Commander P Maravelakis, Director of Education and Training at the Nato Maritime Interdiction Centre in Souda, Greece, tells *CBRNe World* about the work they are doing on afloat CBRN interdiction

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CW: What is the threat challenge you are expecting? Is it passive – boarding suspect vessels and finding substances – or active – being boarded by terrorists, criminals or pirates and having a hostile on-board release?
PM: Although the possibility of a warship being boarded by terrorists, criminals or pirates cannot be discounted, the most probable scenario appears to be the finding of substances, materials or equipment during a boarding operation executed on board a suspect vessel by our teams.

CW: The skill-set you will require for the boarding crews will be more akin to hazmat than CBRN. For example, there are many substances, both chemical and radiological, that are benign but can be used in a malign way (such as radioactive isotopes in soil monitors or a range of chemical precursors). Where are you going to get these skills from?
PM: Among the NMIOTC's instructors there is a Czech officer who is a subject matter expert in CBRN. The boarding team needs to be trained to the levels and with the equipment they have when operating nationally. The Nato Maritime Interdiction Centre (NMIOTC) does not provide them with additional training in the form of theoretical lessons or hands-on practical training on equipment; that will not be organic to those teams. In any case, whenever there are indications of a CBRN threat, the boarding is treated as a "no-go" mission. The amount of information, however, is not always adequate, so the boarding team may find itself in a dangerous hazmat environment. What we usually do is include a general description of the substances that a boarding team may find during a boarding operation, the use of the available detection equipment to do so and, most importantly, the practical ways of protecting against them. It must also be taken into account that our audiences is made up of ships' crews, whose ability to accept in-depth theoretical knowledge can be generally regarded as limited, both because of their background and the time they have available for the training.

CW: What level of preparation is ongoing for ships that are contaminated and need to be boarded? Presumably there is a good chance the hold will be contaminated, meaning high concentrations of agent. Does this mean there would have to be some form of Level A entry to decontaminate/mitigate, as civilian ports are unlikely to want the vessel to berth?
PM: Ships that are known to be contaminated will not be boarded on the high seas. Arrangements will have to be made to divert them to a port or anchorage, or detain them in international waters, and a specially equipped team will board. There is a discussion within Nato on the details of such an operation; that will involve the Nato CBRN Battalion, and the NMIOTC is involved in these discussions as well as the CBRN COE in Czech Republic.

As matters stand today, the most probable course of action would be for the ship to be boarded by a Nato nation, but under National Operational Command. Technically speaking, the contaminated ship will have to be diverted to a specified area (quarantine point) to anchor, probably in a gulf (not at open sea but also out of settled area) close to command and support

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NMIOTC will only be doing the generalist training, not the specialist boarding party ©CBRNe World

elements. The vessel is quarantined and the MIO commander requests a specialised CBRN team.

A specialised CBRN team would have to be equipped with Level A suits to be able to provide all necessary action (executing investigation and surveillance) in unknown contamination. Boarding teams (BT) will usually use some kind of advanced chemical protective garment (ACPG/JSLIST) and a protective mask.

Before boarding a contaminated ship a transfer station and a decontamination station need to be prepared for the CBRN and boarding team, as well as for all affected personnel. Those crewmembers manning the transfer station must adopt the same protection level as those members of the BT. Once the BT has been recovered, all affected personnel will be scanned, including the crews of the dinghies. Once these personnel have been scanned they will proceed, along with the personnel from the transfer station, to the decontamination station. Once decontamination of BT and transfer station personnel is completed, the following actions will be carried out. If there are indications of contamination on board, they will execute CBRN investigation and surveillance within the ship. They will execute decontamination tasks where necessary. Investigation and surveillance on the weather decks will follow; if contaminated areas are detected, they will be decontaminated. They will then carry out decontamination on dinghies and equipment that have been employed in the boarding operation, if necessary.

In any case, a boarding team would most probably be searching for WMD well hidden and packed in such a way as to eliminate, if possible, any tell-tale radiation or chemical agents.

CW: How important is stand-off detection going to be? How likely is it that the crew might approach an "invisible" hazard?
PM: The main focus of the research community is to develop equipment capable of detecting the agents from the maximum possible distance, thus minimising the dangers originating from the exposure of personnel to them. Although considerable advances have been made in the detection of radiological/nuclear materials, it is not at the same maturity as it is for chemical or biological agents. It must be kept in mind that the operation to detect CBRN material on board a vessel at sea constitutes the last line of defence. The layered efforts begin (or at least should begin) in port, where the material inevitably passes through detection protocols. This is the best chance to trace the substance, and technology is already available and is being used more. The second layer for stand-off detection is during the passage of the vessel from the port entrance, where the national port authorities (eg coast guards) can place their boats close to the vessels. Things become very difficult for stand-off detection if those chances are not exploited. Additionally, it must be further highlighted that the boarding teams are not, and cannot, become specialised in confronting CBRN agents.

