

SELF-EVALUATION REPORT FOR THE EVALUATION OF RESEARCH ORGANIZATIONS IN THE AREA OF HIGHER EDUCATION INSTITUTIONS IN THE YEAR 2025

HIGHER EDUCATION INSTITUTION NAME: UNIVERSITY OF DEFENCE

COMPANY REGISTRATION NUMBER (CRN): 60162694

THE LIST OF EVALUATION UNITS IN MODULE 3:

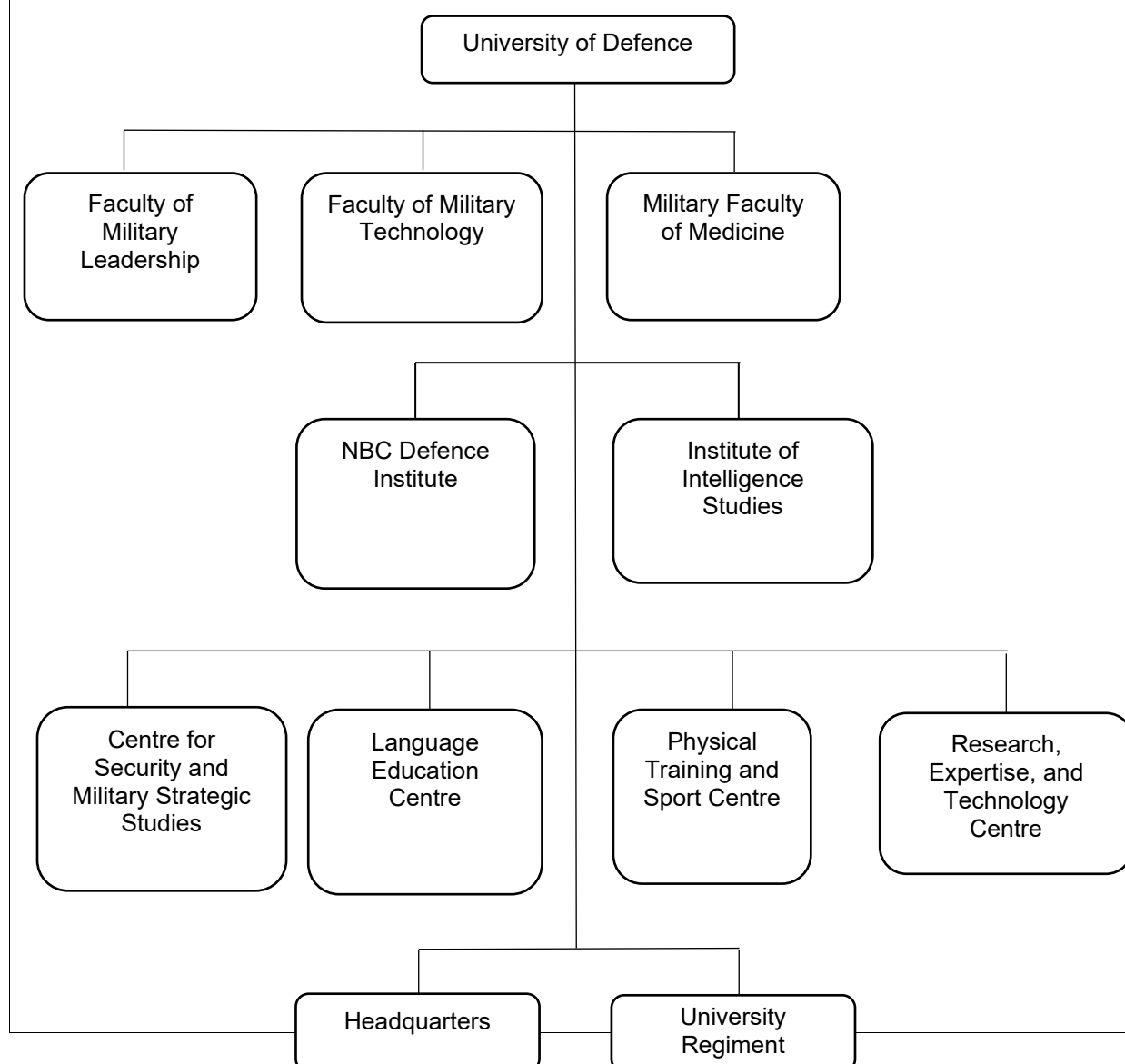
FACULTY OF MILITARY LEADERSHIP

FACULTY OF MILITARY TECHNOLOGY

MILITARY FACULTY OF MEDICINE

NBC DEFENCE INSTITUTE

ORGANIZATIONAL STRUCTURE OF THE HIGHER EDUCATION INSTITUTION



HIGHER EDUCATION INSTITUTION WEBSITE (HTML LINK): <https://unob.cz/>

THE HIGHER EDUCATION INSTITUTION POINT OF CONTACT

Name and Surname: Eva Blahová

Position: Head of the Science and Research Office

Phone Number: [REDACTED]

E-mail: [REDACTED]

Signature (Rector), stamp

Introductory information about the evaluated higher education institution

The HEI briefly introduces itself. The organizational chart, the position of the HEI within the research, development and innovation system and the system of HEIs in the Czech Republic may be commented on, the mission and vision, the size of the HEI, the number and focus of the units evaluated will be briefly presented.

Maximum 500 words.

Description:

The University of Defence (UD) is a university-type state higher education. Unlike public universities, it operates with limited self-governance and is not established as a legal entity. Instead, it functions as an administrative unit of the Ministry of Defence. The rights and responsibilities typically vested in the Minister of Education with regards to universities are, in this case, discharged by the Minister of Defence.

The University of Defence is a member of the Czech higher education system and complies with standard accreditation processes. It offers bachelor's, master's, and doctoral programmes to both military and civilian students, available in full-time and part-time study modes.

The primary mission of the University of Defence is to prepare military professionals for the needs of the Army of the Czech Republic and civilian experts for the state security system, defence industry, and public administration. Its vision is to become a recognized centre of education, research, and development in the field of defence and security, with an emphasis on innovation and international cooperation.

The University of Defence represents a medium-sized institution of higher education with more than 1,500 students and almost 600 academic staff members. In addition to providing university education, the institution is actively involved in applied research. The outcomes significantly contribute to the advancement of the Czech Republic's defence capabilities.

The evaluation will include three faculties and the NBC Defence Institute, or more specifically: the Faculty of Military Leadership focusing on management, command, and decision-making processes; the Faculty of Military Technology, dedicated to technical disciplines and research in the field of military technologies; the Military Faculty of Medicine, specializing in medical support and military medicine; and NBC Defence Institute, engaged in protection against chemical, biological, and other hazards.

SWOT ANALYSIS

Strengths

Specialization in Military Education: The University of Defence has established a strong reputation in the domain of military and security education, positioning itself as a key player in the preparation of experts for the armed forces and security agencies.

High-Quality Professional Staff: The University has experienced and highly qualified educators and specialists with

Weaknesses

Specific Orientation: The specialized emphasis on military and security education may constrain the flexibility and diversity of academic programmes on offer, in comparison with universities with a more comprehensive scope.

Dependence on State Funding: The primary funding of the University may be susceptible to political changes and budgetary constraints,



practical experience in military service.

Strategic Collaboration: The high level of cooperation with the military, state institutions, and international organizations provides strong support and opportunities for development.

Significance for National Security: The University plays a pivotal role in enhancing the state's defence capabilities and preparing specialists to address strategic and security challenges.

Technical and Modern Facilities: The University is furnished with cutting-edge technologies and facilities essential for military and security studies.

Opportunities

Development of New Programmes and Disciplines: Significant opportunities exist for expanding the range of programmes offered, particularly in fields such as cybersecurity, international security, quantum technologies, and sustainability and environmental security.

Enhancement of International Collaboration and Exchanges: Strengthening partnerships with international universities, student exchange programmes, as well as research projects addressing global security challenges.

Integration of Emerging Technologies and Innovations: The University may invest in new technologies such as modelling and simulation, virtual and augmented reality, additive manufacturing, artificial intelligence, quantum technologies, and military research. Such initiatives would enhance its appeal as a hub for cutting-edge academic education and research.

Acquisition of European and International Grants: There is potential to secure funding from international programmes and funds for research and innovation.

Commitment to Lifelong Learning: The programme development tailored for professionals and experts in the field of defence and security would enhance the University's prestige and influence within the professional community.

which could adversely affect its development and stability.

Constrained Research Opportunities for Certain Research Areas: The University's predominant focus on military and security-related fields may result in limited research opportunities in civilian domains, potentially affecting its recognition within the wider academic community.

Limited International Recognition: Despite existing collaborations with international partners, the University lacks significant visibility and recognition on the global stage, particularly within the realm of civilian education.

Threats

Political and Economic Volatility: Shifts in the political environment or economic crises may jeopardize funding and the long-term stability of the University.

Competition from Other Educational Institutions: The emergence of new private or public universities with comparable or more diverse academic offerings may undermine the University's position.

Shifts in Military Policy: Alterations in national or international defence strategies may impact the demand for military and defence studies.

Declining Student Enrolment in Specific Disciplines: A potential decrease in interest towards military and security fields could result in recruitment challenges, potentially leading to a reduction in the range of programmes offered.

Challenges in Response to Emerging Threats (Cybersecurity Threats, Global Security Risks): The University is compelled to remain at the forefront of rapidly evolving defence and security challenges, which requires continuous innovation in educational and research methodologies.

SELF-EVALUATION REPORT FOR MODULE 3

NAME OF EVALUATED UNIT:
FACULTY OF MILITARY LEADERSHIP

FORD: 5 - Social sciences

SOCIETAL CONTRIBUTION OF THE EVALUATED UNIT

3.1 Introductory information about the unit under evaluation

The evaluated unit will describe its mission and vision and provide a general self-reflection of the societal contribution of R&D&I, along with its long-term goals in the fields it develops. The distribution of research activities by type of research will also be commented on.¹ The evaluated unit will describe its organizational structure and size (staffing, number of students, number of programmes of study implemented, etc.) based on the data provided in annex tables 3.1.1 to 3.1.6.

Maximum 1000 words.

This is a non-rated indicator that serves as an introduction to the evaluated unit, providing context for data in indicators 3.2-3.7.

Self-Evaluation:

The creative activities at the Faculty of Military Leadership (FML) are characterized by a highly interdisciplinary nature. In terms of content, they contribute to the development of military science, which is, however, not included in the structure of scientific fields in the Frascati Manual. Military science is most closely related to the scientific field of "Social Sciences" (OECD 50000), which is the primary area for most departments.

Creative activities at the FML are primarily conducted for the benefit of the founder of the University of Defence (UD) – namely the state, represented by the Ministry of Defence of the Czech Republic (MoD). As a result, the outcomes of creative activities typically have predominantly national significance. However, some of these results also display the potential for application in foreign armed forces (e.g., Horizon Europe, NATO STO, EDA, etc.), provided they can be freely publicized.

Over the course of the evaluation timeframe, the FML conducted creative activities encompassing issues related to social science and humanities disciplines associated with leadership, the deployment of military branches and their equipment, technology, and materials, including the essential transport and supply system, optimization of decision-making processes, automation of command and control

¹ Basic, applied, contract, artistic research (see Definition of Terms in Methodology HEI2025+).

processes, certain aspects of cyber-defence, and monitoring global trends in these areas (Horizon Scanning). A key area of focus is Emerging and Disruptive Technologies (EDTs) and their gradual application in selected areas of security and military systems. The FML is involved in examining the impact of EDTs on future warfare, including the system of their potential implementation within the MoD (e.g., additive manufacturing).

The departments of the FML can be divided into two types: theoretical foundation departments and professional (specialization) departments. The theoretical foundation departments conducted creative activities primarily contributing to a deeper understanding of economic, managerial, and legal aspects of national defence and security, as well as the social, mental, and personal prerequisites of commander-leaders, military history, military art, and crisis management. The professional departments are dedicated to the training of military specialists, and their creative activities were primarily oriented towards the needs of relevant military specializations in the Czech Armed Forces (CAF)—mechanized units, artillery, logistics, engineering, and intelligence support. Many of the researched issues (e.g., EDTs) have an interdisciplinary nature, connecting the above-mentioned areas in scientific outcomes and projects.

The Department of Quantitative Methods provides methodological support in the field of quantitative methods for other departments in their scientific work. Given its applications primarily in the field of military science, the results are directed towards the 50000 or 10000 categories (Frascati Manual).

The Department of Resources Management contributes to the development of military science primarily in the domain of resource provision for defence—financial and personnel support (recruitment and retention of military personnel). A significant role has been played by research into the impact of military expenditures on the economy and the determinants influencing their size and stability. The issue of motivation for joining and remaining in the armed forces was addressed based on the needs of the defence sector. Creative activities contribute to a better understanding of the specifics of resource provision for defence, thereby demonstrating societal relevance.

The Department of Applied Social and Humanities also falls within the scope of category 50000 through its creative activities, including the interdisciplinary utilization of other scientific fields (e.g., 6000). The department's creative activities have long been focused on the analysis, identification, and development of competencies for the performance of military professions, specific specializations, and leadership at the direct leadership level, both in non-combat conditions and in military operations. In greater detail, the department examines the effects of modern technologies on individual decision-making processes and behaviour during task execution, including the analysis of ethical aspects of employing autonomous systems and artificial intelligence, as well as the study of psychological resilience and issues related to post-traumatic stress disorder (PTSD).

The Department of Military Science Theory examines both the historical contexts of

past conflicts (e.g., World War II) and contemporary conflicts (primarily within the Section of Military History). The department explores archives and interviews witnesses or their families from Slovakia, Germany, Poland, Croatia, and Slovenia. Comprehensive monographs summarizing findings are widely presented in numerous countries. The Crisis Management Group focuses on the application of risk management for addressing emergencies and crisis situations, as well as population protection. The group develops proposals for implementing various tools to assess the resilience of territories against natural and anthropogenic threats and to protect infrastructure. The results of the creative activities are aimed at building and strengthening resilience and ensuring an adequate level of crisis preparedness.

The Department of Fire Support spans several scientific categories (10000, 20000, 50000) and thus demonstrates a highly interdisciplinary character. The evaluated period is marked by the creation of results driven by practical needs—specifically, the artillery of the Czech Armed Forces, which is currently armed with outdated Soviet-era weapon systems, making it impossible to achieve the desired interoperability within NATO. The creative activities have been directed toward researching comprehensive solutions for the interoperability of Czech artillery within NATO and developing a new system for calculating firing elements based on the use of modern computational technologies. Given the evolving threats on the modern battlefield, the department's scientific activities have expanded to include the use of unmanned systems, the protection of artillery combat formations against threats from unmanned systems and cyberattacks. Additionally, recent attention is devoted to risk analysis in relation with gradual implementation of automated fire control system.

The Department of Engineer Support primarily focuses on measures to enhance the effectiveness of engineer support. It employs constructive simulation (MASA Sword), which allows for the effectiveness verification of selected scenarios for the use of engineer resources. In the field of explosives and demolition, the research activities address the usability of charges in explosive forced entry operations. The department also evaluates the environmental impact of military activities.

The Department of Logistics develops interdisciplinary research in the category of 50000, with overlaps into other categories—20000, 30000. The outputs of its creative activities directly impact the military science development, particularly in the areas of logistical support and military transportation. During the evaluated period, the department explored the possibilities of implementing new technologies (selected EDTs) into the CAF, with implications for NATO and the EU. Primarily, it concerned the procedural aspects of introducing additive technologies into military conditions (EDA and NATO projects – MLCC), the utilization of modern sensor technology, new camouflage methods, and the development of combat rations. A key aspect of the department's creative activities resides in the practical application of selected findings into military practice and the preparation of project proposals (e.g., for the Technology Agency of the Czech Republic (TACR), defence research projects, Horizon Europe, the European Defence Agency, or NATO STO).

The Department of Tactics contributes to the development of military science, specifically the art of war, with an emphasis on tactics and related areas such as

command, control, communication, leadership, and training. One of the key tools employed is constructive simulation (MASA Sword), which enables the verification of selected military operation scenarios. Members of the department have participated in Integrated Working Teams focused on development of the CAF in the field of new system (technology) acquisitions. Additionally, the department has been involved in the work of NATO STO panels and the PESCO project.

The Department of Intelligence Support develops interdisciplinary research in its main field, and the results of its creative activities have a direct impact on the development of the military domain as a whole, particularly in the areas of intelligence (projects of the Ministry of the Interior (MoI)), surveillance, reconnaissance, and electromagnetic warfare (including overlaps with the EU – PESCO project). Close collaboration with sections of the CAF enables the transfer of research results and expert activities directly into practice.

Table 3.1.1 - Staffing per FTE²

Academic/ Professional position	Total / Of which women					
	2019	2020	2021	2022	2023	Total
Professor	5,2/0	5,3/0,6	5,3/0,6	5,8/0,6	5,2/0	5,5/0,4
Associate Professor	21,9/3,1	19,6/4,1	22,2/4	23,1/2,1	20,6/2,1	22,1/2,6
Assistant Professor	51,4/11,2	49,5/9,9	49/8,4	47,8/9,7	52,3/10,1	51,1/10,2
Lecturer	29,6/2,1	28,2/1,1	28,7/1,1	34,2/1,6	34,7/1,6	32,3/1,5
R&D Personnel ³	0/0	0/0	0/0	0/0	0/0	0/0
Researchers in other categories ⁴	0/0	0/0	0/0	0/0	0/0	0/0
Technical and economic staff ⁵	5,5/3	8,1/4,2	8,1/5,1	8,1/5,1	8,5/5,5	8,3/5,3
Scientific, research and development staff involved in teaching activities	108,1/16,4	102,6/15,7	105,2/14,1	110,9/14	112,8/13,8	110,7/14,2
Early career researchers ⁶	32,8/6,8	29/6	30/4	24,8/3,3	25,7/2,7	28,7/4,2
Total ⁷	113,6/19,4	110,7/19,9	113,3/19,2	119/19,1	121,3/19,3	119,5/19,4

² The average number of hours worked is calculated as the ratio of the total number of hours actually worked during the reference period, from 1 January to 31 December, by all staff (including agreement on work activity, excluding agreement on work performance) to the total annual working time pool per full-time employee. The full-time status of the worker in the evaluated unit is always reported. If an employee holds more than one type of full-time job within the evaluated unit, the total sum of the two shall be reported.

³ The category “R&D Personnel” includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).

⁴ The category “Researchers in other categories” includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).

⁵ Who participates in the management and support of R&D&I in the institution.

⁶ See Definition of Terms in Methodology HEI2025+.

Note: The categories professor, associate professor, assistant professor, lecturer, other scientific, R&D personnel, researchers in other categories and technical and economic staff are mutually exclusive, i.e. one staff member is reported under one category only. Scientific, research and development staff involved in teaching activities, as well as early career researchers are reported collectively for all the above-mentioned categories.

3.1.2 Age structure of R&D&I personnel of the evaluated unit and their structure by job title and gender in the year 2019 (numbers of physical employees and personnel)⁸

Academic/ professional position	Under 29 years		30-39 years old		40-49 years old		50-59 years old		60-69 years old		70 years and older	
	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n
Professor	0	0	0	0	1	0	1	0	1	0	2	0
Associate Professor	0	0	4	1	7	1	4	2	6	0	3	0
Assistant Professor	1	1	18	6	14	4	10	0	11	1	0	0
Lecturer	2	1	9	0	10	1	8	0	1	0	1	0
R&D Personnel ⁹	0	0	0	0	0	0	0	0	0	0	0	0
Researchers in other categories ¹⁰	0	0	0	0	0	0	0	0	0	0	0	0
Technical and economic staff ¹¹	0	0	1	0	1	1	3	2	2	1	0	0
Scientific, research and development staff involved in teaching activities	3	2	31	7	32	6	23	2	19	1	6	0
Early career researcher ¹²	1	1	17	5	8	1	5	0	3	0	0	0
Total ¹³	3	2	32	7	33	7	26	4	21	2	6	0

Note: The categories professor, associate professor, assistant professor, lecturer, other scientific, R&D Personnel, Researchers in other categories and Technical and economic staff are mutually exclusive, i.e. one staff member is reported in only one category. The categories of scientific, research and development staff involved in teaching activities and early career researchers are reported collectively for all the above-mentioned categories.

⁷ Total is the sum of the categories: professor, associate professor, assistant professor, lecturer, R&D personnel, researchers in other categories and technical and economic staff.

⁸ The total number of employees/workers as of 31st December of the calendar year in question is to be entered, irrespective of the level of time worked, but only in an employment relationship (including agreement on work activity, excluding agreement on work performance). Other types of contractual relationships under the Civil Code that involve purchase of services are not included.

⁹ The category "R&D Personnel" includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).

¹⁰ The category "Researchers in other categories" includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).

¹¹ Who participates in the management and support of R&D&I in the institution.

¹² See Definition of Terms in Methodology HEI2025+.

¹³ Total is the sum of the categories: professor, associate professor, assistant professor, lecturer, R&D Personnel, Researchers in other categories and technical and economic staff.

3.1.3 Age structure of R&D&I personnel of the evaluated unit and their structure by job title and gender in the year 2023 (numbers of physical employees and personnel)¹⁴

Academic/ professional position	Under 29 years		30-39 years old		40-49 years old		50-59 years old		60-69 years old		70 years and older	
	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women
Professor	0	0	0	0	1	0	0	0	1	0	4	0
Associate Professor	0	0	1	0	10	1	2	0	7	1	3	0
Assistant Professor	0	0	11	3	21	7	12	1	9	1	3	0
Lecturer	2	1	9	0	15	1	7	0	2	0	0	0
R&D Personnel ¹⁵	0	0	0	0	0	0	0	0	0	0	0	0
Researchers in other categories ¹⁶	0	0	0	0	0	0	0	0	0	0	0	0
Technical and economic staff ¹⁷	1	1	0	0	2	1	4	3	4	2	0	0
Scientific, research and development staff involved in teaching activities	2	1	21	3	47	9	21	1	19	2	10	0
Early career researcher ¹⁸	0	0	11	3	11	1	6	0	0	0	0	0
Total ¹⁹	3	2	21	3	49	10	25	4	23	4	10	0

Note: The categories professor, associate professor, assistant professor, lecturer, other scientific, R&D personnel, researchers in other categories and technical and economic staff are mutually exclusive, i.e. one staff member is reported under one category only. Scientific, research and development staff involved in teaching activities, as well as early career researchers are reported collectively for all the above-mentioned categories.

Table 3.1.4 – Students

Type of study	2019		2020		2021		2022		2023		Total	
	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women
Undergraduate	54	25	27	14	82	18	83	28	95	33	341	118
Master's ²⁰	608	148	648	169	771	199	837	208	860	214	372	938

¹⁴ The total number of employees/workers as at 31.12. of the calendar year in question is to be entered, irrespective of the level of time worked, but only in an employment relationship (including agreement on work activity, excluding agreement on work performance). Other types of contractual relationships under the Civil Code that involve purchase of services are not included.

¹⁵ The category "R&D Personnel" includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).

¹⁶ The category "Researchers in other categories" includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).

¹⁷ Who participates in the management and support of R&D&I in the institution.

¹⁸ See Definition of Terms in Methodology HEI2025+.

¹⁹ Total is the sum of the categories: professor, associate professor, assistant professor, lecturer, R&D personnel, researchers in other categories and technical and economic staff.

											4	
Doctoral	28	6	48	15	40	9	32	9	39	13	187	52
Lifelong Learning Courses	213	52	36	0	118	20	290	51	239	57	896	180
Total	903	231	759	198	101 1	246	124 2	296	123 3	317	514 8	1288

Table 3.1.5 – Programmes of Study in Czech/English

Type of programme of study	Total ²¹ / Of which professional programmes of study											
	2019		2020		2021		2022		2023		Total	
Undergraduate	4/0	2/0	4/0	2/0	4/0	2/0	2/0	2/0	2/0	2/0	4/0	2/0
Master's	4/0	1/0	4/0	1/0	6/0	3/0	6/0	3/0	6/0	3/0	6/0	3/0
Doctoral	4/0	1/0	8/0	2/0	8/0	2/0	8/0	2/0	8/0	2/0	8/0	2/0
Lifelong Learning courses	14/0	14/0	3/0	3/0	8/0	8/0	17/0	17/0	16/0	16/0	108/0	108/0
Total	26/0	18/0	19/0	8/0	26/0	15/0	33/0	24/0	32/0	23/0	126/0	115/0

Note: For each SP type, enter the number of SPs in Czech language in the first cell and insert the number of SPs in English language after the slash in the same cell (e.g. 15/3), enter the number of professional SPs in Czech language in the second cell and insert the number of professional SPs in English language after the slash. Follow a similar procedure in the last column of the table (Total).

3.1.6 – R&D&I capacities

R&D&I field	FORD	FORD share [%]	Predominant type of research	Total share of industry group [%]
1. Natural Sciences	1.1 Mathematics	5	Zvolte položku.	8
	1.2 Computer and information sciences		Zvolte položku.	
	1.3 Physical sciences		Zvolte položku.	
	1.4 Chemical sciences		Zvolte položku.	
	1.5 Earth and related environmental sciences		Zvolte položku.	
	1.6 Biological sciences		Zvolte položku.	
	1.7 Other natural sciences	3	Balanced basic and applied research	
2. Engineering and Technology	2.1 Civil engineering	5	Balanced basic and applied research	6
	2.2 Electrical engineering, Electronic engineering, Information engineering		Zvolte položku.	
	2.3 Mechanical engineering		Zvolte položku.	

²⁰ All master's degree students are listed, regardless of the length of their programme of study.

²¹ The total number of programmes of study for which admissions have been announced in a given academic year.

	2.4 Chemical engineering		Zvolte položku.	
	2.5 Materials engineering		Zvolte položku.	
	2.6 Medical engineering		Zvolte položku.	
	2.7 Environmental engineering		Zvolte položku.	
	2.8 Environmental biotechnology		Zvolte položku.	
	2.9 Industrial biotechnology		Zvolte položku.	
	2.10 Nanotechnology		Zvolte položku.	
	2.11 Other engineering and technologies	1	Balanced basic and applied research	
3. Medical and Health Sciences	3.1 Basic medicine		Zvolte položku.	
	3.2 Clinical medicine		Zvolte položku.	
	3.3 Health sciences		Zvolte položku.	
4. Agricultural and veterinary sciences	4.1 Agriculture, Forestry, and Fisheries		Zvolte položku.	
	4.2 Animal and Dairy science		Zvolte položku.	
	4.3 Veterinary science		Zvolte položku.	
	4.4 Other agricultural sciences		Zvolte položku.	
5. Social Sciences	5.1 Psychology and cognitive sciences	1	Balanced basic and applied research	79
	5.2 Economics and Business	5	Balanced basic and applied research	
	5.3 Education	5	Applied Research	
	5.4 Sociology		Zvolte položku.	
	5.5 Law	1	Zvolte položku.	
	5.6 Political science		Zvolte položku.	
	5.7 Social and economic geography		Zvolte položku.	
	5.8 Media and communications		Zvolte položku.	
	5.9 Other social sciences	67	Applied Research	
6. Humanities and the Arts	6.1 History and Archaeology	5	Balanced basic and applied research	6
	6.2 Languages and Literature		Zvolte položku.	
	6.3 Philosophy, Ethics and Religion	1	Applied Research	
	6.4 Arts (arts, history of arts, performing arts, music)		Zvolte položku.	
	6.5 Other Humanities and the Arts		Zvolte položku.	
Total		100 %	-	100 %

RECOGNITION BY THE RESEARCH COMMUNITY

3.2 Recognition by the research community

The evaluated unit will briefly comment on its position in the research community. It shall consider individual and other prestigious R&D&I awards, participation of its academic staff in the editorial boards of international scientific journals, elected membership in professional societies, major invited lectures given by the evaluated unit's academic staff abroad or by foreign scientists and other relevant guests at the evaluated unit. Additionally, it will address the involvement of staff in the evaluation of national or European project/programme calls over the period of 2019–2023 based on the data provided in annex tables 3.2.1 to 3.2.5 (max. 10 most relevant items). If necessary, the evaluated unit shall list any additional services to the scientific community that it considers relevant.

Maximum 1000 words.

Self-Evaluation:

The UD has long been focused on the military-security community at both the national and international level (NATO, the EU). Within this framework, the FML contributes primarily by assigning experts to relevant teams, working groups, committees, panels, and similar bodies. From an international perspective, notable achievements include recognitions at the NATO level, membership in editorial boards of international journals, and deliveries of requested lectures at international institutions. A relatively distinct area involves lectures by foreign experts, for example, at conferences or within other activities organized by the UD, as well as the evaluation of project proposals. The FML maintains long-term communication and cooperation with foreign institutions in the field of military science, primarily with military academies.

Table 3.2.1 - Prestigious R&D&I awards granted during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Name of the award	Awarding institution
COL Ing. Pavel ZAHRADNÍČEK, Ph.D., MBA	NATO STO Young Scientist Event, 24.–25. 4. 2022, Oslo, Sweden: Best Research Proposal Presentation with Poster	NATO
LTC Prof. Ing. Petr STODOLA, Ph.D.	Rector's Award of the University of Defence for Scientific Work, 2021	The University of Defence

Note: Provide up to 10 examples.

Table 3.2.2 Participation of academic staff of the evaluated unit in editorial boards of international scientific journals during the evaluation period

Name, surname and title(s) of the	Name of scientific journal, ISSN
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evaluated unit's staff member	
LTC Prof. Ing. Petr STODOLA, Ph.D.	Editor of the Special Issue "Metaheuristic Algorithms" - released in the journal Mathematics ISSN 2227-7390
COL Assoc. Prof. Ing. Martin VLKOVSKÝ, Ph.D.	Editorial Board Member of the journal Logistics & Sustainable Transport, ISSN 2232-4968.
Assoc. Prof. Ing. Ivo PIKNER, Ph.D.	Editorial Board Member of the journal Obrana a strategie (<i>Defence and Strategy</i>), ISSN 1802-7199
COL Ing. Jan DROZD, Ph.D.	Editorial Board Member of the journal Vojenské reflexie (<i>Military Reflections</i>), ISSN 1336-9202
Prof. Ing. David ŘEHÁK, Ph.D.	Member of International Association of Critical Infrastructure Protection Professionals (IACIPP)
COL Assoc. Prof. Ing. Martin VLKOVSKÝ, Ph.D.	Editorial Board Member of the journal Transportation Management, ISSN 2578-1944
COL Assoc. Prof. Ing. Mgr. Martin BLAHA, Ph.D.	Editorial Board Member of the journal Journal of Systemic, Cybernetics and Informatics
Assoc. Prof. Mgr. Jiří NEUBAUER, Ph.D.	Editorial Board Member of the journal Journal of Numerical and Applied Mathematics (ISSN 2706-9680)
Assoc. Prof. Mgr. Kamila HASILOVÁ, Ph.D.	Editorial Board Member of the journal Transport samochodowy (Motor Transport) (ISSN: 1731-2795)
Assoc. Prof. PhDr. Ivana NEKVAPILOVÁ, Ph.D.	Editorial Board Member of the journal Vojenské reflexie (<i>Military Reflections</i>), ISSN 1336-9202

Note: Please provide up to 10 examples of academic staff participation in editorial boards of international scientific journals (e.g. editor, editorial board member, etc.).

Table 3.2.3 The most important invited lectures delivered by the academic staff of the evaluated unit at foreign institutions during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Invited lecture title	Name of host institution, or name of conference or event	Year
Assoc. Prof. Mgr. Jiří NEUBAUER, Ph.D.	Statistics, probability and randomness for M&S	NATO Modelling and Simulation Centre of Excellence, Rome, Italy	2019-2024
Assoc. Prof. Mgr. Jiří NEUBAUER, Ph.D.	Statistical Evaluation of Simulation Study Data	University of Palermo, Palermo, Italy	2023
Assoc. Prof. Mgr. Kamila HASILOVÁ, Ph.D.	Regression Model of the Degradation Process of Dental Restorative Fillings Over Time	Branch of the Polish Academy of Sciences Lublin, Poland	2019
Ing. Vojtěch MÜLLNER, Ph.D.	The Investment Gap of Military Expenditures in NATO Countries	Royal Military Academy, Brussel	2023
Assoc. Prof. PhDr. Ivana NEKVAPILOVÁ, Ph.D.	The Role and Objectives of Ethics in Education and Human Resource Development in the Armed Forces of the Czech Republic	Armed Forces Academy of General Milan Rastislav Štefánik, Liptovský Mikuláš, Slovakia	2019
LTC Mgr. Radovan VAŠÍČEK	"Specific activities in the electromagnetic spectrum and their relevance to future military operations"	NATO SCI-SET-358 Research Specialist Meeting on Electromagnetic Operations	2021

MAJ Ing. Jan Ivan, Ph.D., LTC Ing. Michal ŠUSTR, Ph.D.	Combat Employment of Artillery, Joint Fire Support	601st Special Forces Group of the Czech Armed Forces, Prostějov	2022
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Note: Provide up to 10 examples.

Table 3.2.4 - The most important lectures by foreign scientists and other guests relevant to R&D&I at the evaluated unit during the evaluation period

Name, surname and title(s) of the lecturer	Lecturer's employer at the time of the lecture	Invited lecture title	Year
Prof. Yaroslav CHABANYUK, DrSc.	Lublin Technology university, Poland	Stochastic approximation procedure for diffusion process with semi-markov switching	2019
MAJ Ing. Matěj TALIAN	Armed Forces of the Slovak Republic	Training Centre, Section of Simulation Technologies	2023

Note: Provide up to 10 examples.

Table 3.2.5 - Involvement in the evaluation of national/European research project/programme calls relevant to the R&D&I area at the unit during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Name of the research project/programme call	Name of the contracting authority/guarantor of the project/programme call	Year
COL Assoc. Prof. Ing. Martin VLKOVSKÝ, Ph.D.	Expert Evaluation Panel/Rapporteur/Opponent, ÉTA, SIGMA, TRANSPORT 2030 Programs	Technology Agency of the Czech Republic	2019- 2023
Assoc. Prof. Ing. Alena OULEHLOVÁ, Ph.D.	Expert support to the PESCO Sectoral Working Group "Electronic Warfare Capability and Interoperability Programme for Future JISR Cooperation"	PESCO/Ministry of Defence	2019- 2023
MAJ Ing. et Ing. Hana MALACHOVÁ, Ph.D.	Expert Evaluation Panel Security Research, SIGMA Programmes, Environment for Life	Technology Agency of the Czech Republic	2020, 2022, 2023
LTC Prof. Ing. Petr STODOLA, Ph.D.	Chairman of International Evaluation Panel for Evaluating Research Organizations in the University Sector: Evaluation of Police Academy of the Czech Republic	Ministry of the Interior	2020

Assoc. Prof. Radomír SALIGER, Ph.D.	Evaluator of selected research results according to the M 17+ Methodology	Expert body of evaluators appointed by the Council for Research, Development and Innovation of the Government of the Czech Republic	2019-2025
Prof. JUDr. Karel MAREK, CSc.	Project No. 1/030024 "Strategic challenges of the application of EU Regulation 650/2012"	Scientific Grant Agency of the Ministry of Education, Science, Research and Sport of the Slovak Republic (VEGA)	2023
RNDr. Markéta SEIDLOVÁ, Ph.D.	SIGMA College of Experts - Sub-objective 2 - Early career researchers and equalization of opportunities in applied research projects (DC2)	Technology Agency of the Czech Republic	2023
RNDr. Markéta SEIDLOVÁ, Ph.D.	SIGMA College of Experts - Sub-objective 3 - Promoting the innovation potential of the social sciences, humanities and arts (DC3)	Technology Agency of the Czech Republic	2023
MAJ Ing. Jan IVAN, Ph.D.	NATO ICG-IF SG/2 Group	NATO	2019-2025

Note: Provide up to 10 examples.

RESEARCH PROJECTS

3.3 Research projects

The evaluated unit shall list at most 10 (considered most significant by the evaluated unit) research projects/activities (regardless of whether they are supported by public funds or based on contract research²²) that it has implemented or participated in during the period of 2019–2023²³. This should be done from the full list in annex tables (Table 3.3.1-3.3.2)²⁴, regarding particularly the results achieved or the application potential of the projects. The unit should also describe how the research projects contributed to the mission and purpose of the evaluated unit. If the evaluated unit has been a participant in listed project, it shall indicate which other entities were involved and describe its contribution to the project. The interdisciplinary aspects of the projects will also be commented on, along with any collaboration with other units of the

²² For the definition of contract research for the purposes of evaluation in the HE segments, see Article 2.2.1 of the Community Framework for State Aid for Research, Development and Innovation 2014/C 198/01.

²³ Regardless of whether the projects are completed or still ongoing, provided that at least part of the project was implemented during the evaluation period.

²⁴ The evaluated unit shall only fill tables that are relevant to it.

evaluated HEI.

Maximum 300 words per project.

Self-Evaluation:

The FML primarily participates in purpose-driven projects focused on military science with an interdisciplinary overlap into general security. The project activities are predominantly centred around projects of MoD – Defence Research Projects, which target specific “gaps” and development programs within the MoD. New trends in this field are typically drawn from initiatives, panels, and projects of NATO STO, EDA, PESCO, etc., which generally do not provide direct funding. However, these platforms represent essential Horizon Scanning, particularly in new technologies (EDTs) and their potential applications in armed forces. Leveraging the experiences of NATO member state armies, or other primarily European armies, is highly effective and typically accelerates the implementation of technologies and new knowledge into the conditions of the Czech Armed Forces (CAF). An example of this is the EDA Cat. B project—Additive Manufacturing for Logistic Support, which is gradually being developed within NATO (e.g., the MLCC project or the RAPID-e initiative) and further elaborated at the national level through the Defence Research Project POV 3D Printing. Another example of the transfer of foreign approaches is the POV MAD21 project, which utilizes STANAG to develop a new camouflage pattern for the 21st century. The potential of new technologies within the CAF is demonstrated by other projects (e.g., UGV, AUTO PYRO EXPLORER, or ROJ), which are developed in collaboration with the Faculty of Military Technology. The role of the FML primarily resides in application of such tools/systems, including their integration into operational structures, including the evaluation of their impact on military operations. The security overlap, aside from military science, is evident in projects such as IKRYTY, KRIZTRANS, or RESILIENCE. These projects represent a complementary contribution of the FML/UD to the field of crisis management and the integrated rescue system, typically falling under the jurisdiction of the Ministry of the Interior of the Czech Republic (the MoI), which is closely linked to the MoD.

Table 3.3.1 Projects supported by public funds

In the role of beneficiary						
Provider ²⁵	Project name	Support (in thousands CZK/EUR) ²⁶				
		2019	2020	2021	2022	2023
Ministry of Defence	MAD21 - New camouflage universal/multi-purpose design				5 415/213,6	1 538/60,7

²⁵ If the provider is from abroad, please indicate the provider’s country of origin in brackets. For the determination of the country of origin of the provider, the place of residence of the provider is decisive.

²⁶ Indicate the total amount expressed in thousands of CZK and the conversion of the total amount into Euro.

Ministry of Defence	NEMOVITOST: Risks Associated with the Prediction of Final Prices in Real Estate Infrastructure				238/9,4	57/2,2
Ministry of the Interior	Planning and Registration of Improvised Shelters					1 083/42,7
Ministry of Defence	TĚLO: Physical Fitness of the Population as a Risk Factor for Ensuring the Defence Capability of the Czech Republic		851/33,6	2 380/93,9	1 720/67,9	1 292/51
Ministry of Defence	ZNALEC: Provision of Expert Services for the Ministry of Defence Needs				5 640/222,5	2 254/88,9
Ministry of Defence	PVO 21: Ground-Based Air Defence of the 21st Century, Mitigation of Emerging Threats				1 976/77,9	940/37,1
Ministry of Defence	Development and Implementation of Standardized Procedures Based on Hazard Analysis and Critical Control Point (HACCP) Principles to Ensure Safe Food Production in Challenging Climatic Conditions				50/2	310/12,2
Total		0	851/33,6	2 380/93,9	15 039/593,3	7 474/294,8
In the role of another participant						
Provider ²⁷	Project name	Support (in thousands CZK/EUR)				
		2019	2020	2021	2022	2023
Ministry of Defence	REKOZ: Development and Utilization of Reconnaissance Vehicles in Artillery	0				
Ministry of the	RESILIENCE 2015: Dynamic Assessment	0				

²⁷ Ibid.

Interior	of Resilience in Interdependent Subsystems of Critical Infrastructure					
Technology Agency of the Czech Republic	Research on Structural and Technical Requirements for Utilizing National TEN-T Ground Infrastructure to Address Large-Scale Crisis Situations				851/33,6	1 078/42,5
Ministry of the Interior	Autonomous System for Conducting Explosive Ordnance Reconnaissance in Extremely Hazardous Areas				4 180/164,9	4 180/164,9
Ministry of the Interior	Robotic System Controlled by Artificial Intelligence Algorithms for Intelligence and Reconnaissance Purposes				3 292/129,9	3 546/139,9
Ministry of Industry and Trade	OP PIK VII: Radar System for Detection of Ground and Low-Slow-Small (LSS) Aerial Targets			0 – no subsidy		
Ministry of Industry and Trade	OP PIK VIII: Autonomous Ground Vehicle for Emergency Supply and Logistics				1 220/48,1	9473/373,7
Total		0	0	0	9 443/376,4	18326/722,9

Table 3.3.2 - Contract research activities

Client ²⁸	Activity name	Revenue (in thousands CZK/EUR)				
		2019	2020	2021	2022	2023
N/A						
Total						

²⁸ If the client is from abroad, indicate in brackets the country of origin of the client.

Note: List and describe contract research activities with a revenue in a given calendar year, regardless of the amount of financial revenue.

3.4 Research results with existing or prospective impact on society

The evaluated unit shall briefly comment on a maximum of 10 (considered most significant by the evaluated unit) research results already applied or realistically heading towards application during the period of 2019–2023, based on the overview annex table 3.4.1 (it is recommended to indicate results with a link to projects listed in indicator 3.3). The evaluated unit must demonstrate in its description that the research results have led or will soon lead to positive impacts²⁹, on society (e.g. description of how the results are used by various users, the range of persons/institutions for which the result is relevant, measurable economic impacts, etc.). The evaluated entity shall indicate in its commentary whether the gender dimension is considered in these results and discuss the impacts of the results regarding sustainability.

Maximum range 300 words/result.

Self-Evaluation:

The primary task of the FML, within the hierarchy of the UD and the MoD, is to provide expert activities underpinned by scientific and research analyses for the benefit of the MoD. This area comprises the application of constructive simulation tools (MASA Sword), the development of additive technologies primarily from a process perspective (EDA Cat. B – AMLS), the management of real estate infrastructure (NEMOVITOST), recruitment support for the CAF (TĚLO), expert activities within the CAF, including their impact on the acquisition process (ZNALEC), equipment provisioning—the new field uniform (MAD21), the deployment of autonomous systems for logistics (UGV) or for conducting pyrotechnic reconnaissance (AUTO PYRO EXPLORER), the development of air defence capabilities using new technologies (PVO21), swarm control of UAVs for intelligence and reconnaissance purposes (ROJ), food security within the MoD (SYRIKRIKO), and the potential for new anti-drone systems (ANTIDRON).

Projects aimed at crisis management have a broader societal impact, typically by way of recommendations, certified methodologies, monographs, etc. An example of their application in the field of critical infrastructure are the RESILIENCE projects, which addressed the assessment of preparedness (resilience) levels of territorial units in the context of critical infrastructure (e.g., energy, transportation, cybersecurity), including the impact of potential cascading effects. The societal impact is primarily in these areas of critical infrastructure (transportation, energy, cybersecurity), relevant ministries (primarily the MoD and MoI), and infrastructure operators, with the goal of enhancing the resilience of the studied critical infrastructure. The KRIZTRANS project focused mainly on the structural and technical aspects of the Trans-European Transport Network (TEN-T) infrastructure in the context of oversized and overweight transports carried out primarily by the armed forces of NATO member states. This “non-standard” use of TEN-T leads to significant demands on organization through

²⁹ See Terms definition.

Host Nation Support and increased requirements for the technical parameters of transport routes and their maintenance. The societal impact is primarily on the MoD, the Ministry of Transport of the Czech Republic (MoT), and infrastructure operators (e.g., the Directorate of Roads and Motorways, the Railway Administration), that, through methodologies, non-legislative documents, and recommendations, can better coordinate the provision of TEN-T transport infrastructure, including prioritizing its modernization, maintenance, and repairs. The iKRYTY project addresses the planning and documentation of improvised shelters in the Czech Republic. The goal is to develop a certified methodology for this area, including supporting software to implement it. The societal impact is national, affecting components of the integrated rescue system, regional authorities, as well as central government bodies in the field of crisis management.

Table 3.4.1 - Overview of research results in the period under evaluation

Type of result ³⁰	Year of application	Name
Article in an impacted journal (Jimp, TĚLO)	2023	Assessment of physical activity among adolescents: a guide to the literature.
EU Industrial Designs (MAD21)	2023	European Industrial Designs 015020068-0001 and 015020068-0002. These are camouflage patterns, gradually being introduced into the CAF (as part of the development of the new field uniform).
Article in an impacted journal (Jimp, ROJ)	2023	Adaptive Ant Colony Optimization with Node Clustering for the Multi-Depot Vehicle Routing Problem.
Non-legislative outcome (Hneleg, SYRIKRIKO)	2024	System for Identification and Control of Food Safety Risk in the Field; Draft Annex to Regulation Prov-1-5.
Methodology (N, NEMOVITOST)	2024	Methodology for Estimating the Future Final Cost of Construction and Reconstruction in the Area of Real Estate Infrastructure.
Software (R)	2023	KSPredict: Software for Predicting the Development of Crisis Situations and Emergencies
Monography (B, RESILIENCE)	2018	Cybersecurity and Critical Information Infrastructure
Research Report (V, RESILIENCE)	2019	Research Report and Mapping Materials for Identifying Critical Elements of Information and Communication Infrastructure in a Selected Area Based on the Requirements and Inputs of Entities from the Perspective of Ensuring Selected Functions of Transportation and Energy.
Article in an impacted journal (Jimp, KRIZTRANS)	2022	Use of Big Data Analysis to Identify Possible Sources of Supply Chain Disruption Through the DOTMLPFI Method

³⁰ Specify the specific type of result. Add rows as needed.

Software (R)	2022	Library with MRSI Computational Functions
Software (R)	2022	TarPic (Targeting Picture)
Non-legislative outcome (Hneleg)	2022	Combat Employment of Artillery of the Czech Armed Forces

Note 1: Please list and describe the results already applied in practice or heading towards application in practice with existing or prospective impact on the society (e.g. domestic or foreign patents, sold licenses, spin-offs, prototypes, varieties and breeds, methodologies, significant analyses, surveys, expert outputs for policymaking or other forms of non-publication outputs, etc.). Indirect results of research, development and creative activities with documented societal impact, e.g. expert activities, services to the public/government/scientific community, may also be reported.

TRANSFER OF RESULTS INTO PRACTICE

3.5 Transfer of results into practice

The evaluated unit shall briefly describe its system for transferring results into practice. It shall also indicate up to five of the most typical users of its results, whether in the university environment or in the non-university application/corporate sphere, detailing how it collaborates with them and how it seeks out new users (using a maximum of five specific examples).

It will also indicate whether and how it commercializes R&D&I results (e.g. selling licences, setting up start-up or spin-off companies, etc.)³¹, providing brief description of the commercialization methods used. The effectiveness of the transfer of results and the commercialization of R&D&I results will be described using a selection of results (max. five) listed in annex table (Table 3.4.1).³²

Additionally, the evaluated unit shall briefly comment on the funds received during the period of 2019–2023 from non-public, non-grant sources (e.g. licences sold, spin-off revenues, donations, etc.). A full summary shall be provided in annex table (Table 3.5.1).

Maximum 500 words plus 200 words for each provided example of finding a new user of results and commercialization.

Self-Evaluation:

Due to the distinct position of the UD as an organizational unit of a state organizational component, including a shared business identification number with the MoD, the commercialization of results at the UD level is not possible. Practical application—excluding the commercialization aspect—is described in Section 3.4, where the impact on relevant entities (the MoD, the MoI, the MoT, infrastructure operators, regional authorities, the integrated rescue system, etc.) is outlined. Table 3.5.1 is not relevant for the FML.

Table 3.5.1 - Summary of non-public revenues received during the period under evaluation

Type of revenue	Revenue (in thousands CZK/EUR)
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³¹ In the case of military HEIs, their specific position is taken into account when evaluating the commercialization/evaluation of R&D&I results.

³² If the commercialization of R&D&I results is carried out in this way.

	2019	2020	2021	2022	2023
N/A					
Total					

Note: Enter funds raised for R&D&I from non-public sources besides grants or contract research (e.g. licences sold, spin-off company revenues, donations, etc.) in the calendar year.

POPULARIZATION OF R&D&I

3.6 The most important activities in the field of the popularization of R&D&I and communication with the public

The evaluated unit shall briefly describe its main activities related to the popularization of R&D&I and communication with the public (e.g. popularization lectures, citizen science initiatives, etc.) during the period of 2019–2023 and provide up to 10 examples that it considers the most significant.

Maximum 500 words plus 200 words for each example given.

Self-Evaluation:

Media Appearances of the UD Experts (2019–2023)

Academic and scientific staff of the UD continue to provide interviews for both the electronic and print media. In this way, they not only present their expert opinions on current topics but also showcase their research projects and achieved results.

Scientists' Night (2018–2023)

This popular event takes place annually across the entire country including the universities located in Brno. The UD participates by opening selected laboratories and classrooms to the public, even during unconventional evening or nighttime hours. Practical demonstrations and interactive exhibits are presented, allowing visitors to engage with the latest technologies or try out experiments from the field of military research.

Open Days at the UD (2019–2023, approximately 3–4 times per year)

As part of this traditional event, teaching and research facilities are made accessible annually to prospective students as well as the general public. Visitors receive information about study programs, research projects, and the facilities of the FML and other faculties of the UD.

IMPLEMENTATION OF RECOMMENDATIONS

3.7 Implementation of the recommendations in Module 3

The evaluated unit will briefly describe how it has implemented the recommendations for Module 3 from the previous evaluation period, if applicable.

Maximum 1000 words.

Self-Evaluation:

Key shortcomings from the previous evaluation were discussed and incorporated into

strategic documents (Strategic Intent of the UD/FML) and subsequently into the implementation plan for strategic objectives. Among such shortcomings/remarks, the following can be included, along with measures/progress in the respective areas:

1) Insufficient Internationalization

Internationalization is a very broad area, and progress in this area at the FML level has been made in specific sub-areas. Efforts have been intensified to submit projects to international calls (e.g., EDA, EDF, PESCO, NATO, Horizon Europe, COST Action, V4). However, success rates remain low due to the FML's limited experience in this regard. During the evaluation period, the FML successfully participated in projects such as EDA Cat. B – Additive Manufacturing for Logistic Support, PESCO Electronic Warfare Capability, NATO projects MLCC Smart Defence Multinational Logistics Partnership – Land Operations and Maintenance project and Interoperability Programme for Future JISR Cooperation, as well as several NATO STO initiatives. A significant shift in this area is the expansion of partnerships to include non-academic entities and the establishment of research collaborations with existing partners who previously only collaborated in the field of education (e.g., through the Erasmus program). This is further developed through foreign research internships for doctoral students and academic staff mobility, with the number of doctoral students increasing over the years, gradually supplementing the aging team of FML academic staff. Although the number of active participations in international conferences decreased in the previous period, this is due to a focus on quality (indexed conferences) rather than quantity. Collaboration with the Faculty of Military Technology (FMT), which focuses on military technologies (EDTs), has led to significant synergy in the application of these technologies. An international dimension exists, at least in selected areas (e.g., additive manufacturing). The primary focus remains on military affairs, which aligns with partner universities specializing in security/military studies. However, a fundamental and long-term limitation is the absence of an OECD field (and corresponding FORD codes) in the areas of military, security, or defence. This not only limits the achievement of excellence in specific scientific fields but also contributes to the overall fragmentation in the formal reporting of creative activities.

2) Insufficient Number of Projects

At the international level, projects have been described above, and FML is gradually developing its capabilities and know-how in this area. At the national level, the situation has significantly improved, although, given the governing authority (the MoD) and the primary focus on military affairs, the orientation remains on defence research projects (provided by the MoD). However, the number of project proposals for other providers (e.g., the Technology Agency of the Czech Republic, the Ministry of the Interior, the Ministry of Industry and Trade, and the Czech Science Foundation (CSF)) has substantially increased, with a higher number of proposals leading to greater success rates. Annually, a sufficient number of projects are submitted to ensure that, on average, at least 1–2 projects commence their implementation each year. In this context, the duality of technology and approach utilization, including interdisciplinary solutions, is also being successfully applied. Compared to the

previous assessment, the number of projects addressed increased from 4 to 11.

