

The unwashed masses

Lieutenant Colonel Eric Yap, Director of the Operations Department at the Singapore Civil Defence Force (SCDF), tells CBRNe World about their mass decontamination work

CBRNe: With Singapore's limited landmass, how much mass decontamination can be done in fixed facilities (swimming pools, the subway, or other public health venues) rather than mobile ones? Wouldn't more fixed sites provide better value for money and utility than your pumper/ Personnel Decontamination Vehicle (PDV) solution? Also, how do you choose between funnelling people to the PDVs or the fixed mass decon? Do you have a similar system to Israel, where worried well are sent to a different facility while ambulant, but contaminated, patients have a higher degree of care?

EY: Singapore, being a small and densely populated nation, cannot afford to allow any of its landmass to be affected by CBR contaminants. We have to limit and contain the extent of the affected areas to as small as possible. In our emergency planning, we also work to minimise or eliminate the threat of contamination of our health care facilities, especially hospitals, so that the critical life-saving services can be preserved. This consideration entails focusing efforts to decontaminate mass casualties on-site rather than at hospitals. This is unlike the practice of some countries where casualties are sent direct to hospitals or designated facilities to be decontaminated using fixed shower facilities. Different countries have different strategic and tactical considerations. In Singapore's context, doing so will congest and overwhelm our hospital systems, limit their abilities to effectively provide the much-needed medical treatment to the casualties and potentially affect other patients in the hospitals due to the risk of cross contamination. It may also render the fleet of ambulances contaminated, adding to the logistical demands of decontaminating them in the recovery phase of operations.

Therefore, in the event of a mass casualty situation in Singapore, decontamination of casualties at the



Wash and Go. SCDF are the lead agency for mass decontamination ©SCDF

incident site is a vital process not just in saving lives but also in effectively preventing the spread of contamination beyond the incident location. Time is of the essence as there is certainly an inverse relation between casualty survivability and the "soak-in" duration. Besides, hospitals resources may already be stretched by the mildly affected walk-in casualties and "worried well". One inevitable scenario in any crisis is where victims who have left the scene turn up at hospitals on their own complaining of symptoms of varying degrees. Catering to this, hospitals in Singapore have fixed facilities for decontamination purposes. These facilities are usually built into existing areas that can be used for other purposes during routine times, such as emergency drive-in areas, car porches, etc. In the event of a CBR incident, these dual-use facilities can be transformed into a decontamination station.

Incident site casualty decontamination is conducted primarily

by means of two appliances and both are in-house innovations by SCDF that leverage technology and user experience in development. Firstly, the PDV caters to all mass decontamination needs. Next, fire pumpers in the SCDF have also been redesigned with a shower system that can provide casualties with a quick wash-down. This way, we are able to achieve the objective of maximising the capabilities of all appliances that are called out to an incident site.

The PDV is a 3-in-1 vehicle – a transporter for a platoon size of 26 rescuer, a decontamination facility and a mass-casualty ambulance. The vehicle is equipped with an array of rescue equipment, CBR detectors and customised ramps for the easy movement of casualties and large equipment. Retractable awnings on both sides of the vehicle can be extended to set up two decontamination lanes with modesty screens within seven minutes upon arrival. Each PDV can decontaminate up to 120 ambulant or 24

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Unlike many other nations, Singapore puts great store in overcoming the social and ethical differences involved in mass decon ©SCDF

non-ambulant casualties every hour. As a mass-casualty ambulance, the PDV can transport up to 12 non-ambulant casualties, which is the capacity of six conventional ambulances.

As for the decontamination capability on fire pumpers, the integrated shower system complete with modesty screen enables up to 36 ambulant or 6 non-ambulant casualties respectively to be decontaminated every hour. Being a first line response appliance, the redesign is a breakthrough offering SCDF a critical decontamination capability within minutes of its presence at any incident site.

CBRNe: Have non-terrorist events such as SARS and bird flu offered useful experiences for terrorist mass decon? Could you give some examples?

