Chapter 7

THE WAY FORWARD

7.1 Outlook: Where do we go from here?

The preceding sections have underlined the important role of First Responders in the light of new homeland security challenges and the valuable support that the corporate sector can provide them. The following will focus on four critical areas: capabilities, research, procurement, and training. Although it will discuss these issues mainly from a European perspective, several topic areas are also applicable to non-European NATO members and other countries.

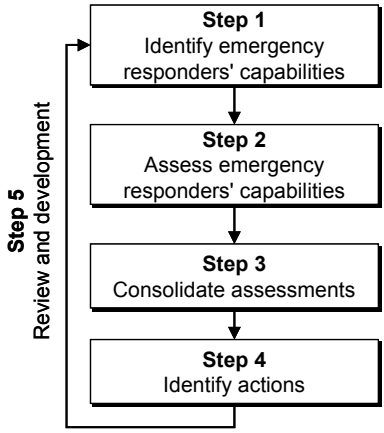
7.1.1 Capabilities

Capabilities are the currency of today's security forces. As shown above, US First Responders have already begun defining their capabilities, assessing strengths and weaknesses, and identifying programs to rectify shortfalls.[33] First Responders in other countries should follow this example, drawing for example on the European Capabilities Action Plan (ECAP), which was established to overcome capability deficits of European armed forces. As illustrated in Figure 23, an *Emergency Responders Capabilities Action Plan* could comprise five phases:

[33] On March 31, 2005 the U.S. Department of Homeland Security will issue a series of 25 scenarios to encourage scenario-based capability assessment. These assessments will then become the basis for the allocation of homeland security funding to develop appropriate capabilities to fill gaps.

F. Steinhäusler and F. Edwards (eds.), NATO and Terrorism, 133–161.

Figure 23: Emergency Responders Capabilities Action Plan



- *Step 1: Capability Definition*

  An international expert group of First Responders should define the key capabilities needed for acting in different environments. The goal is to establish a joint framework that can support analysis of existing national capabilities and identify shortfalls. In the European Union there is as yet no institutional framework to properly address these issues. (LINDLEY-FRENCH, 2004) First Responders' umbrella organizations should take the lead to convene these expert workshops in close cooperation with the European Commission, relevant NATO agencies (including capability planners, Civil Emergency Planning organizations), and representatives of other international organizations and the industry. (CEC 2004, WOHLLEBEN, 2003) At the top of the agenda, international experts should identify what First Responder capabilities are needed to address CBRNE terrorism and to cope with natural and man-made catastrophes. Both issues are crucial to strengthen capabilities for civil protection and, with regard to the EU, to implement the solidarity clause and the civil protection article of the draft EU constitution. (DRAFT TREATY, 2003)

  While it makes sense to address emergency responders' needs separately, respective actions should not be undertaken in isolation. For example, in the EU ongoing work in some of the ECAP project groups could benefit First Responders as well. Among them are projects for mobile headquarters and NBC protection, two issues

that stand at the core of emergency response. Other topics that are relevant for First Responders include:

- Unmanned aerial vehicles, which can improve situational awareness through constant monitoring of crises scenes;
- Space based assets, especially in connection with GPS (Global Positioning System) and GMES (Global Monitoring for the Environment and Security), which can improve communications and facilitate tracking and tracing of emergency responders;
- Communications interoperability issues addressed to ensure that all the First Responders at a disaster scene can share a common frequency or appropriate means of communications across jurisdictions and professions.
- Interoperability issues and working procedures for evacuation and humanitarian operations, which address inter-agency cooperation issues.

To benefit from these and other ECAP activities, First Responders should be included in the respective working groups or at least forge close ties with them.

- *Step 2: Capability Assessment*

Against this background, a comprehensive assessment of national capabilities for First Responders can be launched. This audit will help identify what is available, what is needed, and where priorities should be set. In doing so, public sector capabilities should include First Responders and armed forces. Due to their availability,[34] readiness, and specific capabilities (e.g., mobile communications, CBRN protection, and logistics), the armed forces could play an

[34] One caveat is that the military is, in fact, often not available for civil support functions. For example, in the U.S. there are two significant barriers to military involvement in civil emergencies. The first is the constitutional limitation on military involvement in domestic affairs. The second is the deployment of military assets outside of the U.S., leaving little capability to back-up First Responders in civil emergencies. For years the National Guard, a state military asset under the jurisdiction of each governor, was looked to as the back-up to civilian response. However, two major changes have made this moot. First, the Army Reserve became the logistics force, leaving the National Guard as a combat arms force, thus having little to offer in a civil emergency. Second, and most damaging, the National Guard has become the back-up to the regular military, with most members deployed overseas, leaving few resources at home for civil response.

important role in homeland security and in supporting First Responders. [35] At the same time, corporate capabilities should be analyzed as well, since specific industries may have key niche capabilities that should be integrated into a civil response.

Given the strong intra-European interdependencies, two issues should receive special attention in the EU. First, it will be necessary to identify what capabilities are available at what level. While it will be important that local levels have the necessary capabilities, it could make sense to organize other capabilities at the national, or even at the European level.[36] Second, readily deployable capabilities should be earmarked for mutual assistance among EU members (solidarity clause). In 2001, a Community Mechanism to facilitate reinforced cooperation in civil protection assistance intervention was launched. Even prior to its establishment, the European Commission was able to gather 1,000 rescuers from 15 member states, Norway, and Iceland with appropriate equipment to be dispatched after 9-11 in support of the United States within a few hours. (CEC, 2001)

- *Step 3: Consolidation*

Assessment results obtained in a bottom-up approach should be consolidated at the national and at the international level. This helps establish two action plans that are closely interrelated and makes sure that specific national conditions are taken into account. Exchange of information on national strengths and weaknesses increases transparency among neighbors and facilitates identification of opportunities for further joint action.[37]

---

[35] Each E.U. nation would have to review constitutional limitations on the military to determine if civil support is currently permitted, or could become permitted through legislation.

[36] An interesting example for emergency responders is the new CBRN alert system to be established by Europol, which will provide its members with updates on wind projections every fifteen minutes.