3) Insufficient Application in Practice

Given the unique role of the UD/FML in the field of military affairs, the application of results and acquired scientific knowledge in practice has significantly improved compared to the past (primarily for the MoD sector, crisis management authorities, and the integrated rescue system).

4) Insufficient Reflection of Economic and Social Impacts of Military Deployment

This issue is being developed by at least two departments of FML, including the context of life cycle costs, which is a major topic for the MoD, particularly in connection with the efficiency of the acquisition process. Many such topics have been accelerated by the conflict in Ukraine, which has also led to increased support for the security sector and its research and development. Lessons from Ukraine are carefully evaluated, and solutions are being offered in areas such as the conduct of such conflicts, military mobility, maintenance and repairs, artillery support, intelligence support, etc. Relatively new are also the ethical aspects of using AI and new technologies in the context of developing soldiers' (and particularly leaders') competencies.

A LIST OF SUPPORTING DOCUMENTS/LINKS FOR MODULE 3

Document name	No. criteria	Location (link in HTML)

SELF-EVALUATION REPORT FOR MODULE 3

**NAME OF EVALUATED UNIT:
FACULTY OF MILITARY TECHNOLOGY**

FORD: 2 - Engineering and technology

SOCIETAL CONTRIBUTION OF THE EVALUATED UNIT

3.1 Introductory information about the unit under evaluation

The evaluated unit will describe its mission and vision and provide a general self-reflection of the societal contribution of R&D&I, along with its long-term goals in the fields it develops. The distribution of research activities by type of research will also be commented on.¹ The evaluated unit will describe its organizational structure and size (staffing, number of students, number of programmes of study implemented, etc.) based on the data provided in annex tables 3.1.1 to 3.1.6.

Maximum 1000 words.

This is a non-rated indicator that serves as an introduction to the evaluated unit, providing context for data in indicators 3.2-3.7.

Self-Evaluation:

The Faculty of Military Technology (FMT) at the University of Defence (UD) is a technically oriented educational institution whose long-term mission is to support the defence capabilities of the Czech Republic through educational, research and development, and innovation-related activities. The main objective of the faculty is the training of specialists for the Czech Armed Forces (CAF) and the Ministry of Defence of the Czech Republic (MoD) in accredited programmes of study, lifelong learning programmes, and applied research. The faculty is an internationally recognized educational and research institution with considerable potential in the field of military technology, while also serving as a strategic partner for the MoD and the CAF. This status is reinforced by its activities, focused on developing scientific knowledge crucial for defence and security, as well as implementing this knowledge in practice. In

¹ Basic, applied, contract, artistic research (see Definition of Terms in Methodology HEI2025+).

addition, the faculty also collaborates closely with nationally and internationally recognized experts, which allows it to contribute to the modernization and efficiency of the Czech Republic's defence capabilities. During the evaluation period of 2019–2023, the faculty was fulfilling its vision as an institution that connects educational, R&D, and innovation activities with the current needs of the MoD and the CAF. It focused on the training of specialists in the required specializations and quotas, responding to the dynamic development of technologies and the changing needs of the armed forces. The foundation of its activities consisted of accredited programmes of study and targeted educational activities that reflected current trends in military technology.

The faculty's organizational structure enables the effective management of educational and R&D activities, with key directions of scientific research defined by the faculty's Strategic Plan for the Period 2021–2030. The faculty has focused on three main areas: conducting aerial operations, conducting cyber operations, and developing military autonomous and robotic systems. These directions reflect the current trends in emerging and disruptive technologies (EDTs) and respond to the strategic needs of NATO and the European Union.

During the evaluated period, the Faculty of Military Technology significantly contributed to expert activity, including support for the Czech Armed Forces (CAF), the Ministry of Defence of the Czech Republic (MoD), the Defence and Security Industry Association (DSIA), the defence industry, and state agencies such as the Customs Administration of the Czech Republic. The faculty actively engaged in the modernization and development of military technology, including HUMS systems for combat vehicles and TITUS 6x6 universal vehicle platforms, as well as in the construction of training and military infrastructure. The faculty made significant contributions to artillery and air defence support, participating in the selection and evaluation of systems such as the SHORAD anti-aircraft system, and in the creation of firing tables and automated fire control systems. In addition, the faculty assisted in the CAF logistics section in introducing 3D printing into military conditions, contributing to innovative approaches in the maintenance and development of technology. The faculty's involvement in expert teams brought innovative approaches in the fields of autonomous systems, cyber protection, and modern military technology. The faculty also provided expert opinions, expert reports, and consulting services for the defence industry and public administration, highlighting its strategic role in ensuring the defence capability of the Czech Republic. During the evaluated period, the faculty achieved significant results in applied research, international cooperation, and education. The faculty's societal contribution lies not only in the development and implementation of military technologies, but also in their transfer into practice. The faculty cooperated closely with the partners from the defence industry, the scientific community, and the public sector, contributing to the modernization of the Czech Republic's defence capabilities and strengthening its security infrastructure.

Table 3.1.1 - Staffing per FTE²

Academic/ Professional position	Total / Of which women					
	2019	2020	2021	2022	2023	Total
Professor	20.8/1.1	18.5/1.1	20.3/1.1	20.3/1.1	19.1/1.1	19.8/1.1
Associate Professor	29.7/1.1	32.8/2.1	36.1/2.1	34.8/3.1	34.2/3.1	35.3/2.6
Assistant Professor	83.3/17.3	78.1/8.8	80.1/11.2	74.9/10.1	77.1/9.1	79.2/10.8
Lecturer	17.4/1.1	20.9/1.3	21.2/0	23.5/0.6	25.6/1	24.8/0.8
R&D Personnel ³	3/1	3/1	3/1	3/2	2/1	3/1
Researchers in other categories ⁴	0/0	0/0	0/0	0/0	0/0	0/0
Technical and economic staff ⁵	6/4.3	6.5/4.7	6.5/4.3	7.3/5.2	8.1/5.5	7.9/5.3
Scientific, research and development staff involved in teaching activities	154.2/21.6	153.1/14.3	160.7/15.4	156.5/16.9	158/15.3	158.9/15.8
Early career researchers ⁶	19.7/1.2	18/1.2	14.8/1.3	15.1/1.3	17.3/1.3	16.5/1.3
Total ⁷	160.2/25.9	159.8/19	167.2/19.7	163.8/22.1	166.1/20.8	164.2/21.6

Note: The categories professor, associate professor, assistant professor, lecturer, other scientific, R&D personnel, researchers in other categories and technical and economic staff are mutually exclusive, i.e. one staff member is reported under one category only. Scientific, research and development staff involved in teaching activities, as well as early career researchers are reported collectively for all the above-mentioned categories.

3.1.2 Age structure of R&D&I personnel of the evaluated unit and their structure by job title and gender in the year 2019 (numbers of physical employees and personnel)⁸

Academic/ professional position	Under 29 years		30-39 years old		40-49 years old		50-59 years old		60-69 years old		70 years and older	
	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n

² The average number of hours worked is calculated as the ratio of the total number of hours actually worked during the reference period, from 1 January to 31 December, by all staff (including agreement on work activity, excluding agreement on work performance) to the total annual working time pool per full-time employee. The full-time status of the worker in the evaluated unit is always reported. If an employee holds more than one type of full-time job within the evaluated unit, the total sum of the two shall be reported.

³ The category "R&D Personnel" includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).

⁴ The category "Researchers in other categories" includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).

⁵ Who participates in the management and support of R&D&I in the institution.

⁶ See Definition of Terms in Methodology HEI2025+.

⁷ Total is the sum of the categories: professor, associate professor, assistant professor, lecturer, R&D personnel, researchers in other categories and technical and economic staff.

⁸ The total number of employees/workers as of 31st December of the calendar year in question is to be entered, irrespective of the level of time worked, but only in an employment relationship (including agreement on work activity, excluding agreement on work performance). Other types of contractual relationships under the Civil Code that involve purchase of services are not included.

Professor	0	0	0	0	3	0	6	1	10	0	4	0
Associate Professor	0	0	3	0	6	1	10	1	10	0	4	0
Assistant Professor	1	0	25	2	32	4	11	3	17	3	3	0
Lecturer	2	0	5	0	6	1	0	0	4	0	1	0
R&D Personnel ⁹	0	0	1	0	0	0	1	1	1	0	0	0
Researchers in other categories ¹⁰	0	0	0	0	0	0	0	0	0	0	0	0
Technical and economic staff ¹¹	1	1	0	0	2	1	4	3	1	1	0	0
Scientific, research and development staff involved in teaching activities	3	0	34	2	47	6	28	6	42	3	12	0
Early career researcher ¹²	1	0	15	2	4	0	2	0	0	0	0	0
Total ¹³	4	1	34	2	49	7	32	9	43	4	12	0

Note: The categories professor, associate professor, assistant professor, lecturer, other scientific, R&D Personnel, Researchers in other categories and Technical and economic staff are mutually exclusive, i.e. one staff member is reported in only one category. The categories of scientific, research and development staff involved in teaching activities and early career researchers are reported collectively for all the above-mentioned categories.

3.1.3 Age structure of R&D&I personnel of the evaluated unit and their structure by job title and gender in the year 2023 (numbers of physical employees and personnel)¹⁴

Academic/ professional position	Under 29 years		30-39 years old		40-49 years old		50-59 years old		60-69 years old		70 years and older	
	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women
Professor	0	0	0	0	3	0	5	1	8	0	6	0
Associate Professor	0	0	2	0	11	0	12	3	8	0	5	0
Assistant Professor	0	0	17	2	38	6	12	1	14	1	5	0
Lecturer	4	1	13	1	8	0	0	0	1	0	1	0
R&D Personnel ¹⁵	1	1	0	0	0	0	1	0	0	0	0	0
Researchers in other categories ¹⁶	0	0	0	0	0	0	0	0	0	0	0	0

⁹ The category "R&D Personnel" includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).

¹⁰ The category "Researchers in other categories" includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).

¹¹ Who participates in the management and support of R&D&I in the institution.

¹² See Definition of Terms in Methodology HEI2025+.

¹³ Total is the sum of the categories: professor, associate professor, assistant professor, lecturer, R&D Personnel, Researchers in other categories and technical and economic staff.

¹⁴ The total number of employees/workers as at 31.12. of the calendar year in question is to be entered, irrespective of the level of time worked, but only in an employment relationship (including agreement on work activity, excluding agreement on work performance). Other types of contractual relationships under the Civil Code that involve purchase of services are not included.

¹⁵ The category "R&D Personnel" includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).

Technical and economic staff ¹⁷	1	1	0	0	1	1	4	3	4	2	0	0
Scientific, research and development staff involved in teaching activities	5	2	32	3	60	6	30	5	31	1	17	0
Early career researcher ¹⁸	4	1	15	2	2	0	1	0	0	0	0	0
Total ¹⁹	6	3	32	3	61	7	34	8	35	3	17	0

Note: The categories professor, associate professor, assistant professor, lecturer, other scientific, R&D personnel, researchers in other categories and technical and economic staff are mutually exclusive, i.e. one staff member is reported under one category only. Scientific, research and development staff involved in teaching activities, as well as early career researchers are reported collectively for all the above-mentioned categories.

Table 3.1.4 – Students

Type of study	2019		2020		2021		2022		2023		Total	
	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women
Undergraduate	134	26	103	14	55	5	63	4	58	2	413	51
Master's ²⁰	378	43	441	57	519	62	525	64	535	68	2398	294
Doctoral	61	5	61	6	37	1	29	2	48	9	236	23
Lifelong Learning Courses	338	29	177	20	324	25	510	42	483	36	1832	152
Total	911	103	782	97	935	93	1127	112	1124	115	4879	520

Table 3.1.5 - Programmes of study in Czech/English

Type of programme of study	Total ²¹ / Of which professional programmes of study											
	2019		2020		2021		2022		2023		Total	
Undergraduate	4/0	0/0	4/0	0/0	6/0	0/0	7/0	0/0	7/0	0/0	7/0	0/0
Master's	7/0	3/0	7/0	3/0	9/0	3/0	10/0	3/0	11/0	4/0	11/0	4/0
Doctoral	2/0	0/0	2/0	0/0	8/0	0/0	8/0	0/0	8/0	0/0	8/0	0/0
Lifelong	37/0	37/0	22/0	22/0	36/0	36/0	57/0	57/0	46/0	46/0	339/0	339/0

¹⁶ The category “Researchers in other categories” includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).

¹⁷ Who participates in the management and support of R&D&I in the institution.

¹⁸ See Definition of Terms in Methodology HEI2025+.

¹⁹ Total is the sum of the categories: professor, associate professor, assistant professor, lecturer, R&D personnel, researchers in other categories and technical and economic staff.

²⁰ All master's degree students are listed, regardless of the length of their programme of study.

²¹ The total number of programmes of study for which admissions have been announced in a given academic year.

Learning courses												
Total	50/0	40/0	35/0	25/0	59/0	39/0	82/0	60/0	72/0	50/0	365/0	343/0

Note: For each SP type, enter the number of SPs in Czech language in the first cell and insert the number of SPs in English language after the slash in the same cell (e.g. 15/3), enter the number of professional SPs in Czech language in the second cell and insert the number of professional SPs in English language after the slash. Follow a similar procedure in the last column of the table (Total).

3.1.6 – R&D&I capacities

R&D&I field	FORD	FORD share [%]	Predominant type of research	Total share of industry group [%]
1. Natural Sciences	1.1 Mathematics	4	Basic Research	32
	1.2 Computer and information sciences	11	Basic Research	
	1.3 Physical sciences	8	Balanced basic and applied research	
	1.4 Chemical sciences	2	Basic Research	
	1.5 Earth and related environmental sciences	5	Balanced basic and applied research	
	1.6 Biological sciences	1	Basic Research	
	1.7 Other natural sciences		Select an item	
2. Engineering and Technology	2.1 Civil engineering	4	Basic Research	49
	2.2 Electrical engineering, electronical engineering, Information engineering	18	Balanced basic and applied research	
	2.3 Mechanical engineering	22	Balanced basic and applied research	
	2.4 Chemical engineering		Select an item	
	2.5 Materials engineering	4	Basic Research	
	2.6 Medical engineering		Select an item	
	2.7 Environmental engineering	1	Balanced basic and applied research	
	2.8 Environmental biotechnology		Select an item	
	2.9 Industrial biotechnology		Select an item	
	2.10 Nanotechnology		Select an item	
	2.11 Other engineering and technologies		Select an item	
3. Medical and Health Sciences	3.1 Basic medicine		Select an item	2
	3.2 Clinical medicine	2	Basic Research	
	3.3 Health sciences		Select an item	
4. Agricultural and	4.1 Agriculture, Forestry, and Fisheries	1	Basic	1

veterinary sciences			Research	
	4.2 Animal and Dairy science		Select an item	
	4.3 Veterinary science		Select an item	
	4.4 Other agricultural sciences		Select an item	
5. Social Sciences	5.1 Psychology and cognitive sciences		Select an item	16
	5.2 Economics and Business		Select an item	
	5.3 Education	2	Balanced basic and applied research	
	5.4 Sociology		Select an item	
	5.5 Law		Select an item	
	5.6 Political science		Select an item	
	5.7 Social and economic geography	2	Basic Research	
	5.8 Media and communications		Select an item	
	5.9 Other social sciences	12	Balanced basic and applied research	
6. Humanities and the Arts	6.1 History and Archaeology		Select an item	
	6.2 Languages and Literature		Select an item	
	6.3 Philosophy, Ethics and Religion		Select an item	
	6.4 Arts (arts, history of arts, performing arts, music)		Select an item	
	6.5 Other Humanities and the Arts		Select an item	
Total		100 %	-	100 %

RECOGNITION BY THE RESEARCH COMMUNITY

3.2 Recognition by the research community

The evaluated unit will briefly comment on its position in the research community. It shall consider individual and other prestigious R&D&I awards, participation of its academic staff in the editorial boards of international scientific journals, elected membership in professional societies, major invited lectures given by the evaluated unit's academic staff abroad or by foreign scientists and other relevant guests at the evaluated unit. Additionally, it will address the involvement of staff in the evaluation of national or European project/programme calls over the period of 2019–2023 based on the data provided in annex tables 3.2.1 to 3.2.5 (max. 10 most relevant items). If necessary, the evaluated unit shall list any additional services to the scientific community that it considers relevant.

Maximum 1000 words.

Self-Evaluation:

The Faculty of Military Technology is a multidisciplinary institution that brings together 13 departments focused on a wide range of technical and military disciplines. Key areas include weapons and ammunition, military geography and meteorology, robotics, electrical engineering, air defence, mechanical engineering, computer science, cybersecurity, and other technical fields. This diverse range of expertise allows the faculty to provide comprehensive research and education, contributing to addressing current challenges in defence and security.

Given the extent and diversity of the faculty's activities, it is truly difficult to fully capture all key contributions of its individual departments and their scientific teams. The selected examples presented in the evaluation therefore constitute a representative cross-section of the successes and activities that best illustrate the faculty's expertise and international recognition.

The included contributions in the areas of prestigious awards, participation in editorial boards, invitations to lecture, hosting foreign experts, and evaluation of research projects clearly demonstrate the faculty's significant position in the national and international scientific community. Through its activities, the faculty not only contributes to the development of science and technology, but also to meeting the strategic needs of the defence sector.

Prestigious awards

During the evaluation period of 2019–2023, the faculty achieved recognition through prestigious awards granted to its academic staff for exceptional scientific contributions. These achievements include a NATO Science and Technology Organization award for long-term contributions in the fields of modelling and simulations, the development of the NATO Reference Mobility Model, and other applications of military technologies. Special mention goes to the awarding of the title

of DSc. and of the Rector's award for scientific work to COL Prof. RNDr. Ing. David Vališ, Ph.D. These results underscore the faculty's top-level scientific activity and its ability to respond to current challenges in science and technology.

Participation in editorial boards

The prominent standing of the faculty in the scientific community is evidenced by the service of its academic staff as members of the editorial boards of renowned international journals. Faculty members are involved in journals such as IEEE Access, Advances in Geoscience, Coatings, and the Journal of KONBiN, thereby contributing to the professional steering and quality of published scientific works. This activity demonstrates the high professional authority of the faculty's staff in their fields.

Invitations to lecture

During the evaluation period, the faculty's academic staff were invited to prestigious international conferences and universities to present the results of their research. Notable lectures include contributions at NATO conferences, lectures at technical university in Germany, Poland, and South Africa, and presentations on risk assessment and technology reliability. These activities highlight the high level of scientific work and the international connections of its faculty.

Hosting foreign experts

The faculty regularly hosts prominent foreign scientists who contribute to the development of teaching and research. Among the guests are scientists from institutions such as Mississippi State University, Vilnius University, and the Cold Regions Research and Engineering Laboratory (CRREL). This collaboration ensures transfer of the latest knowledge and trends into the faculty's teaching and research activities.

Involved in evaluating calls for projects

The faculty's staff take part in evaluating national and European research projects and programme-related calls. The evaluated projects include programmes such as THÉTA, EPSILON, and TREND organized by the Technology Agency of the Czech Republic (TACR), as well as international projects focused on crisis management and technological innovations. This activity underscores the trust in the faculty staff's expertise, shown to be at the highest level.

Services to the scientific community

The Faculty of Military Technology actively participates in organizing international conferences and workshops, which facilitates the presentation of new findings and the sharing of experiences among experts from various fields. Moreover, the faculty provides professional consultations and support in technical and military disciplines for both national and international partners.

Conclusion

The Faculty of Military Technology solidified its position as a significant player in the

research community during the period 2019–2023. Through prestigious awards, active participation in editorial boards, international lectures, collaboration with prominent foreign institutions, and involvement in project evaluations, the faculty confirms its role as a key entity contributing to the advancement of science and technology in the fields of defence and security. This wide range of activities demonstrates the faculty's ability to respond to dynamically changing challenges and contribute to innovations with direct applications in both the military and civilian spheres.

Table 3.2.1 - Prestigious R&D&I awards granted during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Name of the award	Awarding institution
COL Prof. Ing. Jan HODICKÝ, Ph.D.	NATO STO Modelling and Simulation Certificate of Appreciation for outstanding 12 years' contribution to NATO science activity	NATO STO
Prof. Ing. Marian RYBANSKÝ, Ph.D.	Award of the NATO Science and Technology Organization for development of the NATO Reference Mobility Model 2020	NATO STO
COL Ing. Vlastimil NEUMANN, Ph.D.	NATO STO – AVT Panel Excellence Award recognizing and appreciating extraordinary scientific contributions rendered to the applied vehicle technology panel in as a member of the task group AVT-248 "Next-Generation NATO Reference Mobility Model (NRMM) Development and Demonstration" 2020	NATO STO
COL Prof. RNDr. Ing. David VALIŠ, Ph.D. et Ph.D., DSc.	Awarding of the DSc. Title in 2020	Academy of Sciences CR
COL Prof. RNDr. Ing. David VALIŠ, Ph.D. et Ph.D., DSc.	Award of the Rector-Commandant for scientific work in 2020	University of Defence
MAJ Assoc. Prof. Ing. Jan BOŘIL, Ph.D.	Best of Session (Pilot Factors) Award for the paper entitled "BDAM Model for Testing the Resistance of Air Force Pilots to Hypoxia"	The 39th Digital Avionics Systems Conference, USA
Prof. RNDr. Šárka MAYEROVÁ, Ph.D.	2023 Best paper award Journal AXIOM	Journal ASIOMS ISSN (eISSN): 2075-1680

Note: Provide up to 10 examples.

Table 3.2.2 Participation of academic staff of the evaluated unit in editorial boards of international scientific journals during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Name of scientific journal, ISSN
Prof. Ing. Dalibor BIOLEK, CSc.	Advances KMUTNB International Journal of Applied Science and Technology, ISSN: 2465-4531
Prof. Ing. et Ing., Fabian KHATEB, Ph.D. et	IEEE Access, ISSN / eISSN: 2169-3536

Ph.D.	
Prof. RNDr. Šárka MAYEROVÁ, Ph.D.	Journal of KONBiN, ISSN: 1895-8281
LT COL Prof. Ing. Zdeněk POKORNÝ, Ph.D., FEng.	Coatings, ISSN 2079-6412
COL Prof. RNDr. Ing. David VALIŠ, Ph.D. et Ph.D., DSc.	Journal of Polish Safety and Reliability Association, ISSN: 2084-5316
COL Prof. RNDr. Ing. David VALIŠ, Ph.D. et Ph.D., DSc.	EiN – Reliability and Maintenance, ISSN: 1507-2711
Prof. Ing. Zdeněk VINTR, CSc., Dr. h. c.	Security and Defence Quarterly, ISSN: 2300-8741
Prof. Ing. Zdeněk VINTR, CSc., Dr. h. c.	Journal of civil engineering and transport - transEngin, ISSN 2658-1698
Prof. Ing. Marian RYBANSKY, CSc.	International Journal of Vehicle Performance, ISSN: 1745-3208,
Prof. Ing. Marian RYBANSKY, CSc.	Advances in Geoscience, eISSN: 1680-7359

Note: Please provide up to 10 examples of academic staff participation in editorial boards of international scientific journals (e.g. editor, editorial board member, etc.).

Table 3.2.3 The most important invited lectures delivered by the academic staff of the evaluated unit at foreign institutions during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Invited lecture title	Name of host institution, or name of conference or event	Year
COL Assoc. Prof. Ing. Jan MAZAL, Ph.D.	M&S in support of Operational Decision Making	NATO MSCOE, Rome, Italy, Invited lecture for NATO Modelling and Simulation Course	2019
COL Assoc. Prof. Ing. Jan MAZAL, Ph.D.	Autonomous Systems Advancing to the Domination on the Future Battlefield,	SMi 5th Annual - Military Robotics & Autonomous Systems Conference, 06th – 07th April, London	2022
COL Prof. RNDr. Ing. David VALIŠ, Ph.D. et Ph.D., DSc.	Risk Management	Defence University for Higher Military Studies (DUHMS) - National Defence College (NDC), Baghdad, Iraq	2022
Prof. Ing. Marian RYBANSKY, CSc.	Mobility Evaluation in Forests	NATO AVT-308 CDT Meeting, Trier, Germany, 2022	2022
Prof. Ing. Marian RYBANSKY, CSc.	Geo-information support for off-road vehicle navigation in crisis situations	Council for Scientific and industrial Research (CSIR), Pretoria, South Africa, 2023	2023
Prof. Ing. Marian RYBANSKY, CSc.	Measurement of vegetation parameters to determine the passability of forests by military vehicles in Central and Eastern Europe	NATO AVT 51st Panel Business Meeting, London, UK, 2023	2023
COL Prof. RNDr. Ing. David VALIŠ, Ph.D. et Ph.D., DSc.	Risk Management in Technical Applications	Wroclaw University of Technology, Poland	2023
COL Prof. RNDr. Ing. David	Reliability Assessment and	Mülhem University of	2023

VALIŠ, Ph.D. et Ph.D., DSc.	Accelerated Testing	Technology, Germany	
COL Assoc. Prof. Ing. Jan FARLÍK, Ph.D.	Counter-Drone Defence	Ministry of Industry and Trade in Prague	2023
Prof. RNDr. Šárka MAYEROVÁ, Ph.D.	Functions and Characteristics of Composite Indicators for Perception of the Severity of Hybrid Threats	Academy of the Police Force in Bratislava	2023

Note: Provide up to 10 examples.

Table 3.2.4 - The most important lectures by foreign scientists and other guests relevant to R&D&I at the evaluated unit during the evaluation period

Name, surname and title(s) of the lecturer	Lecturer's employer at the time of the lecture	Invited lecture title	Year
Prof. George Mason, Ph.D., PE	Mississippi State University, USA	An historical perspective of off-road vehicle testing and simulation in the US	2019
Prof. Lisa Jackson, Ph.D.	Loughborough University, UK	Enhanced health monitoring capabilities for fuel cell energy utilization in perspective defence application	2019
LTC Konrad Madej	Polish Air Force, PL	Meeting present and future battlefield requirements	2019
Dr. Jelena Tamulienė	Vilnius University, Lithuania	Modelling of a new materials with specific properties	2021
Dr. Susan Frankenstein, Dr. Tim Cary, Dr. Nadia Podpora	Cold Regions Research and Engineering Laboratory (CRREL), Hanover, NH, USA	Development of the NATO Reference Mobility Model	2021
Ing. Robert Kosturek	Military University of Technology (WAT), Warsaw, PL	Study on the weldability of AA2519 armour grade aluminium alloy	2021
Prof. Peter Kiss	Hungarian University of Agriculture and Life Sciences, Godollo, Hungary	The influence of the geographical environment on the movement of off-road vehicles	2022
Marek Polcak	Vrgineers, Inc., Dober, USA	Bridging Simulation and Reality: Advanced Virtual and Mixed Reality Solutions by Vrgineer	2023
Prof. Tamer Wasfy	Director of the Advanced Science and Automation Corp., Indianapolis, Indiana, USA	Modelling and simulation of terrain influence on the mobility of military vehicles	2023
MAJ General Ing. Robert Bielený, Ph.D., MSS	Logistics Section of the Czech Armed Forces	Logistical Support in the Czech Armed Forces: Technologies and Their Role in the Future Czech Army	2023

Note: Provide up to 10 examples.

Table 3.2.5 - Involvement in the evaluation of national/European research project/programme calls relevant to the R&D&I area at the unit during the evaluation period

Name, surname and	Name of the research	Name of the	Year
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title(s) of the evaluated unit's staff member	project/programme call	contracting authority/guarantor of the project/ programme call	
Prof. Ing. Marian RYBANSKY, CSc.	Peer review of the international project "Dynamic Mapping Method Oriented on Risk and Disaster Management in the Era of Big Data (LTACH-17002)"	Ministry of Education, Youth and Sports – INTER-EXCELLENCE	2019
COL Assoc. Prof. Ing. Jan MAZAL, Ph.D.	Project title in original language: Planning Optimal Trajectories Through Multiple Targets for Non- holonomic Robotic Systems with Limited Manoeuvrability	Ministry of Education, Youth and Sports – INTER-EXCELLENCE	2019
COL Assoc. Prof. Ing. Jan MAZAL, Ph.D.	Programme EG – Operational Programme Business and Innovation for Competitiveness (2014 - 2020): Development of Modular Multifunctional Diagnostic System	Ministry of Industry and Trade	2020
MAJ Assoc. Prof. Ing. David DOBROCKÝ, Ph.D.	Evaluation of project proposals TK04020240, TK04030111, TK04030295 and TK04030315, THÉTA Programme	TACR (Technological Agency of the CR)	2021
MAJ Assoc. Prof. Ing. David DOBROCKÝ, Ph.D.	Evaluation of project TH03030219, EPSILON 3 Programme	TACR	2021
COL Assoc. Prof. Ing. Jan MAZAL, Ph.D.	Programme to Support Applied Research, Experimental Development, and Innovation in Transport – TRANSPORT 2020+ (2020 - 2026): RoboTouch – Virtual Reality and Robotic Glove for Tele-navigation of Autonomous Transport Systems	TACR	2022
LT COL Assoc. Prof. Ing. Zbyněk STUDENÝ, Ph.D.	Influence of Cryogenic Treatment on Steel and Hard-Metal on the Mechanical Properties and Durability of Products Made from These Materials	TACR	2023
LT COL Assoc. Prof. Ing. Zbyněk STUDENÝ, Ph.D.	Metal Implants with Enhanced Surface Resistance to Degradation Processes During Repeated Sterilization	TACR	2023
MAJ Assoc. Prof. Ing. David DOBROCKÝ, Ph.D.	Evaluation of project FW001010017, TREND 1 Programme	TACR	2023
Prof. Dr. Ing. Alexandr ŠTEFEK	Peer review on the MPVO project, application of OP PIK, "Modular Camera TQC Tester with Artificial Intelligence Elements"	Ministry of Industry and Trade	2023

Note: Provide up to 10 examples.

RESEARCH PROJECTS

3.3 Research projects

The evaluated unit shall list at most 10 (considered most significant by the evaluated unit) research projects/activities (regardless of whether they are supported by public funds or based on contract research²²) that it has implemented or participated in during the period of 2019–2023²³. This should be done from the full list in annex tables (Table 3.3.1-3.3.2)²⁴, regarding particularly the results achieved or the application potential of the projects. The unit should also describe how the research projects contributed to the mission and purpose of the evaluated unit. If the evaluated unit has been a participant in listed project, it shall indicate which other entities were involved and describe its contribution to the project. The interdisciplinary aspects of the projects will also be commented on, along with any collaboration with other units of the evaluated HEI.

Maximum 300 words per project.

²² For the definition of contract research for the purposes of evaluation in the HE segments, see Article 2.2.1 of the Community Framework for State Aid for Research, Development and Innovation 2014/C 198/01.

²³ Regardless of whether the projects are completed or still ongoing, provided that at least part of the project was implemented during the evaluation period.

²⁴ The evaluated unit shall only fill tables that are relevant to it.

Self-Evaluation:**1) Ballistic protection and incapacitating device for armed security escorts of the Czech Police aircraft (2017–2020)**

Main beneficiary: Ministry of Defence – Faculty of Military Technology

Support: MV Ministry of the Interior (VI20172020058)

Project description:

The aim of the project was to develop and produce a limited series of individual ballistic protection equipment (concealed vests, resistant luggage, and multipurpose cases) and an optical incapacitating device, fully meeting the requirements of armed security escorts of the Czech Police aircraft.

Achieved results:

- The concealed ballistic vest is designed for protection under clothing and can also serve as an emergency cover for an explosive device.
- The ballistic-resistant backpack functions as regular luggage, anti-explosion protective equipment, and a supplementary ballistic shield.
- The multipurpose laptop case serves as a discharge device, anti-explosion cover, supplementary ballistic protection (ballistic shield), storage case for weapons and ammunition, and can also be used as an improvised cover or striking tool.
- The optical incapacitating device is designed for temporarily dazzling or blinding the perpetrator, or for striking a sensitive area.

Contribution to the mission of the evaluated unit:

This new equipment and armament significantly enhance ballistic protection during transfers and the handling of weapons. It also allows for non-lethal intervention on board an airplane with the optical incapacitating device. The ballistic-resistant equipment simultaneously increases safety when handling ammunition, even in the confined space of the aircraft. These means have been successfully implemented in practice, which has significantly strengthened both protection and prevention of potential risks in security air transport.

Interdisciplinary aspects:

During the development of ballistic protective equipment, findings from materials engineering, terminal ballistics, and testing were applied to verify the declared resistance according to relevant standards. The development of the optical incapacitating device utilized expertise in optics, electronics, and physiological optics to achieve the desired effect without permanent health consequences.

Cooperation:

The development of ballistic protection was led by members of the Department of Weapons and Ammunition in cooperation with the armed escort of the Czech Police aircraft, the company Hodonský s. r. o., and the company Prototypa-ZM, s.r.o. The

development of the incapacitating device took place with the participation of the UD Department of Weapons and Ammunition, the UD Department of Aviation Technology, the armed escorts of the Czech Police aircraft, and the company OPTICS TRADE, spol. s r. o. Nový Jičín.

2) Research, development, testing, and evaluation of critical infrastructure elements (2017–2020)

Support: Ministry of the Interior (VI20172020061)

Main beneficiary: Vojenský výzkumný ústav, s. p. (*Military Research Institute*)

Co-investigators: MoD – University of Defence (Faculty of Military Technology), BOGGES, spol. s r.o., Poličské strojírný a.s., SVS FEM s.r.o., the Czech Technical University in Prague (Faculty of Civil Engineering)

Project description:

The aim of the project was to improve protection and resilience of critical infrastructure (CI) against modern threats, including explosions, vehicle intrusions, shooting, and other forms of attacks. The project involved the development of new materials, methodologies, and functional samples, testing in laboratory and simulated conditions, and the creation of a comprehensive methodology for evaluating the resilience of CI elements.

Involvement of the Faculty of Military Technology

The academic staff of the Faculty of Military Technology were involved in the following:

- Analysing the risks and the current state of CI: Identifying key vulnerabilities and their interaction with modern threats.
- Numerical modelling: Development of models simulating the behaviour of critical elements of CI under the load of explosions, projectiles, and other threats.
- Testing activities: Design and implementation of test scenarios to verify the resilience of CI components and structures.
- Development of methodologies: Creation of standardized procedures for assessing the resilience of CI objects.
- Practical verification: Testing functional samples and evaluating their effectiveness in real conditions.

Achieved results:

- **New materials and technologies:** Development of fibre-reinforced concrete and fibre-cement cladding to increase resistance to explosions and projectiles.
- **Testing infrastructure:** Creation of a unique testing polygon, including a shooting range and a blast pit, for experimental verification of CI resilience.
- **Methodologies:** Certified procedures for assessing and increasing CI

resilience, usable by state administration and industrial entities.

- **Transfer of knowledge:** Organization of workshops and practical demonstrations for public administration focused on CI protection.

Interdisciplinary aspects:

The project combined knowledge from the fields of construction, material engineering, crisis management, and ballistics. This approach ensured a comprehensive solution for CI protection against various threats.

Cooperation:

The University of Defence cooperated with leading research institutes and industrial partners, which enabled the use of expertise and technologies for the effective implementation of the project.

3) Detection of defence perimeter breaches using immediate change in polarization of optical signal (2019–2022)

Support: MV (VI20192022140)

Main beneficiary: Masaryk University

Co-investigators: Ministry of Defence – Faculty of Military Technology, Brno University of Technology

Project description:

The main goal was to develop an innovative system capable of real-time detection of defence perimeter breaches using the technology of immediate change in polarization of optical signals. This technology allows for an exceptionally rapid and precise response to any unwanted activity near the protected object, which is crucial for the protection of critical infrastructure, military facilities, and other highly guarded locations. The project included the development of complete technology and prototypes of sensors and electronics, the functionality of which was verified in industrial and military environments.

Involvement of the Faculty of Military Technology

Academic staff of the Faculty of Military Technology focused on the design and optimization of polarization sensors, including evaluation electronics that analyse changes in light polarization. A crucial step was testing in real conditions, especially in the military training areas of Boletice and Březina. In these locations, simulations of possible intrusion scenarios were conducted, proving the effectiveness and reliability of the developed system. The faculty also contributed to the design of protective measures to enhance the security of critical objects.

Achieved results:

- Functional prototypes: Four functional samples (two owned by the UD) were

created, capable of quickly detecting perimeter breaches using optical signal analysis.

- Increased security: Minimization of operational costs and high reliability make the system an ideal tool for protecting importation locations.
- Technological innovation: The combination of advanced fibre optics and modern signal processing elevates the level of security to a new level.
- Wide application: Military, civil, and industrial facilities can benefit from effective perimeter protection and early warning.

Contribution to the mission of the evaluated unit:

The project develops technology for the protection of critical objects and infrastructure, significantly contributing to the enhancement of national security.

Interdisciplinary aspects and cooperation:

Findings from the disciplines of optics, physics, software engineering, and infrastructure protection was combined. Close cooperation with Masaryk University, the Brno University of Technology and the Czech Army ensured effective knowledge transfer into practice.

4) ATC simulator with remote access and automated pseudo-pilots (2021–2023)

Support: MPO (EG20_321/0025118)

Main beneficiary: CS SOFT a.s.

Co-investigators: Ministry of Defence – Faculty of Military Technology

Project description:

The project is a milestone in the development of air traffic control (ATC) simulation systems. It extends the existing ATC simulator with remote user access for distance training and an automated pseudo-pilot that responds to instructions without human intervention. Innovations enable effective training from anywhere, new forms of self-study, and crisis training. The synergy between CS SOFT and the Faculty of Military Technology of the University of Defence has produced an advanced product with wide applications—from improving professional controllers' training to remote training of foreign participants. Additionally, it reduces the need for travel, operational costs, and helps maintain high standards even in crisis situations.

Involvement of the Faculty of Military Technology

The FMT's team focused on the research into the automated pseudo-pilot concept. They analysed operational requirements, defined the scope of automation, and prepared a methodology for testing and validating functions. Academics designed the user interface for students and instructors and created a functional demonstrator, which determined the final implementation requirements. This collaboration ensured that the resulting system reflects the latest trends in aviation and personnel training.

Achieved results:

The main output of the project is a functional and production-ready version of the ATC simulator.

Contribution to the mission of the evaluated unit:

As part of a military educational and research institution, the FMT significantly strengthened its expertise in the field of aviation training through this project. The acquired knowledge and newly developed methodologies are applied in internal training programmes for ground aviation personnel and contribute to the development of specialized teaching methods and aviation simulations. The FMT further developed a long-term strategy of integrating modern technologies to offer the most advanced and effective forms of preparation to students and armed forces members. The project also enhanced research capacities, opening doors to further international grants and projects.

Interdisciplinary aspects:

The success of the project stems from the integration of aviation engineering, IT, human factors research, and didactics, complemented by economic and logistical approaches for optimising operations and reducing costs. The resulting synthesis of IT, aviation, pedagogy, security engineering, and strategic management elevates aviation training standards to a more efficient and flexible level.

Cooperation:

CS SOFT, a.s. as the main investigator.

5) Advanced classification of signals (NEOCLASSIG) for radio-reconnaissance systems (2021-2024)

Support: TA CR (TM02000035)

Main beneficiary: URC Systems, spol. s r.o.

Co-investigators: Ministry of Defence – Faculty of Military Technology, Le Quy Don Technical University Vietnam, ASIC Technologies, JSC

Project description:

The NEOCLASSIG project focused on the development and implementation of advanced methods for automatic classification of radio and radio-technical signals. The main goal was to increase the efficiency and accuracy of radio reconnaissance, with collaboration with international partners opening up opportunities for the exchange of experiences and further development.

The developed software is designed as an open system with the ability to easily modify algorithms for new types of signals. This flexibility ensures quick adaptation to modern and future trends in the signal environment.

Contributions of the project:

- Increase effectiveness of protective measures for security and defence

organizations.

- Minimization of manual interventions in signal processing, leading to greater accuracy and reliability of analyses.
- Easy modification of algorithms to respond to new signal structures in the context of rapidly evolving technologies and markets.
- Higher reliability of technical analysis even in challenging or specific conditions.

Outcomes:

- Main output (SW): Developed NEOCLASSIG software, successfully implemented into existing systems.
- Two demonstrators (output type O): installed in the Czech Republic and Vietnam, three months ahead of schedule.
- Secondary outputs (publications and presentations): Articles, professional papers, and workshops conducted in the Czech Republic and Vietnam.

Interdisciplinary aspects:

Development of the software required a combination of knowledge from radio engineering, digital signal processing, cybersecurity, and machine learning. This interdisciplinary synergy enabled effective solutions to complex tasks related to the identification, classification, and analysis of various types of radio signals.

Cooperation:

The project was carried out in close cooperation between URC Systems, the Faculty of Military Technology, Le Quy Don Technical University, and ASIC Technologies. Sharing knowledge and practical experience led to faster development and testing of the created solutions in two locations—in the Czech Republic and Vietnam. This also laid the foundation for ongoing international collaboration.

6) Autonomous ground vehicle for emergency supply and logistics (2022–2023)

Support: MPO (EG20_321/0025219)

Main beneficiary: VOP CZ, s.p.

Co-investigators: LPP s.r.o., Ministry of Defence – Faculty of Military Technology

Project description:

The goal of the project was to develop an autonomous ground vehicle capable of emergency supply and logistics in crisis situations, such as areas affected by natural disasters or military conflicts. The vehicle is designed to handle rough terrain and water obstacles and can operate independently without a human crew.

Involvement of the Faculty of Military Technology

- Development and testing of navigation methods and artificial intelligence:

Including sensors for autonomous movement in various terrains.

- Optimization of logistics operations: Design of usage scenarios and a cooperative planner for multiple autonomous vehicles.
- Implementation of tests in simulated and real conditions: Verification of vehicle durability and functionality of autonomous navigation.

Achieved results:

- Two functional prototypes of amphibious vehicles (4x4 & 6x6) with electric drive and the ability to overcome water obstacles.
- Adaptability to obstacles and robust sensors (LIDAR, cameras, multispectral sensors) with algorithms for collision-free movement.
- Practical verification of operation, including participation in an unmanned ground vehicle platforms (UGV) competition in Estonia.

Contribution to the mission of the evaluated unit:

The developed autonomous systems enhance the ability to respond quickly and effectively to emergencies, increase personnel safety, and contribute to the modernization of both military and civilian logistics.

Interdisciplinary aspects:

The project integrated robotics, logistics, artificial intelligence, and crisis management, requiring a coordinated approach to development and implementation.

Cooperation:

The involvement of industrial partners (VOP CZ, LPP Ltd.) facilitated the efficient realization of the project and the rapid transfer of results into practice. The faculty team ensured advanced research and testing activities in collaboration with the commercial and military sectors.

7) preSATPET – Analysis of the possibility of using passive monitoring systems for satellite tracking in Earth’s orbits (2022–2024)

Support: MoD (OYUOB20220006)

Main beneficiary: Ministry of Defence – Faculty of Military Technology

Project description:

The preSATPET project focused on analysing the possibility of using passive monitoring systems for tracking artificial satellites equipped with mapping radars (SAR: Synthetic Aperture Radar) in low Earth orbit (LEO). The project also included defining key requirements for the new SATPET system (SATellite Passive ESM Tracker), which aims to provide Space Situational Awareness (SSA) in the operational domain of SPACE.

Achieved results:

- Technological analysis: Detailed research on passive system technologies that

can utilize existing signals from the surrounding environment to monitor satellites, with low energy consumption, the ability for long-term continuous operation, and minimal detectable electromagnetic emissions.

- Validation of methods: Testing and verifying detection algorithms in laboratory, simulated, and real conditions, including various types of satellites and disruptive factors. This also included optimizing the configurations of receiving devices and designing a methodology for evaluating accuracy.
- Practical application: Identification of key parameters for deploying passive systems in the field of space object monitoring, enabling effective monitoring of commercial, military, and scientific satellites. The acquired insights are used to design a comprehensive prototype that can be easily integrated into existing infrastructure.

Contribution to the mission of the evaluated unit:

The preSATPET project significantly enhanced the capabilities for detecting and monitoring space objects, thereby contributing to the increased protection and control of national interests in space. The deployment of passive systems helps reduce the risk of revealing one's own monitoring capacities while ensuring continuous awareness of activities in Earth's orbits.

Interdisciplinary aspects:

The project integrated disciplines from the fields of electrical engineering, astronomy, physics, and digital signal processing. The combination of theoretical and practical knowledge from these areas enabled the design of a solution capable of effectively detecting weak signals from satellites even in environments with increased interference.

Cooperation:

The project was carried out in collaboration with national and international institutions possessing expertise in space technologies and military reconnaissance. The mutual exchange of knowledge and experience contributed to the faster validation of proposed methods and to making strategic recommendations for the future development of monitoring systems.

8) PVO 21 – ground-based air defence of the 21st century, eliminating new threats (2022–2024)

Support: MO (OYUOB20220005)

Main beneficiary: Ministry of Defence – Faculty of Military Technology

Project description:

The project focuses on optimizing the structure of ground-based air defence (GbAD) and designing a modern integrated system capable of countering contemporary threats, particularly unmanned aerial vehicles and ballistic or hypersonic missiles. The goal is to analyse current air attack means (AAM), define threat scenarios, and propose

suitable variants for the organization and deployment of GbAD means. Emphasis is placed on evaluating and developing C-UAS, C-RAM capabilities, and potential defence against ballistic missiles. The project also includes the creation of recommendations for the effective protection of critical infrastructure and military object.

Involvement of the Faculty of Military Technology

Threat analysis: Identification and definition of existing and emerging air attack means, including unmanned aerial vehicles and missile threats.

Simulation scenario design: Implementation of models for simulating the dynamics of engagements within ground-based air defence

Structure optimization: Development and testing of algorithms for optimal ground-based air defence configurations (DOTMLPFI) and designing solutions for protection against UAS (Micro, Mini & Small), RAM, and ballistic missiles.

Effectiveness testing: Verification of the functionality of new structures using simulation tools and evaluating their effectiveness in various operational scenarios.

Achieved results:

- Analysis and databases of air attack means (AAM): Overview of available types and effectors, based on NATO documents, foreign ground-based air defence, and the current state of the Czech Armed Forces (CAF).
- System adaptability: Algorithms for automatic optimization resilient to variable threats and environments.
- Increase defence efficiency: Faster response times and more suitable deployment of GbAD means, enhancing the protection of critical infrastructure and military objects.
- Practical application: Validation of proposals in test scenarios, methodology for verifying GbAD capabilities, and materials for strategic documents.

Contribution to the mission of the evaluated unit:

The project provides substantial data and tools for decision-making regarding the development of GbAD means, supports the modernization of air defence, and increases the overall defence capability of the Czech Republic.

Interdisciplinary aspects:

It integrates knowledge from sensor technologies, ballistics, systems engineering, and military operations, creating a comprehensive view of GbAD issues

Cooperation:

The project is carried out in cooperation with research and industrial entities that contribute to the development and testing of key components, systems, and simulations for modern GbAD.

9) Autonomous means for conducting pyrotechnic reconnaissance (2022–2025)

Support: MV (VB01000057)

Main project investigator VOP CZ, s.p.

Co-investigators: Ministry of Defence – Faculty of Military Technology

Project description:

The AUTO PYRO EXPLORER project focuses on developing an autonomous tool for safe and automated pyrotechnic reconnaissance in hazardous areas. The goal is to create a system capable of detecting, analysing, and potentially neutralizing explosive devices with minimal risk to human personnel. This system aims for a high degree of automation and efficient integration of advanced sensors and control algorithms.

Involvement of the Faculty of Military Technology

Academic staff from the Faculty of Military Technology are involved in developing SW for detecting mines and other hazardous objects through data processing from LIDARs, cameras, multispectral sensors, and radars. Simultaneously, they also design hardware and software solutions for autonomous system control in environments with obstacles and mined sectors. Additionally, they conduct functionality and accuracy testing of all proposed modules in real-world scenarios.

Achieved outcomes (project in progress):

- Functional prototype: An autonomous ground vehicle has been designed with advanced detection, communication, and navigation systems. It includes reconnaissance and relay drones and a central control station.
- Semi-operation and methodology: Development of an automated non-destructive testing (NDT) centre for selected materials and parts is underway, ensuring visualization of internal structures and damage assessment. The methodology examines the physical properties of materials used in military technologies, contributing to improved standardization and quality.
- Contribution to the mission of the evaluated unit: The project will significantly enhance the capabilities of pyrotechnic teams, enabling effective detection and identification of explosives without direct risk to human personnel, thereby reducing the risk of casualties. Automation of routine processes contributes to faster and safer deployment.

Interdisciplinary aspects:

The project integrates robotics, detection technologies, crisis management, and mechanical engineering, which creates a comprehensive approach to advance pyrotechnic operations.

Cooperation:

The project involves collaboration with a research organization (Czech Technical University) and industrial partners (COP CZ) that contribute to the development of key technologies and their implementation into final prototypes. The project phase includes the introduction of the prototype into operation and testing.

10) AI-controlled robotic system for intelligence purposes (2022–2025) – ROJ

Support: MV (VJ02010036)

Main project investigator Brno University of Technology

Co-investigators: Ministry of Defence – Faculty of Military Technology

Project description:

The project focuses on developing an advanced robotic system controlled by artificial intelligence (AI) for intelligence and reconnaissance operations. The main goal is to create an autonomous solution capable of collecting, analysing, and immediately transmitting information from various areas, including hostile or otherwise difficult-to-access zones. Thanks to advanced machine learning methods, the system can evaluate situations in real-time and adapt to dynamic conditions, ensuring a high level of safety and efficiency.

Involvement of the Faculty of Military Technology

Academic staff from the Faculty of Military Technology are involved in the design and implementation of AI algorithms that enable autonomous real-time data analysis. This includes the integration of a wide range of sensor systems (LIDAR, cameras, thermal imaging, weapons of mass destruction detectors) and their synchronization for more accurate detection and terrain mapping. Additionally, the faculty optimizes the construction of mobile agents to achieve maximum operational time and minimal detectable signatures. A key role is played by the development of autonomous navigation, which maintains system functionality even when connection with one or more agents is lost.

Achieved results:

A functional prototype has been developed with the capability of autonomous movement and real-time data processing. The system possesses advanced intelligence capabilities, including target identification and risk analysis. Its flexible architecture allows easy adaptation to various types of environments. The application of artificial intelligence along with robotics significantly enhances the accuracy and speed of reconnaissance operations.

Contribution to the mission of the evaluated unit:

The project enhances modern intelligence capabilities and the ability to respond quickly to threats. This increases the security and defence potential of the Czech Republic, as the system enables more efficient collection of critical information.

Interdisciplinary aspects:

The creation of the system integrates robotics, AI, sensor technologies, and military intelligence. This interdisciplinary approach is crucial for achieving a comprehensive, rapidly adaptive solution.

Cooperation:

The project is carried out in collaboration with the Brno University of Technology, Faculty of Electrical Engineering and Communication (FEEC) as the main solver, and the Faculty of Military Leadership at the University of Defence, with key consultations from selected units of the Czech Armed Forces (CAF). This synergy ensures continuous two-way data exchange and adaptation of the designed system to the real needs of the military and security sectors.

Subsequent project stage:

The next phases of the project will focus on the cooperation capabilities of robots and their integration into command-and-control structures.

Table 3.3.1 Projects supported by public funds

In the role of beneficiary						
Provider ²⁵	Project name	Support (in thousands CZK/EUR) ²⁶				
		2019	2020	2021	2022	2023
Ministry of the Interior CR	Ballistic protection and incapacitating means for armed security escorts of the Czech Police PCR	801/31.6	580/22.9			
MoD	preSATPET –Analysis of the feasibility of using passive tracking systems for satellite monitoring in the Earth's orbits				1 169/46.1	892/35.2
MoD	PVO 21 – Ground-based means of air defence GbAD in the 21 st century; elimination of new threats				1 976/77.9	940/37.1
MoD	Processing and implementing permanent procedures based on the principles of the Hazard Analysis and Critical Control Points (HACCP) system to ensure the production of safe food under challenging climatic conditions				50/2	310/12.2
Total		801/31.6	580/22.9	0	3 195/126	2 142/84.5
In the role of another participant						

²⁵ If the provider is from abroad, please indicate the provider's country of origin in brackets. For the determination of the country of origin of the provider, the place of residence of the provider is decisive.