EY: The SARS operation warranted an entirely different concept in incident management that did not entail casualty decontamination. Instead, quarantine

and medical treatment were the principal line of defence against the spread of the virus. With avian-flu, Singapore has been fortunate to be able to prevent any outbreak in the country to date through various control measures. Detailed contingency plans, however, have been developed and exercised to address any eventuality and this also covers the need to decontaminate persons who may be involved in the culling of infected poultry. Decontamination facilities will be established for this purpose near culling sites.

CBRNe: Singapore is a multi-cultural/multiethnic society. How do you deal with the various restrictions that are imposed on the nudity and cleaning products that might be needed in a mass decon situation?

EY: We addressed the issue of modesty and privacy by having shower screens as a fixture in the mobile decontamination facilities. And as far as practicable, there are gender-segregated, sheltered undress areas as the male and female casualties are decontaminated at different compartments. Female SCDF officers will tend to female victims, where possible. The liquid cleaning agent that we use are chemical-based that do not contain any ingredients that may have religious/ethnic sensitivity.

CBRNe: What roles do the SAF and other Home Team agencies play in a decontamination role? What is the role of the MHA, for example?

EY: Incident response to any CBRN attack will be a multi-agency effort. The Homefront Crisis Ministerial Committee chaired by DPM and Minister for Home Affairs and the Homefront Crisis Executive Group led by the Permanent Secretary, Ministry for Home Affairs, will be activated to provide overall policy and strategic guidance. SCDF as incident manager will be supported by various homefront agencies to mitigate the incident. The Ministry of Health (MOH) will deploy their Disaster Site Medical Command (DSMC) to take charge of all on-site medical operations; the Centre for Radiation Protection (CRP) of the Health Science Authority (HSA) will perform radiation monitoring and health

physics assessments while the National Environment Agency (NEA) will conduct terrain decontamination operations; the Singapore Police Force will carry out investigations to track down the perpetrators. In addition, the Singapore Armed Forces (SAF), being an integral component of the national response framework, plays a critical role. The SAF's Medical Response Force may be activated to aid in casualty triage and treatment in the event of large number of casualties, and the Chemical, Biological, Radiological and Explosives Defence Group (CBRE DG) may be deployed to assist SCDF in decontamination work.

SCDF formed the Special Rescue Battalion (SRB) which comprises 260 men that are placed on 24/7 standby for incident response. The Battalion is equipped and trained to conduct search-and-rescue operations, decontamination, fire-fighting and basic medical first-aid operations. A high-level of physical fitness is a pre-requisite for the personnel to be in the SRB. They undergo at least 3 types of training daily – acclimatization and endurance training in full personal protective equipment (PPE); equipment drill; and scenario drill to hone their skills and proficiency to respond to any CBRNE incidents. Following an attack, the SRB rescuers will be among the first responders to rescue casualties out of the contaminated areas for decontamination. This capability is in addition to that of the fire stations where all fire fighters are trained and fully equipped to conduct rescue, detection and mitigation operations in any CBRNE contaminated environment.

CBRNe: Who deals with non-ambulant/wound contamination; is this an SCDF role? How do you get non-ambulant casualties to the clearing/decontamination station? Is there a stretcher system and who gets the non-ambulants from the hot zone?

EY: Non-ambulatory casualties will be conveyed on stretchers. We recognise this can be an arduous activity, especially if the numbers are high. As such, SCDF has specially designed two types of stretcher to address differing needs. The first is the wheeled stretcher which



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allows one rescuer to manage one casualty. The second design is a motorised stretcher that allows one rescuer to manoeuvre two casualties on different stretchers. This method is particularly useful when the hazard zoning does not permit decontamination facilities to be established in closer proximity to the affected location.

CBRN: How do you deal with the physiological drain on mass decon staff? Do you have colpro sites situated nearby for rest and recuperation?

