Colonel Chris Whelan, Defense Nuclear Weapons School chief, talks to Gwyn Winfield about preparing the school for modern nuclear threats

# Nuclear family

When it comes to CBRN training in the US military the mind tends to flick to the US Army CBRN School in Fort Leonard Wood. This might be natural as the commandant also heads the chemical corps, but this does tend to mask all the good work done by the Defense Nuclear Weapons School (DNWS) at Kirtland air force base in New Mexico. Ironically DNWS has a far longer heritage than Fort Leonard Wood, since its training history dates back to 1947, and the CBRN school only moved to Missouri from Fort McClelland in 1999.

The DNWS initially emerged from a need to train people to assemble the first nuclear devices, which was swiftly followed by the need to disassemble them, with an explosive ordnance disposal class added in 1948. In parallel with this, it was necessary to provide radiological awareness training for the vast array of individuals involved across the whole nuclear weapon enterprise. As part of the Defense Threat Reduction Agency (DTRA), it now operates, the Department of Defense's (DoD) only radiological training site, which includes large areas of contamination (thorium) so that students can understand what a post-incident radiological landscape might look like. (Others like the counter terrorism operations support (CTOS) site in Nevada are not run by the DoD.) DNWS also has the classified nuclear weapons instructional museum and provides tours for its students to places like the Trinity test site, the 1950 B-29 crash site and electromagnetic pulse (EMP) test sites… all in all a great day out!

The site offers a variety of courses under the following headings: nuclear weapons orientation; policy and senior executive training; nuclear weapons incident, accident and response training; CWMD radiological and nuclear training; explosive ordnance disposal specialty training; and specialised training (the full list can be found here[1]). As well as the thorium seeded fields, the school has a variety of other training sites with crashed vehicles or aircraft on them, and there's also the technical evaluation assessment and monitor site (Teams). Teams is designed for the radiological, rather

*DNWS Thorium fields allows realistic outdoor training ©DNWS*

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than nuclear, mission and has a shipping container yard, with office buildings, container stacks, a village, subways, and railcars, all of which can have radiological sources hidden in the soil. In addition, it has a 12,000sq ft (1,114sq metre) underground training site, which can replicate an industrial facility, plus the advanced research EMP simulator. If, like me, you've never been out to Kirtland, then you are probably overdue a visit.

The site is primarily for the army and air force, but the marines and navy also train there. Most of the civilians are DoD, but there are also some from the Department of Energy (DOE), Department of Homeland Security, Department of Justice, and others. Col Chris Whelan, DNWS chief, stated that they provided nuclear weapons, core competencies and radiological and WMD training to international and interagency partners as well as DoD assets. "We train people on how the DoD does accident, incident and response operations. Other interagency partners are also involved and while their mission differs from ours, they need to be aware of how we operate for the areas that overlap. Bringing in DOE people to see how we train is important for their understanding for their operations."

"While some of the training may overlap in terms of basic radiological and nuclear surveys, our work is focused on military operations and weapons related incidents rather than domestic response, except as it relates to weapons incidents, and first responders aren't authorised for that. Like CTOS, our site has training areas with low level radiation, allowing students to work in a simulated widespread radiological contamination area, but with minimal risk to the trainees. We also have numerous industrial sealed sources that we can place in the exercise areas to create higher levels of radiation to meet training objectives. The big difference isn't our training objectives. CTOS, Hanford and DNWS are all national resources that I'm glad we have, but they're designed for different customers."

The international element is really quite small, due to security restrictions, though Col Whelan stated that it is something that he'd like to build. "Firstly, we are trying to reach out to our Five Eyes partners; the UK, Canada, Australia and New Zealand. Then, perhaps, to Nato and other close allies to see how the school can support their needs with the right training in an uncertain world where the nuclear threat is growing."

In addition to the courses mentioned above, the school creates bespoke offerings under its partnership training and education programme (PTEP). This is for DoD commanders and interagency partners that might want something a bit special. Col Whelan explained: "We provide the usual offerings, but when a customer is seeking something that's not standard, then PTEP can use the instructor base

*Hot in nature and temperament! DNWS offers realistic rad survey missions... ©DNWS*

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*The curriculum goes through regular updates to ensure that it is current ©DNWS*

and our subject matter experts to customise curricula and include lessons learned and best practices across the spectrum of rad nuke and WMD topics. Our education may include combat support missions, supporting armed combat commanders, component schools, joint universities, special operations, and certain international, academic and other people in our agency."

The challenge for any radiological training centre is staying exciting! Chemical and biological threats evolve as does detection and protective technology - what you might have been unable to do in the 90s can now be managed with apparent ease. That is not true for radiological threats. The ALARA and time, distance and shielding from the 70s is still as applicable, while ionising radiation simply refuses to change! But while the trappings of the training might change, ie the ability to use simulators like Argon or Teletrix, fundamentally you are still controlled by the concept of accumulated dose and how to avoid it.

So how does the school ensure that the training Trooper Jones gets is different from the courses his dad or grandad sat? Col Whelan suggested it's much like other elements of combat operations. "Folks still train small unit tactics as they've done since world war one! You need to look at enemy capabilities and come up with new ways of operating, then update the training. Every year we analyse the curriculum, whether it's classroom training or field training and make sure everything's up to date. That includes threat information, standard operating procedures (SOPs) and tactics, techniques and procedures from other customers and that our scenarios align with current operations and threats. Someone coming through the school now will see similarities with the training of 10 or 20 years ago, along with updates and differences. Also the training a private, or a junior enlisted gets would be different should they came back as a senior NCO."