²⁶ Indicate the total amount expressed in thousands of CZK and the conversion of the total amount into Euro.

Provider ²⁷	Project name	Support (in thousands CZK/EUR)				
		2019	2020	2021	2022	2023
Min. of Interior CR	Autonomous vehicle for conducting explosive ordnance disposal in extremely areas				4 180/ 164.9	4 180/164.9
Min. of Interior CR	Detection of perimeter breaches using instantaneous changes in optical signal polarization	566/ 22.3	1 709/ 67.4	1 436/ 56.6	1 146/ 45.2	
Min. of Interior CR	Smart system for wearable protective equipment enabling surveillance and planning of police and military operations					2 058/81.2
TA CR	MIHRIL II. – progressive ballistic armour designed for defence forces					1 410/55.6
TA CR	Protection of aviation against low-energy lasers				1 283/50.6	1 120/44.2
Min. of Interior CR	Instantaneous signal processing using hybrid systems in defence infrastructure					2 169/85.6
TA CR	Advanced signal classification (NEOCLASSIG) for radio-surveillance systems			839/33.1	1 244/49.1	1 124/44.3
Min. of Interior CR	Robotic system controlled by artificial intelligence algorithms for intelligence and reconnaissance purposes				3 292/129.9	3 546/139.9
TA CR	Robust navigation system					1 440/56.8
TA CR	Application of nano-fibres for the delivery of bioactive substances using dental floss		208/8.2	550/21.7	550/21.7	415/16.4
Min. of Interior CR	Research, development, testing and evaluation of critical-infrastructure elements	364/14.4	364/1.4			
Min. of Industry and Trade (MoIT)	Improvement of the surface quality of KSK ball screws	840/33.1	420/16.6			
MoIT – OP PIK VIII (OP. Programme Enterprise and Innovation for Competitiveness)	ATC simulator with remote access and automated pseudo-pilots				1 070/42.2	270/10.7
MoIT – OP PIK VIII	Autonomous ground vehicle for emergency supply and logistics,				1 220/48.1	9 473/373.7

²⁷ Ibid.

	OP PIK VIII					
Total		1 770/ 69.9	2 701/ 106.5	2 825/ 111.4	13 985/ 551.6	27 205/ 1 073.2

Table 3.3.2 - Contract research activities

Client ²⁸	Activity name	Revenue (in thousands CZK/EUR)				
		2019	2020	2021	2022	2023
	N/A					
Total						

Note: List and describe contract research activities with a revenue in a given calendar year, regardless of the amount of financial revenue.

²⁸ If the client is from abroad, indicate in brackets the country of origin of the client.

3.4 Research results with existing or prospective impact on society

The evaluated unit shall briefly comment on a maximum of 10 (considered most significant by the evaluated unit) research results already applied or realistically heading towards application during the period of 2019–2023, based on the overview annex table 3.4.1 (it is recommended to indicate results with a link to projects listed in indicator 3.3). The evaluated unit must demonstrate in its description that the research results have led or will soon lead to positive impacts²⁹, on society (e.g. description of how the results are used by various users, the range of persons/institutions for which the result is relevant, measurable economic impacts, etc.). The evaluated entity shall indicate in its commentary whether the gender dimension is considered in these results and discuss the impacts of the results regarding sustainability.

Maximum range 300 words/result.

Self-Evaluation:

1) Covertly worn vest

Outcome type: G – functional sample

Application year: 2020

Project: Ballistic protection and incapacitating means for armed security escorts of aircraft of the Czech Police (PCR) (2017–2020) (Min. of the Interior) (VI20172020058)

Outcome description:

One of the key outcomes of the research is a covertly worn ballistic vest, developed within the project “Ballistic protection and incapacitating means for armed security escorts of aircraft,” funded by the Ministry of the Interior of the Czech Republic (VI20172020-058). This functional sample is primarily intended for armed security escorts, especially the Police of the Czech Republic, with the possibility of extending its application to the civilian sector.

The vest brings several significant innovations. Its construction uses a combination of two types of ballistic materials (aramid Twaron CT 714 and Microflex), optimized for high protection with minimal weight—not exceeding 1 kg, which significantly increases the comfort and efficiency of the user’s movement. At the same time, it keeps its protective properties at the level of IIA in conformity with NIJ STD 0101.04 and TON II according to CSN 39 5360. The unique adaptation for covert wearing enhances its user-friendliness in discrete security operations.

This outcome has already found practical application and improved security standards during aircraft escorts, thanks to protection against firearms, explosives, and other risks. Economically, it reduces potential losses during security incidents and has broader applicability in both public and private sectors.

The gender dimension is manifested in the possibility of individual adaptation of the vest’s shape, ensuring protection for both men and women without distinction. The

²⁹ See Terms definition.

positive impact on sustainability is based on the application of long-lasting materials, which reduce maintenance and replacement costs. This outcome thus confirms the ability to connect scientific research with practical applications, contributing to the safety and protection of the population both in the Czech Republic and abroad.

2) Multi-purpose ballistic-resistant laptop case

Outcome type: G – functional sample

Application year: 2020

Project: Ballistic protection and incapacitating means for armed security escorts of the Police of the Czech Republic (2017–2020) (MV (VI20172020058))

Outcome description:

Another significant outcome is the multi-purpose ballistic-resistant laptop case, developed within the project “Ballistic protection and incapacitating means for armed security escorts of aircraft,” funded by the Ministry of the Interior of the Czech Republic (VI20172020-058). This innovative approach to individual protection is primarily intended for the Police of the Czech Republic, with potential applications in the civilian sector.

The case combines functions of ballistic protection, explosion protection, and a standard laptop bag. Its construction includes a multi-layer ballistic core made of materials such as aramid or UHMWPE, ensuring resistance to bullets (ballistic resistance IIIA as per NIJ STD 0101.04), shrapnel ($v50 = 550$ m/s as per STANAG 2920), and stabbing weapons (TON II as per CSN 39 5360). The design allows flexible use as a discharge device for firearms, a ballistic shield, or a protective case for sensitive equipment.

Practical applications of the case are found in security escorts in air transport, where it serves as a protective means against attacks or improvised explosive devices, contributing to higher safety for passengers and crew. Thanks to its modular construction, the device can be adapted to the specific needs of users, extending its application beyond security forces.

The gender dimension is considered with an ergonomic design suitable for different types of users. Sustainability is enhanced by using durable materials with long lifespans, reducing the need for frequent equipment replacement. Not only does the case raise safety standards in air transport, but it can also contribute to the protection of people and property in a broader context. This outcome represents an innovative connection between scientific research and specific security applications, contributing to the protection of the population in challenging situations.

3) Ballistic-resistant backpack

Outcome type: G – functional sample

Application year: 2020

Project: Ballistic protection and incapacitating means for armed security escorts of Police of the Czech Republic aircraft (2017–2020) (MV (VI20172020058))

Outcome description:

Another significant outcome is je ballistic-resistant backpack, developed within the project “Ballistic protection and incapacitating means for armed security escorts of aircraft,” funded by the Ministry of the Interior of the Czech Republic (VI20172020-058). This functional sample represents a multifunctional protective device, primarily designed for security forces such as the Police of the Czech Republic, with potential applications in the civilian sector.

The backpack offers comprehensive ballistic protection thanks to its multi-layer construction made of ballistic-resistant material (PE), achieving resistance class IIIA according to NIJ STD 0101.04 and protection against shrapnel ($v50 = 550$ m/s according to STANAG 2920). The innovative design includes the possibility of expanding the protective area by unfolding the front panel, providing additional protection for the abdomen, groin, and partially the lower limbs. The backpack also includes a ballistic container and a laptop case that can be used separately.

The primary application lies in protection while handling short firearms and in improvised explosive incidents. The backpack ensures the safe transport of personal belongings and service equipment, serving as an improvised shield or an explosion-resistant device. Thanks to its modular construction, it can be adapted to the specific needs of users.

The gender dimension is considered with an ergonomic design suitable for different types of users. Sustainability is supported by the use of durable materials with long lifespans and the possibility of replacing damaged parts.

The backpack has already found application in enhancing safety standards in air transport and during service interventions of security forces. This outcome contributes to the development of security equipment with practical applications and potential for expansion into other sectors.

4) Homogenous expansive high-speed bullet with high wounding potential and its manufacturing method

Outcome type: P – patent

Application year: 2019

Project: Development of special police ammunition for armed security escorts of aircraft (VG20112015037 – MUNIPOL) (2014–2018)

Description:

The outcome, developed within the project “Development of special police ammunition for armed security escorts of aircraft (VG20112015037 – MUNIPOL)” (2014–2018), stands for an innovative 9mm AM service pistol cartridge with a unique bullet design and an unpublished manufacturing process. The patent (No. 307 959)

was applied in 2019, enabling the real deployment of this ammunition first by a special unit of the Police of the Czech Republic, and subsequently, from 2020, by the Austrian Police. The main benefit is more effective combat against terrorism and serious crime in transportation, especially on aircraft, where the 9mm AM cartridge's design reduces the risk of endangering uninvolved persons or damaging the transport vehicle.

The bullet has up to 20% higher initial kinetic energy compared to standard cartridges of similar type and ensures that after entering the target, it does not continue further or exits the target with just minimal residual energy. This combination was not found in commercially available 9mm Luger cartridges during tests, giving the cartridge exceptional functional properties and high societal relevance. In terms of economic impact, the key factor is the licencing agreement with the manufacturer and the potential for broader export, which will support the competitiveness of the Czech arms industry.

The gender aspect was considered during the development of the bullet, as the project involved a balanced team of experts, ensuring equal participation of both women and men in arms research. The positive impact on sustainability is reflected in the minimization of secondary damage and higher protection of passengers, thereby reducing environmental and financial risks arising from possible damage to the transport-providing vehicle. The patent is owned by the Ministry of Defence of the Czech Republic, while 100% of the result was created by the staff of the University of Defence, particularly the Department of Weapons and Ammunition. This cartridge successfully meets the specific requirements of security forces and as well, it contributes to the enhancement of public transport protection.

5) Optical fibre detector based on PM fibre

Outcome type: G – functional sample

Application year: 2022

Project: Detection of defence perimeter breaches using instantaneous changes in optical signal polarization (2019–2022) - Ministry of the Interior (MoI) (VI20192022140)

Outcome description:

The optical fibre polarization sensor, developed by the research team at the University of Defence, represents a key contribution to the modernization and increased efficiency of military operations of the Armed Forces of the Czech Republic as well for the civilian sector. It is able to measure non-electrical quantities in extremely challenging environments where conventional systems fail, thereby enhancing the security and defence capabilities of the Czech Republic. In the near future, this technology can also be deployed for the protection of critical infrastructure or in industrial applications.

The main advantage of the sensor is its immunity to electromagnetic interference and its ability to be galvanically isolated from the evaluation electronics. This makes it ideal for combat zones and high-risk environments with high levels of disruptive signals.

The device is constructed from an optical radiation source, PANDA-type PM fibre, a sensor section, and a liner polarizer; its principle is based on the different propagation speeds of light that change the polarization state and allow reliable detection of defects or anomalies. For the CAF, this means, for example, timely detection of damage to military vehicles or aircraft, reducing the risk of costly repairs or accidents.

Economic impacts include savings due to timely detection of defects and the streamlining of logistical processes. A wide range of users—from military units to the Integrated Rescue System units—benefit from risk minimization and higher operational reliability. The gender dimension was also considered during the development as a diversified team of researchers, both women and men, collaborated on the project, strengthening equal representation in technical fields.

From a sustainability perspective, the technology is designed with long lifespan and low energy requirements of optical fibres in question, reducing environmental burden and promoting economical and responsible resource usage. Not only does this sensor protect human lives and critical infrastructure, but it also contributes to the stable development of modern sensor systems.

6) Demonstrator of ATC simulator

Outcome type: Demonstrator

Application year: 2023

Project: ATC simulator with remote access and automated pseudo-pilots (2021–2023), the Ministry of Industry and Trade (MoIT) (EG20_321/0025118)

Outcome description:

The main output of the project is a functional and production-ready version of the ATC simulator, which includes a remote user station and a sophisticated automated pseudo-pilot. The developed solution enables connection to the server part of the simulator via a public data network with minimal requirements for transmission speed and user skills. It also includes a comprehensive testing and validation methodology that verifies the realistic behaviour of the pseudo-pilot in various operational scenarios – from standard flight communication to intentionally introduced errors and crisis situations.

The proposed demonstrator solution is based on a series of analytical and methodological documents that map technological parameters (e.g., latency or secure connection to public networks) as well as didactic aspects (balanced training scenarios, involvement of the human factor, stochastic error elements). This creates a technically robust and practically usable solution, suitable for various operational and training modes. Newly developed functions of the ATC simulator, enabling remote training and automation of the pseudo-pilot, bring significant economic savings and make training accessible to a wider range of institutions. By reducing the need for travel and operation, operational efficiency increases and environmental impacts decrease. The gender dimension is considered through the neutral nature of technologies that are

accessible to all users without distinction and support diversity in the aviation sector. The result also contributes to sustainability, as digital solutions limit the need for extensive physical infrastructure and reduce disparities and support diversity in the aviation sector. The outcome also contributes to sustainability, as digital solutions limit the need for extensive physical infrastructure and reduce emissions. The ability to be quickly deployed in various organizational conditions increases the safety of air traffic and ensures smooth training even during crisis situations.

7) Software NEOCLASSIG

Outcome type: R-software

Application year: 2023

Project: Advanced signal classification (NEOCLASSIG) for radio-reconnaissance systems (2021-2024) (TM02000035)

Outcome description:

The outcome is new software for automatic classification of radio and radio-technical signals, utilizing advanced signal processing methods, artificial intelligence, and machine learning. By combining the DBSCAN clustering algorithm and deep neural network (DBSCAN-MLP), it achieves classification accuracy of up to 95%, significantly surpassing competing approaches. This technology automatically extracts and evaluates key signal parameters (e.g., time of arrival, burst width, or central frequency), facilitating and accelerating the analysis of large data sets.

In terms of societal benefits, the software will be particularly useful in security and military reconnaissance, telecommunications, and other sectors where accurate signal recognition and classification are essential for effective monitoring, protection, and management of radio bands. Potential users include government agencies, the military, and the private sector, with measurable economic impact arising from reduced costs of manual analysis and increased operational efficiency. The software also enables faster response to potential threats, thereby enhancing overall security.

During the development of the system, the gender dimension was considered, as a diverse team with equal involvement of men and women contributed to the project, supporting an innovative approach and a broader spectrum of expertise. Sustainability is enhanced by limiting the need for extensive hardware equipment and minimizing energy demands, as thanks to smart use of algorithms, NEOCLASSIG processes data more efficiently. This also reduces the environmental burden associated with long-term operation.

Through this combination of artificial intelligence, optimized signal processing, and thoughtful design, NEOCLASSIG contributes to the further development of reliable, high-performance classification systems with a real impact on both the security and economic spheres.

8) Prototype of a logistic unmanned vehicle

Outcome type: G – prototype

Application year: 2023

Project: Outcome type: R-software

Project: Autonomous ground vehicle for emergency supply and logistics (2022–2023)
the Ministry of Industry and Trade (EG20_321/0025219)

Outcome description:

The outcome lies in the development of two functional prototypes of automated, amphibious logistic unmanned ground vehicle platforms (UGV), equipped with a new generation of control algorithms that enable safe and fully electric movement in complex terrain. These vehicles are based on the updated TAROS platform (4x4 with a hybrid power unit, and 6x6 with purely electric drive) and, thanks to a combination of photogrammetric, laser, inertial, and localization sensors, they are able to map the surrounding environment in detail. Deployment in real operations is planned for military and security forces, as well as in the industrial sector (forestry, construction, or mining), where automation and precise monitoring significantly increase operational safety and efficiency. Moreover, the UGV adaptable modular design allows for quick exchange of superstructures according to specific operational requirements, thereby freeing up human resources for more specialized tasks and reducing the duration of operations in hazardous zones.

Positive impacts on society involve particularly higher protection of human health and a reduction in the number of service personnel in risky conditions, leading to fewer injuries and financial losses. Moreover, it accelerates logistic processes, digitizes operations, and strengthens the real application of robotic systems, which can significantly contribute to the development of modern industry and the protection of lives in crisis situations. Electric (or hybrid) propulsion reduces impacts on sustainability, as it is potentially less demanding in terms of emissions and fossil fuel consumption. The economic benefit is expected in the form of lower labour costs, elimination of some damages caused by human error, and increased efficiency in material handling. The gender dimension in this project is not directly influenced by the technology itself, but during its development and testing, equal access for experts of all genders was ensured to achieve the highest quality of the final solution.

9) Software for cooperative control of autonomous systems in the operational environment

Outcome type: R-software

Application year: 2023

Project: Autonomous ground vehicle for emergency supply and logistics (2022–2023),
Ministry of Industry and trade (MoIT) (EG20_321/0025219)

Outcome description:

The outcome brings new software solution for cooperative tactical manoeuvring,

which functions as a key component of the operational or mission control planning system. Its main benefit is the increased efficiency of the behaviour of a group of tactical entities in a dynamically changing environment, considering a wide range of factors, including mutual positions, obstacles, minefields, or enemy forces. The solution is based on multi-criteria optimization of a system of partial manoeuvres to maximize tactical gain or minimize risk factors. It uses a complex manoeuvre graph, enriched with attributable layers encoding individual input parameters, allowing the user to configure priorities and the sequence of analyses. For small numbers of tactical entities (e.g., two ground robots), a sub-algorithm is available that transforms the state space into a graph of potential cooperative manoeuvres, enabling the application of proven algorithms (A*/Dijkstra) to determine optimal routes. Another benefit consists of finding the optimal configuration of deployed forces in terms of the ratio between tactical cost and operational efficiency, testing variants of organizational structures and random input conditions.

The positive impact on the society can be seen in faster and more accurate decision-making during the coordination of units, reducing the risk of loss of life and material resources. The expected users are primarily military and security forces, but the technology will also find applications in rescue operations and complex industrial tasks. Economic benefits arise from more efficient use of equipment and minimising damage caused by incorrect tactical choices. In terms of sustainability, optimising deployment can lead to less resource wastage and reduced operational costs. Regarding the gender dimension, this is a universal algorithmic-software technology whose development and final use do not discriminate against users of different genders, and an expert team consisting of both women and men was involved in creating this solution.

10) Demonstrator of a cooperative reconnaissance system involving swarms of drones and ground robots

Outcome type: G – functional sample

Application year: 2025

Project: AI-controlled robotic system for reconnaissance purposes (2022–2025) – ROJ - Ministry of the Interior (VJ02010036)

Outcome description:

The demonstrator of a cooperative reconnaissance system involving swarms of drones and ground robots stands for a universal, adaptable robotic system consisting of up to ten unmanned aerial vehicles and two ground robots. It is designed for monitoring and analysing areas of interest in various sensor spectra, with the ability to evaluate data directly at the deployment site. Thanks to advanced image processing, the system can focus on identifying key elements or individuals, significantly increasing the accuracy and speed of reconnaissance operations.

The main positive impact on society is the ability to conduct faster and safer reconnaissance of hazardous or hard-to-reach areas, such as during natural disasters

or industrial accidents. The system also enables more efficient monitoring of large areas (e.g., protected landscape areas), thereby contributing to better environmental protection and support for sustainability. Measurable economic impacts can be expected in reducing the costs of rescue or control operations, as the deployment of robotic units eliminates the need for large human teams in the field and minimizes risks that would endanger human personnel.

In the development of the demonstrator, attention is paid to the gender dimension. The research team ensures balanced representation of female and male researchers and considers the specific needs of all users so that the technology is accessible regardless of gender. The sustainability of the project is reflected in the thoughtful energy concept of drones and robots (e.g., the use of more environmentally friendly energy sources), as well as in efforts to minimize environmental impact during production and operation.

This system has the potential to become an indispensable tool for a wide range of users: from rescue units to government agencies to commercial entities focused on security and monitoring. Thanks to its high degree of adaptability, it is expected to be significantly applied in practice in the near future.

Table 3.4.1 - Overview of research results in the period under evaluation

Type of result ³⁰	Year of application	Name
G – functional sample	2020	Concealed ballistic vest
G – functional sample	2020	Multi-purpose ballistic-resistant laptop case
G – functional sample	2020	Ballistic-resistant backpack
P – patent	2019	Homogenous expansive high-speed bullet with high wounding potential, and its manufacturing method
G – functional sample	2022	Optical fibre detector built on PM fibre
O – others - DEMONSTRATOR	2022	Demonstrator of ATC simulator
R – software	2023	NEOCLASSIG software
G – prototype	2023	Prototype of autonomous logistics vehicle
R – software	2023	Software for cooperative control of autonomous systems in the operational environment

Note 1: Please list and describe the results already applied in practice or heading towards application in practice with existing or prospective impact on the society (e.g. domestic or foreign patents, sold licenses, spin-offs, prototypes, varieties and breeds, methodologies, significant analyses, surveys, expert outputs for policymaking or other forms of non-publication outputs, etc.). Indirect results of research, development and creative activities with

³⁰ Specify the specific type of result. Add rows as needed.

documented societal impact, e.g. expert activities, services to the public/government/scientific community, may also be reported.

TRANSFER OF RESULTS INTO PRACTICE

3.5 Transfer of results into practice

The evaluated unit shall briefly describe its system for transferring results into practice. It shall also indicate up to five of the most typical users of its results, whether in the university environment or in the non-university application/corporate sphere, detailing how it collaborates with them and how it seeks out new users (using a maximum of five specific examples).

It will also indicate whether and how it commercializes R&D&I results (e.g. selling licences, setting up start-up or spin-off companies, etc.)³¹, providing brief description of the commercialization methods used. The effectiveness of the transfer of results and the commercialization of R&D&I results will be described using a selection of results (max. five) listed in annex table (Table 3.4.1).³²

Additionally, the evaluated unit shall briefly comment on the funds received during the period of 2019–2023 from non-public, non-grant sources (e.g. licences sold, spin-off revenues, donations, etc.). A full summary shall be provided in annex table (Table 3.5.1).

Maximum 500 words plus 200 words for each provided example of finding a new user of results and commercialization.

Self-Evaluation:

The system for transferring results into practice within the University of Defence (UD) is based on targeted collaboration with key users and flexible responses to their current needs in defence, security, and related sectors. The UD processes research projects commissioned through public competitions or direct requests and also takes advantage of opportunities to establish partnerships with other institutions both domestically and internationally. Participation in professional forums, conferences, and international working groups has proven effective in identifying new users of the results, where the UD experts present current findings and discuss possible application paths. Partner networks, in which the UD is involved (e.g., research and professional associations), also serve to facilitate the more efficient application of results, enabling faster connections between research outputs and practice.

Within the evaluated unit, the application of results typically involves specific solutions that the civilian sector usually does not focus on (e.g., due to sensitive data or special military and security requirements). Since the UD is a state organization and shares an identification number with the Ministry of Defence, the University cannot engage in traditional commercialization activities such as selling licenses, establishing start-ups, or spin-off companies. Therefore, the UD does not receive financial resources directly; all transactions occur exclusively through the Ministry of Defence's budget or within projects funded by grant mechanisms (e.g., the Technology Agency of the Czech

³¹ In the case of military HEIs, their specific position is taken into account when evaluating the commercialization/evaluation of R&D&I results.

³² If the commercialization of R&D&I results is carried out in this way.

Republic).

As a result, no independent income is generated from the sale of intellectual property, making the evaluation of such commercialization irrelevant for the UD. The detailed overview of finances from non-public sources is therefore not included in table 3.5.1, as the UD does not represent an entity capable of independent economic activity. To ensure the transfer of outputs into practice, a close connection with the commissioners, who define specific project goals, is crucial, and the UD then provides expert solutions in accordance with their requirements.

1. Ministry of Defence

The Ministry of Defence (MoD) is the most important commissioner of research projects for the University of Defence (UD), as the UD shares a common identification number with the MoD and is therefore a natural part of the defence ecosystem of the Czech Republic. The MoD formulates key requirements through public competitions (e.g., Defence Research Projects) or direct assignments, often involving topics that cannot be addressed in the civilian sector due to classified information or high demands for military expertise. Typical examples are the preSATPET or PVO 21 projects, which aim to develop sophisticated means for airspace protection and minimize the vulnerability of critical military capacities.

The owner of the resulting outcomes is the Ministry of Defence itself, which corresponds to the legislative framework and the nature of funding. The UD currently also assists in utilizing new opportunities opened by the TACR PRODEF program: since 2024, the MoD can commission research tasks in this line, thereby strengthening the innovative potential of the entire defence community. The process of transferring results is very direct: the UD conducts research and development, the MoD acts as the recipient and coordinator of the application sphere. After the completion of the project, the solution is integrated into military practice, either in the form of technological demonstrators or in the form of methodologies and training programs.

2. DSIA

The Defence and Security Industry Association (DSIA) brings together companies operating in the fields of defence, security, and crisis management. The relationship between the University of Defence (UD) and DSIA is based on collaboration in addressing innovations that arise from the real needs of the industry while reflecting military and security standards. Members of DSIA often participate in projects supported by public agencies, especially the Technology Agency of the Czech Republic (TACR) or the Ministry of Industry and Trade (MoIT), where the University of Defence provides advanced research capacities and expert know-how.

Collaboration with the DSIA allows the UD to flexibly respond to new requirements emerging from the industrial sector—for example, the need to develop special sensors for vehicles in extreme conditions or improve protective equipment for workers in hazardous environments. Regular workshops, trade fairs, and conferences focused on defence and security technologies serve to identify these users, where the

UD actively presents itself. The role of the DSIA as a catalyst for international contacts is also significant, as many member companies export their products to foreign markets. Although the UD cannot commercialize outputs through licenses or spin-offs, cooperation with the DSIA ensures that research results find practical application within individual companies and projects.

3. Ministry of the Interior (MoI)

The Ministry of the Interior (MoI) represents another significant institution with which the University of Defence (UD) collaborates on research projects related to security, public protection, and the fight against terrorism and organized crime. The MoI has its own scientific office and also commissions research needs through competitions held by the Technology Agency of the Czech Republic. This form allows the University of Defence to apply for challenges that precisely define the requirements for the application of results in the integrated rescue system or in the protection of the state's key infrastructure.

Collaboration with the MoI focuses, for example, on the development and testing of special equipment for the intervention units of the Police of the Czech Republic, improving crisis management systems, or simulations and training for the components of the Integrated Rescue System (IRS). The University of Defence provides expertise in areas such as ballistic protection, drone technology, and software tools to support decision-making during emergencies. The MoI subsequently applies these results to legislative norms, methodological procedures, and, above all, to the daily practice of security forces. This ensures a high degree of real impact on society, although the University of Defence itself does not commercially benefit from these projects. In this regard, the MoI functions as a bridge between the academic sphere (UD) and other state institutions, which transform the needs for innovative technologies into specific assignments.

4. NATO

The NATO Science and Technology Organization (NATO STO) represents an international platform for the development of defence and security research within the member and partner states of the Alliance. Representatives of the University of Defence (UD) regularly participate in NATO STO expert panels, where they represent the Czech Armed Forces and actively contribute to discussions on new trends and research directions. During these meetings, it is possible to identify specific projects that then result in joint research activities.

The participation of the UD in NATO STO serves a dual role: on one hand, the UD brings experts specialized in defence, military technology, and security technologies into international projects; on the other hand, it learns from the best practices and experiences of leading foreign institutions. The outcomes of these international collaborations can then be applied in national projects or in defence research projects commissioned by the Ministry of Defence. This creates a circulation of knowledge and technologies that enhance the innovative potential not only within the Czech Republic

but throughout the Alliance. However, as a state organization, the UD still cannot independently commercialize the outputs and therefore focuses primarily on transferring know-how to the main users among the armed forces and defence institutions.

5. EU (European Union)

The European Union represents another significant source of research opportunities. The University of Defence (UD) primarily participates in projects under the European Defence Agency (EDA) in category B and, more recently, under the European Defence Fund (EDF). Since 2024, the UD has been involved in several projects that are competed through public calls, focusing on highly specialized areas such as cybersecurity, autonomous systems, and protection against chemical, biological, radiological, and nuclear threats.

The submission of project proposals is carried out in close cooperation with international partners, with the UD acting as a provider of expertise in defence issues and also as a representative of the Czech Republic in European consortia. These consortia-related projects allow for the expansion of networks and the sharing of technologies, thereby increasing the overall level of the innovation ecosystem across Europe. In the event of success in EDA or EDF calls, it is necessary for financial flows to go through the Ministry of Defence, as the UD, being a state organization, cannot directly offer licenses or establish spin-off companies. Nevertheless, this cooperation with the EU brings new knowledge and research capacities to the Czech Republic, which can be applied in national projects and in the further development of defence research.

Table 3.5.1 - Summary of non-public revenues received during the period under evaluation

Type of revenue	Revenue (in thousands CZK/EUR)				
	2019	2020	2021	2022	2023
N/A					
Total					

Note: Enter funds raised for R&D&I from non-public sources besides grants or contract research (e.g. licences sold, spin-off company revenues, donations, etc.) in the calendar year.

POPULARIZATION OF R&D&I

3.6 The most important activities in the field of the popularization of R&D&I and communication with the public

The evaluated unit shall briefly describe its main activities related to the popularization of R&D&I and communication with the public (e.g. popularization lectures, citizen science initiatives, etc.) during the period of 2019–2023 and provide up to 10 examples that it considers the most significant.

Maximum 500 words plus 200 words for each example given.

Self-Evaluation:**Publication and media presentation****“Listy Univerzity obrany” (*University of Defence Bulletin*) (2019–2020)**

This to initially monthly, later quarterly, bulleting was regularly issued until 2020. It provided an overview of important events at the University of Defence and its departments, including the popularization of scientific research results.

Media appearances of UD experts (2019–2023)

Academic and scientific staff of the University of Defence continue to give interviews to electronic and print media. In this way, they present not only their expert opinion on current topics, but also their own research projects and achieved results.

Presentations at public events**Science Festival Brno (2019–2023)**

This event is held annually in cooperation with Brno universities and scientific institutions. The Faculty of Military Technology and other units of the UD present their research projects here, primarily for university and high-school students, but also for the general public.

Science Fair of the Academy of Sciences of the Czech Republic (2017–2023)

The event continues to be organized by the institutions of the Czech Academy of Sciences, usually once a year. The UD regularly showcases here its latest results in research areas such as ballistics, robotics, and cybersecurity, and popularizes them across a wide spectrum of visitors.

Nights of Scientists (2018–2023)

This popular event takes place every year across the entire country. In Brno, universities including the UD participate by opening selected laboratories and classrooms to the public, even at unconventional evening or night times. Practical demonstrations and interactive exhibits are presented here, allowing visitors to touch the latest technologies or try experiments in the field of military research.

Events held by the CAF for the public: Czech Army Ground Forces Days called “BAHNA,” and NATO Days (2019–2023)

Both the events are held annually, and the UD showcases not only study opportunities, but also research results, often through interactive demonstrations of combat technology and weaponry.

Days with the Integrated Rescue System (2016–2023)

These events take place in various cities, such as Brno, and the UD participates with demonstrations of special training and modern equipment. It focuses on popularising cooperation between the army, police, firefighters, and other units of the Integrated

Rescue System.

Open Days at the UD (2019–2023, approx. 3–4-times a year)

During this traditional event, educational and research facilities are opened annually to prospective students as well as the general public. Visitors receive information about programmes of study, research projects, and the facilities of the FMT and other faculties at the UD.

Open Days of Czech Army Units and air bases (2019–2023)

These events are held at the locations of units and bases across the country. The UD and the FMT present there the latest research results and practical applications of combat technology, including modern sensors, drones, and other cutting-edge technologies. This helps to reach regional communities that cannot regularly attend events held in Brno or Prague.

IMPLEMENTATION OF RECOMMENDATIONS

3.7 Implementation of the recommendations in Module 3

The evaluated unit will briefly describe how it has implemented the recommendations for Module 3 from the previous evaluation period, if applicable.

Maximum 1000 words.

Self-Evaluation:

RECOMMENDATION 3.2

(1) Increase in funding and international projects

- *Recommendation:* Strengthen funding for the FMT of the UD in Brno (direct support from the MoD, projects within the EU and NATO, modernization of laboratories).
- *Our answers:* The faculty has increased its income from targeted support projects and has been negotiating higher institutional support. It submitted two EDF projects (DETER, SCORPIO), which were unsuccessful, and is the main author of the EDA AMLS project. The modernization of laboratories is also ensured by programme funding from the MoD.

(2) Cooperation with defence universities abroad

- *Recommendation:* Develop contacts with defence universities in other countries.
- *Our answers:* The cooperation is already underway (Poland, Slovakia, Hungary, France, Germany, Italy). There is an exchange of doctoral students, organization of conferences and courses, and joint projects (EDF, EDA).

(3) Intensify efforts on international projects

- *Recommendation:* Focus more on the EU-, NATO-, and other projects.

- *Our answers:* The FMT has submitted EDF projects and is the main author of the EDA AMLS project. To maintain doctoral programmes, it is necessary to secure additional international projects.

(4) Continue creative activities with an impact on defence

- *Recommendation:* Maintain a high level of research and development significant for security and defence systems.
- *Our answers:* The faculty focuses on advanced disciplines (cybernetics, electronics, new materials) and EDTs technology, which enhance the state's defence capabilities and have civilian applications.

RECOMMENDATION 3.5 & 3.6

(1) Support research with non-economic impact and disseminate its results

- *Recommendation:* Develop applied research (e.g., cybersecurity), and communicate results to both military and civilian audiences.
- *Our answers:* The FMT cooperates with the Cyber Forces Command of the Czech Army and the National Cyber and Information Security Agency (*NÚKIB in Czech*).

(2) Increase the quality of outputs in Category A and application of results

- *Recommendation:* Focus on patents, important analyses, and international cooperation.
- *Our answers:* The faculty focuses on patents, utility models, functional samples, and methodologies (e.g., patented grenades, expansive bullets, multicopters). There is collaboration on NATO- and EU projects.

(3) Strategic placement off research tasks

- *Recommendation:* Assess what type of research should be provided and in which areas.
- *Our answers:* The FMT follows the priorities of the Czech Republic, the CAF, NATO, and the EU. The strategy until 2030 emphasizes cybernetics, autonomous technology, and the area of emerging and disruptive technologies.

(4) Creating mechanisms for greater involvement of the FMT

- *Recommendation:* Motivate faculty members and utilize all scientific capacities.
- *Our answers:* The Dean's Council for Science and Research was established to coordinate projects, capacities, and cooperation.

(5) Internationalization of applied research

- *Recommendation:* Strengthen international cooperation.
- *Our answers:* The FMT actively develops contacts with many institutions in the EU (e.g., in Poland, France, Germany, Italy). Sharing knowledge and joint projects support innovation and enhance global visibility.

(6) Emphasis on the social impact of research and professional literature in the native language

- *Recommendation:* Publish professional literature for the broader community and students.
- *Our answers:* The FMT has published a number of professional publications (e.g., *Rádiotechnický prieskum (Radio-technical reconnaissance)*, *Matematická kartografie (Mathematical cartography)*, *Jednočipové mikropočítače ARM řady STM32F4 (Single-chip micro-computers ARM of STM32F4 range)*), which also serve as teaching materials.

RECOMMENDATION 3.7 & 3.8

(1) Continuation of cooperation and expansion abroad

- *Recommendation:* The system of activities is excellent; continue the cooperation, and possible to expand it.
- *Our answers:* The FMT has already been cooperating with foreign partners (robotics, cybernetics, modelling, and simulations).

(2) Development of the FMT and practical involvement of students

- *Recommendation:* Utilize practical problems, modern equipment, industry involvement, and joint publications.
- *Our answers:* Students work on their theses with direct applications in the Czech Army and the defence industry. The new Research, Expertise, and Technology Centre (RETC) will provide shared infrastructure and support for EDTs. The Dean's Council for Science and Research coordinates equipment purchases. The UD provides training (Matlab, Maple, CAD systems). Employment for graduates is ensured through military careers. TACR- and MPO projects support cooperation with the industrial sector; and results are often protected by patents.

(3) Application of NATO methodologies

- *Recommendation:* Focus on the methodologies used by the armed forces of NATO member states.
- *Our answers:* Academic staff actively participate in NATO STO panels (for scientific teams put together for modelling, simulation, human factors, technology, etc.).

(4) Verify the system of intellectual property protection and transfer of technology

- *Recommendation:* Review whether the support for transfer of technology is adequate.
- *Our answers:* The University of Defence (UD) is a state institution, and intellectual property rights belong to the Ministry of Defence. The UD cannot independently conduct transfer of technology as the process is carried out through the ministry.

RECOMMENDATION 3.10 & 3.11

(1) Emphasis on presentations and publications

- *Recommendation:* Increase presentations and publications at national and international levels to enhance the reputation of the UD and the FMT.
- *Our answers:* The FMT supports participation in conferences, competitions, and exhibitions. The faculty has received a number of awards (e.g., NATO STO certificates; Best of Session Award; Best Paper Award).

(2) Cooperation with universities of defence in other countries

- *Recommendation:* Establish institutional cooperation to strengthen research and publishing.
- *Our answers:* Cooperation is already underway with many military academies (Poland, Slovakia, Hungary, France, Germany, Italy). Joint projects, publications, and conferences are being created.

(3) More frequent presentations of results at exhibitions / competitions

- *Recommendation:* Increase the number of awards and recognitions.
- *Our answers:* Both academics and students present their results, and the faculty has received prestigious NATO and conference awards during the evaluated period.

(4) Support for internationalization and mobility

- *Recommendation:* Make academic staff more visible and support their teaching abroad.
- *Our answers:* The FMT promotes international exchanges, projects, and cooperation with both civilian and military institutions (Slovakia, Poland, Germany, Hungary, Italy, etc.).

RECOMMENDATION 3.12

(1) Better communication and popularization of the FMT activities

- *Recommendation:* Make the FMT's international collaboration and their benefits more visible.
- *Our answers:* In the next evaluation, the extent of the FMT's involvement will be emphasized to make achievements more visible.

(2) Higher international projects for popularization

- *Recommendation:* Increase participation in fairs and exhibitions with the support of international grants.
- *Our answers:* The FMT submits international projects (EDF, EDA), but their funding depends on the Ministry of Defence. The UD cannot directly receive funds outside the state budget.

(3) Clearer distinction of the FMT's contribution to popularization

- *Recommendation:* Increase the international visibility of both the University and the faculty.
- *Our answers:* Popularization of R&D is carried out university wide. The FMT participates together with other faculties in defence research projects (e.g., RRP – the Rural Rehabilitation Programme, TACR – the Technological Agency of the Czech Republic, MoI – the Ministry of the Interior).

LIST OF SUPPORTING DOCUMENTS/LINKS FOR MODULE 3

Document name	Criterion No.	Location (link in HTML)

SELF-EVALUATION REPORT FOR MODULE 3

NAME OF EVALUATED UNIT:
MILITARY FACULTY OF MEDICINE
FORD: 3 - Medical and health sciences

SOCIETAL CONTRIBUTION OF THE EVALUATED UNIT

3.1 Introductory information about the unit under evaluation

The evaluated unit will describe its mission and vision and provide a general self-reflection of the societal contribution of R&D&I, along with its long-term goals in the fields it develops. The distribution of research activities by type of research will also be commented on.¹ The evaluated unit will describe its organizational structure and size (staffing, number of students, number of programmes of study implemented, etc.) based on the data provided in annex tables 3.1.1 to 3.1.6.

Maximum 1000 words.

This is a non-rated indicator that serves as an introduction to the evaluated unit, providing context for data in indicators 3.2-3.7.

Self-Evaluation:

Mission The mission of the Military Medical Faculty of the University of Defense (MFM) in Hradec Králové is to fulfill the priorities of the Czech Armed Forces (CAF) in terms of construction and development through scientific research focused on the development of military healthcare, protection against nuclear, chemical, and biological weapons, and the development of healthcare management, preventive, and basic clinical fields. The faculty's vision is to become a leading center of military healthcare that connects scientific research, innovation, and modern technology with current and future defense and security needs. In the field of protection against the effects of chemical weapons, the MFM is focused on the development of drugs against nerve agents, including modern methods of their application and analysis of the effect of chemical agents on living systems, and on the area of improving the detection and diagnostics of poisoning by toxic substances. The field of protection against biological agents has been developed towards the development of means of detection and identification of microorganisms from the list of potential combat biological agents based on the identification of unique biomolecular features of individual microorganisms and the search for new possibilities of specific protection, for example through the development of new vaccines and research in the field of early diagnosis of diseases caused by biological agents. The field of protection against nuclear weapons is

¹ Basic, applied, contract, artistic research (see Definition of Terms in Methodology HEI2025+).

focused primarily on the detection of the received radiation dose using biodosimetry and the search for new radioprotectants based on small molecular inhibitors that are synthesized at the MFM. The field of organization of military healthcare and telemedicine using new technologies such as virtual reality or artificial intelligence is also being developed.

Regarding the focus of research activities and the results achieved, the departments of the MFM are unique workplaces where modern technologies are applied to the field of military science. For this reason, it is a unique educational, research, and training facility of the Czech Armed Forces within the Czech Republic. The MFM conducts both basic and applied research in a balanced ratio.

The workplaces also ensure the operation of relevant doctoral degree programs with valid accreditation and thus provide the highest form of higher education for the needs of the Ministry of Defence. There are a total of eight doctoral degree programs at the MFM, of which seven programs were granted 10-year accreditation by the National Accreditation Office in 2021, and one field received accreditation for four years.

Table 3.1.1 - Staffing per FTE²

Academic/ Professional position	Total / Of which women					
	2019	2020	2021	2022	2023	Total
Professor	9,1/1,1	9,3/2,1	11/3,1	12/3,6	12,5/3,6	11,5/2,9
Associate Professor	10,7/2,4	9,7/1,9	8,9/1,1	9,2/1,6	10/1,9	9,9/1,8
Assistant Professor	27,2/10,3	31,8/11,9	32,2/13,8	34,6/15,5	36,1/17	34,2/14,9
Lecturer	17,9/6,1	16,9/8,1	12,3/4,1	10,9/5,1	10,9/4,1	13,2/6,6
R&D Personnel ³	11/9	9/8	10/8	13/12	11,8/10,8	11,5/10,1
Researchers in other categories ⁴	0/0	0/0	0/0	0/0	0/0	0/0
Technical and economic staff ⁵	28,8/21,7	30,7/23,2	31,3/24,6	32,3/23	32,7/23,7	32,4/23,3
Scientific, research and development staff involved in teaching activities	75,9/28,5	76,7/32	74,4/30,1	79,7/37,8	81/3/37,4	80,3/36,3
Early career	12,3/3,5	11,5/2,5	18/6	20,3/7,3	21,5/9,5	18,2/7,6

² The average number of hours worked is calculated as the ratio of the total number of hours actually worked during the reference period, from 1 January to 31 December, by all staff (including agreement on work activity, excluding agreement on work performance) to the total annual working time pool per full-time employee. The full-time status of the worker in the evaluated unit is always reported. If an employee holds more than one type of full-time job within the evaluated unit, the total sum of the two shall be reported.

³ The category "R&D Personnel" includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).

⁴ The category "Researchers in other categories" includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).

⁵ Who participates in the management and support of R&D&I in the institution.

researchers ⁶						
Total ⁷	104,7/50,2	107,4/55,2	105,7/54,7	112/60,8	114/61,1	112,7/59,5

Note: The categories professor, associate professor, assistant professor, lecturer, other scientific, R&D personnel, researchers in other categories and technical and economic staff are mutually exclusive, i.e. one staff member is reported under one category only. Scientific, research and development staff involved in teaching activities, as well as early career researchers are reported collectively for all the above-mentioned categories.

3.1.2 Age structure of R&D&I personnel of the evaluated unit and their structure by job title and gender in the year 2019 (numbers of physical employees and personnel)⁸

Academic/ professional position	Under 29 years		30–39 years old		40–49 years old		50–59 years old		60–69 years old		70 years and older	
	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n
Professor	0	0	0	0	2	0	3	1	3	0	2	0
Associate Professor	0	0	4	1	3	0	4	2	2	0	0	0
Assistant Professor	1	0	12	5	13	5	3	0	2	1	0	0
Lecturer	0	0	12	3	1	1	4	2	0	0	1	0
R&D Personnel ⁹	1	1	6	4	2	2	3	3	0	0	0	0
Researchers in other categories ¹⁰	0	0	0	0	0	0	0	0	0	0	0	0
Technical and economic staff ¹¹	2	2	5	4	9	6	12	8	4	3	0	0
Scientific, research and development staff involved in teaching activities	2	1	34	13	21	8	17	8	7	1	3	0
Early career researcher ¹²	1	1	10	3	2	0	1	0	0	0	0	0
Total ¹³	4	3	39	17	30	14	29	16	11	4	3	0

Note: The categories professor, associate professor, assistant professor, lecturer, other scientific, R&D Personnel, Researchers in other categories and Technical and economic staff are mutually exclusive, i.e. one staff member is reported in only one category. The categories of scientific, research and development staff

⁶ See Definition of Terms in Methodology HEI2025+.

⁷ Total is the sum of the categories: professor, associate professor, assistant professor, lecturer, R&D personnel, researchers in other categories and technical and economic staff.

⁸ The total number of employees/workers as of 31st December of the calendar year in question is to be entered, irrespective of the level of time worked, but only in an employment relationship (including agreement on work activity, excluding agreement on work performance). Other types of contractual relationships under the Civil Code that involve purchase of services are not included.

⁹ The category “R&D Personnel” includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).

¹⁰ The category “Researchers in other categories” includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).

¹¹ Who participates in the management and support of R&D&I in the institution.

¹² See Definition of Terms in Methodology HEI2025+.

¹³ Total is the sum of the categories: professor, associate professor, assistant professor, lecturer, R&D Personnel, Researchers in other categories and technical and economic staff.

involved in teaching activities and early career researchers are reported collectively for all the above-mentioned categories.

3.1.3 Age structure of R&D&I personnel of the evaluated unit and their structure by job title and gender in the year 2023 (numbers of physical employees and personnel)¹⁴

Academic/ professional position	Under 29 years		30–39 years old		40–49 years old		50–59 years old		60–69 years old		70 years and older	
	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n
Professor	0	0	0	0	4	1	5	1	4	2	2	0
Associate Professor	0	0	0	0	10	2	1	0	0	0	0	0
Assistant Professor	0	0	14	6	14	8	8	3	2	0	2	1
Lecturer	1	0	3	1	5	3	1	0	0	0	1	0
R&D Personnel ¹⁵	0	0	2	2	3	3	6	5	1	1	0	0
Researchers in other categories ¹⁶	0	0	0	0	0	0	0	0	0	0	0	0
Technical and economic staff ¹⁷	3	2	7	5	9	6	111	7	6	4	1	1
Scientific, research and development staff involved in teaching activities	1	0	19	9	36	17	21	9	7	3	5	1
Early career researcher ¹⁸	0	0	13	6	6	2	3	2	0	0	0	0
Total ¹⁹	4	2	26	14	45	23	132	16	13	7	6	2

Note: The categories professor, associate professor, assistant professor, lecturer, other scientific, R&D personnel, researchers in other categories and technical and economic staff are mutually exclusive, i.e. one staff member is reported under one category only. Scientific, research and development staff involved in teaching activities, as well as early career researchers are reported collectively for all the above-mentioned categories.

Table 3.1.4 – Students

Type of study	2019		2020		2021		2022		2023		Total	
	Tota	Wome	Tota	Wome	Tota	Wome	Tota	Wome	Tota	Wome	Tota	Wome

¹⁴ The total number of employees/workers as at 31.12. of the calendar year in question is to be entered, irrespective of the level of time worked, but only in an employment relationship (including agreement on work activity, excluding agreement on work performance). Other types of contractual relationships under the Civil Code that involve purchase of services are not included.

¹⁵ The category “R&D Personnel” includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).

¹⁶ The category “Researchers in other categories” includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).

¹⁷ Who participates in the management and support of R&D&I in the institution.

¹⁸ See Definition of Terms in Methodology HEI2025+.

¹⁹ Total is the sum of the categories: professor, associate professor, assistant professor, lecturer, R&I personnel, researchers in other categories and technical and economic staff.

	l	n	l	n	l	n	l	n	l	n	l	n
Undergraduate	34	13	34	16	37	18	36	15	37	15	178	77
Master's ²⁰	162	71	136	67	164	74	173	80	175	78	810	370
Doctoral	81	36	60	28	55	21	61	26	62	25	319	136
Lifelong Learning Courses	846	252	325	85	400	112	642	217	811	312	3024	978
Total	1123	372	555	196	656	225	912	338	1085	430	4331	1561

Table 3.1.5 – Programmes of Study in Czech/English

Type of programme of study	Total ²¹ / Of which professional programmes of study											
	2019		2020		2021		2022		2023		Total	
Undergraduate	1/0	1/0	2/0	2/0	2/0	2/0	2/0	2/0	2/0	2/0	9/0	9/0
Master's	3/0	3/0	6/0	6/0	6/0	6/0	6/0	6/0	6/0	6/0	27/0	27/0
Doctoral	16/0	16/0	16/0	16/0	16/0	16/0	16/0	16/0	16/0	16/0	80/0	80/0
Lifelong Learning courses	39/1	39/1	38/1	38/1	44/1	44/1	44/1	44/1	40/1	40/1	205/5	205/5
Total	59/1	59/1	62/1	62/1	68/1	68/1	68/1	68/1	64/1	64/1	321/5	321/5

Note: For each SP type, enter the number of SPs in Czech language in the first cell and insert the number of SPs in English language after the slash in the same cell (e.g. 15/3), enter the number of professional SPs in Czech language in the second cell and insert the number of professional SPs in English language after the slash. Follow a similar procedure in the last column of the table (Total).

3.1.6 – R&D&I capacities

R&D&I field	FORD	FORD share [%]	Predominant type of research	Total share of industry group [%]
1. Natural Sciences	1.1 Mathematics		Zvolte položku.	36,07
	1.2 Computer and information sciences	1,17	Basic Research	
	1.3 Physical sciences		Zvolte položku.	
	1.4 Chemical sciences	9,90	Balanced basic and applied research	
	1.5 Earth and related environmental sciences	0,50	Basic Research	
	1.6 Biological sciences	22,32	Basic Research	
	1.7 Other natural sciences	2,18	Basic Research	
2. Engineering and	2.1 Civil engineering		Zvolte položku.	2,35
	2.2 Electrical engineering, Electronic	0,34	Applied Research	

²⁰ All master's degree students are listed, regardless of the length of their programme of study.

²¹ The total number of programmes of study for which admissions have been announced in a given academic year.

Technology	engineering, Information engineering			
	2.3 Mechanical engineering	0,50	Balanced basic and applied research	
	2.4 Chemical engineering		Zvolte položku.	
	2.5 Materials engineering	0,17	Applied Research	
	2.6 Medical engineering	1,01	Balanced basic and applied research	
	2.7 Environmental engineering		Zvolte položku.	
	2.8 Environmental biotechnology	0,17	Basic Research	
	2.9 Industrial biotechnology		Zvolte položku.	
	2.10 Nanotechnology	0,17	Balanced basic and applied research	
	2.11 Other engineering and technologies		Zvolte položku.	
3. Medical and Health Sciences	3.1 Basic medicine	20,30	Basic Research	59,56
	3.2 Clinical medicine	20,81	Balanced basic and applied research	
	3.3 Health sciences	17,79	Basic Research	
	3.4 Medical biotechnology	0,17	Applied Research	
	3.5. Other medical sciences	0,50	Basic Research	
4. Agricultural and veterinary sciences	4.1 Agriculture, Forestry, and Fisheries	0,17	Basic Research	0,17
	4.2 Animal and Dairy science		Zvolte položku.	
	4.3 Veterinary science		Zvolte položku.	
	4.4 Other agricultural sciences		Zvolte položku.	
5. Social Sciences	5.1 Psychology and cognitive sciences		Zvolte položku.	1,68
	5.2 Economics and Business	0,17	Basic Research	
	5.3 Education	0,34	Basic Research	
	5.4 Sociology		Zvolte položku.	
	5.5 Law	0,17	Basic Research	
	5.6 Political science	0,17	Basic Research	
	5.7 Social and economic geography		Zvolte položku.	
	5.8 Media and communications		Zvolte položku.	
	5.9 Other social sciences	0,84	Basic Research	
6. Humanities and the Arts	6.1 History and Archaeology		Zvolte položku.	0,18
	6.2 Languages and Literature		Zvolte položku.	
	6.3 Philosophy, Ethics and Religion	0,17	Basic Research	
	6.4 Arts (arts, history of arts, performing arts, music)		Zvolte položku.	
	6.5 Other Humanities and the Arts		Zvolte položku.	
Total		100 %	-	100 %

RECOGNITION BY THE RESEARCH COMMUNITY

3.2 Recognition by the research community

The evaluated unit will briefly comment on its position in the research community. It shall consider individual and other prestigious R&D&I awards, participation of its academic staff in the editorial boards of international scientific journals, elected membership in professional societies, major invited lectures given by the evaluated unit's academic staff abroad or by foreign scientists and other relevant guests at the evaluated unit. Additionally, it will address the involvement of staff in the evaluation of national or European project/programme calls over the period of 2019–2023 based on the data provided in annex tables 3.2.1 to 3.2.5 (max. 10 most relevant items). If necessary, the evaluated unit shall list any additional services to the scientific community that it considers relevant.

