European Defence Agency

EDA CBRN EXERCISE

"FIRM FOUNDATION 2008"
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Dealing with Improvised Explosive Devices (IEDs) that contain Chemical, Biological, Radiological or Nuclear (CBRN) agents is a growing threat to Europe's armies. Handling these deadly weapons is no simple matter, however. It entails detection, analysis and precise identification of the threat, defusing and separating the explosive from the CBRN elements and, finally, safely disposing the components. In case of explosion, the threat's impact on military and civilian personnel must be contained as much as possible – with all the disaster-response consequences that implies – followed by decontamination and remediation of the affected area.

No single set of military specialists can execute the complexity of tasks required to deal with explosive devices containing CBRN agents. This is why most armies traditionally have separate Explosive Ordnance Disposal (EOD) and CBRN teams who often do not coordinate with each other. Yet a combined IED/CBRN threat demands a combined – and common – operational response across Europe's armies, particularly as they work increasingly together for expeditionary missions. Indeed, the likely use of this double-edged weapon by hostile forces is rising and could pose a serious threat to European Security and Defence Policy missions in the future if not addressed.

Identifying how these teams can better coordinate their tasks was the focus of a three-day table-top exercise organised by the European Defence Agency near Namur, Belgium. The 11-13 November exercise brought together some 80 military and civilian CBRN/EOD experts from national armies, military schools and research institutes across 20 nations. Observers from NATO were also present. It was hosted at the CBRN Joint Training Centre of the Belgian Army in Jambes, which supplemented the event with a live demonstration of how the Belgian military confronts CBRN/EOD threats.

Breaking down the operational barriers that separate national EOD and CBRN teams so they can work interoperably with each other – and with their counterparts in joint operations – is among the policy goals of the EDA. The Agency promotes joint capability and armaments development, R&T efforts and market & industry initiatives among its participating Member States. All 27 EU nations except Denmark belong to the Agency.

"Operating environments have become very complicated for militaries today and for CBRN defence specialists," Frank Kaemper, EDA Capabilities Project Officer - Protect, told the experts. "CBRN defence soldiers are having to become more qualified and specialised. In most of the environments that military must confront today, it is no longer enough to simply cordon off a contamination with yellow tape and forbid people to go in there. In urban environments, which are increasingly the main focus of military operations, that is not possible or realistic, as people have to continue to live there."

A combined CBRN/EOD incident is a very complicated issue, which requires a good understanding of the threat and time, according to Kaemper.

"You've got to set up an operational safe distance around the incident site, then deal with the potential with the explosive part of the incident before carrying out CBRN hazard management activities. It means we've got to start talking to each other from the onset of the incident, which includes the planning for such an incident. It's important that the CBRN officer has the chance to provide advice before an EOD team goes in to tackle the explosive render safe procedures. What type of detector should the EOD team have with it, or what sensor module should an EOD robot carry, if the situation demands automated render-safe procedures? Essentially we are talking about survivability issues here" he said.

Dubbed "Firm Foundation 2008," the exercise was the culmination of two years' preparatory work by the Agency's project team of national experts with an eye to developing a coherent set of CBRN/EOD procedures for its 26 member nations that could be tested at the level of a Joint Operational Centre.

Many enablers at play

To successfully deal with CBRN/EOD threats requires a range of enablers:

- Detection, identification and monitoring capabilities to warn personnel of hazardous agent concentrations and provide additional information on the type and nature of the hazard, as well as monitor the hazard over time;
- Warning and reporting capabilities for the rapid collection, evaluation and dissemination of data about CBRN incidents, including prediction of hazard areas;
- Individual and collective protection, which enable personnel to survive incidents and to continue operating in a CBRN environment;
- Hazard management capabilities to limit the threat impact on ESDP operations – from decontamination to controlling the spread of bio-agents; and
- Medical countermeasures to decrease the susceptibility of personnel to CBRN hazards and to treat and evacuate casualties.

Not all EU Member States have the full range of these capabilities, but even for those who do, coordinating them between national branches and/or services – and all the more so between two or more nations – is a daunting task. Indeed, as Firm Foundation's organisers saw, it was not easy at first for the multi-national EOD and CBRN experts in Jambes to develop a coherent operational view for dealing with the simulated threats. However, a more common vision emerged by the end, which provides the basis for the Agency to carry forward its work.