EY: Depending on the nature and scale of an incident, the conduct of decontamination operation can be a protracted function. In our planning, we recognise the need to ensure that all casualties of a CBRN incident must be decontaminated within a shortest possible time-frame. Physiological strain on the decontamination crew is a valid concern especially given Singapore's warm and humid climate coupled with the PPE. Work rotations will be instituted to allow for adequate rest and recuperation.

For major operations, special resting facilities will be set up by our service support staff. These mobile rest areas, mainly tentages with basic amenities, will be established in safe areas (ie outside the warm zone).

CBRN: What are the population educated to expect? What impact do the emergency masks/hoods, that the police give out, have on the population? Does this make them more likely to self-present, or return home (spreading contamination)?

EY: SCDF has been educating the public to follow the instructions from the authorities in the event of any Hazmat/CBRN release by adopting in-place protection and/or evacuation. The in-place protection (IPP) involves staying indoors by shutting and sealing the window, doors and other openings to the outside. This aims to minimise the infiltration of harmful, hazardous materials into the home or office. The population will be alerted through the sounding of the island-wide public warning system, followed by instructions broadcast through the mass media to adopt IPP, advising members of the

public in the affected area to stay indoors and close all doors, windows and openings. The public should also switch off all ventilation and air-conditioning units that draw in air from outside and

"To prepare them (for a major disaster) members of the public are trained by SCDF in first aid... emergency procedures and responses to unconventional threats"

go to a room with the least number of openings, preferably with a toilet and water supply. If adhesive tape is available, they should use it to seal off any obvious gaps around the windows, doors, vents and other openings. They may use trash bags or plastic sheets to cover any gaps or openings and seal them up. Members of the public should continue to monitor the local television and radio channels for further information or instructions from authorities and leave the sealed room only when instructions are given by the authorities to do so. The above information and a sample guideline for preparing IPP for buildings other than homes are available on SCDF's website at www.scdf.gov.sg.

The evacuation hoods that the Singapore Police Force (SPF) stockpile as part of the national response plan are meant to protect people around the vicinity of the incident site who may have the potential of being affected by contaminants while being evacuated. The Civilian Escape Hoods and Customised CA PPE storage vehicle are available only to facilitate the evacuation of affected civilians in the event of any CA incident.

In the immediate aftermath of any CBRN attack, there will certainly be a short interval before the emergency responders could arrive at the scene. It is during these critical moments that people will need to be able to look after themselves and render aid to those around them. To prepare them, members of the public are trained by SCDF in first-aid, cardiopulmonary resuscitation, emergency procedures and response to unconventional threats under the framework of the Community Emergency Preparedness Programme

(CEPP). The training, both classroom and practical-based, are offered at no cost to the public in all SCDF Division HQ premises every day. Since its launch in September 2003, some 217,000 people

have been trained. In addition, at least 72 emergency preparedness exercises are conducted annually at commercial, industrial, and residential premises to better prepare the population against terror threats.

CBRN: Do you have different procedures for the mass decon of chem, bio or rad (other than the usual scoop and run – evacuate or stay and treat, ie IPP)?

EY: There are no different procedures for the mass decontamination of chemical, biological, or radioactive contaminated casualties. The process is similar but different detectors will be used to monitor the casualties following decontamination to ascertain that no remnants remain that may cause cross-contamination issues when the casualties are conveyed to hospitals.

CBRN: Do you provide psychological counselling for those that are affected, or their families?

EY: Yes, we have a National CARE Management System (NCMS) to address the issue of psychological impact on those affected as well as families of the victims. The NCMS is under the purview of our Ministry of Health, with the CARE (Caring Action in Response to an Emergency) officers coming from the various agencies such as SCDF, SPF, MOH, MCYS (Ministry of Community, Youth and Sports), etc. These officers are trained to provide psychological intervention and emotional support to the affected. In any major incident, SPF will establish a Family Assistance Centre (FAC) to provide assistance to concerned next-of-kin of the victims. Psycho-emotional support is one of the services available at the FAC.