[37] Because the U.S. is comprised of fifty sovereign states, some of the same issues of developing cross-jurisdictional plans and capabilities arise. The new National Response Plan (http://www.dhs.gov/dhspublic/display?content=4268 and http://www.dhs.gov/dhspublic/display?content=4270 Accessed 1/26/05) and NIMS guidelines documents (http://www.dhs.gov/dhspublic/display?theme=51&content=3423 Accessed 1/26/05) might provide useful models for future NATO and E.U. cross-

- *Step 4: Identify Actions*

  In order to overcome capability deficits, a number of different actions can be undertaken. In a first step, various First Responders at the national and international level could join forces to procure general equipment that requires no or only marginal customization (such as gloves, boots, coats, helmets, breathing apparatus).[38] By commonly procuring these products First Responders leverage their buying power vis-à-vis the industry. At a more advanced level, national emergency responders might decide to launch national programs aimed at rectifying shortcomings that could be opened for participation by foreign First Responders. This approach is recommended for neighbouring communities and countries facing similar risks either because of population density or because of industries with cross-border impacts (e.g., Mexico-USA-Canada; EU member states along the River Rhine). Finally, there is the option of joint multinational procurement projects for First Responders. The more First Responders embrace the logic of network centric or network enabled emergency operations, the more frequently this option should be considered for purchasing ICT.

- *Step 5: Review and Development*

  As with all assessments, it will not suffice to view the preceding steps as a one-time exercise. Rather, First Responder capabilities should be reviewed regularly at the national and at the international level. In order to assure continuous strengthening of capabilities, it will be necessary to adapt capability goals to reflect changes in the international and national risk assessment. In doing so, national and international *carrots and sticks* will be needed, as non-compliance is quite likely. Revising staffing plans to limit or eliminate volunteer participation, which is characteristic for many First Responder organisations, could be another option. Finally,

---

jurisdictional planning and capability assessment. The existing EMAC agreement might also be a useful resource.

[38] The Italian experience in developing a national standard for uniform CBRNE equipment caches across the country, and the national adoption of the Incident Command System, might be a useful model. See 6.6 above.)

the provision of additional national or multi-national funds for CBRNE preparedness should be made contingent upon achieving certain standards to improve First Responder capabilities.

7.1.2 Research

From the perspective of First Responders, research can provide valuable returns in three different fields. First of all, it can improve products and technologies used to manufacture PPE and the technical devices used by emergency responders. If US assessments are in any way representative of the First Responder community as a whole, there is a need for PPE that is lighter and more comfortable to reduce physical stress under extreme conditions, such as working at a crisis scene after an act of catastrophic terrorism for weeks rather than only hours or days. At the system level, interoperability among various First Responders and other security forces that can be called to cope with a crisis is a key issue. Research can help identify standards for commonly used products and devise products that serve the purposes of many different emergency responders.

Second, catastrophic events such as 9/11 also expose First Responders to situations that they are not yet adequately trained to cope with – either because of the long duration of their assignments or because of the specific conditions that they face (such as picking up body parts among debris, dealing with terrorists on the scene, combating biological agents). Insights into the relationship between psychological and physical stress under severe conditions can help identify the limits of human endurance and resistance. This knowledge is indispensable for adapting and improving operational concepts. (LaTOURETTE, 2003) Finally, the advent of new risks might also require new doctrinal concepts in approaching scenes of catastrophic events. Here research can help spread lessons learned among First Responders from different countries, transfer insights from network centric/enabled operations to First Responders doctrines, and establish codes of best practice to increase the efficiency and effectiveness of First Responders.[39]

[39] In the U.S., the Department of Homeland Security has contracted with the Memorial Institute for the Prevention of Terrorism (http://www.mipt.org/ Accessed 1/26/05) to create a Lessons Learned website (https://www.llis.dhs.gov/ Accessed 1/26/05) with password protected access for First Responders. E.U. or NATO could create a similar website to promote knowledge and the spread of information among European First Responders.

New concepts that were established recently to improve national security and defense capabilities play an important role in addressing First Responders' research needs. As an example, the following describes European actions. In 2002, the European Council and the Commission launched a joint program to improve cooperation between member states in the field of CBRN risks that also includes research. Among other things, the program aims to strengthen risk analysis and assessment of CBRN threats, ensure quick detection and identification of CBRN attacks and provide those concerned with appropriate information, develop adequate instruments for consequence management, and strengthen the scientific basis of the program. (DE WIJK, 2004) The European Commission has launched preparatory actions towards establishing the European Security Research Programme (ESRP), which identifies five fields of activities.

Many of these activities are directly relevant for First Responders (Table 10). Capability-based assessment of existing strengths and weaknesses as suggested above should also help identify research priorities for First Responders. These should be taken into account when selecting projects under the ESRP preparatory action plan. For in 2007, when the first ESRP will be launched, First Responders needs must be systematically integrated in the call for proposals. A relevant share of the program volume, whose minimum threshold was set by the Group of Personalities at 1 bn Euro, (GROUP OF PERSONALITIES, 2004) should be earmarked for FR-related projects. As these funds should be available on top of existing research financing, (GROUP OF PERSONALITIES, 2004) the ESRP is particularly well suited to address key capability shortfalls. In this regard, it should be considered, whether the discussion on convergence criteria or other yardsticks that tie the financing of research to accomplishing certain minimal capability standards, could be applied in this area as well.

Table 10: Fields of activity in the European Commission Preparatory Action Plan for Security Research. Source: European Commission (2004), 8-9.

Fields of Activity	Relevant Issues for Projects
Improving situation awareness	• Demonstration of concepts, technologies and capabilities for situation awareness systems, to enhance surveillance of land and sea borders, especially supporting measures for new land borders in EU-25 and assets of global interest. • Demonstration of the appropriateness and acceptability of tagging, tracking and tracing devices by static and mobile

	multiple sensors that improve the capability to locate, identify and follow the movement of mobile assets, goods and persons, including smart documentation (e.g. biometrics, automatic chips with positioning) and data analysis techniques (remote control and access).
Optimizing security and protection of networked systems	• Development of standardized methodologies and decision tools for assessing the nature of the potential threat to critical networked infrastructures and to assess the respective vulnerabilities. • Demonstration of measures for enhanced protection and assurance of elements critical to public, private and government infrastructures to maintain security in an enlarged Europe. • Development of detection, prevention, response and alert capabilities to strengthen information and control systems, integrating, where appropriate, the use of space-based assets as well as fixed terrestrial and wireless terrestrial systems.
Protecting against terrorism (including bio-terrorism and incidents with biological, chemical and other substances)	• Demonstration of effective integration of active and passive sensor techniques, suitable for a wide range of platforms and data correlation techniques for detection and identification systems. • Development of models of large-scale dispersion over large areas and using multiple routes of high-risk pathogens of concern (smallpox, anthrax, C. botulinum, Yersinia pestis, haemorrhagic fever viruses, Francisella tularensis and genetically modified organisms) to produce a validated model for use by public authorities. • Demonstration of the viability of technologies and protocols for personnel, facilities and equipment decontamination against biological or chemical or other substances. • Assessment and identification of the overall needs of an enlarged EU for biosafety level 4 laboratories in order to guarantee optimal complementarity and development of an effective methodology for networking.
Enhancing crisis management (including evacuation, search and rescue operations, active agents control and remediation)	• Development of shared information management tools and models to facilitate the efficient integration of diverse emergency and management services with attention to inter alia: organizational structures, inter-organizational co-ordination and communication; distributed architectures and human factors.

