



EXPLOSIVE ORDNANCE DISPOSAL CENTRE OF EXCELLENCE

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Preface

Dear Readers,

NATO Centres of Excellence are one of the tools of NATO Supreme Allied Commander for Transformation aiming to improve military capabilities, value and efficiency of the Alliance. They are nationally or multi-nationally sponsored entities offering recognized expertise and experience to the benefit of the Alliance, especially in support of transformation.



The Explosive Ordnance Disposal Centre of Excellence (EOD COE) was founded in 2007, three years after Slovak Republic joined NATO and volunteered to establish the EOD COE on its territory. With the Slovak Republic as a Framework Nation, providing the Centre with infrastructure and the main manning body, the EOD COE is supported by four Sponsoring Nations (CZE, HUN, POL and ROU).

Since its establishment, the EOD COE has been solidifying its leading position within the EOD community. The expertise accumulated within the Centre has fostered the development of future EOD capabilities in support of the NATO level of ambitions.

The EOD COE contributes to the NATO standardization process to improve cooperation within the organization. We help develop the Allied EOD publications and have led the creation of the first-ever NATO EOD Doctrine, which was introduced at the start of 2018. We support various NATO Working Groups (WG), including EOD WG, MILENG WG, Force Protection WG, and C-IED WG. Within the EOD WG, we have taken charge of the Terminology Team and the Lessons Learned Team.

The world is witnessing increasing number of attacks in various parts of the globe. Homemade explosives are still a growing concern due to the easy availability of precursors in the market. To tackle this challenge, the EOD COE offers courses on homemade explosives at basic as well as advanced levels. Responding to a NATO request, the Centre has taken up the role of a project manager for NATO CBRN EOD Incident Management Training.

The Centre contributed to EOD capabilities training through multinational exercises, such as Bison Counter, Northern Challenge, and Ardent Defender.

As EOD is an integral part of NATO capabilities, we also support NATO Defence Planning Process (NDPP). The EOD COE is recognized as an appropriate point/linkage body through which the EOD expertise knowledge is embedded into the NDPP.

The Centre has established the EOD/IED Equipment Catalogue in order to provide more information about EOD/IED equipment, its brochures, training manuals and users' opinion statistics.

In cooperation with the C-IED COE and the MILENG COE, the EOD COE organizes NATO EOD Demonstrations and Trials series harmonized with a series of EOD Workshops, both events being organized biennially. Furthermore, since 2017 the Centre, in cooperation with the NATO Communication and Information Agency, has launched the Integration of Exoskeleton in the Battlefield project as a part of the Defence against Terrorism Programme of Work.

Since 2022, EOD COE has run a new ETACS Project in order to address the training of EOD operators and support them during the completion of their tasks.

ETACS is a software development project for Virtual Reality goggles, combining virtual environments with 3D models to provide a unique training experience for EOD operators.

The main goal of the project is to create a tool presenting a new approach to EOD training by utilizing virtual reality. This technology enables a spectrum of numerous possibilities to support and enhance EOD training.

The development of the project is sponsored by NATO HQ ESCD.

The above-mentioned passage provides a brief summary of the work and efforts made by the entire EOD COE team. Our mission is to be a relevant supporter in building EOD capabilities for Sponsoring Nations, NATO Alliance and its Partners, while also assisting the NATO transformation process. We are always prepared to collaborate with other nations to develop solutions and address global security challenges.

František MIHALOVIČ
Colonel, SVK Army
Director

Background, History and Milestones

One of the first steps of the Slovak Republic after joining NATO in 2004, was volunteering to establish the Explosive Ordnance Disposal Centre of Excellence (EOD COE) on its territory. Since then we went through several milestones, assessments and accreditations to finally become the official NATO Education and Training Facility:

2007	Establishment of the EOD COE, collocated with the national EOD unit
2009	Splitting into a national and a NATO organization, including full Host Nation Support
2010	Functional and Operational Memoranda of Understanding were signed by SVK as Framework Nation and CZE, HUN, FRA and ROU as Sponsoring Nations
2011	Assessment by the ACT HQ team following the North Atlantic Council accreditation of the EOD COE, the Centre was activated as an International Military Organization Poland joining the EOD COE
2013	France leaving the EOD COE
2015	Quality Assurance /Institutional Accreditation/
2017	Exoskeleton Project
2019	ACT Periodic Assessment, successful fulfilment of criterias
2021	ACT Periodic Assessment
2022	QA Assessment as NATO Education & Training Facility
2023	7th NATO EOD Demonstrations and Trials

