

Home town boy

GW: What will the Ministry of Home Affairs (MHA) Science and Technology (S&T) labs offer in the CBRE arena that DSO and DSTA labs currently don't?

LK: MHA's S&T laboratories, under the purview of the Office of the Chief Science and Technology Officer (OCSTO), are focused on constantly looking out for and validating new CBRE detection and mitigation technologies to serve the needs of the Ministry of Home Affairs and our departments, including the Immigration and Checkpoints Authority, Singapore Civil Defence Force, Singapore Police Force, Singapore Prisons Service and Central Narcotics Bureau. It is also focused on training frontline officers in the early detection of security sensitive materials that can

be chemical, biological, radiological and explosive in nature; ensuring officers are able to undertake effective individual protection measures against hazards posed by such materials in their efforts to respond to them; and ensuring that our officers are able to undertake effective mitigation postures and measures against such threats.

Our focus is on putting people as our core strategy in fighting terrorism. We do not just look at exotic S&T systems and solutions. We put a lot of emphasis on providing our ground officers with the basic tools and capabilities to spot and detect potential CBRE threats. Further down the road, we will also undertake on-site analysis of suspicious materials to confirm the presence of CBRE elements that can pose as security threats, so that timely and effective mitigative measures can be deployed against them. These are areas and capabilities that research institutes and laboratories outside our Ministry cannot provide or address.

GW: Why was it necessary to create a new organisation for this, rather than making it the mission of one of the existing facilities?

LK: Among other factors, the setting up of the OCSTO is a testament to the MHA's growing commitment to infuse science and technology into our operational domains – such as civil defence, police, immigration and checkpoints, etc – at all levels, so that S&T serves not only as an important leverage but also as a strong force multiplier for the home team in today's challenging security terrain. With the OCSTO, we hope to enhance not only MHA's strategic and operational capabilities in the CBRE arena, but also to develop game-changing solutions in other S&T areas that would lead not only to improvements but also advancements in the way we operate.

GW: What are the major priorities? Are you focusing mainly on EOD/IED and CBR, or are they behind other such as network security and physical protection?

LK: The OCSTO of MHA adopts an all-hazards approach in our science and technology efforts; we do not just focus on CBRE threats, which in our view not only affect the individual but also the infrastructure. In the case of the latter, we do keep an active look-out for technologies that are able to provide effective physical protection of buildings and hardening of infrastructure against such threats. In particular, we also roll out outreach programmes for stakeholders like the building authorities and infrastructural developers to communicate the importance of incorporation such technologies into their building design.

GW: Are there any major priorities, and where does CBRN/IED defeat sit in that list?



Mind the gap: Singapore is still leading the world in devising innovative ways of combatting CBRNE terrorism ©MHA

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LK: While we adopt an all-hazards approach, our major priorities within the CBRE domain are detection, defeat and mitigation. To achieve this, we have been working closely with our local and foreign partners as well as industry to develop and bring in new and more effective CBRE detection, defeat and mitigation technologies and solutions. Within the ministry, we have also been developing new and important CBRE facilities, such as laboratories to enhance our operational capabilities in this domain.

GW: What are the priorities with EOD/IED? Some experimentation is being conducted into possible terrorist explosive substances – does this then result in improved understanding of what EOD protection suits need to be, or detection devices? Is this theoretical research or applied? Can you see some of the technology being turned into products and designed under licence?

LK: Drawing upon the example of the July 2006 London bomb plot, terrorism is shifting towards the use of home-made explosives and employing alternative methods of detonation. This serves as an important call for knowledge in our officers, and the deployment of state-of-the-art technologies to pick up the new threats quickly. Our laboratories identify the risks associated with different home made explosives and possible detonation methods so we can

sensitise our officers to watch out for such devices. We also ensure that the technologies used by our officers are able to detect and identify explosive materials of concern early.

GW: What are the priorities for CBR? A considerable body of work has already been done in DSTA on CBR, but bearing in mind that Singapore is a city state, there is unlikely to be the same divide between homeland and operations that many military have. How do your priorities differ?

LK: Traditionally, the military side is more concerned with weaponisable chemical and biological agents. On the home front side, we are more concerned with the day-to-day occurrences with incidents that could be chemical, biological and radiological in nature. Our officers can encounter a broad range of security sensitive materials which can come in the form of industrial hazards, highly toxic substances and biological waste. Hence, their readiness capabilities need to be pegged against a wide spectrum of challenges in the CBRE arena which can also be highly fluid in nature. This therefore requires our office to continually raise the level of science and technology appreciation and the confidence of home team front-liners through training, evaluation and validation to address this broad spectrum of challenges.

