Major General Steve Reeves, Joint Program Executive Officer for Chemical Biological Defense (JPEO CBD) for the US DOD, gave Gwyn Winfield an appraisal of the JPEO at the Joint CBRN Conference at Fort Leonard Wood

The JPEO is looking for more efficient ways to decontaminate equipment ©CBRNe World

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GW: Could you give me an overview of what has happened in the 12 months since we spoke last? What have been the successes, what are you now working toward?

SR: Our major thrusts, and successes are continuing U.S. government interagency cooperation, civil-military integration and common architectures – both technical and systems architectures. For example, we've established common pharmaceutical stockpiles under the Strategic Stockpile Program for both domestic and U.S. Department of Defence needs. We have multiple joint development programs with both the U.S. Department of Health and Human Services and Department of Homeland Security. We've also published a joint DoD CBRN sensor architecture while also linking with the U.S. National Biodefense architecture in our Installation Protection Program and further developing systems-of-systems architectures.

What I've seen here at this exhibition is that the contracting community and others are starting to get it. I see equipment that can be decontaminated, worked with gloves on, capable of being networked – so the thrust that we have been working on, of developing system-of-systems, things that are net-centric and more, are coming to fruition. We see that not only in the Department of Defense area, but across the federal government – in terms of where the Department of Homeland Security is going, for example – and their networks, and I find all that very encouraging. I see a lot of great innovation in convergence, bringing disparate capabilities into a single device, or network, so we are integrating our systems together and giving decision-makers a more useful common operating picture. Whether you are a Division commander or a captain of a ship; a mayor or a governor, the basic questions are fundamentally the same (regarding a potential CBRN hazard): What is it? Is it dangerous? What do I do about it?

So I find all of that very encouraging and the U.S. Congress continues to be very supportive of the Chemical and Biological Defence program. I think that we continue to get a lot of support because we have continued to focus our capabilities on the concept of civil-military cooperation, so we keep a foot in both camps. Obviously our first demand is to support the Warfighter,

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but there is also our role in homeland defense and the ability to interoperate with our first responders. The last area that I am very happy with is the Installation Protection Program (IPP). It is a great opportunity to get interoperability with the local communities and provide mutual support as needed in case of any significant WMD event.

GW: Looking around the exhibition, it seems to be indicative of the state of bio detection that there are a number of iterative improvements, but nothing that could be called innovation – we are still lagging around and waiting for the great leap forward...
SR: It is lagging behind, although I see a lot of areas that are very encouraging, and there are some near-term wins in that area. For instance, microfluidics has come a long way, and we have seen an increase in the greater sensitivity, selectivity and overall capability in our stand-off detection capabilities. Mass spectrometry is still largely elusive for biologics in a field environment because nature isn't consistent, so fully characterising biologics and all their variants in a mass spectrometer is challenging. These are all capabilities that are going to be funded in the next few years. One of the areas I would suggest that we are really on the cusp of is moving from presumptive analysis in the field environment to confirmatory analysis. Because we are so convinced of that we have set up a technology readiness evaluation to get companies to bring their systems to us. This evaluation is not just from the detection capability perspective, but also "How do we develop a common module across our platforms and mission sets?" Something with selectivity and sensitivity that not only gives me confirmatory analysis but we can develop that module so that we can plug it into a detector or a medical diagnostic device and we have the same degree of confidence in the result. Also on the horizon is a common standard for assays, so when there is a result from a Civil Support Team (CST), the public health service or first responder, the result is based on a common standard and there is a common degree of confidence in what the outcome will be. So while it may not appear that there has been a lot of progress in bio detection, there has been and it is about implementing that progress.

The promise of field biological detection is still elusive ©CBRNe World

GW: Many nations in Europe are seeing a drive to having presumptive analysis done by soldiers and anything more done by specialists – probably in mobile labs. Does the US differ from this approach? Are you trying to get as much identification down to the front line as possible?
SR: My answer is both. We are trying to push as much technology forward as possible without making it onerous on the operator. The operator doesn't need to have five vials of stuff and run it through lab analysis; he needs to push a button and get an answer. The answer needs to be something that he has confidence in, but also there needs to be a capability to further confirm that with more sophisticated equipment. There is also the problem of attribution – whether for international purposes or for criminal purposes is immaterial, but the lab capability must be there in order to get as much detail on what that substance is as rapidly as possible.