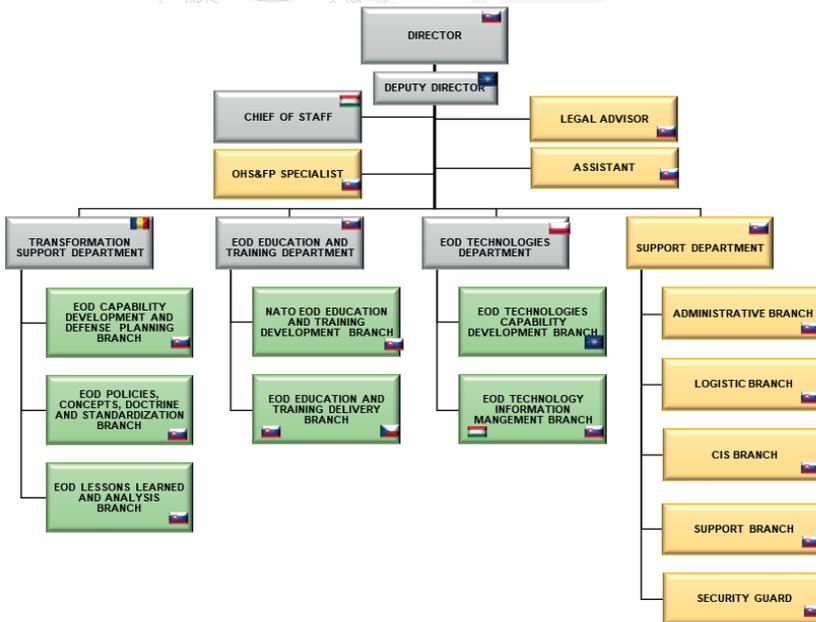
Four Pillars and Organisational Structure

The EOD COE is continuously aiming to harmonize own and coordinated work efforts and produce valuable expertise outcomes and entries for the whole spectrum of requirements from EOD COI.

In harmony with the EOD COE mission anchored in the MOUs all main tasks are performed in support of four COE mission pillars:

- Education, Training, Exercise and Evaluation
- Analysis and Lessons Learned
- Doctrine Development and Standardization
- Concept Development and Experimentation

Therefore, the EOD COE has implemented and applied the Quality Assurance mechanism and tailored its organizational structures accordingly (see the current EOD COE chart below).





Main Efforts Current and Future

The EOD COE dedicates its main current efforts to the umbrella EOD COE objective to support and enhance the NATO transformation and operational efforts in the field of EOD. At the same time, a great deal of attention is paid to the future security challenges, analyzing them, searching and projecting possible solutions within EOD area. These ambitions and focuses are brought to life throughout following lines of operation:

- Expertise support
- Cooperation with respective COIs and works on projects for the future
- Training

Expertise Support

To enhance the Interoperability the EOD COE contributes to the NATO Standardization process by providing the EOD expertise to the NATO Working Groups (WG), especially:

- Explosive Ordnance Disposal Interservice Working Group (EOD WG)
- Military Engineering Working Group (MILENG WG)
- Counter-Improvised Explosive Device Working Group (C-IED WG)
- NATO Technical Exploitation Group (NTEG)
- Force Protection Working Group (FP WG)
- Allied Joint Operations Doctrine Working Group (AJOD WG)
- Land Operations Working Group (LO WG)

In the area of Collective Training and Exercises (CT&E) the EOD COE acts as a recognized institution in EOD area of expertise. Our SMEs contribute to the development of Main Events List/Main Incidents List in EOD related scenarios, including the EOD injects there.

These injects may be used within NATO exercises which are listed in Military Training and Exercises Program (MTEP). At the same time, our SMEs monitor how the EOD ratified procedures are implemented/practiced during the CT&E. There are several multinational EOD exercises, where our Centre provides relevant expertise and contribution.



