMRAAM are being processed in cooperation with the US authorities and the NATO Support and Procurement Agency (NSPA).

The armament of the F-35, which is procured along with the airframe, is also dealt with in K4 across all units (with the exception of the airborne cannon). Here, the AIM-9X Sidewinder and AIM-120C AMRAAM are the weapons of choice for air-to-air armament. When it comes to air-to-ground effectors, the GBU-31 (1,000 kg class), GBU-54 (250 kg class) and GBU-53 (Small Diameter Bomb II) precision bombs and a long-range guided missile, the AGM-158B Joint Air to Surface Standoff Missile (JASSM) are available.

Group K5 „Armoured Combat and Transport Systems“ consists of six units.

Unit K5.1 Combat Tanks, Family Vehicles and Onboard Guns is divided into the project teams: Leopard 1-based vehicles - i.e. Dachs armoured engineer vehicle (PiPz), Biber armoured bridge-laying vehicle, Armoured Recovery Vehicle 2 on the one hand and the Leopard 2 project team on the other. At present, the following projects worth EUR 25 M are being prioritised:



ELCAN SPECTER® WEAPON SIGHTS

Two views. One of a kind.

Battle-proven. Rugged and reliable. NATO interchangeability. Switches instantly from long range to close up. The ELCAN Specter DR dual role weapon sight delivers a decisive advantage in the toughest environments.



[RTX.com/specter](https://www.rtx.com/specter)



October 2022: Operational test of the 127-mm Vulcano ammunition on the Frigate Rheinland-Pfalz

The introduction of the Kodiak armoured engineer vehicle 3, as the successor to the armoured engineer vehicle (PiPz) Dachs, the modernisation of the Leopard 2 MBTs to the Leopard 2 A7V standard, and the integration of a hard-kill active protection system in Leopard 2, which will then receive the variant designation 2 A7 A1.

Branch K5.2 deals with the Puma and Marder infantry fighting vehicles (IFVs). The Puma IFV and the 'enhanced future infantryman system' equipment, which is also part of the 'mechanised infantry system', have reached a decisive milestone on the way to full operational maturity through the successful implementation of the design status, which has been significantly improved with regard to VJTF 2023. On the basis of the contract concluded in mid-2021 for the retrofitting of the Puma, the progress achieved will be gradually implemented in the first lot of Pumas. At the same time, the operational readiness of the Puma has been significantly improved over the past two years. As part of the extension of the Marder IFV's service life, comprehensive measures were initiated to remove obsolescence. In addition, a digital command and control (C2) system will be installed in selected vehicles in order to ensure the operational capability for VJTF 2023 in a comprehensive manner. Branch K5.3 "Heavy Weapon Carriers/Armoured Transport Vehicles" deals with the BOXER multi-role armoured vehicle, the Fuchs armoured transport vehicle 1, its successor vehicle and the Heavy Weapon Carrier Infantry.

The main focus of the work conducted by Branch K5.4 is on dealing with the extensive in-service support tasks of the Fennek weapon system, which is currently operating also in Mali. In addition, the division is working on three other projects: a project to develop the service life extension meas-

ures of the Wiesel 1 fleet, the project „Air Mobile Weapon Carrier“ as a successor to the Wiesel 1 fleet and the project Successor System Collaborative All-Terrain-Vehicle (CATV) for BV 206 S and D.

The task spectrum of Branch K5.5 „Bridges and Crossing Equipment“ comprises bridges, ferries and light crossing equipment and also the systems which are closely linked to them in terms of functional dependencies, namely systems designed to improve the trafficability of soils. The main focus of the work is the fast-floating bridge 2, which is to replace the M3 amphibious rig and the folding girder bridge, the procurement of the second lot of the LEGUAN assault bridge as well as the successor system for the folding trackway.

Branch K5.6 deals with the outstanding topic of the successor to the conventional 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 2035 on. For this purpose, the Branch is set up as a combined project team (CPT), which has also included French staff.

All projects in Group K5 are involved in the Digitisation of Land-Based Operations (D-LBO) projects.

The range of tasks of Division K6 includes small, medium and large caliber guns of the Bundeswehr, including their corresponding ammunition, as well as explosive ordnance and explosive ordnance disposal systems.

Branch K6.1 is tasked with the PzH 2000 self-propelled howitzer, the MARS rocket launcher, the ARES artillery rocket system and mortars as the Army's indirect fire support weapons.

As the standard gun of the German artillery, the PzH 2000 self-propelled howitzer

has also been fielded in five other nations. With a comprehensive package for maintaining and expanding its capabilities, PzH 2000 is being prepared for in-service use in the next years. At the same time, work on the future systems of short, medium, long range indirect fire is underway.

Branch K6.2 is responsible for small-arms weapons and handguns, the appropriate ammunition, pyrotechnic ammunition, hand grenades and nonlethal weapons.

Hand-held weapons have developed into systems which, in addition to the actual weapon, also include target optics, laser light modules, night vision devices, shot counters, silencers, components for increasing precision, various magazines, transport containers and extensive maintenance and repair equipment. The most current project in the unit is the „System Sturmgewehr Bundeswehr“, a new standard rifle to replace the G36.

Branch K6.3 deals, among other things, with the projects

- heavy machine guns
- programmable 40 mm airburst ammunition for the grenade machine gun (GMG),
- programmable 30 mm airburst ammunition (PUMA AIFV),
- 30 mm ammunition with reduced range for training purposes,
- remote weapon stations (RWSs),
- 12.7, 27, 76 and 127 mm naval gunnery systems.

Improvised explosive devices (IEDs) pose an increasing threat to Bundeswehr soldiers deployed to areas of operation. Protection against this threat is a focal point of Unit K6.4.

The project TPz Fuchs KAI (Explosive Ordnance Reconnaissance and Identification) improves the capability to protect against mechanised explosive ordnance and IEDs, especially in roadside areas and on buildings and bridges.

Unit K6.5 is responsible for the procurement of large-calibre tank, artillery and mortar ammunition.

Currently, preparations are underway for the fielding of guided artillery ammunition in the Army and Navy. In the field of naval ammunition this will be ensured by the 127 mm VULCANO ammunition 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 capability of point target engagement within a range of up to 70 km, the VULCANO 155 mm GPS/SAL (semi active laser) is planned to be used from the Panzerhaubitze 2000 self-propelled howitzer. ■

A Further Insight



**Interview with Brigadier General Jürgen Schmidt,
Head of the Combat Directorate (K)**

ESD: The installation of a digital communication system in the operational systems is a particular challenge for your department. Do you see any opportunities to achieve such upgrades more quickly in the future and keep up with progress in digitisation?

Schmidt: A first significant step towards the digitisation of the Army's comm systems has already been successfully completed with the conversion of the Puma infantry fighting vehicle and the associated soldier equipment Infantrymen of the Future-Advanced System (IdZ-ES) for VJTF 2023. In addition to the modern digital radios, Software Defined Radios (SDR), the digital command and control systems were further improved to ensure

uninterrupted communication from the individual gunner up to the unit level. The future design of the Army's communication systems will be carried out within the framework of the D-LBO programme (Digitisation of Land-Based Operations). In a first step (D-LBO Basic), standardised armament sets will be integrated into the platforms in order to achieve a "digital initial capability" in a timely manner. Experience shows that a consistent standardisation of hardware and software interfaces is a key success factor in simplifying the installation of new communication systems. This not only allows for a quicker installation, but also reduces technical and economic risks.



EUROSATORY
PROTECT YOUR FUTURE

17·21 JUNE
2024

PARIS

THE GLOBAL EVENT FOR DEFENCE & SECURITY

1,750+
Exhibiting companies
from 62 countries

250+
Official delegations
from 150 countries
Decision makers from
governments and
supranational organisation

62,000+
International
trade visitors

**Book
your
stand**



ESD: On the agenda is a successor to the Fuchs armoured personnel carrier. Which solutions do you consider feasible? What is the time horizon for replacing legacy systems?

Schmidt: Initially, the next-gen Armoured Personnel Carrier project to replace the legacy Fuchs fleet was part of the special fund, but was taken off the list during the course of planning. Nevertheless, the project is of great importance to the armed forces because the legacy armoured personnel carrier with its different variants has many capabilities, but after more than 40 years of service it is clearly showing its age and needs to be replaced. Within the scope of the project, a versatile, flexible 6x6 armoured transport vehicle should be procured, which, in addition to personnel transport, should be equipped with armament kits to cover a wide range of capabilities, such as armoured reconnaissance, fire control, mortar, EW [Electronic Warfare] and a command and control radio system. At present, there is a demand for more than 800 vehicles with 20 different armament kits or vehicle variants. Due to these diverse requirements, the number of suitable products is rather limited. One possible solution that can be procured quickly is the market-ready vehicle of the Finnish defence company Patria, which is developed under the 'Common Armoured Vehicle System (CAVS)' programme and is already being equipped on an international cooperative basis by Finland, Latvia and Sweden. The MoD's Head of Department A signed a Statement of Intent to join the programme at Eurosatory on 14 June 2022.

ESD: Protection against airborne threats is a pressing issue. Where are we with the VSHORAD/SHORAD (NNbS) air defence projects?

Schmidt: In regard to SHORAD/VSHORAD, we are currently processing the bid of the ARGE NNbS (Rheinmetall Electronics GmbH, Hensoldt Sensors GmbH and Diehl Defence GmbH & Co. KG) for developing the air defence system for close- and short-range protection (LVS NNbS) sub-project (TP) 1 (initial capability) by the BAAINBw. The contract is scheduled for the second half of 2023. The complete weapon system is to be available in 2028, after successful qualification.

At the moment, the MoD is taking a decision on how to divide up the components of VSHORAD/SHORAD. It has been agreed between the Army and the Air Force that the SHORAD components will be assigned to the Air Force. The VSHORAD systems are to be operated by the Army in future. With the initial qualification, two squadrons for short-range protection (anti-aircraft missile squadrons "FlaRakStff") and two batteries for short-range protection (anti-aircraft missile battery "FlaRakBttr") will be delivered.

In addition, from 2024 onwards, there will be a mobile solution to address the capability gap in Counter - Unmanned Aircraft Systems (C-UAS). BAAINBw is currently preparing the proposed solutions. The C-UAS effector vehicles to be developed will be integrated into the FlaRakBttr and are to enter service from 2028 at the latest.

The IRIS-T SLM fast track programme is part of the EUR 100 Bn package and is to quickly close the capability gap in stationary short-range protection. Because components have already been successfully exported, this project can enter service with three fire units in the German Air Force as early as late 2025. The contract for this will be concluded before the parliamentary recess in 2023.

Qualified Air Defence (qFlgAbw): In the capability gap and functional requirement (FFF) LVS SHORAD/VSHORAD, sub-project 1b (TP1b) was additionally included in the supplementary commissioning of 29.09.2017, which is to address qualified air defence capabilities. The system for qFlgAbw to be procured in TP1b is not part of the LVS SHORAD/VSHORAD, but is assigned to the respective army units as an organic component.

Due to ongoing global resource shortages and supply chain disruptions, it has not yet been possible to deliver the weapon station for integration into the Boxer mission module.

Additional challenges regarding the finalisation of the construction status of the weapon stations have led to delays and consequently to a postponement of the delivery of the weapon stations including the radars by Kongsberg. We will immediately begin integrating the functionality into the Boxer vehicles provided by KMW as soon as the components are delivered. The qualification of the weapon station will take place during the verification of the overall system with the first series-production vehicle.

As a result, the authorisation for use (GeNu) and roll-out to the troops will be postponed until 2024.

ESD: Equipping the wheel-based medium forces is imminent. Industry offers numerous possible solutions in the form of functional modules for the Boxer: bridges, artillery, mortars, barrel weapons, air defence, drone defence, etc. Besides logistical advantages, would it not be possible to quickly achieve operational readiness of these units by using these solutions on GTK on the basis of available technologies and a proven standard basis?

Schmidt: We are keeping a close eye on what is happening here, also in cooperation with our international partners, and we are of course pleased with the potential of the vehicle as demonstrated by the industry itself.

In our view, the new variants advertised here are still at the feasibility study or prototype stage and are far from being ready for series production. For some of the proposals, we also have fundamental questions about their suitability for approval, since the chosen technical implementation makes it rather difficult to comply with legal requirements.

Therefore, we do not believe that a quick realisation is possible on this basis, especially since, after the introduction of Bundeswehr-specific requirements and the finished development, a corresponding verification and qualification must be carried out to ensure that the material actually meets the performance requirements and that there is also no danger to life and limb.

The new variants currently being advertised place a wide range of demands on a new driving module for the Boxer armoured transport track vehicle (GTK), such as for example a significant increase in the permissible total mass. The supposed logistical advantages you mentioned do not come without further ado, since far-reaching technical changes to the vehicle would be necessary, which would lead to considerable deviations from the existing vehicles, which means that there would not be a single standard Boxer base, but rather several that would have to be supplied logistically.

Therefore, as we move towards a heavy weapon carrier, one focus of our considerations is to maintain logistical uniformity in the future as the number of variants grows.

The interview was conducted by Michael Horst.

Land Support Directorate (U)

The spectrum of tasks of the Land Support Division (Division U) of the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) ranges from the procurement of personal equipment for special forces to security technology, field camps, military pharmacy, medical facilities, medical equipment and NBC protection.

This also includes military wheeled vehicles, special vehicles/equipment, EloKa (electronic warfare), reconnaissance, intelligence/space, air traffic control as well as robotics and training/simulation.

Some of the department's projects are described as examples to give an overview of the range of tasks.

Mobile Accommodation during Deployment

In the Bundeswehr, accommodation during deployment is conceptually divided into stationary and mobile accommodation during deployment.

Mobile accommodation is the short-term, temporary, often decentralised accommodation of units and staffs during deployment. As a matter of principle, it is carried out without relying on stationary accommodation capacities with own forces and resources of the military organisational units and should not last longer than 60 days.

To this end, the solutions involve significant limitations on comfort.

In 2015, the Army identified capability gaps in the areas of accommodation, hygiene and sanitary requirements, and food preparation.

For the accommodation during deployment (UiE) of soldiers outside of field camps and operational infrastructure, the tent sheet and the sleeping pad included in personal equipment were available at that time. The tarpaulin tents are known in the troops as the 'dachshund garage' (Dackelgarage), they do not have a tent floor and provide the soldiers with only very limited protection against insects, wind and moisture.

For food preparation, soldiers had only the Esbit cooker for heating water or food with solid fuel tablets in their personal equipment and the TFK 250 tactical field kitchens at unit level. However, there was no practical and up-to-date solution for preparing food in squad, group or platoon strength.

Within the framework of Customer Product Management (CPM), the existing ca-



Photo: Kärcher

The overall system of accommodation in action (UiE) consists of five building blocks

pability gaps were closed in the following years with the mobile UiE project.

The new system consists of five modules that can be put together in a modular way and are intended for four soldiers.

The core accommodation module consists of four one-person tents, additionally equipped with a headlamp. The tents are compact and can be carried in the soldiers' backpacks.

The tents have a waterproof floor, are of the same quality as products from the high-end trekking sector and are stable even in high winds.

For a longer stay, the core accommodation module can be supplemented. With the supplementary module, the four one-person tents can be connected to a communal tent. The supplementary module is designed to be replenished in case of a longer stay and available transport space.

The communal tent and the furniture (four folding stools, one folding table and four field couches) are stored in two packages. The communal tent can be walked on in an upright position and can be connected to all four one-person tents in a star shape and rainproof thanks to the existing connection tunnels.

The catering module includes the most important components for the preparation of full meals. Like the accommodation module, one set is designed for four

people. This includes a high-quality and robust multifuel cooker that offers a high degree of flexibility in terms of the fuels that can be used. The accompanying aluminium cooking pot with non-stick coating has a base with heat exchanger to reduce cooking time.

The core hygiene/sanitation component includes a foldable dry toilet including a visual or weather protection tent that allows soldiers to defecate with a minimum of privacy. Both the toilet and the shelter tent are stored in a compact carrying bag together with consumables such as thickener, wet wipes and soap.

The waste collection component contains various waste bags that enable waste separation in the field.

The mobile accommodation material is used to accommodate contingents of the Bundeswehr on operations, but can of course also be used across the entire capability spectrum, such as mission-like operations, exercises and training at home and abroad.

The current framework contract covers the delivery of up to 19,000 modular tent systems on call over a period of seven years. For the first procurement year, a firm order of 2,500 sets (to accommodate 10,000 soldiers) with a delivery date in June 2022 was agreed when the contract was concluded.

Photos: Kärcher



Cooking equipment for the preparation of wholesome meals

In spite of unfavourable circumstances such as raw material bottlenecks and globally disrupted supply chains, the first procurement batch was delivered on schedule. The material will thus be available to the forces during the preparation and certification exercises for the VJTF 2023. The delivery of a replacement stock of 30 per cent of the sets, initially planned for 2023, has also already been accelerated to 2022.

The framework contract allows for the call-off of a further 15,750 sets, so that up to 76,000 soldiers can be accommodated if the contract is fully taken up. With the material of the mobile accommodation, the Bundeswehr thus has an initial supply of modern equipment at its disposal, albeit in small quantities for the time being. The framework agreements concluded with high quantities and long terms allow for further equipment in the coming years, provided budget funds are available.

In future, the medium protected ambulance vehicle (mgSanKfz) will close the capability gap between the light (lgSanK-

fz Eagle IV BAT) and the heavy (sgSanKfz GTK Boxer BAT) protected ambulance vehicle of the Bundeswehr. The vehicle classes of the protected medical vehicles differ significantly in terms of tactical mobility, mission-optimised and threat-appropriate protection, payload or payload volume as well as strategic and operational deployability.

The light and heavy protected medical vehicles already in service with the German Armed Forces have been field-tested many times and have proven themselves exceptionally well. The mgSanKfz will expand the capability spectrum of the medical service in such a way that the transport and treatment capacity is now increased to two patients per vehicle while maintaining the highest mobility classification. The vehicle will also have a high level of protection with a relatively low operating weight.

In March 2020, the contract for the production and delivery of 80 mgSanKfz was concluded. The first two vehicles were delivered to the Bundeswehr in June 2022. These vehicles will be used to carry

out the approximately ten-month integrated verification at the various Defence Technical Services, Defence Science Institutes, the Army Technical School and the Bundeswehr Medical Service Command. The integrated verification as part of the realisation phase of a project serves to determine the suitability of the vehicle and to check the conformity with the contract. It thus basically comprises the verification of the contractor's performance records, the verification of selected performance values at the various Bundeswehr Defence Technical Services and Defence Science Institutes, the performance of the tactical and technical-logistical operational test by the user, as well as the determination of further operating parameters and functional limits.

Verification of the performance figures as well as determining further operating parameters and functional limits is subject to laboratory tests, test runs as well as test and trial runs at the Bundeswehr's Defence Technical Services and Defence Science Institutes. There, the requirements for the mgSanKfz previously defined in the performance specification are checked and evaluated.

At the Wehrtechnische Dienststelle 41 (WTD 41) in Trier, the mgSanKfz will be tested until the end of 2022 for its on-board network, electrical system, ergonomics, driving safety, climate suitability and mobility characteristics. WTD 41 acts as the technical competence centre for land-based vehicle systems as well as for pioneer and troop technology. The service has diverse and unique test stands, laboratories as well as test courses and tracks.

The operational test consists of the parts tactical operational test (conducted by the Bundeswehr Medical Service Command) and technical-logistical operational test (conducted by the Army Technical School) and extends from October 2022 to the end of April 2023.

The operational test comprises in particular the testing and evaluation of the mgSanKfz under operational conditions. The aim is to test the mission-critical functions under consideration of the conditions specified in the utilisation profile and to assess their suitability.

Parallel to the operational test, the remaining verifications, e.g. of the NBC protective ventilation system, the weapon launcher, air mobility and the electromagnetic compatibility, will be completed at other Bundeswehr stations after the tests at WTD 41.

The results obtained within the framework of integrated verification later form

Medium Protected Ambulance Vehicle	
Profile:	
Capability	Protected, qualified transport of two stretcher patients
Requirement	80
User	Central Medical Services, Navy
Scheduled Delivery	07/2023 – 12/2024
Length x Width x Height	7.4 m x 2.4 m x 3.3 m
Max Gross Weight	16.6 t
Power	225 kW (306 PS)
Drive Unit	All-wheel drive (6x6)
Transmission	6-Speed Automatic Transmission
Range	> 800 km



www.fhf-gmbh.com

We contain your ideas.



IT Server-Containers



Workshop-Containers



Army-Containers



Field-Camp-Containers



Switchgear-Containers

We contain your ideas

FHF GmbH is your partner for special-purpose containers. We equip, convert or modify any containers in line with clients' particular needs and wishes – for instance, to laboratory or office containers, large container complexes, rocket- and mortar-proof accommodation containers or containers for housing research facilities, specially fitted out to enable them to be used under extreme climatic conditions. Mobility, flexibility and safety are the key benefits our solutions can offer you.

Full service – around the globe

In addition to made-to-measure container solutions, we also offer you every type of container-related service imaginable. This includes repairs, cleaning, maintenance, cutting and welding work, and touching up the rust-proofing. If necessary, trained staff ensure seaworthy securing of loads by welding lashing eyes for general and heavy cargo. We perform load tests on sea containers on our own special test stand. What's more, we have direct access to our own port for direct loading and unloading.

- » [Racking load test stand](#)
- » [Service for hydraulic systems and electrical installations](#)
- » [Hiring containers and container complexes](#)

FHF Flurfördergeräte GmbH

Kap-Horn-Straße 26
28237 Bremen
Germany

Telephone: +49 (0) 421 / 618 00 10

E-Mail: info@fhf-gmbh.com
www.fhf-gmbh.com



the basis for issuing the approval for use. The approval essentially confirms that the safe commissioning and performance of the product are ensured and that the product is ready for use. Subsequently, the delivery of the additional 78 mgSanKfz to the Bundeswehr will follow by the end of 2024.

Radar systems for the air force mission control service

Due to Germany's geographical location in Europe's densely populated centre with the world's highest air traffic density, military airspace surveillance (MSA) and ensuring permanent airspace security (DEA SiLuRa) in cooperation with other ministries have a special role and responsibility.

The national forces and assets deployed to maintain the integrity of German airspace belong to the Air Force Operations Command (EinsFüDst) and are in principle permanently subordinated to NATO for deployment by means of Transfer of Authority (TOA).

The unit structure of the EinsFüDst with two operational command areas consists at battalion level of one stationary Control and Reporting Centre (CRC) each, a total of 18 stationary radars, the Training and Procedures Centre (TPC) and the deployable operational modules. To fulfil its mission, the Operational Command Service currently has a total of 20 active long-range radar systems. The oldest Hughes Air Defence Radar (HADR) systems were installed in Germany in the 1980s. The systems have significantly exceeded their intended service life of 25 years. In recent years, extensive obsolescence elimination measures have been carried out in particular in the area of signal generation

and signal processing. Currently, the secondary radar systems are being replaced. The new systems enable the use of Mode 5 IFF (Identification Friend or Foe) for secure friend-foe identification.

In the 1990s, eight systems were procured and introduced under the designation Remote Radar Post 117 (RRP-117). The first extensive obsolescence elimination on the Radar Data Processor also enabled a first service life extension beyond the planned 25 years. However, further obsolete components, including in the area of signal generation and processing, require further measures on critical components. An upgrade is intended to replace the obsolete components with the manufacturer's most modern hardware configuration. Manufacturer support for these modules is guaranteed until at least 2035. The extensive upgrade will be carried out on the eight systems in the period from 2024 to 2026.

In 2005, the Bundeswehr decided to procure two deployable radar systems for air surveillance. The main tasks of these radar systems are to provide temporary focal points, to compensate for failures of stationary systems and to serve missions in the alliance framework. In a competitive tendering process, the RAT-31 DL/M systems were selected. These systems, which entered service in 2010, are also currently experiencing obsolescence-related limitations in availability. Extensive measures to maintain operational readiness are planned or already being implemented. The two systems are regularly used for the protection of high-value events and within the alliance framework. At the moment, one system is deployed in central Iraq in order to increase the coverage of airspace there. As a result of the NATO Defence Planning Process,

the procurement of a third deployable radar system is currently under preparation. NATO Support and Procurement Agency (NSPA) will conclude the contract with the technical support of Unit U5.3. The system is scheduled to enter service in 2024 and will complement the existing fleet.