Achieving interoperability and integrated systems for information and communication	• Develop and demonstrate with existing and potential categories of users, concepts and architectures for internationally interoperable systems and standards, for example in control and command as well as communication and information exchange systems. Attention should also be given to dependability, organizational aspects, protection of confidentiality and integrity of information.

7.1.3 Procurement

In procurement, the situation of First Responders is comparable to the defense sector. Incompatible funding and equipment replacement cycles, diverging purchasing powers, and strong bonds with traditional and well-established vendors make it difficult to think about joint procurements. (LaTOURETTE, 2003) Although substantial, these barriers could be overcome, for example in the European Union, within the framework of the new European agency in the field of defense capabilities development, research, acquisition, and armaments.[40] Although it is not yet clear to what extent the new agency will influence national procurement establishments and whether it will address First Responders issues, there are good reasons for doing so. First, the EU-Group of Personalities advising on the ESRP has underlined the need to address the dual use purpose of research and technology for security and defense purposes. The new agency would be ideally suited to achieve this goal, thereby bridging the gap between civil and military security forces. Second, the analysis of First Responder capabilities has identified some opportunities where they could plug in to ongoing activities aimed at rectifying key military capability short-comings. Finally, joint procurement would help address interoperability problems. In case of joint procurement, the purchase of similar equipment will mean that First Responders can become fully interoperable. If First Responders decide to buy different equipment, the agency could be

[40] The overall goals of this new body are to develop defense capabilities in the field of crisis management, promote and enhance European armaments cooperation, contribute to identifying and, if necessary, implementing policies and measures aimed at strengthening the European defense industrial and technological base, and promoting, together with the Community's research activities, research aimed at fulfilling future defense and security capability requirements.

instrumental in setting-up joint standards and certification processes to help improve interoperability. (LaTOURETTE, 2003)

The challenge entailed with the proposal to expand the scope of the European defense agency is at least threefold. First, it is not clear whether national defense ministers and representatives of the defense procurement establishment are willing to accept the participation of other security forces. In the current risk environment they should have an utmost interest in welcoming additional security forces to address new security challenges in tandem. Second, up to now First Responders have not yet found an "institutional home" in the EU architecture. This is particularly a problem because it renders coordination more difficult. However, it was argued above that joining forces with ongoing ECAP activities or launching a capabilities development mechanism would represent a major step forward. Finally, in order for European cooperation to bear fruit, national procurement processes for First Responders must either be overhauled or established anew. Here much depends on the different national starting points. If it is indeed true that the national procurement architecture for First Responders is weak at best, then it would be most suitable to redesign European and national processes in a coherent top-down approach.

7.1.4 Training

Training is indispensable to guarantee the availability of effective First Responders. In dealing with new threats, skills maintenance is critical. (LaTOURETTE, 2003) To this end, the European Commission organizes regular training courses and exercises in the framework of the Community Mechanism for civil protection.[41] A second priority is interoperability. Among other things, this includes knowledge of the equipment and techniques used by First Responders in different countries. This is important, because in many cases where First Responders assist their colleagues abroad they use local equipment. (CEC, 2004) In addition, the need for interaction among military forces and First Responders in dealing with the risks of terrorist CBRNE attacks increases training demands to further smooth cooperation.

In addition, consideration should be given to training First Responders countries considered as accession candidates, and – if it makes sense – in regions where the EU has fielded stabilization operations. As some of

[41] More recently, the European Commission has organized three exercises and two workshops on the CBRN issue, and five exercises on natural disasters and technical accidents are scheduled for 2004 and 2005.

these countries might one day become future members of the Union, similar training standards and procedures will facilitate cooperation in times of crisis. Some of the Union's emergency crisis information systems have already been expanded to non-member states. (CEC, 2004) Therefore, it is only logical to offer them training for First Responders as well, thereby strengthening their ability to act in solidarity with existing EU members.

Finally, the need for new doctrinal approaches to meet new security demands and the potential use of network centric/enabled emergency operations could direct attention to NATO's Concept Development and Experimentation (CD&E) branch at the new Atlantic Command Transformation.[42] The purpose of this branch is to devise, test, and assist in the implementation of new doctrinal concepts that support force transformation to the benefit of increased co-operability. Some of the training scenarios developed there could be of interest to First Responders. Crisis Management Exercise 2004, for example, simulates a Dutch request for NATO support in case of an explosion in a petrochemical plant. In the simulation, the situation worsens as the deadly cloud drifts and neighbouring countries experience casualties. (MONACO, 2004) These and other exercises could be well suited to address co-operability issues between armed forces and First Responders, and among First Responders themselves. Assuming that both will play a key role in national and international homeland security, joining forces in this field should be welcomed on both sides. In doing so, armed forces and First Responders would be undertaking a valuable first step towards harmonizing the development of their capabilities to the benefit of crisis prevention, crisis management, and stabilization in the aftermath of a crisis.