NATO EOD Demonstrations and Trials Series

NATO EOD Demonstration and Trials is a biennial event intended for experts from NATO and partner armed forces and the defence industry highlighting the latest EOD/IEDD technology development through live demonstrations, static exhibitions, seminars and conferences. The series of NATO EOD Demonstrations and Trials is organized by the Centre of Excellence for Explosive Ordnance Disposal with full support of the Ministry of Defence of the Slovak Republic. It is funded through the NATO Defence Against Terrorism Programme of Work (DAT POW) established under the auspices of the NATO HQ Emerging Security Challenges Division.

The first NATO EOD Demonstration and Trials event was organized in Slovakia in 2010. Since then, the event has been organized every two years with different leading topics, such as “Technological Innovations Influencing Future EOD and

Related Capabilities” in 2021 or “Future EOD Development in Light of the Modern Conflicts and Technological Progress” in 2023.

The main objective is to offer:

- A common platform for companies, research and development institutes, NATO bodies and nations to present the latest technological solutions for an improvement of Alliance forces interoperability and EOD operator’s capability in protecting the forces and civilian population.
- An open space for discussions as part of the conference, seminars, or panels about Urgent Military Requirements for the DAT POW and compare them with the direction of actual roadmaps.

Organizing the event broadens the knowledge about current and future aspects of EOD-related technology capability horizons and confirms or identifies the area of shortfalls. Discussions and demonstrations of technologies, TTPs and connecting different organizations and bodies continuously help to shape the future of the DAT POW effort and roadmaps.



EOD/IEDD Catalogue

The NATO Explosive Ordnance Disposal Centre of Excellence Trenčín maintains an Explosive Ordnance Disposal / Improvised Explosive Devices Disposal (EOD/IEDD) Equipment Catalogue.

The main aim of this project is to facilitate a search for suitable equipment for EOD specialists as well as to support other armament subject matter experts in procurement when they seek available solutions on the market. It is equally important to promote new technologies and advanced EOD equipment along with the operators' practical experience from the field and real deployment.

Having this kind of assessment/information at one central spot brings the full spectrum of benefits to all those involved in this area of interest. It also provides an excellent opportunity for manufacturers to promote their products and highlight the latest upgrades and technological progress to the EOD community.

The Technology Department as a part of the EOD COE is responsible for the Catalogue, its operational functionality, accuracy and regular updates. The Catalogue splits products into several main categories like Detectors, ROVs (Remotely Operated Vehicles), Protection equipment, Tools and Active materials.

NATO EOD COE experiences from several EOD technology projects have shown that cooperation between producers, academia and end-users is essential. Thus, at the end of 2020, the Centre enhanced the Catalogue's options with the "EOD-related institutions" database.

Today, the end-user of the catalogue can easily find EOD-related Centres of Excellence, institutions or entities that deal with equipment testing, development and research, education and training as well as institutions in the possession of the EOD-related databases. The database of available EOD-related institutions helps to establish direct contact between any relevant subject matter experts (SMEs) worldwide.

The EOD/IEDD Catalogue is a living database updated daily and permanently growing.

The classification of the Catalogue remains NATO UNCLASSIFIED/RELEASABLE TO IP.