The most modern radar systems for airspace surveillance were procured between 2010 and 2015. With the Groundmaster 406 Fixed (GM406F) systems, a system with a fully digital antenna was procured for the first time. The generation of the transmit signals as well as the digitisation of the receive signals is carried out with 384 transmit-receive modules, which are mounted on the antenna. The digital signals are transmitted to the processor unit via an optical rotary coupling for further processing. This early digitisation enables extensive software-based processing of the radar data. Among other things, digital beamforming is realised on the receiving side, which enables highly accurate target detection despite a comparatively small antenna aperture. However, the high degree of digitalisation is accompanied by shorter obsolescence cycles in the area of the hardware used. A first extensive modification measure to the systems is therefore planned for the period 2024 to 2026.

In July 2021, following a competitive procedure, the BAAINBw concluded a contract for the procurement of four radars to replace the HADR systems. The selected radar system is the German Air Force's first long-range radar with electronic beam steering in azimuth and elevation. This also provides the required ballistic missile detection capability, which will contribute to the continuous operational task of territorial missile defence. ■



Photo: GDELS-Mowag

The medium protected ambulance closes the capability gap between the Eagle IV and the GTK Boxer mobile medical team

Photo: Bundeswehr



Remote Radar Post 117 Kalkhorst/Elmenhorst



**One-on-One with Jan Gesau,
Director BAAINBw and Head of the
Land Support Directorate**

ESD: In the years ahead, there is an urgent need to regenerate the Protected Command and Function Vehicles (GFF). What considerations are there in this regard from the point of view of cooperation and from the technical side with regard to a modular vehicle family for different load classes?

Gesau: Finding cooperation partners is an ongoing task for project management. This also applies to the possible regeneration of the GFF. In this context, the differing requirements under different framework conditions of two or even several nations need to be brought in line with each other, which is difficult to achieve.

On the issue of modularity, it should be noted that, on the one hand, synergies can be achieved in areas such as training, material maintenance and supply. On the other hand, the design options are limited by a modular structure. This can have a detrimental effect on the degree to which operational tasks can be fulfilled. The balance between economic aspects and operational suitability needs to be kept in mind at all times and considered on a case-by-case basis.

The assumption of simultaneously renewing all GFF classes, which is implicit in the question, will not happen in this way. In addition to economic and technical considerations, many other factors affect the regeneration schedule.

More specifically, some of the GFF1 to GFF3 vehicles will soon reach the end of their service life. A service life extension is planned for these vehicle types. The Enok 6.1 of GFF1 will remain in service for another ten years. For the Eagle V of the GFF2, a supplementary procurement is pending.

With the next generation of GFF3, a project for the Dingo 1, Dingo 2 and DURO/YAK vehicles is in the assessment phase. The primary aim is to cover the additional demand for protected vehicles and only then to implement renovation.

ESD: How will the field camp system be advanced with regard to mobility in the context of national and allied defence (LV/BV)?

Gesau: In the Bundeswehr, accommodation during deployment is conceptually divided into stationary and mobile accommodation during deployment (UiE).

The Bundeswehr field camps are considered stationary accommodation. Stationary accommodation is largely centralised, not short-term, and is geared to the spatial organisation required for the mission and the forces that are to be housed.

Stationary UiE is thus primarily aimed at long-term foreign deployments and requires considerable effort to relocate and set up.

So far, field camps have not been relevant in LV/BV (nation and alliance defence) scenarios. For mobile combat in LV/BV scenarios, mobile accommodation during deployment is indispensable.

A 'field camp system' in the sense of a harmonised overall system does not exist in this form.

The material of the field camp component 300 has been in use since 1998 and serves the mobility requirements depending on the contractual regulations. It consists of a modular construction kit, the individual components of which are put together individually for each deployment.

The modular system Field Camp Type I (FLM) was procured as a system. The purpose of the system, which was announced when the requirements were determined, is to enable rapid deployment in the initial phase of a foreign deployment.

The further development in the field of field camps, also with a view to the LV/BV, the "Modular System Field Camp Type II" was cancelled as an armament project due to its high financial cost. It is currently being pursued at a smaller scale as a service solution in the BAIUDBw.

ESD: The advancement of a 3rd generation soldier system (IdZ) is on the agenda. Which results of the associated study will be implemented in a timely manner?

Gesau: Two studies on the third generation of the soldier system 'Infantryman of the Future' (IdZ-ES 3rd Gen) were started in 2021 and are due to run until autumn 2022. The more extensive of the two studies considered, in addition to an overall system concept, the aspects of connection to the D-LBO system network, ergonomics, occupant safety and the integration of the IdZ equipment into Puma, Boxer, A400M and NH90, among others. Another essential service was an estimation of the life cycle costs (LCC) resulting from this concept. Market reviews and assessments were conducted for a potential Designated Marksman Rifle (DMR) with appropriate targeting optics, for the portable power supply of a dismounted group as well as for a modern digital Helmet Mounted Display (HMD).

The second study looked at the potential of eSWIR (enhanced Short Wave Infrared) technology, the integration of different imaging and non-imaging sensors in one device, and the fusion of this sensor data.

Based on the theoretical and partly prototypical results of the study, readiness for series production of a modern HMD is to be initiated in 2023 and an assembly for data distribution and energy management is to be made ready for serial production. The creation of technical prerequisites for interoperability in the D-LBO system network is also one of the measures planned for 2023.

All findings will be continuously incorporated into the design of the next steps towards the realisation of the third generation.

The interview was conducted by Michael Horst.

Pioneer Equipment Modified

Pioneer container including contents ceremonially handed over in Gera

Gerd Portugall

On 22 June 2023, two new special containers were officially handed over to the army pioneers of the Bundeswehr in Gera, Thuringia. At the pioneer barracks there, Frank Hartwich, Managing Director of the container construction service provider FHF GmbH Bremen, and Lieutenant Colonel Thomas S., responsible project manager of the Bundeswehr Technical Center 41 (WTD 41) in Trier, handed over the symbolic key for the „Pioneer Equipment Modified“ (PiGA mod.) to Vice Admiral Carsten Stawitzki, Head of the Directorate-General for Equipment of the German Federal Ministry of Defence (BMVg).

As part of the handover, Lieutenant Colonel S., business unit manager of WTD 41 and project manager for PiGA mod., presented the implementation history of this procurement project. He is responsible for Business Unit 350, which includes pioneer material and equipment sets. According to the project manager, the final functional requirement (AF) was drawn up on 18 July 2002 for the container procurement. However, this project was not included in the budget until funding was committed. This was finally done on 8 June 2020 by Division A I 5 (Administration and Budget Affairs) of the Equipment Department in the BMVg. On May 2022, the procurement contract with FHF GmbH Bremen was concluded on the basis of trust after a very successful negotiation process, according to Lieutenant Colonel S..

The project manager of the WTD was impressed by the service provider's performance: "first-class, professional tools, future-oriented, flexible installation kits and central logistical availability". A total of 2,000 different tools are in the containers, including, for example, the "Mechanic's General Tool Kit" or the self-contained cutting equipment kit in portable design.

By 31 October 2023r, the series delivery of a total of 102 modified pioneer containers (i.e. 51 systems with two containers each) for the Bundeswehr is to be completed. The delivery is valued in the double-digit million euro amount. The new equipment was finally received by Lieutenant Colonel Daniel

Photos: Gerd Portugall



Symbolic handover of keys (from left to right): Vice Admiral Carsten Stawitzki, Head of Directorate-General for Equipment of the BMVg, Frank Hartwich, Managing Director of FHF GmbH Bremen, Lieutenant Colonel Thomas S., Project Manager of WTD 41, Lieutenant Colonel Daniel Spieß, Commander of Armoured Engineer Battalion 701.

Spieß, commander of the Armoured Engineer Battalion 701 (PzPiBtl 701) and garrison commander in Gera. Admiral Stawitzki was visibly impressed by the quality of the material handed over.

The Pioneer Troops

The pioneers belong to the Army's combat support troops in the army and have a personnel strength of around 6,200 ac-

tive soldiers. In domestic and foreign operations, they support their own troops with construction and technically trained personnel as well as through the use of special vehicles, machines, equipment and tools.

The pioneer troops help friendly forces overcome barriers and obstacles. They overcome minefields, clear unexploded ammunition, remove rubble and barricades after destruction caused

by war or disaster, and build roads and bridges. For this purpose, the pioneers have mine clearance tanks, ammunition disposal equipment, pioneer vehicles, various bridging equipment, construction machinery and a variety of special tools at their disposal.

In addition, the Joint Support Service (SKB) has the Husum-based Special Engineer Regiment 164 (SpezPiRgt 164) and the Air Force has an object protection regiment that is responsible for pioneer service – for example, for runway rapid maintenance. Therefore, the pioneer forces of the Bundeswehr have a broad range of occupations. They include bricklayers and reinforced concrete builders, carpenters, locksmiths, welders, as well as construction electricians and civil engineers.

The Armoured Engineer Battalion 701

The Armoured Engineer Battalion 701 is a combat support unit of the German Army. Around 700 soldiers serve in five companies of the battalion. Its inventory includes the Fuchs armoured transport vehicle, Dachs armoured engineer vehicle, Keiler mine-clearing tank and the Leguan armoured vehicle launched bridge (AVLB). In 2007, the Armoured Engineer Battalion 701 emerged from the Engineer Battalion 701. Since 2020, Lieutenant Colonel Spieß has been the commander of PzPiBtl 701. His command vehicle is a modern GTK Boxer. A pioneer battalion



The department head inspected the material handed over (from left to right): Vice Admiral Carsten Stawitzki, Christian Hahn, Project Manager Military & Defense at FHF GmbH Bremen, and Frank Hartwich, CEO of FHF.

was first commissioned in Gera in 1961 by the then National People's Army (NVA) of the GDR.

For the stowage, transport and storage of the tool equipment, two 20-foot roll-off containers with integrated hook lifting equipment are provided, so that transport is ensured mainly by Bundeswehr vehicles with load-handling system for roll-off containers. Within the scope of its intended use, the "Pioneer Equipment Modified" is to be transported and deployed in worldwide operational areas

both on paved and unpaved roads and terrain or in the case of partially missing, insufficient and/or destroyed infrastructure under all weather conditions.

FHF GmbH – Service Provider for Container Construction

The company, founded in 1990 in the Hanseatic city of Bremen, employs around 120 people – including steel construction, mechanical and welding engineers. In addition to civilian companies from various sectors and research institutes, FHF also supplies various NATO armed forces, such as those of the US, France and Belgium.

Tailored to the specific requirements of different armies, FHF offers a wide range of certified container systems for special applications. These military containers are individually converted and equipped according to customer requirements. The "Minebreaker", for example, is a fully equipped container for mine clearance operations.

A newly developed adaptive protection system secures individual containers or complete camps. This protection system was developed in close cooperation with the Bundeswehr, which had used the system in Kunduz, Afghanistan, among other places. From the very beginning, the international practice of arranging containers for field camps in block construction was included in the considerations.



This is one of the two containers including equipment from the company FHF that were handed over to the Armoured Engineer Battalion 701 in Gera on 22 June 2023.

Air Directorate (L)

The Air Directorate of the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) manages aircraft systems of the Bundeswehr.

The project divisions of the Air Directorate are responsible for implementing projects in accordance with the Customer Product Management (CPM) process and for supervising the in-service support management of fielded products until they are phased out. Directorate L also exercises functional supervision of the Bundeswehr Technical Center for Aircraft and Aeronautical Equipment (Bundeswehr Technical Center 61 (WTD 61)).

The project portfolio of Division L includes combat aircraft as well as:

- transport and special aircraft,
- all helicopter systems,
- unmanned aircraft including tactical drones,
- rescue and protection systems for crews,
- cross-sectional ground service and test equipment and workshop equipment for aircraft maintenance facilities,
- simulators and training equipment,
- space-based reconnaissance and electronic warfare.

Almost all large-scale projects are implemented through multinational, predominantly European partnerships and management agencies, and are realised through multinational effort.

Directorate L assumes materiel responsibility for operational viability throughout the entire life cycle of airborne weapon systems assigned to it. Prior to the implementation phase, this viability is ensured through:

- applied basic research and application-oriented defence research and technology (R&T levels 1 and 2) as well as system- and solution-oriented studies (level 3),
- support in the field of planning during Analysis Phase I and
- the preparation of proposed solutions during Analysis Phase II;
- implementation and in-service support through acquisition life cycle,
- the management of all in-service support activities for maintaining the operational viability of all manned and unmanned aircraft and space-based reconnaissance systems fielded in the Bundeswehr,
- the supervision of systems engineering and the integration of subsystems, including armaments,

Photo: Luftwaffe



Eurofighter of the Tactical Air Force Squadron 74 from Neuburg/Donau

- life cycle management, including obsolescence management and risk management.

This also includes highly prioritised procurements in the context of fast-track initiatives for operations.

Divisions L1 "Economic and Technical Affairs, Policy/Fundamentals of A/C, Aeronautical and Non-Essential Equipment" and L2 "Economic and Legal Affairs" as well as the Directorate Staff and Directorate Controlling support the project divisions.

Additionally, project and in-service support management has also been assisted by the Airworthiness Staff and the In-Service Support Manager at the level of deputy director.

Current and Future Challenges

The Russian war on Ukraine, which began on 24 February 2022, has initiated a 'turning point' (Zeitenwende) not only for politics, society and industry. The special fund (Sondervermögen) of the Bundeswehr is due to significantly expand the capabilities of the Bundeswehr in the air domain. More than EUR 40 Bn has been allocated to the air domain alone. Of course, however, it remains a balancing act to harmonise the capabilities of the Bundeswehr with the requirements of the troops, the legal pro-

visions, technically feasible solutions and long-term budgetary conditions. The following projects, which provide an insight into the comprehensive task portfolio of the Air Division, enjoy particular attention in the short and medium term.

Eurofighter ECR

In his 'turn of the times' speech, Chancellor Scholz declared on 27 February 2022: „The Eurofighter should be Electronic Warfare capable.“ That was reinforced by Defence Minister Christine Lambrecht's statement on 14 March that the further development of the Eurofighter for electronic warfare would retain key technologies for Germany and Europe. The Eurofighter ECR (Electronic Combat and Reconnaissance) project focuses on maintaining the electronic combat capability in light of the changing threat scenarios and the foreseeable end of the service life of the Tornado weapon system, which has so far covered essential capabilities in the Tornado ECR variant. For the Bundeswehr, this capability underwent its baptism by fire during the KFOR mission in 1999, when Tornado aircraft of the Luftwaffe used HARM missiles to suppress enemy air defences in the Federal Republic of Yugoslavia so that subsequent NATO air operations were successfully carried out.

In the light of recent security policy developments, the importance of electronic warfare is consequently also made visible by the fact that it is included in the special fund of the Bundeswehr.

In a first step, the project-leading group L6 in the BAAINBw will develop an initial capability of the Eurofighter weapon system for electronic warfare.

By early 2023, the basic conceptual considerations will be refined and - in coordination with the partner nations - harmonised with the plans for the further development of the Eurofighter.

After a market review, the technical possibilities for integration and certification - including a risk assessment - in the Eurofighter can be examined in more detail.

The aim is to develop an armament/pod-based solution that can be used in a timely manner with the Eurofighter aircraft and consists of sensor and effector components. NETMA (NATO EF 2000 and Tornado Development, Production & Logistics Management Agency) is the international agency responsible for the realisation of the project, in close coordination and partnership between Germany, Great Britain, Spain and Italy.



Photo: F-35 Joint Program Office

Lookheed Martin F-35A

In a second step, the electronic warfare capability of the Eurofighter is to be further expanded and optimised. To this end, the Bundeswehr plans to procure 15 additional combat aircraft with a performance profile tailored to this capability.

Combat Aircraft F-35

While the Eurofighter ECR variant is to assume the electronic warfare capability profile of the Tornado, the project „Successor to Tornado, Procurement of F-35 incl. Armament“, which is anchored in

DRIVING THE FUTURE OF DEFENCE & SECURITY

ESG is a manufacturer-independent system integrator and your technology and innovation partner for defence and public security. With our solutions and services, we are a driving force for secure digitalisation and networking in all dimensions. Innovative, with implementation expertise and passion: We develop, realise, support and operate individual platforms and complex complete systems.

esg.de

Photo: Bundeswehr



A Luftwaffe C-130J Super Hercules

the 'Sondervermögen Bundeswehr' (special fund of the German Armed Forces), is intended to ensure nuclear sharing capabilities in view of the end of the service life of the Tornado weapon system.

In March 2022, the Federal Minister of Defence decided to procure the US F-35A Lightning II (F-35 for short) as the successor to this aircraft.

BAAINBw's Air Directorate will quickly realise the project together with the Combat Directorate (responsible for the armament). The intention is to procure 35 F-35 aircraft as a US government purchase via the Foreign Military Sales (FMS) procedure. Germany has already submitted a corresponding request to the US side. The corresponding offer was approved by the German Bundestag in December 2022. The intended procurement is to include the delivery of the aircraft, training and mission equipment, documentation, logistical support and initial training as well as an initial requirement for armament and ammunition.

All aircraft are to be delivered to the Air Force by the end of this decade.

Based on the operational experience and capability profile of the Bundeswehr, the STH is also to fill capability gaps in terms of range, standing time and payload in the areas of

- rescue and evacuation of personnel (including armed search and rescue),
- direct tactical air support to special operations forces,
- national risk and crisis management.

In June 2022, the German Armed Forces decided to procure 60 CH-47F Block II Standard Range helicopters with air-to-air refuelling capability from the manufacturer Boeing. The procurement of the helicopter, also known as the 'Chinook', is to be a US government purchase. For this purpose, the US side has already been asked to submit a bid. An offer approved by the US Congress is expected in January/February 2023. Parliamentary involvement should then be completed before the summer break in 2023.

The German requirements for the aircraft will be based on the equipment already available on the market in order to largely exclude technical and certification risks. The Bundeswehr will be the first armed

force to receive the helicopters in the Standard Range version with the air-to-air refuelling (AAR) capability.

Delivery of the first helicopters is planned as early as 2026.

C-130J

The C-130J Super Hercules provides protected tactical airlift at airfields with limited infrastructure for national risk and crisis management missions to protect German nationals abroad and to support special operations after the C-160 Transall was decommissioned at the end of 2021.

To this end, Germany operates ten aircraft together with France in a joint Franco-German squadron at Évreux in France. France contributes four aircraft to the programme. Germany is participating with six aircraft. These will be purchased by the US government from the US manufacturer Lockheed Martin under the FMS process and delivered to Germany.

Three aircraft will be purchased in the extended transport version C-130J-30 and three in the tanker configuration KC-130J.

Training and provision of infrastructure will also be ensured in cooperation with France at the Évreux site.

The project is progressing very satisfactorily so far and is ahead of the planned/contractually fixed schedule in many respects. The third C-130J-30 aircraft was handed over to the Franco-German squadron on 25 August 2022, almost ten months earlier than contractually agreed. The other three aircraft in the tanker configuration are to be delivered by mid-2024.

The task now is to further consolidate Franco-German cooperation, to stabilise training and operational activities and to further expand tactical airlift capabilities. ■

Heavy Transport Helicopter

The procurement of a new heavy transport helicopter (STH) to replace the aging and now almost 50-year-old helicopters of the CH-53G family, which has been announced for some time, is gaining momentum. With the item 'procurement of heavy transport helicopters' in the special fund for the German Armed Forces, the STH project is now being placed on a solid footing in terms of finance and armament policy.

The STH will take over and ensure the operational tactical air transport capabilities currently still covered by the CH-53G in terms of air mobility of land forces/airborne operations, air transport and qualified air transport of wounded.

Photo: Boeing



Boeing-Vertol CH-47F



**One-on-One with Ralph Herzog,
Acting Director at BAABW and Head of Air Directorate L**

ESD: The Air Force will purchase the F-35 and CH-47 aircraft types from the USA. What challenges does this pose for the L Division?

Herzog: In fact, it is not the Luftwaffe that will be buying

the aircraft types from the USA, but the procurement authority BAABW. Of course, we are working very closely with the German Air Force as the future user of the aircraft.

Both aircraft types are procured under a government purchase through the so-called 'Foreign Military Sales' process. The contract is concluded at the end of the process by means of a government purchase agreement with the US Department of Defence (Letter of Acceptance), not with the industrial manufacturers of the weapon systems. Both programmes are financed through the Bundeswehr Special Fund. There are high expectations for both projects in terms of time and content. The aim is to replace the legacy weapon systems Tornado and CH-53 by the end of the decade without disrupting operations. Given that the weapon system to be procured should be as similar as possible to the US configuration and therefore have advantages in terms of time and cost, deviations in the configuration of the two systems will be avoided as far as possible.

A characteristic and, to some extent, a challenge of the 'Foreign Military Sales' process is that key procedures and the associated timeline are determined by the partner nation, the USA. This results in the demanding task of harmonising these processes with the ambitious project timelines and synchronising them with the national, multi-layered project periphery. On the one hand, a government purchase of this kind is typified by highly formalised, fixed processes that can only be influenced to a limited extent; on the other hand, it demands a high degree of flexibility and adaptability in implementation within the national framework. This ranges from differences in the respective applicable standards and regulations – for example in the area of environmental protection, and occupational health and safety – to sometimes considerable fluctuations in exchange rates and their respective effects on the financial bottom line.

The progress made so far in both projects shows that the L Department is keeping a careful eye on these multi-layered boundary conditions and – based on its extensive experience with national and international aviation programmes – has the necessary prerequisites for the successful implementation of these two important major projects.

ESD: The Eurofighter is to take over the role of the ECR Tornado. What is the status here?

Herzog: Capability transition from the Tornado ECR to the Eurofighter is to take place in two stages.

Initial qualification of the Eurofighter weapon system for electronic warfare is scheduled to be achieved in time with the phase-out of the Tornado weapon system. This primarily involves the integration of an emitter locator system combined with a corresponding missile. In total, a fleet of 15 Eurofighters

of the German Air Force are to be equipped to assume this operational role.

In the second step, it is planned to expand the range of capabilities to include escort jamming and to procure a further 15 Eurofighter aircraft, which will then be available for the role of electronic warfare.

At present, investigations and evaluations of solutions based on commercially available components and systems are already underway. We will also commission preparatory work packages for the technical and constructive realisation of the integration into the Eurofighter weapon system by the end of this year. In addition, we are currently coordinating with the Eurofighter partner nations and industry on the realisation of this capability package within the four-nation framework of Eurofighter cooperation.

ESD: FCAS remains important for the three countries involved. What are the next steps and what is the role of BAABW?

Herzog: After the project came to a standstill this year due to detailed questions that had to be clarified on the part of the participating industries, the programme is now starting up again at full speed. The delay makes it necessary to review the contracts between the French Direction générale de l'armement (DGA) and the industrial partners once again and partially update them. The goal is to conclude a contract for the demonstrator phase (project phase 1B) by the end of 2022.

The Next Generation Weapon System (NGWS) project is managed by the trinational project team in Paris as part of the Future Combat Air System (FCAS) on the side of the participating nations. In the current phase, the national leadership of the project still lies with the Planning Department in the Ministry of Defence. BAABW supports this with technical and project management expertise and represents the German interests in the tri-national project team.

ESD: How are things going with equipping the Franco-German airlift squadron with the C-130J?

Herzog: The delivery of the German C-130J transport aircraft to the Franco-German Air Transport Squadron is going excellently so far.

The aircraft were delivered well ahead of the deadline agreed in the 'Foreign Military Sales' contract with the US Air Force, so that all three German C-130J-30 version aircraft are already in Évreux.

This was originally planned for the second quarter of next year [2024]. Based on the current status, the three German KC-130J version aircraft will also be delivered on time in 2023 and 2024. They will complete the fleet for a total of ten aircraft, six of them German and four French.