7. 2 Fifty actions recommended

The war against terrorism is being fought at home as well as abroad. It will only be won by balancing the effort to prevent terrorist acts and the ability to respond to the threat or actual event successfully. Apparent failure to protect the domestic civilian population and the national infrastructure from terrorism will drive a wedge between the citizen taxpayers and their government, and then the terrorists have won. Based on the information derived from a review of the lessons learned in different countries and the current level of training and equipment

[42] <http://www.act.nato.int/transformation/cdeindex.htm> (accessed 24 April 2004).

available for First Responders in case of an act of catastrophic terrorism, the following fifty short- and long-term actions are recommended:

1. The US Homeland Security Presidential Directives define the phases of emergency management as prevention, response and recovery. (HSPD-5) Prevention is based on excellent intelligence. The 9/11 hearings have focused on the failure of intelligence gathering and integration as the main causes of the vulnerability that led to the attacks (CBS EVENING NEWS). First Responders need expanded and integrated **"smart systems" for intelligence gathering** that can integrate information across agencies and disciplines to provide comprehensive data bases.[43]

2. Continual **threat assessment for the chemical infrastructure** of NATO member states is needed. Tons of highly hazardous chemicals move through Western industrialized countries every year which can be used as weapons, even openly declared through a truck or a rail car placard attached to the vehicle.[44] With the US "Chemical Security act of 2003" it can expected that chemical plant security will improve, but the shear number of chemical plants and the pervasiveness of chemicals throughout the transportation infrastructure means that these chemicals will always represent a threat and this calls for vigilance.

---

[43] In the spring of 2004 the President planned a visit to the City of Santa Clara in California. Just hours before his planned arrival a variety of law enforcement equipment was stolen. First an FBI agent's car was stolen. It contained credentials, clothing and communications equipment. Later that same night a law enforcement clothing store in nearby Santa Cruz County was burglarized, and uniforms and patches of local law enforcement agencies were stolen. Both crimes were carried out very professionally, with the burglar knowledgeable about overcoming security systems. Someone using the stolen law enforcement and FBI material would have been recognized as part of the Federal law enforcement group protecting the President, making it easy to infiltrate off limits areas. Because a new intelligence system was in place in Santa Clara County, based in the San Jose Police Department, this information was quickly shared with all the First Responders, and warnings were issued to be sure to match the face on the FBI ID card with its carrier very carefully. Generally a badge suffices for law enforcement personnel, so this extra layer of identification checking would have prevented the successful use of the stolen equipment as a disguise.

[44] In the fall of 2003 crew members of the the U.S. news investigation show "60 Minutes" walked unchallenged onto a chemical plant processing highly toxic anhydrous ammonia and boron trifluoride[8] that could have had deadly affects on the city of Pittsburgh, PA, USA if these chemicals had been subject to an uncontrolled release.

3. **Federally sponsored R&D for equipment and supplies** should be accompanied by reliable independent evaluation of the capabilities of the equipment at the field level.

4. Federally **funded training and equipment** should meet local needs rather than complying with an arbitrary national template. Research, procurement, and training should be geared to the new demands of emergency responders in the framework of homeland security.

5. Federal **funding of specialty teams** should be reliable.

6. The **partnership between public and corporate sectors** must be strengthened, based on new guidelines, processes, and structures to guarantee close interaction.

7. Emergency responders should follow a **capabilities-based planning approach**, jointly agree on key capabilities to fight the new security risks, and establish a capability development mechanism at the national and at the European level.

8. Frequently the **domestic intelligence system** is limited to law enforcement personnel. Joint Terrorism Task Forces in major metropolitan areas bring together the police agencies, but excludes other First Responders. New mechanisms for intelligence development and sharing need to be promoted, such as those based in US FBI field offices.[45] The Joint Regional Information Exchange System (JRIES) is being placed in multiple First Responder agencies to enhance information sharing among agencies and jurisdictions in the U.S.[46] Originally developed for

---

[45] In the San Francisco Bay Area the FBI partnered with the State Office of Emergency Services regional office to create the Bay Area Terrorism Working Group (BATWING). BATWING, which meets quarterly, includes not only law enforcement, but also fire, EMS, OES and large businesses' emergency managers. At these meetings information on homeland security concerns is shared so that all the professions can work in a partnership for surveillance and rapid reporting of unusual events. In Los Angeles they went the next step and created the Terrorism Early Warning Group, which brought together a multi-discipline task force for on-going analysis of data related to potential terrorist groups and acts. (LAW ENFORCEMENT AGENCY RESOURCE NETWORK)

[46] http://www.dhs.gov/dhspublic/display?content=3649 (Accessed 1/26/05)

the G-8 Summit, this system may prove to be a useful model for a web-based European intelligence sharing capability.

9. Protocols must be developed for integrating fire personnel, hazardous materials teams, EMS, OES, Public Health, and health care into **surveillance and intelligence systems** to create the largest network possible. These allied professions may see people with explosion-related injuries or receive reports of missing or stolen hazardous materials that may never come to law enforcement attention. Conversely, law enforcement may learn of events that could impact the other services' safety.[47] By alerting fire and medical personnel the net of surveillance can be widened, and prevention is enhanced.

10. Multi-disciplinary, information technology-based **data analysis system** need to become more user friendly, and have terminals in every dispatch center to facilitate information collection. For best success they should also be tied into a national database that can sort the routine from the unusual and notify the human analyst to review the significant data.

11. Improvements in **detectors** are needed. Detectors must be developed for use at the field level that are both rapid and accurate. Law enforcement and fire personnel have to be able to use them with little training and experience. Good detectors would be an asset for hazardous materials teams day-to-day. Better biohazards detectors are an even greater challenge, but need to allay public and staff fears when unknown substance/ "white powder" calls come in. New field tests are needed that rapidly and accurately assess solubility, reactivity, explosivity, and volatility to ensure that it is safe to move the material to a reference lab.

12. At the lab level there need to be **improved diagnostic tests** that do not require long preparation time. PCR still requires that some materials be "grown" first in a petri dish or other controlled medium to prepare the sample for DNA analysis. Wet chemistry requires preparatory and analysis time in the lab. New tests are

[47] Recent examples of such events happened in the US where tanker truck hauling a large quantity of fuel oil, one component of ANFO was stolen; stolen ambulances and stolen fire uniforms that, like the stolen FBI and police items before Bush visit in March 2004, could have bee used by terrorists to infiltrate "secure" scenes.

needed that provide rule in/ rule out information with a high degree of confidence in a much shorter time period.

13. To prevent the introduction of more inappropriate equipment into the First Responder community, **scientific hardware- and software evaluation** should be performed on all equipment created under Federally-funded R&D efforts.[48] Once the scientists have determined that the tests are accurate with a high degree of confidence, field-testing should follow, to rate the capabilities, uses, and benefits of various technologies.[49] Universities could form partnerships with local law enforcement and fire agencies to field-test and evaluate new technologies.

14. There is a need to accelerate **partnership programs,** which bring together academic institutions and high tech businesses. The US Federal government is putting together such a "new academic model", e.g., the Great Lakes Regional Center of Excellence that is developing around Argonne National Laboratory. (VAN, 2004) There are expectations for the development of specific products, including therapeutics and better tests.