Maximum 1000 words.

Self-Evaluation:

The Military Medical Faculty (MFM) is perceived as a recognized medical faculty with a unique connection between medical disciplines and military aspects. In the field of preclinical research, it focuses mainly on the areas of diagnostics, treatment, prevention and prophylaxis in the following sub-areas that may have an impact on the combat efficiency of the Czech Armed Forces (CAF): a) protection against weapons of mass destruction (CBRN)—research and expert activities in the field of pathological conditions caused by biological, chemical and nuclear weapons or ionizing radiation and their effect on the human body, as well as treatment options (diagnostics, pharmacological research, etc.); b) research into infectious diseases including their epidemiological manifestations, research into poisons and infectious agents, poisoning and pathological processes caused by factors other than weapons of mass destruction, and idiopathic processes that are essential for the health of soldiers or civilians; c) research and other expert activities in the field of preventive medicine and health protection, injuries and other pathological conditions that arise during war events as a result of weapons of mass destruction and other factors (infectious and non-infectious diseases, war injuries, etc.) and research in the field of patient care within the scope of activities provided by healthcare institutions in the Czech Armed Forces.

Within these three mentioned areas, the MFM cooperates with a wide range of research organizations (faculties of medicine, pharmacy, science, and others) and is, therefore, an equal partner for R&D&I in biomedical fields, which is evidenced by the grant projects executed through mutual cooperation or in research consortia listed below. In some aspects of security and defence research, it is a unique institution within the EU, as it has a unique combination of equipment and knowledge (e.g., bio-safety level 3 laboratories, cobalt ionizing radiation source, vivarium for breeding small and large experimental animals, sensitive mass spectrometers, and other cutting-edge devices). Interest in cooperation with the MFM is growing from private companies and foreign research institutions. The creative activities of the MFM staff

have a significant international impact, which is documented by the number of professional papers in prestigious international journals and cooperation with foreign institutions on joint projects, but also by the high citation response (h-index values). The creative activities of the MFM academic staff are focused on both basic and applied research, which has led to several individual awards (see 3.2.1). MFM staff members serve on a number of editorial boards of international scientific journals (see 3.2.2) and are invited to international conferences or foreign institutions to give lectures (3.2.3). Some hold positions in professional societies or evaluation panels of grant agencies or are involved in the evaluation of national or European project/program calls (3.2.5).

Table 3.2.1 - Prestigious R&D&I awards granted during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Name of the award	Awarding institution
COL RNDr. Hynek SCHVACH, Ph.D.	The Dominique-Jean LARRY Award	NATO COMED Health Information Systems & Technology Working Group (2022)
Prof. RNDr. Vanda BOŠTÍKOVÁ, Ph.D.	Cancer League Award for the best publication "Clinical Dermatovenerology"	League Against Cancer (2020)
Prof. RNDr. Vanda BOŠTÍKOVÁ, Ph.D.	Josef Hlávka Award for Scientific Literature "Clinical Dermatovenerology"	Czech Literary Fund Foundation and the Josef, Marie, and Zdeňka Hlávkoví Foundation (2020)
Prof. PharmDr. Jana ŽDÁROVÁ-KARASOVÁ, Ph.D.	Loreal UNESCO Prize for Women in Science	Loreal – UNESCO (2019)

Note: Provide up to 10 examples.

Table 3.2.2 Participation of academic staff of the evaluated unit in editorial boards of international scientific journals during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Name of scientific journal, ISSN
Prof. MUDr. Pavel BOŠTÍK, Ph.D., editor	Antibiotics, 2079-6382
Prof. MUDr. Roman CHLÍBEK, Ph.D., editor	Journal of Vaccines and Immunology, 2640-7590
COL Assoc. Prof. PharmDr. Daniel JUN, Ph.D., editor	Scientifica, 2090-908X
Assoc. Prof. PharmDr. Jan KORÁBEČNÝ, Ph.D. editor-in-chief	Military Medical Science Letters, 2571-113X
COL Assoc. Prof. Petr LOCHMAN, Ph.D., member	Cancer Research Journal, 2330-8192
COL prof. RNDr. Miroslav POHANKA, Ph.D., editor-in-chief	Interdisciplinary Toxicology, 1337-9569
COL prof. RNDr. Miroslav POHANKA, Ph.D., editor	Biosensors, 2079-6374

COL Prof. RNDr. Miroslav POHANKA, Ph.D., editor	BioMed Research International, 2314-6133
Prof. MUDr. Jiří STULÍK, Ph.D., editor	Frontiers in cellular and infection microbiology, 2235-2988
LTC Prof. PharmDr. Aleš TICHÝ, Ph.D., guest editor	Frontiers in pharmacology, 1663-9812

Note: Please provide up to 10 examples of academic staff participation in editorial boards of international scientific journals (e.g. editor, editorial board member, etc.).

Table 3.2.3 The most important invited lectures delivered by the academic staff of the evaluated unit at foreign institutions during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Invited lecture title	Name of host institution, or name of conference or event	Year
Prof. MUDr. Roman CHLÍBEK, Ph.D., invited speaker	Key pillars for adolescent MenB Vaccine recommendation and inclusion in the NIP	41st Annual Meeting of the European Society for Paediatric Infectious Diseases, Lisbon, Portugal	2023
PharmDr. Lukáš GÓRECKI, Ph.D., invited speaker	Step by Step in Finding Novel ABCC1 Activators for the Treatment of Alzheimer's Diseases: An Organic Synthesis Approach	Transport Dementia meeting, Tromso, Norway	2023
COL Prof. Jan SMETANA, Ph.D., invited speaker	Současné možnosti a perspektivy očkování proti malárii. (<i>Current options and perspectives of malaria vaccination</i>)	XIV Slovak Vaccinology Congress, Tatranská Lomnica, Slovakia	2023
LTC Prof. PharmDr. Aleš TICHÝ, Ph.D., invited speaker	Blood-based radiation biomarkers in human plasma (<i>Blood-based radiation biomarkers in human plasma.</i>)	6th International Military Radiation and Innovation Symposium, Paris, France,	2022
Prof. RNDr. Vanda BOŠTÍKOVÁ, Ph.D., invited speaker	Consolidation of Molecular Testing in Clinical Virology	Armed Forces Section Telehealth for Global Emergencies, Atlanta, Gergia, USA	2021
Prof. RNDr. Vanda BOŠTÍKOVÁ, Ph.D., keynote speaker	Molecular Pathology of Emerging Viruses	Annual Conference Workshop Emory University Hopsital Midtown, Atlanta, Georgia, USA	2021
Assoc. Prof. PharmDr. Ivona PÁVKOVÁ, Ph.D., invited speaker	Nanoparticles in the treatment of intracellular infections and vaccine development	University of Galway, Ireland	2021
COL Assoc. Prof. Petr LOCHMAN, Ph.D., invited speaker	Abdominal sepsis: classification of peritonitis	20th European Congress of Trauma and Emergency Surgery, Praha, Česko	2019
LTC Prof. PharmDr. Aleš TICHÝ, Ph.D., invited speaker	Plasma Proteins as New Biomarkers of Irradiation in Humans	Global Conference on Radiation Topics, Munich, Germany	2019

COL RNDr. Hynek SCHVACH, Ph.D.	National Research in Military Medical Informatics and Pre-Hospital Care	NATO Committee of Chiefs of Military Medical Services –Future Advisory Board, Paris, France	2019

Note: Provide up to 10 examples.

Table 3.2.4 - The most important lectures by foreign scientists and other guests relevant to R&D&I at the evaluated unit during the evaluation period

Name, surname and title(s) of the lecturer	Lecturer's employer at the time of the lecture	Invited lecture title	Year
Dr. Christophe Badie	United Kingdom Health Security Agency	FDXR, a novel radiation biomarker for biological dosimetry	2019
COL Zoltan Vekerdi, MD	NATO Military Medicine Centre of Excellence	Invited speaker to the 18th Conference of the Professional Society of Military Doctors, Pharmacists and Veterinary Doctors of the Czech Medical Association of J. E. Purkyně	2019
COL David Williams	Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defence	Recent challenges for NATO in CBRN defence	2019
Dr. Irene E. Mac Allister, Ph.D.	Construction Engineering Research Laboratory at the U.S. Army Engineer Research and Development Center in Champaign, USA	Research and Development Overview in CERL	2021

Note: Provide up to 10 examples.

Table 3.2.5 - Involvement in the evaluation of national/European research project/programme calls relevant to the R&D&I area at the unit during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Name of the research project/programme call	Name of the contracting authority/guarantor of the project/programme call	Year
Prof. MUDr. Roman CHLÍBEK, Ph.D., panel chairman	Program to Support Applied Medical Research	Health Research Agency	2019–2023
Prof. MUDr. Pavel BOŠTÍK, Ph.D., panel member	Program to Support Applied Medical Research	Health Research Agency	2019–2023
Prof. PharmDr. Ondřej	Open competition	Czech Science Foundation	2019–

SOUKUP, Ph.D., panel member			2023
LTC Prof. PharmDr. Aleš TICHÝ, Ph.D., panel member	Open competition	Czech Science Foundation	2022–2023
COL Prof. MVDr. Zuzana ŠINKOROVÁ, Ph.D.	Gama 2 Program	Technology Agency of the Czech Republic	2020
Assoc. Prof. PharmDr. Ivona PÁVKOVÁ, Ph.D., assessor	16th round of the GAUK competition	Charles University Grant Agency	2019
Prof. RNDr. Vanda BOŠTÍKOVÁ, Ph.D., assessor	Program to Support Applied Medical Research	Health Research Agency	2021
COL prof. RNDr. Miroslav POHANKA, Ph.D., assessor	Public Call 2023	Agency for Research and Development Support of the Slovak Republic	2023
LTC Prof. PharmDr. Aleš TICHÝ, Ph.D., assessor	Internal Funding Award	United Kingdom Health Security Agency	2020–2022
Ing. Hana STRÍTECKÁ, Ph.D.	INTER-EXCELLENCE: sub-program INTER-ACTION Czech Republic – USA LUAUS23028	Ministry of Education, Youth and Sports	2022

Note: Provide up to 10 examples.

RESEARCH PROJECTS

3.3 Research projects

The evaluated unit shall list at most 10 (considered most significant by the evaluated unit) research projects/activities (regardless of whether they are supported by public funds or based on contract research²²) that it has implemented or participated in during the period of 2019–2023²³. This should be done from the full list in annex tables (Table 3.3.1–3.3.2)²⁴, regarding particularly the results achieved or the application

²² For the definition of contract research for the purposes of evaluation in the HE segments, see Article 2.2.1 of the Community Framework for State Aid for Research, Development and Innovation 2014/C 198/01.

²³ Regardless of whether the projects are completed or still ongoing, provided that at least part of the project was implemented during the evaluation period.

potential of the projects. The unit should also describe how the research projects contributed to the mission and purpose of the evaluated unit. If the evaluated unit has been a participant in listed project, it shall indicate which other entities were involved and describe its contribution to the project. The interdisciplinary aspects of the projects will also be commented on, along with any collaboration with other units of the evaluated HEI.

Maximum 300 words per project.

Self-Evaluation:

1. The most important projects supported by public funds are listed. Projects supported based on contractual research cannot be implemented due to the legal nature of the MFM's existence as a state university.

2. Induction of Antiviral Immune Response by Mucosal Vaccination Using Nanoparticles Project (Ministry of Education):

3. Nasal immunization represents an innovative and promising way of vaccine delivery that offers many advantages compared to more traditional approaches. Since most infections start at the mucous membranes, mucosal immunization provides rational grounds for its use. Mucosal vaccine delivery (e.g., orally or through the nose) could stimulate systemic and mucosal immune responses. However, there are still some limitations that should be addressed for the broader use of this approach. To induce a strong immune response, it is still necessary to use highly immunogenic antigens or suitable adjuvants. Using nanoparticles in vaccine development could represent a promising approach for mucosal vaccine research. Nanoparticles could thus serve as carriers providing vaccines with their unique properties, such as antigen stabilization and protection, serve as adjuvants, and induce antigen-specific immune responses at target sites. Results such as Jimp (Janovká et al., 2023. Chitosan Nanoparticles as Delivery System for Nasal Immunization) advance knowledge in the field of epidemiology and immunology.

Sensor Design for Quantitative Determination of Antibodies Against Tissue Transglutaminase for the Diagnosis of Celiac Disease (TACR):

4. Celiac disease (CD) is a hereditary disease characterized by the presence of IgA antibodies against tissue transglutaminase (anti-tTG) in the serum. In this work, we compared a standard enzyme-linked immunosorbent assay (ELISA) with a quartz crystal microbalance (QCM) measurement system to determine anti-tTG. The new immunosensor is based on immobilized tTG in the open conformation (open-tTG) and is optimized for determining IgA anti-tTG with a detection limit of 13.3 RU/ml and good specificity and stability over time. Testing of serum samples from CD patients showed the suitability of the prepared immunosensor for practical use. Compared to the ELISA method requiring qualified personnel and expensive equipment, the newly designed measurement system for measuring the QCM sensor is inexpensive, easy to prepare and does not require any special skills, so it can be implemented in every laboratory or general practitioner's office. The result is a functional sample and several Jimp

²⁴ The evaluated unit shall only fill tables that are relevant to it.

publications that advance knowledge in the field of electrochemistry and diagnostics of digestive tract diseases.

5.

6. New Approaches in Diagnostics and Therapy of Irradiated Persons (Ministry of the Interior):

7. This project aimed to create a methodology for rapidly and effectively sorting individuals into evacuation categories in the event of radiation exposure associated with the risk of developing acute radiation sickness. The methodology aims to separate individuals who have not been irradiated (category H0) and to divide the others according to the expected severity of radiation exposure based on the analysis of basic blood (hematological) indicators into four categories: H1, H2, H3, and H4, which differ from each other in the severity of clinical consequences of radiation exposure. The certified methodology is feasible in all healthcare facilities with hematological and immunological equipment and contributes significantly to the field of protection against CBRN agents.

The Potential of Xanthohumol and Beta Bitter Acids for the Treatment of Nosocomial Infections (Ministry of Health):

8. *Clostridioides (C.) difficile* is a major cause of nosocomial gastrointestinal infections in humans with increasing incidence, morbidity, and mortality. Available treatment options for this pathogen are limited. Standard antibiotics are expensive, may promote resistance, and the infection recurrence rate is high. Therefore, new approaches are urgently needed to face these challenges. One possible treatment alternative is using compounds available in commonly used plants. In this study, purified extracts isolated from hops—alpha and beta acids and xanthohumol—were tested in vivo for their inhibitory effect against *C. difficile*. An oral intestinal *C. difficile* infection model was developed in rats. The results show that both xanthohumol and beta acids from hops have a significant antimicrobial effect in *C. difficile* infection. The application of xanthohumol showed the most significant antimicrobial effect, along with an improvement in local inflammatory symptoms in the colon. Thus, hop compounds represent promising antimicrobial agents for treating intestinal infections caused by *C. difficile*. Jump-type results advance knowledge in the fields of infection biology and medical microbiology.

9. Development of New Radioprotective Agents Based on Small Molecular Inhibitors (Czech Science Foundation)

The increasing risk of radiation exposure highlights the need for new radioprotective agents. Therefore, a series of novel 1-(2-hydroxyethyl) piperazine derivatives were designed and synthesized in this project. Some of these compounds protected human cells from radiation-induced apoptosis and exhibited low cytotoxicity. Compared with the previous series of piperazine derivatives, compound 8 exhibited radioprotective effects on cell survival in vitro and low toxicity in vivo. It also increased the survival of mice 30 days after whole-body irradiation (although this increase was not statistically significant). Taken together, our in vitro and in vivo data suggest that some of our compounds are valuable for further research as potential radioprotectants, which is why they have been protected by patent. Jump and Patent type results advance

knowledge in the field of protection against CBRN agents, specifically in the field of radiobiology.

Research on Oxime-CB(7) Complexes in the Penetration of Quaternary Acetylcholinesterase Reactivators into the Central Nervous System (Czech Science Foundation)

Oxime-based molecules are used to treat patients with reactivation of acetylcholinesterase (AChE) function after organophosphate intoxication. However, their efficacy is limited by low blood-brain barrier penetration and rapid elimination. In this work, the carrier cucurbit[7]uril (CB[7]) was used to encapsulate the clinical substance asoxime, which increases its bioavailability in the brain and the therapeutic window. The project performed a complete pharmacokinetic study of asoxime and the asoxime-CB[7] complex in a mouse model in vivo and led to the creation of a pharmaceutical. Together with other Jimp results, they advance knowledge in the field of protection against CBRN agents, specifically in the fields of toxicology, pharmacology, and protection against chemical weapons.

European Agile Network for Medical COUNTERmeasures Against CBRN Threats (European Defence Fund)

Acute radiation syndrome (ARS), also known as radiation toxicity or radiation sickness, is an acute illness that occurs after exposure of a large part of the body to ionizing radiation, such as from medical and industrial sources of radioactive material and accidental or deliberate releases of radiological and nuclear materials. The rapidly dividing cells of the bone marrow are among the most sensitive to radiation damage. Radiation-induced bone marrow damage reduces the number of neutrophils and lymphocytes that fight pathogens, platelets that control and reduce bleeding, and red blood cells that carry oxygen in the blood. Death can result from excessive bleeding, infection, or hypoxia.

The aim is to develop Myelo001 as a H-ARS MCM monotherapy for mild, moderate, and severe cases of myelosuppression caused by ionizing radiation. In addition, to confirm the observed efficacy of Myelo001 in polypharmacotherapy with growth factor G(M)-CSF in cases of severe and potentially lethal doses of ionizing radiation. The COUNTERAct project will enable the development of Myelo001 towards the first EU-approved medical countermeasure for radiation events for the treatment of acute radiation syndrome.

This is a prestigious project in a 23-member international consortium. The MFM employee is the so-called Leader scientist responsible for the “work package” focused on testing on an animal model of a minipig. The results of this type will develop knowledge in the field of protection against CBRN agents, specifically in the field of radiobiology.

Colorimetric Sensor for Diagnosing Pesticide Poisoning (TACR)

Acetylcholinesterase (AChE) and butyrylcholinesterase (BChE) can serve as

biochemical markers of various pathological conditions, such as liver dysfunction and nerve agent poisoning. The Ellman assay is a standard spectrophotometric method for measuring cholinesterase activity in clinical laboratories. The authors present a novel colorimetric assay to assess AChE and BChE activity in biological samples using chromogenic reagents, modified 3D printed measurement pads, and a smartphone camera as a signal detector. The main advantage of this method is its overall simplicity, as samples are applied directly without any specific treatment or added reagents. The assay was also validated against the standard Ellman assay using human plasma samples. In conclusion, this smartphone camera-based colorimetric assay appears to be practically applicable and is a suitable method for point-of-care testing, as it does not require specific handling, additional staff training, or the use of sophisticated analytical instruments. This is applied research in collaboration with the company RANADAL s.r.o., and the results (functional sample and Jimp) advance knowledge in the field of electrochemistry and in the fields of toxicology, pharmacology, and protection against chemical weapons.

Proteomic Analysis of Potential Markers of Dilated Cardiomyopathy (Ministry of Health):

Determining the prognosis and treatment outcomes of dilated cardiomyopathy is a major challenge due to the lack of valid specific protein markers. Using an in-depth analysis of the discovered proteome, we compared 49 plasma samples from patients with dilated cardiomyopathy with plasma samples from their healthy counterparts. In total, we identified 97 proteins showing statistically significant dysregulation in the patient plasma samples. Functional enrichment analysis of differentially expressed proteins revealed dysregulation in biological processes such as inflammatory response, wound healing, complement cascade, blood coagulation, and lipid metabolism in patients with dilated cardiomyopathy. The same proteomic approach was used to find protein markers whose expression differs between patients with good responses to treatment and those without. In this case, 45 plasma proteins were found to have statistically significant different expression between the two groups. Of these, fructose-1,6-bisphosphate aldolase appears to be a promising candidate biomarker, as it accumulates in plasma samples obtained from patients with insufficient response to treatment and with worse or fatal outcomes. The project was carried out in cooperation with the lead investigator of the Faculty Hospital Hradec Králové. The MFM played a key role in the analytical part of the project. Jimp-type outputs advance knowledge in the fields of cardiology, biochemistry, and analytical chemistry.

Preparation of a Collection of Standards of Biologically Significant Toxins with the Support of the European Biodefence Laboratory Network (Ministry of the Interior):

The main objective of this study was to develop, test, and validate a targeted proteomic method for detecting *C. perfringens* protein toxins within the Biodefence initiative. *C. perfringens* toxins are considered potential biological weapons of mass destruction, especially epsilon toxin, which belongs to the group of the most potent

bacterial toxins. For the purpose of method development, protein standards of toxins were first required. If it was not possible to obtain a suitable commercial standard, the proteins were prepared in-house, and their preparation methods constitute a substantial part of these results. Although the production of selected *C. perfringens* toxins was highly desirable, attempts to isolate them from natural producers were problematic due to the complexity of the protein samples and their low production, which greatly limits their use for preparing standard toxins for MS analysis without enrichment with specific antibodies. For example, we present an efficient approach for expressing and purifying alpha, beta, beta2, epsilon, iota a, and iota b proteins of *C. perfringens*. Genes of interest were amplified from chromosomal or plasmid DNA of *C. perfringens* and cloned into the expression vector pET28b+ to obtain fusion proteins with its tag. Recombinant proteins were expressed in *E. coli* and purified by immobilized metal affinity chromatography. Calibration curves and lower limits of detection and quantification were determined for *C. perfringens* toxins. The project was carried out in cooperation with the Military Health Agency, and another co-investigator was the State Institute of Nuclear, Chemical and Biological Protection, v.v.i. The MFM was responsible for performing most of the analyses. Jimp develops knowledge in the field of protection against biological weapons and in the field of genomic and proteomic analysis.

All of the above projects are highly interdisciplinary and mostly combine theoretical biomedical or natural science fields with clinical fields. The MFM was involved in projects 1-6 as the main investigator and projects 7-10 as the co-investigator. Due to their specific professional focus, these projects did not involve cooperation with other parts of the UD.

Table 3.3.1 Projects supported by public funds

In the role of beneficiary						
Provider ²⁵	Project name	Support (in thousands CZK/EUR) ²⁶				
		2019	2020	2021	2022	2023
Ministry of Education	Induction of Antiviral Immune Response by Mucosal Vaccination Using Nanoparticles	-	1114/43,9	1064/41,9	834/32,8	-
Technology Agency of the Czech Republic	Sensor Design for Quantitative Determination of Antibodies Against Tissue Transglutaminase for	526/20,7	-	-	-	-

²⁵ If the provider is from abroad, please indicate the provider's country of origin in brackets. For the determination of the country of origin of the provider, the place of residence of the provider is decisive.

²⁶ Indicate the total amount expressed in thousands of CZK and the conversion of the total amount into Euro.

	the Diagnosis of Celiac Disease					
Ministry of the Interior	New Approaches in Diagnostics and Therapy of Irradiated Persons	4 437/175	2 733/107,8		-	-
Ministry of Health	The Potential of Xanthohumol and Beta Bitter Acids for the Treatment of Nosocomial Infections	894/35,2	884/34,8			
Czech Science Foundation	Development of New Radioprotective Agents Based on Small Molecular Inhibitors	1 057/41,6	-	-	-	-
Czech Science Foundation	Investigation of Oxime-CB(7) Complexes in the Penetration of Quaternary Acetylcholinesterase Reactivators into the Central Nervous System	1 225/48,3	1 265/49,9	-	-	-
Ministry of the Interior	Creation of a Czech-Irish Project Initiative to Address the Country's Biosecurity Issues		261/10,3	873/34,4	503/19,8	
Ministry of Health	Development of a Polyvalent Decontamination Agent	1276/50,3	1256/49,5	1257/49,6		
Ministry of Health	Study of the Secretion of Outer Membrane Vesicles in the Microbe Francisella Tularensis and Their Role in Interaction with the Host	2007/79,1				
Ministry of Education	Concept of Non-selective Cholinesterase Reactivators Inhibited by Organophosphates					1723/67,9
Ministry of Health	Hit-to-lead Development of					763/30

	Small Molecules to Improve Radiation Protection in Therapy and Diagnostics					
Ministry of Health	Development of broad-spectrum disinfectants with enhanced virucidal activity					948/37,4
Czech Science Foundation	Nonspecific and Broad-Spectrum Cholinesterase Reactivators Against Organophosphorus Intoxication				1743/68,7	1893/74,6
Czech Science Foundation	Nerve Agents from the Novichok Group: Toxicity and Treatment				1318/51,9	1493/58,8
Ministry of the Interior	Biomarkers of Poisoning with Novichok-Type Substances					416/16,4
Ministry of the Interior	Research into the Properties and Methods of Protecting People from the Effects of the Latest Generation of Nerve Agents	1197/47,2	2349/ 92,6	2349/ 92,6	1167/46	
Total		12619/497,4	9862/388,8	5543/218,5	5565/219,3	7236/285,2
In the role of another participant						
Provider ²⁷	Project name	Support (in thousands CZK/EUR)				
		2019	2020	2021	2022	2023
EU – EDF	European agile network for medical COUNTERmeasures Against CBRN Threats	-	-	-	-	5 554/219
Technology Agency of the Czech Republic	Colorimetric Sensor for Pesticide Poisoning Diagnosis	290/11,4	290/11,4	290/11,4	-	-
Ministry of	Proteomic Analysis of	426/16,8	975/38,4	1 228/48,4	988/38,9	-

²⁷ Ibid.

Health	Potential Markers of Dilated Cardiomyopathy					
Ministry of the Interior	Preparation of a Collection of Standards of Biologically Significant Toxins with the Support of the European Biodefence Laboratory Network	1 171/46,1	1 171/46,1		-	-
Ministry of Health	Centrally Effective Antidote for the Treatment of Poisoning by Organophosphates	1076/42,4	1036/40,8			
Czech Science Foundation	Butyrylcholinesterase Reactivators for the Preparation of Pseudo-Catalytic Scavengers Useful in Organophosphorus Compound Intoxications	965/38	935/36,8			
Czech Science Foundation	Modified Nucleophiles for Reactivation of Cholinesterases Inhibited by Organophosphorus Compounds			563/22,1	786/30,9	836/32,9
Ministry of the Interior	Interlaboratory Comparison of the Dicentric Chromosome Test for Radiation Biodosimetry					458/18
Ministry of the Interior	Complex of Methods of Biological and Physical Retrospective Dosimetry for Radiation Emergencies					2910/114,7
Ministry of the Interior	A Smart System for Wearable Protective Equipment Enabling Surveillance and Planning of Police					2058/81,1

	and Military Interventions					
Technology Agency of the Czech Republic	MIHRIL II.: Progressive Ballistic Armor for the Armed Forces					1410/55,6
Technology Agency of the Czech Republic	Innovative Oromucosal Immunization			992/39,1	992/39,1	852/33,6
Total		3928/154,7	4407/173,5	3073/121,1	2766/109	14078/554,9

Table 3.3.2 - Contract research activities

Client ²⁸	Activity name	Revenue (in thousands CZK/EUR)				
		2019	2020	2021	2022	2023
N/A						
Total						

Note: List and describe contract research activities with a revenue in a given calendar year, regardless of the amount of financial revenue.

3.4 Research results with existing or prospective impact on society

The evaluated unit shall briefly comment on a maximum of 10 (considered most significant by the evaluated unit) research results already applied or realistically heading towards application during the period of 2019–2023, based on the overview annex table 3.4.1 (it is recommended to indicate results with a link to projects listed in indicator 3.3). The evaluated unit must demonstrate in its description that the research results have led or will soon lead to positive impacts²⁹, on society (e.g. description of how the results are used by various users, the range of persons/institutions for which the result is relevant, measurable economic impacts, etc.). The evaluated entity shall indicate in its commentary whether the gender dimension is considered in these

²⁸ If the client is from abroad, indicate in brackets the country of origin of the client.

²⁹ See Terms definition.

results and discuss the impacts of the results regarding sustainability.

Maximum range 300 words/result.

Self-Evaluation:

1. Functional sample for celiac disease diagnostics (result of project 2. Design of a Sensor for Quantitative Determination of Antibodies against Tissue Transglutaminase for Celiac Disease Diagnostics). Testing of serum samples from patients suffering from CD showed the suitability of the prepared immunosensor for practical use. Compared to the ELISA method requiring qualified personnel and expensive equipment, the newly designed measuring system for measuring the QCM sensor is inexpensive, easy to prepare and does not require any special skills, so it can be implemented in every laboratory or general practitioner's office.
2. Certified methodology for rapidly and effectively sorting individuals into evacuation categories in the event of irradiation associated with the risk of developing acute radiation sickness (the result of the project 3. New Approaches in Diagnostics and Therapy of Irradiated Persons). The aim of the methodology is to separate individuals who were not irradiated (category H0), and to divide the others according to the expected severity of irradiation according to the analysis of basic blood (hematological) indicators into four categories H1, H2, H3, and H4, which differ from each other in the severity of clinical consequences of irradiation. The procedure below can be applied to sorting suspected irradiated subjects based on the analysis of specific biological indicators and allows for determining the risk of subsequent development of acute radiation sickness. The sorting methodology was developed on an experimental animal model of a pig and is based on the analysis of collected peripheral blood. The results based on the reading of parameters from peripheral non-coagulating blood of an individual collected 1 hour after irradiation are known within 4 hours of irradiation. If such early collection is not possible, blood collection is performed at 4 and 8 hours after irradiation, and the categorization results are known 14 hours after irradiation. Subsequent blood collection at 48 hours after irradiation verifies the correctness of the inclusion of each individual in the appropriate group. The methodology is feasible in all medical facilities with hematological and immunological equipment and contributes significantly to the field of protection against CBRN agents. The key user is the Medical Service Corps of the Czech Armed Forces, the State Office for Nuclear Safety, and clinical hematological laboratories. The certifying body was the Military Health Service of the Ministry of Defence. The benefit of the methodology is evident from an economic and practical point of view due to the time savings and the reduction in the number of sample collections, which will make the sorting of irradiated persons more efficient and contribute to faster diagnosis of irradiated persons. Current methods are lengthy. Sample preparation alone takes over 72 hours, and analysis requires expertise. The proposed methodology will lead to lower economic costs not only for diagnostics but also for subsequent treatment.

3. The utility model "Detection Device for Determining the Absorbed Dose in the Event of High Levels of Radiation Damage to the Body" was developed in cooperation with ÚJP Praha a.s. The detection device is intended for rapid biodosimetric determination of the radiation level of a person exposed to high doses of ionizing radiation from a sample of their body fluid. The body fluid sample (peripheral blood, serum, urine) is electrochemically analyzed and within a few minutes, the level of damage to the body is roughly determined by measuring the concentration of 8-hydroxyguanine molecules, which is considered one of the leading biological indicators of DNA damage due to radiation, or other molecules formed during oxidative DNA damage. The method allows for rapid primary classification of a wide spectrum of the irradiated population for subsequent time-consuming detailed analysis of radiation damage to the body.
4. Patent "1-Aryloxy-3-(4-(2-hydroxyethyl)piperazin-1-yl)propan-2-ols, Method of Their Preparation and Their Use" (result of project 5. Development of New Radioprotective Substances Based on Small Molecular Inhibitors. Developed in cooperation with the Faculty Hospital Hradec Králové and the Faculty of Medicine of Charles University in Hradec Králové. The presented solution relates to 1-aryloxy-3-(4-(2-hydroxyethyl)piperazin-1-yl)propan-2-ols of general formula I, where R is selected from the group consisting of phenyl and naphthyl, unsubstituted or substituted by 1, 2 or 3 substituents independently selected from the group consisting of C1-C4 alkyl, C1-C4 alkoxy, C2-C4 alkenyl, nitro; and their pharmaceutically acceptable salts with alkali metals, ammonia or amines, or their addition salts with pharmaceutically acceptable acids. The substances mentioned are suitable for use as radioprotectants based on apoptosis inhibitors. Currently, there is no approved preparation as a radioprotectant in the Czech Republic or within the EU. The potential social benefit is great.
5. Patent "Pharmaceutical Preparation and Method of Its Preparation" (result of project 6. Research of Oxime-CB(7) Complexes in the Penetration of Quaternary Acetylcholinesterase Reactivators into the Central Nervous System). The presented solution provides a pharmaceutical preparation containing oxime, which is capable of reactivating organophosphate-inhibited acetylcholinesterase, and cucurbit[7]uril. This pharmaceutical combination increases the penetration of oxime through the blood-brain barrier without the need to interfere with its structure, i.e. without reducing its effectiveness. Furthermore, the absolute bioavailability of oxime is significantly increased. In this work, the carrier cucurbit[7]uril (CB[7]) was used to encapsulate the clinical substance asoxime, which increases its bioavailability in the brain and the therapeutic window. The presented solution further provides a method of preparing such a pharmaceutical preparation and its use in treating poisoning caused by organophosphorus inhibitors. A result has a social impact in the field of population protection against chemical weapons and

pesticide poisoning.

6. Patent “Nitrogenous Heterocyclic Compounds Containing 2-((1E)-hydroxyimino)methyl)-3-hydroxypyridine, Their Use as Drugs, Pharmaceutical Preparations”. Similar to the previous patent, nitrogenous heterocyclic compounds containing 2-((1E)-hydroxyimino)methyl)-3-hydroxy-pyridine of general formula I represent new, previously unpublished derivatives of 2-(5-(5-hydroxy-6-((1E)-(hydroxyimino)methyl)pyridin-2-yl)pentyl)-pyridinium, quinolinium or isoquinolinium salts. These compounds consist of two basic fragments, capable of binding simultaneously to the catalytic site of the reactivating part of the molecule and the peripheral site of the enzyme of the anchoring part of the molecule. Nitrogenous compounds can be used for reactivation of human acetylcholinesterase when inhibited by an organophosphorus compound from the group of nerve agents (military) or pesticides (civilian use).
7. The software “SW for Evaluation of Biodosimetric Doses” is designed as a tool for sorting irradiated patients. It functions as a two-stage. The first stage is an integral part of the firmware of the detection device and serves to provide quick orientation in the results in field conditions. It is intended to separate three groups of the affected population—undamaged or slightly damaged, moderately damaged, and severely damaged. The second part of the SW is implemented on a personal computer and serves for detailed analysis of each measured sample, archiving of measured data, and the possibility of other, e.g., statistical analyses created ex-post on the data of damaged persons. The social benefit is potentially great due to the unstable geo-political situation.
8. The patent “Set of Gel-Forming Solutions Intended for the Preparation of a Hydrogel Based on a Covalently Cross-Linked Hydroxyphenyl Derivative of Hyaluronan for the Prevention of Postoperative Complications Related to the Creation of a Colorectal Anastomosis and Its Use.” was developed in cooperation with the company Contipro a.s. Colorectal carcinoma is one of the most common oncological diagnoses. The relative five-year survival of patients with colorectal carcinoma in cases diagnosed in the years 2001–2005 was approximately 50% for both sexes (calculated from all reported cases, i.e. treated and untreated for various reasons). Hyaluronan hydrogel cross-linked with polyvalent iron ions (Intergel) was previously evaluated as a material that increases the virulence of some bacterial strains and increases the risk of postoperative complications. Anti-adhesive membranes based on a mixture of hyaluronan and carboxymethylcellulose are contraindicated for use in direct contact with intestinal anastomoses, for direct contact with the anastomotic suture line, and in the case of clinically manifest infection. Therefore, a method was developed that involves the separate preparation of at least two solutions to form a hydrogel containing a covalently cross-linked hydroxyphenyl derivative of hyaluronan. The societal impact is obvious, as in the European Union, the

incidence of rectal cancer ranges between 15–25 newly diagnosed tumors per 100,000 inhabitants per year. Mortality is reported in approximately 4–10 patients per 100,000 inhabitants per year, with a slight male predominance.

Table 3.4.1 - Overview of research results in the period under evaluation

Type of result ³⁰	Year of application	Name
Functional sample (for project 2.)	2023	Platform for Mounting Quartz Crystal Microbalances. Functional Sample Number G-UO-K308-POH-1-2023-TACR.
Certified methodology (ad project 3.)	2022	Sorting of Suspected Irradiated Individuals after a Radiation Event.
Utility model	2023	Detection Device for Determining the Absorbed Dose in the Event of High Levels of Radiation Damage to the Body. Industrial Property Office. Utility Model 36975.
Patent (ad project 5.)	2022	1-Aryloxy-3-(4-(2-hydroxyethyl)piperazin-1-yl)propan-2-ols, Process for Their Preparation and Their Use. Industrial Property Office. Patent Document 309081.
Patent (ad project 6.)	2019	Pharmaceutical Preparation and Method of its Preparation. Industrial Property Office. Patent Document 307341.
Patent	2020	Nitrogen Heterocyclic Compounds Containing 2-((1E)-hydroxyimino)methyl)-3-hydroxypyridine, Their Use as Drugs, Pharmaceutical Preparations. Patent Document 308675.
Software	2023	Software for Evaluating Biodosimetric Doses. PUV2023-40783
Patent	2022	A Set of Gel-Forming Solutions Intended for the Preparation of a Hydrogel Based on a Covalently Cross-Linked Hydroxyphenyl Derivative of Hyaluronan for the Prevention of Postoperative Complications Related to the Creation of a Colorectal Anastomosis and Its Use. US2024207481A1

Note 1: Please list and describe the results already applied in practice or heading towards application in practice with existing or prospective impact on the society (e.g. domestic or foreign patents, sold licenses, spin-offs, prototypes, varieties and breeds, methodologies, significant analyses, surveys, expert outputs for policymaking or other forms of non-publication outputs, etc.). Indirect results of research, development and creative activities with documented societal impact, e.g. expert activities, services to the public/government/scientific community, may also be reported.

TRANSFER OF RESULTS INTO PRACTICE

3.5 Transfer of results into practice

³⁰ Specify the specific type of result. Add rows as needed.

The evaluated unit shall briefly describe its system for transferring results into practice. It shall also indicate up to five of the most typical users of its results, whether in the university environment or in the non-university application/corporate sphere, detailing how it collaborates with them and how it seeks out new users (using a maximum of five specific examples).

It will also indicate whether and how it commercializes R&D&I results (e.g. selling licences, setting up start-up or spin-off companies, etc.)³¹, providing brief description of the commercialization methods used. The effectiveness of the transfer of results and the commercialization of R&D&I results will be described using a selection of results (max. five) listed in annex table (Table 3.4.1).³²

Additionally, the evaluated unit shall briefly comment on the funds received during the period of 2019–2023 from non-public, non-grant sources (e.g. licences sold, spin-off revenues, donations, etc.). A full summary shall be provided in annex table (Table 3.5.1).

Maximum 500 words plus 200 words for each provided example of finding a new user of results and commercialization.

Self-Evaluation:

The MFM transfers results into practice primarily through the governing authority—the Ministry of Defence—specifically the Section of Industrial Cooperation, and the vast majority of results are for the end users: the Medical Service of the Czech Armed Forces and the components of the Integrated Rescue System. These institutions do not need to be actively sought out, but there is a process of listing the so-called Research Needs, by which the Ministry of Defence defines the sub-areas on which it is necessary to focus scientific and research activities and the MFM then responds to them by incorporating them into the strategic plan and then addresses these areas and submits proposals for grant projects of the so-called Defence Research Projects (DRP). Typical results are Certified methodologies or treatment procedures, utility or functional designs, and/or patents.

The MFM cannot, by law, commercialize its results. Therefore, it is not possible to comment on the profit from the funds. Below are examples of the transfer of results into practice:

1. A certified methodology for rapid and effective classification of individuals into evacuation categories in the event of radiation exposure associated with the risk of developing acute radiation sickness (the result of the project 3. New Approaches in the Diagnosis and Therapy of Irradiated Persons) was created to identify individuals who were not irradiated (category H0) and classify other patients into evacuation categories according to the severity of clinical consequences of radiation exposure. The methodology was adopted by the Medical Service Corps of the Armed Forces of the Czech Republic, a key user, and by the State Office for Nuclear Safety. Other users in practice are clinical

³¹ In the case of military HEIs, their specific position is taken into account when evaluating the commercialization/evaluation of R&D&I results.

³² If the commercialization of R&D&I results is carried out in this way.

hematology laboratories. The presented methodology will lead to lower economic costs not only for diagnostics, but also for subsequent treatment.

2. The utility model "Detection Device for Determining the Absorbed Dose in the Event of High Levels of Radiation Damage to the Body" was developed in cooperation with ÚJP Praha a.s. The detection device is intended for rapid biodosimetric determination of the radiation level of a person exposed to high doses of ionizing radiation from a sample of their body fluid. The body fluid sample (peripheral blood, serum, urine) is electrochemically analyzed, and within a few minutes, the level of damage to the body is roughly determined by measuring the concentration of 8-hydroxyguanine molecules, which is considered one of the main biological indicators of DNA damage due to radiation, or other molecules formed during oxidative DNA damage. The method allows for rapid primary classification of a wide spectrum of the irradiated population for subsequent time-consuming detailed analysis of radiation damage to the body. Potential users are the so-called first responders of the IZS, especially the fire department, as well as the Czech Armed Forces and medical facilities.
3. The patent "Set of Gel-Forming Solutions Intended for the Preparation of a Hydrogel Based on a Covalently Cross-Linked Hydroxyphenyl Derivative of Hyaluronan for the Prevention of Postoperative Complications Related to the Creation of a Colorectal Anastomosis and Its Use." was developed in cooperation with Contipro a.s. Colorectal carcinoma is one of the most common oncological diagnoses, and the developed hydrogel is used in treatment at the University Hospital in Hradec Králové.
4. Functional sample for celiac disease diagnostics (result of project 2. Design of a Sensor for Quantitative Determination of Antibodies against Tissue Transglutaminase for Celiac Disease Diagnostics). Testing of serum samples from patients suffering from CD showed the suitability of the prepared immunosensor for practical use. Compared to the ELISA method, requiring qualified personnel and expensive equipment, the newly designed measuring system for measuring the QCM sensor is inexpensive, easy to prepare, and requires no special skills, so it can be introduced into any laboratory or general practitioner's office. No economic implementation is planned. The functional sample will serve as a basis for further applied research. Using the result by another entity is possible without acquiring a license (the result is not licensed).

Table 3.5.1 - Summary of non-public revenues received during the period under evaluation

Type of revenue	Revenue (in thousands CZK/EUR)				
	2019	2020	2021	2022	2023

N/A					
Total					

Note: Enter funds raised for R&D&I from non-public sources besides grants or contract research (e.g. licences sold, spin-off company revenues, donations, etc.) in the calendar year.

POPULARIZATION OF R&D&I

3.6 The most important activities in the field of the popularization of R&D&I and communication with the public

The evaluated unit shall briefly describe its main activities related to the popularization of R&D&I and communication with the public (e.g. popularization lectures, citizen science initiatives, etc.) during the period of 2019–2023 and provide up to 10 examples that it considers the most significant.

Maximum 500 words plus 200 words for each example given.

Self-Evaluation:

Publication and media presentation

The University of Defence Pages (2019–2023): a quarterly journal of the University of Defence, which presents important events from the past period in the life of the faculties, institutes, centers and the entire school, including the popularization of significant results in the field of scientific and research activities.

Military Medical Science Letters (2019–2023): a professional journal dedicated to military medicine, focusing on the intersection of healthcare and military service, publishes articles on a wide range of topics such as medical research, healthcare, trauma care, surgery, medical technology, psychology, and preventive medicine in the military context.

Appearances of UD experts in the media (2019–2023): academic and scientific staff of the Military Faculty of Medicine presented in electronic and printed media, where they popularized, among other things, their own scientific and research activities and the results of expert activities.

Public presentations: CZ Defence, Czech Radio, Czech Television, TV Nova (the Weekend program), IDnes, Náchodský deník, Chebský deník, Hradecký deník, Lidové noviny, etc.

Presentations at public events

Brno Science Festival (2019–2023): an event co-organized by universities in Brno, taking place once a year to present the results of scientific and research activities of the MFM and the University of Brno to the general public, especially for university and high school students.

Science Fair of the Academy of Sciences of the Czech Republic (2019–2023): an event organized by the offices of the Academy of Sciences of the Czech Republic in Prague

once a year, where significant results of the scientific and research activities of the MFM and other parts of the UD were presented, primarily for high school students and cross-sectionally for other interested parties.

Gaudeamus Brno and Gaudeamus Prague (2019–2023): post-secondary and lifelong education fairs, where the MFM UD annually presents study opportunities at this faculty.

Public events of the Czech Armed Forces – Czech Army Ground Forces Days “BAHNA”; NATO Days (2019–2023): presentation activities organized by the Ministry of Defence and the Czech Army Command once a year, when within these events, the MFM and other parts of the school presented not only study opportunities, but also attractive, often interactive results of scientific research and creative activities.

War Medicine Conference (2019): presentation of military-professional topics by a number of representatives of the MFM UD.

Military Competition (2019–2023): an annual presentation of the MFM UD to the public, which combines sports activities with the possibility of presenting the activities of the MFM UD, including the possibility of studying at this faculty.

Open Days of the UD (2019–2023, approx. two sessions per year): a standard recruitment and popularization event intended for potential students interested in studying at the MFM or other faculties of the UD. This event regularly included guided tours of teaching facilities and facilities used for scientific and research activities of the MFM.

Open Door Days of Czech Army Units and Air Bases (2019–2023): as part of these events, the MFM and other parts of the UD presented the results of scientific, research, and creative activities at the locations of the units and air bases, in an effective combination with the use of combat equipment and infrastructure of the host units to primarily address segments of interest to the public in the given region.

IMPLEMENTATION OF RECOMMENDATIONS

3.7 Implementation of the recommendations in Module 3

The evaluated unit will briefly describe how it has implemented the recommendations for Module 3 from the previous evaluation period, if applicable.

Maximum 1000 words.

Self-Evaluation:

The recommendations for Module 3 in the MEP Evaluation Report in the previous evaluation were as follows:

1. Address the increase in funding for applied research. Initiate direct financial support from the Ministry of Defence of the Czech Republic. Address projects directly in the area of support for military medical activities—clinical medicine.

Try to be effective with NATO partners in obtaining funding for other joint projects and modernization of research laboratory equipment.

The MFM has actively and successfully participated in obtaining funds from the PRODEF program, which is focused on defence research through the Technology Agency of the Czech Republic, which emphasizes applied research. This program replaced direct support through the Ministry of Defence, which implemented the so-called Defence Research Projects in the past. The MFM is also successful in obtaining EDF projects and is currently working on the Counteract and Resilience projects. The submission of another (3rd) STEM IRR project is currently in the preparation stage. All these projects are being worked on with NATO partners.

2. In my opinion, the number of projects focused on medical support to the CAF should be increased and efforts to obtain international projects (within the EU, NATO, etc.) in cooperation with other foreign institutions should be intensified. There should be opportunities to continue and engage in cooperation with international institutions/entities and colleagues. If successful, this effort could further improve the profile of the FMHS and expand the societal relevance of R&D&I activities by reaching a wider international audience.

See response to Recommendation No. 1. Furthermore, academic staff participate in addressing soldier health protection programs through the activities of the NATO Science and Technology Organization (NATO STO).

3. Increase the quality of outputs in category A. Focus on processing patents, large analyses, and studies. It is important to expand the use of this scientific knowledge in practice in treating people. Cooperate on an international platform.

The MFM emphasizes and prioritizes rewarding high-quality results through the so-called incentive program. Patents are being processed, but the Ministry of Defence poses a significant obstacle in that it only requires 100% ownership of the patent, which is very limiting because the vast majority arise during cooperation with several institutions, and 100% ownership is not possible. Cooperation on the international platform is improving (see response to Recommendation No. 1).

4. FMHS should expand its economic and non-economic impact on society from the local to the international level, especially considering that the Czech Republic is a member of international organizations (e.g., NATO).

The MFM actively participates in NATO STO expert panels. The number of foreign business trips to academic staff conferences and meetings has doubled in the last 5 years.

5. Although the faculty stated in its self-evaluation that this activity falls within the UD Headquarters's competence, evaluating technology transfer and intellectual property protection is extremely important. In addition, efforts should be made to initiate similar projects with partner faculties/universities abroad, especially those with which there is an exchange of teachers and students.

There are significant limitations in the area of TTO (see response to Recommendation No. 3). We agree with the need to establish cooperation with foreign universities. A visit to the University of Ljubljana is planned for next year and we are actively seeking others.

6. FMHS needs to achieve greater participation as an editor and editorial board member worldwide for conferences, congresses, workshops, etc. It would be very useful to publish information about the awardees on the official website of FHMS. Faculty members are recognized (have won awards) and can demonstrate participation in national and international associations and organizations. In my opinion, the Ministry should increase its involvement in military projects. Encourage mobility of academic staff for teaching purposes.

The number of staff on editorial boards is increasing. However, in this regard, we prefer quality over quantity and recommend that staff avoid cooperation with predatory journals. Staff achievements are regularly published in the faculty newsletter and via social networks. The Ministry cannot itself participate in military projects, but it supports the creation of programs such as PRODEF, in which the MFM has participated. The Erasmus+ program supports AP mobility.

7. The public outreach and popularization of FMHS R&D&I activities can be expanded to reach an international audience through publications, presentations, and distributed media. Expand the presentation among commercial and business entities. Increase the number of international projects to popularize R&D&I activities (international fairs, exhibitions, etc.).

The MFM's budget for marketing and popularization is quite limited, and we agree that increasing it would benefit public outreach. The MFM has repeatedly and unsuccessfully asked the University to increase the budget for these activities. However, this is a long-term problem, the solution of which is in the hands of the University's Headquarters. Within the limited resources, we try our best to promote in the Czech Republic, often based on voluntary activities of our employees without any remuneration and in their free time.

A LIST OF SUPPORTING DOCUMENTS/LINKS FOR MODULE 3

Document name	No. criteria	Location (link in HTML)

SELF-EVALUATION REPORT FOR MODULE 3

**NAME OF EVALUATED UNIT:
NBC DEFENCE INSTITUTE**

FORD: 1 - Natural sciences

SOCIETAL CONTRIBUTION OF THE EVALUATED UNIT

3.1 Introductory information about the unit under evaluation

The evaluated unit will describe its mission and vision and provide a general self-reflection of the societal contribution of R&D&I, along with its long-term goals in the fields it develops. The distribution of research activities by type of research will also be commented on.¹ The evaluated unit will describe its organizational structure and size (staffing, number of students, number of programmes of study implemented, etc.) based on the data provided in annex tables 3.1.1 to 3.1.6.

Maximum 1000 words.

This is a non-rated indicator that serves as an introduction to the evaluated unit, providing context for data in indicators 3.2-3.7.

Self-Evaluation:

The NBC Defence Institute (NBCDI) carries out its research and educational activities in accordance with the needs of the Ministry of Defence of the Czech Republic (MoD). Its work has a significant impact on national security. Within the Ministry of Defence, the results are primarily intended to support the activities of the Chemical Corps of the Czech Armed Forces (CC CAF) and to enhance its capabilities in the areas developed by the Institute. However, these results affect the activities of all units and facilities of the Czech Armed Forces (CAF) in the field of protection against weapons of mass destruction and other hazardous substances. If utilized, they may also have an impact on selected units of the Ministry of the Interior of the Czech Republic (MoI).

The results of scientific activities can also be used by the civilian community as identical or similar detection principles, methodological procedures, specialized equipment, protective equipment, and decontamination agents are applied in the fields of detection and identification of chemical and radioactive substances, ionizing radiation detection, individual protection, and decontamination. This is due to the fact that in many areas of expertise, there are no fixed boundaries between military and civilian applications of the results obtained. The applicability of these results is also justified by the fact that the Institute is authorized to work with chemical warfare agents and their precursors, to

¹ Basic, applied, contract, artistic research (see Definition of Terms in Methodology HEI2025+).

work with sources of ionizing radiation in the form of open and closed emitters, and also, for example, to work with psychotropic and addictive substances and their precursors. Experimental work can thus be carried out with real hazardous substances and not only with surrogate substances (simulants), making it possible to achieve results applicable to a wide range of potential users.