EOD/IEDD Equipment Catalogue

Home / EOD/IEDD Equipment Catalogue / Equipment producers

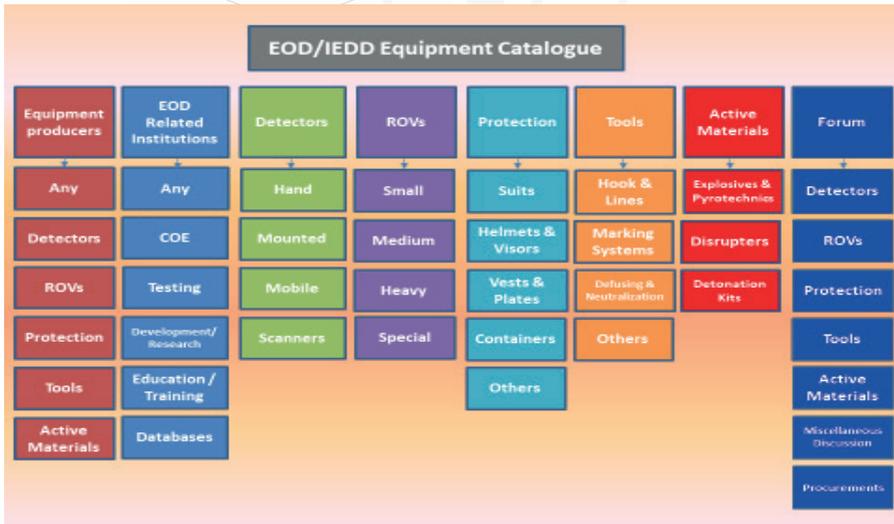
- Equipment producers
- EOD related institutions
- Detectors
- ROVs/UAVs
- Protection
- Tools
- Active materials
- Forum

Equipment producers in EOD/IEDD catalogue

Product

Search

No.	Company	Address	Phone contact / email contact	EOD/IEDD related products	Link to company Web page
1	3MON	Černyševského 10, Bratislava, Slovakia	+421918641394 kalinovska@3mon.sk	ROVs	www.3mon.sk
2	AERO VISION Ltd	Prof. Georgi Zlatarski 18, Sofia, Bulgaria	+359 878 47 87 64 office@aero-vision.net	ROVs	www.aero-vision.net
3	Alakai Defense Systems	Bryan Dairy Road 8285, Suite, United States	011 7275411600 jj.bare@alakaidefense.com	Detectors	www.alakaidefense.com
4	Alford Technologies Ltd.	Glenmore Business Park, Vincents Road, Bump 17-18, Chappenhams, Wiltshire SN146BB, United Kingdom	+44(0)1249 651111 info@explosives.net	Active materials	www.explosives.net
5	ANT Applied New Technologies AG	Hinter den Kirschkatzen 32, Lübeck, Germany	+49 451 5 83 80-0 info@ant-ag.com	Tools	www.ant-ag.com



ETACS Project

The EOD/IEDD VR/XR Training and Combat Support Kit, shortly called ETACS is a project initiated by NATO EOD COE in 2022 in order to address the training of EOD operators and support them during the completion of their tasks.

ETACS is a software development project for Virtual Reality goggles, combining virtual environments with 3D models to provide a unique training experience for EOD operators.

The main goal of the project is to create a tool presenting a new approach to EOD training by utilizing virtual reality. This technology enables a spectrum of numerous possibilities to support and enhance EOD training. The development of the project is sponsored by NATO HQ ESCD.

Another part of the project is research into other technologies of spatial computing and the determination of their potential to support EOD operators in the field.

In order to deliver a quality product, the EOD Centre of Excellence cooperates with the EOD community of interest and several partners:

- NATO HQ ESCD DaT POW
- 4Experience
- Swedish Demining Centre
- Alford
- Aerovision



EOD Workshops Series

The EOD WS Series is a tool for organizing events in the main responsibility of the LLAB. It started in 2012 as an EOD LL Seminar, where EOD operators and staff officers had the opportunity to share their lessons.

Throughout the years, the EOD Community of Interest (COI) learned from these yearly events their information and outputs.

As the EOD COE is continuously heading towards more valuable and efficiently organized events, the EOD WS became a platform not only for LL sharing but it also started to serve as a workshop supporting development of particular projects/studies since 2017. By this approach the EOD Workshops indirectly connect knowledge obtained from past lessons with probable or possible EOD trends arising in the present and it forms requirements for the future EOD capabilities.

Besides this, the EOD WS will continuously contribute to the EOD COI by providing space for fruitful networking of SMEs on tactical and operational levels (including SMEs from academia and commercial sector) from 2017 on biennial basis in order to synchronize the EOD COE main events.