Since the C-130J is a mature aircraft type that is available on the market, it was possible to obtain operational approval within a short period of time.

The German aircraft alone have already clocked up more than 400 flight hours.

The interview was conducted by Lars Hoffmann.

The Sea Directorate (S)

The Sea Directorate is responsible for matters related to the realisation and in-service use of Navy ships and boats, Navy-specific shore-based systems, communication systems and training installations, and other Navy-specific equipment. It supports equipment from the first stages of development until retirement.

The Sea Directorate consists of a total of eight divisions, each with a different focus of activities, as well as the Directorate Staff and Directorate Controlling. Within this organisation, five project groups support the German units afloat: S3: Frigates and Corvettes, S4: Mine Countermeasure Units and Unmanned Systems, Subsurface Weapon Systems and Subsurface Sensor Systems, Divers, and Combat Boats, S5: Support Vessels, Auxiliary Ships and Support Systems, S7: Submarines, S8: Type 126 Frigates.

Apart from the project groups, the Sea Directorate also has three specialist groups that support the projects: S1: Economic and Technical Affairs, S2: Economic and Legal Affairs, S6: Naval Command and Control Systems.

In addition to its specialist tasks, the group S6 is also in charge of the project management of shore-based systems and training installations, and is responsible for checking the IT security, operational reliability and functional reliability of software and hardware in the command and weapon control systems (FüWES).

To meet the increasing challenges related to in-service use, the Sea Directorate has established the position of a deputy director and in-service support manager.

Taking examples from this extensive portfolio, the projects of the Maritime Department presented below are testimonies to our current work.

Graphic: Damen Schelde Naval Shipbuilding B.V.



Artist's impression of a Type 126 frigate

Replacement of the obsolete long-range sensor and enhancement of the air defence capability of Type 124 frigates

With its three Type 124 frigates, the German Navy operates ships specifically designed for force and joint air defence. The main sensor for the development of a long-range air picture is the SMART-L (Signal Multibeam Acquisition Radar for Targeting, L-Band) air surveillance radar system, which is affected by considerable obsolescence.

The primary objective of this project is to maintain an air surveillance capability. Additionally, the frigates are to be enabled to contribute to NATO Ballistic Missile Defence (BMD) in the fields of early warning and cueing in a manner that appropriately reflects Germany's leading role in cluster Air and Missile Defence (AMD).

On 23 August 2021, the contract for stage 1 (procurement and integration of the new wide-range sensor) was signed with the company HENSOLDT.

According to current plans, the integration of the first new long-range radar into the test, reference and training system (TRA) is scheduled for 2024. Beginning in 2025, the first frigate will be the first ship to be equipped with the new long-range radar in the course of her scheduled maintenance phase.

Type 125 Frigate

The four new Type 125 frigates (F125) have been designed for multinational joint military operations of low or medium intensity and long duration. The third of the class, the frigate Sachsen-Anhalt, was handed over in January 2022. On 13 July 2022, she was commissioned at 4 Frigate Squadron, like all Type 125 frigates before and after her.

The first frigate to reach technical operational readiness and participate in an

Photo: ARGE K130



Corvette Köln undergoing shipyard sea trials

Safe Power Supply for Military Applications

VINCORION's Green Technology has Tactical Advantages



Photo: VINCORION / Speckardt

Daniel Zeitler, Director of Product Management, in front of an IRIS-T energy system at VINCORION.

The technology company VINCORION focuses on military energy and drive systems. These include state-of-the-art gensets and interconnected systems, hybrid energy systems as well as storage and power electronics. The company's production facilities in Wedel, Altenstadt, and Essen also supply weapon stabilisation and power supply systems for main battle tanks such as the LEO-PARD 2 and infantry fighting vehicles such as the PUMA. In this interview, Daniel Zeitler, Director of Product Management, talks about the company's latest developments.

How does VINCORION make sure that the military has a safe supply of energy?

Zeitler: Mainly with experience. We have for example supplied more than 1500 power systems for air defense systems. The first ones in the 1980s for Patriot and most recently the energy systems for IRIS-T, which has been delivered to Ukraine since 2022. But we are making energy systems also for tanks and radars. With this decades

of experience in military systems, everyone at VINCORION is aware of the importance of a safe power supply. And if people, infrastructure and public energy grids are as endangered as in Ukraine, reliability in the power supply of air defense system is crucial. Although, that our modern hybrid systems can also operate with grid power, if available.

In the course of the process, you are utilizing hybrid technology?

Zeitler: Exactly. Hybrid technology has great advantages in how it works, how easy it is to use in terms of a modern, highly automatized system, and how much it cost lifecycle-wise. Fuel consumption is thus lower, which reduces dependence on fuel logistics & cost.

Besides the technology, are there other advantages to this approach for soldiers in the field?

Zeitler: First and foremost, it is possible to reduce the number of personnel. A reduction of a third in refueling operations implies that up to 50 per cent of the personnel previously required for operations can be utilized in more useful ways. This also implies increased safety: the troops are no longer vulnerable to the adversary's sights. In public grid operation zero refueling or maintenance is needed, but you still have the genset in standby to take over without interruption. So we always guarantee the performance of the air defense with maximum efficiency.

Can you back that up with data?

Zeitler: Normally, a conventional diesel genset used to supply a Patriot unit requires 3.37 liters of fuel per hour. With a modern hybrid diesel unit consumption drops to 1.78 liters per hour. This means that 72 refueling operations a day can become 24 refueling operations - which shows the impressive

progress we made for users. We have further improved the direct working environment by reducing all emissions significantly with modern diesel engines, up to Stage V standard, still fully compliant with NATO single fuel policy and tactical requirements.

This will also affect how much CO₂ is released into the air.

Zeitler: Oh yes. So our technologies are helping to save significant amounts of carbon dioxide. With an older Patriot system, the emissions would amount to 7.86 million tons of CO₂ annually, assuming a high operational readiness of approximately 2000 hours. These emissions can be reduced by 33 per cent, to 5.23 million tons. This approach also effectively reduces the emission of nitrogen oxides, depending on the performance class of the units. Savings of between 40 and 60 per cent are possible.

However, are the systems equally efficient in the context of military requirements?

Zeitler: Of course, as said before, understanding the tactical requirements of our military users is part of our DNA. The great tactical advantages mentioned before have been the driver for the implementation of hybrid technology. The positive economic and ecological effects go hand in hand with higher performance. Operational readiness even increases as the maintenance intervals of the gensets are reduced as they are less susceptible to wear. We have successfully tested this in Germany and the USA.

Everyone is talking about green defence. Is this your contribution to a more environmentally friendly defence?

Zeitler: We're gearing up for the big changes in the world of carbon reduction, digitalization, and decentralization. We offer Green Defence solutions to make military activities less harmful to the environment, like using less energy and reducing the amount of carbon emissions. We enable our military users to take benefit of relevant but reliable modern hybrid technology, not only for air defense systems, but also to military vehicles and other military application that need tactical power.



Photo: VINCORION

operational deployment will be the frigate *Baden-Württemberg* in the summer of 2023 after completing its first scheduled overhaul.

Graphic: NVL

Type 126 Frigate (F126)

On 19 June 2020, at the end of a Europe-wide competitive bidding process, the project of the Type 126 frigate (formerly known as MKS 180 multirole combat ship), reached the most important realisation milestone until then, namely the conclusion of the building contract with Damen Schelde Naval Shipbuilding B.V.

Initially, four units will be procured, with the option being to procure another two to cover the conceptual demand of a total of six units. The frigates will be capable of three-dimensional naval warfare in the entire intensity spectrum of operations around the globe. Delivery of the first of class is planned for 2028, with the other units scheduled to be delivered by 2032.

As a modular maritime capability platform, the Type 126 frigate will have basic capabilities that will particularly meet the requirements of permanent operational commitments. These capabilities include above all the ability to exercise command and control in a maritime formation, a self-defence capability and, additionally, an antisurface and antiair warfare capability.

The Type 126 frigate will provide capabilities focussed on wide-area antisubmarine warfare for the protection of task forces and sea areas. Moreover, the options for a missionised equipment suite will also allow it to meet the requirements of other than the above operations and missions. In order to further tailor the ship to the respective operation, it is possible to take two shipborne helicopters and one unmanned aeri-



Preliminary design of the Class 707 naval fuel supply ship

al system (UAS) aboard and embark special forces, a fleet surgical team or signals intelligence personnel.

The project is currently in the simulation and design phase, in which the Preliminary Design Reviews (PDR) take place. Here, for example, the system architecture, interface and design documents are provisionally defined in order to be able to proceed to detailed design.

The goal is to complete the final design with the critical design reviews at the end of this year in order to be able to start the construction plans for the start of production, which is expected to begin in the fourth quarter of 2023.

Supplementary procurement of Type K130 corvettes

The first five Type K130 corvettes procured constituted extremely advanced and highly complex state-of-the-art weapon systems. The proven basic design of the K130 will

be maintained for the procurement of the vessels no. 6 to 10.

Currently, the boats are being built and equipped. On 21 April 2022, the corvette „Köln“ was christened during a festive ceremony in Hamburg. Vessels no. 6 to 10 are planned to enter service from 2025 onwards.

Type 212CD submarine

The contracts for the U212 Common Design (CD) submarines were signed on 8 July 2021 after intensive preparation and negotiations between the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support, the Nor-

Photo: PLZ Marine



Frigate class 123 Schleswig-Holstein off the coast of Catania

Photo: Mergener



Model of a Type 212CD submarine



PIONEERING – IN PARTNERSHIP – PERFECT

Creating innovations and building perfect ships together with our customers: For almost 100 years, we have been a partner for navies all over the world.

ABEKING & RASMUSSEN

www.abeking.com

wegian Defence Materiel Agency (NDMA) and the contractor thyssenkrupp Marine Systems (tkMS). The first new submarine is to be delivered to Norway in 2029.

The contracts between the three parties cover the procurement of a total of six identical submarines - four for Norway and two for Germany. When the contract was signed in summer 2021, both nations had drawn up a joint harmonised list of requirements with the design-determining parameters. This design has been subjected to the Preliminary Design Review since May 2022 and will be concluded in 2024 in the following Critical Design Review. Parallel to the CDR, production is already to begin in the new production facilities. The two procurement offices will closely accompany the work of the industry with the jointly established Joint Programme Office (JPO) in Kiel and deepen and intensify the binational cooperation.

Type 123 frigate – remaining in service until 2035

Comprehensive obsolescence elimination measures and measures to implement outstanding product changes will be taken to ensure that the capability of the Type 123 platforms is maintained, so that they remain available in an operationally ready condition without interruption until the delivery of the Type 126 frigates and that the four Brandenburg class units remain operational until 2035.

As a comprehensive, overarching measure, the Frigate 123 'Ensuring operational availability' programme will see renovation of the vessels' tactical radar systems, the command and control weapon deployment system, sensors and data link,

missile systems and the Anti-Submarine Warfare (ASW) system in four planned packages. In parallel, a Performance Based Logistics (PBL) contract will be concluded, which will ensure optimal availability of the systems for their remaining service life.

Replenishment of Seagoing units

After more than 40 years of operation, the two naval supply vessels Rhön and Spessart will reach the end of their service life in 2023 (Spessart) and 2024 (Rhön) respectively. Therefore, on 7 July 2021, a contract was concluded with Fr. Lürssen Werft GmbH (now NVL B.V. & Co. KG) for the design planning, construction and delivery of two naval fuel supply vessels.

The new oilers can travel at a maximum speed of 18 knots and have an off-load capacity of 11,000 m³ of diesel fuel and of at least 500 m³ of aviation fuel. The capability profile is supplemented by a helicopter landing pad and the ability to stow and autonomously handle up to ten containers. The contract for the procurement of the vessels was concluded on 7 July 2021. The ships will be designed and built at the Neptun shipyard in Rostock, which belongs to the Meyer shipyard. Provided that the first unit will be delivered from 2024 on, the capability to replenish seagoing German Navy units will be seamlessly maintained.

Under the overall responsibility of NVL, the two units will be built at the Neptun shipyard in Rostock, which belongs to Meyer Werft. The new fuel supply vessels are scheduled to be delivered in March 2025 and March 2026 respectively.

Type 424 Intelligence Collector

On 23 June 2021, a contract for the procurement of three Type 424 intelligence collectors and a reconnaissance training and reference system was concluded between the BAAINBw and NVL. This procurement is intended to help achieve the objective of maintaining a sea-based signals intelligence capability without any interruption. The highly complex project is characterised by special demands placed on the surface and subsurface reconnaissance components to be used in worldwide operations as well as by specific military requirements such as self-protection, command and control capabilities, and the need for extremely low-noise propulsion systems.

Outlook

In addition to the above projects, the Sea Directorate is concerned with many other large- and small-scale projects and product modifications that it is currently working on in very close cooperation with, and supported by Bundeswehr Technical Centre 71, the Naval Arsenal, the Navy and other organisational elements. These projects range from launching cranes and boats for special operations forces to electronic warfare systems and further Navy-specific systems and equipment (optronics, radar, navigation). In the following, three selected examples are presented to provide a glimpse at the order book of the Sea Directorate.

Combined MCM capability platform

The demand for maintaining mine countermeasures (MCM) and minelaying capabilities was documented when the phase 1 document 'Capability Gap and Functional Requirement for a Combined MCM Capability Platform' was approved in January 2021. This also marked the completion of part 1 of the analysis phase conducted under the responsibility of the Bundeswehr Office for Defence Planning. Project responsibility for phase 2 of the analysis portion has now been transferred to the BAAINBw.

The integrated project team was established immediately. Under the lead of the project team in the BAAINBw Sea Directorate, the course was set for the preparation of solution proposals.

The aim is to ensure a seamless transition from the current MJ332 class units to the new capability carriers, which can be commissioned depending on the Bundeswehr's medium-term financial planning. For a tran-

Graphic: Bundeswehr/Naval Vessels Lürssen



Artist Impression of a Type 424 intelligence collector



Graphic: Bundeswehr/MTG

Concept sketch of the Next Generation Frigate NGFrig

sitional phase of several years, the MJ332 class will be modernised once again and expanded to include a so-called toolbox of unmanned systems. This interim step will lead to an improvement in both the quality of the data to be acquired in mine hunting and the area search performance of the naval mine hunting system network.

The integration concept of the toolbox will follow a strongly modular approach in order to be able to operate within expected scenarios.

Next Generation Frigate – Air Defence (NGFrig-AD), Type 127 frigate

The work of the Integrated Project Team F127 for the analysis phase Part I was completed with the submission of the FFF

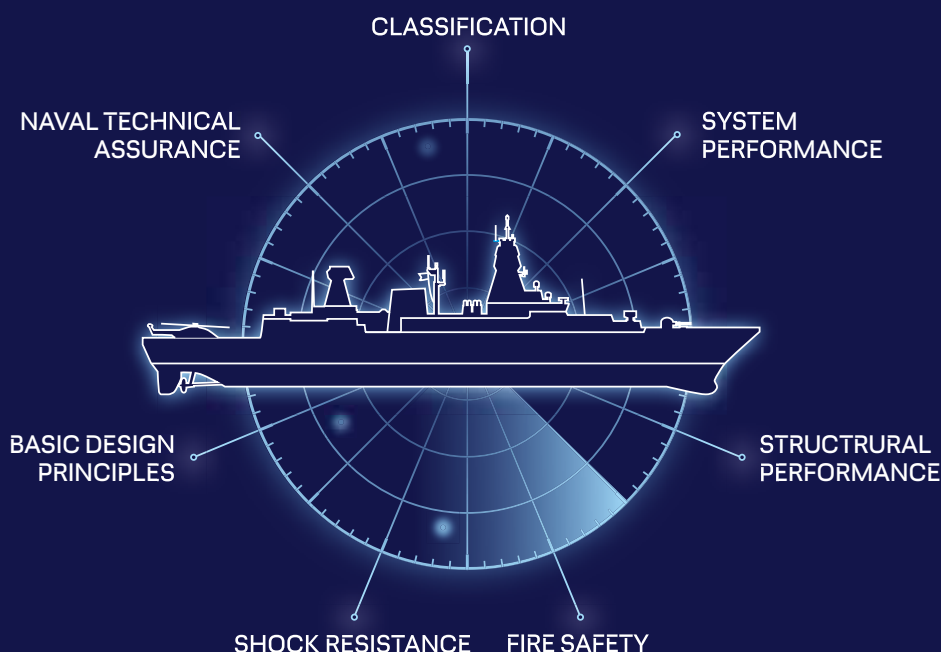
(Funktionale Forderungen Fähigkeitsträger) draft to the BMVg Planning Division on 30 June 2022. After approval by the Inspector General and approval of the R&T Level 3 budget for the analysis phase Part 2, the various proposed solutions for making a selection decision will be developed in this phase by 2025 at the latest. The aim is to provide operational ships from the end of 2033 for timely replacement of the F124 frigates.

New branch for combat craft

In summer 2020, Unit S4.4 'Combat Boats' was newly established in the S4 project group. After assuming the designated structure at the beginning of 2022, the branch has assumed responsibility for combat boats and all associated Custo-

mer Product Management (CPM) phases. The first project to be taken on was the procurement of nine medium-range combat boats to replace the H1010 rigid-hull inflatable boat. The contract for nine response boats with accessories was concluded as early as mid-2022, after successfully passing the award procedure. At the beginning of 2022, the branch took over the 'multi-purpose combat boat' programme from the Phase 1 analysis stage. The project is intended to equip the naval battalion and the special forces of the navy with operational boats of greater range than available on the market. The project is currently still in the orientation phase. The planned expansion of the unit was completed in mid-2022 with the handover of the specialised boats and launching equipment. ■

DNV NAVAL SERVICES



Assurance and Advisory – Tailored to the challenges of today's navies

Naval forces are not just facing a moment of change, but an era of transformation. The decisions have never been so complex, nor the consequences so impactful. DNV offers navies unique solutions, on everything from finding an appropriate assurance approach, dealing with regulatory compliance, next generation fuels, through to platform and operational optimization, and in-depth advice and insight. As the maritime industry's most trusted voice, at DNV we help decision-makers throughout the naval world to make purposeful and assured choices.



Learn more:
dnv.com/navy



One-on-One with Rear Admiral Andreas Czerwinski, Head of the Sea Directorate (S)

ESD: The Chief of the Navy as well as his deputy, the Commander of the Fleet and Support Forces, point to the lack of available ships as a result of a bottleneck in maintenance. What is the problem from your point of view?

Czerwinski: The root of the problem is the 2011 decision to effectively halve the naval arsenal. At the same time, the ageing of the fleet, especially in the support and auxiliary ships, as well as mandatory measures to maintain the operational readiness of the combat ships and boats have increased the scope and frequency of maintenance measures in recent years. In addition, changes in procurement law and the German shipyard industry's eagerness to take legal action have put additional strain on the naval arsenal in 2020 and 2021, resulting in delays that affected the availability of ships.

These challenges were mitigated by a combination of personnel support for Navy officers in the Naval Arsenal, additional staff in the Naval Arsenal's procurement office and new procurement processes, so that the Naval Arsenal is once again able to award

projects in a timely manner. We must permanently counteract the ageing of the ships by consistently pursuing the renewal of the German fleet that has already begun.

The new location of the Naval Arsenal in Rostock, where more in-house repairs will be carried out in future and thus the capabilities of the Naval Arsenal will be strengthened, is also very positive in this regard. The measures initiated allow me to look to the future with optimism that we will once again be able to provide maintenance services to the navy in a timely manner and to the required level.

ESD: Could you tell our readers more about the Warnemünde Naval Arsenal?

Czerwinski: By acquiring the property of the former MV Werften shipyards at the Rostock facility, in particular the dock capacities available there, and by taking on highly specialised and motivated skilled personnel from the shipyard industry, the Bundeswehr has succeeded in creating the infrastructural and personnel framework for a noticeable and sustainable increase in the material readiness of the German Navy. In future, we want to look after a large part of the Navy's Baltic Sea units in Rostock within the framework of scheduled and unscheduled repairs and carry out necessary immediate repairs with in-house personnel in areas that we have not been able to cover so far. This includes, above all, carrying out maintenance work on the equipment and furnishings of ships, on their electrical systems and on ship operating systems. With a length of 320 m, a width of 54 m and a depth of almost 11 m, the dry dock of the naval arsenal in Rostock offers sufficient potential to carry out unscheduled repairs on all vessels of the navy at very short notice, in addition to the intended scheduled maintenance projects on the K130 corvettes with their own infrastructure. Previously, such unforeseen repair measures required the availability of free dock capacities on the market and a quick awarding of contracts. Since free dock space is also a scarce commodity in the shipyard industry, our possibilities in the past were limited to ensure the material readiness of the navy even at short notice. This will change now with the establishment of Rostock naval arsenal and thus allow correcting the 2011 decisions as a contribution to national and alliance defence.

ESD: Last year you commented on organisational changes in your department with regard to information security. What has happened so far?

Czerwinski: Having set up the field 'cross-sectional information security for projects of the Maritime Division' last year, the task now is to fill this field with life. This internal 'pool of experts' is intended as a point of contact and central support element to ensure that the ever-increasing demands on information security are met across all projects. For example, in a phased process, cross-sectional specifications and agreements for a command and control and weapons deployment system (FüWES) are developed and coordinated by this department, along with the German Military Security Accreditation Authority (DEUmISAA) and other agencies. Additional information for specific weapon systems is then provided to the relevant project branch, so that the IT security officers only have to provide the access to information specific to the branch.

The interview was conducted by Hans Uwe Mergener.

WEIBEL
DOPPLER RADARS

**RADARS FOR C-UAS,
SHORAD AND
MISSILE DEFENSE**

www.weibelradars.com

The Information Technology Directorate (I)

Department I is responsible for the procurement and maintenance of all IT equipment for the Bundeswehr. The department has approximately 820 employees working on about 130 projects in the analysis and project planning phase as well as on about 170 other projects that are already operational.

In addition to the numerous small projects, Division I is working on future-oriented large-scale projects or programmes such as the Herkules follow-on project, the German Mission Network (GMN) and the Bundeswehr Satellite Communications System (SATCOMBw). The major projects Digitalisation Land-Based Operations (D-LBO), Encryption Modernisation of the Bundeswehr (KryptoMBw) and Federated Mission Network (FMN) are presented below.

D-LBO moves forward, ZNV enters the troops

The Digitisation of Land-Based Operations (D-LBO) programme is one of the most important and overarching projects in BAABW's IT department as it combines individual projects into a holistic procurement programme for military IT. In addition to the procurement of radio equipment for integration into combat and support vehicles or the provision of command and control equipment for situation display and communication, the procurement of deployable communication systems is also one of the elementary components of the D-LBO programme. The project Deployable Cellular Networks (ZNV) is a key component in equipping land-based units with a modern, high-performance and wireless communication system.

At the core of ZNV is a radio communication system based on a cellular radio structure. The wireless communication system is based on the Terrestrial Trunked Radio (TETRA) standard. This radio standard has been a reliable communication standard for authorities and organisations with security tasks (BOS) for several years and has established itself in the corresponding operational applications of the BOS. The mobile radio standard Long Term Evolution (LTE) is used for the broadband transmission of data within the framework of the wireless communication system of the ZNV project. This offers the possibility of modern and high-performance radio communication. The project planning of the system design is based on the user requirements as

well as on the current state of IT technology. The wireless communication system is basically divided along two different lines.

The 'Cellular Network deployable Container' (ZNV C) system is a larger, container-based solution. This type is intended for deployable operation. The entire network infrastructure, including the workstations for the administrators, the supply technology, the antenna system, the terminal equipment and all accessories are stored in three 20 ft ISO containers.

The cellular network deployable BTuLB (ZNV B) system is the smaller system. It is used for mobile operations or to establish an initial capability in the area of operation. Here, the network infrastructure and the supply technology are integrated into so-called operational, transport and storage containers (BTuLB). The other system components such as the antenna mast including antennas, the terminals and the required accessories are transported in separate transport and storage containers (TuLB).