CW: What are the plans for reach-back? Other nations that have faced the same issue, such as the Australians, have scientists heli-dropped along with the survey team. Is this the only practical solution (other than staying on point for potentially dangerous periods of time)?
PM: What is required for a boarding team that traces CBRN agents is a credible and quick estimation of the nature of the substance and reliable advice by experts for further action. A group of specialists and a communication system must be established to satisfy both these demands. Specific efforts are being made in these directions. The experts already exist, and tentative steps are being made to compose a "centre" manned 24/7 and ready to provide any answers and directions. Additionally, we participate in a series of experiments with Allied Command Transformation and the University of NPS Monterey (Naval Postgraduate School) to find practical and tactical methods so that the boarding teams will have the capability to acquire real-time reach-back support.

CW: How much of this can be done remotely? Could there be a series of CBRN sensor buoys, or UUV/UAVs, that transverse the vessel and make readings?
PM: The most important aspect for control of CBRN material proliferation is stand-off detection at strategic choke points and also anomaly detection in harbours. Another necessity is to have capability in mobile stand-off detection, whether airborne or seaborne. Studies regarding "CBRN Detection in Maritime Interdiction Operations", most of them classified, have aimed to explore some promising capabilities to detect CBRN agents onboard ships without direct contact with the substance (when material is sealed or shielded in closed barrels or containers).

Existing work demonstrates that current technologies only allow stand-off detection in the area of radiological

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and nuclear materials (for example with air gamma spectrometer); such systems could result in also uncovering shielded radiological materials or radiation through many containers. Initial experimentation has shown that mobile sensors fixed to boats and rotary-wing aircraft can detect, and in some cases identify, radiological material at greater than 80 meters by boat, and at over 100-foot altitudes from aircraft. It is possible to use these detection capabilities on UUV and UAVs and take remote readings from ships at sea. Chemical and biological stand-off detection of contained substances is not so advanced. Detection becomes easier if chemicals or biological elements ooze out or evaporate into the air, however.

CW: Traditionally, the majority of CBRN forces come from the army. Where do you see these troops coming from? Is it easier to train army soldiers in boarding ships, or to train navy personnel in CBRN?

PM: As I said previously, normal boarding teams will not be sent to a vessel where a CBRN threat is known to be present, since this timely acquired information turns the mission to a "no-go" from the initial conception. In these cases, a Special Forces team, enriched with CBRN experts, will conduct the mission. In a situation where the boarding team finds itself facing the threat, it must be trained and capable to protect itself, and educated not to transfer the contamination to the mother ship. In NMIOTC we are focused on the capability-building for this second case scenario.

CW: Is there a concern of a commercial vessel being manned entirely by terrorists/fundamentalists? If they threaten a CBRN payload, then traditional optional responses – such as sinking it – are out and it becomes a highly costly contested landing/search. Is this the case?

PM: There is clearly an opposed boarding case, and Nato policy at present is to avoid boardings conducted by Nato forces. Since the NMIOTC trainers are navy, coast guard and army Special Forces Seals, the capability to explore advanced scenarios does exist, although this is considered to be part of exercises, not of standardised Nato training.

The centres core skill is teaching maritime interdiction operations ©NMIOTC

CW: What is the Centre doing to prepare for future threats?

PM: Although we are getting increasingly involved in some Nato conceptual initiatives (such as the Maritime Security Operations concept and Allied Maritime Strategy), being aware of the latest developments at first hand, we are limited by our role in the contributions we can offer Nato. Our field of expertise is maritime interdiction operations. Our nature as a Nato Education and Training Facility (NETF) imposes the obligation to "translate" the Nato policy into Nato-accredited training programmes. By including training sessions for anti-piracy and WMD in our curricula, we are actively keeping pace with the modern maritime environment and trends. Whenever a common practice is adopted, we stand ready to deliver it to Nato and partner nations' naval units.

CW: Finally, much of this is an international problem, far larger than Nato. How do you reach out to other international bodies, such as ASEAN, to try and get an international consensus on action?

PM: It is a fact that a large number of actors are involved in confronting this issue. Not only states, but also international organisations, trans-national treaties, NGOs and industry have an important role to play. Nothing can be achieved, however, if co-ordination is not established between them, and the good news is that the need for this "comprehensive approach" is well understood. The contacts that need to be made belong to the high-level policy makers, and they occur. We, as a training centre, must co-ordinate our activities with other experts in maritime interdiction so best practices are adopted and converged to the final users, which are the units at sea. And we do it.