15. **Near real-time air monitoring** needs to be improved. In addition to the on-going US EPA Biowatch effort, Oak Ridge National Laboratory is developing SensorNet, which is being field tested in Tennessee cities. The goal of SensorNet is to develop near real-time detection, identification and assessment of chemical, biological and radiological threats, will allow for First Responders to be dispatched within minutes of an event." (BIOTERRORISM WEEK) More important, when these First Responders are dispatched they will have knowledge about the PPE to wear and the decontamination and treatment needs of the victims.

16. Programs aiming on the development of more sophisticated **protection technologies** should be accelerated, e.g., like the

---

[48] In the US the obvious candidates for evaluating these technologies are the FBI's laboratory, the Department of Justice's existing testing program, and the National Labs.

[49] For example: Flow cytometry is a credible and well understood laboratory-based technology. But it is questionable whether a truck-mounted unit can remain calibrated after being jostled over the average streets.

Information Analysis and Infrastructure Protection branch of the Department of Homeland Security.

17. Improved **treatments for victims of CBRNE** are also needed. Biological research is needed to develop antidotes for chemical warfare agents that create less trauma to the patient's system. For examples, new pharmaceuticals are needed that stop the spasms quicker and can be evacuated from the system quicker to lessen the dependence on respiratory support. As long as respiratory support will be a required as part of the treatment protocol, bioengineers need to develop ventilators that can be more easily stored for long periods of time, and that are smaller and easier to move, with reliable battery power for field use. At present there are few ventilators available, even in large metropolitan areas, because they deteriorate quickly in storage.[50]
18. The development of **new field level EMS protocols** is also warranted. For example, in the US the Mark 1 kits were meant for military personnel to use for self-protection and buddy aid. Civilian EMS protocols limit their use in a field situation to emergency responders. Protocols and packaging for pediatric use, use in the small of stature and the elderly are needed to save lives in a real event. Antidotes typically have to be administered within the first few minutes to be effective against nerve agents. Only the field level First Responders will arrive in time to make a difference for the most contaminated patients.

19. **New antibiotics** need to be developed for dual use with fewer side effects to make prophylaxis less costly to the economy and more acceptable to the victims. Existing prophylactic drugs can be debilitating. For example, the people who took the full 60-day course of Cipro following potential exposure to anthrax in the fall of 2001 had unpleasant gastro-intestinal side effects from the treatment, and many were out of work for the full course of the treatment. (FDA) Cipro was developed as a 7-14 day antibiotic for infectious diseases.

20. Similarly, **new anti-virals** that are more effective, and better vaccines with less side effects and contraindications are needed.

[50] Most areas have only a few percent above the normal annual maximum stock needed for flu and pneumonia season.

Existing anti-virals are not effective against most of the weaponized diseases. (Santa Clara County Public Health Zebra binder) The currently available vaccine against smallpox has many contraindications for adults, lessening the likelihood that adequate "herd immunity" could be developed to prevent a significant number of deaths and injuries, both from the disease and from the vaccination-related injuries. (CDC, SMALLPOX) Anthrax vaccine requires many visits over an 18 month time period to develop true protection. It is unlikely that people will stick with the regimen once the initial danger has past. There are also significant side effects from the vaccine. Newer protective regimens must be developed that overcome the contraindications and unwanted side effects.

21. Improved trauma care and more effective treatment protocols for **burn & blast injuries** are needed both for day-to-day events and for terrorist events. This dual use area of practice represents an investment that could save lives lost to accidents, as well as provide more effective and rapid care to victims of mass casualty events, including terrorism.
22. Improved **medical decontamination equipment** is required for contaminated or infectious patients. Current CBRNE decontamination equipment was designed for either the military of fire/EMS field environments. Recognizing from the Tokyo Sarin event that patients run away from mass casualty events and take themselves, still contaminated, to the hospital, outdoor decontamination capabilities have to be present at hospitals. Hospital staff members have to be trained to provide not only decontamination, but also triage and life saving treatment, in a contaminated environment or to contaminated patients. CBRNE PPE for medical applications has been adopted from the fire/EMS and military arenas. These designs were based on a stable population of trained individuals who would use the PPE on a regular basis, either in their usual work, as with fire SCBAs, or in routine training, as with the military. These basic assumptions about function are inappropriate for the medical community.

23. Nurses usually perform the triage function in most hospitals. Today most American hospitals rely on a small permanent staff augmented with nurses from the registry. Since nurses also move frequently, investments in staff training may be lost, while

registry staff may be untrained in CBRNE response. Therefore a revised **CBRNE training scheme for nurses** is needed.

24. **Improved PPE** is needed which has to be easy to use and require little or no training to be effective. Most PPE requires fit testing according to specific OHSA protocols. Facemasks usually cannot be properly fitted for individuals with beards. Those needing glasses have to have special lenses made for their masks. While these issues are not problems in the military and fire communities, where grooming codes can be dictated, medical personnel may find these limitations unacceptable. Also, the cost of assigning a mask and obtaining the spectacle holder and lenses for a regular user of equipment may seem small, but if the mask is to be assigned to someone who may never use it the extra $300-$400 will be economically prohibitive.

25. A decision needs to be made regarding what is actually adequate PPE for the management and supervision of **outdoor decontamination of self-dispatched patients**. Presumably these patients are only lightly contaminated to begin with, or they would have been too sick to leave the scene without First Responder care. In addition, they should be ambulatory and be self-cleaning, requiring minimal contact with medical caregivers before they are clean. NIOSH and other regulatory bodies should evaluate the actual probable levels of contamination and create a protocol for equipment use that responds to the real threat.