To achieve this, our office has been proactive in advancing our local and international S&T collaborations in order to promote the transfer of technology and exchanges to address the dynamic nature of the security landscape and its ever changing threats. Our office has also been leveraging on the academia, industry and international partners to deliver state-of-the-art solutions for home team missions and fostering greater operational and technical integration to ensure the best choice of technologies are used.

GW: What is the budget for the division and how is it allocated?

LK: We cannot provide the figure for the budget as this is confidential information. Our budget allows us to address the main tenets of our scientific and technological efforts which straddle over Outreach and Collaborations, Translational Development, Technology Impactful Solutions (TIS) and Testing, Evaluation and Training. Let me elaborate on each of these areas and give examples of our work in these areas.

Outreach and Collaborations

MHA maintains a heightened technology watch on promising scientific and technological solutions through outreach and collaborations with key industry players, academia and counterparts. Some examples of research developments that caught MHA's interest include real-time dynamic tracking of traffic to enhance fast response and diagnostics breakthroughs for fast detection and analysis of avian influenza and bio-agents of concern (e.g. anthrax and ricin). These are areas which we have worked on with various partners.

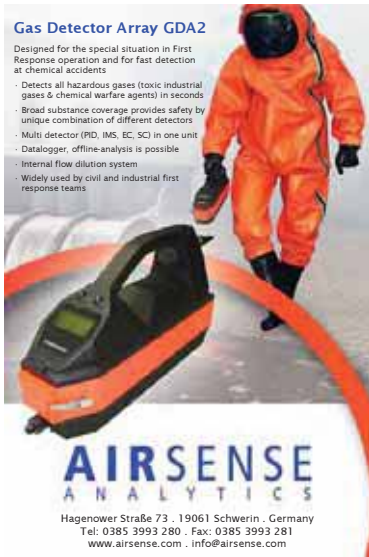
Translational Development

This area focuses on translating promising commercial off-the-shelf (COTS) solutions into operational solutions. Some good examples of these efforts are the Enhanced Immigration

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Automated Clearance System (e-IACS) which employs COTS biometrics solutions to provide fast immigration throughputs at our borders without compromising security. The Hazmat Vehicle Tracking System is another fine example of translational deployment which taps into the Global Positioning System technology to track the movement of local and foreign Hazmat Vehicles and immobilise them should they deviate from their approved routes in Singapore.

Technology Impactful Solutions (TIS) Otherwise known as TIS, these focus on high-risk, high-impact solutions that, if successful, can provide quantum leap improvements to our operational capabilities. One fine example is the AMFIS system (which uses bluetooth technology) to allow our security forces

to carry out wireless and remote verification of individuals' biometrics, both in land and sea environments, to enhance operational checks on illegal immigrants and overstayers.

Testing, Evaluation and Training This tenet of OCSTO looks closely into developing an organisation of smart users of technology by inculcating technology appreciation and threat awareness towards prevailing and future threats. Much of our work here is conducted at our various laboratories.

GW: What do you expect your early successes to be?

LK: Our early successes will revolve around significant awareness in science and technology for our operations. We have been progressive in our training of first responders in this aspect. Another

important marker will be the deployment of the best COTS and available technologies to meet the challenges of our home team missions.

GW: If you had to pick one project that is going to make an impact in the next 12-18 months what would it be?

LK: It would be the field-deployable lab-on-chip that is able to provide fast detection of Yersinia Pestis (Plague), Francisella Tularensis (Tularemia), Variola Smallpox (Smallpox), Bacillus Anthracis (Anthrax) and Ricin, which we have been working closely with our local industry on. The bio-diagnostic lab-on-chip will be a game-changing breakthrough given today's bio-diagnostic detection capability which is limited to lab-based analysis.

GW: How do you engage with other government research labs and private industry?

LK: MHA maintains a heightened technology watch on promising scientific and technological solutions through outreach and collaborations with key industry players, academia and counterparts. Whenever necessary, we have been proactively engaging these parties in the joint development of scientific and technological capabilities.

GW: Are you trying to bring synergies from other departments, such as biometrics and human factors, into CBR and IED-defeat, or do they stay in pure workflows?

LK: Yes, we do tap strongly into biometrics and human factors in our CBR and IED-defeat efforts. We view biometrics and human factors as important complements to our CBRE efforts, particularly as we adopt an all-hazards outlook in our science and technology efforts. Biometrics is an important force to harness for enhanced border security and building security. For example, biometrics can ensure that entry to all chemical, biological and radiological facilities are secured against potential perpetrators of CBRE threats. Human factors play a key role in providing the man-machine interface to ensure the optimal and safe use of CBRE detection, protection and mitigation equipment.



Teamwork across all agencies enforces CBRN response ©MHA

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