Regarding the scenarios it's not easy to get your arms around what they might be for the DNWS. They have to cover everything from incidents involving the strategic deterrent in transit (or elsewhere), to explosions from adversaries on US or friendly soil. Soldiers or marines might come into contact with medical isotopes from destroyed machinery. Is there, then, a core set of scenarios involving nuclear weapons that sees some more 'vanilla' situations excluded? Col Whelan stated that they can use their facilities for all scenarios. "Our thorium field, where we do outdoor incident response, can be used for any training for a ground unit operating in a radiological area. We also have an above and underground facility that we're upgrading to become the DNWS advanced radiological training site (Darts) that will allow us to bring in sources and do exactly the type of medical isotope incident you mentioned. We can have someone look for a source or prosecute that target as if they were searching a foreign radiological nuclear site and looking for sources or information.

"Teams is DTRA R&D's site, 18 acres largely used for testing and evaluating detectors as part of scientific experiments. We use that site for

training and it's a complex environment that allows survey and research training, but we can't always have access because it might be needed by our R&D customers. So we have Darts, 12,000sq ft of enclosed training space, which replicates a complex industrial facility that was formerly the advanced research EMP simulator. This site is still in its nascent stages and we have plans to expand it, perhaps bring in some airframes for more complex target analysis. We can train in this facility as part of our classes, but we can also allow units to come through, develop their own scenarios and support them with sources, observer controllers and evaluators. The 20th CBRNE Command had its 110th chemical battalion come through the school in August. They spent several weeks on field exercise training at Kirtland air force base where they used the DART facility and more for lots of complex scenarios. It will probably never be 'finished' as we hope to keep expanding its capability as customers have things they want to do on that site."

The CBRN school has recently invested significantly in virtual reality/augmented reality (VR/AR) and also its live agent training facility, bringing in airsoft and recorded explosions to try and provide a more realistic experience. Are there any plans within DNWS to try and provide some of this next level training, or do their thorium fields make this irrelevant? Col Whelan stated that currently there were no plans for VR/AR or further investment. "[Those things] go beyond the scope of what we want to do. We're not trying to replicate a joint readiness training centre or a kinetic environment. It's about helping a soldier, or a team hone their specific R/N detection, characterisation and prosecution skills in a realistic environment but not necessarily a hostile or a non-permissive environment. There are other places that can do that work. We're focused on enhancing their technical capabilities to give them confidence in their detectors, gear and SOPs.

"While we aren't an army school, we want to help support them. Our school works directly with the other army schools, such as the CBRN school, to make sure we're up to date on their service and joint doctrine, so our training nests into it and can augment it. We don't want to replicate what the army, navy, air force or marines are doing individually for their schools, but as a joint school, we do what they're not doing at the joint or maybe sometimes graduate level."

CBRN soldiers need to understand, and potentially be involved in, counterproliferation operations. These can be military only activities, such as operations in the Middle East, or more civilian intelligence led with some form of military buy-in. Does anything at the school provide for such operations? "Some of classes look at nuclear proliferation but we don't have any course focused on non proliferation or counterproliferation. It's funny as I worked on non proliferation at the State Department for three years with partners from DOE, Commerce, DoD, and at times the Department of Justice. Based on my conversations with them and with our national lab partners at Sandia Los Alamos, Lawrence Livermore, and the Kansas City National Security Campus, I believe there is a need for a proliferation primer course. It should leverage experts across the interagency and the school using our nuclear weapons instructional museum as a backdrop to give an introduction for people entering the proliferation mission space. I know that when I joined, I didn't know enough and would have liked a course that could provide more.

"I haven't yet established a customer demand signal on this, but I'm pursuing the idea. If would be great if some of your readers chime in and let me know if it's a good idea or not! Proliferation is a very complex topic that brings in all parts of the enterprise, DoD technical experts, justice, commerce. There are many customers out there for this kind of training because we're always very concerned about nuclear proliferation."

Like every training institution DNWS has been badly impacted by Covid, which affected the way courses operated. From March to September 2020 there were no in-house courses and the mobile teams had to suspend operations, from Spring 2021 the classes started ramping up, with all staff required to be vaccinated and an improved cleaning regime. Demand didn't go away, however, so the team is now trying to satisfy the pent up need. "We made some inroads into virtual training and continue to pursue that but the requirements for classified nuclear weapons and response training are difficult. Also hands-on field training just can't happen. So we're looking at ways to work through those things. We're trying to improve the school's AV capabilities and seriously considering digitising our nuclear weapons museum. That would make it possible to take the museum out on the road with a mobile training team and provide the same instruction we do in the classroom. That's not a fast process because it requires AV experts to go through the museum then provide the voiceover, so it's a goal for the future."

Once Covid is over, Col Whelan will be preparing for the next few curveballs that life will throw him, and the school. "The reemergence of Russia as a more prominent threat, the emergence of China's nuclear capabilities, and the way it's operating in the geopolitical mission space as a near-peer threat, have forced the military to redouble its efforts at nuclear defence and operating in a nuclear environment. The US nuclear enterprise has risen to meet that challenge, but it takes a village to do that. The DNWS is poised to start it, by the virtue of our mandate, our expert instructors from the army, navy, air force and marines, expert civilians and contractors, and our location at the world's nuclear birthplace. There are many challenges in the global arena, but the school is here watching it and we're involved with others to make sure that we're moving in front of it and are there when we know our customers need us."

[1] https://www.dtra.mil/Portals/61/Documents/DNWS/FY_2022_Course_Catalog_rev1.pdf