26. In a mass casualty event some patients who are quite ill and somewhat contaminated may be brought in by friends or family members, or by taxi. Again their ability to arrive at the hospital without debilitating the driver suggests that their level of off gassing is limited. However, since contaminated patients may arrive who could pose a threat to treating personnel forced to be in close proximity to the patient, a decision must be made regarding **PPE for medical staff treating contaminated patients** whose condition is now too grave to wait for decontamination before initial treatment. [48]

---

[48] For example, the nerve agent may have built up in the enclosed vehicle and be causing more severe symptoms. This would be especially true in a child or small person whose driver was a larger adult, and perhaps driving with the window open clearing his air space, while a person lying on a back seat might not benefit from much air circulation, and would suffer from a higher concentration of the material. Or what about a lightly contaminated victim with a stress-induced asthma attack or heart attack? What about a lightly-contaminated woman in stress-induced labor? What PPE is adequate to protect medical

27. Depending on the level of PPE recommended, it will be necessary to **redesign some standard medical equipment** to work within the hearing and sight limitations of the PPE. For example, could designs be created for pulse-ox and stethoscopes that required no hearing, but relied only on visual readouts or light pulsations? What other essential information about patient history and vital signs needs to be collected that normally come through conversation with the patient, but which now will be interfered with by the hearing limitations imposed by PPE. Is it easier to overcome the limitations of the PPE by providing a microphone and earphone as part of the mask, for example?
28. There is a need to develop surge capacity in treatment and in-patient care, especially for patients needing on-going medical supervision, constant use of medical gasses, or who are infectious/contagious. Could surge capacity (for treatment only) be provided in non-hospital settings like schools, community centers or hotels without permanently damaging the economic usefulness of the facility in future? Experience suggests that such expedient uses may render the facility useless in the future.[49] Use of public facilities for activities perceived as "harmless," such as vaccination facilities or public education sites, might survive to be re-used for their original purpose, as witnessed by mass vaccinations in schools with student meningitis outbreaks. Social science research is needed here to determine what factors make re-use unacceptable, and how to rapidly evaluate those factors during a CBRNE attack.
29. In California a law requiring the **seismic safety of hospitals** by the year 2030 is resulting in the closure without replacement of older in-patient hospital facilities. This is reducing ICU, CCU and medical/surgical beds to the number that can be filled to 95% on

---

staff while they provide expedient medical treatment outdoors – administer atropine, attach a monitor or IV line, provide an oxygen mask? What concentrations would there be and how long would the exposure be? What PPE would provide adequate protection to the medical responder pre-decontamination? Once this is known, appropriate protocol for current equipment, or appropriate new equipment, could be developed.

[49] For example, the boy's school gym used as a morgue in the 1978 San Diego (California) air disaster had to be razed because no one would use it. The Bellevue Stratford Hotel in Philadelphia (Pennsylvania) was bankrupted by the 1976 Legionnaire's Disease outbreak.

an average day. Given that little elective surgery is performed on an in-patient basis, most patients filling the beds are not candidates for early release. In a disaster it will be very difficult to create bed capacity for victims. Plans such as moving medical patients to skilled nursing facilities may work, but a study needs to be made of the actual surge capacity in these facilities. Medical evaluation of outpatient treatment and home care need to be considered. Research on the sociology and economics of these issues is needed**.**

30. A study needs to be done on what the **value of *phantom hospital beds*** (i.e., empty but available beds) is to the nation's security. [50] However, the space for those phantom beds is currently used for offices, storage or other purposes. Conversion could not be accomplished overnight. Would the federal government pay a space fee to have rooms closed off but set up for surge capacity? What would be a reasonable cost? Should federal hospitals be strategically developed and located against the day that a CBRNE event, or natural outbreak, occurs? Is the cost-benefit justified?

31. Current HRSA funding in the US is supporting the development of a plan to bring clinics into the medical treatment resource pool. However, most states do not require these facilities to have disaster plans or preparedness. Clinics are located in Fire Code B-2 occupancies, and they lack any special seismic or wind resistance factors in the building. They are not required to have generators or on-site water storage. They have no capability to create special post-CBRNE security for the facility or staff. A study should be done of what the cost would be to eliminate some of these **deficiencies in clinic facilities** and what added licensure requirements would be reasonable to ensure disaster preparedness for all hazards, not just CBRNE.

32. The economic cost and benefit of disaster preparedness and emergency management is going to have to be included in the business equation. A study of the **medical economics of**

[50] For economic reasons US Health Maintenance Organizations have consolidated care into a few facilities, and are limiting in-patient care. This trend means that as the population grows, the ratio of beds available per population is likely to continue to decline. Today hospitals in California may have 10-25% more licensed beds than they have staffed beds. The extra licenses are kept because the cost is low, and population growth might dictate adding facilities.

emergency preparedness steps could follow the standard business continuity model used by banks under FDIC laws, and NFPA 1600 requirements, as well as the hospital accreditation model. Makes one baby pool and a garden hose in a closet really constitute being prepared to decontaminate a patient? Does the new environment of care standard meet the need to have all hazards disaster preparedness in place without bankrupting the hospital? What is the comparison of disaster preparedness effort between an HMO based or for-profit hospital versus a not-for-profit community or religious-based hospital?

33. **Surge equipment** has to come from somewhere. We need to create logistics systems that are readily stored and rapidly activated. Items such as beds, medical gasses, and surgical support equipment would need to become available rapidly.[51]

34. A study needs to be done on **staffing the surge capacity.** In the US National Guard units have very limited medical capabilities. Army Reserve Medical units may be deployed to a foreign war, as many are now. The DMATs could be deployed, but it takes 24-72 hours for them to gather, emplane and arrive at the point of need. The President proposed, as part of the Citizen Corps Council effort to recruit volunteers, that a Medical Reserve Corps be developed nationally, but many barriers exist. (CITIZEN CORPS; MEDICAL RESERVE CORPS) Most active medical personnel with specialties related to disasters – trauma specialists, surgical staff, and infectious disease specialists – have reporting responsibilities to the hospitals where they practice if their community is impacted. If they have to cross state lines, they would have to be federalized to be licensed. Who would provide the malpractice insurance for these doctors? [52] In case of recruiting retired medical professionals, is their training

[51] While some military and Veterans Administration facilities might be a part of the solution in some parts of the nation, base closures have limited the number of bases available to communities. Logistics support units were taken over by the Army reserve System, while the National Guard units kept the combat arms resources. The result is that most states would have to turn to the federal government for help with medical care and logistics, not their more quickly mobilized and local National Guard units.

[52] Local projects, like the one in Santa Clara County based at the Volunteer Center of Silicon Valley (VCSC), are underway to try to answer some of these questions. The focus is on recruiting medical professionals who are retired or in specialties not required to respond to hospitals.

appropriate to the needs of a CBRNE attack? What services could a podiatrist or a dermatologist provide? What malpractice insurance issues would arise in practicing out of the board certified specialty?