As Renato Scudicio of the Italian military's EOD school and the EDA's Project Team Chairman told the gathering when launching the exercise: "This is the perfect occasion for us to test the CBRN EOD policy and concept developed by the project team. We need to take a stock of required future work by the project team to provide solutions for responding to these threats. Our goal is to develop an EU CBRN/EOD planning guide for EU-led operations. We do not have this today across Europe."

EDA officials confirmed that view. Hubert Muckel, EDA's Capability Manager for Engagement, said "we must be prepared for the possibility that our adversaries could use CBRN: it's a much greater risk than in the past."

Jim Blackburn, former explosives specialist with the British Army and now an EDA Capability Planner, added: "We believe there is an intention to use CBRN. There are numerous sources for people to learn how to deliver them so the capability is definitely out there. With a capability and an intention, we have a threat."

Noting that there have been cylinder-based chlorine attacks in Iraq, he said the devices "were not very effective at the beginning, but there have been improvements in their technology. We're not yet seeing the regular occurrence of such threats, but the frequency is increasing."

The objectives of the Jambes exercise were to: investigate and test CBRN/EOD policy and concepts; define the best operational solutions to respond to various CBRN/EOD threats in a failed-state environment where civil infrastructure has been compromised and where government agencies no longer function normally; and agree common techniques to prepare, approach and deal with combined CBRN/EOD incidents.

Firm Foundation 2008's participants were divided into three mixed syndicates, or teams. Each was designated as a Joint Operational Centre (JOC) and included one person playing the role of host-government representative. The teams were unstructured, meaning it fell to each to decide how to organise its members and define a Concept of Operations (ConOps) for an incident commander who would have to deal with the threat.

The syndicates were assigned three increasingly complex IED vignettes during the excerise:

A: one with a chemical payload located in an urban park in a safe and permissive operating environment

B: one with a biological agent located inside a building with a safe and permissive environment

C: one with a radiological payload located in the open air but in an unsafe and non-permissive environment.

All three vignettes involved an ESDP mission operating in the theoretical country of Brownland, a large failed state with major cities and ports, a diversity of landscapes and growing chaos due to religiously-charged rebel groups operating in and around the country. The vignettes were enriched with the usual array of complicating factors such as variable weather conditions, urban complexity, population density, restricted host-nation competencies, etc.

After a general introduction to the exercise's purpose during the morning, the three syndicates were given the full afternoon of the first day to define their ConOps for vignette A, followed by discussion and analysis during the second morning. For the next and more complicated vignette B, however, the syndicates had only two hours to put together a ConOps. The third and final vignette was analysed by all 80 participants on day 3 in the same room to collectively extract lessons learned.

Prior to launching the teams' work on the first vignette, Yves Dubucq, a member of the Agency's CBRN/EOD Project Team and Head of Belgium's CBRN Joint Centre, told the participants: "We are not looking at individual practices but general procedures. The goal is to develop procedures. The procedure you use in your country might be fine, but we want the best practices from each nation."

What worked and what didn't

Splitting Firm Foundation's participants into multi-nation teams distinctly underscored the need for a common approach among Europe's armies to define and execute a counter-CBRN EOD concept of operations.

For example, one team predictably divided all its members into specialised sub-groups of EOD and CBRN experts, so that the two had to negotiate a common set of guidelines for the JOC's Incident Commander (IC). Another team took a more integrated approach by tackling the ConOps as a group, but then got bogged down in tactical details and ended up rushing to complete its work. The third syndicate split only its EOD and CBRN experts into sub-groups, leaving the rest of the team to work together.

Not surprisingly, the exercise results for the first vignette were mixed, given that each team had to resolve a wide array of problems on the ground, some of which required comprehensive planning foresight. For example, once an IED is discovered, how to get updated intelligence prior to an operational briefing? Should a liaison officer be sent to local hospital and police units to interview any casualties caused by those who discovered or may have approached the toxic device? There were variations in the way each team defined the importance and order of these tasks and others.

On the plus side, all three identified the capabilities and the key host-nation contacts their IC would need. They also correctly identified the threat level of the IED and the protective measures required.

Yet no team produced an optimal concept of operations for vignette A. Part of the problem lay in the different responsibilities that armies have across Europe. In Ireland, for example, EOD teams are not required to deal with waste management, remediation or waste disposal, while the military in Belgium has a greater follow-up role.

Another source of confusion was who to appoint as Incident Commander – a specialist or a higher-ranking officer with a broader range of managerial experience? As one Spanish participant observed: "This is a sensitive point because the IC may not necessarily be familiar with CBRN matters. If so, you can't task him with that in addition to all the other things he must do. Not only will he have to manage the CBRN/EOD situation itself, but also any local authorities and international organisations. I think it's better to have someone with more strategic/managerial authority in the position."