In addition, the ZNV project includes the procurement of a training, a reference and an exercise support system. The reference facility will be located at the Bundeswehr IT System Operations Centre (BITS) in Rheinbach, while the training support facility will be built at the Army Combat Training Centre in Gardelegen. The training facility is used to train administrators of the wireless communication system and has already been set up and put into operation at the Bundeswehr Information Technology School (ITSBw) as part of the current project. Initial feedback from the user was obtained in a first training course. This feedback is now integrated during further system development in the course of the project.

In addition to the use of commercially available TETRA handheld radios already introduced in the Bundeswehr, the introduction of hybrid terminals is a future-oriented part of the project. These are the Motorola MXP7000 handheld radio and the Motorola MXM7000 vehicle radio. These terminals have the option of using TETRA and LTE in hybrid mode. This com-

Photo: Motorola



Radio Motorola MXP7000 developed within the framework of ZNV

bines the respective functionalities of the already established trunked radio standard TETRA and the modern mobile radio standard LTE in a profitable way.

The ZNV wireless communication system also includes a so-called intersystem interface. This interface, which is defined in the TETRA standard, offers the possibility of coupling two different TETRA communication networks. Operationally, the possibility to couple networks is a real added value in civil-military cooperation. In future, it will be possible to link the deployable communication systems of the German Armed Forces with the TETRA network of the BOS, for example, in order to ensure joint wireless communication in the event of a disaster.

Project KryptoMBw – Modernising the Bundeswehr's Encryption Systems

The Encryption Modernisation of the Bundeswehr (KryptoMBw) project aims to equip the Bundeswehr with modern encryption devices. The major challenge of the project is, on the one hand, to protect the security of data and communication transfers against new threats such as quantum computers, and on the other hand, to ensure the widest possible interoperability between different encryption systems.

The devices provided within the framework of the KryptoMBw project must be able to encrypt data and their transmissions up to secrecy levels SECRET or NATO SECRET. Confidentiality must be ensured in such a way that data encrypted in the present cannot easily be hacked in the future. A major challenge is the current development of quantum computers, which could break some of the encryption algorithms currently in use. At present, we can only speculate about when quantum computers could become a serious threat to the encryption algorithms. For the KryptoMBw project, this means that newly introduced encryption systems must be quantum computer resistant from the outset. The devices to be procured should also have powerful, future-proof and robust hardware, be IP-capable and be able to use different encryption algorithms.

Interoperability with other encryption systems used in the defence alliances is another requirement for a modern IP-based encryption device of this kind, in



KryptoMBw - Equipping the Bundeswehr with modern crypto devices

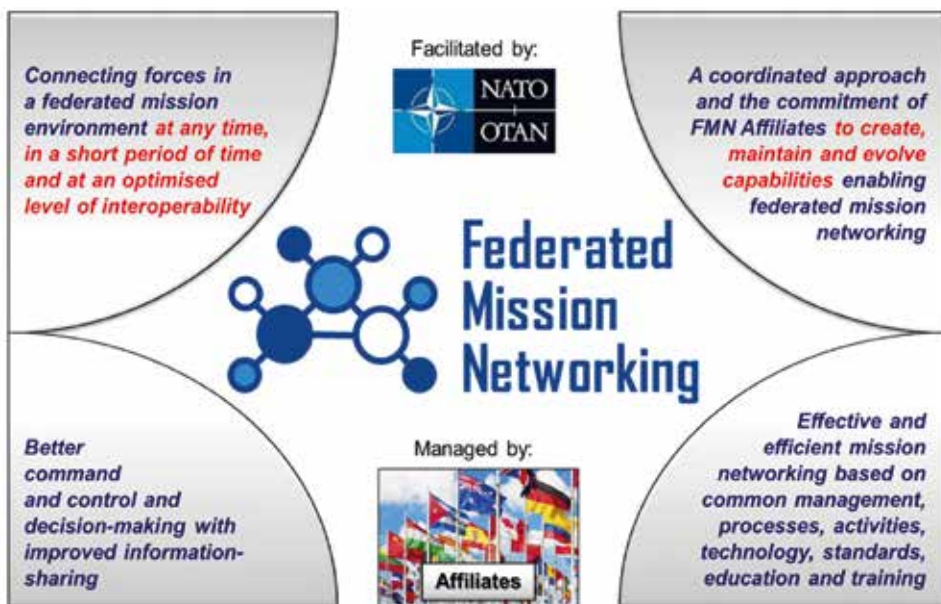
addition to protection against emerging threats. In this context, interoperability between the Federal Ministry of Defence and the Bundeswehr and other ministries up to a level of secrecy SECRET needs to be implemented within the national framework. Furthermore, modern encryption devices need to be able to communicate internationally with other NATO and EU nations up to the classification levels NATO SECRET and EU SECRET. If an encryption device can handle several security levels, it is called a 'multi-encryption' device. In order to guarantee the interoperability of different encryption devices, especially in an international environment, the necessary standards are being developed or updated in various committees. For national communication up to the classification level SECRET, the BAAINBw works closely with the Federal For-

eign Office and the Federal Office for Information Security (BSI), among others. Corresponding international standards are also closely monitored.

With regards to information security, there are very high demands on the KryptoMBw project. Within the national framework, the IT systems with high levels of secrecy must be tested and approved by the BSI on the basis of strict security requirements in accordance with legal stipulations. Close cooperation with the BSI is essential right from the planning phase of a corresponding project. In the context of the KryptoMBw project, the fine line between meeting user requirements and implementing information security specifications must be found for successful approval in order to be able to provide users with the required IT devices in an IT system that is as secure as possible.

Federated Mission Networking

FMN is a multinational organisation initiated by NATO with the aim of improving the interoperability of multinational mission networks. The common vision of NATO and numerous partners (affiliates) is so-called Day Zero Interoperability. This means that the information technology of mission partners is implemented in such a way that it can be seamlessly interconnected in missions. In addition to technical interfaces, the focus in FMN is also on operational processes and FMN users (People, Processes and Technology). Therefore, in addition to technology in the form of service instructions, work and operational procedures are harmonised as procedural instructions. In order to keep up with the fast-moving innovation cycles of IT, FMN follows an iterative development cycle in spirals and publishes updated specifications every two years. The challenge of harmonising with the schedules of national armament processes is met by not choosing the scope of a spiral too large. Spiral capability development can be divided into three phases: First, there is the two-year definition phase, in which the specifications (Procedural and Service Instructions) are created on the basis of common requirements. The focus is on technical feasibility studies with the help of demonstrators on interoperability exercises. This is followed by a four-year implementation phase comprising the realisation of the specifications in national IT services, including their standardised verification in the form of Assurance, Ver-



FMN – creating a common understanding

ification and Validation stages. Successful completion of these stages is the FMN seal of approval for an IT service, which can then officially call itself FMN-compliant. Finally, the two-year use phase follows, in which the spiral development is set as the standard for mission networks.

Currently, the fifth iteration is underway, in which, in addition to improving the core services, more attention is being paid to users and communities of interest (CoI). Many affiliates had expressed concerns about the challenging timelines with regard to the national processes (planning, budgeting, equipping, training and certification). The FMN framework has responded by permanently extending the implementation phase from three to four years. This is accompanied, among other things, by an extension of the Definition Phase of Spiral 5: Affiliates now have one year more, i.e. until the end of 2023, to sharpen up previous drafts of the specifications or even to move content to a later spiral (de-scoping). All considerations follow the vision of FMN, namely providing the highest possible interoperability between all affiliates.

Division I provides the national representative in the Capability Planning Working Group (CPWG). This multinational working group is responsible for the technical part of the specifications. For this purpose, the CPWG steers its sub-working groups (syndicates), in which the service-related expertise of the participating Affiliates works on common solutions. Issues that cannot be resolved at this level are escalated to the CPWG and taken to a solution.

Furthermore, Division I ensures that the stakeholders from the BAAINBw can voice their concerns in the syndicates. On the one hand, this ensures that national interests can be integrated into the multinational standardisation work in a decentralised and direct manner. On the other hand, it ensures that the results expected through close and continuous participation in the multinational coordination process can be integrated into national project work.

To support the development of specifications, Division I is financing a prototype service reference facility in close cooperation with the Bundeswehr Dig-

itisation Centre (ZDigBw) as the operator. Proposed specifications are tested for feasibility, thereby helping to minimise risks. All stakeholders are invited to participate in the prototyping of their services at any time and to use the service reference facility.

Working with trend-setting technology

The varied tasks of Division I are reflected in many ways throughout the Bundeswehr and make their contribution to equipping our servicemen and women, but also our civilian employees, with the IT products they need. In the process, the IT systems of BAAINBw's IT Department provide the interfaces between many national and international projects to ensure interoperable voice and communication. In order to be able to realise their projects, the Information Technology Project Department relies on the extensive experience of the civil-military personnel mix of its employees and thus groups together the necessary expertise. ■

Directorate G – IT Support

A variety of projects from data protection to interactive documentation

The IT Support Division (G) in the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) is the central service provider for administrative and logistical IT support in the Bundeswehr.

As an essential component, Department G provides qualified and reliable IT services for the entire Bundeswehr and thus also for deployment and mission-related obligations. This is predominantly implemented with responsibility for the operation of SASPF (Standard Application Software Product Families) and the systems in use (SinN) integrated therein. With complex IT projects, Division G is continuously digitising the Bundeswehr's processes and making a significant contribution to the ability to control and make decisions at all levels. We will take a closer look at four of the ongoing projects to give you a small impression of the diversity in Department G.

ETD/IETD

The acronym ETD/IETD stands for the Electronic Technical Documentation/Interactive Electronic Technical Documentation project run by the BAAINBw unit G4.5. The 'Technical Logistics Management' task area provides its 40,000 users with a nationwide and uniform IT system for co-review, administration and operation, for example for the presentation of (I)ETD.

The software solutions of the ETD/IETD project ('StyleCheckerBw' and 'BESTD') support inter-office processes such as syntactic and technical co-checking up to the release of the (I)ETD.

To ensure future viability, the ETD/IETD project management is constantly devel-

oping its software solutions with a view to current user requirements, network structures, standards and hardware offers. Since 2017, users have been able to use the 'BESTD Anzeige' software autonomously on hardened tablets with the Windows 10 operating system directly on the weapon system or on the device without a network connection.

As a result of software modifications, mobile devices with an Android operating system can also display the (I)ETD without any problems since 2021. A Windows-specific browser plug-in is no longer needed to display vector graphics. Together with the BwFuhrparkService project, the ETD/IETD project is currently a pilot for the development of its own

app for the Bundeswehr App Store. The release of the IETD app is planned for 2023.

Since August 2022, the ETD/IETD project, together with the 'Flensburger Fahrzeugbau GmbH' company, has been conducting a study on the use of the (I)ETD with data goggles for a period of 2 years.

Based on market research, the project aims to create a prototype including peripherals for the display of (I)ETD so that users, such as maintenance personnel, can work more efficiently. Ideally, a smart assistant, specific warnings or immediately available information directly on the weapon system or equipment in the maintenance personnel's field of vision will reduce the number of errors. New orders or information or updates on ongoing maintenance work can be transmitted to the maintenance personnel via the data goggles without delay.

In addition to training at schools or in lecture halls, the data goggles can be used to provide training directly on the weapon system or device.

However, the possible uses of the (I)ETD are only part of the digitisation. It is part

of daily routine in armament management, as can be seen from the ongoing rollout of IT support for Customer Product Management (IT-U CPM).

Armament Management – Rollout of IT-U CPM

In order to meet the challenges of security policy, Germany needs a well-equipped Bundeswehr. Challenges for procurement that accompany the modernisation of the armed forces have long since been incorporated into BAAINBw's digitisation goals and activities.

The project 'IT-U CPM, Replacement of Electronic Management Information System for Armament (EMIR) and Integration of Project Management Resources/ Project Monitoring and Controlling (IVF/VOCON)' is key to modernising BAAINBw's procurement practices. IT-U CPM (IT support Customer Product Management) is a modern tool that meets the requirements for continuous, integrated and efficient programme and project management. It provides BAAINBw's project leaders and managers with instruments

for project planning, budget management, risk management and modern reporting in a single technical solution.

This innovative and highly integrative SASPF-based solution will replace several old procedures (SinN). This mainly affects EMIR, which has been in use for more than 40 years, as well as other procedures that have also been in use for a long time, such as the IVF/VOCON system and data processing in the quality inspection service (DV-GP).

The IT-U CPM project has now successfully completed the test rollout and is ready for rollout. With the imminent start of the area rollout, the solution will be rolled out in all BAAINBw departments in the years ahead. The rollout includes the migration of 600 projects as well as the training of over 3,000 users and is quite a challenge for the AIN organisational unit. However, it is worth the effort. By now, all newly established projects are created in IT-U CPM only. The advantages of an integrated and consistent project management environment are apparent. IT-U CPM will put BAAINBw's procurement activities on a future-proof footing and

Photo: BAAINBw



Since August 2022, the ETD/IETD project, together with the company 'Flensburger Fahrzeugbau GmbH', has been conducting a study on the use of the (I)ETD with data glasses for a period of 2 years

We are going **GREEN**, **BEIGE**, and **BROWN**!



So you may not always see us,
but we've always got your back!

In the land defense and security industries, Kallman Worldwide is the world's largest national pavilion organizer — working with hundreds of exhibitors at these world-class events.



Chiba, Japan



Rio de Janeiro, Brazil



Kielce, Poland



London, UK



Bangkok, Thailand



Paris, France



Bogota, Colombia



Singapore



Kuala Lumpur, Malaysia



Australia



New Delhi, India



Doha, Qatar

VISIT KALLMAN.COM TO SECURE YOUR SPACE IN THE
PARTNERSHIP PAVILION AT THESE UPCOMING DEFENSE SHOWS



decisively advance the digitisation of armament management.

There is another important IT support project which focusses on increasing the control and response capability of the Federal Ministry of Defence (BMVg) with the help of the SASPF IT-U operational readiness situation.

Project IT-U Operational Readiness

So what exactly is it? The operational readiness assessment (EBL) assists in analysing and controlling the Bundeswehr's operational readiness. It optimises the availability of mission-ready forces and resources across the entire spectrum of tasks and missions of the Bundeswehr. It is addressed directly to the Federal Minister, the Secretaries of State, the Inspector General, the heads of department in the MoD (BMVg), the inspectors or the heads of the organisational divisions, as well as the commander of the Bundeswehr Operations Command, both for basic operations and for deployment.

For ascertaining the EBL, a holistic view of all relevant information (e.g. personnel, material, training, etc.) is necessary. In 2017, the 'IT-U EBL' project was initiated with the aim of providing the Bundeswehr with a digital application that serves as both a control instrument and a central management dashboard.

Within each output perspective, the information is presented in a way that is appropriate for the target group. Each output perspective therefore contains several levels that build on each other in terms of content. The result is a situation report for the management of the BMVg which is of utmost political and strategic importance. The situation report immediately serves the fulfilment of permanent obligations under the general law and political requirements. The application was expanded in 2022. In future, the aim is to be able to assess the operational capability as well as the operational availability for national and alliance defence across entire troop formations. This assessment was carried out and evaluated for the first time in the EBL 22/2 survey. In this way, a comprehensive picture of the condition and perspective of committed and available forces could be shown.

The aim was to digitise the Bundeswehr's EBL, taking into account current missions and obligations, in order to be able to identify future challenges and options for action. To support the initial

assessors and commentators in their assessment, digital situation images were integrated that provide overviews of personnel, material, large-scale equipment and fleet management.

Faster, more networked and more modern work are advantages of digitalisation. One of the most important points to which special attention must be paid is data protection. The Bundeswehr's personnel management system (PersWiSysBw) illustrates the technical implementation of data protection. The normative framework here is the European Data Protection Regulation (EU-DSGVO).

Data Protection in Human Resource Management

The introduction of the EU Data Protection Regulation meant that the rights of individuals with regard to the processing of their data were significantly strengthened. The tightening of personal data (PersDat) protection is a considerable challenge, not least for the PersWiSysBw, and had an immediate influence on the design of the system.

In principle, the EU's GDPR law defines all data that can be attributed to a natural person as PersDat in accordance with Article 4. In addition, the EU GDPR defines special data with a higher protection level (so-called special PersDat) in accordance with Article 9. This category includes health data, information on sexuality, ethnicity, political opinion and religion.

Data protection takes place on two levels: Via regulations at the access and authorisation level and via technical implementation at the system level. Roles and authorisations (RoAs) are important for data protection. Predefined RoAs are used to regulate and delimit access authorisation to PersDat. The RoAs are subject to a concrete task- and function-related as well as a structural assignment: Different concepts for access to the PersDat exist for different levels in the management hierarchy and the areas of activity. The access rights to the PersDat assigned by a role must be justified by the task and responsibility of the role holder.

Another control authority for the implementation of the EU GDPR is the strict approval process for the assignment of roles. The application process is carried out via a hierarchical procedure with the head of the department at the top. This procedure ensures a multiple check ('at least four-eyes' principle) as to whether

the request for the respective access to the PersDat by means of the requested RoAs is justified, with the participation of various hierarchical levels.

The implementation of data protection at system level focuses on different areas: One point of attack in the area of data protection is the transport of data. In order to ensure data protection in this area as well, PersWiSysBw includes strict transport control via underlying interface concepts for data traffic.

Furthermore, the encryption of the database servers and the storage of data via zones and firewalls prevent access to the system by potential intruders and unlawful access to the PersDat stored there. These measures as well as the physical access protection to the data centre enable the best possible protection against potential perpetrators from inside and outside.

In addition, necessary accesses are logged and monitored by administrative staff in the computer centre. Another approach to data protection compliance is technical support in the implementation of a professional deletion concept.

As well as this, the possibility of downloading data must be prevented. The download of data is technically prevented across all levels of the workflow. Options such as the export of query results or copy & paste are therefore generally not possible. Only in justified exceptional cases is this technical prevention suspended by means of a separate authorisation. In this way, data protection is also given the highest consideration in the Bundeswehr.

However, data protection is not the only important factor in projects.

Every day, colleagues have to deal with the major challenges of a project. Because in addition to the client's technical specifications that have to be met, it is always necessary to think outside the box. A project is not a self-contained entity, it always has an impact on other projects and solutions and systems in use that have to be taken into account. Added to this are the factors of economy, time and the resource of people. In addition to the pure implementation of the project, it is essential to involve all those involved throughout the entire project cycle and then to bring the result to the people during the training phase. Success is only guaranteed if all factors mesh like small cogs. The projects presented, along with over 30 other projects currently underway in Division G, are a very good example of the digitisation strategy in the Bundeswehr. ■

Complex Services/Purchasing Directorate (E)

The task spectrum of Directorate E, the Complex Services/Purchasing Directorate, comprises all three pillars of the procurement and in-service support management process: Bundeswehr Purchasing, the satisfaction of demand via complex services and, to some extent, the procurement of material solutions in compliance with Customer Product Management (CPM) principles.

These tasks are performed in Lahnstein and Koblenz by three divisions with thirteen branches.

Divisions E1 and E2 – part of Bundeswehr Purchasing

Bundeswehr Purchasing comprises strategic tasks as well as the operational procurement of both commercially available and Bundeswehr-specific material goods, rights and services for operation and use in the area of responsibility of the Federal Ministry of Defense (MoD). These tasks are performed by around 1,000 procurement agencies in the area of responsibility of the MoD. Procurement by Bundeswehr Purchasing also encompasses follow-on spare

parts for weapon systems and equipment during the in-service use phase as well as requirements that are met via interdepartmental procurement (such as through 'Kaufhaus des Bundes' – the Federal Government's virtual marketplace).

By implementing Bundeswehr Purchasing, a strategic level of procurement has been added to the mostly operational level of the procuring agencies. The intention is to ensure an optimised and comprehensive purchasing process.

Overall responsibility for the purchasing process lies with Division A II at the Federal Ministry of Defense as the purchasing authority. It is at that level that the organisational framework for Bundeswehr Purchasing is established, the purchasing strategy is de-



Einkauf
der Bundeswehr

Bundeswehr Purchasing logo

fined, and the relevant guidelines are issued. A key element of the Bundeswehr Purchasing system is strategic planning and control through independent segment management in cooperation with the demand side, which is the responsibility of the purchasing managers at the office level. Complex contracts such as framework and

GENERAL DYNAMICS European Land Systems–Deutschland

Proven Mobility for Medium Forces



EAGLE 4x4



M3



PANDUR EVO



EAGLE 6x6



COBRA



ANACONDA

gdels.com

We Enable Military Mobility



BwFührparkService GmbH is one of the three companies owned by the Federal Government within the BMVg's area of responsibility.

successive supply contracts with a term of several years are concluded with the Bundeswehr's suppliers. From a logistical point of view, this strategic approach has also resulted in a partial shift from the predominantly depot-based supply of the troops to economic provision directly to the recipient location (direct supply).

Bundeswehr Purchasing is strategically managed and planned through a dynamic purchasing plan that is annually approved and geared towards the purchasing strategy. In addition, the purchasing managers and the purchasing director are supported by a system of targets and indicators. Any obstacles and difficulties that arise can thus be identified, analysed and eliminated through targeted measures at an early stage.

Procurement in the Bundeswehr is subject to permanent review. In particular, this is to optimise structures in Bundeswehr Purchasing and strengthen strategic and operational procurement. As a result of the directed measures, required supplies will be provided faster and the burden of administrative tasks will be eased for those who request supplies. This will immediately improve the operational readiness of the armed forces.

Tangible progress is being made, for example, by setting up purchasing segments, improving pre-processes and adapting SASPF processes to automate the fulfilment of commercial material requirements (electronic catalogues, electronic procurement files, electronic marketplaces).

A basic and support component (GUK) has been set up for the Bundeswehr purchasing process in order to provide targeted support to purchasing managers. Within the framework of the established information and communication concept for the Bundeswehr purchasing process, information and action aids on procurement can be quickly made available centrally for all procurement officers.

Division E - Complex Services/Purchasing is a key player in BAAINBw and in the AIN Division both in the area of strategic control and in the operational fulfilment of the Bundeswehr's operational requirements. The resulting tasks in Bundeswehr procurement are handled by the strategic, operational and support elements in groups E1 and E2.

Division E1 consists of three branches. They perform the following tasks:

Branch E1.1:

- policy issues, purchasing trends, planning the purchasing process,
- continuously developing the Bundeswehr Purchasing process,
- managing the Bundeswehr Purchasing performance process, procurement business process,
- analysing the purchasing process, purchasing statistics,
- managing catalogues,
- ensuring sustainability in procurement.

Branch E1.2:

- service master records, contract registration and framework agreement database,
- order information, contract statistics and managing creditor-related data,
- investment reviews (foreign direct investment),
- commercial information and register information,
- Bundeswehr reporting office for European statistics of complex central armaments projects and the regulation on public procurement statistics.

Branch E1.3:

- reviewing and managing demand requests, technical coordination,
 - SASPF coordination,
 - drawing and design office, managing drawings,
 - collection of company proposals and preliminary taking into stock of items.
- Group E2 is divided into five units and performs both strategic and operational tasks in the Bundeswehr purchasing process at the purchasing segment-specific level.

In order to achieve the primary goal of improving the material readiness of the Bundeswehr, BAAINBw will in future focus even more strongly on its core competencies in the armament and utilisation process and hand over the procurement of commercially available material not related to weapon systems to the Federal Office of Infrastructure, Environmental Protection and Services of



Unit E2.4 procures, among other things, all individual consumable goods needed for medical supplies, such as medicines, vaccines, blood products and personal protective equipment.

the Bundeswehr (BAIUDBw). A first step was taken in April 2022 with the transfer of the following purchasing segments: construction equipment, office supplies, office equipment, office technology and stationery. The transfer of the purchasing segments still planned for this purpose is currently being actively prepared in cooperation between the BAAINBw and the BAIUDBw. As a result, Bundeswehr purchasing process in the BAAINBw will no longer be oriented towards 'ecl@ss' - the cross-industry product data standard for the classification and clear description of products and services - but will be divided into the purchasing segments air, land, sea and cyber/IT as well as, if necessary, cross-sectional purchasing segments, thus mirroring the project areas in organisational terms.