35. Overall **contagious disease planning** is underdeveloped and requires more funding. In most communities there is no hospital designated as a contagious disease hospital. Therefore there are very limited resources for managing contagious patients, such as negative pressure rooms, HEPA filtration systems for patient care facilities, and staff PPE for a "hot" strain.[53] There is no existing protocol for determining which patients would be hospitalized and which would be sent home for family-based care. If a patient needs to be isolated, who is going to enforce it, and where is that patient going to go? And what if there are a dozen or a hundred such patients?

36. In case of **quarantine** the difficult question of who is going to enforce quarantine must be faced. Most law enforcement agencies are currently unwilling to use lethal force against a person with no symptoms who simply wants to flee with his family to an uninfected area. What would be the impact on a community if its police were seen as its jailers in an outbreak? Whose job is it to stop people from leaving an area with an outbreak? What about violence against people leaving by those in unaffected communities who do not want those fleeing to stop in that town and bring the potential for contagion? Can anyone state that vaccinations or prophylaxis provide adequate assurance that the fleeing person is not a danger to others? Who would say that and be believed? Plans need to be made based on good social science research, and studies need to be conducted on both the science and the social science of communicable disease management. SARS has offered a recent example that could be studied.

37. The **management of large local stockpiles of pharmaceuticals and medical equipment** needs to be addressed.[54] Planning for

---

[53] With the rapid increase in the number and type of antibiotic resistant strains of disease – tuberculosis, pneumonia and staph to name only a few – this type of planning is not just for CBRNE attacks, but should be part of good public health practice all the time.

[54] In the US a Strategic National Stockpile (SNS) has been created, using both pre-positioned goods at 16 locations around the United States, and "vendor managed inventories" in warehouses that can be rapidly deployed when needed. (CDC. SNS) The original concept grew out of the recognition that the Metropolitan Medical Strike

reception, distribution, allocation, security, organization, administration was first given to the Metropolitan Medical Strike Teams/Task Forces (MMTFs), who quickly recognized that the attacked community would not have the capacity to also manage an influx of tons of pharmaceuticals and medical goods. Who really has or can develop the resources to manage and distribute these materials? Where can the planeload of goods be received and safeguarded pending breakdown and distribution? How will the MMTFs, local law enforcement, State Police, pharmacists, truck drivers and delivery services, community volunteers and other partners be brought into the planning and response? Where will the partner agencies get the resources for planning, training and exercising the plan once it is made?

38. Facing and resolving the **personnel issues** are the key to success in responding to CBRNE events. How to deliver adequate training for all First Responders that is appropriate to their role and level of responsibility. How do we maintain the appropriate level of response capability? What special certifications are needed for the equipment operation and PPE use? How many staff members on each shift need this level of training and certification? Which staff members in police, in fire, in EMS, and in all the other "First Responder" professions need specific training, and/or certifications? How many in each category? How do we draw the line between regular training and specialized resources for CBRNE. If we adopt the cost-effective dual use strategy, do we staff for the day-to-day demand for hazardous materials response, for example, or do we train adequate staff members on three shifts to manage a CBRNE event? Who will pay the cost of maintaining that level of qualified staff and that size equipment stockpile? What about specialty training in the medical community?

39. **Maintaining adequate training** comes at the cost of personnel time. Most of the training cannot be obtained while on-duty due to

---

Teams/Task Forces (MMTFs) would need a source of re-supply during a CBRNE event. US State Health Departments were then tasked with developing a plan. US State Health Officers asked for logistical support from the Federal government. In 2004 the National Association of County and City Health Officials started developing planning guidance for local health departments on the management of the SNS. (NACCHO).

its length, intensity, and practical participation requirements. [55] The challenge for the local community still remains the allocation of scarce resources to CBRNE or day-to-day responsibilities. How often should the continuing professional training or seldom-used skills on CBRNE be offered relative to confined space rescue, barricaded hostage and swift water rescue skills? How can dual use of skills for CBRNE be embedded into departmental SOPs? How often can the "dual use" skills be applied beneficially in the community? Answering these questions becomes the management challenge.

40. The same challenges exist at the regional, state and federal levels with regard to **financial resources for First Responders.** In a time of shrinking tax revenues and rising personnel costs, what is the proper allocation of funds among dealing with the unthinkable and managing the day-to-day? Where the specialized teams and caches should be maintained? How do you maximize the cost/benefit day to day? Currently regional teams in the US include the Disaster Medical Assistance Teams under the Department of Health and Human Services, and the Urban Search and Rescue Teams formerly under Federal Emergency Management Agency (now Homeland Security). They rely, like the MMTFs, on federal funding for sustainment. These, however, are volunteer teams who donate their time but get their supplies and equipment from federal sources. When they are activated and deployed they become federalized and are paid. How many such teams do we need? How long will people continue to volunteer for the weekend drills? It is already getting harder to get medical personnel for the DMATs. How do we manage the specialized caches of equipment and supplies provided for CBRNE response? Locally we rely on the Fire Department's Hazardous Incident Team and the Police Department's Explosive Ordinance Disposal Unit as the First Responders to any CBRNE event. When the local government's budget dictates that these specialized units be downsized or eliminated, how is that weighed against library services or after-school programs that will have to be cut instead?

---

[55] Some of the new US federal programs will pay for overtime or backfill wages for training for FR. At present the payments are limited to courses taught by specific vendors through the US Office for Domestic Preparedness (OFFICE FOR DOMESTIC PREPAREDNESS). However, cities can propose locally taught courses for certification, and can then use the Federal funds to cover the training.

The Metropolitan Medical Task Force episodically gets sustainment funds from Congress. In between largess how does the local government maintain and replace the pharmaceuticals, Level A suits and other dated, perishable equipment that will be the key to a rapid response to a CBRNE event, but is seldom used in large quantity day-to-day? Fire department urban search and rescue capabilities will be important to successful victim rescue in explosions and building collapses. How are these capabilities, certifications and equipment caches maintained when balanced against day-to-day demands?

41. **CBRNE operational planning** represents a major challenge for all organizations, including the Public Health departments who have to find solutions with regard to medical planning, staffing and training for such a rare event. Surveillance and epidemiology systems in place for infectious disease outbreaks may be part of a dual use plan for bioterrorism response. How much training can focus on CBRNE versus more common diseases? How much infrastructure is needed to monitor tuberculosis outbreaks, and can it be used for bio terrorism, or would it require augmentation?

