Martin Valovsky shows us that in responding to a CBRN silent killer, the toughest enemy is…

TIME

A low rumbling of truck in the distance interrupts the silence. It is pitch dark and freezing gets quickly under the skin. Nights in the desert are harsh. There are three or four of us sitting bored in the trailer. After the first five minutes taking Falcon 4G out of the box and switching it on, we have been sitting the whole night trying not to fall asleep.

The mostly successful fight to stay awake is randomly interrupted by the movement of your head falling… then jolting awake… then quickly getting back into position. Eyes are wide open again in a split second.

Disasters don't wait for a spotlight nor do they report their arrival. Less than a mile from us, a silent killer is slowly spreading in the air, the concentration of vapour just within the detection limits, yet high enough to kill people. Options to save lives are quickly decreasing with time.

The reading on our display is clear: MES agent detected. The same constant message has come with every measurement for the past few minutes; only the concentration changes. Until now everyone is calm.

"..Concentration two milligrams per cubic metre, one minute to end of release… over" echoes the voice on the radio in Peter's hand. Mike notes down the data. "We match the concentration of the referee system the whole time. From one point two kilometres away: isn't that great?"

Mike is filling up the notepad with data. Back-scattering shows clear air all the whole way up to the tunnel, with the stuff only detected inside it.

Luckily, this is just an experimental trial and collecting data is all that matters. The 'silent killer' is replaced by a simulant. Nobody is in danger.

The toughest enemy

By the end of the night many of us are satisfied with the results. "Very good. We had few alarms," said a technician from one of the teams who'd placed the device inside the tunnel. "Collected a lot of data," said another guy.

Time…

Successful trials; just the time… The time is driving me mad.

I don't remember the last time I slept. Preparations take ages. Tuning point detectors inside the tunnel and moving passive stand-off detectors in front of the tunnel as a 200-m-long cloud is too small for their wide field of view.

Once everyone seems to be ready,

TRINITY OF DETECTION

Having reliable data in the shortest possible time is crucial, and without figuring out how to beat the clock we can hardly win. To do that we need to sort out three main questions:

1 Rapid deployment of a system that can be deployed without any previous preparation to enable data to be collected instantly

2 Low detection threshold: the ability to detect clouds that are close to the ground and also in low concentrations

3 Ability to collect data from a safe distance – miles away

there are still another few minutes to collect the background. From the moment everyone got into position eternity had passed. Our team was sitting and waiting with nothing to do. Some of the preparations must be there just to collect better data for further training development. Still, most of the noticeable procedures happening around us are simply necessary to deploy this or that particular technology. In many instances it's just moving the system itself.

It doesn't take too long for it to hit me. The time! Time is the enemy we have to beat first! If this had been a real scenario where lives of people are in danger, how much time would we have?

Real life brings upon us complex scenarios we have not prepared for. Would we have enough time without preparation, would it be even possible to collect data without knowing the method of the release? How do you know where the cloud is in the first place?

Assuming this was a triggering event and we can assume where the chemical

A final check-up is carried out before delivery to customer.

One of the inventors and current CTO conducts demonstration in Italy.

Master Control Module.

The Falcon 4G tripod version is equipped with both camera and aiming scope as an option.

is, have we got our point detectors there? How long does it take for a reconnaissance vehicle to drive downwind? Or for a passive stand-off system to come close enough if the cloud is too small, or low in height?

No, wait a minute – the background wasn't collected. So let's fly the drone. Drones are fast. There's another explosion, a triggering event – on the opposite site. The first drone was already in the cloud; we can't bring it back as it will be contaminated. So let's deploy another one…

The clock is ticking. What will be the next course of action?

I can go on and on with theoretical scenarios that will suit or create barriers

for one or another technology. And yes, all these barriers we can overcome.

All but one: the time. Time is the enemy that beats most of the systems.

I strongly believe that each of the existing technologies has its benefits – while none is perfect. No one technology can provide the answer to all our demands. Rather, the correct combination of all available devices is the way forward.

This involves combining the various technologies with versatile operating procedures. And for different scenarios, any one of them could have the upper hand. So far, only one technology appears to beat the clock for the trinity of detection – rapid deployment,

low-detection threshold, and long distances – in the same time. This is active stand-off detection, and in particular, differential absorption LIDAR (DIAL).

When the development of stand-off systems began decades ago, everyone was preparing for a big war – when the enemy would spread tons of chemicals: one big army fighting another big army. Even though this scenario is still possible, terrorism and hybrid, asymmetric wars are now the more likely settings for chemical attack. This means small, localized clouds in densely populated areas – and with no prior warning and no visible triggering event. The complexity of the riddle is increasing. How much time do we have? ▌▌

Martin Valovsky is founder of SEC Technologies, a company producing stand-off detection systems for chemical and biological warfare agents. He is also an investor in multiple technological companies.