It is divided according to different procurement segments, which facilitates targeted searches for required supplies and equipment on the procurement markets by developing and implementing specific procurement strategies for each segment to be procured. Support in terms of purchasing process analysis is provided for all procurement segments by BAAINBw Branch E1.1. This facilitates a common procurement process throughout the Bundeswehr for the individual procurement segments. In Branch E2.1, the strategic tasks for the

procurement segments are organised into weapon system-specific tasks and common tasks. Therefore, the strategic tools needed for the development of the operational procurement activities have been concentrated in one organisational unit for most procurement segments.

In addition to Branch E2.1, Branch E2.4 also handles strategic tasks, particularly in the area of awarding contracts (framework and bundling framework agreements) for 'POL' (Petrol, Oil, Lubricants) to ensure the Bundeswehr's supply of operating materials at home and abroad. In addition, E2.4 procures the total requirement for individual consumables in the area of medical supplies such as medicines, vaccines, blood products, personal protective equipment, etc. and thus also assumes operational tasks.

Operational tasks concerned with the actual procurement of products for operational requirements are concentrated in Branches E2.2, E2.3 and E2.5. Essentially, this encompasses the following tasks:

- implementing any procurement strategies and standards that have been set,
- carrying out the public contract award process,
- order processing (including the assertion and enforcement of warranty rights),
- assessing deficiencies in the performance of services from a legal point of

view and asserting the corresponding claims,

- checking deliveries and invoices,
- carrying out monetary transactions.

The three aforementioned branches procure almost all of the follow-on spare parts required by the armed forces in connection with weapon systems and equipment during the in-service use phase. The sections of Branch E2.5 are not specialised in categories of products but in weapon systems so that the demand for follow-on spare parts is met on the basis of specific weapon systems. Expertise on specific weapon systems can thus be pooled in one branch and cooperation with the corresponding project teams is facilitated. This approach will be continued and extended to the other operational branches, so that they reflect the new purchasing segments (air, land, sea, cyber/IT and cross-sectional elements) as much as possible.

Operational procurement will continue to be developed further through continuous optimisation of the Bundeswehr Purchasing process in order to improve the service quality of EinkaufBw.

Essential instruments for this are

- an even stronger organisational focus on the weapon systems of the Bundeswehr,
- sustainable strategic planning and, in particular, contractual

LITEF

Leading Inertial Technology

**ACT TODAY FOR
A SAFE WORLD
TOMORROW**

When it comes down to it, what you need is reliability. We are an expert in developing and producing navigation and stabilisation solutions in Germany for challenging missions for our customers. Through the constant further development of our key technologies, we are creating the basis today for reliable products tomorrow – for the ground forces, air force and navy.

Do you have specific requirements?
Contact our experts at defence@litef.de.

LITEF.COM

- contractual instruments such as the use of complex contractual arrangements, such as multi-year framework agreements, successive supply contracts and contractual arrangements from the field of Performance Based Logistics (PBL).

PPP/Complex Services – Division E3

Public-Private Partnerships (PPP) – Complex Services constitute the third pillar of the procurement and in-service support process.

They are a form of satisfying requirements which can occur in all Bundeswehr task areas and processes whenever a demand cannot or should not be met by using Bundeswehr-owned resources alone. Unlike procurement in accordance with the CPM or through Bundeswehr Purchasing, this procedure focuses not on the product but on the service itself.

Branches E3.2 through E3.4 have been set up as organisational elements for the project management of complex services projects, taking both technical-logistic and overall control of the projects. Projects for complex services are systematically developed and implemented by these branches. The task spectrum of Branch E3.5 primarily involves contract and price negotiations for the Bundeswehr Vehicle Fleet Service, Army Maintenance Logistics, warehousing and the Clothing Management.

Extensive service and framework agreements exist with each of the three state-owned companies in the BMVg's departmental area, BwFPS, HIL and Bundeswehr Bekleidungsmanagement GmbH (BwBM). In the case of KDL Bekleidung and HIL, far-reaching adjustments to the contracts have become necessary in the meantime.

Within the framework of an economic efficiency study (EIS), the BMVg has determined how the tasks in the Bundeswehr clothing sector can be ensured economically and reliably in the long term. The result of the study confirmed that the tasks can be fulfilled by the BwBM - but with far-reaching optimisations. Following swift negotiations and approval by the Budget Committee of the German Bundestag, the transition to the follow-up solution will be able to take place as early as 1 January 2023, one year earlier than initially planned.

The future fulfilment of tasks is based on the three pillars:

- Area structure with regional service stations for primary services,
- online platform for the provision of information and complementary services, and
- further expanded logistics (including a planned expansion of the central warehouse due to the increased demand for clothing).

The main performance obligations of the BwBM will continue to be:

- the procurement of newly introduced clothing and personal equipment,
- the regeneration of clothing and personal equipment already in service,
- the cleaning and reconditioning of clothing and personal equipment in Germany,
- the operation of service stations and
- supplying Bundeswehr personnel with clothing and personal equipment at home and abroad.

Optimisations through greater digitalisation, especially in direct contact with the service provider, will become noticeable. In the future, Bundeswehr employees will be able to view master data such as equip-

ment requirements, the current clothing and equipment record (BAN) and the availability of goods at the service facilities via an online platform as a fully integrated web and app solution. The additionally stored size data of the service recipients ensure smooth clothing. An additional clothing centre (BZ) with an automated small-parts warehouse in a central location in Germany (so-called Autostore) will also be built. In addition, new services are to be offered at selected services. These include, for example, digital measurement during muster and clothing by 3D body scanners or the postal dispatch of clothing and personal equipment.

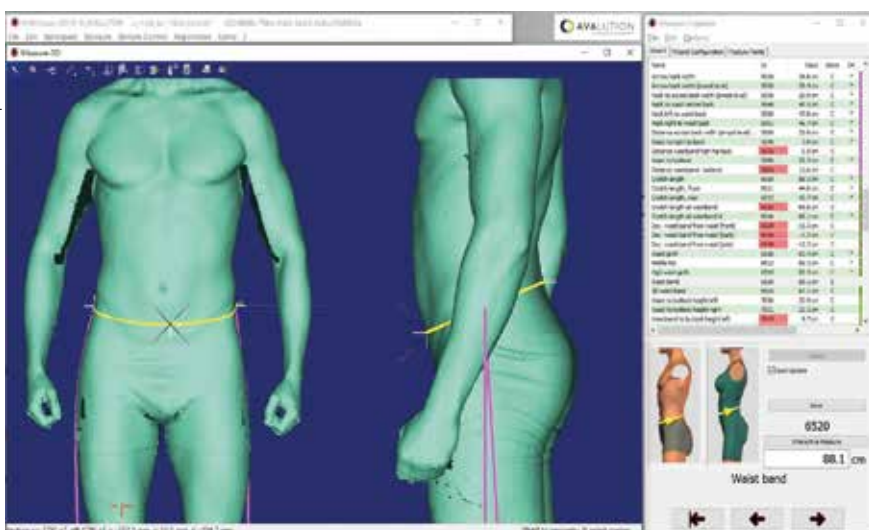
As part of the modernisation of service and casual clothing, all soldiers will in future be fully equipped with the articles that are part of this apparel. In addition, all soldiers will then be able to purchase any extra clothing they feel they need from a BwBM sales organisation. The clothing fund, where only officers and non-commissioned officers have so far been able to purchase clothing and sports articles, will be dissolved after the complete introduction of the new service and casual dress.

In view of the changed security policy situation in April 2022, the Federal Ministry of Finance (BMF) has released unbudgeted budgetary funds of around 2.4 billion euros (2.2 billion euros from the special fund). This sum will be used for the early procurement of protective waistcoats, combat clothing and rucksacks as well as new combat helmets to fully equip the active troops by the end of 2025 - instead of 2031 as originally planned. The optimisations that the new service contract requires of the clothing service provider, as well as the early provision of protective equipment and the modernisation of service and casual clothing, contribute significantly to an improved public image and make a considerable contribution to the personal well-being and motivation of the soldiers. This is another building block in terms of operational readiness and therefore the attractiveness of the Bundeswehr as an employer.

Branch E3.6 is responsible for processing contracts and dealing with issues related to contract award law for the projects under its responsibility.

Additionally, Branch E3.6 is in charge of processing and awarding contracts related to transportation in the Bundeswehr (for transport by road, rail, air and sea). As such, Branch E3.6 is the central contracting authority ensuring that the demands for transportation in the Bundeswehr are met both during routine duty (including exercises) and during missions.

Graphic: BAAINBw



In the future, digital measurement by means of 3D body scanners will be a standard part of clothing.

Directorate T – Common Technical, Logistic and Economic Activities

At Directorate T, the essential common technical, logistic and economic activities of the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) are pooled and managed centrally.

Thus, Directorate T has a wide range of responsibilities:

- Controlling (e.g. research and technology (R&T) projects, enhancing and enabling projects),
- Coordination (e.g. operations analysis, fast-track initiatives for operations),
- Support (e.g. for the BAAINBw executive group, projects, other directorates, all logistics processes),
- External representation (e.g. other major organisational elements, agencies, ministries, partner nations and international organisations),
- Licensing authority (e.g. transportation licenses), expert assessment activities (e.g. accident investigations, price audits).

Bringing together and concentrating common specialist tasks, Directorate T plays an essential role in the sequence of BAAINBw activities. In addition, Directorate T is deeply involved in the strategic

topics of the Armaments Agenda, the strategic control of research and technology matters and the In-Service Support Agenda. Consequently, Directorate T also plays an important role in efficient armaments management.

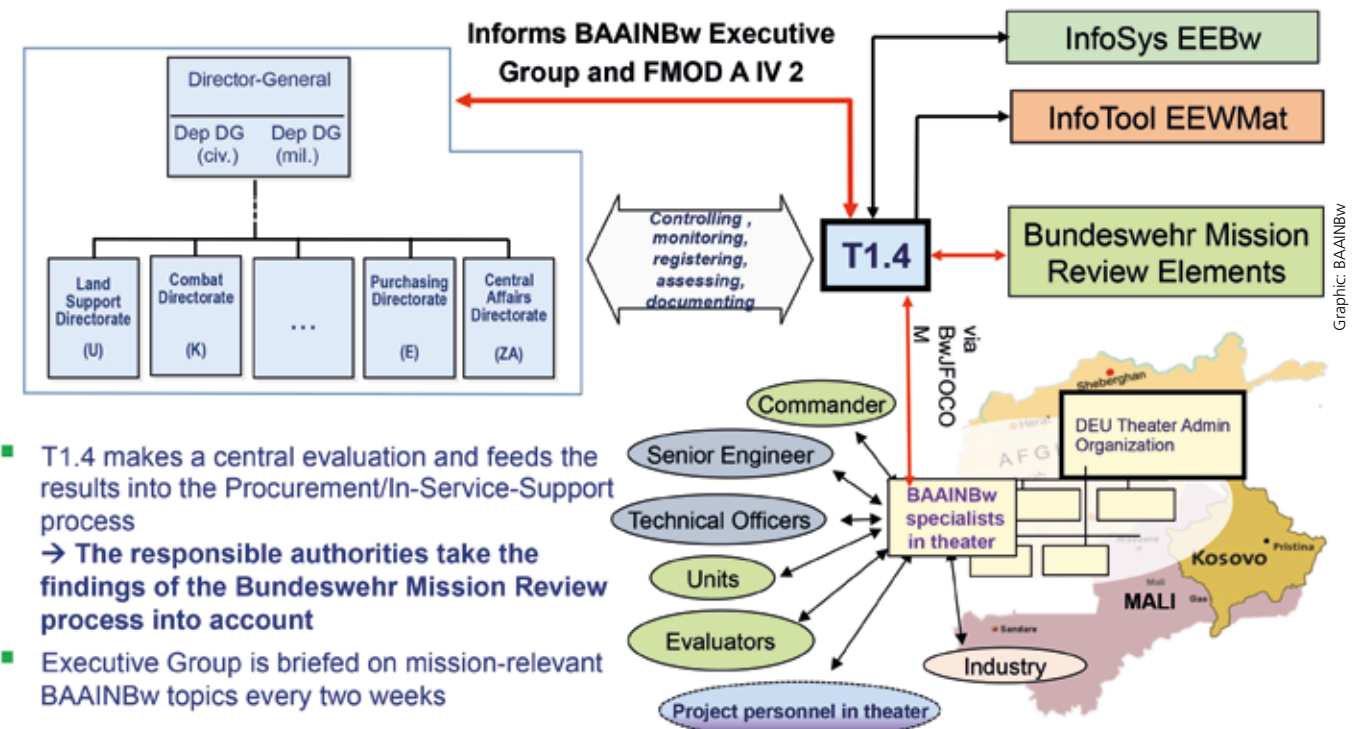
Division T1

Group T1 comprises the following tasks: Deployment matters, overall coordination of research and technology (R&T), international cooperation, project-related international interdepartmental agreements, official and training assistance. The portfolio of the T1 group is supplemented by the tasks of modelling and simulation (M&S), concept development and experimentation (CD&E), geo-information, defence material of other states, national and international standardisation, standardisation and technical delivery conditions (TL).

In addition to other tasks, Unit T1.1 is the central contract unit for the ZA, T,

ZsQ divisions as well as the OS, GB and J staffs. It is responsible for official and equipment assistance and concludes the necessary utilisation and disposal contracts for the utilisation of decommissioned military material and country transfer contracts in the case of transfer to other countries. This unit is also responsible for the coordination of upgrade programmes. The aim of upgrading assistance is to strengthen partner nations and allies in order to enable them to carry out their own sustainable peacebuilding and post-crisis rehabilitation, as well as crisis prevention and management. In individual cases, T1.1 also draws up mandate agreements to support partner states.

Unit T1.2 takes the lead in negotiating and concluding project-related international armament cooperation agreements with other nations - also within the framework of cooperation with various international organisations and agencies (NATO, EDA and OCCAR) -



The role of T1.4 in the mission review process

and, on the German side, oversees the US Department of Defence's Foreign Military Sales (FMS) programme. The field of armament cooperation includes drafting and negotiating agreements such as Memorandum of Understanding (MoU), Project Arrangement (PA) and Data Exchange Arrangement (DEA). In the FMS process, procurement contracts for weapon systems and related spare parts are concluded with the US government.

immediate initiatives for deployment (SiE), and on the other hand, these are tasks within the framework of deployment evaluation. The knowledge gained flows directly into the further development of material or the provision of services. In addition, co-checks of decrees and orders in the area of deployment/exercise and civil/military cooperation are centrally coordinated in the unit in order to ensure that the BAAINBw is taken into account in

ic equipment decisions. Internationally, the focus is on targeted networking with international partners in Europe, within the NATO Science & Technology Organisation and beyond.

In addition, Unit T1.5 coordinates the evaluation of defence material from other countries. This provides a valuable basis for the analysis of capability gaps and the threat-oriented technical adaptation of the systems introduced in the Bundeswehr.



Examples of safety and environmental protection requirements for a weapon system

Unit T1.3 coordinates and controls international cooperation in the field of cross-sectional, non-project-related armament cooperation. It is the central point of contact for the BAAINBw in general matters relating to OCCAR, the EDA and for the joint liaison system of the Bundeswehr. In addition, the unit is responsible for processing technical delivery conditions and for controlling and coordinating standardisation work in the Bundeswehr and NATO standardisation work in the AIN organisational area. Unit T1.4 performs coordinating and controlling functions in various fields related to operations. On the one hand, these are tasks within the framework of the procurement of emergency and urgent requirements, the so-called

these documents in accordance with the mission. In addition, the BAAINBw's specialist personnel on deployment are coordinated and supervised here. During deployment in Mali, this personnel serves as a catalyst between the troops on the ground and the project managers at the BAAINBw for the swift resolution of any problems that arise with equipment and clothing. Unit T1.5 coordinates all activities of the BAAINBw in the field of defence research and technology (R&T). In the national part, the aim is to ensure the department's own analysis and evaluation capability outside of projects and to provide scientific and technological knowledge in all relevant technologies for expedient, intelligent and econom-

Unit T1.6 is responsible for modelling and simulation (M&S), concept development and experimental verification (CD&E) as well as geo-info consulting for the projects in the BAAINBw. The 'Leitstelle M&S' in the unit coordinates existing and new M&S standards of the Bundeswehr in the national and international environment (NATO, EDA). It conducts numerous R&T projects relating 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 augmented reality, virtual reality and mixed reality (AR/VR/MR) or 'XR' for short. The 'SimDBw Coordina-

tion Centre', which is currently being set up, is to provide future simulation systems with models of weapon systems. The CD&E Control Centre is the Single Point of Contact (SPOC) for CD&E in the BAABW and has successfully completed the '3D-DruckBW' project in 2022. Current projects include the use of 5G technology, unmanned driving, land systems, digitalisation of military training areas and optimisation of operational command for the KdoTerrAufgBW. The GeoInfo Element BAABW performs the following functions:

- advises the project units in the BAABW,
- is the point of contact for the provision and request of geo-info data and products in the OrgBer AIN and,
- coordinates the provision of geo-simulation data in order to optimise the supply of all Bundeswehr systems with quality-assured simulation data as the 'SimDBW Coordination Office', which is still being set up.

Division T2

The project managers are responsible for the procurement of defense materiel, the observance of regulations and standards concerning occupational safety, environmental protection, ergonomic design of workplaces and weapon system/ammunition safety. After all, Bundeswehr civilian and military staff are entitled to the same standards of health protection and ergonomics at their places of work as employees working in commercial industry. Furthermore, Bundeswehr activities – e.g. in training, in theaters of operations and in weapon system maintenance – must have no inadmissible impacts on the environment. When determining and establishing suitable requirements for a weapon system, the project management is advised and supported by the experts for 'product-specific protection activities' of Division T2.

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 have to be found, and it has to be assessed whether the protection of the personnel and/or the environment can still be adequately ensured with these measures. The assessment of the proposed solutions, which may involve waivers and deviations from occupational safety and environmental protection regulations, is another responsibility of Division T2.

Apart from these traditional responsibilities in the field of occupational safety, the focus is also increasingly on functional safety and/or software security when assessing system safety due to the progress and dominance of smart system components in weapon systems.

In addition, Division T2 deals with the investigation of accidents during weapons and ammunition handling. The 'Officer for Design Safety of Ammunition and Firing Safety at BAABW' is also part of the division.

Another task of Division T2 is to take care, at an early stage, of the disposal of materiel that the Bundeswehr no longer needs or uses. To this end, the specialists in charge of this task control and monitor the recycling/reuse or disposal of Bundeswehr materiel. They ensure that the resulting costs are minimised and a maximum financial return is achieved from recycling or reuse. In doing so, special attention has to be paid to observing the provisions of the War Weapons Control Act, of weapons law and environmental law. If the suitability criteria are met, the materiel is sold – via the German utilisation company VEBEG¹ – to third parties or transferred to friendly nations/organisations entitled to receive such materiel.

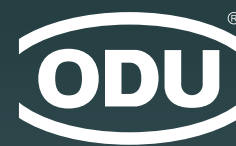
The Scientific Collection of Defense Engineering Specimens (WTS) is BAABW's defense engineering archive and contains functional demonstrators. As such, the WTS contributes to preserving expertise in the armaments sector and thus supports the career training of civil servants and pre-deployment training of forces by lending out foreign weapons. Interested citizens have access to the public part of the exhibition, which is located in Koblenz-Lützel and comprises 2,500 exhibits, allowing them to trace the major lines of development in military technology from the late 19th century until today.

Finally, Division T2 coordinates and supports the occupational health management activities offered to the BAABW personnel in Koblenz/Lahnstein.

Division T3

Division T3 is divided into the following branches:

- Cost Competence Center (T3.1),
- Price Auditing Policy/Common Price Auditing (T3.2),
- Price Auditing: Airframe/Engine Aeronautical Equipment (T3.3),



ODU AMC[®]

Systemlösungen für High End Dismounted Soldier Systems



odu-connectors.com

¹ VEBEG GmbH, a government-owned trust company responsible for the utilisation of discarded property of the Federal Republic of Germany and other public purchasers; its original name meaning 'company for the utilisation of goods formerly owned by occupying powers'.

- Price Auditing; Material Maintenance, Missiles, Other Aeronautical Equipment (T3.4),
- Price Auditing: Electronics, Sensor Systems (T3.5) and
- Price Auditing: Weapons and Ammunitions, Wheeled and Tracked Vehicles, Ships and Vessels (T3.6).

It is the task of the cost competence center to provide support concerning economic aspects for the execution and implementation of projects and programs in all phases of the CPM procedure. This is achieved by

- technical advice on the conduct of cost estimates in all project phases and the execution of parametric cost estimates,
- technical advice and support in the conduct of economic efficiency evaluations and IT efficiency considerations for armaments projects,
- assessment of alternative forms of satisfying demand and
- review and staffing of phase documents.

The support of economic efficiency evaluations within the context of 'external advice and support (eBU)' rounds off the task spectrum of Branch T3.1. In addition, T3.1 is the central point of contact within BAAINBw for matters regarding life cycle cost management and provides the representative in the NATO Working Group WG/3. The tasks of Branch T3.2 range from

- central control of price audits and co-operation with the pricing agencies of the German states,
- answering questions regarding fundamental aspects of pricing law, business administration and cost auditing,
- preparing work instructions and guidelines for the BAAINBw price audit branches and price negotiations,
- developing model contract price and cost arrangements, to
- supporting multinational organisations and NATO program offices and
- processing requests for official assistance of foreign governments as regards price audits.

The task of the operative price audit branches T3.3 through T3.6 is to provide, within the context of price audits, an expert opinion on whether the cost prices are appropriate in terms of technical and economic aspects and whether they are in conformity with pricing law. For this purpose, they assess the quantities and values quoted by contractors.

Division T4

Division T4, in charge of 'Common Activities Relating to Expenditures for Equipment, In-Service Use and Logis-

tics', combines responsibilities of a primarily common technical, economical and logistic nature.

The tasks of Division T4 focus on project support by managing logistics as a project element. It serves as the link to the Bundeswehr Logistics Command and is, as such, an essential service provider in the implementation of product-related logistic processes. Furthermore, in co-operating with the Logistics Command, BAAINBw strongly contributes to the tailoring and further development of the Bundeswehr Logistics System.

Branch T4.1 assumes basic equipment, in-service use and logistics tasks and advises the project branches with regard to the logistics project element within the framework of technical support tasks. The T4.1 unit is also involved in various special projects for the Bundeswehr. Furthermore, the unit is fundamentally involved in sub-projects of the utilisation agenda and in the further development of the BAAINBw.

In clear contrast to Branch T4.1, Branches T4.2 to T4.5 provide operational support to project directorates and agencies.

Branch T4.2 provides the project directorates with technical advice on almost all issues of materiel management (with the exception of bulk expendable supplies). This includes, for example,

- the management and forecasting of follow-on spare parts requirements and the monitoring of budget planning,
- Processing of guideline value overruns within the framework of procurement processes,
- the definition of the annual spare parts requirements of HIL GmbH (the state-owned industrial company to which Army logistic tasks are outsourced) in cooperation with the project directorates
- Implementation and monitoring of provisions within the framework of armament measures, including ammunition.

In addition, Branch T4.2 assists the project directorates in all matters of disposal of defense equipment, and it coordinates all disposal measures at BAAINBw. The appointed Defense Materiel Disposal Officer then makes final decisions about all disposals. In 2021, for example, there were approximately 10,100 material disposal projects with a procurement value of approximately 3.72 billion euros.

Branch T4.3 maintains the catalog of materiel planning objects for the Bundeswehr across organisations, thus

providing the basis for materiel target planning in all Bundeswehr agencies. Furthermore, the branch advises and supports the project directorates of BAAINBw with regard to the codification of materiel (on individual request); it is responsible for user administration in the 'equipment component list' data processing procedure; and it assigns project identifiers and defines technical responsibilities for supply items.