Involvement and Contribution to NATO Defence Planning Process (NDPP)

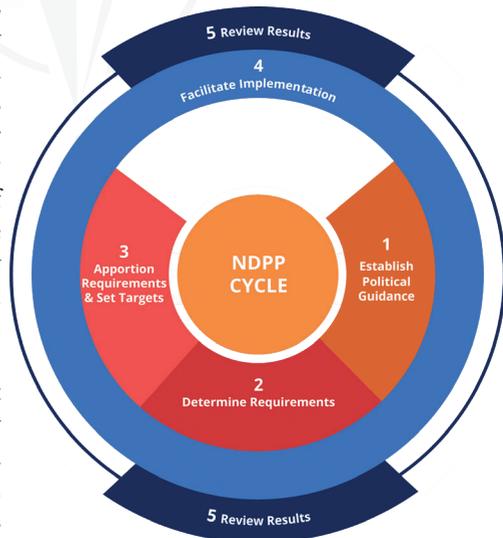
The aim of NATO defence planning is to provide a framework within which national and Alliance defence planning activities can be harmonised to meet agreed targets in the most effective way.

It facilitates the timely identification, development and delivery of the necessary range of forces that are interoperable and adequately prepared, equipped, trained and supported as well as the associated military and non-military capabilities to undertake the Alliance's full spectrum of missions.

As a permanent member of Military Engineering Defence Planning Advisory Group (MILENG DPAG), EOD COE brings its substantial contribution by providing consolidated expertise and support to the NDPP planning domains in a comprehensive and effective manner to all related tasks, reflecting the NDPP planning domains mainly in the area of development and revision of respective Capability Codes and Capability Statements (CC&CS) e.g. MILENG, C-IED, JCBRN Defence.

The latest review of the CC&CS has built on the Capability Requirement Review and has incorporated recent changes and recommendations from relevant Policies, Doctrines, Allied Standards, Lessons Learned as well as operationa

requirements arising from the current strategic environment, and the newly identified Concepts and Multi-Domain approach. The overall aim of the CC&CS revision is to revalidate and further develop them, as appropriate, in order to ensure their relevance for use in the forthcoming NDPP cycle.



Training Way Ahead

Education & Training (E&T) is one of the important pillars in which the NATO EOD COE disseminates the fruits of its work. The EOD COE provides for NATO, Sponsoring Nations and its partners in general, Education and Individual Training (E&IT) to EOD staff and EOD operators' level as a Target Audience (TA).

Education for the EOD staff is based on NATO EOD related publications once the EOD staff conducts EOD operations on multinational deployment. On the other side, the analysed shared knowledge on Homemade Explosives (HME) subjects are tailored to the EOD already trained personnel based on the best practices.

All of the EOD COE E&IT solutions are tracking the so-called NATO System Approach to Training (SAT) in line with Alliance approach to Education, Training, Exercises and Evaluation Policy (ETEE).



The EOD COE with the E&T portfolio reflects the NATO Military Engineering (MILENG) discipline identified gaps in EOD area, which are driven by new trends. These gaps are further elaborated by the EOD COE as the MILENG discipline recognized specialized institution.

In 2022 EOD COE was accredited in E&T Quality Assurance (QA) at the unconditional level of accreditation. The high accreditation grade proves that the analysed, designed, developed and delivered products to the EOD Community of Interest (COI) are meeting NATO's QA criteria with their systematic improvement.

The high quality of the deliverables offer is not only the NATO EOD COE merit, but also the Centre's external EOD COI, which helps to orchestrate the EOD COE level of "excellence".

In the Collective Training and Exercises (CT&E) area, the EOD COE provides NATO led multinational exercises and, in particular, EOD related exercises with EOD advice, which challenges the multinational deployed EOD capabilities. The EOD COE Education & Training is effectively connecting the EOD COI entities with its final goal to enhance NATO's transformation and interoperability through training.



Courses and Training Activities



NATO EOD Staff Officer Training

Aim:

NATO EOD SOT is designed to educate and train non-qualified EOD staff officers to achieve basic level of proficiency in accordance with NATO and UN standards. EOD staff officer is able to plan, prepare, command, control and coordinate EOD operations within multinational operations at battalion and brigade levels of command.