EDA officials agreed that the issue of choosing a CBRN/EOD Incident Commander within a multinational mission is a tough call to make. "Perhaps we need to establish some kind of readiness level," observed Kaemper. "That could help define an immediate response team and a pre-defined IC. Again, this underlines the importance of intelligence during such an operation: what are the indicators that launch a CBRN incident?" Blackburn added: "We probably can't definitively write this out (as a rule for selecting an IC), but maybe we can come up with some general guidelines."

Finally, the teams suffered from gaps in pre-planning, the provisions for Command & Control coordination and – tellingly – too much focus on the tactical versus operational level. This suggests that future work on a common approach may require drawing a finer distinction between tactical and operational tasks in the CBRN/EOD area so that all EDA countries have a common understanding.

Ideal ConOps?

After the three ConOps for vignette A were presented, the Team of Experts (ToE) responsible for the conduct of the table top exercise then explained how it would have tackled the issue. Their ConOps envisioned that the incident commander would:

- Create a command post 300 meter south of the device;
- Get debriefed by police and search and reconnaissance teams to determine the cordon area around the weapon, evacuation routes and predicted contamination patterns;
- Determine the minimum dress (protective) state for all subordinate assets on site;
- Establish direct communication links to the EU Force's multinational JOC and to all subordinate assets on site;
- Create a media meeting point at EU Force's Headquarters with a liaison officer who gives briefs on safety measures taken to restore confidence in the population;
- Authorise the beginning of the deployment;
- Confirm the EOD team's reconnaissance of the device;
- Deploy a decontamination station for personnel and material;
- Confer with the host nation to prepare a dump waste disposal for the CBRN payload and explosive material;
- Activate his EOD team, followed by debriefings that igniters were disarmed and all IED components packaged for forensic analysis.

The ToE's analysis prompted a lively exchange of views among the participants, which was followed by the Belgian Army's demonstration of a CBRN training exercise based on the detection, identification, defusing and disposal of an IED/bio threat.

Teamwork quickens

During the afternoon of day 2 the participants' work on vignette B saw stronger group dynamics and analysis. Whether this derived from the ToE's ConOps example or from the experience each team gained in making its EOD and CBRN specialists work together – or perhaps both – the results visibly improved in terms of the ConOps produced by the three syndicates. The lessons were apparently learned.

Not only did each team sketch out a ConOps framework more quickly, but there was a broad convergence in their approaches to the scenario. There were still minor problems, of course, such as insufficient communication between one syndicate's members and its team leader or too much accommodation by another team of the host nation's demands. There was also some duplication in one team's overall ConOps.

In reality such differences between EU militaries could be reconciled ahead of time if there was a common set of Command, Control and Communications (C3) principles for dealing with CBRN/EOD incidents, said Kaemper. "We need to put incident command on a multi-nation basis by getting the Member States' different CBRN and EOD communities talking to each other," he said. "This would enable them to quickly form a multi-nation Joint Operational Centre for dealing with these threats."

Blackburn agreed. "We also need national points of contact. Every nation should have a CBRN/EOD liaison officer embedded in multinational operations," he said. "I think if we can identify any common theme, it's the requirement to have a very clear C3 structure that determines the participants, separates execution and command levels, allocates responsibilities to each level and checks the practices, procedures and capabilities. The overall idea should be to establish centralised planning and cooperation, but allow decentralised execution and control, so that local commander can use what he has at his disposal."

In his view, if the Member States can incorporate these into their national doctrines, "then it should lead to interoperability of approach between them, especially since it is unlikely that any one nation among us will go it alone into an operation where these risks exist."

Conclusion

Notwithstanding the obstacles that face the development of a common set of CBRN/EOD operational guidelines, EDA officials were confident this could be achieved.

"I was impressed with work I've seen, despite the fact that there was no single simple solution," said Muckel. "Is that a surprise? No. Everyone is starting to notice that when you're actually dealing with a combined CBRN/explosive threat that you cannot work as two separate entities – EOD on one side, and CBRN on the other. From my experience, changing this is not a problem in the practical world, but you have to change your mindset. If this can be done, then we're heading in the right direction."

Muckel told his audience that a principle aim of Firm Foundation 2008 "was to check whether our work is on track regarding CBRN/EOD tactics and operational needs. More steps are needed - but we're moving in the right direction. This exercise is just the beginning of the work that still lies ahead of us."

