



Chemical Stand-Off Detection: Will Active Approach Change How Reconnaissance Is Done?

For someone involved in CBRN for a very long time I have become very used to experiencing the same things over and over. Today was different. Not just thanks to technology, as it usually goes, but this time thanks to people involved too. Some in army uniforms others dressed more casually occupied small café very early morning. Liptovsky Mikulas, a small picturesque town in north Slovakia was hosting attendees from countries as far as India, Australia or Canada. CBRN and Stand-Off detection in particular was a common subject. Local team, technically lead by two inventors Jiri Vicenik and Zdenek Monik have spent three decades developing what is today the unsurpassed chemical detection on large distances. At the end of the day it really depends on user perspective. Afternoon demonstration has presented some answers to how does this technology perform in the real world but what captured my interest more were morning discussions. Classic argument used in comparison of passive and versus active stand-off detection systems of eye safety was debunked by certificate of Eye Safe Class I laser. Detectability on the battlefield explained in the beginning by using different wavelengths as laser warning devices. But this was no classic discussion. Number of doctorates and vast experience in the room took this workshop to a different level.

Dr. Sylvie Buteau of DRDC Canada, one of the world's leading scientist within Stand-Off detection space was the most active and frequently involved in a very energetic but rational disputes. On par with his counter arguments was SEC Technologies CTO, Dr. Jiri Vicenik. As they both know each other from NATO committee that has once defined standards for stand-off detection requirements, the discussion had a very interesting flavor. Important angle to all of it was brought by Mr. Stefan Bova from Slovak Armed Forces that had arguably more experience using active stand-off detection for reconnaissance than anybody in the room. First prototypes were used by Slovak Armed Forces as early as 2003. And real life experience is difficult to argue with. I haven't seen anybody in the room doubting superiority of an active stand-off detection approach in sensitivity or in fighting barriers of the real environment such as high humidity, small height of the cloud or cloud delta t (temperature difference between cloud and background). Just when it came to an end user viewpoint debaters have varied greatly. For instance, some delegates brought an urban area usage and monitoring purposes. How would you guard a building of interest? Place detector on the top of it or observe it from the side? Small Field of View makes active detection prime candidate in narrow urban spaces and long streets, but "Passive detectors do 360 degree scanning much faster and provide cloud's visual in almost real time", argues one of the attendees. "Yes they do, but with what sensitivity? 20-30 times worse than active system, not even considering increased CO2 and humidity that blocks passive detectors" reasons another. Then scanning, strongly debated topic of itself. The further the distance the bigger the circle once need to

work with. Take all the three axes and the volume that has to be monitored is vastly bigger on 5km than on 1km. If your detection resolution is high, another words if you use small Field of View, your time to scan will take longer. Are the thresholds Stand-off detector can achieve more important or do we rather sacrifice it for fast scan achieving hundreds of meters at best? More and more question came on the surface waiting for end users to choose which "optics" to apply.

Throughout the history of chemical warfare armies have looked up to technology of stand-off detection to provide accurate data in ultra-fast and reliable fashion. And finally, I have seen it working. Afternoon demonstration hasn't fall short of surprising with the detection of less 100 grams of a simulant on 5km. It was fascinating experience realizing how far 5km really is. Even though it was amazing to witness such sensitivity in real life, I ask myself a question: does it fit into the operational puzzle required? Nothing can be faster than light, yet drones, todays only alternative on such large distance and high sensitivity combined, can bring back a sample. Moreover, the drone do not require clear line of sight. The time or the reach? Sample or fast data? Which are indispensable?

Captain and his team from Austrian CBRN unit have successfully tested on the move detection just few weeks earlier using Falcon 4G and seemed to have no doubts about its capabilities. Though, he was less convinced about this demo itself. I must agree that screen where the measurements were presented wasn't very well situated during the demo. Attention to detail was not a strength today and details make the difference. While speaking to SEC Team about how to improve the demo, a promise of bio detection demonstration during next year workshop came up. "We are building our own Bio Chamber that will allow us to make bio releases. Chamber will be built with Stand-Off detector in mind." I find this to be quite a bit more compelling to have bio detection and chemical detection within one machine. We are leaving the demo site with hope that next year we will experience it live.

Fine dinner in little charming hill hotel made great end to the event. What will take more time to digest are all sort of questions that resulted from today. Everything from the day was quickly melted in friendly atmosphere.