The Institute's educational activities are primarily focused on building the knowledge necessary to understand the principles of protection against weapons of mass destruction and hazardous substances of interest. Students must master a wide range of theoretical knowledge and practical skills in the field of chemistry, ionizing radiation dosimetry, technical means for the detection and identification of hazardous chemical and radioactive substances, the principles of individual protection against potential contaminants, and technical instruments and mixtures for the decontamination of personnel, material, and equipment. This knowledge is essential for the professional activity of a chemical warfare specialist presenting qualified information to support the decision-making process of a combined arms commander carried out in conditions when weapons of mass destruction are used. The knowledge and skills acquired by the student are the basis for their independent and informed decision and for managing the professional activities of the chemical warfare unit or facility.

The NBC Defence Institute is focused on applied research in the field of protection against weapons of mass destruction, which includes detection and identification of hazardous chemical substances of interest, detection and identification of radioactive substances of interest, nuclear and radiological weapons, individual protection in its entirety, decontamination, both in terms of decontamination mixtures and procedures, as well as in terms of technical means for its implementation. The field of combat and operational use of chemical warfare in all types of operations is also being developed. The achieved results and findings are beneficial both for theory and for the development of new and innovation of the existing technical equipment, procedures and technologies applied in the professional activities of the Chemical Corps. The Institute also carries out evaluation and expert activities based on the deep knowledge of its academic staff in the areas developed by the Institute.

The NBC Defence Institute is headed by the Director. The Institute consists of two departments: the Chemical and Radiation Defence Department and the Chemical Corps Department. The Director, apart from the Heads of Departments, has another direct subordinate—the Coordinating Officer. In total, the Institute has 19 systemized positions for staffing allocation, of which 15 positions are earmarked for academic staff. Out of this number, two positions have remained vacant for a long time.

The NBC Defence Institute staff therefore carry out all of the Institute's activities: educational, scientific, marketing, and military. Due to the nature of the Institute's professional scope, its authorized personnel carry out activities related to the control, registration, and management of chemical warfare agents, radioactive substances, addictive substances and their precursors, nuclear materials and activities related to radiation protection. The Institute's staff are also members of

a number of bodies and committees within the University of Defence, such as the Senate, the University of Defence Scientific Board and the scientific boards of the individual faculties and units, and the University of Defence Ethics Commission.

The Institute does not have its own programme of study. It participates in the training of chemical warfare specialists within the Management and Employment of Armed Forces programme of study, which is accredited by the Faculty of Military Leadership. The Institute will provide training for students in the Military Chemistry university programme of study, which was approved by the National Accreditation Authority on 22 February 2024. The total share of the Military Chemistry programme in the preparation of students will be around 50%, and training in subjects shaping the future chemical warfare specialist will reach 100%. The Institute also participates in educating students in the doctoral degree programme in the Theory of National Defence in the field of Weapons of Mass Destruction, Harmful Substances, and Protection. The Institute is a training facility for this specialization. In 2024, the training in the university doctoral study programme Protection of Military Forces and Population was completed, in which the Institute was the training facility for the specialty Weapons of Mass Destruction, Harmful Substances and Protection. This validity of this programme of study expired on 31 December 2024. Although the Institute educates and trains students for the needs of the Czech Armed Forces and participates in the implementation of master's degree programmes, it does not administratively have its own students due to the fact that it is not the holder of accreditation of programmes of study. The academic staff of the Institute also provide their lectures as the professional content of courses for the units of the University of Defence.

Table 3.1.1 - Staffing per FTE²

Academic/ Professional position	Total / Of which women					
	2019	2020	2021	2022	2023	Total
Professor	2/0	3/0	3/0	2/0	2/0	2/0
Associate Professor	2/0	1/0	1/0	1/0	2/0	2/0
Assistant Professor	7/3	7/3	7/2	8/2	8/2	8/2
Lecturer	1/0	1/0	2/0	1/0	1/0	1/0
R&D Personnel ³	0/0	0/0	0/0	0/0	0/0	0/0
Researchers in other categories ⁴	0/0	0/0	0/0	0/0	0/0	0/0

² The average number of hours worked is calculated as the ratio of the total number of hours actually worked during the reference period, from 1 January to 31 December, by all staff (including agreement on work activity, excluding agreement on work performance) to the total annual working time pool per full-time employee. The full-time status of the worker in the evaluated unit is always reported. If an employee holds more than one type of full-time job within the evaluated unit, the total sum of the two shall be reported.

³ The category "R&D Personnel" includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).

Technical and economic staff ⁵	1/0	1/0	1/0	1/0	1/0	1/0
Scientific, research and development staff involved in teaching activities	-	-	-	-	-	0
Early career researchers ⁶	1/0	1/0	1/0	2/0	3/0	3/0
Total ⁷	13/3	13/3	14/2	13/2	14/2	14/2

Note: The categories professor, associate professor, assistant professor, lecturer, other scientific, R&D personnel, researchers in other categories and technical and economic staff are mutually exclusive, i.e. one staff member is reported under one category only. Scientific, research and development staff involved in teaching activities, as well as early career researchers are reported collectively for all the above-mentioned categories.

3.1.2 Age structure of R&D&I personnel of the evaluated unit and their structure by job title and gender in the year 2019 (numbers of physical employees and personnel)⁸

Academic/ professional position	Under 29 years		30-39 years old		40-49 years old		50-59 years old		60-69 years old		70 years and older	
	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n
Professor	0	0	0	0	0	0	1	0	1	0	0	0
Associate Professor	0	0	1	0	1	0	0	0	0	0	0	0
Assistant Professor	0	0	0	0	4	3	2	1	0	0	0	0
Lecturer	0	0	0	0	1	0	0	0	0	0	0	0
R&D Personnel ⁹	0	0	0	0	0	0	0	0	0	0	0	0
Researchers in other categories ¹⁰	0	0	0	0	0	0	0	0	0	0	0	0
Technical and economic staff ¹¹	0	0	0	0	0	0	0	0	1	0	0	0

⁴ The category "Researchers in other categories" includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).

⁵ Who participates in the management and support of R&D&I in the institution.

⁶ See Definition of Terms in Methodology HEI2025+.

⁷ Total is the sum of the categories: professor, associate professor, assistant professor, lecturer, R&D personnel, researchers in other categories and technical and economic staff.

⁸ The total number of employees/workers as of 31st December of the calendar year in question is to be entered, irrespective of the level of time worked, but only in an employment relationship (including agreement on work activity, excluding agreement on work performance). Other types of contractual relationships under the Civil Code that involve purchase of services are not included.

⁹ The category "R&D Personnel" includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).

¹⁰ The category "Researchers in other categories" includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).

¹¹ Who participates in the management and support of R&D&I in the institution.

Scientific, research and development staff involved in teaching activities	0	0	1	0	6	3	3	1	1	0	0	0
Early career researcher ¹²	0	0	1	0	1	0	1	1	0	0	0	0
Total ¹³	0	0	1	0	6	3	3	1	2	0	0	0

Note: The categories professor, associate professor, assistant professor, lecturer, other scientific, R&D Personnel, Researchers in other categories and Technical and economic staff are mutually exclusive, i.e. one staff member is reported in only one category. The categories of scientific, research and development staff involved in teaching activities and early career researchers are reported collectively for all the above-mentioned categories.

3.1.3 Age structure of R&D&I personnel of the evaluated unit and their structure by job title and gender in the year 2023 (numbers of physical employees and personnel)¹⁴

Academic/ professional position	Under 29 years		30-39 years old		40-49 years old		50-59 years old		60-69 years old		70 years and older	
	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n	Total	Wome n
Professor	0	0	0	0	0	0	0	0	2	0	0	0
Associate Professor	0	0	0	0	1	0	1	0	0	0	0	0
Assistant Professor	0	0	2	0	4	1	2	1	0	0	0	0
Lecturer	0	0	0	0	1	0	0	0	0	0	0	0
R&D Personnel ¹⁵	0	0	0	0	0	0	0	0	0	0	0	0
Researchers in other categories ¹⁶	0	0	0	0	0	0	0	0	0	0	0	0
Technical and economic staff ¹⁷	0	0	0	0	0	0	0	0	1	0	0	0
Scientific, research and development staff involved in teaching activities	0	0	2	0	4	1	2	1	0	0	0	0
Early career researcher ¹⁸	0	0	2	0	1	0	0	0	0	0	0	0
Total ¹⁹	0	0	2	0	6	1	3	1	3	0	0	0

¹² See Definition of Terms in Methodology HEI2025+.

¹³ Total is the sum of the categories: professor, associate professor, assistant professor, lecturer, R&D Personnel, Researchers in other categories and technical and economic staff.

¹⁴ The total number of employees/workers as at 31.12. of the calendar year in question is to be entered, irrespective of the level of time worked, but only in an employment relationship (including agreement on work activity, excluding agreement on work performance). Other types of contractual relationships under the Civil Code that involve purchase of services are not included.

¹⁵ The category "R&D Personnel" includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).

¹⁶ The category "Researchers in other categories" includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).

¹⁷ Who participates in the management and support of R&D&I in the institution.

¹⁸ See Definition of Terms in Methodology HEI2025+.

Note: The categories professor, associate professor, assistant professor, lecturer, other scientific, R&D personnel, researchers in other categories and technical and economic staff are mutually exclusive, i.e. one staff member is reported under one category only. Scientific, research and development staff involved in teaching activities, as well as early career researchers are reported collectively for all the above-mentioned categories.

Table 3.1.4 – Students N/A

Type of study	2019		2020		2021		2022		2023		Total	
	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women
Undergraduate	0	0	0	0	0	0	0	0	0	0	0	0
Master's ²⁰	0	0	0	0	0	0	0	0	0	0	0	0
Doctoral	0	0	0	0	0	0	0	0	0	0	0	0
Lifelong Learning Courses	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.1.5 – Programmes of Study in Czech/English N/A

Type of programme of study	Total ²¹ / Of which professional programmes of study											
	2019		2020		2021		2022		2023		Total	
Undergraduate	0	0	0	0	0	0	0	0	0	0	0	0
Master's	0	0	0	0	0	0	0	0	0	0	0	0
Doctoral	0	0	0	0	0	0	0	0	0	0	0	0
Lifelong Learning courses	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0

Note: For each SP type, enter the number of SPs in Czech language in the first cell and insert the number of SPs in English language after the slash in the same cell (e.g. 15/3), enter the number of professional SPs in Czech language in the second cell and insert the number of professional SPs in English language after the slash. Follow a similar procedure in the last column of the table (Total).

3.1.6 – R&D&I capacities

R&D&I field	FORD	FORD share [%]	Predominant type of research	Total share of industry group [%]
1. Natural	1.1 Mathematics		Zvolte položku.	80

¹⁹ Total is the sum of the categories: professor, associate professor, assistant professor, lecturer, R&D personnel, researchers in other categories and technical and economic staff.

²⁰ All master's degree students are listed, regardless of the length of their programme of study.

²¹ The total number of programmes of study for which admissions have been announced in a given academic year.

Sciences	1.2 Computer and information sciences		Zvolte položku.	
		30	Balanced basic and applied research	
	1.3 Physical sciences			
		30	Balanced basic and applied research	
	1.4 Chemical sciences			
	1.5 Earth and related environmental sciences		Zvolte položku.	
2. Engineering and Technology	1.6 Biological sciences		Zvolte položku.	
		20	Balanced basic and applied research	
	1.7 Other natural sciences			
	2.1 Civil engineering		Zvolte položku.	
	2.2 Electrical engineering, Electronic engineering, Information engineering		Zvolte položku.	
	2.3 Mechanical engineering		Zvolte položku.	
	2.4 Chemical engineering		Zvolte položku.	
	2.5 Materials engineering		Zvolte položku.	
	2.6 Medical engineering		Zvolte položku.	
	2.7 Environmental engineering		Zvolte položku.	
	2.8 Environmental biotechnology		Zvolte položku.	
3. Medical and Health Sciences	2.9 Industrial biotechnology		Zvolte položku.	
	2.10 Nanotechnology		Zvolte položku.	
	2.11 Other engineering and technologies		Zvolte položku.	
4. Agricultural and veterinary sciences	3.1 Basic medicine		Zvolte položku.	
	3.2 Clinical medicine		Zvolte položku.	
	3.3 Health sciences		Zvolte položku.	
5. Social Sciences	4.1 Agriculture, Forestry, and Fisheries		Zvolte položku.	20
	4.2 Animal and Dairy science		Zvolte položku.	
	4.3 Veterinary science		Zvolte položku.	
	4.4 Other agricultural sciences		Zvolte položku.	
	5.1 Psychology and cognitive sciences		Zvolte položku.	
	5.2 Economics and Business		Zvolte položku.	
	5.3 Education		Zvolte položku.	
	5.4 Sociology		Zvolte položku.	
6. Humanities and the Arts	5.5 Law		Zvolte položku.	
	5.6 Political science		Zvolte položku.	
	5.7 Social and economic geography		Zvolte položku.	
	5.8 Media and communications		Zvolte položku.	
		20	Balanced basic and applied research	
	5.9 Other social sciences			
	6.1 History and Archaeology		Zvolte položku.	
	6.2 Languages and Literature		Zvolte položku.	
	6.3 Philosophy, Ethics and Religion		Zvolte položku.	

	6.4 Arts (arts, history of arts, performing arts, music)		Zvolte položku.	
	6.5 Other Humanities and the Arts		Zvolte položku.	
	Total	100 %	-	100 %

RECOGNITION BY THE RESEARCH COMMUNITY

3.2 Recognition by the research community

The evaluated unit will briefly comment on its position in the research community. It shall consider individual and other prestigious R&D&I awards, participation of its academic staff in the editorial boards of international scientific journals, elected membership in professional societies, major invited lectures given by the evaluated unit's academic staff abroad or by foreign scientists and other relevant guests at the evaluated unit. Additionally, it will address the involvement of staff in the evaluation of national or European project/programme calls over the period of 2019–2023 based on the data provided in annex tables 3.2.1 to 3.2.5 (max. 10 most relevant items). If necessary, the evaluated unit shall list any additional services to the scientific community that it considers relevant.

Maximum 1000 words.

Self-Evaluation:

The NBC Defence Institute fulfils the needs of the Ministry of Defence of the Czech Republic as a priority and participates in ensuring the capability of the Chemical Corps of the Czech Armed Forces. Within the framework of its scientific and research activities, it advances the field of detection and identification of hazardous substances of interest, with emphasis on chemical warfare agents and substances potentially exploitable in combat activities, the field of detection and identification of radioactive substances and detection of ionizing radiation, the field of individual protection, and the field of decontamination, especially in terms of the development of the technical means for its implementation. It also advances the field of combat and operational deployment of the Chemical Corps in all types of operations. These areas, with the exception of the field of combat and operational deployment of Chemical Corps, also have applications in the civilian sector, which gives the Institute the possibility of cooperation with civilian facilities, and its results can be applied in a civilian environment.

The Institute is a recognized institution in the research community. Through the University of Defence, it has concluded cooperation agreements with the Military Research Institute of Brno, which addresses a number of similar problems as the NBC Defence Institute in the field of protection against weapons of mass destruction. The Military Research Institute is one of the top research institutions in the field of protection against weapons of mass destruction, not only in the Czech Republic, but also Europe as a whole. The Military Research Institute collaborates with the Lázně

Bohdaneč Population Protection Institute, which provides research and educational activities in the field of population protection and is a facility run by the Ministry of the Interior of the Czech Republic. In the field of analysis of addictive substances and their precursors, the Institute has signed a cooperation agreement with the Customs Technical Laboratory, which is part of the Customs Administration of the Czech Republic. The Institute cooperates with a number of public universities, such as the Czech Technical University in Prague, Tomas Baťa University in Zlín, and Brno University of Technology. The academic staff of the Institute participate in lecturing activities at Helmut-Schmidt Universität/Universität der Bundeswehr Hamburg in Germany and provide lecturing activities at the international NATO Joint Chemical, Biological, Radiological, and Nuclear Defence Centre of Excellence. There is also ongoing cooperation with the Babes-Bolyai University in Cluj, Romania, and an interest in cooperation has been expressed by the Vasil Levski National Military Academy, Veliko Tarnovo, Bulgaria. Cooperation with the Military Academy in Belgrade in the field of individual protection was ongoing until 2022. The Institute cooperates with public universities mainly by participating in projects of departmental, national, or international importance. The Institute has established very close cooperation with institutions involved in projects of the national security in the areas of CBRNE threats. COL prof. Ing. Stanislav FLORUS, Ph.D., is a member of the scientific board of the Military Research Institute s.p. Brno, which allows for very close collaboration in the design and solution of projects falling within the scope of national security. Cooperation in the field of scientific work is also carried out through contractual cooperation with the National Institute for NBC Protection (NINBCP).

None of the Institute's academic staff are members of the editorial board of an international scientific journal or an elected member of a scholarly society. MAJ Ing. Dušan TREFILÍK, Ph.D. has been a member of the validation group for mass spectra at the Hague OPCW since 2013 at the nomination by the State Office for Nuclear Safety (SONS), the Czech national authority. Associate Professor Ing. Daniel SAS, Ph.D. has been a member of the Nuclear Chemistry Expert Group of the Czech Chemical Society since 2014.

The prestigious Rector's Prize for Scientific Work award was presented to COL prof. Ing. Pavel OTŘÍSAL, Ph.D., MBA in 2019, and in 2023 to CAP Ing. Tomáš ROZSYPAL, Ph.D. Furthermore, CAP Rozsypal also received the awards for the best poster and the best presentation at two international conferences (see section 3.2.1) in 2023. In 2022, the dissertation defended by 1LT Ing. Erik RAJCHL, Ph.D. received the top evaluation by the Czech Nuclear Society.

The most important lectures abroad are those delivered at Helmut-Schmidt Universität/Universität der Bundeswehr Hamburg, Germany, which were given by two academic staff members of the Institute (see section 3.2.3). The topics of these lectures were detection focused on chemical warfare agents in field conditions and the issue of explosive (energetic) agents.

Due to the specific research focus of the Institute, no lectures by foreign scientists have

been given at the Institute. However, every two years, except for the period of the COVID-19 pandemic, the Institute organizes international conferences under the title CBRN PROTECT which most recently took place in 2019 and 2023. This conference is aimed at areas that are also dealt with by the NBC Defence Institute. The conference is regularly attended by approximately one hundred specialists in fields that fall within the Institute's area of expertise. The contents of each conference are compiled and published as conference proceedings with an official ISBN. The 2023 conference marked the ninth year of the conference.

The Institute regularly participates in the international nuclear forensics exercise CMX-8 (Collaborative Materials Exercise). This exercise is regularly organized by the Nuclear Forensics International Technical Working Group, and participation in it confirms the ability of a laboratory (and therefore of a country) to handle nuclear forensic cases requiring a high level of knowledge base in this field and in the analytical infrastructure.

Upon request from the Embassy of the Socialist Republic of Vietnam in the Czech Republic and an intergovernmental agreement between the two countries, the Institute has provided a course for chemical experts of the Vietnamese Army. A total of 60 hours of lectures on topics were delivered as requested by the Vietnamese. The lectures were conducted by seven academic staff members of the Institute from 4 to 17 November 2019.

Academic staff of the Institute also participate in the evaluation of the results of scientific work, especially at the national level. In this area, the most important involvement is the evaluation of project results for the Technology Agency of the Czech Republic (TACR) and the Ministry of Industry and Trade of the Czech Republic (MoTI) (see section 3.2.5). The Institute's staff evaluate a number of projects assigned by the Ministry of Defence of the Czech Republic.

Table 3.2.1 - Prestigious R&D&I awards granted during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Name of the award	Awarding institution
LTC Prof. Ing. Pavel OTŘÍŠAL, Ph.D., MBA	Rector's Award for Scientific Work in 2019	University of Defence
CAPT Ing. Tomáš ROZSYPAL, Ph.D.	Rector's Award for Scientific Work in 2023	University of Defence
CAPT Ing. Tomáš ROZSYPAL, Ph.D.	Best Poster Award (3rd place) within ISSS 2023 Conference	Central European Group for Separation Sciences
CAPT Ing. Tomáš ROZSYPAL, Ph.D.	Award for best presentation of VCCA-2023	University of Mauritius
1LT Ing. Erik RAJCHL, Ph.D.	Award for the best dissertation in 2022	Czech Nuclear Society

Note: Provide up to 10 examples.

Table 3.2.2 Participation of academic staff of the evaluated unit in editorial boards of international scientific journals during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Name of scientific journal, ISSN

Note: Please provide up to 10 examples of academic staff participation in editorial boards of international scientific journals (e.g. editor, editorial board member, etc.).

Table 3.2.3 The most important invited lectures delivered by the academic staff of the evaluated unit at foreign institutions during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Invited lecture title	Name of host institution, or name of conference or event	Year
LTC Ing. Monika Hoskovcová, Ph.D.	CBRN, 12 hours of lectures in the CBRN subject, Field detection	Helmut-Schmidt Universität/Universität der Bundeswehr Hamburg, Germany	2023
CAPT Ing. Tomáš Rozsypal, Ph.D.	Chemistry of Explosives, 18 hours of lectures in the Fundamentals of Energetic Materials subject	Helmut-Schmidt Universität/Universität der Bundeswehr Hamburg, Germany	2023
MAJ Assoc. Prof. Ing. Jiří JANDA, Ph.D.	Current Nuclear Threads.	Joint Chemical, Biological, Radiological and Nuclear Defence Centre of Excellence	2023
LTC Ing. Monika Hoskovcová, Ph.D.	CBRN, 12 hours of lectures in the CBRN subject, Field detection	Helmut-Schmidt Universität/Universität der Bundeswehr Hamburg, Germany	2022
CAPT Ing. Tomáš Rozsypal, Ph.D.	Chemistry of Explosives, 12 hours of lectures in the Improvised Explosives Devices Disposal subject	Helmut-Schmidt Universität/Universität der Bundeswehr Hamburg, Germany	2022
LTC Ing. Monika Hoskovcová, Ph.D.	CBRN, 12 hours of lectures in the CBRN subject, Field detection	Helmut-Schmidt Universität/Universität der Bundeswehr Hamburg, Germany	2019

Note: Provide up to 10 examples.

Table 3.2.4 - The most important lectures by foreign scientists and other guests relevant to R&D&I at the evaluated unit during the evaluation period

Name, surname and title(s) of the lecturer	Lecturer's employer at the time of the lecture	Invited lecture title	Year

Note: Provide up to 10 examples.

Table 3.2.5 - Involvement in the evaluation of national/European research project/programme calls relevant to the R&D&I area at the unit during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Name of the research project/programme call	Name of the contracting authority/guarantor of project/programme call	Year
Assoc. Prof. Ing. Daniel SAS, Ph.D.	OP PIK APPLICATION "Research and Development of a New Aviation Gammasspectrometer"	Ministry of Industry and Trade of the Czech Republic	2023
LTC Ing. Monika HOSKOVCOVÁ, Ph.D.	Cooperation in the implementation of the Chemical Weapons Convention	OPCW/Military Research Institute of Brno	2023
MAJ Assoc. Prof. Ing. Jiří JANDA, Ph.D.	ZÉTA2 AD4HEL- Activation Detectors for High Energy Laser: the use of quasi-offline methods for the detection of laser-generated neutrons	Technology Agency of the Czech Republic.	2022
MAJ Assoc. Prof. Ing. Jiří JANDA, Ph.D.	EPSILON2 "Advanced analytical tools for severe industrial accidents"	Technology Agency of the Czech Republic.	2021

Note: Provide up to 10 examples.

RESEARCH PROJECTS

3.3 Research projects

The evaluated unit shall list at most 10 (considered most significant by the evaluated unit) research projects/activities (regardless of whether they are supported by public funds or based on contract research²²) that it has implemented or participated in during the period of 2019–2023²³. This should be done from the full list in annex tables (Table 3.3.1-3.3.2)²⁴, regarding particularly the results achieved or the application potential of the projects. The unit should also describe how the research projects contributed to the mission and purpose of the evaluated unit. If the evaluated unit has been a participant in listed project, it shall indicate which other entities were involved and describe its contribution to the project. The interdisciplinary aspects of the projects will also be commented on, along with any collaboration with other units of the

²² For the definition of contract research for the purposes of evaluation in the HE segments, see Article 2.2.1 of the Community Framework for State Aid for Research, Development and Innovation 2014/C 198/01.

²³ Regardless of whether the projects are completed or still ongoing, provided that at least part of the project was implemented during the evaluation period.

²⁴ The evaluated unit shall only fill tables that are relevant to it.

evaluated HEI.

Maximum 300 words per project.

Self-Evaluation:

The scientific work of the Institute is focused primarily on the development of Chemical Corps capabilities. It is conducted in areas that have been developed by the Institute for a long time and provided with the necessary instrumentation and personnel. Priority areas include the modernization of the chemical protection system, radiation protection and dosimetry, and chemical support. In the period 2019–2021, industrial hazardous substances, biochemical, spectrophotometric, and colorimetric methods of analysis of highly toxic substances aimed at expanding the capabilities of the technical means of chemical control and reconnaissance of the Czech Armed Forces were studied within the framework of the project named **PROTECT: Research of Methods and Technologies of Protection against the Effects of Weapons of Mass Destruction and Industrial Hazardous Substances** as part of the modernization of the chemical protection system. The transfer of the results of research activities in the subject area to military practice in the form of a patent and a utility model was implemented. Attention in the field of decontamination was focused on the issue of emulsion decontamination mixtures and methodology of their use by technical means of decontamination. In the field of personnel protection, the solution was mainly focused on the issues of the evaluation of the current state of individual protective equipment (IPE), the introduction of new tools for the testing of structural nodes of IPE and the further development of existing ones, and research into new methods of testing the resistance of protective foils for the production of body surface protection equipment. In the field of radiation protection and dosimetry, the focus was mainly on the research of new rapid and conclusive methods for the detection of radioactive substances with their subsequent analysis, and on methods for the rapid determination of the total activities of alpha and beta radionuclides. Further attention was paid to plastic large volume scintillation detectors and dose rate monitoring over large areas. The focus was also on airborne gamma spectrometry and the technical means for its implementation. In the field of chemical support, the organizational structures of the Chemical Corps units and facilities were finalized. A detailed analysis of the organizational structures of combined-arms and other military units and formations was carried out, and the forces and equipment of the CAF Chemical Corps required for the provision of combat support to troops in the field in response to crisis situations related to the use of weapons of mass destruction (WMD) and hazardous industrial substances (HIS) were specified. The results of the project were successfully defended in January 2022.

The follow-up **PROTECT II: Research of Methods and Technologies of Protection against the Effects of Weapons of Mass Destruction and Industrial Hazardous Substances**, with commencement in 2022, is aimed at obtaining new scientific knowledge in the field of chemical and radiation protection in relation to the results

achieved in the previous period and their application to the system of chemical and radiation protection and to the implementation of combat support of deployed forces. In the form of applied research, by addressing three main objectives developed into sub-objectives for individual periods, the project is focused on research of methods of detection and determination of the new potentially most dangerous chemical warfare agents and substances used in actions of non-military character, on research of the system of detection, sampling and analysis of selected radionuclides, including their application to the system of field analysis of the CAF. At the same time, the area of improving the quality of construction materials and nodes of individual protection equipment and the objectivization of experimental results of the studied characteristics is addressed, with the aim of improving the quality of individual protection equipment and nonreinforced collective protection capabilities. Efforts are also devoted to researching new active agents for decontamination mixtures. Following the new findings in the field of chemical and radiation protection, the portion of the Chemical Corps required for the implementation of measures for supporting military personnel has been modified. The subject of the research activity is the modern concept of the theory of protection against WMD and chemical support in the Czech Armed Forces and NATO. Theoretical approaches to effective prevention, protection, and recovery in the case of threat or occurrence of a CBRN incidents are sought. The research reflects changes in the operational environment and follows trends in the research and development of new means for protection against WMD. Another subject of research activity is the investigation and assessment of the impact of different types of CBRN incidents on the activities of military units (task forces) at the tactical level. For relevant simulation, scenario development and wargaming methods are applied using special application software. Last but not least, the subject of the project is the systematic monitoring of modern world trends in the field of technical means, new technologies and procedures in the field of CBRN Defence and their application to the conditions of the CAF Chemical Corps.

The main objective of project **MARYŠA**: Research on the Properties and Methods of Personnel Protection against the Effects of the Latest Generation of Nerve Paralytic Chemicals, was to obtain knowledge and information on Group A nerve paralytic substances, especially O-ethyl-N-diethylaminoethylideneamidofluorophosphate, A-234, which would be usable in the protection system of CAF personnel and the civilian population against these substances. The sub-objectives of the project were: to obtain information on the chemical, physical, and toxic properties of the investigated group of substances; to verify the capabilities of detection and identification of the group of substances in the chemical control system of the CAF, and the Fire Rescue Service from the level of field detection to identification in stationary laboratories using all established methods and procedures; to evaluate the toxicity and biological properties of this substance; to assess the effectiveness of the existing antidotal protection within the CAF and the civilian sector; to determine the degradation effectiveness of established decontamination mixtures and substances; and to verify the possibilities of the protection of personnel by established means of individual

protection. The main objective and the sub-objectives of the project were fulfilled in accordance with the Decision on Granting Special Purpose Support for the Research, Development and Innovation Project and in accordance with the Request for Special Purpose Support. In 2019–2022, the results related to the expertise part of the project were processed in the form of the Research Project Interim Report and in 2022 the results were sent in the form of the Professional Interim Report on the Status of the Project for the Year of 2022. All these documents included detailed documentation of the results achieved by the participating departments in the individual stages of the project in the form of reports or studies. The following organizations participated in the project: the NBC Defence Institute of the University of Defence, the Department of Toxicology and Military Pharmacy of the Military Faculty of Medicine of the University of Defence, the Military Research Institute of Brno, and the Lázně Bohdaneč Population Protection Institute. The project was defended at the final meeting on 11 January 2023, and resulted in a total of six research reports, three technical reports, three studies, four certified methodologies, and a final project report. The evaluation committee of the Ministry of the Interior of the Czech Republic rated the results of the project as excellent.

Collection and Analysis of Urban Debris as Evidence of Use of Chemical Weapons

(SV23-FVL-OPZHN-ROZ). The project aims to develop methods for the identification of chemical warfare agents in solid matrices, such as concrete, ceramics or glass, which are present in built-up areas after a chemical attack. The existing procedures for environmental samples are not generally applicable to these materials, which complicates collection and analysis. The project will focus on two sampling methods—surface swabbing and physical sampling—with emphasis on maximizing extraction efficiency and examining persistence (with respect to sample lifetime). The project involves optimizing the material and procedure of the swabs, validating the homogenization and extraction process from the samples collected, and monitoring the development of the contaminant including its conversion to degradation products. The aim is to develop rapid, simple, and repeatable procedures that will be validated in collaboration with the CAF sampling teams and chemical laboratories. The results will contribute to expanding the capabilities of sampling teams and mobile and stationary laboratories in the analysis of toxic substances in complex urban matrices, with potential use in crisis situations and military operations. Students from the University of Defence make up 75% of the research team.

The main research objective of the **ADAR** Project: Accelerator Driven Advanced Reactor was to evaluate the basic design of an accelerator-driven subcritical nuclear reactor with fuel and coolant in the form of liquid chloride salts. A secondary research objective was to identify “white spots” on the scientific research map of accelerator-driven subcritical reactors with chloride salts and to initiate research work in these areas. The main non-scientific objective of the project was to maintain the cooperation initiated between the Czech technical universities (Brno University of Technology and

the Czech University of Technology) and Texas A&M University in the field of classical nuclear engineering, and to extend this cooperation to related scientific disciplines of physics, engineering and accelerator systems, and to other research groups in the Czech Republic (University of Defence, Nuclear Physics Institute, University of Chemistry and Technology), as well as in the state of Texas to Texas A&M University, College Station, Texas, USA. The secondary non-scientific goal included supporting the work and development of a scientific multidisciplinary team of young researchers and students, encouraging the involvement of women in this team, equally from the Czech Republic and the USA, bringing them to work together and letting them do their own research, take responsibility for it, present their results internationally, start their own career and gain valuable contacts for the future. The following scientific and educational institutions participated in the project: the Czech Technical University in Prague, the University of Chemistry and Technology in Prague, the University of Defence, the Nuclear Physics Institute CAS, and the Brno University of Technology.

The main purpose of the project Centre for Nuclear and Radiation Safety Technology Development: **RANUS-TD** was to increase the efficiency, competitiveness, and export of Czech industry in the field of production of radiation and nuclear detection technologies and intelligent evaluation systems used in the nuclear fuel cycle, in other industrial applications and applied research, in health care, in surveillance activities, in geological applications and in space research. Significant application of the results in basic research was also a prerequisite. A secondary objective and consequence of the Centre's activities was, following the anticipated deployment of new technologies in nuclear power plants (NPPs), the improvement of the safety of nuclear installations and more efficient waste management, a more sophisticated decommissioning process for old nuclear power plants in the EU as expected in the next decades. This process has been closely monitored for environmental impacts. It was anticipated that the results of the project would be used by the Czech Republic's long-term partners in Europe and worldwide to improve the overall safety situation of new, operating and decommissioned nuclear power plants in the EU.

The main objectives of the project were the development of new detection technologies, especially for the operation of large nuclear sources and for their safe disposal after decommissioning; the development of new detection technologies to enable rapid management of the impact of large nuclear and local radiation accidents on the environment (to be extended to other applications in industry and security); the development of new detection materials and components usable for the above-mentioned objectives, especially for the first and second objective as stated above, and expanding into other fields (medicine, geology, space research, detectors for basic research).

The following companies and entities participated in the project: NUVIA a.s., CRYTUR, spol. s r.o., T E M A – Technika pro měření a automatizaci, spol. s r.o., the Czech Technical University in Prague – Institute of Experimental and Applied Physics, Charles University – Faculty of Mathematics and Physics, National Radiation Protection

Institute, Ministry of Defence – University of Defence – NBC Defence Institute.

The project achieved all desired outcomes and results within the specified deadlines. In total, there were 65 results that included prototypes (9), functional samples (25), utility models (1), industrial designs (17), methodologies (4), software (3) and proven technologies (5). A total of 121 results related to this project are stored in the Register of Information on Results (RIR). The project was duly completed by conducting the final opponent procedure on 28 January 2021 with the rating “A-Project succeeded with excellent results” and was nominated for the TACR award by the opponent committee.

The Institute is not involved in contract research activities.

Table 3.3.1 Projects supported by public funds

In the role of beneficiary						
Provider ²⁵	Project name	Support (in thousands CZK/EUR) ²⁶				
		2019	2020	2021	2022	2023
Ministry of Defence	Research of Methods and Technologies of Protection against the Effects of Weapons of Mass Destruction and Industrial Hazardous Substances. PROTECT.	2 221,7/ 87,6	2 057,8/ 81,2	3 782,4/ 149,2	-	-
Ministry of Defence	Research of Methods and Technologies of Protection against the Effects of Weapons of Mass Destruction and Industrial Hazardous Substances. PROTECT II	-	-	-	4 869,0/ 192,0	5 390,3/ 212,6

²⁵ If the provider is from abroad, please indicate the provider's country of origin in brackets. For the determination of the country of origin of the provider, the place of residence of the provider is decisive.

²⁶ Indicate the total amount expressed in thousands of CZK and the conversion of the total amount into Euro.

Ministry of the Interior	Research on the Properties and Methods of Personnel Protection against the Effects of the Latest Generation of Nerve Paralytic Chemicals. MARYŠA	1 197,0/ 47,2	2 349,2/ 92,7	2 349,2/ 92,7	1 167,0/ 46,0	-
Ministry of Education	Collection and Analysis of Urban Debris as Evidence of Use of Chemical Weapons.	-	-	-	-	107,0
Total		3 418,7/ 134,9	4 407,0/ 173,8	6 131,6/ 241,9	6 036,0/ 238,1	5 497,3/ 216,9
In the role of another participant						
Provider ²⁷	Project name	Support (in thousands CZK/EUR)				
		2019	2020	2021	2022	2023
Ministry of Education	ADAR – Accelerator Driven Advanced Reactor	660,0/26,0	720,0/28,4	600,0/23,7	520,0/20,5	-
Technology Agency of the Czech Republic	Centre for Nuclear and Radiation Safety Technology Development: RANUS-TD	1 000,0/39,4				
Total		1 660,0/65,4	720,0/28,4	600,0/23,7	520,0/20,5	

Table 3.3.2 - Contract research activities

²⁷ Ibid.

Client ²⁸	Activity name	Revenue (in thousands CZK/EUR)				
		2019	2020	2021	2022	2023
N/A						
Total						

Note: List and describe contract research activities with a revenue in a given calendar year, regardless of the amount of financial revenue.

3.4 Research results with existing or prospective impact on society

The evaluated unit shall briefly comment on a maximum of 10 (considered most significant by the evaluated unit) research results already applied or realistically heading towards application during the period of 2019–2023, based on the overview annex table 3.4.1 (it is recommended to indicate results with a link to projects listed in indicator 3.3). The evaluated unit must demonstrate in its description that the research results have led or will soon lead to positive impacts²⁹, on society (e.g. description of how the results are used by various users, the range of persons/institutions for which the result is relevant, measurable economic impacts, etc.). The evaluated entity shall indicate in its commentary whether the gender dimension is considered in these results and discuss the impacts of the results regarding sustainability.

Maximum range 300 words/result.

Self-Evaluation:

During the evaluated period, the scientific work of the Institute was focused mainly on increasing the capabilities of the CAF Chemical Corps in the specialized fields that the Institute primarily deals with. The results are mainly methodologies for work in both stationary and mobile laboratories, utility and functional designs, and possibly specialized books that can be used by a wide range of readers, both those working within the CAF and in the civilian sector.

The list of the most significant results that may have an influence on society includes:

- Methodology for the identification of fentanyl and its select derivatives.
- Methodology for sample preparation using the electrodeposition system.
- Methodology for the preparation and calibration of gamma spectroscopic systems using the GammaVision spectrometric software.
- Methodology (Procedure) for the introduction of a new protective mask as a military universal item of individual protection.
- Methodology for evaluating the resistance time of insulating construction materials exposed to the liquid phase of nerve chemical-warfare agents at low vapour pressure.

The most significant results of the Institute's applied research include:

²⁸ If the client is from abroad, indicate in brackets the country of origin of the client.

²⁹ See Terms definition.

- Utility model: "Liquid Polymer Film for Colorimetric Detection of Chemical Toxic Substances".
- Utility model: "Liquid Scintillator Tank".
- Prototype: "Liquid Scintillator Cell".

Significant results include two military regulations and two specialized books:

- NN 30 0101. *CHEMICKÉ VOJSKO: Názvoslovná norma. (Chemical Corps: Nomenclature Standard)*
- Chem-1-6. *Činnost jednotek radiačního a chemického průzkumu. (Activities of Radiation and Chemical Reconnaissance Units).*
- KOBLIHA, Zbyněk, ROZSYPAL, Tomáš. *Chemické zbraně (Chemical Weapons)* Brno: University of Defence, 2022 pp. 202, ISBN 978-80-7582-468-4.
- FLORUS, Stanislav. *Základy izolační ochrany povrchu těla (Basics of Insulating Body Surface Protection)* Brno: University of Defence, 2022, pp. 160, ISBN 978-80-7582-445-5.

The methodology for the determination of fentanyl and its selected derivatives is used to determine a group of opioid substances, namely fentanyl, alfentanil, remifentanyl, sufentanyl in an acidic environment using the dye Acid Red 88 (CAS 1658-56-6). It can be used both in stationary and mobile field chemical laboratories. Scope: stationary laboratory, mobile field chemical laboratory PPCHL AL-2/ch from the CAF Chemical Corps. The result is used by the recipient. Recognition of the certified methodology was published in the Bulletin of the Ministry of Defence No. 1/2020, part 1, p. 77, dated 22 April 2020.

The methodology for sample preparation using the electrodeposition system is applicable for the preparation of samples containing alpha radionuclides in stationary analytical laboratories for subsequent measurements using alpha spectrometric systems. The recognition of the certified methodology was published in the Bulletin of the Ministry of Defence, volume 2021, part 12, dated 27 October 2021. The result is used by the recipient.

The methodology for the preparation and calibration of gamma spectroscopic systems using the GammaVision spectrometric software is designed for the calibration and verification of the functionality of gamma spectrometric systems based on the ORTEC platform and using the GammaVision software tool. Recognition of the certified methodology was published in the Bulletin of the Ministry of Defence, volume 2021, part 12, dated 27 October 2021. The result is used by the recipient.

The methodology "Procedure for introducing a new protective mask as a military universal item of individual protection" was developed for the needs of the Ministry of Defence of the Czech Republic as part of the research project "MASKA - research on materials and structural elements of face masks", which was carried out by the team of the Military Research Institute of Brno, Section of Chemical and Biological Protection, in 2018–2020. The content of the methodology is research on the characteristics of materials, structural elements and the design of tactical and technical requirements for the development of a new face mask. Furthermore, the methodology contains an

assessment of the current state and proposals for possible trends in the development of filtering-type respiratory protection devices (face masks).

Methodology for evaluating the resistance time of insulating construction materials exposed to the liquid phase of nerve chemical-warfare agents at low vapour pressure.

Chemical warfare nerve agents (CWNA), namely agents from group A V, have a low vapour pressure. For this reason, automatic sampling systems with an analytical end-piece in the form of a gas chromatograph cannot be used to measure the resistance time (RT). The penetrated test chemical does not create a sufficient amount of vapour for its analysis. In addition, further losses of the substance occur in the transport paths of the device from the automatic sampling system to the gas chromatograph, which does not allow an objective assessment of the amount of penetrating substance and thus the determination of the RT. For the measurement of RT, the methodology for determining the RT of surface construction materials was modified, which uses the DETEHIT colorimetric sensor introduced into the CAF armament to detect the passage of CWNA. The colorimetric sensor is in direct contact with the construction material and its sensitivity allows detecting the presence of penetrated CWNA at the level of hygienic limits. The methodology can be used both in stationary and mobile laboratories of the CAF Chemical Corps. The methodology was published in the Bulletin of the Ministry of Defence under the registration number MO 154206/2022-2994.

The essence of the utility model **Liquid Polymer Film for Colorimetric Detection of Chemical Toxic Substances** is a liquid polymer film formed by an acetone solution of acetylcellulose with the addition of 5–15 % wt. of cyclic 18-crown-6 ether. The addition of 18-crown-6 ether (CAS: 17455-13-9) increases the structure of the produced detection film and thus enables better availability of chemicals that are captured in the polymer matrix. In some cases, 18-crown-6 ether itself contributes greatly to the stabilization of chemical reagents for the detection of harmful substances or functions as a phase transition catalyst. The advantage is the possibility of very rapid preparation of the required detectors directly at the detection site (in-situ) by simple evaporation of the solvent to form a rigid, water-insoluble film. The suitability of the designed film was verified by integrating several detection chemical complexes, e.g. benzimidazole/rhodamine dyes for the detection of phosgene, potassium iodide, for the detection of oxidizing gases and 4,4'-dipyridyl/dimedone for the detection of cyanogen chloride. The proposed devices are also suitable for long-term monitoring of the surrounding environment during e.g. a work shift, checking the tightness of distribution pipelines in chemical plants, etc. With an appropriate combination of detection reagents, the polymer carrier is also suitable for the detection of toxic substances in water. The utility model was registered by the Industrial Property Office on 31 August 2022 under registration number 35 360.

The main advantage of the utility model **Liquid Scintillator Tank** lies in its design

which enables to be filled with liquid scintillator by the user, even several times. After proper cleaning, the tank can also be filled with another liquid scintillator. This makes the tank suitable for use in research. The tank allows replacing the liquid scintillator with another at any time or filling up. The tank eliminates the shortcomings of the diffuse reflector formed by the inner coating of the chamber and the instability of the composition of this coating. The material of the tank is mechanically and chemically resistant so that it does not in any way affect the composition of the liquid scintillator filled in the chamber. At the same time, the material and design of the tank also guarantee the possibility of using this case in deteriorated conditions. The utility model was registered by the Industrial Property Office on 12 October 2022 under registration number 36 381.

The purpose of the technical solution of the **Liquid Scintillator Cell** prototype is to create a housing for any liquid scintillators with the possibility of their implementation on 1" and 2" readout systems (PMT, AVPD, or others). The material of the outer housing is mechanically and chemically resistant so that it does not affect the composition of the scintillator in any way and at the same time guarantees the possibility of use in deteriorated conditions. The outer housing is equipped with a filling hole that allows for any replacement of the liquid scintillator and at the same time it can be hermetically closed. The reflector is made of a diffusion type of reflector, which is inert to most chemicals and at the same time creates an internal, precisely defined space (geometry) that does not contain any bubbles for thermal expansion of liquids. The effect of thermal expansion is eliminated by using chemically inert expanded materials that have the property of changing their volume under pressure.

NN 30 0101. CHEMICKÉ VOJSKO: Názvoslovná norma. (*Chemical Corps: Nomenclature Standard*). This regulation contains terminology from the field of activities of the CAF Chemical Corps and introduces terminology from the area of protection against weapons of mass destruction and chemical support which is used in standardization agreements, allied publications and other documents of the North Atlantic Treaty Organization (NATO). The regulation is based on laws, decrees, Czech defence standards and NATO standardization agreements and allied publications. The regulation was introduced into the CAF through the Bulletin of Ministry of Defence, volume 2019, part 12, dated August 28, 2019.

Činnost jednotek radiačního a chemického průzkumu. (*Activities of Radiation and Chemical Reconnaissance Units*). This military regulation contains a summary of the basic requirements for the activities of radiation and chemical reconnaissance units with the aim of specifying and unifying these activities. The regulation sets out the principles for the use and activities of radiation and chemical reconnaissance units. The regulation is intended for all commanders and staffs of the Czech Armed Forces who are responsible for the training and combat deployment of radiation and chemical reconnaissance units. The individual provisions of the regulation are based on the principles set out in the military regulations *Vševojsk-2-6, Chemické zabezpečení v Armádě České republiky (Chemical Support within the Czech Armed Forces)* and *Chem-1-4,*

Monitorování radiační, chemické a biologické situace v Armádě České republiky (Monitoring the Radiation, Chemical and Biological Situation in the Czech Armed Forces).

The annexes to the regulation contain draft documentation and selected procedures necessary for the preparation of radiation and chemical reconnaissance units and their activities. Individual parts of the regulation are also applicable to the activities of chemical observers of units and the processing of their documentation and procedures for performing individual tasks. This regulation comes into force on 1 January 2023. Military Regulation Chem-1-6. (ref. no. MO 210903/2022-SRS MO). Published in the MoD Bulletin, volume 2022, part 10, distributed on 1 July 2022.

The book **Chemické zbraně** (*Chemical Weapons*) is intended for students of chemical weapons and others interested in the subject. The book describes the history of the use of chemical weapons and the physical, chemical and toxicological properties of chemical warfare agents, important for understanding the mechanisms of spread. It also describes external and internal factors influencing the destructive effects of chemical weapons. The following part deals with the theory of air contamination and the spread of a cloud of chemical warfare agents. Attention is paid to the influence of topographical features on the spread of a cloud of chemical warfare agents. It also describes the contamination of terrain and objects with droplets of chemical warfare agents and the influence of various factors on their stability. Another part is dedicated to the division and construction of chemical munitions and chemical warfare agents, giving examples. The legislation on the use of chemical weapons and methods of their disposal, including prohibited methods, is described. The last part is focused on chemical terrorism. The aim of the book is to provide basic information on the properties of chemical warfare agents, the possibilities of their use in chemical weapons and chemical munitions, the tactics of using chemical weapons and the behaviour of chemical warfare agents on the ground and in the air. The text is intended to provide information on the dangers of toxic substances used in various types of chemical munitions and chemical warfare agents and to provide a theoretical basis for decision-making by specialists when planning protective measures against the effects of chemical weapons. The book is identifiable by ISBN 978-80-7582-468-4.

The book **Basics of Insulating Body Surface Protection** is intended for those interested in studying the subject of insulating body surface protective equipment. The content of the book focuses on the history of protective clothing introduced into the military, from the establishment of the Czechoslovak Republic to the present. The book also contains the necessary theoretical foundations for understanding the penetration of chemical substances through structural materials with a polymer barrier layer. Attention is paid to the main factors that affect the permeability of chemical substances through polymers. The book includes a description of some methods used for practical measurement of chemical resistance of structural materials in protective equipment. The conclusion presents selected design characteristics of insulating body surface protective equipment and their influence on its practical use. The book is identifiable by ISBN 978-80-7582-445-5.

Table 3.4.1 - Overview of research results in the period under evaluation

Type of result ³⁰	Year of application	Name
Specialized book	2022	Chemické zbraně (<i>Chemical Weapons</i>)
Specialized book	2022	Základy izolační ochrany povrchu těla (<i>Basics of Insulating Body Surface Protection</i>)
Certified methodology	2022	Methodology for evaluating the resistance time of insulating construction materials exposed to the liquid phase of nerve chemical-warfare agents at low vapour pressure.
Directives and regulations of a non-legislative character within the competence of the provider concerned.	2022	Činnost jednotek radiačního a chemického průzkumu. (<i>Activities of Radiation and Chemical Reconnaissance Units</i>)
Utility model (36381. 12.10.2022)	2022	Liquid Scintillator Tank.
Prototype (No. NG-Cela-1_2.)	2022	Liquid Scintillator Cell.
Utility model (35 360. 31.8.2021.)	2021	Liquid Polymer Film for Colorimetric Detection of Chemical Toxic Substances.
Certified methodology	2021	The methodology for the preparation and calibration of gamma spectroscopic systems using the GammaVision spectrometric software.
Certified methodology	2021	The methodology for sample preparation using the electrodeposition system.
Certified methodology	2020	The methodology for the determination of fentanyl and its selected derivatives.
Directives and regulations of a non-legislative character within the competence of the provider concerned.	2019	CHEMICKÉ VOJSKO: Názvoslovná norma (<i>Chemical Corps: Nomenclature Standard</i>)

Note 1: Please list and describe the results already applied in practice or heading towards application in practice with existing or prospective impact on the society (e.g. domestic or foreign patents, sold licenses, spin-offs, prototypes, varieties and breeds, methodologies, significant analyses, surveys, expert outputs for policymaking or other forms of non-publication outputs, etc.). Indirect results of research, development and creative activities with documented societal impact, e.g. expert activities, services to the public/government/scientific community, may also be reported.

³⁰ Specify the specific type of result. Add rows as needed.

TRANSFER OF RESULTS INTO PRACTICE

3.5 Transfer of results into practice

The evaluated unit shall briefly describe its system for transferring results into practice. It shall also indicate up to five of the most typical users of its results, whether in the university environment or in the non-university application/corporate sphere, detailing how it collaborates with them and how it seeks out new users (using a maximum of five specific examples).

It will also indicate whether and how it commercializes R&D&I results (e.g. selling licences, setting up start-up or spin-off companies, etc.)³¹, providing brief description of the commercialization methods used. The effectiveness of the transfer of results and the commercialization of R&D&I results will be described using a selection of results (max. five) listed in annex table (Table 3.4.1).³²

Additionally, the evaluated unit shall briefly comment on the funds received during the period of 2019–2023 from non-public, non-grant sources (e.g. licences sold, spin-off revenues, donations, etc.). A full summary shall be provided in annex table (Table 3.5.1).

Maximum 500 words plus 200 words for each provided example of finding a new user of results and commercialization.

Self-Evaluation:

As it is a component of a public university, the Institute does not have the possibility to commercialize the results achieved. These results are the property of the Ministry of Defence, which decides on the manner of their use. Primarily, they are intended to increase the capabilities of the Czech Armed Forces and the Chemical Corps. They also serve to further increase the capabilities of the Institute in activities necessary for the building of national defence and also supporting the educational activities of the Institute and development of professional skills of students, especially in the chemical specialization. However, the nature of the expert activities and the results obtained can be applied not only in the conditions of the Czech Armed Forces, but also within the framework of the Ministry of the Interior of the Czech Republic, for example at the Fire

³¹ In the case of military HEIs, their specific position is taken into account when evaluating the commercialization/evaluation of R&D&I results.

³² If the commercialization of R&D&I results is carried out in this way.