Wrapping up the three-day exercise, Jon Mullin, EDA's Capabilities Director, reminded his listeners that the Agency "is here to assist the participating Member States to support capability development for ESDP crisis management operations – now and in future. There are many different ways to develop military capabilities, and what we're doing here is to push through the conceptual side."

Mullin said the EU is interested in a cross-pillar approach. "This means that you're dealing with one of the really big issues since this work will contribute greatly to the homeland security side," he said. "If your nations run [CBRN/EOD] risk registers– and a number of them do–then you will see that your work is right at the top level of risks. We've done this exercise at an unclassified level, but we all realise what the implications are if we get it wrong in the long run. This has strategic effects and we can't afford to make mistakes."

As a follow-up action to the Jambes exercise, Kaemper said the EDA will propose CBRN/EOD training courses and other initiatives to its Member States. "One of these initiatives is the plan to create a training portal on the Web where the Member States can exchange information on multinational training opportunities and send their personnel for training via the portal," he said, noting that the new training tool is currently available as a prototype version with the first one-day user training session scheduled for 26 February 2009.

EDA's CBRN related work

EDA activities in the CBRN area are conducted in two Project Teams (PTs), addressing the priority capability requirements: the PT CBRN Explosives Ordnance Disposal (EOD) and the PT CBRN Detection Identification and Monitoring (DIM).

Both PTs have established close cooperation with the relevant R&T Capability Technology group (CapTech ESM 04 - Human Factor & CBR Protection), with ongoing Force Protection (FP)R&T Studies under the Joint Investment Programme-FP and with the European Commission, in order to ensure that work is complementary.

The Project Team CBRN EOD aims to enhance CBRN EOD capabilities by analysing all capability lines of development and developing appropriate recommendations and actions, thus:

- Improving the EU and pMS response to the threat posed by Potential Agressors' use of CBRN substances, in manufactured munitions or improvised devices, for the protection of EU military forces and civilian population.
- Enabling the Member States to improve their CBRN EOD capabilities through multinational cooperation and interoperability standards, resolving the EU shortfall in this domain.
- Enhancing the ability of CBRN EOD assets to operate safely and successfully, in cooperation with other military supporting assets and civilian emergency services, in EU-led operations and for the protection of EU citizens.

The Project Team CBRN DIM addresses all capability lines of development (concepts, doctrine, equipment, training, infrastructure, personnel, organisation and interoperability) and covers all joint capability issues with regards to the detection, identification and monitoring of CBRN and Toxic Indsutiral Materials (TIM) agents and materials. Detection, Identification and Monitoring are needed to detect and characterise CBRN incidents, identify the agents and hazards, to delineate areas of change and to monitor changes. The operational components of detection and identification are CBRN reconnaissance, survey and surveillance.

This PT aims at:

- Improving European military forces' ability to detect, identify and monitor CBRN/TIM agents and materials.
- Enhancing the ability to operate safely and successfully in a CBRN/TIM environment, in cooperation with civilian emergency services, in EU-led operations and for the protection of EU citizens.
- Creating a platform to foster exchange of information and sharing of lessons learned.

As an initial step, the PT CBRN DIM developed a CBRN DIM Concept that describes how EU military commanders at the joint and component level intend to attain their objectives when operating in a CBRN environment. It supports capability planners to establish a baseline against which DIM operational requirements can be better identified and staffed. It also helps to develop a common understanding of required CBRN/TIM DIM capability and to give guidance on current and future requirements.

In support of the CBRN DIM Concept, a study on an "Integrated Biological Defence Systems Architecture (IBDSA)" was launched. In support of the future work, the PT CBRN DIM conducted also BIO DIM Symposium in June 2008 at the Bundeswehr Research Institute for Protection Technologies - NBC Protection, in Munster, Germany. The aim of the symposium was to inform on the results of the IBDSA Study and engage operational, R&T and armaments community as well as Industry in preparation for the launching of a Biological Detection Identification and Monitoring Equipment Development and Enhancement Programme in 2009.

Recent EDA work includes a concept for the EOD containing CBRN materials, a concept for the Detection Identification and Monitoring of Biological agents and work on a dual protection of Individual Protective Equipment (IPE) against both explosives and CBRN agents for bomb disposal operators. More recently, work has started on a programme for the development of a biological agent detection equipment programme.

More information on www.eda.europa.eu.

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