GW: One of the changes that has occurred more over the past year is an increased desire to see CBRN troops involved in detection of narcotics and explosive substances. Once they get involved in sensitive site exploitation (SSE) they need to know what they are looking at, as opposed to whether it is something that they are looking for. Does explosives and narcotics detection come under the JPEO-CBD?
SR: To a degree, yes, and that is another aspect of Convergence. Explosives and narcotics detection is fundamentally the same technology that is used for a chemical that is on the chemical warfare agent list. We have shared that information with the Joint Improvised Explosive Device (IED) taskforce, and as we have evolved the mission, roles and functions of 20th Support Command, who have a very high-end capability that ranges the whole spectrum of Chemical, Biological, Radiological, Nuclear and Explosive. We will be standing up a project manager that is going to be used to support that organization. So I see these areas converging and increasingly coming into our realm of responsibilities.

GW: The other part of SSE is the need for forensic skills and equipment. Is the delivery of this forensic tool set part of the JPEO-CBD, or does it come via a different route?
SR: Absolutely. In fact at this conference you can see a couple of vans that are exclusively for that capability!

GW: Another part of convergence that has been seen in the past year is the change from it being the Chemical School to being the CBRN School. As they focus more on CBRN threats are you seeing them feed in lessons learned, so that they can become part of the future procurement program, rather than them being a rude surprise that needs to be dealt with through urgent operational requirements (UORs)?
SR: Yes and we actively use experimentation with CBRN school to both refine and anticipate needs rather react to surprise. BG Tom Spoehr, the CBRN school commandant and I work that together very hard and Tom's replacement, BG (select) Les Smith I have known for some time and know he will continue these experiments . In terms of my organization, even though I support the CBRN School, I also support the Military Police School and Engineer School, collectively, the Army's Manoeuvre Support Centre. Although part of that is done with Army funding rather than Joint Chemical Defence Program funding, the development and much of the technology is clearly the same. There are soldiers developing multi-disciplinary skills in these areas that are going to cross all of those functional areas. It also shows the way that the

Army thinks about it as they have the three schools here together.

GW: In terms of trends of exhibitors at the Fort Leonard Wood conference there would seem to be more robotics and stand-off detection devices being exhibited. Is this a trend that is mirrored in the procurement process, are you seeing more requirements for unmanned ground vehicles (UGV) and stand-off?
SR: Both are examples of the need for greater early warning and keeping our warfighters out of harms way whenever we can. We are seeing more requirements for robotics for both detection and decontamination but also in the areas of physical security and, of course, explosive ordinance disposal. It terms of stand-off, it is a great example of the fact that there is no silver bullet – especially in stand-off detection. There was a requirement for a passive detector, and I think Fourier Transform Infrared technology had been taken as far as it is going to go for now for the level of specificity and selectivity that was required. I think it can go further if it is to be used as a tipping device, rather than an identifying device, so the question is now how to converge the chemical and biological aspects in stand-off and tie them together in networks using active and passive technology.

GW: Looking toward this time next year what do you think you will have seen that will be interesting? Do you have any tenders coming out that will drive change?
SR: We have the Joint Biological Tactical Detection System (JBTDS), which offers us a lot of opportunity and from it I am looking for the Common Bio-Module that can be used on everything from tactical and strategic systems to medical systems. For collective protection (ColPro), we are asking ourselves, 'How do we develop an expeditionary ColPro capability?' The other area that we are looking at in terms of research and development is in decontamination. This is very challenging in terms of an environmentally safe solution but a solution that can still decontaminate. So as we go into our Program Objective Memorandum plan, one of the things that we are going to roll out is our decontamination system-of-systems approach, with a lot of emphasis on

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The JPEO CBD continues to evaluate a number of roles for UGVs on the CBRN battlefield ©CBRNe World

what that decontaminant is and a lesser emphasis on what the applicator is – but at the end of the day we have to make sure that we do both of those well. Of course we also have the next generation stand-off detection program I just mentioned. Underlying all those programs and their pieces, is the architecture and networks that give each of those systems synergy and ultimately give warfighters great capabilities than any individual item of equipment.

GW: Are you getting enough detailed information from the agent fate programs to allow you to make the sort of informed decisions that you need to work out whether the solution is going to fulfil the fourth stage decontamination need?
SR: We are getting that information up to a point. We have a lot of good Agent Fate data, but we can always use more, especially as you never know what kind of environment you will be in. So we continue to fund our S&T base Agent Fate studies. The other side is we are still, and it will be a perpetual argument, working on 'how clean is clean?' That decision will continue to push our detection technology, as to what is the lowest limit that is safe and what we can detect?

GW: Again the European idea would seem to be that thorough decontamination is best done by trained experts, yet one of the streams of research in the US is for decontamination to be done by UGVs. How do the two concepts sit together, or will you pursue both streams?
SR: We are looking at a range of solutions, from the exotic things like coatings and microbes to 'how do we use robotics so we don't put people in harm's way?' We are also looking at how do we do more efficient decontamination, so we only decontaminate where the contamination is, and going after those areas specifically so we have greater economy in our decontamination operations.