Rescue Service of the Czech Republic and facilities under its subordination, namely the Lázně Bohdaneč Population Protection Institute and the National Institute for NBC Protection. The results can be further used by the Military Research Institute of Brno, the National Radiation Protection Institute, the Joint Chemical, Biological, Radiological and Nuclear Defence Centre of Excellence, the General Directorate of Customs - Customs Laboratory Prague. From the university sphere, these are mainly the Czech Technical University in Prague, namely the Faculty of Nuclear Sciences and Physical Engineering and the Faculty of Biomedical Engineering. From the corporate sphere, we can mention the company Oritest spol. s r. o. with its registered office in Prague, and NUVIA, a. s.

The forms of cooperation with the mentioned companies are as follows:

- The Lázně Bohdaneč Population Protection Institute, the Military Research Institute—Joint Project MARYŠA—Research on Methods and Technologies of Protection against the Effects of Weapons of Mass Destruction and Industrial Hazardous Substances.
- The National Institute of NBC Protection, v. v. i. – KONTRACBRN defence research project.
- The Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering – ADAR project – Accelerator Driven Advanced Reactor.
- The National Radiation Protection Institute, v. v. i. – cooperation in the field of ionizing radiation detection, possibilities of using UAVs, jointly solved RANUS-TD project.
- The General Directorate of Customs, Customs Laboratory Prague – cooperation in the field of detection of addictive substances and their precursors.
- The Czech Technical University in Prague, Faculty of Biomedical Engineering – opposition of students' theses, participation in the Scientific Board of the NBC Defence Institute.
- Joint Chemical, Biological, Radiological and Nuclear Defence Centre of Excellence –consulting activities done by the Institute, lectures given by specialists being organized both by the Institute and the Centre.
- Oritest spol. s r. o. – cooperation in the development of tube detectors and simple detection aids such as detection papers, etc.
- NUVIA, a. s. – joint solution of the RANUS TD project, cooperation in the field of detection of ionizing radiation sources and UAVs.

The Institute presents the results of its scientific work at conferences and symposia, both in the Czech Republic and abroad. The Institute itself organizes CBRN PROTECT conferences in two-year cycles. The conferences cover topics that are the subject of the Institute's creative activities and at the same time address them or are of interest to other scientific and developmental institutes. At these events it is then possible to find new users or partners for cooperation. At the conference organized by the Lázně Bohdaneč Population Protection Institute, cooperation with the Customs Laboratory in Prague was established. The Institute has been cooperating with other partners for

many years beyond the evaluation period. The cooperating organizations are also sought depending on the intention in the project solutions.

Table 3.5.1 - Summary of non-public revenues received during the period under evaluation

Type of revenue	Revenue (in thousands CZK/EUR)				
	2019	2020	2021	2022	2023
N/A					
Total					

Note: Enter funds raised for R&D&I from non-public sources besides grants or contract research (e.g. licences sold, spin-off company revenues, donations, etc.) in the calendar year.

POPULARIZATION OF R&D&I

3.6 The most important activities in the field of the popularization of R&D&I and communication with the public

The evaluated unit shall briefly describe its main activities related to the popularization of R&D&I and communication with the public (e.g. popularization lectures, citizen science initiatives, etc.) during the period of 2019–2023 and provide up to 10 examples that it considers the most significant.

Maximum 500 words plus 200 words for each example given.

Self-Evaluation:

Assoc. Prof. Ing. Daniel SAS, Ph.D. Lecture for the State Office for Nuclear Safety (SONC) and the National Radiation Safety Office (NRSO) staff on Nuclear and Radiological Weapons - Current Threats. Held on 16 May 2023, Prague. Introduction to the issue of nuclear and radiological weapons, their destructive effects and possible protection. List of nuclear weapon holders and possible means of their transport to a target. Prediction of destructive effects using special software.

MAJ Ing. Dušan TREFILÍK, Ph.D. Public Lecture: From Arrow Poisons to Novichok. Held on 20 November 2019 in Písek for everyone interested in the topic. Organized by Science Café. Písek, Pi local club.

MAJ Ing. Dušan TREFILÍK, Ph.D. Public Lecture: Abuse of Commonly Available Chemicals. Held on 20 February 2019 in Písek for everyone interested in the topic. Organized by Science Café. Písek, Pi local club.

MAJ Ing. Dušan TREFILÍK, Ph.D. Lecture: Commonly Available Chemicals Used by Terrorists. Held on 6 December 2019 and 9 December 2019 in Prague at "Brána jazyků" Elementary School.

MAJ Assoc. Prof. Ing. Jiří JANDA, Ph.D. Lecture: Nuclear Energy in the Military - Today's Threats and Protection against Them. Held at the Faculty of Mechanical Engineering of the Czech Technical University in Prague on 3 May 2022.

CAP Ing. Tomáš ROZSYPAL, Ph.D. Lecture for students of the Faculty of Chemistry of the Technical University. Topic: Mobile Chemical Laboratories of the Czech Armed Forces. Tasks of the Chemical Corps with a focus on chemical laboratories of the 31st Regiment of Radiation, Chemical and Biological Protection. Held on 27 October 2020, 29 November 2021, and 16 November 2023 in Brno. The audience got acquainted with the unit's activities, tasks and equipment. At the same time, the interconnection of mobile laboratories with the NBC Defence Institute of the UD and the possibilities of doctoral studies within the Institute's training facilities were presented.

In the area of popularization of scientific activities of the Institute, worth mentioning is the international conference CBRN PROTECT, which the Institute organizes every two years (except for the ban due to the pandemic COVID-19). At this forum, the results of the Institute's scientific activities are presented and at the same time the Institute's activities are popularized among experts from the academic and scientific community.

The Institute participates in the activities of the University of Defence by giving lectures within the framework of the so-called Academy of the Third Age, as well as in the Night of Scientists promotion event, which takes place annually.

Within the framework of popularization and marketing activities, the Institute provides presentations with demonstrations in its own premises, which are intended for students of secondary vocational schools and grammar schools or, upon the request, academic staff are sent to secondary schools where they give lectures. Lectures were conducted at Heyrovsky Secondary Industrial School of Chemistry in Ostrava in 2019 and 2023.

IMPLEMENTATION OF RECOMMENDATIONS

3.7 Implementation of the recommendations in Module 3

The evaluated unit will briefly describe how it has implemented the recommendations for Module 3 from the previous evaluation period, if applicable.

Maximum 1000 words.

Self-Evaluation:

Regarding the implementation of the recommendations on individual sections.

As for **Section 3.2** it was recommended to interconnect the Institute with another similar facility and to launch joint research projects.

The Institute cooperates intensively with the Military Research Institute (MRI), Brno, with which it has been working on the MARYŠA project. Specialists of the MRI participated as supervisors in the management of the dissertation, both institutes are represented in the scientific board of the partner institute. Through the Rector-Commandant the cooperation agreement between the institutes has been signed. Working meetings are held for specialists of both institutes to evaluate the possibilities

of involvement in joint projects.

The second institute with which the NBC Defence Institute cooperates is the National Institute for NBC Protection (NINBCP). At present, an employee of the NINBCP is involved in a defence research project, the principal investigator of which is the NBC Defence Institute.

An important partner for cooperation is also the Department of Toxicology and Military Pharmacy of the Military Faculty of Medicine of the University of Defence, with which the Institute has been working on the MARYŠA project and cooperating on other issues related to the Long-Term Development Plan of the Organization.

The NBC Defence Institute also cooperates with the Institute of Chemistry and Technology of Environmental Protection at the Faculty of Chemistry of Brno University of Technology in the form of using their experimental equipment for validation of the results of research work to support scientific outcomes.

In terms of recommendations regarding intensification of efforts to attract international projects in cooperation with foreign institutions, it can be stated that the University of Defence has not developed support structures that would be able to help with the administration of international projects, especially in the financial area. This possibility has been discussed many times with potential project partners from the Czech Republic with the view that the NBC Defence Institute is unable to cope with the bureaucratic obstacles in terms of management of financing projects on its own. However, in the evaluated period, the Institute worked on three projects that have fully loaded the scientific capacity of the Institute. For this reason, it can be concluded that the main recommendation, stating that scientific work must be carried out with regard to the total number of ongoing scientific tasks and the number of researchers, was met during the evaluated period.

The recommendations relevant to sections 3.5 and 3.6, which namely relate to 3.5 Applied Research Results with Existing or Future Economic Impact on Society and 3.6 Significant Applied Research Results with Non-Economic Impact on Society, are not explicit or unifying.

It is recommended that the NBC Defence Institute should place more emphasis on cross-border cooperation, with a focus on applied research projects that would be beneficial to a wider international public. In this context, it should be emphasized that the mission of the Institute is to build up the capabilities of the Czech Armed Forces in particular in the areas under development. The results of research are often applicable within an international context, but it is a matter of consideration whether the aim is to bring benefit to an international public if the results are achieved within a national funding environment. Significant results are published in indexed journals, which can provide a platform for sharing key results arising from research projects, if the nature of the project allows for this in terms of protecting sensitive information. However, the nature of the project and its funding often makes it impossible to share research results without the permission of the funding organization.

Another recommendation of the report is to increase the quality of outputs in category A, i.e. to focus on the processing of patents, important analyses and studies. It is recommended to further expand the use of these scientific findings to other scientific disciplines. All these activities have been and are being implemented by the Institute. A number of utility models were filed and accepted by the Industrial Property Office in the previous and evaluated periods. The Ministry of Defence decides which documents submitted to the Industrial Property Office shall be implemented and it finances the necessary costs. It is therefore not entirely within the competence of the Institute whether or not a submission is implemented. The studies are part of the analytical work of the Institute. Due to the fact that they are generally not the most significant work required for the International Evaluation Panel report, the studies were not included in the previous report.

Recommendations were also made regarding the production of literature in the mother tongue to serve as a source of information for the expert community in general and for education of students. During the evaluation period the following titles of study texts, books or chapters in books were produced by Institute staff:

Study texts

ZAHRADNÍČEK, Radim, BEDNÁŘ, Kamil, ŽUJA, Petr. *Zbraně hromadného ničení a ochrana proti nim (Weapons of mass destruction and protection against them)*. [textbook]. Brno: University of Defence, 2023, pp. 326. ISBN 978-80-7582-278-9.

TREFILÍK, Dušan. *Fyzikální chemie pro vojenské chemiky (Physical chemistry for military chemists)*. [study text]. Vyškov: University of Defence, 2023, pp. 83. ISBN 978-80-7582-288-0.

TREFILÍK, Dušan. *Návody pro laboratorní cvičení z fyzikální chemie (Manuals for laboratory work in physical chemistry)*. [study aid]. Vyškov: 2022, pp. 75, ISBN 978-80-7582-197-3.

HOSKOVCOVÁ, Monika, JELÍNKOVÁ, Romana, ŽERAVÍK, Jiří. *Výpočetní chemické úlohy (Chemical Equation Exercises)*. [study aid]. Brno: University of Defence, 2022, pp. 122 ISBN 978-80-7582-183-6.

BEDNÁŘ, Kamil. *Použití jednotek chemického vojska v rámci operací nevojenského charakteru (The use of chemical corps units in non-military operations)*. [study text]. Brno: University of Defence, 2022, pp. 75.

ZEMAN, Tomáš, PAULUS, František, BEDNÁŘ, Kamil. *Ochrana obyvatelstva a integrovaný záchranný systém I (Population protection and the integrated emergency services system I)*. [study text]. Brno: University of Defence, 2021, pp. 83. ISBN 978-80-7582-384-7.

ŽUJA, Petr. *Výzbroj chemického vojska, Díl VII, Souprava pro dekontaminaci osob SDO (Chemical corps equipment, Part VII: Person decontamination kit)*. [study text]. Brno: University of Defence, 2021, pp. 62. ISBN 978-80-7582-410-3.

ŽERAVÍK, Jiří. *Laboratorní cvičení z obecné a anorganické chemie (Laboratory Exercises in*

general and inorganic chemistry). [study aid]. University of Defence, Brno, 2021, pp. 190. ISBN 978-80-7582-435-6.

HOSKOVCOVÁ, Monika, JELÍNKOVÁ, Romana. *Analytická chemie – kvalitativní a kvantitativní chemické metody (Analytical chemistry: qualitative and quantitative methods)*. [study text]. Brno: University of Defence, 2021, pp. 130. ISBN 978-80-7582-424-0.

ZAHRADNÍČEK, Radim, BEDNÁŘ, Kamil. *Činnost chemického specialisty štábu při plánování na taktické úrovni (Activities of a staff unit chemical specialist at a tactical level)*. [study text]. Brno: University of Defence, 2021, pp. 72. ISBN 978-80-7582-412-7.

ZAHRADNÍČEK, Radim. *Chemické zabezpečení taktických pozemních činností (Chemical support of tactical ground activities)*. [study text]. Brno: University of Defence, 2020, pp. 123. ISBN 978-80-7582-323-6.

ŽUJA, Petr, OTŘÍŠAL, Pavel. *Výzbroj chemického vojska: Díl VI: Vozidlo radiačního a chemického průzkumu Land Rover RCHM (The Land Rover TCHM chemical corps exploration vehicle)*. [study text]. Brno: University of Defence, 2019, pp. 35. ISBN 978-80-7582-105-8.

ZAHRADNÍČEK, Radim. *Důsledky vzniku radiačních, chemických a biologických událostí (Impacts of radiation, chemical, and biological incidents)*. [study text]. Brno: University of Defence, 2019, pp. 139. ISBN 978-80-7582-115-7.

Specialized Books, Textbooks

FLORUS, Stanislav. *Základy izolační ochrany povrchu těla*. [specialized book]. Brno: University of Defence, 2022. pp. 160. ISBN 978-80-7582-445-5.

KOBLIHA, Zbyněk, ROZSYPAL, Tomáš. *Chemické zbraně*. [specialized book]. Brno: University of Defence, 2022. pp. 202. ISBN 978-80-7582-468-4.

OTŘÍŠAL, Pavel. *Nové přístupy k ochraně proti zbraním hromadného ničení v operacích*. [Textbook]. Brno: University of Defence, 2019, pp. 184. ISBN 978-80-7582-091-4.

OTŘÍŠAL, Pavel, VAŇKOVÁ, Dana. *Vybrané kapitoly chemie a technologie polymerů*. [Textbook]. Brno: Tribun EU s.r.o. (knihovnicka.cz), 2019, pp. 215. ISBN 978-80-263-1537

Chapters in Specialized Books

PROKOP, Bronislav. *Československé vojenské umění v operaci Pouštní bouře (Czechoslovak art of war in Operation Desert Storm)*. In: Stanislav Polnar, Tomáš Řepa. *Ozbrojené síly a československý stát II (The Armed Forces and the Czechoslovak state II)*. Brno: University of Defence, 2021, pp. 229-252. ISBN 978-80-7582-434-9.

PROKOP, Bronislav. *Armáda české republiky v misi ISAF*. In: *Ozbrojené síly a československý stát*. Brno: University of Defence, 2020, pp. 367-382. ISBN 978-80-7582-353-3

OTŘÍŠAL, Pavel, HOŠKOVÁ-MAYEROVÁ, Šárka. *Selected Aspects of Barrier Materials Assessment as a Part of the Reaction on Threats and Risks Connected with CBRN Problems*. In: Kacprzyk, Janusz. *Decision Making in Social Sciences: Between Traditions and*

Innovations. Cham: Springer International Publishing, 2020, pp. 531-543. ISBN 978-3-030-30658-8. doi:10.1007/978-3-030-30659-5_32

The study materials or produced specialized books cover the needs of students for the subjects taught by the Institute. They can also be used by professionals in the civilian sector, or by the CAF personnel in the case of materials for teaching tactics and combat deployment of chemical units or their technical equipment. In addition to the above-mentioned results, two regulations were prepared by the Institute staff for the needs of the Czech Armed Forces.

The international evaluation panel recommended paying attention to the internationalization of applied research. In the period under review, the management of the Institute also addressed the possibilities of cooperation with foreign institutions. The solution of this recommendation is of a long-term perspective. During the evaluated period, the Institute cooperated with the Military Academy in Belgrade, Serbia, and the Helmut-Schmidt Universität/Universität der Bundeswehr Hamburg, Germany, in the area of lecturing activities. Cooperation has been established with the Babes-Bolyai University in Cluj, Romania, where cooperation is taking place on a professional level. Vasil Levski National Military Academy, Veliko Tarnovo, Bulgaria, has expressed interest in cooperation, which is under consideration. The need to strengthen the internationalization of research is perceived by the Institute's management as a long-term priority task. The financial and personnel prerequisites for its implementation are gradually being created.

Only one recommendation emerged from **sections 3.7 and 3.8**, which related to promoting opportunities for collaboration between non-academic and corporate entities, both domestically and internationally.

Cooperation with non-academic or corporate entities was solved by means of contracts concluded by the Rector- Commandant of the University of Defence upon the recommendation of the Institute's management. During the period under review, a total of six contracts were concluded with non-academic entities from the national environment. The contracts are available in the register of contracts of the University of Defence.

From the sections **3.10 Most Important Individual Awards for Research, Development and Innovations** and **3.11 Recognition by the International Community in the Field of Research, Development and Innovations** (elected membership in international scientific communities, participation in editorial boards of international scientific journals, lecturers invited to foreign institutions), recommendations emerged, but they are mutually contradictory. Their contradiction lies in the fact that on the one hand it is recommended developing cooperation with NATO and EU countries in the specific areas of detection and identification of chemical and radioactive substances and the need to participate in the work of international and scientific committees and the organization of international conferences, etc., so that another recommendation is that in the future the Institute should not be

evaluated according to this criterion because it is not relevant.

The content of the evaluation is based on the submitted requirement for the evaluation of the university units. This evaluation is based on a general model for evaluating research centres or educational institutions. However, it is not based on the real capabilities of the institute, in particular its staffing, i.e. the number of academic staff in particular. Although the academic staff of the institute have received individual awards, this is an area that the institute is generally unable to actively influence. The same applies to the possibility of being involved in various types of editorial boards of international journals, etc. For this reason, given the number of academic staff, the suggestion of deleting this evaluation criterion is endorsed.

From section **3.12 The Most Important Activities in the Field of Popularization of Research, Development and Innovations and Communication with the Public**, only general recommendations were made, which were more related to the promotion of the Institute on the website. During the period under review the website of the University of Defence and, simultaneously, of the NBC Defence Institute, were completely redesigned, resulting in the loss of previous information. Due to the fact that the Institute does not have a staff member dedicated to permanently updating the Institute's website, this area remains a weakness for the Institute. However, in terms of promoting to the public, the Institute has undertaken a number of activities.

In the framework of cooperation with secondary schools, the director of the Institute is invited to the meetings of the chemistry section of the Association of Secondary Industrial Schools of the Czech Republic, where he has the opportunity to present programmes of study and be informed about changes in the system of secondary education, legislative amendments and requirements in relation to students who are educated in chemistry and related fields. It is thus a link between secondary and university education. Within the framework of cooperation with the Secondary Industrial Chemical School in Brno, the Institute provides guidance to students in secondary school vocational activities. In the evaluated period, the staff of the Institute supervised five secondary school students.

Popularization activities are also carried out at Heyrovsky Secondary Industrial School of Chemistry in Ostrava, where lectures by the Institute's academic staff were given in the years under review, namely in 2019, 2023. The staff of the Institute is engaged in the university-wide activity the Night of Scientists, in which the Institute participates every year. The popularization of scientific work also includes lectures at the so-called Academy of the Third Age, which is intended for the general public.

Regarding the other activities recommended by the international evaluation panel, some of the suggestions are not realistic such as, for example, the recommendation to participate in the development of school educational programmes focused on the protection of the environment and the protection of living conditions, or the recommendation to increase the number of international projects to popularize activities in the field of international fairs, exhibitions, etc. The school educational

programme is in the conditions of the Czech Republic designed for primary schools and therefore it is not within the competence of the Institute to engage in similar activities. Recommendations on international popularization projects are beyond the Institute's capacity.

A LIST OF SUPPORTING DOCUMENTS/LINKS FOR MODULE 3

Document name	No. criteria	Location (link in HTML)

SELF-EVALUATION REPORT FOR MODULES 4 AND 5

HIGHER EDUCATION INSTITUTION NAME: UNIVERSITY OF DEFENCE**COMPANY REGISTRATION NUMBER (CRN): 60162694****MODULE 4 – VIABILITY****ORGANIZATION AND MANAGEMENT OF R&D&I****4.1 Organization and management of R&D&I**

The HEI will briefly describe its organizational structure¹ and describe the R&D&I management system including the role of the HEI's central management, the management of faculties, and the HEI's institutes in organizing and managing R&D&I. It should also describe the role and structure of the technical and economic apparatus.

Maximum 1000 words.

Self-Evaluation:

The University of Defence (UD), founded in accordance with Act No. 214/2004 Coll., on the Establishment of the University of Defence, is a part of an organizational component of the state — the Ministry of Defence of the Czech Republic (MoD). The UD is, in the sense of Act No. 111/1998 Coll., on Higher Education Institutions and on Amendments and Supplements to Other Acts, Annex No. 2, a military university, one of the two state higher education institutions within the Czech Republic. Due to its professional focus in the field of defence and security, and its position in the educational system of higher education in the Czech Republic, it has precisely defined competences from its governing authority—the Ministry of Defence of the Czech Republic. The UD is headed by the Rector-Commandant (R-C).

In terms of organizational structure, the UD is divided into three faculties: the Faculty of Military Leadership (FML), the Faculty of Military Technology (FMT), the Faculty of Military Medicine (MFM), two institutes: the Nuclear, Biological, and Chemical Defence Institute (NBCDI), the Institute of Intelligence Studies (ISS) and three centres: the Centre for Security and Military Strategic Studies (CSMSS), the Language Centre (LC), the Physical Training and Sport Centre (PTSC). In addition, the Research, Expertise, and Technology Centre (RETC) is also included in the organizational structure of the UD, but due to its specific role and internal organizational structure, it cannot be seen as a fully-fledged, independent centre. The activities at the UD are managed from the Rector's Office, and the running of the UD is ensured by the Bursar's Department in the technical and economic context. The students of bachelor's and master's degree programmes at the UD who are professional soldiers are organizationally assigned to

¹ A graphical representation of the organisational structure will be provided as an annex.

the structure of the School Regiment (SR).

The role of the UD management in relation to science, research and innovation (R&D&I) in areas related to defence and security is to create conditions within the institution they manage so that its employees and students are able to fully participate in research and the support of expert activities in both a national and international context. The R&D&I carried out by the UD, particularly in the areas of security, the operational and combat environment, the development of the art of war, military technology and technology, and military medicine, are purposefully developed under the purview of the Vice-Rector for Scientific and Expertise Activities (VRSEA). The subject matter purview of the VRSEA includes the focus and organization of creative activities, habilitation proceedings, and proceedings associated with the appointment of professors. The VRSEA has a departmental Science and Research Unit to execute their activities. This unit is responsible in particular for the provision of methodological guidance to the units of the UD in the field of scientific research and project activity, and for the development information systems to support creative activity. The RETC is also falls within the oversight of the VRSEA and is primarily responsible for supporting research and expert activities and providing a supportive environment for the development of new scientific and technological breakthroughs and key activities in the field of defence and security.

The UD Scientific Council has an unparalleled role at the UD in the area of expert advice in ensuring the quality of educational, creative, and related activities, including R&D&I. The Scientific Council appointed by the RC, and its members are prominent representatives of the fields in which the UD carries out educational and creative activities. It is composed of a chairman (the RC), a vice-chairman (the VRSEA), 18 other internal members of the UD, 23 external members, and four permanent guests (directors of UD centres and institutes). This composition of the UD Scientific Council guarantees transparency, independence, and objectivity in the evaluation of scientific projects and in the decision-making, and also ensures a broader disciplinary perspective, increased credibility and support for UD cooperation with various academic institutions and external entities profiled in the field of defence and security.

The role of the management of faculties, institutes, and centres is to ensure that their members, meaning the employees and, in the case of faculties, also the students, purposefully develop not only their own professional competences, but also the credibility and reputation of these organizational units of the UD, especially in relation to the national and international environment. It is also the task of the management of the aforementioned units to ensure that, by implementing R&D&I, the academic staff are able to guarantee accredited programmes of study in all forms of military and civilian studies in accordance with Act No. 111/1998 Coll. At the faculties of the UD, the area of R&D&I is purposefully developed from the level of the Vice-Rector for Scientific and Expertise Activities, while at the institutes and centres of the UD, these activities are the responsibility of the individual directors, who customarily ensure their delivery by delegating their subordinates to the task of overseeing such activities.

The Bursar's Unit is managed by the Bursar, whose substantive responsibility includes the management of the UD and the internal administration of the University, unless

this internal administration is entrusted to another core management element of the UD. The role of the Bursar's Unit derives from the organizational structure. It comprises the Bursar's Group, the Department of Economics, the Department of Logistics, the Department of Communication and Information Systems, the Department of Property Infrastructure, the Department of Human Resources and the Department of Publishing and Administration of Study Funds. The role of the individual units of the Bursar's Group is to provide resource and material and technical support to all entities participating in these activities of the UD in relation to the R&D&I issues in their respective areas of responsibility.

R&D&I QUALITY MANAGEMENT AND SUPPORT SYSTEM

4.2 System of support for a quality R&D&I environment and incentive measures for quality science

The HEI will briefly describe the systemic incentive measures/tools to support quality R&D&I (if applicable). For each measure/tool described, an example will be provided to illustrate the effectiveness of the measure/tool in practice (e.g. number of projects supported by internal grants, statistics on the use of advisory systems, number of newly established research teams, etc.). The description will pay particular attention to:

- A system of support for attracting national and international projects of projects.
- A system for project consultancy/management/administrative support.
- Science management (e.g., personnel and financial capacity for R&D&I transfer, personnel and financial capacity of the project acquisition support system, science managers, data analysts, business and innovation advisors, etc.).
- The existence of internal funding schemes.
- Strategy/opportunities for establishing new research teams (including international ones) and supporting them within the HEI (e.g. sharing of R&D&I equipment, laboratory and information facilities, administrative support, etc.).
- Support system for students and early career researchers².
- a system to support excellent science (e.g. support for excellent scientists, research teams, PhD students, collaborations, infrastructure, etc.).
- A system of support for interdisciplinary research and collaboration within the HEIs.
- The concept of providing conditions for the emergence of new, high quality research directions/topics, especially those with application potential.

Maximum 300 words per point.

Self-Evaluation:

In implementing the support system for R&D&I and incentive measures for quality scientific work, the UD draws on the Quality Assurance System Rules of Educational,

² Student grants, support for PhD students, postdocs and early career scientists.

Creative and Related Activities and Internal Quality Evaluation System Rules of Educational, Creative and Related Activities at the University of Defence. The University's creative activities are mainly carried out to benefit the Ministry of Defence. However, the University also responds to societal demands by realizing creative activities within the framework of support provided by other providers. An overview of current projects is provided in Table 4.10. 4.

An important part of R&D&I at the UD is the implementation of defence research projects based on the precisely defined needs and requirements of the Ministry of Defence. Projects with these areas of focus are in high demand:

- Development of the state defence policy, support of command-and-control in a changing security and operational environment and the role of the armed forces within society.
- Development of new weapons and defence systems.
- Effective force and resource protection.
- Staff training.
- Transportation, sustainability of forces, and effective engagement of forces.
- Medical security.
- Development of command-and-control systems, communication and information systems, and cyber defence.

As previously stated, the UD deals mostly with defence research projects. In the years 2020–2024, 17 projects were addressed under the AMBICE Programme.

Project support is mainly provided to the UD's Science and Research Department staff, who work in collaboration with the UD's financial and human resources managers. Project calls are regularly monitored and information on them is communicated to academic staff via the University of Defence Research, Development, and Innovation Information Portal. A number of support measures are in place to assure the quality of R&D&I at the UD.

The Rector's Prize for Scientific Work is awarded annually. It is awarded to academic staff for significant results in creative activity achieved in the previous calendar year. Its awarding may be proposed for an academic staff member who has not been awarded a similar honorary award in the given or previous calendar year at any part of the University. The award shall be accompanied by a prize of CZK 30 000/EUR 1 200; the prize-winner shall also receive a certificate. The award is typically presented by the Rector at a meeting of the University's Scientific Council.

Student creative activity (Measure of the Rector No.7/2017 – Student Creative Activity) is an important part of the educational process at the University of Applied Sciences. It is one of the main forms of systematic work with gifted and talented students, and a motivational tool for the development of independent creative activity of all students. Students involved in student creative activities have the right to use the material and technical equipment of the UD units to the extent necessary for the successful completion of tasks. They also have the right and responsibility to participate in seminars, lectures, scientific debates, and conferences. The results achieved by students in the framework of student creative activities are presented in competitions

for the best student scientific work, in the professional press, in annual reviews, bachelor- and master-level theses, and in other publications. The authors of the best results in student creative activity receive the “Student Brain” award.

In order to support the creative activities and educational development of the academic staff of the University of Defence and students of the military students of full-time doctoral degree programmes (hereinafter referred to as “students”), a so-called Motivation Programme is announced annually. The awards and rewards for UD academic staff and student creative activity achievements are funded by a portion of the institutional support received.

On the basis of the Order of the Minister of Defence of 6 January 2009 on “Industrial Property Objects under the Responsibility of the Ministry of Defence,” the originators of the creation of industrial property objects are rewarded.

4.3 Quality control system for R&D&I environment

The HEI will briefly describe the system of internal and external evaluation of research units, including the following aspects:

- Internal and external evaluation of R&D&I quality: This includes the evaluation of R&D&I by the HEI’s authorities, the evaluation of research teams (if such a system exists), and the involvement of international scientific councils or other independent advisory bodies in quality control and of R&D&I management.
- The ethical aspects of research: This includes adherence to ethical principles and good scientific practice, compliance with related legislation (codes of ethics, ombudspersons, ethics committees and ethics hotlines, and systems for reporting whistleblowing and ethical misconduct).

The HEI shall demonstrate the functioning of the quality control systems in the R&D&I environment by examples (e.g., brief information on the evaluations carried out and their results, specific examples of the use of whistleblowing or the handling of ethical violations, etc.).

Maximum 500 words plus 200 words for each example described (max. five).

Self-Evaluation:

In terms of the code of ethics and supervision of compliance with the ethical principles of creative activities, the role of the authorities and management of the University and its units in relation to the internal evaluation of the quality of creative activities (R&D&I), are defined in the [Statute of the University of Defence](#) as amended by the 1st, 2nd, 3rd and 4th amendments (Part 2) in the [Rules of the Quality Assurance System for Educational, Creative, and Related Activities and Internal Evaluation of the Quality of Educational, Creative, and Related Activities at the University of Defence](#) (Art. 7 and 9), in the [Code of Ethics of the University of Defence](#), in the [Rules of Procedure of the Internal Evaluation Council of the University of Defence](#), in the Rules of Procedure of the Scientific Councils ([UD](#), [FML](#), [FMT](#), [MFM](#), [NBCDI](#), [IIS](#)) and also in the internally available Annex to Measure of the Rector No. 2/2024 – Details to the Rules of the

Quality Assurance System for Educational, Creative, and Related Activities and Internal Evaluation of the Quality of Educational, Creative, and Related Activities at the University of Defence (Part A.3 and Part B) and in Measure of the Rector of the University of Defence No. 15/2023 – Ethics Committee of the University of Defence.

The management of the process of quality assurance and internal evaluation of the educational, creative, and related activities of the University of Defence is carried out by the Internal Evaluation Board of the University of Defence. The Board, among other things, decides on the evaluation of activities and determines recommendations for the improvement and development of the evaluated activities. It also prepares, and the Academic Senate of the University of Defence approves, the Report on the Internal Quality Assessment of the Educational, Creative, and Related Activities of the University of Defence and its annual supplements.

The long-term performance of quality assurance and internal quality assessment consists in the fulfilment of quality standards in the evaluated activities of the University and is aimed at the fulfilment of the objectives set by the strategic documents of the University of Defence in Brno (the [Strategic Intent for Educational and Creative Activities of the University of Defence for the Period 2021–2030](#) and its annual implementation plans, the Definition Framework of the Competences of the University of Defence in Brno, and the Strategy of Creative Activities of the University of Defence in Brno until 2025, looking towards 2030).

The quality assurance and evaluation of creative activity at the UD is focused in particular on the clear definition and fulfilment of the strategic goal of creative activity of the UD and its units, the establishment of processes for the management of creative activity at the UD units, the provision and success of obtaining special-purpose support within the units, the development of the ability to cooperate internationally on the results of creative activity and in the implementation of projects in the field of research, development and innovation, the growth in the number of publications in the Open Access mode, the achievement of results (esp. Jimp and JSC) of both academic staff and PhD students, and growth in the number of impacted articles in the first (Q1) and second quartile (Q2) of the Journal Citation Reports or Web of Science Core Collection of discipline-relevant journals, with the quartile determined by the Article Influence Score (AIS).

Each evaluation includes a recommendation of measures for further development of the evaluated unit for improvement and the setting deadlines for their adoption, and in case of identified non-conformities, a recommendation of corrective and preventive measures. A follow-up evaluation or follow-up inspection may be carried out after the expiry of the set deadlines.

The University has established ethical principles and procedures for creative activities which binding for all employees and students of the University ([Code of Ethics of the University of Defence](#), Articles 1, 2 and 4; internally available Measure of the Rector of the University of Defence No. 6/2018 – Intellectual Property, and Measure of the Rector of the University of Defence No. 12/2023 – Final Theses). With regards to the ensuring the protection of industrial property objects and the treatment of intangible results of

research and development, the internal standards of the Ministry of Defence are followed.

The UD has had the Repozitar.cz system at its disposal since 2020; it is primarily used to detect plagiarism in the presented results of habilitation and appointment procedures.

In order to assess compliance with ethical regulations, including that of the area of creative activities, the University has established, by means of the [Statutes of the University of Defence as amended by the 1st, 2nd, 3rd and 4th Amendments](#) (Article 12a(1) and (2)), an Ethics Committee as an independent body to ensure compliance with ethical standards in the conditions of the University. In particular, the Ethics Committee adopts and discusses:

- suggestions pointing to possible violations of the University's Code of Ethics by persons to whom the Code of Ethics applies, and issues decisions on them,
- upon request, assesses and issues opinions on proposals for university research, development and innovation projects, as well as research proposals that are part of theses and habilitation theses, whether involving human probands or experimental animal models or containing intervention programmes.

The Committee's scope of activity and rules of conduct are set out in the internally available Measure of the Rector of the University of Defence No.17/2024 – Organizational Regulations of the University of Defence, and Measure of the Rector of the University of Defence No.15/2023 – Ethics Committee of the University of Defence.

The opinions of the UD Ethics Committee are published in an anonymized form on the UD [website](#) (Czech version). Between 2018 and 2024, the UD Ethics Committee discussed cases of violations of the protection of intellectual and other property of authors, including plagiarism of the results of other authors' work. Six cases of violation of protection of intellectual and other property of authors were confirmed.

The Research, Development and Innovation Information Portal at the UD provides academic staff with access to guidelines and templates for research practice and publishing.

4.4 Sustainability and resilience of R&D&I

The HEI will describe the arrangements for sustainability and increasing the resilience of R&D&I, if such a system exists, and provide examples of its implementation. These include:

- The sustainable development concept (strategy, objectives, plan and implementation).
- Social responsibility strategy.
- A knowledge transfer system, if it is established at central level.³
- The third role, the transfer of R&D&I results to society and interaction with local actors.
- The concept of research data management (data collection, access and sharing of data, use of the information obtained for R&D&I management, responsibility for data files, archiving and backup of data).
- Ethics and personal data protection.
- Intellectual property protection.
- Ensuring institutional resilience (resistance to foreign influence, cyber security, risk prevention, prevention of misuse of R&D&I and knowledge transfer results, a system to prevent or mitigate the negative impacts of R&D&I and knowledge transfer in society).
- Digitisation and the use of smart technologies.
- The institutional strategy for Open Science 2.0/Open Access (if one exists), including information on the operation of the institutional repository or similar tools.
- A system for training undergraduate and postgraduate students as well as staff in the field of intellectual property protection and technology transfer.

The HEI will demonstrate the effectiveness of its procedures by examples (e.g., the number of people trained in intellectual property protection and technology transfer, data on the usage of Open Access repositories, handling of risk incidents, etc.).

Maximum 300 words per point.

Self-Evaluation:

The UD has developed a sustainable development strategy that links academic activities with environmental, economic, and social responsibility. This strategy includes goals related to minimising the ecological footprint, promoting green technologies, and integrating sustainability into educational and research

³ If the knowledge transfer system is decentralised to the unit level, the HEI shall describe how the system works.

programmes. Examples include the implementation of energy-saving measures on campuses, such as building upgrades, switching to renewable energy sources. In addition, the UD focuses on research into low-impact technologies, such as the development of biodegradable military equipment materials. Student involvement is an integral part of this. The University's educational programmes include courses and modules focused on sustainability, which prepare graduates to meet the challenges of climate change and global security. The UD furthers sustainability by way of interdisciplinary research teams that bring together experts from different fields. Adherence to high ethical standards in research and development is a key principle. This includes both the transparent publication of results and emphasis on the protection of intellectual property. The UD systematically links sustainability with research and educational activities. Thanks to its strategy and specific measures, it contributes not only to the development of defence capabilities, but also to the achievement of sustainable development goals within the Czech and international academic community.

Records of the results of the scientific research activities of the academic staff of the UD are kept in an internal information system. Each result must be clearly marked with a sensitivity level and is treated accordingly. Regular staff training sessions on the principles of protecting sensitive R&D&I results are held.

The requirements for respecting copyright and protection of intellectual property are contained in Measure of the Rector No.6/2018 – Intellectual Property and the Code of Ethics of the University of Defence. In the field of education, the UD focuses in particular on combating plagiarism and fraud within studies in relation to the protection of intellectual property. The UD uses the “Repozitar.cz” system to detect plagiarism of habilitation theses, academic publications, etc. The system also serves as an archive of habilitation theses and other works of authorship and provides the backing up of the data. The UD uses the “Theses.cz” system to detect plagiarized theses. The UD uses the “Odevzdej.cz” system to check for plagiarized term papers.

The UD uses the Garance application and the database of theses within the UD information system for the archiving of theses.

Doctoral programme students are educated on the issue in the Methodology of Scientific Work course, which includes an introduction to the relevant legislation on creative activity, the relationship to intellectual property, and information on technology transfer.

The management of the area of intellectual property, including its transfer, is a matter for the owner of the intellectual property (IPR), which is the MoD. The UD is an organizational unit of this organizational component of the state without its own business identification number, so it does not own the IPR, and therefore cannot carry out technological transfers. In order to process the initial IPR documents at the MoD, a systemized post was created on 1 January 2025 within the RETC, the job description of which includes the management and protection of intellectual property.

Digitalization and the use of “smart” technologies play a key role in the educational

process, research, and administration of the UD. The UD uses systems that support distance and hybrid learning, as well as autonomous learning. Examples of these systems are principally Moodle, but also platforms such as MS Teams. An important element is an increase in the intensity of the involvement of simulation technologies at different levels, which enable training in emergency situations, military operational training, and security management. The aim is to model realistic scenarios without the need for physical deployment. The University is striving for a closer integration of artificial intelligence into the process of processing the results of scientific work. Processing data obtained as part of project implementation and its use in improving management processes is commonplace practice. Just as with educational processes, the use of virtualization, specifically in the context of simulation, is growing in importance in research. The UD has achieved a high degree of digitalisation in the specification and subsequent implementation of developmental requirements in the educational process, and also in research. However, there are a number of obstacles arising from the fact that the UD is a budgetary unit of the state and, as such, certain systems related to digitisation are imposed on it.

The UD is the first university and institution which, within its scientific base and expert activities in the Czech Republic, has implemented criteria for a major information system (in a legislative context).

UD is actively integrating “smart” technologies into all key areas of its operations. These technologies not only make the educational process more efficient, but also push the boundaries of research and innovation, responding to current and future challenges in security and defence. The laboratory base is being expanded to include virtual and augmented reality systems. In order to make military operation training, teaching of tactics, medical training, etc. more effective, the base laboratory is being expanded. The UD participates in projects using sensorless systems, sensor networks, artificial intelligence, and other technologies for military and security usage.

The topic of institutional resilience at the UD encompasses complex approaches aimed at protecting and strengthening key areas of the University in relation to security and risk prevention. In particular, it focuses on resilience against the influence of foreign powers. Regular training sessions for staff and students are conducted on hybrid threat methods, disinformation, and influence operations. Systems are implemented to monitor and assess the risks of influence campaigns. Measures are in place within internal control mechanisms to detect and prevent infiltration of key structures by foreign entities.

In the context of the Open Science requirements, an institutional [Repository](#) has been established to archive and make scientific results and data available. Only results that meet security and compliance requirements are deposited in the Repository.

The Open Science process at the UD is unique in that it combines the principles of openness with the requirements for security and protection of sensitive information, which is essential in the context of military and security research. The UD is guided by the principle of “as open as possible, as closed as necessary,” which takes into account both the requirements for sharing scientific results and the protection of national

security and compliance with international agreements.

All research activities are initially evaluated for possible publication of results. Emphasis is placed on identifying results that can be openly published and, conversely, on protecting sensitive or classified information. Research that falls within the fields of military strategy, security technology, or cyber defence is carefully assessed for the risks associated with its public sharing. The UD is bound by international agreements, for example with NATO, the EU, and other security institutions, which set out the rules for the handling of sensitive data. Research teams are trained to publish results in accordance with these agreements without compromising national or alliance security. The University is committed to sharing research results that are not sensitive in a security or strategic sense, particularly in the areas of basic research, educational studies, and health sciences. Publication in open access scientific journals is actively encouraged where circumstances permit. Researchers are encouraged to use licenses such as Creative Commons, as long as this does not compromise security interests. The UD encourages researchers to publish research results in reputable journals and databases that meet Open Science standards (e.g. Web of Science, Scopus or other recognized platforms). Data that could compromise security interests or contain classified information are excluded from the open sharing process. This information is stored in accordance with security regulations and rules for handling classified information. The University provides its researchers with training and methodological support in the area of Open Science.

This support includes advice on the creation of Data Management Plans that incorporate the principles of FAIR (Findable, Accessible, Interoperable, Reusable) while respecting security rules.

The UD thus integrates the principles of Open Science into its activities responsibly, with respect to its unique role in the field of defence and security research. In doing so, it contributes both to the development of academia and to the protection of the strategic interests of the Czech Republic.

PERSONNEL POLICY

4.5 Structure of human resources

The HEI shall describe the current state, age structure, degree of internationalization and development trends of the staff involved in R&D&I, along with their distribution by a job title and gender for the period of 2020–2024 as detailed in annex tables (Tables 4.5.1 to 4.5.3) (including the provision of technical and economic facilities).

Maximum 1000 words.

Self-Evaluation:

The current status, age structure, and development trend of employees involved in R&D&I in the assessed period, including their structure according to job classification and gender aspects, is reflected in the table section (Tables 4.5.1, 4.5.2, 4.5.3), including employees with foreign citizenship, except for those with Slovak citizenship.

4.5.1 Staff involved in R&D&I of the University (FTE) in the period under review

Academic/professional position	Total 2020	Of which women [%]	Of which foreign [%] ⁴	Total 2024	Of which women [%]	Of which foreign [%]
Professor	35,5	13	0	36,7	12	0
Associate Professor	66,7	12	0	72,9	12	0
Assistant Professor	200,8	21	0,5	219,3	25	1
Lecturer	147,4	40	3	210,9	42	3
R&D Personnel ⁵	14	71	0	36	44	0
Researchers in other categories ⁶	0	0	0	0	0	0
Technical and economic staff ⁷	184,2	47	0	188,6	45	0
Early career researcher ⁸	86,5	19	0	89,9	21	1
Scientific, research and development staff involved in teaching activities	464,4	27	1	575,8	30	1
Total number of foreign nationals	8	37,5	100	9	33	100

Note: The categories professor, associate professor, assistant professor, lecturer, other scientific, research and development staff, scientific staff not falling into other categories and technical and economic staff are mutually exclusive, i.e. one staff member is reported under one category only. Scientific, research and development staff involved in teaching activities, as well as early career researchers are reported collectively for all the above-mentioned categories.

⁴ Researchers with Slovak citizenship are not considered foreign.

⁵ The category "Other scientific, research and development personnel" includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).

⁶ The category "Researchers not falling under other categories" includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).

⁷ Who participates in the management and support of R&D&I in the institution.

⁸ See Definition of Terms in Methodology HEI2025+.

Note: The average number of hours worked is calculated as the ratio of the total number of hours actually worked during the reference period, from 1 January to 31 December, by all staff (including agreement on work activity, excluding agreement on work performance) to the total annual working time pool per full-time employee. The full-time status of the worker in the evaluated unit is always reported. If an employee holds more than one type of full-time job within the evaluated unit, the total sum of the two shall be reported.

4.5.2 Percentage of the HEI's staff involved in R&D&I, categorized by age structure, job title, and gender in the year 2020 (number of physical employees and staff)

Academic/ professional position	Under 29 years [%]		30-39 years [%]		40-49 years [%]		50-59 years [%]		60-69 years [%]		70 years and over [%]	
	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women
Professor	0	0	0	0	18	25	23	75	38	0	21	0
Associate Professor	0	0	16	22	31	33	24	33	21	12	8	0
Assistant Professor	3	2	28	36	33	34	18	11	15	15	3	2
Lecturer	5	3	25	21	40	49	20	17	8	8	2	2
Early career researcher ⁹	7	6	50	60	18	11	19	17	6	6	0	0
R&D Personnel ¹⁰	0	0	33	36	20	18	33	46	14	0	0	0
Researchers in other categories ¹¹	0	0	0	0	0	0	0	0	0	0	0	0
Technical and economic staff ¹²	5	9	15	14	29	27	34	37	16	13	1	0
Scientific, research and development staff involved in teaching activities	3	3	27	31	31	36	20	20	14	9	5	1

Note: The total number of employees/workers as of 31.12. of the calendar year in question is to be given, irrespective of the proportion of full-time equivalents, but only in an employment relationship, i.e. not including persons working parttime agreements. Other types of contractual relationships under the Civil Code that involve purchase of services are not included.

4.5.3 Percentage of the HEI's staff involved in R&D&I, categorized by age structure, job title, and gender in the year 2024 (number of physical employees and staff)

⁹ See Definition of Terms in Methodology HEI2025+.

¹⁰ The category "Other scientific, research and development personnel" includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).

¹¹ The category "Researchers not falling under other categories" includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).

¹² Who participates in the management and support of R&D&I in the institution.

Academic/ professional position	Under 29 years [%]		30-39 years [%]		40-49 years [%]		50-59 years [%]		60-69 years [%]		70 years and over [%]	
	Tot al	Wom en	Tot al	Wom en	Tot al	Wom en	Tot al	Wom en	Tot al	Wom en	Tot al	Wom en
Professor	0	0	0	0	21	25	16	25	28	50	35	0
Associate Professor	0	0	1	0	42	50	23	38	21	12	13	0
Assistant Professor	1	2	22	22	37	51	21	13	15	10	4	2
Lecturer	6	3	20	19	41	46	24	22	7	8	2	2
Early career researcher ¹³	3	5	51	52	26	32	15	11	5	0	0	0
R&D personnel ¹⁴	35	11	23	28	13	22	21	28	8	11	0	0
Researchers in other categories ¹⁵	0	0	0	0	0	0	0	0	0	0	0	0
Technical and economic staff ¹⁶	3	5	15	14	29	27	30	30	21	22	2	2
Scientific, research and development staff involved in teaching activities	5	3	17	20	37	45	21	20	14	10	6	2

Note: The total number of employees/workers as of 31.12. of the calendar year in question is to be given, irrespective of the proportion of full-time equivalents, but only in an employment relationship, i.e. not including persons working parttime agreements. Other types of contractual relationships under the Civil Code that involve purchase of services are not included.

¹³ See definitions in Methodology HEI2025+.

¹⁴ The category "Other scientific, research and development personnel" includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).

¹⁵ The category "Researchers not falling under other categories" includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).

¹⁶ Who participates in the management and support of R&D&I in the institution.

4.6 Academic and Research Careers

The HEI will briefly describe the central system for HR recruitment, placing particular emphasis on recruitment from outside the HEI, especially from abroad, as well as system of career development of academic and research staff, if such system exists. Information will be provided on:

- Career development rules and legislation related to the recruitment and career development of domestic and foreign employees (e.g. Career Code, HR Award, OTMR policy, etc.).
- International tenders.
- The process of new employee adaptation and mentoring.
- Transparent distribution of institutional time, attitudes towards chaining of contracts and senior academic positions.
- Rules for filling senior positions in the context of R&D&I.
- The rules and support system of sabbaticals.
- Measures for the return of workers after a stay in an external workplace, including a foreign workplace.
- Arrangements for workers to return after maternity/parental leave or other career breaks (e.g. caring for family members).
- Other relevant information at HEI discretion.

The HEI shall provide a reference to an existing career code or similar document (if one exists). The HEI shall describe the effectiveness of the systems used with examples (e.g. a model example of the adaptation process, a specific anonymised example of an academic's career path, statistics on the return after maternity/parental leave or career breaks before and after the implementation of the measures, etc.).

Maximum 300 words per point.

The system of career growth of academic and research staff at the University of Defence is regulated in detail by both Ministry of Defence regulations and the internally available Measure of the Rector No.7/2019 – Management of Career Development of Academic Staff. The UD is guided by the approved [OTM-R Policy](#), the [Human Resources Strategy for Science Management \(HRS4R\) of the University of Defence – Action Plan](#) and the regularly updated [Gender Equality Plan of the University of Defence for the Period 2022–2030](#). On 16 January 2024, the UD received the HR Excellence in Research Award.

Career development of academic staff is executed in the form of annually evaluated personal career development plans consisting of a mandatory development part and an optional part comprising individual goals. In order to meet the conditions set out in these plans, the managers create appropriate conditions for the academic staff. The University has also implemented the Academic Staff Evaluation Information System application as a support tool for the evaluation of academic staff, which is used to evaluate the performance of the staff in two main areas: educational activities and creative activities. The model used takes into account the staff member's workload in terms of academic functions and managerial activities.

The overall evaluation of the academic staff member is formed by the aggregation of

the aforementioned areas, wherein educational activity was evaluated on the basis of pedagogical activity relating to instruction, pedagogical activity relating to student supervision, and organizational activity relating to the development of studies. Within creative activities, R&D&I results are evaluated according to the definitions of types R&D&I results within the R&D&I information system—the R&D&I database, other results, and organizational activities related to R&D&I. Standards are set for different categories of academic staff (lecturer, assistant professor, associate professor, professor) in the individual areas evaluated (educational activities, creative activities). The standards themselves are set differently for each part of the University (faculty, institute, centre), depending on its focus.

Due to the nature of the UD being a state university and the only military university in the Czech Republic, all degree programmes with currently valid accreditation are accredited only in the Czech language. Several instructors of other nationalities work at the UD, especially in the position of foreign language teachers. The hiring selection procedures with the participation of foreign national native speakers typically concern the filling of teacher or tester positions.

However, foreign nationals also apply for positions within other units aside from the Language Centre and are subsequently employed at the UD as civilian employees.

The adaptation of new employees and employees returning after a career hiatus is addressed at UD by Measure of the Rector No.7/2019 – Management of Career Development of Academic Staff, and is supported by the [Gender Equality Plan of the University of Defence for the Period of 2022–2030](#) (Priority Area 4: Gender Equality in Selection and Career Development). Adaptation is carried out according to the specifics of individual units and on the basis of adaptation plans, which, among other things, impose the aforementioned Gender Equality Plan (to create an adaptation programme for individual employees reflecting the specifics of different groups of employees, workplaces, etc.) on management staff.

There is always a clearly identified person to whom early-career researchers can turn with questions concerning the execution of their duties (see the internally available document Measure of the Rector University of Defence in Brno – Career Development Management of Academic Staff, where the role of the mentor is regulated in Article 10). At the same time, an academic staff member may address his/her direct supervisor (the head of the group, section, or department, depending on the structure of the unit), and a PhD student may address his/her supervisor. However, the University must pay more attention in the future to the actual preparation of academic staff for the role of mentors and supervisors.

Support for academic staff in the field of creative activities is embedded in the [Strategic Intent for Educational and Creative Activities of the University of Defence for the Period 2021–2030](#) Measure 4A2: Optimize Administrative and Institutional Facilities for Research and Development Support. The measure has been incorporated into the tasks set out in the annual plans for the implementation of the strategic plan for the years 2021–2024.