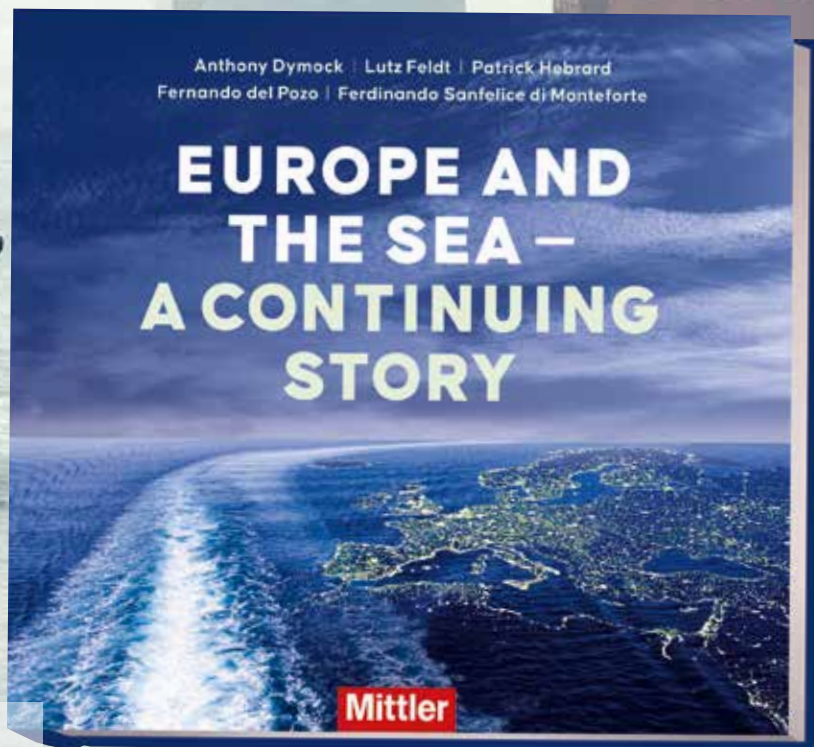
Branch T4.4 provides operational support to agencies subordinate to BAAINBw (Bundeswehr technical centers and research institutes, Naval Arsenal). It also exercises functional supervision in terms of their logistic tasks regarding the organisation of work, materiel management, maintenance and equipment planning. Moreover, Branch T4.4 has the in-service and supply responsibility for the AIN major organisational element (Equipment, Information Technology and In-Service Support).

Branch T4.5 is responsible for the management of imports based on procurement contracts of BAAINBw and its subordinate agencies, the Federal Office of Bundeswehr Infrastructure, Environmental Protection and Services (BAIUD-Bw), the Bundeswehr universities and the Bundeswehr Geoinformation Office. It is also responsible for disposal-related exports/shipments and for Bundeswehr materiel transfers to other countries, including requests to the Federal Office for Economic Affairs and Export Control (BAFA), customs clearance and export control at BAAINBw. In addition, the branch is responsible for and manages transport activities, fundamental transport issues as well as Bundeswehr materiel loans, free-of-charge transfers, the end use of defense materiel, and maintenance activities for equipment loaned by HIL GmbH.

In addition to these primary tasks, Division T4 is involved in several special organisations and task forces. This includes the subproject for the optimisation of spare part and exchange part management and the development of principles for the preparation/management of the project-related logistic concept (PLK) as part of the In-Service Use Agenda, the re-structuring of the fixed logistics facilities (oIE 2019+), the preparation and continuous revision of the Type A2 general publication on the performance of tasks in the in-service phase (WAN). Moreover, Division T4 coordinates the build-up of an operational stock of spares and replacement parts ensuring 30 days of supply. ■

EUROPE AND THE SEA

A CONTINUING STORY



29,95 €
ISBN 978-3-8132-1110-8
Order now at
koehler-mittler-shop.de
or by telephone
+49 (0)40 /70 70 80 322

Scan me & order
now!



Mittler
mittler-books.de

Technical Quality Management Center (ZtQ)

The financial volume of materiel and services which, on a daily basis, are checked for contract conformity, released for delivery or referred back by the Technical Quality Management Center in the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw, Directorate ZtQ) amounts to tens of millions of euros. In addition to providing the Bundeswehr with appropriate equipment, the focus is also on the sustainable and economical use of taxpayers' money. At the same time, the ZtQ Directorate bears the overall responsibility for technical quality aspects of the materiel, the quality of which can determine the safety of soldiers. Accordingly, ZtQ supports high-risk projects in terms of technical quality assurance from the beginning of their conceptual design, through realisation (procurement), in-service use and maintenance, to disposal.

The commercial aspect of these activities is governed by the framework conditions contractually agreed between the customer and the contractor. Government quality assurance activities accompanying the production process are also included in ZtQ's remit, be it by the implementation of the General Terms of Contract for the Provision of Supplies and Services (VOL/B) or the Allied Quality Assurance Publications (AQAP; NATO quality assurance publication with a normative character). The quality management system of Directorate ZtQ, which is based on DIN EN ISO 9001:2015 (Quality management systems – Requirements), defines the proce-

dures for government quality assurance within BAAINBw.

The challenge of an increasing complexity of purchased goods and services needs to be met also in the field of quality assurance, and a purely process-oriented optimisation is not sufficient. In addition, a continuous evolution of methods in government quality assurance is of crucial importance. Continuing the digitalisation process and using the opportunities it offers remains a significant aspect in this endeavour, which may require a new mindset and goes well beyond IT support for traditional administrative practice. Tools for checking suppliers, for random and incident-based

testing of products and requirements, as well as a uniform database available throughout the country are aspects that are relevant in the context. The aim is to take robust, preventive and predictive measures to ensure quality.

One Directorate, 23 regional offices, 60 locations

With its complementary quality assurance activities – based on the contractors' and the suppliers' proof of qualification (certificates) as well as their quality management activities (such as documented tests and inspections) – the ZtQ Directorate increases the public customer's confidence in full

Government quality assurance in the Bundeswehr



conformity of products with contractual and economic requirements. This confidence justifies the subsequent acceptance of the finished product as a legal act. There are approximately 450 employees in the decentralised ZtQ regional offices, working all over Germany directly at the premises of contractors of the Bundeswehr or its partners. From 60 branch offices, they provide direct support to project managers and thus, indirect support to our armed forces in tracking and demonstrating contractual progress step by step and in support of production. They independently process maintenance contracts with industry, particularly concerning the implementation of open-end maintenance contracts with factory repair.

Directorate ZtQ – Certified in accordance with ISO 9001:2015

ZtQ is the first directorate of a higher authority in the area of responsibility of the Federal Ministry of Defence (MOD) to implement and maintain a quality management system (QMS) certified by an independent third party in accordance with ISO 9001:2015. This QMS integrates all BAAINBw ZtQ activities and provides an effective and efficient basis to further develop internal priorities, job descriptions and methods. On both the government's and industry's side, there is a trend toward holistic management systems that integrate and make transparent all major organisational and/or business interdependencies, such as resource, IT, financial, occupational safety and sustainability management. The fact that ZtQ is able to set standards with its QMS is also reflected by the results of the successful QMS recertification from March 2021. In the Covid-19 framework, the ZtQ quality management system, with its detailed processes, workflows and guidance, has proved to be a valuable tool for both new and existing staff members, facilitating targeted and efficient cooperation under contact restrictions.

IT support – Driving force and opportunity

The way forward in quality management is, not least, characterised by the consequences of comprehensive digitalisation. The first building blocks of digital administrative work with regard to audit-proof electronic documentation, workflow-based case management,

cross-organisational cooperation and procedural support of technical procedures have already been implemented. They form the basis for the integration into a network of previously isolated IT solutions and for mutual access to data which had previously been independent of one another. This, in turn, will create new perspectives on relevant issues and thus contribute to the control of quality-related key performance indicators (KPI).

Due to their clearly definable tasks and roles within the scope of any procurement and throughout the life of defence materiel, many activities of the ZtQ Directorate are ideally suited for IT support. Thus, government quality assurance procedures are reflected in the 'QM module' of the enterprise resource planning (ERP) system employed by the Bundeswehr. In order to continuously increase convergence toward a coordinated overall system, the individual functionalities are rolled out in a differentiated manner, according to different task areas.

Participation in national and international bodies

As a member of a number of national bodies and associations, the ZtQ Directorate maintains a dialog with partners from industry and science to further develop methods and procedures in the field of quality management. In addition, the continuous exchange with German industry associations, such as BDSV (a member of the Aerospace and Defence Industries Association of Europe), serves to improve standardised contractual agreements for quality assurance in Bundeswehr contracts with the German defence industry and foster their mutual acceptance. Small and medium-sized enterprises (SMEs), in particular, benefit as Bundeswehr contractors from the better understanding of these contractual arrangements achieved through this committee work.

Equally important for ZtQ is the active and formative participation in relevant NATO bodies in which NATO partners, friendly nations and OCCAR (Organisation Conjointe de Coopération en Matière d'Armement) exchange experience and information and develop common strategies for government quality assurance. As a result of this exchange, these bodies regularly review and update the relevant NATO AQAP for mutual support in accordance with STANAG 4107.

The integration of government quality assurance (BAAINBw ZtQ), which enjoys a high reputation among the NATO partners, is therefore a regular prerequisite and, thus, an enabler for German industry contracts from friendly nations.

So, it is not surprising that the quality inspectors from the ZtQ regional offices use more than 10 percent of their working hours for contracts between our NATO partners and German companies, or for bilateral agreements on government quality assurance.

Audits: Benefits and opportunities

Government quality assurance provided by the ZtQ Directorate is not only intended to ensure and demonstrate the contractual conformity of the products and services delivered to the Bundeswehr or its partners. Rather, in modern quality management many priorities of effort shift toward continuous support of contractor development in order to establish long-term confidence in the supplies and services rendered by industry as a strategic partner of the Bundeswehr. Against this background, it is important to expand the contractor-related audit activities of ZtQ. In this context, the contractor's quality management system and individual quality assurance measures are considered in a holistic way. It should be noted that with the consistent expansion of an IT-based quality management, audit management is also becoming increasingly digitalised and geared toward the future.

Conclusions

Directorate ZtQ supports the preparation of Bundeswehr contracts, checks production and maintenance services of industry for contractual conformity and, where appropriate, provides the impetus for the further development of industry's own quality management systems. The Directorate, acting as a strategic partner of industry, thus contributes significantly to the reliability and functional safety of materiel and makes an essential contribution to the materiel readiness of the Bundeswehr as well as to the protection of the life and limb of our soldiers.

In addition, it ensures the economical use of taxpayers' money in accordance with the principles of economic efficiency pursuant to Section 7 of the Federal Budget Code. ■

Central Affairs Directorate (ZA)

The Central Affairs Directorate (ZA) of the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) is in charge of central administrative affairs.

Four divisions with a total of 21 branches and one directorate office deal with interdisciplinary and general administrative matters.

The Directorate Office of ZA directs, coordinates and controls matters that affect all divisions.

Division ZA1 Organisation, Process Orientation Officer for Branch AIN, Security and Alarm System, Specialist Information Centre

Division ZA1 consists of four Branches. It is responsible for organisational structures and procedures of BAAINBw and its agencies, organisational consulting (organisational studies and manpower requirement calculation), cost and performance accounting (CPA), process orientation, and the BAAINBw continuous improvement process (CIP).

It is also responsible for any issues relating to military and industrial security and the request for visit process. The Security Officer of the BAAINBw and the Senior Military Security Officer AIN are situated here.

The BAAINBw Technical Information Centre researches, acquires and archives necessary technical information and makes it centrally available to BAAINBw and agencies staff. Bundeswehr contractors receive technical information and regulations as part of contractually agreed government-furnished items. Bundeswehr units on deployment abroad are supplied with regulations using the DvWeb internet portal. Furthermore, this Branch is responsible for administrative tasks in the area of technical regulations for the entire Bundeswehr. The Active Regulation Management functional area offers assistance to the Publication Management Centre established at the Bureaucracy Reduction, Publication and Working Time Management Branch at the Federal Ministry of Defence and to the Bundeswehr Regulation Management division at the Armed Forces Office, providing support in implementing regulation management at BAAINBw and its remit.

Division ZA2 Financial Management

Structure and tasks of Division ZA2 – Finance – are marked by the particular responsibilities of BAAINBw, which is not only a major procurement agency of the Federal Republic of Germany and thus an important public customer, but has also had materiel responsibility for the operational viability of defence materiel since its founding. The division also administers the budgetary funds required for BAAINBw administration. The tasks of financial planning and implementation of the budget as well as all matters relating to the main accounting process in the BAAINBw are pooled in Division ZA2.

In detail, this includes, in addition to dealing with fundamental issues of tax and budget law during contract review and consultation, the monitoring and corresponding booking of all current claims of the Federal Government (recoveries, contractual penalties, interest, etc.).

Another main task is the planning and management of financial resources for the following areas.

This includes the management of financial resources for research and technology as well as for the development and procurement of defence equipment. This includes the new Special Fund of the Bundeswehr (Sverm Bw) established in 2022, which provides for additional investment procurements to the tune of 100 billion euros.

The management of financial resources to ensure material maintenance within the framework of material responsibility for operational readiness in the Bundeswehr is another area. This includes tasks in the area of financial requirements analysis, budget management and budget management.

Other important tasks are financial planning and funds management of the funds required for maintaining the operability of BAAINBw and its subordinate agencies. Furthermore, the funds for information technology and the Bundeswehr information and communication system as well as for operator solutions are planned and managed in this Branch.

In addition to the settlement of contracts concluded by the BAAINBw, the tasks include the agreement of final cost reimbursement prices and the recovery of any overpayments after a price check has been carried out.

Group ZA2 is responsible for co-auditing and co-signing all notices of intended federal grants in the BMVg and the BMVg division in accordance with sections 23 and 44 of the Federal Budget Code (BHO) as well as auditing completed grants in accordance with section 44 of the Federal Budget Code (BHO). The Accounting Process Officer SASPF is responsible for all aspects of the main accounting process in the BAAINBw.

The Centre of Competence Taxes Bw consists of three pillars - VAT, income tax as well as IT support and ICS (internal control system), deals with overarching tax issues for the entire BMVg division and is under the technical supervision of BMVg R III 6.

Division ZA3 Responsibilities for Human Resources, Procurement Supervision of the Departments, Cross-Sectional Legal Matters

Group ZA3, which consists of five units, is responsible, among other things, for the tasks assigned to the BAAINBw for civilian and military personnel.

This includes coordinating the interests of the civilian personnel of the BAAINBw. In this respect, this is the central point of contact for the Bundeswehr's personnel processing offices. The group is also responsible for providing assistance to the Federal Ministry of Defence, the Federal Office of Personnel Management of the Bundeswehr (BAPersBw) and the Bundeswehr Service Centres (BwDLZ) in personnel matters.

Further tasks include decentralised personnel management with the handling of personnel matters of the military personnel of the BAAINBw and the subordinate offices as well as the performance of tasks of the personnel requisitioning body in military personnel management.

Branch 'Strategic Planning of Training and Continuous Professional Development for AIN Personnel, Attractiveness Agenda' is responsible for coordinating matters pertaining to basic and advanced training of civilian and military staff of BAAINBw and its agencies. The Branch's responsibilities also include support for the Federal Office of Bundeswehr Personnel Management in matters of personnel recruitment measures. Additional tasks are disciplinary affairs, general administration and consulting in matters of the equal opportunities, personnel representation and disabled persons law. The Branch also deals with matters regarding the balancing of work and family life, in particular with the establishment and overseeing of BAAINBw childcare facilities in Koblenz and Lahnstein.

It exercises functional supervision of BAAINBw agencies' procurement activities (contracts/contract award) and advises the decentralised military personnel management on questions of military law.

The manager of the Personnel major process in the AIN major organisational element and the BAAINBw administrative data protection officer are also located here.

Division ZA4

IT Officer BAAINBw, Infrastructure and User Administration Affairs, Internal Service, SASPF Main Process Management Armament (HPM Armament)

Division ZA4 consists of four Branches. Among other things, this is where the IT

service, including the office's own IT operations, is located. This includes the classic tasks of IT service management for the provision, administration and user support of the required and requested IT hardware and software as well as the provision of central IT services and special applications for armament projects via the BAAINBw's own server farms in its computer centre.

The coordination, control and commissioning of IT relocations in the BAAINBw together with the IT service provider BWI form a further focus.

The civilian organisational area Equipment, Information Technology and Use (OrgBer AIN) is responsible for determining and specifying its own infrastructure requirements in analogy to the provisions for the armed forces (TSK). In addition, the task area of infrastructure is performed for the in-house companies of the Federal Government in the BMVg division (HIL GmbH, BwBM GmbH, BwFPS GmbH, BWI GmbH and GeKA mbH) which are assigned to the AIN organisational unit in terms of infrastructure.

For the year 2022, the technical support of the 'Bw Bekleidungsmanagement 2023ff' (Bw Clothing Management 2023ff), which is assigned to the area of complex services (KDL), and the 'Kompetenzzentren Rad und Kette' (Centres of Competence for Wheels and Chains), which are to be conceptualised within the framework of the future development HIL 2031, are to be named as outstanding projects.

The Activities in Representation of the User area coordinates all matters concerning the sites, facilities and accommodation of

BAAINBw in Koblenz, Lahnstein and Bonn. The internal service for the BAAINBw with the subject areas 'procurement for own use', 'budget', 'logistics and material supply', 'transport service', 'mail and messenger service', 'print shop' and 'VS registry' can also be found here.

The scope of responsibility of Branch ZA4.3 includes internal services for BAAINBw with the areas 'Procurement of own requirements', 'Budget', 'Logistics and material provision', 'Motor pool', 'Postal and messenger services', 'Print shop' and 'Classified material registry'.

Another unit is responsible for the area of 'Armament Process Management' (HPM Rü). The Armament Main Process designs and optimises, independently of the organisation, the core process components in the Bundeswehr's process network that are required for the provision of equipment-related material requirements in a technically, economically and temporally appropriate manner. The focus is thus on business process workflows for:

- the procurement (purchasing) of products and services (SAP MM-PUR and 'AI Awarding Manager'),
- the support of Bundeswehr project management (SAP PS/PPM),
- Bundeswehr quality management (SAP QM), and
- the distribution and sales of products and services (SAP SD)

Workflows are thus shaped and coordinated with the other major processes (for example Logistics and Accounting) for all organisations. ■

SIMPLIFYING DEFENSE PROCUREMENT:

WE KEEP YOU MISSION READY

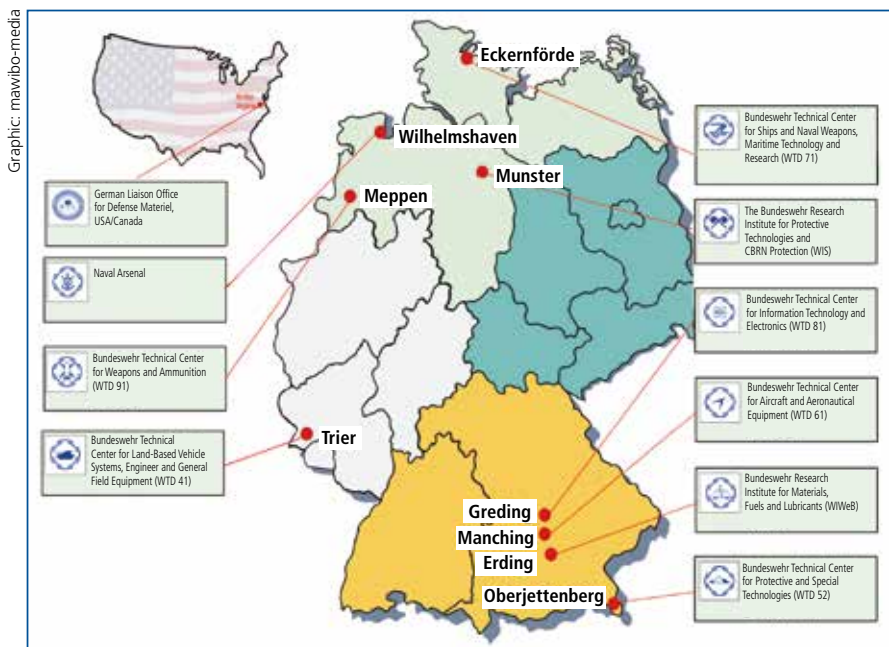
RAS/FAS/VERTRAP SYSTEMS . ENGINEERED PARTS . SPARE PARTS



The BAAINBw Agencies

A total of six defence technology departments, two military science departments and the Naval Arsenal are subordinated to the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw).

In addition, the German Liaison Office of the Armaments Division USA/Canada (DtVStRu USA/Ka) in Reston, Virginia, USA, is also part of BAAINBw.



Project VGMw

In the VGMw project, two proposed solutions are being investigated in analysis phase II as part of R&T (Research & Technology) stage 3:

1. consideration of two commercially available road layer systems (pictures 1 and 2).
2. modified mat sets for the already introduced folding road laying (picture 3)

Road laying systems

In this phase, the main components of two different commercially available systems, i.e. a self-sufficient road laying platform with 50 m of road surface and a static platform (replacement roller support) with 50 m of road surface, are being investigated.

The road laying system has a self-sufficient electrical and hydraulic power supply, which is used to rotate the super-

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

WTD 41 is the Bundeswehr centre of expertise for the technical assessment of land-based vehicle systems and engineer and general field equipment.

The agency on Grüneberg hill in Trier provides the expertise for the assessment of wheeled and tracked vehicles including their assemblies, while the branch offices in Koblenz focus on analysing engineering and general field equipment, in particular engineer vehicles, POL supply, camp systems, wet gap crossing systems and robotics.

To perform its tasks, WTD 41 is staffed with highly qualified personnel and is equipped with a unique infrastructure.

From the abundance of tasks, the project 'Capabilities for reinforcing and making marching ways passable (VGMw)' will be dealt with in the following as an example. Studies on the project are currently being carried out in the Koblenz-Rübenach field office.

Photo: Deschamps



Deschamps road unroller with FCR3 aluminium plates

Photo: Deschamps



Faun Trackway M150 road layer



Photo: Bundeswehr

Road layer from KMW, using a folding road made from hexagonal aluminium plates

structure of the platform and lay the road surface.

Once the first layer of the laying system has been laid, another 50 m of road surface can be placed on the laying system using a replacement roller carrier, and then laid as well.

Foldable road layer

The future viability of the introduced folding road layer depends on two essential prerequisites:

1. modular design of the laying equipment;
2. increasing the load-bearing capacity of the aluminium hexagonal plates.

The laying device of the folding road unit and its carrier vehicle are firmly connected to each other in the current state of construction. A rough concept of modular construction was worked out with the result that the laying device can be converted with an assessable risk.

An increase in the load-bearing capacity of the folding road is necessary when using

protected vehicles and in view of the many vehicles now in use with a military load class from MLC 50. Modification and optimisation of the aluminium hexagonal plates was already initiated during analysis phase I as part of R&T stage 2, and two new sets of partial mats will be delivered to WTD 41 this year after manufacture. At the beginning of 2023, these sub-mat sets will be classified in terms of load-bearing capacity.

Challenges regarding ground types, additional work by the earthworks laboratory The subsurface of the test track on which the rolling/folding roads are laid down is prepared in accordance with the folding road tests carried out in the past at WTD 41.

Here, a soil bearing capacity of 'Konus-index 60' (CI 60) was determined on the 'slightly gravelly, sandy, clayey silt' soil type of the excavation site.

The employees of the earthworks laboratory ensure that the soil of the test section to be driven over is prepared in accordance with the aforementioned requirements.

Implementation programme

The following tests are planned:

- Functional tests and compatibility tests:
 - Determination of basic and static characteristics of WTD 41's tilt plate;
 - Investigation of carrier vehicle interface and system components.
- Investigation of the rolling/folding roads (driving tests):
 - Laying, driving on, and picking up the different roads;
 - Laying of the roads on test track with defined subsoil (CI 60);
 - Driving on roads with different load vehicles;
 - Damage assessment, deformation measurements, lifting the roads;
 - Determination of the total mass and the axle loads.