42. In the US the National Guard has created **Civil Support Teams** at the state level. These specialized active duty units come with a mobile lab, communications equipment and self-support supplies. Their goal is to confirm the cause, size, and scope of the event and assist the US Department of Defense in mobilizing its resources. It is not a direct aid to communities at risk. How many such teams are needed, and where should they be placed? What travel times will impact delivery of goods and services?

43. **Public-private cooperation** must be complemented by improved public-public partnerships with increased and improved inter-agency coordination and cooperation.

44. There is a need to define **adequacy with regard to CBRNE preparedness and response** for a nationwide organization like US CDC. **Maintenance of specialized First Responder infrastructure with CBRNE** is essential. In the US there are teams that have been developed for assisting with preventing, preparing for or responding to CBRNE events, for example: DOE's NEST was developed to find and rescue nuclear material that had been lost or stolen, and to protect communities potentially exposed to the

material. That need continues to exist, and is likely to escalate as the Yucca Mountain spent fuel storage facility is developed, and spent fuel is moved around the nation. The Marine Corps' Chemical Biological Incident Response Force (CBRIF) was created for support for First Responders in a domestic CBRNE event. (CBIRF) Part of the CDC is the Agency for Toxic Substances and Disease Registry (AGENCY FOR TOXIC SUBSTANCES) whose emergency response teams assist communities. (ATSDR, FACT SHEET) These specialists can assist with acute chemical events. In the 9/11 attacks ATSDR staff provided air-monitoring services at Ground Zero, helped to make the GIS maps of the dust cloud, and assisted with the development of community protective information. They were also active in developing air samples for the anthrax events in the fall of 2001. (ATSDR - ROLE) Other CDC elements are active in laboratory support and the development of public information and education for diseases of concern, including CBRNE. Resources to support these programs battle with other priorities in Congress for funding.

45. Industry has to be shown the **cost/benefit in strengthening on-site security**, justifying the additional cost. Many of the chemicals and agents that could be used in attacks are already in place within our communities.[56]

46. Community planning on **managing large numbers of people in disasters** needs to be accelerated. Most emergency plans use an earthquake or hurricane as the paradigm, but a CBRNE event overlays the emergency with different psychology and different fears. Population relocation may not be as easy. Reception sites may be harder to find if contamination or contagion are issues. The numbers of people who could potentially be homeless, if a community had to be evacuated to avoid radiological material from a Chernobyl-style event, would be very large.

---

[56] For example, the City of San Jose (California) alone has 1700 different sites where hazardous materials are used or stored. Although these sites are registered with the fire department, and are required to comply with state and federal storage regulations, it is clear that not all companies abide by all the requirements all the time. In addition, security for these materials is lax in some areas, such as in labs where small quantities are used in R&D work and not accounted for during the workday. Toxic gasses used in high tech can do significant damage in small quantities.

47. **Public education on evacuation versus shelter in place** decisions has to be improved.[57] More work is being done at the local level through emergency preparedness programs to help people understand how and why they may need to shelter in place. Progress is slow. Evacuation planning is well understood in areas where hurricanes are a seasonal threat. However, many communities are unprepared for large-scale evacuations. Communities with nuclear power plants have had community evacuation drills. However, even with an announced drill the same problems of running out of gas, flat tires and erratic driving lead to blocked roads and traffic snarls.[58]

48. **Isolation and quarantine issues** involve a whole series of legal and moral judgments. More work needs to be done to understand the rights of residents, the limits of the health officer's authority, and the pre-event steps that could be taken to get public cooperation in the quarantine were needed. Local health departments are working on mass vaccination and mass prophylaxis plans under CDC grants. Health departments have to bring into partnerships the local governments in whose jurisdictions the vaccination or distribution centers will have to be established. Traffic control and crowd control will be the obligation of the local law enforcement agencies. Local EMS agencies will have to provide standby support for individuals with bad reactions to the vaccination, or stress reactions to the event. Planning departments or general services departments will have to find facilities that are suitable for the medication distribution, taking into account parking, crowd control and security issues. Ethnic sensitivities and gang control issues may also come into play in the site selection process. Little of this coordination has been recognized in the planning to date.

49. After the terrorist bombing in Madrid in 2004 the importance of **emergency planning for transportation resources** became very

---

[57] The well-meaning public education materials about duct tape issued by the US Department of Homeland Security in the fall of 2001 led to ridicule and little education.

[58] Washington, DC has clearly marked snow evacuation routes, yet in the uncoordinated decision to evacuate government workers from the District on 9/11 a traffic jam was created because one of the major exit routes was blocked to traffic on the Virginia side due to the Pentagon emergency response.

apparent. Public transit has been a target in Europe and Israel for some time. (JENKINS) New concerns include how to protect spent nuclear fuel rods while they are in transit, how to protect hazardous materials being transported by road or rail, and how to monitor cargo containers in international trade. All of this goods movement offers the opportunity for the theft of CBRNE materials, or for the placement of CBRNE materials in vulnerable areas. Owners and managers of bridges, tunnels, and freeways are also concerned about vulnerabilities to terrorist attacks using CBRNE. Explosives could be used to destroy transportation infrastructure as the primary incident, or to prevent help from arriving to another event.

50. As the E.U. moves forward with CBRNE response development it should consider:

    a. Developing **common systems**, **procedures** and **equipment** that allow rapid identification of any signal/clue that will lead to larger CBRN Emergency
    b. Strengthening the **flow of communication between European First Responder** organizations. This will help to spread immediately any useful information. The flow of information is the "must" of every effective Incident Management System.
    c. Training programmes based on common procedures and standards. This will enhance interoperability in multi-jurisdiction events and ensure that First Responders will work together effectively.

7.3 Conclusions

After the March 2004 attacks in Madrid, there can be no doubt that European cities are as likely to be targeted by terrorist activities as their US counterparts. The drafters of the EU constitutional treaty have thus rightly foreseen a solidarity clause providing mutual assistance for EU member states in case of terrorist activities. So far, however, ongoing discussions about improving Europe's security capabilities have focused primarily on expeditionary tasks while neglecting the provision of homeland security. To overcome this problem, the capabilities of First Responders must receive substantial reinforcement. Here the corporate sector can play a useful role. However, the most substantial reform effort

will have to be undertaken by the community of First Responders themselves. By adopting a capabilities-based planning approach, First Responders should jointly identify their capabilities at the international and national levels and set up a capability development mechanism. These actions will help coordinate research, procurement, and training. In doing so, First Responders will be able to assume the much needed role of a credible and capable player to complement NATO's security and defense policy.