Within the framework of the [Human Resource Management Strategy for Science](#)

(HRS4R) of the [University of Defence - Action Plan](#), the University has set the task to “provide experienced mentors to support and advise early career researchers in their career development, and to organize regular mentor meetings to share exchange experience” (target for 2Q 2027).

The University ensures the transparent distribution of employment terms through clearly defined rules and processes, which are enshrined in internal regulations and other documents ([Regulations of the Selection Procedure for Filling the Positions of Academic Staff of the University of Defence as amended by the First Amendment, Measure of the Rector of the University of Defence No.10/2024](#) – Details of the Regulations of the Selection Procedure for the Filling of the Positions of Academic Staff at the University of Defence). Each staff member shall be informed of the criteria for each post, which shall take into account the volume and nature of the duties, such as teaching, research, administrative activities, and support for the development of the University. The University also allows employees to make suggestions for adjustments or comments, which fosters trust and openness in institutional management.

The University approaches the chaining of contracts and the filling of senior academic positions in accordance with applicable legislation and the principles of transparency. The chaining of fixed-term contracts is restricted by legislation. Once the statutory threshold is reached (though typically earlier), the University seeks to stabilize employment relationships by moving to a permanent contract.

Senior academic positions are filled through open selection procedures that take into account professional competence, scientific contribution, and management experience. Again, the filling of senior positions is governed by the Regulations and Measures referenced above.

The rules for the filling of senior positions in the context of R&D&I are regulated in detail by the [Regulations of the Selection Procedure for Filling Academic Staff Positions at the University of Defence, as amended by the 1st Amendment](#), which was supplemented by Measure of the Rector of the University of Defence No.10/2024 – Details to the Regulations of the Selection Procedure for the Filling of Academic Staff Positions at the University of Defence.

The position of an academic staff member automatically also includes scientific research activities, and during the evaluated period, the positions of senior researchers were held by academic staff—professional soldiers and civilian employees.

The evaluation in the Academic Staff Evaluation Information System application is used as one of the factors considered in the filling senior positions in the context of R&D&I.

The procedures for the filling of academic staff positions with foreign national staff was based on the role of the UD within the Ministry of Defence as a state military university. It was therefore based on the general principles for filling these posts, which are described in the MoD Labour Regulations and the departmental regulations setting out the rules for the employment of foreigner nationals.

Due to the above-mentioned facts, it is not possible to employ academic staff from the ranks of foreign professional soldiers at the UD. The selection of academic staff—

civilian employees from abroad was carried out in the same way as the selection of domestic applicants, according to the [Regulations of the Selection Procedure for Filling Academic Staff Positions at the University of Defence, as amended by the 1st Amendment](#), and the subsequent Measure of the Rector. Under predetermined conditions, the applicants' qualifications for a particular systemized post were determined.

In accordance with Section 76 of the Higher Education Act, the University grants six months of creative leave to academic staff at their request. The University's rules for granting sabbatical leave are regulated within Measure of the Rector of the University of Defence in Brno No. 7/2019 – Management of Career Development of Academic Staff (internally available document). Academic staff may be granted sabbatical leave, in particular in the final phase of their studies in a doctoral programme or in the final phase of preparation for the submission of a proposal for the commencement of habilitation proceedings or proceedings for the appointment to the rank of professor. An academic staff member requests the granting of sabbatical leave by submitting a written request for sabbatical leave to his or her line manager at least two months prior the date from which sabbatical leave is requested. The Rector makes the decision on the request. The request is submitted to the Rector for his/her decision by the manager within whose unit the academic staff member is working. Together with the application, the lead manager also forwards to the Rector his/her written opinion of the academic staff member's line manager's and his or her own written opinion on the application, provided that both opinions must clearly indicate whether or not it is recommended that the Rector should grant the request for sabbatical leave. This recommendation will depend on the development plans of the department in which the academic staff member is based, and on whether the granting of sabbatical leave is consistent with the academic staff member's career development.

Returning employees after a period of stay at an external workplace, including one abroad, is addressed both in the [Human Resources Management Strategy for Science \(HRS4R\) of the University of Defence – Action Plan](#) and in the [Gender Equality Plan of the University of Defence for the Period 2022–2030](#).

Through its measures, the University creates conditions for both enabling and facilitating of the return of employees from a period of stay at an external workplace, including one abroad:

- creating adaptation programmes for individual staff members returning from their stay,
- supporting staff in maintaining contact with these sites,
- a designated staff member and University Human Resources staff provide assistance with administrative and organizational issues related to the return of the employee.

Staff members returning following maternity/parental leave or other career breaks is addressed in both the [Human Resources Management Strategy for Science \(HRS4R\) of the University of Defence – Action Plan](#) and in the [Gender Equality Plan of the University](#)

of Defence for the Period 2022–2030.

Through its measures, the University creates conditions to both ensure and facilitate the return of staff following maternity/parental leave or other career breaks:

- creating adaptation programmes for individual employees returning after a break from work,
- measures taken to modernize the workplace environment,
- the possibility of adjusting working hours for employees caring for children or a dependent,
- part-time work, or, depending on the nature of the work and workplace, the possibility of combining it with a home office mode,
- an extension of a fixed-term contract to exclude time spent on maternity and parental leave,
- a children's playgroup is run as a pre-school for the children of employees,
- a designated staff member and University Human Resources staff provide assistance with administrative and organizational issues related to the return of the employee, the offer of benefits within the framework of the departmental collective agreement.

4.7 Gender equality measures

The HEI will briefly describe the measures relating to the application of gender equality in the areas required for assessment criteria 4.5, 4.6, with an emphasis on:

- Gender equality in recruitment and career development.
- Legislation and documents regulating gender equality (e.g. Gender Equality Plan, Action Plans, strategic documents for equality, including links to overarching strategies, etc.).
- The filling of leadership positions (including gender balance in leadership positions, see Table 4.7.1).
- Nominations to professional bodies.
- Evaluation and remuneration.
- Measures to reconcile the work and family life of researchers (flexible working hours, flexible forms of work, maternity/parental leave management, facilitating child/dependent care, age management in relation to gender).
- Measures to eliminate negative workplace behaviour such as mobbing and sexual harassment.

The HEI shall provide evidence of the examples from practice (e.g. use of flexible working hours, dealing with cases of mobbing or sexual harassment, compliance with the principles of gender equality in HEI professional bodies, etc.).

Maximum 300 words per point.

Self-Evaluation:

The UD consistently applies the principle of gender equality in all areas of its activities, especially within recruitment, career development, leadership positions, nominations to professional bodies, evaluation, and remuneration.

The University emphasizes equal opportunities for men and women in the selection of new employees and in career development planning. The principle of gender equality is systematically applied in recruitment processes to ensure transparency and fairness in the selection process. Employees are also supported in their professional development and career planning regardless of their gender.

On 1 November 2022, the Rector-in-Chief approved the [Gender Equality Plan of the University of Defence for the Period 2022–2030](#). The plan was created in accordance with MoD documents, which regulate equal opportunities for women and men, and also in accordance with the European Strategy for Gender Equality for the period 2020–2025.

Gender equality is consistently taken into account in the filling of leadership positions. The University of Defence University actively supports women in their candidacy for leadership and decision-making positions. These measures contribute to increasing gender diversity in management structures.

The University ensures that nominations for membership in professional bodies are consistent with the principle of gender equality. When selecting members of expert committees and working groups, emphasis is placed on the representation of both genders.

The evaluation and remuneration of employees is based on objective criteria that do not take differences in gender into account. The University ensures that the principles of equal pay for equal work are observed in practice.

The UD supports researchers in balancing work and family life through the following

measures:

- flexible working hours,
- the possibility of part-time work,
- a combination of working from home and at the workplace (depending on the nature of work),
- support when returning from maternity and parental leave,
- running a playgroup as a pre-school for the children of employees,
- age management with consideration of gender needs.

Category	Professional Soldiers (Academic Staff)	Professional Soldiers (Not Academic Staff)	Civilian Employees (Academic Staff)	Civilian Employees (Not Academic Staff)	Total
Total Number	219	149	365	352	1 085
Part-Time Employment	0	0	85	20	105
Percentage of Part-Time Employment	0 %	0 %	23,3 %	5,7 %	9,7 %

The University pays particular attention to creating a safe working environment:

- There have been no reports of mobbing, bossing, or sexual harassment within the evaluated period.
- A support system is in place to deal with any problems, including a counselling centre, ethics committee, disciplinary committee, legal services department, military chaplain, etc.

On March 11, 2024, the [Methodology Guide of the Rector of the University of Defence on the Handling Sexual Harassment Cases](#) was issued, which sets forth procedures for handling these situations and reinforces prevention measures.

Gender ratios in management positions are statistically expressed in Table 4.7.1.

4.7.1 Gender balance in management positions

Senior staff	2020		2024	
	Men	Women	Men	Women
Rector	0	1	1	0
Vice-Chancellor	4	0	3	1

Dean ¹⁷	3	0	3	0
Academic Senate	23	4	21	7
Scientific/Artistic/Academic Council	35	2	38	5
Quaestor	1	0	1	0
Board of Directors	0	0	0	0

Note: If one person holds more than one of these positions within the HEI, he/she will be counted in each.

4.8 Mobility of academic and research staff (including sectoral and inter-sectoral mobility)

The HEI shall describe in a concise and structured manner its strategies and objectives for the mobility of academic and research staff (including PhD students), with particular emphasis on mobility related to the development of excellent science and interdisciplinary (intersectoral) mobility. The HEI shall identify potential barriers to mobility, including gender-based barriers. The HEI shall provide information on long-term stays abroad by its own academic staff or, conversely, by foreign staff at the HEI being evaluated.¹⁸

The achievement of the set objectives will be demonstrated by the HEI by describing specific examples of mobility or by brief statistics on mobility during the period of 2020–2024.

Maximum 500 words plus 200 words for each example given (max. five examples with a specific description of the relevance of mobility to the stated objectives).

Self-Evaluation:

The UD strategy related to the mobility of academic staff and doctoral students has been based on the adopted concept oriented towards the strategic partners of the school and aligned with the needs of the defence sector, the long-term plan of the University, and the programmes of study so that academic staff and doctoral students increase their competence, especially with an emphasis on security and defence issues. The ERASMUS+ programme is the tool for the implementation of this strategy.

The mobility of academic staff has been and is primarily linked to the execution of international projects that take place within the framework of international (bilateral) agreements, the promotion of relations to strengthen scientific progress and innovation in science, the building or strengthening of networks between individual researchers and cooperation between universities in the framework of scientific research cooperation, and mutual disciplinary awareness at joint bilateral scientific

¹⁷ or other head of a relevant work unit of a higher education institution under Section 22(1) of the Higher Education Act performing R&D&I activities, regardless of the designation.

¹⁸ Long-term mobility means an uninterrupted period of more than three months.

events and platforms.

With regards to the position, role, and focus of the UD, there are objective limits that significantly constrain the University within the area of sectoral and inter-sectoral mobility in relation to the development of business in the field of research, development, and innovation, and contract research. Therefore, the UD engages in activities in this area only marginally and in relation to the needs of the MoD.

Barriers affecting mobility include:

- safety limits set by the MoD's governing authorities,
- the cost per student of military doctoral students—set out in ministerial regulations.

In 2023, the return phase of the “Mobility at the University of Defence in Brno” project was successfully completed, carried out under the Operational Programme Research, Development and Education project announced by the Ministry of Education and Science, financed at 85% by the European Union and co-financed at the level of 15% from the state budget. Although the subsidy for the project had obtained in 2020, due to COVID pandemic, the actual trips abroad were postponed until 2022. Within the framework of the project, eight scientists from the University of Defence travelled abroad for work placements (including three doctoral students) to six countries. During these internships, they participated in scientific projects. In the return phase, they reported on the experience gained abroad and the results of their activities at seminars or workshops organized at the UD. These researchers also gained important contacts with foreign countries for possible future cooperation.

RESEARCH INFRASTRUCTURE

4.9 Research infrastructure

The HEI will describe the system for acquiring/optimizing expensive instruments and equipment, as well as refurbishing outdated expensive instruments. The HEI will also briefly present the internal organization of the research infrastructure (including technology, expensive instruments, and instrumentation)¹⁹. The HEI will describe the system of sharing (including external research entities) of instruments and instrumentation, including expensive instruments and instrumentation units, referred to as 'core facilities' (if such a system exists). The HEI will demonstrate the effectiveness of the systems with examples (e.g., specific instruments acquired/optimised and their relevance to the achievement of research objectives, examples of sharing of expensive instruments and instrumentation, statistics on sharing of expensive instruments and instrumentation, etc.). The HEI will briefly comment on the data in Table 4.9.1.

The HEI shall also indicate whether it hosts large research infrastructure projects. The name and a brief description will be provided.

Maximum 500 words plus 200 words for each example given (max. five examples).

Self-Evaluation:

Acquisition/optimization of cargo instruments and equipment, and the renewal of outdated cargo instruments, is carried out at the UD in accordance with Act No.134/2016 Coll., on Public Procurement as amended and in accordance with the Internal regulations of the Ministry of Defence of the Czech Republic, as amended.

The request for the acquisition of instruments and equipment is entered by the researcher into the Research, Development, and Innovation Information Portal at the University of Defence. The request is processed by the specialized units of the Bursar's Department and is, in the final stage, submitted to the Procurement Office of the Economic Section of the Bursar's Department of the Rector's Office.

The internal system of the UD research infrastructure is based on the professional focus of individual units and departments of the school. On 1 July 2024, the Research, Expertise, and Technology Centre of the University of Defence (RETC) was established, the professional framework of which represents an integrated unit as a shared centralized support and technological workplace with a wide range of modern laboratory capacities to support creative and expert activities, with the concept of open access for research and expert activities. The centre aims to provide physical and virtual access to its unique capabilities to internal and external users from academia and the industry sector.

The data in Table 4.9.1 is based on the Financial Information System. From the data in the table, it is possible to assess the stability in expenditure over the last three years.

¹⁹ The definition of research infrastructure is set out in the Framework for State Aid for Research, Development and Innovation (2014/C 198/01) and Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in accordance with Articles 107 and 108 of the Treaty.

The UD is not host to large research infrastructure projects.

4.9.1 Summary of expenditure/costs on research infrastructure and equipment for the period under review (including related non-investment and personnel costs).

Costs/expenses in thous. CZK/EUR/year	2020	2021	2022	2023	2024	Total value of assets ²⁰
Costs/expenses related to the acquisition of small fixed assets for R&D&I	31 213/1231, 3	27 946/1102, 4	35 618/1405	36 009/1420, 5	35 428/1397, 6	166 213/6569,7
Cost of repairs and maintenance of equipment	940/37,1	1 648/65	1 291/50,9	5 680/224,1	1 068/42,1	10 628/419,3
Acquisition of tangible (DH) and intangible (DN) assets for R&D&I (investments)						
Of which software	3 279/129,3	919/36,3	6 156/242,8	2 133/84,1	4 616/182,1	17 103/674,7
Of which other intangible fixed assets	0	0	0	0	0	0
Of which land, buildings and structures	0	0	0	0	0	0
Other intangible fixed assets (machinery, apparatus, equipment, etc.)	42 562/1679	24 022/947,6	38 056/1501, 2	39 393/1554	40 966/1616	184 999/7297,8
Total infrastructure spending in years ²¹	77 994/3076, 7	54 535/2151, 3	81 121/3200	83 215/3282, 6	82 078/3237, 8	378 943/14948, 4

²⁰ Enter the sum of the row.

²¹ Enter the sum of the column.

FINANCES

4.10 Budget and structure of financial resources

The HEI shall provide and comment on an overview of the total R&D&I budget in the period of 2020–2024, broken down by organizational units of the evaluated HEI and by source of funds (Table 4.10.1). The HEI shall also comment on the shares of total costs/outputs covered by public and non-public sources by type of R&D&I for the period under evaluation as shown in Table 4.10.2.

As complementary data, the University will provide an overview of prestigious research projects obtained during the period of 2020–2024 (ERC²², MSCA²³, HHMI²⁴, HFSP²⁵, NSF²⁶, Horizon Europe²⁷, NIH²⁸, Wellcome Trust²⁹, EDF³⁰, OP JAK³¹, OP TAK³², NPO³³, GA ČR³⁴, TA ČR³⁵ etc.). Include information on the amount of funding received and whether the HEI were principal investigator or co-investigator in Tables 4.10.3, 4.10.4 and 4.10.5.³⁶

In addition, the HEI will describe in more detail up to five of the most important projects from the list of prestigious individual projects abroad (ERC, MSCA, HHMI, HFSP, NSF, etc.), providing basic information at the HEI's discretion and regardless of the funder: title, field of expertise, agency, amount of funding, other project participants, and other relevant information as appropriate.

²² The European Research Council (ERC) is part of the "Excellent Science" pillar of Horizon Europe. The ERC funds cutting-edge research by supporting individual Principal Investigators and their research teams.

²³ Marie Skłodowska-Curie Action (MSCA) is part of the "Excellent Science" pillar of Horizon Europe and is also aimed at supporting young researchers, including PhD students.

²⁴ Howard Hughes Medical Institute - a non-profit organization in the USA significantly supporting international biomedical research.

²⁵ Human Frontier Science Program - an international programme to support research, particularly in the natural sciences and computer science.

²⁶ National Science Foundation (USA).

²⁷ Horizon Europe - the EU's 9th Framework Programme for research and innovation, running from 2021-2027.

²⁸ National Institutes of Health (NIH) - an agency under the United States Department of Health and Human Services. NHI is a major player in project support for biomedical research.

²⁹ major UK private foundation supporting mainly biomedical research.

³⁰ European Defence Fund.

³¹ Operational Programme Jan Ámos Komenský - Priority 1 - Research and Development - multiannual programme under the Ministry of Education, Youth and Sports. Within the framework of the OP JAK it is possible to draw financial resources from the European Structural and Investment Funds (ESIF) in the period 2021-2027.

³² Operational Programme Technologies and Applications for Competitiveness. The European Regional Development Fund (ERDF) is available in the period 2021-2027 to co-finance business projects in the areas of research, development and innovation, digitalisation and digital infrastructure, business development, smart and sustainable energy and the circular economy.

³³ National Recovery Plan - under Pillar 5 - Research, Development and Innovation of the National Recovery Plan, the Recovery and Resilience Facility (RRF) is available for the period 2022-2026.

³⁴ Czech Science Foundation.

³⁵ Technology Agency of the Czech Republic.

³⁶ The military and the police HEIs, as parts of the organisational unit of the state, are treated specifically in terms of the possibility to participate in the projects.

A maximum of 500 words plus 200 for each example of a prestigious international individual project given.

Self-Evaluation:

Within the framework of the OP JAK scheme, the UD received a subsidy for its equipment with modern devices for the teaching and scientific activities of doctoral studies within the project “PhD Infrastructure at the UD.” The length of duration of the project is planned to be over the years 2024–2026, and the total amount of the subsidy is 37.7 million CZK.

The UD has received a grant from EDF as a co-investigator in the “European Agile Network for medical COUNTER-Measures Against CBRN Threats” (COUNTERACT) international project. The project aims to create a robust and agile network of European partners capable of developing and fielding medical countermeasures against the current primary CBRN threats. The project involves 13 entities from 11 EU countries, with planned funding of EUR 540,000 for the UD. The length of duration for the project is planned to be 48 months between 2023 and 2027.

The UD is also a co-investigator in the EDF-2022-FPA international project called the European Defence Medical Countermeasures Alliance (Resilience), which involves 95 entities from 16 countries. The project commenced in the second half of 2024; the first withdrawal of grant funds will take place in early 2025.

Furthermore, the UD is also a co-investigator of two international projects where foreign scientific agencies are the providers; no financial subsidy funds were withdrawn in 2024:

- HRZZ Croatia, project name: Mechanisms of Long-term Survival of Francisella in Amoebae (FranAm),
- NWO Netherlands, project name: Swarm Technology Enabling Advanced Drone-Facilitated Active Support Tactics for Military and First Responder Operations (STEADFAST).

4.10.1 Total budget of the HEI

Name of the HEI unit	Total budget in thous. CZK/EUR	Percentage of public funding in the Czech Republic	Share of public funding from abroad in %	Percentage of funding from other sources
University of defence	781 415/30825	99,29	0,71	0,00

4.10.2 Share [%] of total costs/outputs by type of R&D&I paid from public and non-public sources

	2020	2021	2022	2023	2024	Total
Basic research	4	3	5	4	4	4
Applied Research	96	97	90	93	93	93

Experimental development and innovation	0	0	5	3	3	3
Total	100	100	100	100	100	100

Note: For definitions see Definition of Terms in Methodology HEI2025+.

4.10.3 Projects supported by a foreign provider

In the role of beneficiary							
Provider / Investor	Programme/ Grant Scheme	Project name	Support (in thousands CZK/EUR)				
			2020	2021	2022	2023	2024
Total							
In the role of another participant							
Provider / Investor	Programme/ Grant Scheme	Project name	Support (in thousands CZK/EUR)				
			2020	2021	2022	2023	2024
EDF	EDF-2021-MCBRN-D	European Agile Network for Medical COUNTER-measures Against CBRN Threats (COUNTERACT)				4 493/ 177,2	1 939/ 6,5
EDF	EDF-2022-FPA	European Defence Medical Countermeasures Alliance (Resilience)					0
NWO The Netherlands	KIC	Swarm Technology Enabling Advanced Drone-Facilitated Active Support Tactics for Military and First Responder Operations (STEADFAST)					0
HRZZ Croatia	Croatian Science Foundation	Mechanisms of Long-term Survival of Francisella in Amoebae (FranAm)					0
Total						4 493/ 177,2	1939/ 76,5

Note: For co-sponsorship projects, please only indicate the amount of funding for the evaluated HEI.

4.10.4 Projects supported by the Czech provider

In the role of beneficiary							
Provider / Investor	Programme/ Grant Scheme	Project name	Support (in thousands CZK/EUR)				
			2020	2021	2022	2023	2024
Ministry of Education	OP VVV	Mobilita na Univerzitě obrany v Brně (Mobility at the University of Defence in Brno)			5 186/ 204,6	1 604/ 63,3	
Ministry of Education	OP JAK	PhD Infrastruktura pro UO (PhD Infrastructure of the University of Defence)					12 450/ 91,1
Ministry of the Interior	Bezpečnostní výzkum ČR 2015-	Protection and Disabling Tool for Armed Security (Escorts of Aircraft of the Police of the	580/2 2,9				

	2022	Czech Republic)					
Ministry of the Interior	OPSEC (2023-2029)	Biomarkery otrav látkami typu Novichok (Biomarkers of Novichok-Type Substance Poisoning)				410/1 6,2	410/1 6,2
Ministry of the Defence	Ambice (2020-2026)	EOMPS – Experimentální ověření Metodiky plánování schopností rezortu MO (Experimental Verification of the Methods of the Planning of the Abilities within the Scope of the Ministry of Defence)		93/3, 7	75/3	16/0, 6	
Ministry of Health	Zdravotnický aplikovaný výzkum (2020-2026)	Hit-to-lead vývoj malých molekul pro zlepšení radiační ochrany v terapii a diagnostic (Hit-to-Lead Development of Small Molecules for Improved Radiation Protection in Treatments and Diagnostics)				763/3 0,1	1 180/4 6,5
Ministry of the Interior	INTER-EXCELLENCE (2016-2024)	Indukce protivirové imunitní odpovědi slizniční vakcinací s užitím nanočástic (Induction of Antiviral Immune Response of Mucosal Vaccinations Using Nanoparticles)	1 114/4 3,9	1 064/4 2	834/3 2,9		
Ministry of the Interior	INTER-EXCELLENCE (2022-2029)	Koncepce neselektivních reaktivátorů cholinesteras inhibovaných organofosfáty (Conception of Non-Selective Cholinesterase Reactivators Inhibited by Organophosphates)				1 723/6 8	1 997/7 8,8
Ministry of the Defence	Ambice (2020-2026)	MAD21 – Nový maskovací universální/víceúčelový design (MAD21 – New Camouflage Universal/Multi-Purpose Design)			5 415/2 31,6	1 538/6 0,7	2 400/9 4,7
Ministry of the Defence	Ambice (2020-2026)	NEMOVITOST – Rizika predikce výše finálních cen v oblasti nemovité infrastruktury (NEMOVITOST – The Risks of the Prediction of Final Prices in the Area of Non-Tangible Infrastructure)			238/9 ,4	572/2 ,2	
The Czech Science Foundation	Standardní projekty	Nervově paralytické látky ze skupiny novičoků – toxicita a léčba (Nerve-Paralytic Substances of the Novichok Group – Toxicity and Treatment)			1 318/5 2	1 493/5 8,9	1 433/5 6,5
The Czech Science Foundation	Standardní projekty	Nespecifické a širokospektré cholinesterasové reaktivátory proti organofosforové intoxikaci (Non-Specific and Broad-Spectrum Cholinesterase Reactivators Against Organophosphorus Intoxication)			1 743/6 8,8	1 893/7 4,7	1 893/7 4,7
Ministry of the Interior	Bezpečností výzkum pro potřeby státu 2016-2021	Nové přístupy v diagnostice a terapii ozářených osob (New Approaches in the Diagnosis and Treatment of Irradiated Persons)	2 733/1 07,8				
Ministry of the Interior	Ambice (2020-2026)	Plánování a evidence improvizovaných úkrytů (Planning and Records of Improvised Shelters)				1 083/4 2,7	1 083/4 2,7
Ministry of the Defence	Ambice (2020-2026)	POS – Místo a úloha MO a GŠ AČR v procesu plánování obrany státu za krizových stavů			28/1, 1	28/1, 1	28/1, 1

		<i>(POS – The Place and Role of the Ministry of Defence and the General Staff of the Army of the Czech Republic in Planning for the Defence of the State in States of Emergency)</i>					
Ministry of Health	Zdravotnický aplikovaný výzkum (2015-2023)	Potenciál xanthohumolu a beta hořkých kyselin pro léčbu nozokomiálních infekcí <i>(The potential of xanthohumol and beta-bitter acids in the therapy of nosocomial infections)</i>	884/3 4,9				
Ministry of the Defence	Ambice (2020-2026)	preSATPET – Analýza možnosti využití pasivních sledovacích systémů pro účely sledování družic na orbitách Země <i>(preSATPET – Analysis of possible uses of passive surveillance systems for monitoring satellites in Earth's orbit)</i>			1 169/4 6,1	892/3 5,2	424/1 6,7
Ministry of the Defence	Ambice (2020-2026)	PVO 21 – Pozemní PVO 21. století, eliminace nových hrozeb <i>(PVO 21: Ground-based anti-aircraft warfare of the 21st century: the elimination of new threats)</i>			1 976/7 8	940/3 7	730/2 8,8
Ministry of the Defence	Ambice (2020-2026)	TĚLO – Tělesná způsobilost populace jako rizikový faktor pro zabezpečení obranyschopnosti České republiky <i>(TĚLO – The physical aptitude of the population as a risk factor in ensuring the defence of the Czech Republic)</i>	851/3 3,6	2 380/9 3,9	1 720/6 7,9	1 292/5 1	
Ministry of Health	Zdravotnický aplikovaný výzkum (2015-2023)	Vývoj polyvalentního dekontaminačního činidla <i>(Development of a polyvalent decontamination agent)</i>	1 256/4 9,5	1257/ 49,6	0		
Ministry of Health	Zdravotnický aplikovaný výzkum (2020-2026)	Vývoj širokospektrých dezinfekčních látek se zesílenou virucidní aktivitou <i>(Development of broad-spectrum disinfectants with enhanced virucidal activity)</i>				948/3 7,4	1 316/5 1,9
The Czech Science Foundation	Standardní projekty	Výzkum oxim-CB(7) komplexů při prostupu kvarterních reaktivátorů acetylcholinesterasy do centrálního nervového systému <i>(Investigation of oxim-CB(7) complexes in the permeation of quaternary acetylcholinesterase reactivators into the central nervous system)</i>	1 265/4 9,9				
Ministry of the Interior	Bezpečnostní výzkum ČR 2015-2022	Výzkum vlastností a způsobů ochrany osob před účinky poslední generace nervově paralytických chemických látek <i>(Investigation of the properties and methods of protection against the effects of the latest generation of nerve paralytic chemicals)</i>	2 349/9 2,7	2 349/9 2,7	1 167/4 6		
Ministry of the Defence	Ambice (2020-2026)	ZNALEC – Zajištění znalecké činnosti pro potřeby rezortu Ministerstva obrany <i>(EXPERT - Provision of expert services for the needs of the Ministry of Defence)</i>			5 640/2 22,5	2 254/8 8,9	269/1 0,6
Ministry of the Defence	Ambice (2020-2026)	Zpracování a uvedení stálých postupů založených na zásadách systému analýzy rizika a			50/2	310/1 2,2	

			stanovení kritických kontrolních bodů k zajištění výroby bezpečných potravin v náročných klimatických podmínkách (<i>Developing and introducing permanent procedures based on the principles of risk analysis systems and the establishment of critical control points to ensure the production of safe food in challenging climatic conditions</i>)					
Ministry of the Defence	Ambice (2020-2026)	(2020-2026)	BATTLE FIELD 2030+: Konfiguračně-investiční strategie rozvoje schopností ozbrojených sil ČR (<i>BATTLE FIELD 2030+: Configuration and Investment Strategy for the Development of the Czech Armed Forces Capabilities</i>)					3 720/1 46,7
Ministry of the Defence	Ambice (2020-2026)	(2020-2026)	Definování požadovaného standardu zdravotní péče o vojáky v prostoru nasazení (<i>Defining the required standard of medical care for soldiers in the deployment area</i>)					291/1 1,5
Ministry of the Defence	Ambice (2020-2026)	(2020-2026)	PERSONÁL – Zvýšení účinnosti rekrutačních aktivit Univerzity obrany a retence studentů 1. a 2. Ročníku (<i>PERSONNEL - Increasing the effectiveness of Defence University recruitment activities and retention of 1st and 2nd year students</i>)					28/1, 1
Ministry of the Defence	Ambice (2020-2026)	(2020-2026)	Posílení fyzické a psychické odolnosti vojáků pro nasazení do bojových operací (<i>Strengthening of physical and psychological resilience of soldiers for deployment to combat operations</i>)					1 721/6 7,9
Ministry of the Defence	Ambice (2020-2026)	(2020-2026)	UIOZ – Analýza možnosti využití umělé inteligence ve zpravodajství z otevřených zdrojů (<i>UIOZ - Analyzing the possibility of using artificial intelligence in open-source intelligence</i>)					100/3 ,9
Ministry of the Defence	Ambice (2020-2026)	(2020-2026)	Úroveň zdravotní gramotnosti příslušníků ozbrojených sil ČR v kontextu NATO (<i>The level of health literacy of members of the Czech Armed Forces in the context of NATO</i>)					305/1 2
Ministry of the Defence	Ambice (2020-2026)	(2020-2026)	Vybrané parametry kognitivního válčení s potenciálním dopadem na bezpečnost České republiky (<i>Selected parameters of cognitive warfare with potential impact on the security of the Czech Republic</i>)					188/7 ,4
Ministry of the Defence	Ambice (2020-2026)	(2020-2026)	Výzkum zásad taktické činnosti úkolových uskupení v boji proti CBRNE hrozbám (<i>Research on the principles of tactical activities of task forces in the fight against CBRNE threats</i>)					63/2, 5

Total			11 032/4 35,2	7 143/2 81,8	21 373/8 43,1	15 640/6 17	32 029/1 263,4
In the role of another participant							
Provider / Investor	Programme/ Grant Scheme	Project name	Support (in thousands CZK/EUR)				
			2020	2021	2022	2023	2024
Ministry of Industry and Trade	OP PIK VII	Radarový systém pro detekci pozemních a LSS vzdušných cílů (Radar system for detection of ground and LSS air targets)		0 – Without provided funds			
Ministry of Industry and Trade	OP PIK VIII	ATC simulátor se vzdáleným přístupem a automatizovanými pseudopiloty (ATC simulator with remote access and automated pseudo-pilots)			1 070/42,2	270/10,7	
Ministry of Industry and Trade	OP PIK VIII	Autonomní pozemní vozidlo pro nouzové zásobování a logistiku (Autonomous ground vehicle for emergency supply and logistics)			1 220/48,1	9 473/373,7	
Ministry of Education	INTER-EXCELLENCE (2016-2024)	ADAR – Pokročilý jaderný reaktor řízený urychlovačem (ADAR: Advanced Accelerator Controlled Accelerator Reactor)	720/28,4	600/23,7	520/20,5		
Ministry of the Interior	SECTECH (2021-2026)	Autonomní prostředek pro provádění pyrotechnického průzkumu v extrémně nebezpečných oblastech. (Autonomous vehicle for conducting pyrotechnic reconnaissance in extremely hazardous areas.)			4 180/164,9	4 180/164,9	
Ministry of Health	Zdravotnický aplikovaný výzkum (2015-2023)	Centrálně účinná antidota pro léčbu otrav organofosfáty (Centrally effective antidotes for the treatment of organophosphate poisoning)	1 036/40,9				
Ministry of the Interior	Bezpečnostní výzkum ČR 2015-2022	Detekce narušení obranného perimetru pomocí okamžité změny polarizace optického signálu (Detection of defensive perimeter breaches by instantaneous change of polarization of the optical signal)	1 709/67,4	1 436/56,6	1 146/45,2		
Ministry of the Interior	OPSEC (2023-2029)	Chytrý systém pro nositelné ochranné pomůcky umožňující dohled a plánování policejních a armádních zásahů (Smart system for wearable protective equipment enabling surveillance and planning of police and military interventions)				2 058/81,2	1 931/76,2
Technology Agency of the Czech Republic	TREND (2020-2027)	Inovativní oromukosální imunizace (Innovative oromucosal immunization)		992/39,1	992/39,1	852/33,6	

Technology Agency of the Czech Republic	EPSILON (2015-2026)	Kolorimetrický senzor pro diagnostiku otrav pesticidy (<i>Colorimetric sensor for diagnosis of pesticide poisoning</i>)	290/1 1,4	290/1 1,4			
Ministry of the Interior	OPSEC (2023-2029)	Komplex metod biologické a fyzikální retrospektivní dozimetrie pro radiační mimořádné události (<i>Complex of biological and physical retrospective dosimetry methods for radiation emergencies</i>)				2 910/1 14,8	2 910/1 14,8
Technology Agency of the Czech Republic	SIGMA (2022-2029)	Koordinovaný model péče o novodobé válečné veterány v České republice (<i>Coordinated model of care for modern war veterans in the Czech Republic</i>)				49/1, 9	142/5 ,6
Technology Agency of the Czech Republic	TREND (2020-2027)	MIHRIL II. - progresivní balistický pancíř pro ozbrojené složky (<i>MIHRIL II: progressive ballistic armour for armed forces</i>)				1 410/5 5,6	1 410/5 5,6
The Czech Science Foundation	Standardní projekty	Modifikované nukleofily pro reaktivaci cholinesteras inhibovaných organofosforovými sloučeninami (<i>Modified nucleophiles for reactivation of organophosphorus-inhibited cholinesterases</i>)		563/2 2,2	786/3 1	836/3 3	
Technology Agency of the Czech Republic	DOPRAVA 2020+ (2020-2026)	Ochrana letectví před nízkoeenergetickými lasery (<i>Aviation protection against low-energy lasers</i>)			1 283/5 0,6	1 120/4 4,2	1 120/4 4,2
Ministry of the Interior	OPSEC (2023-2029)	Okamžité zpracování signálů pomocí hybridních systémů v obranné infrastruktuře (<i>Instantaneous signal processing using hybrid systems in defence infrastructure</i>)				2 169/8 5,6	2 369/9 3,5
Technology Agency of the Czech Republic	DELTA 2 (2020-2025)	Pokroková klasifikace signálů (NEOCLASSIG) pro radio-průzkumné systémy (<i>Advanced Signal Classification (NEOCLASSIG) for Radio Surveillance Systems</i>)		839/3 3,1	1 244/4 9,1	1 124/4 4,3	331/1 30,1
Ministry of Health	Zdravotnický aplikovaný výzkum (2015-2023)	Proteomická analýza potenciálních markerů dilatační kardiomyopatie (<i>Proteomic analysis of potential markers of dilated cardiomyopathy</i>)	975/3 8,5	1 228/4 8,4	988/3 9		
Ministry of the Interior	Bezpečností výzkum pro potřeby státu 2016-2021	Příprava kolekce standardů biologicky významných toxinů s podporou Evropské sítě laboratoří biologické ochrany (European biodefence laboratory network) (<i>Preparation of a collection of standards for biologically relevant toxins with the support of the European biodefence laboratory network</i>)	1 171/4 6,2	932/3 6,8			
The Czech Science Foundation	Standardní projekty	Reaktivátory butyrylcholinesterasy pro přípravu pseudo-katalytických scavengerů využitelných při intoxikacích organofosforovými sloučeninami (<i>Butyrylcholinesterase reactivators for the</i>	935/3 6,9				

		<i>preparation of pseudo-catalytic scavengers useful in organophosphorus intoxication)</i>					
Ministry of the Interior	IMPAKT 1 (2019-2025)	Resilience ozbrojených sil a ozbrojených bezpečnostních sborů vůči hybridním hrozbám (<i>Resilience of armed forces and armed security forces to hybrid threats</i>)		1 379/5 4,4	2 167/8 5,5	1 791/7 0,7	1 854/7 3,1
Ministry of the Interior	IMPAKT 1 (2019-2025)	Robotický systém řízený algoritmy umělé inteligence pro zpravodajské a průzkumné účely (<i>Robotic system controlled by artificial intelligence algorithms for intelligence and reconnaissance purposes</i>)			3 292/1 29,9	3 546/1 39,9	3 062/1 20,8
Ministry of the Interior	IMPAKT 1 (2019-2025)	Mezilaboratorní porovnání dicentrického chromozomového testu pro radiační biodozimetrii (<i>Inter-laboratory comparison of a dicentric chromosome assay for radiation biodosimetry</i>)				458/1 8,1	755/2 9,8
Technology Agency of the Czech Republic	DELTA 2 (2020-2025)	Robustní navigační systém (<i>Robust navigation system</i>)				1 440/5 6,8	1 430/5 6,4
Technology Agency of the Czech Republic	SIGMA (2022-2029)	Síť expertů pro analýzu strategických globálních trendů (<i>Network of experts to analyse strategic global trends</i>)				177/7	528/2 0,8
Ministry of the Interior	IMPAKT 1 (2019-2025)	Vytvoření česko-irské projektové iniciativy pro řešení problémů biologické bezpečnosti státu (<i>Establishment of a Czech-Irish project initiative to address national biosecurity issues</i>)	261/1 0,3	873/3 4,4	503/1 9,8	0	
Technology Agency of the Czech Republic	TREND (2020-2027)	Využití nanovláken k aplikaci bioaktivních látek pomocí zubní nitě (<i>Use of nanofibers for application of bioactive agents using dental floss</i>)	208/8 ,2	550/2 1,7	550/2 1,7	415/1 6,4	
Technology Agency of the Czech Republic	DOPRAVA 2020+ (2020-2026)	Výzkum stavebně-technických požadavků na využití národní pozemní infrastruktury TEN-T k řešení krizových situací velkého rozsahu (<i>Research into the civil engineering requirements for the use of the national TEN-T land infrastructure to deal with large-scale emergencies</i>)			851/3 3,6	1 078/4 2,5	1 093/4 3,1
Ministry of the Interior	Bezpečnostní výzkum ČR 2015-2022	Výzkum, vývoj, testování a hodnocení prvků kritické infrastruktury (<i>Research, development, testing and evaluation of critical infrastructure elements</i>)	364/1 4,4				
Ministry of Industry and Trade	TRIO (2016-2022)	Zkvalitnění povrchu kuličkových šroubů KSK (<i>Improvement of the surface of KSK ball screws</i>)	420/1 6,6				
Ministry of the Interior	SECTECH (2021-2026)	Augmented reality pro vzdálený biomonitring					1 550/6

		a záchranné operace v CBRN situacích (<i>Augmented reality for remote biomonitoring and rescue operations in CBRN situations</i>)					1,1
Ministry of the Interior	SECTECH (2021-2026)	Autonomní UAV s multisenzorovou stabilizovanou hlavou s umělou inteligencí (<i>Autonomous UAV with multi-sensor stabilized head with artificial intelligence</i>)					406/16
Technology Agency of the Czech Republic	DELTA 2 (2020-2025)	Přenosný modulární MoCap systém pro záznam a hodnocení stavu příslušníků ozbrojených sil a záchranářů (<i>Portable modular MoCap system for recording and assessing the condition of armed forces personnel and rescue workers</i>)					726/28,6
Total			8 089/3 19,1	9 682/3 81,9	18 502/7 29,9	25 613/1 010,4	21 617/8 52,7

Note: Please summary list Czech Science Foundation, TACR, and other departmental projects. For co-sponsor projects, please indicate the financial volumes for the HEI. Projects financed from EU structural funds and focused exclusively on R&D&I (e.g. OP JAK, OP TAK, NPO) and projects financed from regional sources focused exclusively on R&D&I list individually. For co-sponsoring projects, please indicate the financial volumes for the evaluated HEI only.

4.10.5 Projects supported from non-public sources

In the role of beneficiary						
Provider / Investor	Project name	Support (in thousands CZK/EUR)				
		2020	2021	2022	2023	2024
N/A						
Total						
In the role of another participant						
Provider / Investor	Project name	Support (in thousands CZK/EUR)				
		2020	2021	2022	2023	2024
N/A						
Total						

Note: Indicate, for example, sponsorship donations, resources generated from other own economic activities, foreign subsidy programmes of private entities.

4.11 Rules for the use of institutional support for the LCDRO

The HEI will describe the strategy and rules for the use of institutional support for the LCDRO in the management of institutionally supported research activities (e.g., prioritisation of research topics by the HEI according to individual needs, internal grant agencies, incentive tools, support for excellent science) and the method for distribution of institutional support to individual departments/research teams for the period of 2020–2024. The impact on the management of institutionally supported research activities will be described by the HEI using specific examples (e.g. distribution of institutional support in the period of 2020–2024 depending on the evaluation results, examples of supported excellent science projects, etc.).

Maximum 500 words plus 200 words for each example given (max. five examples).

Self-Evaluation:

Institutional support (IP) for the conceptual development of a research institution is aimed at acquiring knowledge especially in applied research related to the needs of the Czech Armed Forces based on the transfer of knowledge and technology to the comprehensive development of the Czech Armed Forces, as well as support for expert activities. The tool for effective use of IP is the Organization's Long-term Development Plans (OLDP), funded by IP, which addresses research objectives from five defined fundamental areas for the development of key scientific disciplines for the needs of the development of the operational capabilities of the Czech Armed Forces, national security, NATO and the EU, and at the same time supports the development of capabilities by renewing laboratory and instrumentation equipment and building a central service facility for research (the so-called "Core Facilities"). The IP contributes to the support of unique publications in the field of military specializations, which are key in terms of their importance and societal benefit for the Czech Armed Forces and the University of Defence. At the same time, it is also of fundamental importance from the perspective of the governing authority.

The IP of the long-term conceptual development of priority disciplines was implemented at the UD in order to support the accreditation needs of the programmes of the school or its faculties.

The primary way of using IP was determined by the departmental Decisions on the Provision of Institutional Support for the Long-term Development Plan of a Research Organization and, in particular, by the General Conditions for Individual Decisions.

The UD allocates IP to several core areas:

a) Educational activities

- Covering the costs of student education (materials, technology, etc.).
- Supporting innovation in teaching, the purchase of modern equipment, and

licenses.

- Funding for specialized programmes (e.g. military and security education).

b) Research and development

- Funding for defence and security research projects.
- Support for research teams, PhD students, and the professional development of academic staff.
- Operation and maintenance of research infrastructure.
- International cooperation in research (e.g. NATO, EU projects).

c) Operations and infrastructure

- Maintenance of buildings, laboratories, libraries, and other facilities.
- Investments in the modernization of information systems and IT infrastructure.
- Energy costs, equipment maintenance, and military facility operations.

d) Specific projects and activities

- Support for participation in national and international projects (e.g. Horizon Europe).
- Funding of safety simulations, exercises, and other activities related to the University's professional focus.
- Support for students and staff to attend professional conferences and internships.

The distribution of funds at the University follows a clearly defined process. The University has set its objectives based on a long-term plan approved by the Ministry of Defence. The use of funds is regularly monitored and evaluated in interim reports submitted to the provider.

Thanks to the financial support received from the OLDP, excellent results have been produced, which are submitted for annual evaluation according to the 2017+ Methodology, Module M1.

For the evaluation period of 2020–2024, 66 high quality (excellent) results were submitted. The resulting grade is available on the Research, Development and Innovation Council [Publicly Accessible Data of the Research, Development, and Innovation Information System](#). Results submitted in 2024 have not yet been evaluated.

A selection of five results graded a 1 or 2 during the given period:

[1: The impact of preoperative immune modulating nutrition on outcomes in patients undergoing surgery for gastrointestinal cancer: A systematic review and meta-analysis](#) (DOI)

J – Article in a specialized periodical, *Contribution to Knowledge*, **3.3** Health sciences

2019 University of Defence – Faculty of Military Medicine Hradec Král (Adiamah, Alfred; Skořepa, Pavel; Weimann, Arved; Lobo, Dileep N.), 10 s., **41** cit. according to the [WoS](#), **48** cit. according to the [MS](#) (est. 70)

1: [Protection against varicella with two doses of combined measles-mumps-rubella-varicella vaccine or one dose of monovalent varicella vaccine: 10-year follow-up of a phase 3 multicentre, observer-blind, randomised, controlled trial](#)
(DOI)

J – Article in a specialized periodical, *Contribution to Knowledge*, **3.3** Health sciences 2019 University of Defence – Faculty of Military Medicine Hradec Král (Povey, Michael; Henry, Ouzama; Bergsaker, MAR ; Chlíbek, Roman; Esposito, Susanna; Flodmark, Carl-Erik; Gothefors, Leif; Man, Sorin; Silfverdal, Sven-Arne; Stefkovicova, Maria; Usonis, Vatautas; Wysocki, Jacek; Gillard, Paul; Prymula, Roman), 11 s., **18** cit. according to the [WoS](#), **17** cit. according to the [MS](#)

2: [Hybrid Ant Colony Optimization Algorithm applied to the Multi-Depot Vehicle Routing Problem](#) (DOI) [→]

J – Article in a specialized periodical, *Contribution to Knowledge*, **1.2** Computer and information sciences 2020 University of Defence – Faculty of Military Leadership (Stodola, Petr), 13 s., **27** cit. according to the [WoS](#)

2: [Modeling of Streamer Ignition and Propagation in the System of Two Approaching Hydrometeors](#) (DOI) [→]

J – Article in a specialized periodical, *Contribution to Knowledge*, **1.5** Earth and related environmental sciences 2020 University of Defence – Faculty of Military Technology Brno (Jánský, Jaroslav; Pasko, Victor P.), 12 s., **10** cit. according to the [WoS](#)

2: [The Categorization of Individuals with Suspected Exposure Following a Radiation Event](#) [→]

N – Methods, treatment processes, historical restoration processes, specialized maps with specific content, *Societal Relevance*, **2.6** Medical engineering 2022 University of Defence – Faculty of Military Medicine Hradec Králové (Andrejsová, Lenka; Čížková, Jana; Filipová, Alžběta; Lierová, Anna; Milanová, Marcela; Pejchal, Jaroslav; Šinkorová, Zuzana; Tichý, Aleš; Tóthová, Iveta)

NATIONAL AND INTERNATIONAL COOPERATION

4.12 Important collaborations in R&D&I

The HEI will describe specific cases of R&D&I collaboration at the national level (maximum five examples) and the international level (maximum five examples), including examples of concrete results and impacts in the field of R&D&I beneficial for the HEI during the period of 2020–2024.

Maximum 300 words per example.

Self-Evaluation:

Within the Military Faculty of Medicine (MFM), several examples of national cooperation can be mentioned. This is for example the cooperation with the Hradec Králové University Hospital. In a wide range of clinical and preclinical fields, this is an extremely fruitful collaboration, especially in the number of prestigious publications and patents. Examples include the long-term collaboration with the Centre for Biomedical Research on the Health Research Agency project (Proteomic Analysis of Potential Markers of Dilated Cardiomyopathy or Development of Broad-Spectrum Disinfectants with Enhanced Virucidal Activity) or the Czech Science Foundation (Development of Novel Radioprotective Agents Based on Small Molecular Inhibitors). There are several dozens of joint projects. Very often, the third co-implementer is the Faculty of Medicine or Pharmacy of Charles University in Hradec Králové. The benefit for the faculty is in the development of its methodological portfolio, the sharing of cutting-edge technologies, and the possibility of conducting research on samples of patients, which is particularly valuable, especially by international comparison.

Another example MFM is cooperation is that with the private sector. Development of a colorimetric sensor for the diagnosis of pesticide poisoning in biological samples using chromogenic reagents, modified 3D printed measuring pads, and a smartphone camera as a signal detector. This is an applied research endeavour in collaboration with RANADAL s.r.o., with functional sample and Jimp type results. The benefit is the development of applied research, often in areas where there is no adequate partner in academia.

In the framework of cooperation with the Technology Agency of the Czech Republic (TACR), the Faculty of Military Technology (FMT) participated in the “Advanced Signal Classification (NEOCLASSIG) for Radio Research Systems” (TM02000035) project. The project, implemented in the years 2021–2024, focuses on the development of sophisticated methods for the detection and classification of a wide range of radio signals. The FMT team has contributed primarily expertise in the field of electromagnetic spectrum analysis and algorithm design applicable in defence systems environments. The key output is prototype software with innovative classification models that enables the faster and more accurate identification of signals. For the University, this means strengthening its research reputation in the field of electronic and radar technologies, as well as the practical application of the results in the military and civilian sectors. In addition, the project has fostered inter-university collaboration and is being used as a basis for theses and dissertations, thereby

enhancing the quality of education in technical and security disciplines.

Based on the successful cooperation with the Ministry of Industry and Trade (MoIT), the FMT participated in the “Autonomous Ground Vehicle for Emergency Supply and Logistics” (EG20_321/0025219) project in 2022–2023. The aim was to develop and validate the concept of a semi-autonomous vehicle capable of operating in crisis conditions, such as during natural disasters or in conflict-prone areas. The faculty focused on the integration of robotic systems and the development of control software that uses advanced sensor technologies to navigate in unfamiliar terrain. The main benefit of the project is a prototype that enables safer and more efficient delivery of supplies and medical equipment. For the FMT, this means strengthening know-how in military robotics and increasing attractiveness for future research and industrial partners.

The NBCDI Defence Institute (NBCDI) has long cooperated with the Military Research Institute of Brno. As co-investigators, the institutes worked on the MARYŠA project—Research on Methods and Technologies of Protection Against the Effects of Weapons of Mass Destruction and Industrial Hazardous Substances. Both institutions have a representative of the cooperating organization on their scientific boards. The NBCDI utilizes the option whereby the members of final state examination boards may be a professional subject matter expert and allows the Scientific Council of the University of Defence to approve lists of individuals which may act as members of final state examination or other boards. The NBCDI also draws on the professional erudition of the staff of the Military Research Institute of Brno to act as specialist supervisors for the dissertation supervision of doctoral students. The UD has signed a cooperation agreement with the institute.

The NBCDI also cooperates intensively with the NUVIA company. This company deals with detection systems for monitoring radiation situations, develops carrier systems for monitoring radiation situations in the field and on objects, and creates specialized software for evaluating measurements. The NBCDI has been working with this company for eight years on the joint project RANUS-TD, which was commissioned by the Technology Agency of the Czech Republic. The NBCDI also cooperates with NUVIA on the verification of functionality and sensitivity of detection systems, such as that of detection instruments, detection frames, UAVs, etc. The NBCDI is a co-organizer of the RadTech conference alongside NUVIA. The last conference was held in 2023. The University of Defence has a cooperation agreement with NUVIA.

In the field of international cooperation, the following cooperation can be mentioned.

The MFM was involved in the EDF CounterACT project. This is a prestigious grant in the field of CBRN protection in a multinational consortium (23 institutions), which has opened up cooperation and the possibility of a follow-up EDF Resilience project (202–2026) in an even larger consortium (approximately 100 members). In addition to publications, this is a benefit in the form of raising awareness of the University and its reputation internationally.

In addition, we can mention MFM 's collaborations with the Bundeswehr Institute für Radiobiologie (Munich, Germany), the Armed Forces Radiation Research Institute

(Bethesda, MD, USA), and the United Kingdom Health Security Agency (Didcot, UK). These include collaborations in the field of radiation biomarker research with some of the world's most prominent experts (Prof. M. Abend, Prof. V. Singh, and Dr. C. Badie). The results are joint impacted publications in prestigious journals (14 joint publications since 2017) and projects.