Course objectives:

After successful completion of the course, the graduates will be able to:

- recognise explosive ordnance (EO) by type and hazards and IED threat and its impact on operation,
- understand types of EOD incidents, task appropriate EOD assets to deal with them and state of command and how they are applied to the C2 EOD structure,
- apply NATO EOD messages and reporting system and current NATO EOD publications,
- conduct a threat analysis and mitigate (decrease) the impact of UXO on operations,
- plan, prepare and conduct the EOD/IEDD activities based on the multinational deployment,
- prioritize and plan EOR/EOD/IEDD operations.

Depth of knowledge:

Apply (on the basis of Bi-SC 075-007 Education and Individual Training Directive)

Target audience:

EOD staff officers or senior NCOs from NATO and Interoperability Platform Countries assigned or intended to be assigned as officers at Combined Joint EOD Cell, EOD Coordination Cell, EOD Cell or as National EOD Point of Contact during multinational deployments.

Course length:

2 weeks (1 week of theory - EOD standards and procedures, 1 week of a practical training and exercises)

Home-Made Explosives Course - Basic

Aim:

HMEC-Basic's aim is to educate Non-EOD qualified personnel about the fundamentals of identification of individual precursors that are regularly used in the process of manufacturing of Home-Made Explosives (HMEs). The same teaching process also applies to the identification of HME final products. Great emphasis is also placed on recognition of various manufacturing equipment and clandestine HME laboratories. The students are also taught basic principles of taking the necessary safety precautions and reporting the HME-related incidents.

Course objectives:

After successful completion of the course, the graduates will be able to:

- Understand the explosives phenomena, types and their effects, as well as the explosives characteristics and the basic chemistry as it relates to the common energetic HME mixtures,
- Recognize particular types of HME manufacturing equipment and HME clandestine laboratories,
- Identify and describe Nitrate, Nitromethane, Chlorate & Perchlorate and Peroxide-based home-made explosives,
- Take necessary steps to introduce basic safety measures on the HME/HME manufacturing site.

Depth of knowledge:

Apply (on the basis of Bi-SC 075-007 Education and Individual Training Directive)

Target audience:

Non-EOD qualified personnel from NATO and Interoperability Platform Countries, or EOD qualified personnel with no/little knowledge related to HME.

Course length:

3 days (2 days of theory, one day hands-on training)

Home-Made Explosives Course - Advanced

Aim:

The HMEC-Advanced introduces responding personnel to the precursors used by criminals and terrorists in the manufacturing process of home-made explosives, along with the synthesized finished explosive mixtures. Students learn to identify the hazards of mixed or partially mixed precursor chemicals, identify unknown materials and related hazards, process a scene for evidentiary purposes and safely remove and dispose of these hazards.

Course objectives:

After successful completion of the course, the graduates will be able to:

- Explain properties of HME and their precursors,
- Demonstrate HME manufacturing Processes and equipment,
- Operate equipment supporting HME scene processing,
- Process clandestine explosives laboratory.

Depth of knowledge:

Apply (on the basis of Bi-SC 075-007 Education and Individual Training Directive)

Target audience:

EOD Qualified personnel, WTI specialists or SOF from NATO and Interoperability Platform Countries.

Course length:

5 days (40% of theory, 60% of hands-on training)

NATO CBRN EOD Incident Management Staff Officer Training

Aim:

The aim of the NATO CBRN EOD Staff Officer Incident Management Training is to train qualified personnel (EOD staff officers) in managing CBRN EOD incident up to brigade staff level during multinational operations and advising commander on chemical, biological and radiological explosive ordnance disposal and CBR IED matters.

Course objectives:

After successful completion of the course, the graduates will be able to:

- apply CBRN EOD threat management including CBRN weapons,
- advice commander on up to Brigade Staff level on CBRN Explosive ordnance disposal,
- manage CBRN EOD Incident within the overall spectrum of EOD tasks.

Depth of knowledge:

Apply (on the basis of Bi-SC 075-007 Education and Individual Training Directive)

Target audience:

EOD and CBRN staff officers or senior NCOs from NATO and Interoperability Platform Countries to be appointed during multinational deployments as officers at Combined Joint EOD Cell, EOD Coordination Cell, EOD Cell or as a National EOD Point of Contact.

Course length:

5 days (4 days of theory, 1 day of practical exercise)



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