Trials of both systems by WTD 41 were completed in 2023, however the Army and Joint Support Service (SKB) are set to continue until Q1 2024.

Challenges regarding ground types, additional work by the earthworks laboratory

The subsurface of the test track on which the rolling/folding roads are laid down is prepared in accordance with the folding road tests carried out in the past at WTD 41.

Here, a soil bearing capacity of 'Konus-index 60' (CI 60) was determined on the 'slightly gravelly, sandy, clayey silt' soil type of the excavation site.

The employees of the earthworks laboratory ensure that the soil of the test section to be driven over is prepared in accordance with the aforementioned requirements.

TIED TO THE OCEAN

We give structure to the sea.



**INDEPENDENT
NAVAL CONSULTANTS**

www.mtg-marinetechnik.de

**The Center of Knowledge
and Competence for the
Maritime Dimension.**

The Bundeswehr Technical Centre for Protective and Special Technologies – WTD 52

The Bundeswehr Technical Centre for Protective and Special Technologies (WTD 52) in Oberjettenberg contributes defence technology expertise in a variety of protective technologies to the Bundeswehr. These include:

- protection of infrastructure against weapon effects and Improvised Explosive Devices (IED) as well as ammunition storage safety,
- numeric simulation of protection and effects,
- indirect protection (camouflage, concealment and deception),
- non-lethal weapons (NLW) and
- physical detection of IEDs.

As an example of the extensive expertise of the office, the topic of 'Mobile multispectral camouflage equipment for the Bundeswehr' is described in more detail below.

As early as 1999, the Bundeswehr Technical Centre for Protection and Special Technology (WTD 52) took over technical responsibility for supply articles for indirect protection (camouflage and deception, signature management) from the former Federal Office of Defence Technology and Procurement (BWB) and located the task in Business Unit 310 (GF 310). Within the framework of the technical responsibility for camouflage material, an essential core task is to control the research activities for indirect protection. Due to emerging demands for vehicle

interior due to its insulating effect. This relieves the burden on an existing room cooling system. Platforms such as the Marder infantry fighting vehicle (SPz) and the self-propelled howitzer (PzH) 2000, which were equipped with mobile multispectral camouflage (MMT) as part of a procurement of immediate operational requirements (ESB) for the ISAF mission in Afghanistan, benefited from these findings. In 2012, GF 310 contributed its expertise in adapting the camouflage equipment to the PzH 2000 in Afghanistan on site in Kunduz and Mazar-e-Sharif. By combining cooling systems for electronics and propellant charge, as well as MMT, it was possible to ensure the functionality of the system in the PzH 2000 even at high outside temperatures. The demonstrably improved camouflage effect initially took a back seat here. In the MINUSMA (Multidimensional Integrated Stabilisation Mission of the United Nations in Mali) operation in Mali, material and personnel were also exposed to considerable solar loads.

With the assumption of responsibility in the Gao region (Mali), the Fennek 1A2 reconnaissance vehicle, as a powerful 'sensor' of the reconnaissance company, was also affected by the climatic conditions. The high temperatures put a strain on both the technical equipment and the crew of the vehicles. By procuring MMT for the Fennek 1A2 reconnaissance vehicle via an Immediate Deployment Initiative (SiE), an improvement was achieved for the personnel and material with regard to the temperature load. The equipment of the vehicles on site and the use of the MMT were closely supervised by specialist BAAINBw personnel in the field and the project management. Vehicle crews testified to a noticeable reduction in temperature and an increased camouflage effect.

The operational findings will be used by GF 310 to optimise future camouflage equipment. After MMT were initially procured exclusively via ESB or SiE, the Multispectral Signature Reduction initiative for Army platforms was created in 2017 to close the capability gap in multispectral signature reduction of Army platforms. This initiative also served as a reference when the initial actions were taken for the preparation of a FFF (Capability Gap and Functional Requirement) for a Mobile Multispectral Camouflage Equipment for the PzH 2000 for VJTF. Further deliberations on this project resulted in an FFF for Mobile Multispectral Camouflage Equipment for Bundeswehr

Photo: Bundeswehr



Multispectral camouflage cover for the PzH 2000

WTD 52's responsibilities also include special technology areas, for instance, aerodynamic load tests on pilot equipment, nuclear blast protection as well as underwater firing and detonation tests. The infrastructure specific to WTD 52 is geared to its tasks and makes best use of its location in the Bavarian Alps. This is why WTD 52 is organized into three major infrastructural areas. Apart from the administrative, laboratory and office buildings in the valley, which include compliance demonstration facilities and workshops, there are an underground facility in the 'Reiteralpe' massif and alpine test sites at an altitude of approximately 1,600 m, which offer a wide range of possibilities for research and compliance demonstration activities. The mountain site is linked with the facilities in the valley by our own cable car, which covers an elevation difference of 1,100 m.

camouflage which does not restrict the mobility or functionality of the vehicle, these research activities have been prioritised in this context. With the adaptation of a camouflage kit demonstrator to a Leopard 2A4 main battle tank as part of a study, the multispectral camouflage effectiveness of such a camouflage measure could be demonstrated. With the increased performance of Bundeswehr tasks outside Europe, especially in desert-like, arid areas of operation, the focus of GF 310 studies was realigned accordingly.

From 2006 to 2009, another study on the Fennek reconnaissance vehicle laid the foundations for a mobile camouflage adapted to the Bundeswehr's new operational spectrum. It was also proven that the camouflage equipment significantly delays the solar heating of the ve-

Combat Vehicles. On the basis of this FFF, all Bundeswehr platforms considered for MMT can be equipped with mobile camouflage.

GF 310 is the permanent representative in the Integrated Project Team (IPT), advises the project management on issues of indirect protection and is in charge of the verification process. Here, a process is also controlled that has proven its worth in the context of verification. In this process, the multispectral signature examinations of the platforms take place on the test stands of WTD 52. The roadworthiness of the platform with adapted MMT is determined with the involvement of the officially recognised expert at WTD 41. If the weapon or weapon system is affected by the MMT, further compatibility tests are commissioned at WTD 91.

The involvement of the defence technical services is coordinated by GF 310. This close cooperation proved its worth during the 2019 measurement campaign with the Leopard 2 and the 2022 measurement campaign with the PzH 2000. Thanks to the high level of commitment of the participants from the services, BAAINBw, institutes and armed forces, numerous technical and logistical challenges could be mastered. On the one hand, the results showed a high degree of maturity of the product; on the other hand, it became clear that conscientious verification can reveal considerable potential for improvement even with such products. A modern MMT serves to reduce the signature in the visual, thermal image and radar range. It optimises the interior climate control of the platforms and thus achieves improved ergonomics for the crews and reduces the load on the on-board electronics. In the coming years, multispectral stationary camouflage will be introduced in addition to mobile camouflage. The two camouflage options (mobile/stationary) are not mutually exclusive, but complementary.

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

Based in Manching, the Bundeswehr Technical Centre for Aircraft and Aeronautical Equipment (WTD 61) is a Bundeswehr technical centre of excellence which plays a vital role in ensuring that only safe and operational aerial vehicles are used in the Bundeswehr.

For this purpose, it is essential that the Bundeswehr is able to make judgements and provide advice independently of the manufacturing companies.

Therefore, aircraft and aviation equipment developed by industry on behalf of the Bundeswehr are tested and evaluated at WTD 61 by means of complex flight test projects in ground and flight tests. All newly developed flying systems of the Bundeswehr as well as modifications to aircraft systems in use are qualified and technically evaluated from the point of view of performance and characteristics as well as roadworthiness.

In order to be able to competently and promptly conduct flight and ground tests with its own test vehicles according to internationally recognised standards, WTD 61 operates its own test airfield and has representative, mission-relevant aircraft as instrumented test vehicles. All the test facilities necessary for the fulfilment of the task, its own test airspace, the necessary measuring equipment, as well as personnel trained and qualified to conduct a wide range of tests are unique selling points. The complex, specifically military and mission-relevant testing topics include, for example, the integration of airborne armament and effectors, software development, airdrop technology for people and loads, aerial refuelling, testing of new sensor and communication technology, night vision capability and, of course, unmanned aerial vehicle systems.

Numerous further developments are being made to the Tornado weapon system. After the software standard ASSTA 4.1 (Avionics System Software Tornado in Ada) was introduced into the force in 2021, ASSTA 4.2 is now being flight-tested in various cycles. This software standard mainly contains components for the HARM successor missile AARGM (Advanced Anti Radar Guided Missile). A fir-

ing of this missile is planned in the USA after completion of all software cycles at the end of 2024. In the field of avionics, the HUD (Head-Up Display) to be replaced in the next few years has been finally defined in terms of functionalities and formats, so that the foundation has been laid for a project phase in a software update/package yet to be determined. In the course of 'maintaining Tornado test capability', the modernised, network technology-based, flight test instrumentation (FTI) of the first of the WTD's test Tornados was and is being used in ongoing test flight operations. The second Tornado is currently being upgraded to this level of technology.

In the Eurofighter sector, a test firing with the IRIS-T missile was recently completed. The focus of the test was on two new software versions of the missile, an improved integration into the aircraft, as well as the testing of operational procedures and possible uses. In parallel, preparations are already underway for the flight test of the new national software development 'IMPACT 2.1' for the Eurofighter. Following this testing, a test firing with the AMRAAM and METEOR missiles is planned. All projects are being carried out in close coordination with the German Air Force in anticipation of a national Eurofighter test centre to be set up jointly.

With the takeover of the first A400M aircraft as a test vehicle of WTD 61 for the cooperation A400M Flight Test & Evaluation Centre (AFTEC), own flight operations could begin in June 2022. The required operation of a Continuing Airworthiness Management Organisation (CAMO) WTD 61 in cooperation with the



Photo: Bundeswehr

Testing the FZ225 rocket launcher at Kletz proving ground



Photo: Bundeswehr

Chute with dummy loaded onto CH-53

German Air Force has proven successful. Also in cooperation with the German Air Force, the operational capabilities of the A400M transport aircraft are continuously being expanded. This includes, among other things, the testing of the Container Delivery System (CDS) for dropping loads. In close cooperation with the TTVG LTG 62, it is currently being upgraded for HALO (High Altitude Low Opening) operations for maximum tactical benefit. Deployments from altitudes of up to 3,658 m (12,000 ft) have already been carried out successfully and with high accuracy. In the UAV Launcher project, the aircraft also functions as a technology carrier for future systems such as FCAS. In a first step, the safe separation of a drone in the 150 kg class was demonstrated. In the next phase of the project, the drone is to transition into controlled flight after take-off from the A400M and be controlled from a control station on the A400M, then hand over control to a ground station for mission completion. In the field of helicopters, too, WTD 61 handles a diverse range of tasks. For example, the approval of the new EPC-B automatic parachute system for the paratroopers was supported with flight tests. Here, the 'Manching chute' system, which has been tried and tested at WTD

61, was used to drop torso dummies from the CH-53 aircraft. This demonstrated that the new automatic parachute was suitable for safe use, and the first jumpers could be dropped. UH Tiger was used to support WTD 91 to create a destruction order for a rocket launcher dropped from the UH Tiger. The pilots of the WTD dropped two launchers. A successor for the fire tank on the NH-90 TTH was tested. Among other things, the maximum speed up to which a release is possible was determined in order to provide the troops with the greatest room for manoeuvre. For the NH90 NTH, testing of the ship-to-ship helicopter limitations (largest possible range for take-offs and landings) was prepared for use on a task force supply ship. For this purpose, a helicopter is equipped with flight test instrumentation for recording aircraft data.

WTD 61 is involved in all projects in the field of unmanned systems through a wide range of activities. A special business unit for unmanned aerial systems, including the National Competence Centre UAS (Unmanned Aerial Systems), acts as the central technical contact for UAS in the Bundeswehr and plays a central role in the Bundeswehr's R&T activities in the field of UAS.

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

Based in Eckernförde, the Bundeswehr Technical Centre for Ships and Naval Weapons, Maritime Technology and Research (WTD 71) works in all areas of maritime defence technology and research. It comprises a total of nine sites with measurement and test facilities throughout Schleswig-Holstein and currently employs a staff of 700. In addition

to its special infrastructure, the Technical Centre also operates the research ship Planet and other trials vessels to execute research and technology (R&T) projects as well as tests and final acceptance trials for the Navy.

Tests are one of WTD 71's main areas of responsibility. It is only during tests that new material or technical modifications can be tested for their contractually guaranteed functions. This often requires the involvement of many various public agencies and divisions of the German Armed Forces, which quickly turns planning, implementation and result assessment into a very complex management task. The following example of the technical acceptance of a new parachute for a lightweight torpedo provides an insight into the testing operation.

Testing of a new parachute for torpedoes in the German Bight

It all starts with the planning. Several aspects have to be considered and coordinated for the trials. The selection of a suitable and easily accessible sea area, the adequate equipment of the ship for the salvage as well as the embarkation of the necessary testing personnel (experts for salvage, torpedo technology, image documentation, testing management etc.) are only three of them. This is the task of the Operations Command, the key function on board. It has to coordinate the salvage ship, the securing of the sea area, the torpedo specialists and the deployment of the helicopter (the lightweight torpedo is deployed with a naval helicopter). For this purpose, the means of communication are coordinated in advance, and applications are made to reserve or close airspace and sea areas, as these must be monitored in such a way that any

Photo: WTD 71



The new parachute drops the torpedo safely into the water.

danger to third parties and the environment can be ruled out. Nevertheless, monitoring of the closed areas visually and with the help of radar is necessary during the trials and must be ensured by the mission command.

During a helicopter mission, the operations command is in radio contact with the pilot in order to confirm the flight altitude, speed and operational data of the torpedo to each other. In addition, constant contact with the ship's command is immensely important in order to check one's own position and to query the free sea area for the safe execution of the test. The best possible result is achieved if 2-3 trial runs are carried out before the actual test. If the procedure is correct here, the acceptance test starts. After a successful test, the torpedo is recovered and brought on board by the recovery team. The recovery team works closely together with the ship's personnel. On board, it is particularly important that everyone takes up their assigned position and performs their task prudently in order to ensure a smooth procedure and accident-free recovery. After recovery, the units involved, the sea area and the airspace are released again.

Once the training torpedo is on board, it is processed by the specialist personnel. This includes expert inspection for damage, reading out the recorded data and discharging the internal battery to rule out any danger during dismantling.

The biggest risk factor during trials is the weather. If the weather is bad, the planned trials have to be postponed. The technology can also sometimes go on strike, so that new plans have to be made. The most important thing is that all participants remain flexible, patient and creative, even if it sometimes takes longer.

The results of the experiment are summarised and discussed with those responsible. Here, initial findings are discussed to see if the next trial needs to be adapted at short notice. After a testing campaign, a deep analysis with final evaluation takes place.

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

WTD 81 in Greding is the centre of excellence for information technology and electronics in the field of Bundeswehr equipment.

Its core tasks are project support and assistance, the processing of technical tasks and the management of research and technology projects. Its core tasks also include project management for naviga-



Photo: Bundeswehr/Köster

Operating, transport and storage containers (BTuLB)

tion equipment, for cross-sectional measuring and testing equipment and the test centre for IT security in the Bundeswehr. WTD 81 has distinctive technical competencies in the following areas:

Information acquisition and processing, reconnaissance technology, electromagnetic compatibility, electronic warfare, unmanned systems, interoperability of command information and weapon engagement systems, radar and detection technology, communications, intelligent weapon systems, fire control technology, modelling and simulation, navigation and IT security.

To fulfil its tasks, the service has highly qualified personnel, modern, technically high-quality equipment and a unique infrastructure.

Two ongoing projects are illustrated below by way of example.

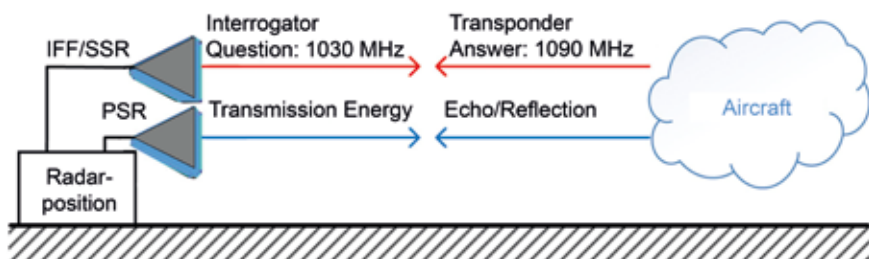
Evaluating a concept for mobile data centres

Within the framework of NATO's Federated Mission Networking programme, the German Mission Network (GMN) project has set itself the goal of developing HaFIS-com-

pliant data centres (Harmonised Command and Control Information System) in various sizes and deployment capability levels. Among these, highly deployable data centres are the smallest variant, which are to be operated in the operations centre (OPC) on ships, for example.

Suitable equipment must be identified and evaluated for this purpose. The cramped conditions demand, among other things, a minimum footprint, electrical power requirements and noise and heat generation of the hardware. At the same time, the computing power must be high enough to provide a minimal set of IT services from the HaFIS architecture service catalogue.

MilDef components from Roda Computers were selected for closer evaluation. These offer hardened boxes as operating, transport and storage containers (BTuLB), which are passively cooled. The initially planned two BTuLBs, each with two servers, a network switch, a network storage (NAS) and an uninterruptible power supply (UPS), had to be extended by another BTuLB with three UPSs, which supply the other BTuLBs with power. Since the boxes



Comparison of the IFF/SSR and radar principles

Graphic: Bundeswehr/Tesker

are stackable, the required floor space does not change.

According to the HaFIS architecture, a test scenario was developed in which the virtual machines (VM) of the shared service area (SSA) and the HaFIS service area (HSA) are physically separated and the SSA is not connected to the central NAS. The remaining three servers are built into a cluster for the HSA, which uses the NAS as central storage for the VMs. For the virtualisation, the comparable open source product 'Virtual Environment' from the company Proxmox was used instead of VMWare.

A programme was developed that simulates random user actions modularly and in several instances and currently offers SharePoint, Outlook Web Access and file services, among others. In order to be able to make transferable statements to GMN, the programme must be extended by a map service and some community-of-interest services. During the test, performance parameters such as CPU, RAM and network utilisation of the cluster and the individual VMs were monitored.

So far, the system has proven to be solid and reliable in the tests, even if, for example, a network storage repeatedly 'forgets' hard disks and has to remount them. However, further technical and operational tests are still pending.

IFF acceptance at ARED air surveillance radar

In Germany, three chains of air surveillance radars (LÜR) are installed (in north-south orientation): in the west Hughes Air Defence Radar (HADR), in the middle Active Radar Search Device (ARED) Einsatzführungsdienst der Luftwaffe, and Remote Radar Post 117 (RRP 117) in the East. Each radar of a chain covers at least 460 km (250 NM). A LÜR system consists of a primary and a secondary radar (PSR or SSR with identification friend or foe (IFF)). The IFF system requests the identity of cooperative military/civilian aircraft (see diagram).

To ensure military integrity, the encrypted Mode 5 is used in NATO. In the case of non-cooperative aircraft, the identity cannot be assigned and results, among other things, in clarification via radio (in cases of incorrect settings or defects) or, as a last resort, in the immediate ascent of an alert squadron (a group of fighter jets).

In order to meet the latest NATO requirements, system upgrades or replacements of successor systems must be carried out as needed. At the ARED radar position at Detached Platoon 242, WTD 81 success-

fully conducted a Site Acceptance Test (SAT) of the IFF system upgrade with the manufacturer. Among other things, the capability according to STANAG 4193 Edition 3 as well as the logistical resupply capability were ensured. In the SAT of IFF systems, in addition to the evaluation of random objects, among other things the radar system is surveyed against a known position with a Far Field Monitor (FFM). An FFM is a transponder that responds to the interrogations of the IFF system. The IFF system can use the responses to determine the orientation, range and altitude. The PSR ARED is based on gallium nitride (GaN) semiconductor technology. It is the most modern German air surveillance radar system.

Bundeswehr Technical Centre for Weapons and Ammunition (WTD 91)

The Bundeswehr Technical Centre for Weapons and Ammunition (WTD 91) plays an outstanding role worldwide as a centre of excellence for weapons and ammunition, including in the field of testing. This is where more than 250 experts from various disciplines thoroughly test potential Bundeswehr material. No ammunition, no rifle, no tank is introduced into the armed forces if it does not meet the high standards of WTD 91.

WTD 91 is located in Meppen, Lower Saxony, near the Dutch border. Its area of 19,200 hectares extends over 31 kilometres in length and up to seven kilometres in width. Weapon systems with a range of up to 28 kilometres can be tested here. The present site of WTD 91 was first put into operation in 1877 as the 'Krupp Shooting Range' by the industrial

magnate Friedrich Krupp for testing army and naval guns. After temporary use by occupying forces and the civilian population, the Bundeswehr finally took over the site and the existing leases in 1957.

WTD 91 is the centre of expertise for weapons and ammunition, mobile platform protection and reconnaissance within the Bundeswehr. It is responsible for or advises on all phases of the development, procurement and use of defence materiel as well as research and technology (R&T) activities. It also examines missiles, guided missiles, drones, as well as optical and acoustic devices, such as those used in target recognition and target sighting. This applies both to Bundeswehr-owned material and to the examination of foreign defence material. The testing of Bundeswehr material is about identifying and eliminating weak points. The aim of all testing is to further improve the equipment of German soldiers in order to be able to guarantee the greatest possible protection even under the toughest conditions.

The safety of each individual begins with the storage and handling of weapons and ammunition. There are many questions that soldiers do not have to worry about later because they have already been taken care of at the military base.

Take ammunition, for example: How sensitive is ammunition to external irritants such as temperature fluctuations, long transport routes or unintentional dropping? Do I need special transport devices? How long can a bomb be stored? What happens if a missile explodes unintentionally?

Answering these questions is part of the daily routine of the specialist staff at WTD 91. Ammunition is first broken down into its components here and examined

Photo: WTD 91



Vehicles can be measured from different angles using the sensor training system.

physically/chemically, and then tested in extreme situations. The findings can be taken into account, for example, during storage; as a result, the manufacturer sometimes has to make improvements. In extreme cases, the ammunition can be rejected altogether. This is because the consequences of an unintentional chain reaction of explosions in an ammunition depot or in action would be catastrophic. Technical modes of operation and mechanical resilience in extreme situations are also examined. If the Bundeswehr intends to introduce a new weapon system, WTD 91 will examine a great many scenarios in advance that the new weapon could encounter.

A Bundeswehr weapon must function reliably in heat, in cold and after prolonged time in and on salt water. Moreover, the system must not fail even in the finest desert sand.

In addition to technical tests, WTD 91 also focuses on the specific needs of the weapon carrier with regard to ergonomics, emissions and handling. Which ammunition penetrates which of our protective vests? Which helmet presses, slips or restricts field of view? Where are German tanks still vulnerable and what are the possibilities for improvement?

Test samples such as helmets, combat boots or protective vests are shot at and examined on the range under real conditions. Vehicle underbodies are blasted, armoured seats are tested for impact in a centrifugal apparatus. Increasingly, such tests are also supported by simulations in order to reduce the number of time-consuming real blast tests.

In addition to these extensive tests, WTD 91 also evaluates how the defence material behaves under real operational conditions, such as enemy attacks on vehicles or dismounted soldiers. On behalf of the Federal Ministry of Defence, the unit heads the expert team for the technical analysis of mine and explosive ordnance incidents, as well as incidents involving unconventional explosive and incendiary devices in action, or ETAV for short. With the involvement of experts from the civilian and military organisational areas of the Bundeswehr, past operational situations are analysed in detail in order to further improve the material and equipment of the Bundeswehr.

WTD 91 currently employs about 800 people, including about 250 scientists, engineers and technicians. These include specialists in:

- ballistics,
- acoustics,
- optronics,

- chemistry,
- physics,
- laser technology,
- Mechanical Engineering,
- electrical engineering and electronics,
- computer science and information technology,
- aerospace,
- surveying

...and many others. As one of the largest employers in the Emsland region, WTD 91 also offers up to 100 apprenticeships in six different trades.