The FMT is the main author of the European Defence Agency (EDA) "Additive Manufacturing for Logistic Support" (AMLS) category B project, implemented in the period of 2021–2024, which aims to develop 3D printing technologies for military logistics, from design to deployment in operational conditions. The FMT focuses on optimizing manufacturing processes and material testing to ensure high reliability and durability of printed components. The project results include new additive manufacturing and testing methodologies that can be applied not only in military environments but also in the civilian sector (e.g. emergency facilities and air transport). For the University, this brings prestige resulting from participation in international defence projects and a significant expansion of its professional base, which is reflected in the better training of students and greater international visibility.

Furthermore, in the framework of cooperation with the NATO Science and Technology Organization (NATO STO), members of the FMT have long been involved in panels focused on modelling and simulation (MSG), technical informatics, and cyber security. In 2020–2024, for example, the faculty took part in MSG-ET-040, which addresses the strategic direction of teaching and training methods in NATO. Concrete results are standards and recommendations for crisis management simulation and tactical operations, which are being applied throughout the alliance. As a result, the faculty gains access to state-of-the-art knowledge and methodologies, thereby strengthening its teaching and research in the areas of simulation and cybernetics. It also benefits from a larger network of international contacts, which allows the FMT to respond more quickly to research challenges and to develop joint projects with other alliance partners.

The NBCDI has initiated cooperation with the staff of the Babes-Bolyai University in Cluj, Romania; the academic staff of the National Military Academy of Vasil Levski, Veliko Tarnovo, Bulgaria, have also expressed interest in cooperation. The initial outputs of this collaboration are a joint article in Environmental Chemistry Letters and a contribution to conference proceedings. It is envisaged that the collaboration will develop further, particularly in the area of detection and identification of chemicals of interest. The NBCDI has cooperated with the Military Academy in Belgrade within the Defence Education Enhancement Programme (DEEP). This cooperation has focused mainly on the area of individual protection. Within the framework of the cooperation, several scientific communications were published. The last visit of the Serbian delegation to the DEEP was carried out in 2021.

In the field of lecturing activities, the NBCDI cooperates with the Helmut-Schmidt Universität/Universität der Bundeswehr Hamburg, Germany. Experts from the Department of Chemical and Radiation Protection give lectures on the subject during a week-long stay in accordance with the request of the University of Hamburg.

The NBCDI also cooperates with the Joint Chemical, Biological, Radiological and Nuclear Defence Centre of Excellence in the Czech Republic. The cooperation is focused on lectures by experts from both sides, or on the demonstration of some laboratory techniques by the NBCDI. The Director of the JCBRN Def COE is a member of the NBCDI Scientific Council. The workplace abroad offers various types of educational activities to the NBCDI in the form of courses, seminars, and participation in conferences. The UD has signed a cooperation agreement with the centre.

STUDIES

4.13 Doctoral studies

The HEI will briefly describe the organization of the doctoral studies (if there are any doctoral degree programmes³⁷). HEI will comment on:

- Structure and organization of studies.
- A system of cooperation between PhD students and their supervisors.
- Basic statistics (including drop-out rate, student workload, etc.).
- Information on promotion and recruitment schemes.
- Cooperation within doctoral studies (e.g., Czech Academy of Sciences, application sphere, building open programmes of study for foreign nationals and creating international networks of degree programmes, "joint degree", "cotutelle", etc.).
- Student care system (e.g. counselling, wellbeing care, career guidance).
- A system for tracking the future careers of graduates³⁸.
- Other relevant data, such as the existence of a doctoral school, basic soft skills courses, etc. at the discretion of the HEI.

The HEI shall support this with appropriate examples (e.g. a model example of doctoral student cooperation with their supervisor, statistics on collaboration within doctoral studies, specific examples within doctoral studies, statistics on the use of student care systems, etc.).

Maximum 300 words per point.

Self-Evaluation:

The University respects the strategic documents of the Ministry of Education, in particular, the [Long-Term Plan of Educational and Scientific, Research, Development and Innovation, Artistic and Other Creative Activities in the Field of Higher Education for the Period 2016-2020](#) and the Strategic Plan of the Ministry for the Field of Higher Education for the Period from 2021, on the basis of which it has prepared its Long-term Plan, which it has prepared for the period of 2016-2020 (including annual implementation plans), and subsequently the [Strategic Intent for Educational and Creative Activities of the University of Defence for the Period 2021-2030](#) and the

³⁷ If the HEI does not organize any doctoral programme, it will explicitly state this information in the self-evaluation report.

³⁸ The HEI will list the top five highest ranked graduates in academia, the private sector, and public administration over the past five years.

resulting annual Implementation Plan of Strategic Intent for Educational and Creative Activities of the University of Defence for a given calendar year.

The UD has linked its long-term and strategic plan with the Concepts of Defence Applied Research, Development and Innovation for the period 2016–2022 and 2023–2029 to ensure the UD's ability to continuously respond to the requirements of the National Security Council.

The basic starting document of every doctoral degree programme is its accreditation documentation. Furthermore, the study is regulated by the [Study and Examination Regulations of the University of Defence and the Measure of the Rector of the University of Defence No. 7/2023 – Details on Doctoral Programmes](#).

The requirements for the profiles of graduates of doctoral programmes are obtained by the UD from the Czech Armed Forces and Military Intelligence through the Secretary of State's Section, the Department of Educational Policy. The thesis topics of UD students are in line with the needs of the Ministry of Defence, as the UD obtains them directly from the Ministry of Defence.

The University cooperates closely with the practice of the Czech security system, especially with its strategic partner—the Czech Armed Forces, both in terms of providing rotating lecturers drawing on practice, organizing internships and placements of students and academic staff, as well as in terms of regular involvement of professional experts in the membership of committees in state doctoral examinations or dissertation defences, or instruction in doctoral programmes. Experienced professionals comment on proposals for programmes of study, participate in evaluating the quality of their implementation, and provide internships and other activities for students. They often also act in the role of supervisor-specialist. Details are given in the Annual Reports on the Activities of the University of Defence in Brno for 2019 and 2020 and the Annual Reports on the Activities of the University of Defence for 2021, 2022, and 2023 (Section 8 Research, Development and Other Creative Activities; Table 8.2 Experts from the Application Sphere Involved in Teaching and Practice in Accredited Programmes (Numbers)).

The UD currently offers full-time and part-time doctoral degree programmes for military and civilian students in the fields of Security Studies, Electrical Engineering, Mechanical Engineering, Technology and Materials, Earth Sciences, Pharmacy and General Medicine, and Dentistry. All doctoral degree programmes have a standard study period of 4 years and are accredited in the Czech language. The Faculty of Military Leadership currently has an accredited doctoral programme in National Defence Theory, while the Faculty of Military Technology offers programmes in Military Technology – Mechanical, Military Technology – Electrical, and Military Geography and Meteorology. The Faculty of Military Medicine has a total of eight accredited doctoral programmes: Epidemiology, Infectious Biology, Medical Microbiology, Preventive Medicine and Public Health Protection, Toxicology, Military Surgery, Military Radiobiology, and Military Internal Medicine. Thus, it is a broad offering for a large spectrum of prospective students. At the end of 2024, the accreditation of programmes of study that have not been accepting new students in recent years will expire,

precisely because of the impending end of their accreditation. These were the following Faculty of Military Leadership programmes: Military Logistics; Protection of Troops and Population; and Economics and Management; the following Faculty of Military Technology programme: Military Technologies; and the following Faculty of Military Medicine programmes: Epidemiology; Infectious Biology; Medical Microbiology; Toxicology; Military Surgery; Military Radiobiology; Military Internal Medicine; and Preventive Medicine and Public Health Protection. Programmes with currently valid accreditation are accredited only in the Czech language.

The table below represents the core statistics of doctoral degree programmes of the University of Defence in the years 2019–2024.

	Number of Students Accepted	Number of Students Registered	Number of Graduates
2019	45	45	40
2020	33	26	35
2021	46	42	43
2022	35	33	29
2023	56	56	17
2024	37	33	36

Doctoral programmes studies are conducted under the guidance of a supervisor who guides the student throughout the entire period of study. The supervisor may be a professor or associate professor whose creative activity is consistent with the topic of the thesis; only in exceptional cases may the supervisor also be a distinguished expert with a scientific degree approved by the relevant scientific council. The supervisor is appointed and dismissed by the programme guarantor on the recommendation of the programme supervisor. In the case of dissertations, the supervisor may propose the appointment of a specialist supervisor who directs the student, particularly in solving specific and professionally demanding tasks in the dissertation. The supervisor-specialist may be a professor or associate professor whose creative activity is in line with the topic of the thesis; only in exceptional cases may the supervisor-specialist also be a distinguished expert with a scientific degree.

The supervisor:

- cooperates with the student in the development of an individual study plan and coordinates his/her study activities,
- directs the student in approaching issue of his/her dissertation and guides him/her in its progression,

- orients the student to the solution of specific scientific projects thematically related to the dissertation topic, encourages the student's publishing activities and provides effective professional support,
- controls the implementation of the student's individual study plan,
- participates in student evaluation and prepares an annual student evaluation.

If circumstances arise in the course of a doctoral degree programme that prevent the supervisor from properly supervising the student, the supervisor may request his/her removal from the position of supervisor.

In general, students in part-time studies have a lower academic success rate. The success rate in part-time studies is negatively affected in particular by the service obligations of military students, such as compulsory participation in military exercises, deployment on operations abroad, etc., which lead to an increased need to pause studies and thereby reduce the success rate. For civilian students, the situation is similar, and it is often very difficult for students to combine their studies with their work commitments or family life.

Regarding the teaching load of students, the number of hours of student teaching is determined by the accreditation documentation of the programme. In general, the greatest amount of time is, of course, devoted to the student's creative activity. For full-time students, the number of hours to be taught is determined in the same way.

Complete information on the possibility of studying in doctoral degree programmes and on the admission procedure is published on the public website of the University of Defence. For the Ministry of Defence, information is offered in the document Overview of Educational and Training Activities of the Ministry of Defence, which is published for a given calendar year in the Staff Information System under Educational Activities. This document also sets out the numbers of students admitted to each programme based on MoD requirements. The numbers of civilian students are regulated on the basis of the capacity of the individual educational institutes. Opportunities for studying are further publicised through Open Days and other UD marketing activities, including promotion on social media.

Abroad, the UD doctoral degree programmes are offered at meetings of university staff, military representatives of defence departments, etc.; however, given that the studies are currently only accredited in the Czech language, interest from abroad is not very high. Students who are foreign nationals who have, for example, dual citizenship, or foreign nationals who study at the UD on the basis of an international treaty and learn Czech prior to starting their studies.

Each faculty organizes an annual PhD conference, often with international participation, at which students present their results in the form of a short lecture. These conferences are often attended by master's students who are interested in continuing their studies in a doctoral degree programme.

Due to the uniqueness of the programmes of study at the UD, the majority of students in doctoral degree programmes are recruited from the ranks of the graduates of UD master's or post-graduate degree programmes. As a rule, professional soldiers with

several years of experience in the armed forces apply for studies. During the master's studies, talented students are selected and further developed, and those who are interested in doctoral studies and a possible future career as an academic staff member return to the UD as students of doctoral degree programmes after several years of military service. Civilian students typically continue their doctoral studies immediately upon completing their master's degree, or they come in from other universities.

In previous years, an important step was taken when the department negotiated the possibility for graduates of master's degree programmes to continue their studies in doctoral programmes. A graduate of a master's degree programme, after fulfilling the conditions for admission, is placed into a part-time doctoral degree programme and is assigned to the UD. At the moment when he/she can be promoted from Second Lieutenant to the rank of First Lieutenant, he/she moves to the full-time studies. Although this system has increased the number of candidates for doctoral studies from among professional soldiers, the situation remains complicated by the number of systemized places, the possibility for military units to send students to part-time studies, etc.

Information about scholarships that support students in their studies can also be counted among the promotion of studies. Full-time civilian students are supported by scholarships (doctoral scholarship, merit scholarship, social scholarship, accommodation scholarship, scholarship to support study abroad, scholarship to support studies in the Czech Republic). Military students in full-time studies can receive a merit scholarship in addition to their salary.

Within the framework of the implementation of doctoral degree programmes, cooperation with the Academy of Sciences of the Czech Republic and its workplaces located in Brno is also fostered, providing a course on the basics of scientific work for UD students.

Since all currently accredited programmes of study are accredited only in Czech, their connection to the international environment is very complicated. Students are admitted if they have sufficient knowledge of the Czech language (at least at a B2 level, according to the CEFR).

The student's main support is provided by the student's supervisor and his/her educational workplace. If a student requires specialised psychological, academic, or pedagogical counselling, counselling in service affairs for clients with special needs, socio-legal and legal counselling, or career counselling, he/she can make use of the services of the Counselling Centre of the UD like all other students.

The monitoring of graduates' future careers is currently carried out mostly informally, especially in cases where graduates remain in contact with the UD or are its employees. For soldiers, their career path is determined by their assignment to the relevant units, which ensures direct continuity with their graduate studies. For civilian graduates, there is no formal link to the UD, and therefore, information on their career paths is not

systematically collected. However, many of these graduates also remain in informal contact with their supervisors, etc.

Doctoral students are offered specific courses at the discretion of their supervising departments based on their professional focus, or educational activities designed for all UD students.

The table shows the best placed graduates of doctoral programmes in academia, the private sector, and public administration over the last five years.

Name, Surname/Initials, and Academic Degrees	Name of the Subject in which the Graduate Received a Ph.D. within the Czech Republic	Year of PhD Completion	Career Following PhD Completion
			Name of Employer, Job Position, Timeline
MAJ Ing. Jan Ivan, Ph.D.	Economics and Management/Military Management	2020	University of Defence, Head of the Fire Support Section of the Department of Fire Support, 2024–present
COL Ing. Petr Hlavizna, Ph.D.	Economics and Management/Military Management	2020	University of Defence, Head of Department, Vice-Rector for External Relations and Internationalization, 2024–present
Ing. Martin Zachar, Ph.D.	Military Technology – Transportation Machinery and Equipment	2022	Mechanical Design Engineer, Transmisie Engineering, s.r.o, 2024–present
Ing. Aleš Novák, Ph.D.	Military Technology – Communication and Information Systems	2021	Senior Developer, Team Leader, and System Architect, JISR Institute, a.s., 2020–present
Ing. Roman Buldra, Ph.D.	Military Technology – Aviation Technology	2023	Deputy Commander of the 132 nd Artillery Brigade of the 13 th Artillery Regiment, 2022–present



MUDr. Michal Moravec, Ph.D.	Medical Microbiology	2024	Head Physician of the Anaesthesiology Resuscitation Clinic of the 1st Medical Faculty 1. LF at Charles University and the Thomayerova University Hospital
MUDr. Miroslav Sirový, Ph.D., MBA.	Military Surgery	2024	Deputy Chief of General Surgery, Hradec Králové University Hospital

IMPLEMENTATION OF RECOMMENDATIONS

4.14 Implementation of the recommendations in Module 4

The HEI will briefly describe how it has implemented the recommendations for Module 4 from the previous evaluation period, if applicable.

Maximum 1000 words

Self-Evaluation:

As requested by the Provider in October 2023, a report was submitted on the implementation of the recommendations for Module 4 that were included in the MEP Evaluation Report in the previous evaluation. In the area of education, the UD has a particular focus on combating plagiarism and cheating in relation to the protection of intellectual property.

The requirements for respecting copyright and the protection of intellectual property are contained in Measure of the Rector No.6/2018 – Intellectual Property and the Code of Ethics of the University of Defence. Since 2022, the UD has used the Odevzdej.cz application to check the originality of seminar papers. For final theses, the UD uses the plagiarism detection system (SyOP) Theses.cz. The system allows representatives of participating schools to upload theses and search for plagiarism among them. Since 2020, the UD has had the Repository.cz system in place, which is primarily used to detect plagiarism in habilitation proceedings.

Students are educated in this issue in the course Methodology of Scientific Work, which includes an introduction to the relevant legislation on creative activity, the relationship to intellectual property and information on technology transfer.

The key document in the area of intellectual property and technology transfer will be the new order of the Minister of Defence, which is currently being prepared. All new activities should be based on it and should be processed after its announcement. The current Secretary of Defence's 2009 order is no longer suitable.

A seminar on Intellectual Property was organized for interested employees in cooperation with an external expert. The management of the intellectual property agenda, including its transfer, is a matter for the owner of the intellectual property (IPR), which is the Ministry of Defence. The MoD is an organizational unit of the State without its own ID number, does not own the IPR and cannot therefore carry out technology transfer. In order to process the initial IPR documents at the UD for the MoD, was employed a staff member with knowledge of IPR.

By Order of the Rector-Commandant No.1/2021, a standing committee was established to evaluate the results according to Methodology 17+ in module M1 and to evaluate the submitted books and chapters in the books for reporting in terms of R&D&I.

Currently, the UD Scientific Council has one member who is a foreign national.

On July 1, 2024, VETC was established, the professional framework of which represents an integrated unit as a shared centralized support and technology workplace with a wide range of modern laboratory capacities to support creative and expert activities

with the concept of open access for research and expert activities. The achieved results of creative and expert activities will be used and applied mainly in the Czech Armed Forces, the armed forces of the Czech Republic. The aim of the centre is to provide physical and virtual access to internal and external users from both academia and industry to its unique capabilities and to make available experimentally or model-verified outputs. This connection with the scientific community could be used in the future for the development of national defence, security, construction, and development of the Czech Armed Forces, the support of scientific excellence, the strengthening of cooperation with public universities, research partners, and state enterprises of the Ministry of Defence.

Complete information regarding doctoral degree study options and the admission procedure is published on the public website of the University of Defence. For the Ministry of Defence, they are offered in the document Overview of Educational and Training Activities in the Ministry of Defence, which is published for a given calendar year in the Staff Information System under Educational Activities. Studying opportunities are also publicised during the Open Days and other marketing activities of the MoD, including promotion on social media.

Abroad, the UD doctoral degree programmes are offered at meetings of university staff, military representatives of defence departments, etc., however, given that the study is currently accredited only in the Czech language, interest from abroad is not very high. Foreign students are students who have, for example, dual citizenship, or students from the Socialist Republic of Vietnam who study at the UD on the basis of an international agreement and who learn the Czech language before starting their studies.

Full-time civilian students are supported with scholarships (doctoral scholarship, merit scholarship, social scholarship, accommodation scholarship, scholarship to support study abroad, scholarship to support studies in the Czech Republic). Military students in full-time studies can receive a merit scholarship in addition to their salary.

The reasons for the lower number of students in doctoral degree programmes can be seen mainly in the system of posting for study within the defence department, which the UD has little influence on. The possibility for graduates of master's degree programmes to continue their studies immediately in doctoral programmes has been negotiated within the Ministry.

A graduate of a master's degree programme, after fulfilling the conditions for admission, is placed into a part-time doctoral degree programme and is assigned to the UD. At the moment when he/she can be promoted from Second Lieutenant to the rank of First Lieutenant, he/she moves to the full-time studies. Although this system has increased the number of candidates for doctoral studies from among professional soldiers, the situation remains complicated by the number of systemized places, the possibility for military units to send students to part-time studies, etc. For civilian students, the success rate is lower for students in part-time programmes, as it is often very difficult for students to balance their studies with work commitments or family life.

Interest in doctoral degree studies, especially among professional soldiers, also has a significant impact on the number of students. There are only a very limited number of posts in the Ministry of Defence for which a doctoral degree is required, which can be considered a demotivating factor. Graduates of master's degree programmes are in many cases more interested in entering the workplace after five years of studying than to continue in their studies.

The UD tries to accommodate civilian students of full-time doctoral degree programmes with financial support (scholarships) and other activities (e.g. by approving and implementing strategic documents such as the Gender Equality Plan of the University of Defence for the period 2022-2030, which includes, among other things, support for women in science. In the case of civilian part-time studies, the UD's possibilities to support students are very limited, as the UD cannot interfere in any way with their work obligations or family life, which often complicate their studies. For all students, without exception, the support of the Counselling Services and Veterans Care Centre is also available in difficult life situations, but this can be seen as a means of support rather than a solution to the root causes of problems.

The Strategic Intent for Educational and Creative Activities of the University of Defence for the Period 2021–2030 includes in its operational goals and objectives the support and development of doctoral degree programmes at the institutional level.

The majority of students of doctoral degree programmes are enrolled in part-time programmes. This is the main obstacle to fulfilling their obligation to complete a one-month internship abroad. Civilian part-time students have difficulties in obtaining sufficient leave or time off from their employer. For military students, the situation is complicated by the system of financing foreign missions in the Ministry of Defence.

The numbers of foreign thesis and dissertation opponents are problematic, particularly due to language. The majority of dissertations are written in Czech. Although the Study and Examination Regulations of the University of Defence allow for the preparation of dissertations in English, in many cases, the realistic preparation of a dissertation in English could cause complications in the formation of a dissertation defence committee. The topics studied at the UD are often very specific in their focus, and it is complicated to assemble a committee of relevant experts according to all the necessary requirements. The UD is trying to expand its portfolio of external collaboration with other universities, but it is often difficult to obtain experts in certain specific areas from other universities, especially when military issues are involved.

The Strategic Intent for Educational and Creative Activities of the University of Defence for the Period 2021–2030 includes in its operational goals and objectives the support and development of doctoral degree programmes at the institutional level focused, among other things, on developing international cooperation.

As of 1 January 2024, the Department of Science and Research has 12 systemized places for part-time students of doctoral degree programmes. These places are intended for students until they can be promoted to the rank of First Lieutenant.

The University has created conditions for the reconciling of work and family

responsibilities, especially for providing care for employees' children and other family members. The University has completed the creation of a children's group, which has been open from 1 September 2023.

The principle of a multidisciplinary approach between institutes and faculties in project solutions is anchored in the strategic documents of the UD. The number of projects with collaboration between its constituent components has increased within the framework of earmarked support. The UD has long-term project cooperation with Czech universities such as Czech Technical University, Brno University of Technology, Masaryk University, and the Hradec Králové University Hospital.

The UD develops its scientific activities within international consortia in calls where the European Defence Fund (EDF) is the provider. Of the four EDF projects submitted (with the UD as a co-investigator), two were approved by the provider (Counteract and Resilience—co-authored by the MFM). Currently, the UD is a co-investigator in three other projects submitted by international consortia, where the FMT is a co-author (Hipolaw, Decomus, Sapper).

Furthermore, the UD is connected to the EUREKA International Networks/ INTER-EXCELLENCE II programme. One project has been approved by the Ministry of Education, and two more projects have been submitted to the competition (with the UD as a co-investigator).

The UD was awarded a project in the call of the Ministry of Education – International Mobility of Research, Technical, and Administrative Staff of Research Organizations called “Mobility at the University of Defence in Brno.” This project was carried out from 1 December 2021 to 30 June 2023. A total of five academic staff members and three students of doctoral degree programmes participated in this mobility project.

The UD is a co-investigator of NATO Science and Technology Organization (NATO STO) projects. The average number of projects is 25. In addition, the UD is involved in the European Defence Agency (EDA) projects within the Permanent Structure Cooperation (PESCO), as a co-investigator or observer in five projects. Participation in the EDF projects is listed above.

The Erasmus+ programme offers two types of mobility stay programmes for UD staff:

- educational stays
- training stays

Both types of mobility stays can be combined. The length of stay for each mobility stay or their combination two ranges from 2 days to 2 months.

On the basis of the Participation Contract, the teacher/staff member receives a grant, the amount of which depends on the country and the duration of the stay. A teaching placement is only carried out on the basis of valid inter-institutional agreements between the UD and the foreign institution with an ECHE.

Long-term mobility stays of academic staff can be supported when a call is announced in the operational programmes of the Ministry of Education and Science. No such call

has been published or planned for 2023 and 2024.

In terms of the age distribution of habilitation applicants, there has been an increase in the average age of applicants by 6 years compared to the processes having taken place up to the year 2020 and from the year 2020 onwards. In the case of the processes for the appointment to the rank of professor, the average age of applicants has fallen by 6 years within the same period.

Staff selection at the University of Defence is not conditional on gender requirements. The University ensures a gender-balanced composition of selection panels and supports new staff and staff on career breaks through adaptation programmes in their professional development. The University allows staff who are caring for children or a dependent to adjust and/or reduce their working hours. In order to support staff in returning to work after a career break, a children's group was established on 1 September 2023. The University is committed to gender equality in leadership and decision-making positions and in membership in advisory bodies, based on individuals' realistic aptitudes, educational attainment, abilities, and skills. The University supports the motivation of women to apply for leadership positions through mentoring activities.

The University has developed a Gender Equality Plan as a strategic document that expresses the explicit commitment of the UD to the promotion of gender equality. The plan was developed in accordance with departmental, national, and European legislation. The University of Defence Gender Equality Plan for the Period 2022–2030, approved by the Rector-Commandant on 1 November 2022, is published on the University's website and is also fully available for applications for funding from the Horizon Europe Framework Programme or other institutions (the Czech Science Foundation, the Czech Technology Agency, etc.), where it serves as one of the necessary background materials.

One of the tasks contained in the Implementation Plan of Strategic Intent for Educational and Creative Activities of the University of Defence for the Year 2023 is to strengthen the strategic management of human resources at the University. In connection with the implementation of this task, the European Commission was presented with UD materials for the receiving of the HR Award.

In 2023, the Policy on Selection and Recruitment of Personnel Involved in Scientific Research (OTM-R) of the University of Defence came into force.

The UD, in accordance with the principles of the Charter and the Researchers' Code, fully supports the requirements for the selection and recruitment of staff involved in scientific research activities, which are based on an open (O=open) and transparent (T=transparent) approach with regard to the assessment of merit (M=merit based) and respect for equal opportunities and the avoidance of discrimination during recruitment (R=recruitment).

The basic criteria for the selection of applicants are professional skills, publications, accomplishments in terms of creative work, experience of international mobility, and other relevant criteria where appropriate. The selection process is fully compliant with

national legislation, departmental regulations and standards, internal regulations and measures of the University, as well as the Code of Ethics of the Defence University.

The UD was awarded the project “PhD infrastructure at the University of Defence” in the amount of CZK 37.7 million under by the provider the Ministry of Education under the Operational Programme Jan Amos Komenský (OP JAK); 34 million CZK will be the amount spent on instruments and computer equipment. In addition, the UD plans to participate in three more OP JAK calls in 2024:

- ERDF call for universities – quality (application requesting up to 90 million CZK),
- ERDF call for universities – students with SP (application requesting up to 20 million CZK),
- ESF+ call for universities (application requesting up to 30 million CZK)

The UD, as an organizational unit of the state, cannot create internal resources for the preparation of quality project applications according to the rules of financial management.

A Methodological Guideline on project administration and management at the UD is being prepared.

The costs of PESCO, EDA, and NATO projects are covered by the UD’s own IP.

In EDF projects, the UD enters into consortia with different participants depending on the focus of the call. The UD has a long-term cooperation with various research organisations, e.g. Czech Technical University, Brno University of Technology, and Masaryk University.

Based on the consideration of the programmes and calls of the national managing authorities supported by the EU Cohesion Fund (CF) in terms of the UD’s eligibility for participation, it appears that the UD is not eligible for participation in the calls of the Operational Programme Environment 2021-2027 due to the ownership structure of the objects intended for use by the UD. The second operational programme Technical Assistance is used to support the submission of other projects under other calls and programmes.

The UD is undergoing an international university evaluation in accordance with the M17+ Methodology. The evaluations are quite detailed and, together with the annual reports and the evaluation by the National Accreditation Office, provide quite robust data that can serve as a basis for institutional funding.

With regards to internal evaluation, the UD has established the Internal Evaluation Council for this purpose, which aims to determine the main directions of the scientific and research activities of the University, to streamline the activities of research teams and the integration of the UD’s scientific potential for the development of capabilities, and the fulfilment of the needs of the Ministry of Defence and the Czech Armed Forces, and which provides independent expert and advisory opinions and suggestions for possible interventions within the context of the UD. Another instrument that

implements the management process of evaluation at the University is the “Details on the Rules, Quality Assurance of Educational, Creative, and Related Activities and Internal Evaluation of the Quality of Educational, Creative and Related Activities at the University of Defence” Measure of the Rector, setting out the minimum quality requirements, indicators, and standards in the field of science and research and doctoral studies.

The UD works with external experts to select quality results for the M17+, M1 assessment. Comments and recommendations from previous periods are taken into account when selecting results.

In relation to the implementation of the recommendations, scientific research infrastructure (the RETC) was established, the nature of which is based on shared values with the concept of open facilities. As one of the starting points for the establishment of the facility, a technical situational analysis was prepared in relation to instrumentation and laboratory equipment and financial resources (a plan for the acquisition of instrumentation and laboratory equipment in the period 2023-2030, analysis of the state of rooms and spatial capacities, a needs analysis including a staffing plan and salary costs). The RETC represents a workplace with progressive and advanced technologies, instrumentation, and technical staff to support scientific research and expert activities primarily for the benefit of the MoD and the Czech Armed Forces, and to share the latest in military knowledge, support key defence and security activities, and the carrying out in-house scientific research and research in the implementation of domestic and international projects with the benefit of an interdisciplinary approach for accreditation purposes.

A LIST OF SUPPORTING DOCUMENTS/LINKS FOR MODULE 4

Document name	No. criteria	Location (link in HTML)
Quality Assurance System Rules of Educational, Creative and Related Activities and Internal Quality Evaluation System Rules of Educational, Creative and Related Activities at the University of Defence	4.2	09 Quality Assurance System Rules .pdf
Study and Examination Regulations of the University of Defence	4.13	06 Study and Exam. Reg.- Consolidated.pdf
Strategic Intent for	4.13	Strategic Intent UoD 2021-2030.pdf



Educational and Creative Activities of the University of Defence for the Period 2021–2030		
Implementation Plan of Strategic Intent for Educational and Creative Activities of the University of Defence for the Year 2024	4.13	PRSZ UD 2024
Measure of the Rector of the University of Defence No. 6/2018	4.14	6-2018 Intellectual Property.pdf
Code of Ethics of the University of Defence	4.14	Etický kodex UD EN.pdf

MODULE 5 - STRATEGY AND POLICIES

5.1 Mission and vision of the evaluated institution in R&D&I

The HEI will briefly describe its mission and vision with emphasis on R&D&I in general and its R&D&I capacities in the implemented R&D&I fields³⁹ (Tables 5.1.1 and 5.1.2). In particular, the HEI's vision covers the following five-year period and must relate to the strategic objectives of the Provider, the National Policy on Research, Development, and Innovation of the Czech Republic 2021+, the Gender Equality Strategy 2021-2030, and other higher national and supranational strategic documents in the field of R&D&I (Table 5.1.3). The HEI shall complement the description with active references to its Strategic plan for the teaching, scholarly, scientific, research, development, artistic, and other creative activities of the higher education institution (regarding the results and recommendations from the previous evaluation period, if the evaluated HEI participated in it). The HEI shall describe how the vision and mission were implemented during the period of 2020–2024.

Maximum 2000 words.

Self-Evaluation:

The UD aims to be a key institution in the field of research, development and innovation (R&D&I) in the defence and security sector of the Czech Republic. As a state university, it strives to produce applicable scientific knowledge and innovations that directly support the capabilities of the Czech defence system, enhance the security of citizens, and contribute to national and international stability. The University promotes an interdisciplinary approach, linking theory with practice and cooperation with key partners, including state institutions, industry actors, and academia.

The vision of the UD is to become a leader in research and innovation at the national and international level through intensive collaboration with the public, private, and non-profit sectors. We would like to be an institution that contributes to the development of new technologies, improving living standards, and achieving sustainable development. Our research activities have the ambition to shape the future in a field where technical, natural, and social sciences intersect, taking into account the current challenges facing contemporary society.

In the period of 2020–2024, the UD:

- Increased the quality of research activities: it implemented projects aimed at supporting national defence and security, including several applied research projects funded by national and international sources.
- Developed human potential: invested in the training of researchers and increased the involvement of PhD students in research activities.
- Improved infrastructure capacity: upgraded research laboratories and facilities to increase efficiency and capacity for new projects; establishment of the RETC.

³⁹ For so-called R&D&I capacities, see Definition of Terms in Methodology HEI2025+.

- Strengthened international cooperation: strengthened partnerships with foreign universities and NATO organisations.

More information is provided in the Strategic Intent for Educational and Creative Activities of the University of Defence for the Period 2021–2030, which summarises the achieved results and key priorities for the next period.

The UD remains committed to continuing to pursue its mission and vision and to further develop its capabilities to meet current and future defence and security challenges.

As can be seen from the data in Table 5.1.1 below, the UD specializes mainly on the following areas:

- Cybersecurity (FORD: Computer Science and Communication Technologies)
Research in this area includes the protection of information systems, the development of tools for the detection and prevention of cyber-attacks, and solutions for secure communications.
- Military Technology (FORD: Mechanical Engineering and Materials Technology) Focusing on the development of new materials, weapon systems, autonomous systems, and technologies used in modern militaries.
- Health Sciences (FORD: Medical and Health Sciences)
Including military medicine, emergency medicine, biotechnology and research on health protection in emergencies.
- Security Studies (FORD: Social Sciences)
Examination of crisis management, defence strategy, and security policy, including geopolitical and social aspects.

The expression of the UD's vision in terms of disciplinary capacity can be quantified by discipline, as shown in Table 5.1.2. Emphasis shall be placed on quality research with a focus on increasing the proportion of applied research.

5.1.1 R&D&I capacities of HEI in the year 2025

Field of Research	FORD	FORD share [%]	Predominant type of research	Total share of field of research [%]
1. Natural Sciences	1.1 Mathematics	3	Basic research	25
	1.2 Computer and information sciences	4	Basic research	
	1.3 Physical sciences	3	Balanced basic and applied research	

	1.4 Chemical sciences	6	Balanced basic and applied research	
	1.5 Earth and related environmental sciences	2	Basic research	
	1.6 Biological sciences	7	Basic research	
	1.7 Other natural sciences	1	Basic research	
2. Engineering and Technology	2.1 Civil engineering	2	Applied research	22
	2.2 Electrical engineering, Electronic engineering, Information engineering	7	Applied research	
	2.3 Mechanical engineering	8	Balanced basic and applied research	
	2.4 Chemical engineering	0	Zvolte položku.	
	2.5 Materials engineering	1	Applied research	
	2.6 Medical engineering	0	Zvolte položku.	
	2.7 Environmental engineering	0	Zvolte položku.	
	2.8 Environmental biotechnology	0	Zvolte položku.	
	2.9 Industrial biotechnology	0	Zvolte položku.	
	2.10 Nanotechnology	0	Zvolte položku.	
	2.11 Other engineering and technologies	3	Balanced basic and applied research	
3. Medical and Health Sciences	3.1 Basic medicine	4	Basic research	18
	3.2 Clinical medicine	8	Balanced basic and applied research	
	3.3 Health sciences	4	Basic research	
	3.4 Medical biotechnology	1	Applied	

4. Agricultural and veterinary sciences				0
	3.5. Other medical sciences	1	Basic research	
	4.1 Agriculture, Forestry, and Fisheries	0	Zvolte položku.	
	4.2 Animal and Dairy science	0	Zvolte položku.	
	4.3 Veterinary science	0	Zvolte položku.	
	4.4 Other agricultural sciences	0	Zvolte položku.	
5. Social Sciences	5.1 Psychology and cognitive sciences	1	Basic research	34
	5.2 Economics and Business	2	Basic research	
	5.3 Education	2	Basic research	
	5.4 Sociology	0	Zvolte položku.	
	5.5 Law	4	Basic research	
	5.6 Political science	6	Basic research	
	5.7 Social and economic geography	0	Zvolte položku.	
	5.8 Media and communications	0	Zvolte položku.	
	5.9 Other social sciences	18	Basic research	
6. Humanities and the Arts	6.1 History and Archaeology	0	Zvolte položku.	1
	6.2 Languages and Literature	1	Basic research	
	6.3 Philosophy, Ethics and Religion	0	Zvolte položku.	
	6.4 Arts (arts, history of arts, performing arts, music)	0	Zvolte položku.	
	6.5 Other Humanities and the Arts	0	Zvolte položku.	
Total		100 %	-	100 %

5.1.2 Target R&D&I capacities of HEI for the next five-year period

Field of Research	FORD	FORD share [%]	Predominant type of research	Total share of field of reaserch [%]
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1. Natural Sciences	1.1 Mathematics		Zvolte položku.	25
	1.2 Computer and information sciences		Zvolte položku.	
	1.3 Physical sciences		Zvolte položku.	
	1.4 Chemical sciences		Zvolte položku.	
	1.5 Earth and related environmental sciences		Zvolte položku.	
	1.6 Biological sciences		Zvolte položku.	
	1.7 Other natural sciences		Zvolte položku.	
2. Engineering and Technology	2.1 Civil engineering		Zvolte položku.	25
	2.2 Electrical engineering, Electronic engineering, Information engineering		Zvolte položku.	
	2.3 Mechanical engineering		Zvolte položku.	
	2.4 Chemical engineering		Zvolte položku.	
	2.5 Materials engineering		Zvolte položku.	
	2.6 Medical engineering		Zvolte položku.	
	2.7 Environmental engineering		Zvolte položku.	
	2.8 Environmental biotechnology		Zvolte položku.	
	2.9 Industrial biotechnology		Zvolte položku.	
	2.10 Nanotechnology		Zvolte položku.	
	2.11 Other engineering and technologies		Zvolte položku.	
3. Medical and Health Sciences	3.1 Basic medicine		Zvolte položku.	20
	3.2 Clinical medicine		Zvolte položku.	
	3.3 Health sciences		Zvolte položku.	
	3.4 Medical biotechnology		Zvolte položku.	

4. Agricultural and veterinary sciences	3.5. Other medical sciences		Zvolte položku.	0
	4.1 Agriculture, Forestry, and Fisheries		Zvolte položku.	
	4.2 Animal and Dairy science		Zvolte položku.	
	4.3 Veterinary science		Zvolte položku.	
	4.4 Other agricultural sciences		Zvolte položku.	
5. Social Sciences	5.1 Psychology and cognitive sciences		Zvolte položku.	30
	5.2 Economics and Business		Zvolte položku.	
	5.3 Education		Zvolte položku.	
	5.4 Sociology		Zvolte položku.	
	5.5 Law		Zvolte položku.	
	5.6 Political science		Zvolte položku.	
	5.7 Social and economic geography		Zvolte položku.	
	5.8 Media and communications		Zvolte položku.	
	5.9 Other social sciences		Zvolte položku.	
6. Humanities and the Arts	6.1 History and Archaeology		Zvolte položku.	0
	6.2 Languages and Literature		Zvolte položku.	
	6.3 Philosophy, Ethics and Religion		Zvolte položku.	
	6.4 Arts (arts, history of arts, performing arts, music)		Zvolte položku.	
	6.5 Other Humanities and the Arts		Zvolte položku.	
Total		100 %	-	100 %

5.1.3 Relation to the strategic objectives of the provider and strategic documents in the field of R&D&I

Strategic document	Follow-up
Strategic Goals of the Ministry of Defence	Strategic Intent for Educational and Creative Activities of the

	University of Defence for the Period 2021–2030
Gender Equality Strategy for 2021–30	Gender Equality Plan of the University of Defence for the Period 2022–2030

5.2 Research and development objectives

The HEI will describe its intentions and goals for the next five-year period. The objectives in the field of research development, innovation, and knowledge transfer as well as the objectives in the field of cooperation with public administration, entrepreneurs, and non-profit organizations will be described in relation to the mission, vision and disciplinary capacities of the HEI. Furthermore, the objectives for the development of the HEI as a research organization will be described, in the areas of human potential development, institutional resilience, the implementation of open science and adherence to the principles of ethics, scientific integrity, and good practice, and their interrelationship with R&D&I objectives. The objectives described must be consistent with the Strategic plan for the teaching, scholarly, scientific, research, development, artistic and other creative activities of the higher education institution.

Maximum 2000 words.

Self-Evaluation:

The UD has set ambitious goals for the next five-year period, ones that reflect its mission, vision and strategic focus on research, development, innovation, transfer of knowledge, as well as expert activities. This plan will include:

- **Research, Development, and Innovation (R&D&I) Goals:** The University shall focus on providing quality basic and applied research to contribute to innovation and new technological solutions that can bring concrete benefits to society and the business sector. The focus will be on increasing capacity for interdisciplinary research and building strong research teams to work on the development of new products, services, and technologies. The University will actively participate in the creation of collaborative innovation ecosystems with businesses, public administration, and non-profit organizations.
- **Goals in the area of cooperation with public administration, business sector, and non-profit organizations:** The University aims to broaden and deepen cooperation with public administration, business sector, and non-profit organizations. The intention is to adapt research activities to the current challenges facing these sectors and to create synergies that lead to the effective use of the University's scientific and professional capacities. Cooperation with public institutions will be oriented towards supporting policy decisions and developing strategies in areas such as environmental protection, health, and social equity.
- **Goals for the development of the University as a research organisation:** The development of human potential will be a key point of this period. The University will support the professional development of academic and

scientific staff, invest in quality research infrastructure, and create opportunities for international collaboration. At the same time, it will support the mobility of researchers, both towards foreign institutions and within the domestic research context.

Emphasis will be placed on developing institutional resilience, meaning the strengthening of the school's internal processes and infrastructure to be able to respond effectively to changes in political, economic, and technological conditions. This process includes ensuring the long-term sustainability of the University's research activities, effective management, and monitoring of research projects.

In the area of open science, the University will strive to increase the transparency of research processes and the increased availability of research data, publications and tools. Open access to scientific results will support the dissemination of scientific knowledge and provide access to the wider public.

Emphasis on ethics, scientific integrity, and good scientific practices will be an integral part of all research activities. The University will actively promote the development of ethical standards in research, ensure compliance with them, and work to create an environment that fosters trust and the transparency of scientific results.

These goals are designed to be consistent with the University's mission, its focus on quality research and education, and to support its role in the broader academic and societal context.

5.3 Institutional tools and measures for the implementation of the research and development strategy

The HEI will describe its institutional and strategic tools (e.g., strategic management tools, tools created to support the implementation of research objectives, legal and organizational norms in relation to R&D&I support, etc.) that are designed to fulfil the research and development objectives for the next five-year period (Table 5.3.1), with an emphasis on:

- Supporting quality R&D&I.
- Excellent science.
- Innovative environment and increasing the international or disciplinary competitiveness of the HEI's research activities.
- Development of human potential.
- Institutional resilience.
- Adherence to ethical principles, scientific integrity and good practice in R&D&I.

Maximum 2000 words.

Self-Evaluation:

In accordance with the Higher Education Act and the Minister of Defence, the University of Defence submits the Strategic Intent for Educational and Creative Activities of the University of Defence for the Period 2021–2030, which represents the key strategic document defining the main directions of the University's development

and its approaches to fulfilling its vision and mission, as well as to realising the needs of the MoD. In formulating its strategic plan, the University, as an integral part of the Czech educational system, draws on the Ministry's Strategic Plan for Higher Education for the period from 2021, issued by the Ministry of Education, which it incorporated into the specific context of the University. At the same time, it must respond to new trends and challenges while accounting for its own commitments to fulfilling the requirements and needs of the Ministry of Defence and the Czech Armed Forces, in conjunction with the developmental requirements of the Czech Armed Forces listed in The Conceptual Building of the Czech Armed Forces 2035. The University is also responsible for the development of the Armed Forces of the Czech Republic, in accordance with the requirements of the development of the Armed Forces of the Czech Republic set out in the following: Concept of the Construction of the Armed Forces of the Czech Republic 2035; Long-Term Outlook for Defence 2035; Concept of Defence Applied Research, Development and Innovation within the Ministry of Defence for the Period 2023 to 2029; and National Priority of Oriented Research, Experimental Development and Innovation in the area of "Safe Society" with a reflection on systemic problems in the section "Defence, Defence Capability and Deployment of the Armed Forces."

The UD has long striven to fulfil research and development goals through systematic strategic management and support tools aimed at promoting quality R&D&I. The following objectives have been defined for the coming five-year period:

- Establishment of an internal research support system for the development of innovative projects with high potential for the defence sector.
- Introduction of a system of regular evaluation of research activities using internationally recognised metrics.
- Establishment of specialised research centres in defence technology, military medicine, and cyber security.
- Annual evaluation of high quality (excellent) scientific and research results.
- Strengthening the reputation of the University through publications in prestigious journals and participation in international conferences.
- Organization of training, workshops, and programmes aimed at improving research and teaching skills.
- Setting up support programmes for PhD students and early career researchers, including funding for research projects and mobility.
- Support for participation of researchers in foreign projects and exchange programmes.
- Continuous upgrading of laboratories, research facilities and digital systems to ensure a state-of-the-art environment.
- Implementation of long-term strategies aimed at financial and environmental sustainability of research activities.
- Adoption and implementation of a code that sets out principles for ethical conduct in research.

The organization of educational activities aimed at raising awareness on ethics,

intellectual, property protection and transparency.

5.3.1 Institutional tools and measures for the implementation of the research and development strategy

Name of instrument/measure	Description of the tool/measure	Implementation status	Year
Implementation of the Recommendation of the International Assessment Panel (M17+)	Implementation of MEP recommendations according to the M17+ methodology, including increasing the quality of publication outputs and the availability of Open Access.	Implemented partially	2024
Optimization of administrative and institutional support for scientific work and research	Improving institutional support for researchers, for example through analysis of the use of industrial days.	Implemented	2024
Supporting excellence and societal relevance	Support of research priorities with potential for excellence and ensuring knowledge transfer.	Not implemented	2023
Development of international scientific cooperation	Promoting international staff mobility and establishing cooperation with international organizations.	Implemented	2023
Support for the winning of international research projects	Monitoring European Defence Fund calls and supporting researchers in applying for projects.	Implemented	2020
Cooperation with strategic partners in the context of scientific work and research	Deepening cooperation with the MoD, public universities, and research consortia.	Implemented partially	2024
The establishment of a Research, Expertise, and Technology Centre (RETC)	Building and staffing a centre focused on advanced research and technological innovation for the needs of the MoD and the CAF.	Implemented	2024
Supporting excellence and the applicability of scientific results	Supporting the focusing of research on current defence and security needs and cooperation with the application sphere.	Implemented partially	2024

5.4 Implementation of the recommendations in Module 5

The HEI will briefly describe how it has implemented the recommendations for Module 5 from the previous evaluation period, if applicable.

Maximum 1000 words

Self-Evaluation:

The UD is actively involved in four calls within the OP JAK, through which it can obtain funds (up to approximately CZK 180 million) for laboratory equipment, modern classroom equipment, internationalization, etc. The UD is unable to generate internal sources of project financing.

The UD has long been involved in long-term cooperation with leading Czech universities and institutions in investigating projects in the field of public protection and safety, for example, with Czech Technical University, Brno University of Technology, Masaryk University, Charles University, etc. The UD cooperates with foreign organizations, such as the Technical University of Košice (Slovakia), Università di Genova (Italy), Commissariat à l'énergie atomique et aux énergies alternatives (France), Academisch medisch centrum bij de universiteit van Amsterdam (Netherlands), National University of Ireland (Ireland), The Robert Koch Institute (Germany), Forsvarets Forskningsinstitut (Norway), Wojskowy Instytut Higieny i Epidemiologii (Poland), etc.

In 2023, an application for the accreditation of a master's degree programme in Military Chemistry was submitted to the accreditation authority. The programme is purpose-built for the needs of the Ministry of Defence and the Czech Armed Forces. It is a professionally oriented programme aimed at preparing future military professionals, and its structure reflects the requirements for the profile of an officer of the Czech Armed Forces.

The aim of the master's degree programme is to provide a master's level education corresponding to the range of theoretical knowledge and practical skills in the broad field of modern technologies used in the field of chemistry, with a focus on working with extremely toxic substances, understanding the principles of protection against weapons of mass destruction, and the possibilities of their application for the field of defence and security.

The issue in terms of scientific, research, and innovation activities, is the lack of suitable fields of study according to the Frascati Manual and the related possibilities of applying the results of scientific and research activities. This is closely linked to the subsequent evaluation of scientific results according to M17+, which is thus limited.

A suggestion of the Rector-Commandant has been forwarded to the Minister of Defence with a request to initiate support in taking into account UD's publication activities by the Research, Development, and Innovation Council, especially in the issue of specific, security and military disciplines that are not explicitly mentioned in the Frascati Manual. We do not have an official response; however, assessors from these fields can be found in the M17+ quality assessment of M1 results for 2022, which can be perceived as a positive reaction from the Research, Development, and Innovation

Council.

In terms of R&D training, seminars on the subject are organised several times a year for UD staff.

In order to support the creative activities and educational growth of UD academic staff and full-time doctoral students, a part of the institutional support is used each year for extraordinary rewards given to UD academic staff and students for their achievements in creative activities. The conditions of the support are published annually in the Incentive Programme.

In accordance with the Higher Education Act and the Minister of Defence, the University of Defence submits the Strategic Intent for Educational and Creative Activities of the University of Defence, which represents the key strategic document defining the main directions of the University's development and its approaches to fulfilling its vision and mission, as well as to realising the needs of the MoD. In formulating its strategic plan, the University, as an integral part of the Czech educational system, draws on the Ministry's Strategic Plan for Higher Education for the period from 2021, issued by the Ministry of Education, which it incorporated into the specific context of the University. At the same time, it must respond to new trends and challenges while accounting for its own commitments to fulfilling the requirements and needs of the Ministry of Defence and the Czech Armed Forces, in conjunction with the developmental requirements of the Czech Armed Forces listed in The Conceptual Construction of the Czech Armed Forces 2035. The University is also responsible for the development of the Armed Forces of the Czech Republic, in accordance with the requirements of the development of the Armed Forces of the Czech Republic set out in the following: Concept of the Construction of the Armed Forces of the Czech Republic 2035; Long-Term Outlook for Defence 2035; Concept of Defence Applied Research, Development and Innovation within the Ministry of Defence for the Period 2023 to 2029; and National Priority of Oriented Research, Experimental Development and Innovation in the area of "Safe Society" with a reflection on systemic problems in the section "Defence, Defence Capability and Deployment of the Armed Forces."

The organisational structure of the Centre for Security and Military Strategic Studies (CSMSS) supports the fulfilment of the centre's mission, meaning the implementation of educational and creative activities for the needs of ensuring national defence. The centre's mission is to support, in particular, the career education of MoD officers for the needs of mid- and higher- level defence management. The creative activity of the CSMSS is mainly aimed at providing expertise for the needs of the MoD. Expert activity includes support for conceptual, normative, doctrinal, and analytical activities at the strategic level of national defence management. For the needs of providing interdisciplinary expertise, ad-hoc teams are formed at the CSMSS for individual research and expert tasks. The effectiveness of their activities is limited by the traditional hierarchical perception of the world in military organizations and the level of implementation of project management. The current model is functional, but it is implemented with difficulty (the filling of military positions is not linked to the career order of the MoD, the retention of younger people is problematic, and the skills of

former soldiers do not typically cover the requirements of a career in academia).

It contributes intensively to the Smart and Sustainable Growth Strategy of the Czech (European) Society through its social relevance, which is assessed mainly from three perspectives:

- the criteria of the Government Research, Development, and Innovation Council in accordance with the 17+ methodology;
- recognition by the governing authority of the MoD;
- societal recognition, and recognition by the expert community, which is very robust.

The end users of the results of the creative activities of the CSMSS are the sections and departments of the Ministry of Defence and the General Staff of the Czech Armed Forces, for whose benefit and support expert opinions are prepared, inputs to strategic documents, which are subsequently published by the Ministry of Defence. Typical examples include the participation of the CSMSS in the development of the Doctrine of the Czech Armed Forces, participation in the development of the Conceptual Construction of the Czech Armed Forces and support for the update of the Long-Term Defence Outlook. In addition, academic staff participated in the development of methodologies and internal regulations of the Ministry of Defence, documents for the strategic level of management, and other concepts, such as the concept of training Ministry of Defence personnel.

A LIST OF SUPPORTING DOCUMENTS/LINKS FOR MODULE 5

Document name	No. criteria	Location (link in HTML)
Strategic Intent for Educational and Creative Activities of the University of Defence for the Period 2021–2030	5.1	Strategic Plan of the University of Defence for the Period of 2021–2030
Gender Equality Plan of the University of Defence for the Period 2022–2030	5.1	Gender Equality Plan of the University of Defence for the Period 2022–2030