Behind the entire experimental operation of the service is another – rather inconspicuous – department, which nevertheless has a high status in WTD 91: The Department of Meteorology and Geodesy of WTD 91. In addition to terrain surveying, ground weather measurement in firing positions and target areas as well as wind component measurements along the firing paths, the department also works with the German Meteorological Service. Only with the data obtained can the tests be carried out at all.

In addition to its highly qualified personnel, the Defence Technology Centre in Meppen has extensive equipment and measurement technology at its disposal. An 830 m long rocket sled track makes it possible to accelerate large-calibre warheads to twice the speed of sound before they hit their target in a controlled manner. In the environmental simulation

centre of WTD 91, any climatic scenario can be simulated for testing weapons, ammunition and technical equipment. High-resolution radar technology can be used to precisely examine the trajectories of missiles and projectiles. In the underwater blasting facility, the bombardment or blasting – even of ship hulls – is examined.

In addition, WTD 91 is researching the military usability of virtual, mixed and augmented reality. A hall is currently being converted for this purpose, in which research is being conducted into the extent to which infantry scenarios such as local and urban combat can be trained safely in a virtual environment. In contrast to conventional situation training, the three-dimensional representation through virtual reality goggles makes the experience seem more real and biological-psychological factors such as stress and fear can be observed and influenced.

The Bundeswehr Research Institute for Protective Technologies and CBRN Protection (WIS)

As a military research facility, WIS is concerned with the protection of Bundeswehr service members against the effects of nuclear, biological and chemical weapons of mass destruction. Other primary tasks include fire protection technology, protection against strong electromagnetic fields and drinking wa-



**Defence Science Institute
for Protective Technologies –
NBC Protection (WIS)**

Graphic: WIS



Photo: U.S. Army Medical Research Directorate-Georgia

Georgia implemented a voluntary transparency initiative 'Peer Review Mechanism' in 2018 at the Richard M. Lugar Center for Public Health in Tbilisi, and was able to demonstrate to an international panel of experts that the BWC is being complied with.

ter treatment. The institute develops the technical-scientific fundamentals required for this purpose and contributes to covering the demand for CBRN and fire protection equipment. As a service provider for policy-makers and the general public, WIS ensures the capability of assessing CBRN weapons.

In the operational areas of WIS, application-oriented issues are researched by highly qualified personnel and examined using scientifically sound methods, while technical expertise is constantly advanced and extended. The current tasks in the armaments process are characterised by interdisciplinary approaches and interlinked task performance.

Thematic Implementation of the Biological Weapons Convention – A Contribution of the WIS to Arms Control and New Technologies in Departmental Research

Arms control, transparency and confidence building are essential elements of a forward-looking security policy. They have a crisis-preventive and conflict-preventive effect and contribute to peaceful dispute settlement and disarmament. In this context, rapid technological innovations and strategic developments require constant adjustments in order to recognise the early detection of militarily relevant trends, especially in the field of biological weapons as well as in the field of biotechnology. The assessment of these capabilities is important for confi-

dence-building and transparency in arms control and is part of the fulfilment of the mission of the WIS.

The Biological Weapons Convention (BWC) is an international treaty that entered into force on 26 March 1975 on the prohibition of the development, production and stockpiling of bacteriological and toxin weapons and on the destruction of such weapons. Germany has been a member state since 7 April 1983. Because the 184 States Parties have not yet been able to agree on the establishment of a verification regime, transparency initiatives and confidence-building measures are of particular importance in monitoring compliance with the BWC. An example of a transparency initiative is the voluntary peer review mechanism. Here, international experts visit BWC-relevant national research institutions and assess compliance with the BWC. WIS experts were involved in the preparation of two transparency initiatives in an advisory capacity in Germany in 2016 and in Georgia in 2018.

Germany also supports the improvement of the operationalisation of the United Nations Secretary-General Mechanism (UNSCM) for investigating suspected use of biological and chemical weapons with concrete measures such as expert training and workshops. The VNSGM is to be used in the BWC as a replacement mechanism for the non-existent verification regime. Here, the WIS and its experts are part of the VNSGM laboratory and expert network

to provide continuous support for German engagement.

Research cooperation is an integral part of technological observation as well as in the conduct of defence science research (R&T levels 1 and 2). The focus is on national research cooperations, which are supplemented by international cooperations.

An important step in the area of national research cooperation was taken in 2022 with the cooperation of the Department of Microbiology and Biotechnology of the Institute of Plant Sciences and Microbiology at the University of Hamburg. In a joint project, biophysical analysis methods for characterising fully virulent bacterial strains are being investigated for use as a potential verification technology for BWC. Through the collaboration with the University of Hamburg, a verification technology is being developed that is potentially useful for the WIS's range of orders on the one hand and of great interest to biotechnology in general on the other.

The monitoring and research of new technologies in biotechnology contribute to national security preparedness and can in principle be translated into equipment and support decisions. The scientific monitoring of BWC-relevant technologies enables the timely identification and assessment of new threats and thus of new challenges for the capabilities of the Bundeswehr. The WIS acquires and maintains relevant expertise in the field of BWC for the scientific advice of political and military decision-makers of the BMVg, the provision of science-based decision-making aids and the long-term assurance of scientific expertise.

WIWeB – Research and Services for our Soldiers

The Bundeswehr Research Institute for Materials, Fuels and Lubricants (WIWeB) is the Bundeswehr's centre of expertise for the safety, technology and chemistry of materials and petroleum, oils and lubricants (POL). In addition, it is concerned with the clothing and individual equipment of soldiers and with issues pertaining to occupational safety and health as well as environmental protection. It provides the technological and scientific foundation required to ensure the safety and reliability of defence materiel. Thus, it contributes substantially to the technical operational readiness of the Bundeswehr.

As a departmental research institute, WIWeB monitors technological trends and innovative technologies for potential

Bundeswehr use and has scientific expertise available at short notice.

WIWeB assesses the properties of materials and POL in the context of overall systems and on the basis of an interdisciplinary approach. It is closely connected to all major organisational elements of the Bundeswehr, the research community, the defence industry and partners both within Europe and beyond.

The objective is to provide optimum, safe and reliable products for use in the Bundeswehr. The tasks performed by WIWeB are of tremendous importance for the Bundeswehr:

- Materials form the basis of all weapon systems and the starting point for innovations.
- Fuels and lubricants ensure mobility and are subject to certain changes due to the current energy transition.
- Clothing and personal equipment are used for specific functions and offer protection and safety.

The facilities integrated into WIWeB also include the Bundeswehr 3D Printing Centre, the Bundeswehr Centre of Welding and Bonding Technology and the Bundeswehr Hazardous Substances Measuring Office South.

Current Activities

In July 2022, the then Federal Minister of Defence, Christine Lambrecht, opened the innovation laboratory System Soldat during her visit to WIWeB. In future, soldiers' clothing and equipment will be considered there in a system context and with the close involvement of users and project departments at the BAAINBw.

The plans for a suitable laboratory environment and a digitalised outdoor area in which these technologies can be researched and tested were further concretised and the corresponding steps for realisation were initiated.

The WIWeB is also the Bundeswehr's authority in the field of clothing technology. Here, not only are technical delivery conditions drawn up and operational clothing and personal equipment developed and tested. Research is also conducted on how highly functional equipment can optimally support soldiers while being comfortable and sustainable. Elastic fabrics that can be equipped with the necessary flame and vector protection and increase wearer comfort are examples of this. To improve sustainability, highly functionalised fabrics with recycled fibre content are being researched and multi-layer laminates for functional clothing are being evaluated with regard to the longest possible service life.

For the modernisation of the field suit system, which will be introduced into the Bundeswehr from 2025, the cut design was digitally optimised and the first promising prototypes were produced. The serial measurement with the help of 3D body scanning technology of up to 2,500 members of the Bundeswehr (selected representatively according to branch of the armed forces, age group and gender) will further improve the cut design and fit in the future. In addition, it provides the basis for digital clothing. Here, the soldier determines his/her own body measurements with the help of a

mobile phone app and can thus ideally receive a custom-fit outfit online. In the area of camouflage, the established five-colour camouflage print is being revised, as it now appears too dark due to changes in vegetation caused by climate change.

The energy transition also requires the armed forces to switch to a sustainable energy supply. As a contribution to the efficient use of resources, for example, unused residues could be converted into usable energy carriers. The pyrolysis of plastic waste is a promising chemical recycling path for the production of liquid storable energy carriers. In a military context, this technology could contribute to the energy supply in field camps.

At WIWeB, the pyrolysis of plastics is carried out at both laboratory and pilot plant scales, and the resulting energy carriers are analysed. The properties of these pyrolysis oils can be further optimised by hydrogenating after-treatment or blending with conventional diesel fuel. Further investigations are aimed at yield maximisation, energetic utilisation of the pyrolysis gases that are also produced and the decomposition of real-world plastic mixtures, in order to come closer to a scenario that is relevant for use.

The Naval Arsenal (MARs)

The new location Naval Arsenal Warnowwerft

Since its foundation in 1957, the Naval Arsenal (MARs) has been looking after all units of the German Navy worldwide and at any time within the scope of scheduled and unscheduled maintenance and carries out necessary immediate repairs with its own personnel. As a reliable partner, it ensures the operational readiness of the fleet together with the servicemen and women of the navy.

The stationing decision of 2011, which formed the basis for the organisational dissolution of the Kiel arsenal operation at the end of 2015 and a reduction in the number of personnel to 954 posts, subsequently impaired the MARs' ability to comprehensively live up to this self-image. With largely the same operational obligations, an increasing complexity of the floating units, and challenges posed by European procurement law to the placement of necessary maintenance contracts on the market, it recently became increasingly difficult to carry out necessary repair and maintenance measures in a timely manner and thus to maintain the material basis for the operational readiness of the Navy.



Photo: Bundeswehr/ Sebastian Scheuermann

The first pilot plant for research into the pyrolysis of discarded plastics is located on the WIWeB site.

At the same time, it became increasingly clear that the urgently needed infrastructural renewal of the MArS sites in Wilhelmshaven and Kiel would not lead to visible results until the first years of the coming decade at the earliest.

Already with a view to the future rear-mament planning of the German Navy, which envisages the provision of 50 units in the surface area alone within the framework of its alliance commitment and its national ambitions in the planning horizon up to the year 2032, it became clear that without a significant improvement in the personnel and infrastructural equipment of MArS, the imbalance between MArS' tasks and its available resources could not be eliminated.

The insolvency of the MV shipyards in Mecklenburg-Western Pomerania at the beginning of 2022 presented the opportunity to initiate a turnaround in the development of the material, personnel and infrastructural prerequisites for guaranteeing the mission of MArS. In taking over the mobile and stationary assets of the company at the Rostock site, the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support, the technical supervision in the Federal Ministry of Defence and the Navy seized this unique opportunity.

Through an enormous joint effort by the Bundeswehr, politicians and trade

unions, it was possible, at a speed that was immense for many of those involved, even in retrospect, to lay all the foundations for the decision on the acquisition of the mobile and immobile assets of the MV Werften at the Rostock site and the construction of further MArS property.

In view of the construction costs that would have to be budgeted today for the erection of a dry dock 320 metres long, 54 metres wide and 11 metres deep – the dimensions of the dock in Rostock – the takeover price of the new property on the Warnow seemed downright favourable – especially bearing in mind that the Bundeswehr was acquiring one of the most modern shipbuilding halls in the world in one of the most sought-after locations in Europe with this purchase.

In future, all Baltic Sea units of the German Navy are to be serviced in Rostock and Kiel. The declared aim is to carry out in-house repairs on all K130 corvettes of the first batch and the supplementary procurement. In the role of a general contractor, MArS will award maintenance services as work packages to the private sector. In addition, the capabilities of MArS in the area of immediate repairs will be built up and expanded in the so-called main construction sections (HBA) 1 to 4 according to the naval construction list. This refers to the equipment and furnishing of ships, their propulsion systems, electrical systems and ship operating systems. These

capabilities, which are currently not trained at other MArS sites, will distinguish the Rostock site in future and allow it to offer repair services to the German Navy at short notice, either directly on site or even worldwide.

The development and expansion of MArS' service portfolio follows a complementary approach. In concrete terms, this means that the special capabilities that the service already offers at its locations in Wilhelmshaven and Kiel in the area of material maintenance of weapon systems and necessary basic services will be maintained and strengthened and – by performing tasks in maintenance HBA 1 to 4 – supplemented at the Rostock site.

Among other things, MArS can draw on the excellent technical expertise of the existing personnel at the previous traditional locations and the many employees of the former MV shipyards who successfully applied for the newly created posts in the course of the staffing procedure in the past months. In addition, thought has also been given to the future regeneration of skilled personnel. In view of the site's own need for young talent, it is planned to initially offer six apprenticeships per year in the professions of industrial mechanic and plant mechanic from September 2023. One year later, a further four apprenticeship places per year will be added to the training offer to include the profession of electronics technician for devices and systems. ■

Photo: MArS



Part of the fourth deck of the Global 2 leaves the dock at Warnowwerft.

German Liaison Office for Defence Materiel, USA/Canada

The German Liaison Office for Defence Materiel, USA/Canada (DtVStRü USA/CAN) is a subordinate agency of the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) and based in the US state of Virginia.

The agency represents the Bundeswehr's interests in matters of defence technology and armaments towards the armed forces and agencies of the United States of America (USA) and Canada and the industry of these countries. Transatlantic cooperation covers a wide spectrum of defence-related technologies and various weapon systems in the domains of land, air and sea.

Currently, the Liaison Office has 50 posts, comprising

- 28 posts for engineers or scientists,
- 11 posts for non-technical administrative officials,
- 6 posts for officers, and
- 5 posts for local personnel.

More than half of the posts are assigned to the following project offices and to the liaison offices at US Army and US Air Force facilities (see Fig. 1):

- Rolling Airframe Missile Project Office (RAMPO) in Arlington/VA,
- NATO Seasparrow Project Office (NSPO) 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 in San Diego/CA.

For these personnel of the major organisational element of equipment, information technology and in-service support employed in different program offices on the North American continent, the Liaison Office is the home organisation in terms of general administrative affairs, but in technical terms the German positions on the projects are determined

solely by the responsible project managers in Germany. In this regard, the Liaison Office does not have an independent role or decision-making authority.

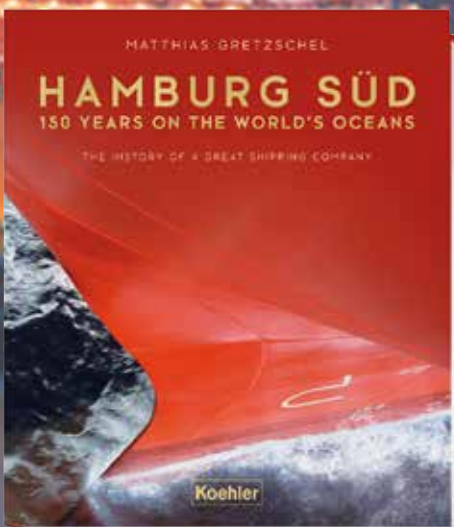
The aim of its work is to strengthen national military and industrial capabilities and to promote the development of joint standards and interoperable solutions for mission-oriented equipment of the armed forces.

The Liaison Office is a 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 programs up to the use of defence goods procured there. It contributes to maintaining and developing the capabilities of the national defence industry.

Other focuses of its work are the procurement and repair of US and Canadian defence goods for the Bundeswehr, the management of personnel exchange

HAMBURG SÜD

150 YEARS ON THE WORLD'S OCEANS



The history of a great shipping company

39,90 €

ISBN 978-3-7822-1505-3

Order directly from us at koehler-mittler-shop.de or
by telephone on 040/70 70 80 322

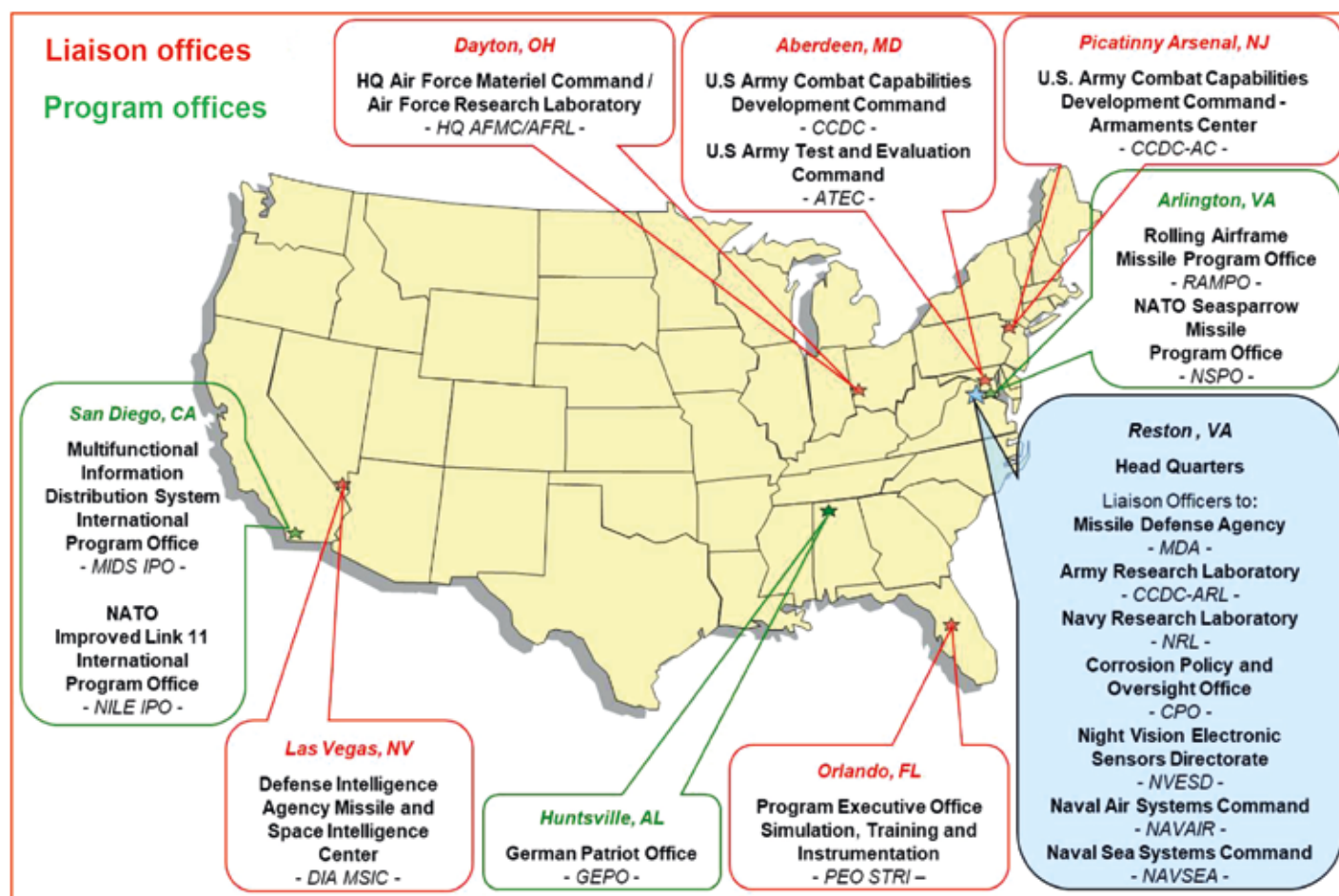
Scan & order
now!



Koehler

koehler-mittler-shop.de

Maximilian Verlag GmbH & Co. KG | Stadthausbrücke 4 | 20355 Hamburg



Graphic: DtVStRü USA/CAN

Locations of the Liaison Office USA/CAN and its branch offices

programs for defence engineers and defence scientists (Engineers and Scientists Exchange Program, ESEP) as well as administrative personnel (Administrative and Professional Personnel Exchange Program, APEP) of both nations, and the representation of German interests in international FMS (Foreign Military Sales) working groups.

Furthermore, the Liaison Office assumes Government Quality Assurance tasks for products ordered in the USA and Canada. To this end, it cooperates closely with US and Canadian government quality assurance authorities.

Current Activities

Personnel exchange programmes

For the Engineers and Scientists Exchange Program (ESEP) between the Bundeswehr and the US Air Force, US Army, US Navy and Marine Corps, which will celebrate its 60th anniversary next year, 14 participants from the Bundeswehr were recruited in 2022. Two Bundeswehr personnel each took part in the Administrative and Profes-

sional Personnel Exchange Program (APEP) and the ESEP with Canada in 2022.

Multifunctional Information Distribution System (MIDS)

MIDS is a tactical radio system for air navigation and distribution of situational information (data link). It was originally developed for the US Armed Forces, now it is generally used by NATO forces. In Germany, it is used by the air force, navy and army.

The MIDS programme focusses on production stabilisation, platform integration and further development of the BU2 terminal on the basis of the lessons learned during integration. The MIDS IPO uses its own technical expertise and concludes all necessary contracts with industry.

Rolling Airframe Missile (RAM)

RAM is a missile system for short-range protection of seagoing units. The bilateral RAM program management in the German-American RAMPO covers all aspects of the development, procure-

ment and in-service use of the RAM weapon system.

The RAM Block 2 missile is currently being further developed in order to adapt to new threats. Activities for the series procurement of the latest generation are being prepared.

In addition, missile re-certification activities are currently being performed or prepared.

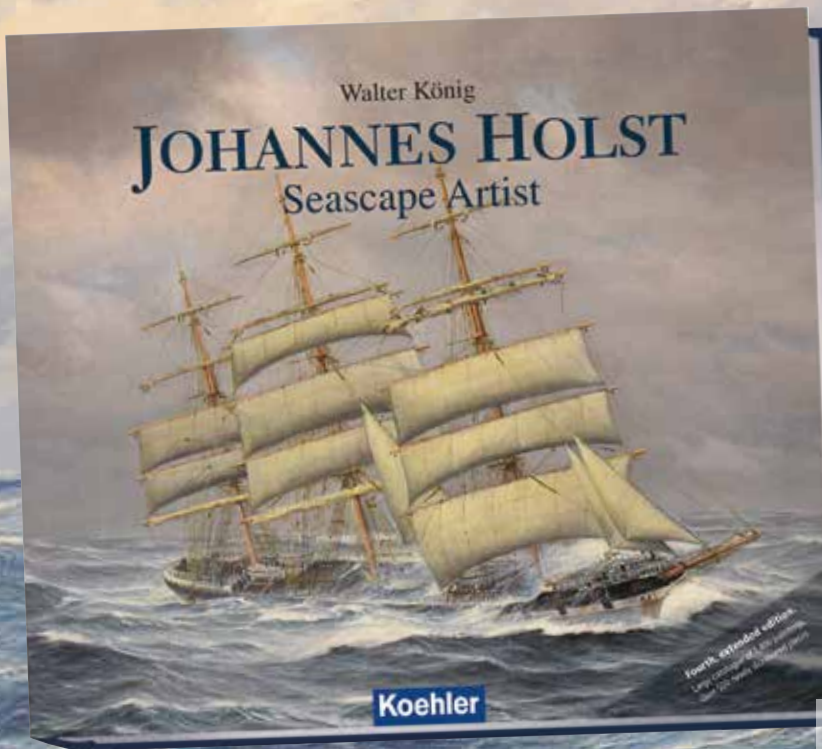
Government Quality Assurance

Apart from regular spare parts procurement for all technical Bundeswehr systems, the procurement of the new corvettes continues to determine the daily business of Government Quality Assurance personnel. Both the IMCS (Integrated Monitoring and Control System), an automated ship system, and the RAM close-in defence system are procured in North America.

Research & Technology

The DtVStRü USA/CAN contributes significantly to the realisation of project arrangements for cooperation in the field of defence research and technology between Germany and the USA and supports the BAAINBw in this cooperation. ■

THE GERMAN SEASCAPE ARTIST



148,00 €
ISBN 9978-3-7822-1323-3
Order now at
koehler-mittler-shop.de
or by telephone
+49 (0)40 /70 70 80 322

Scan me &
order now!



Koehler

CAESAR® 6x6

The power to
change History

