

No Second Chances:

Closing the Gap in CBRNe Training Before the Next Crisis

By Steven Pike

Interoperability doesn't happen on the day. It's built through training — realistic, repeated, and embedded — because capability without preparation is just potential.

13 Minutes Too Late

A CROWDED INTERNATIONAL AIRPORT, mid-morning. A small quadcopter arcs silently across the sky, barely noticed until it cuts low over the long-term car park.

The drone is flagged — late — by counter-UAS software. Jammer protocols engage, forcing the craft down. It works. Mostly. The drone spirals, lists, and lands near the staff shuttle stand. There is no fireball. No explosion. Just a faint dispersal, almost invisible.

Within minutes, staff are coughing. A security officer vomits. The terminal supervisor radios for emergency response. Local fire and hazmat units arrive quickly with modern detection equipment — but their readings diverge. One sensor flags a possible choking agent. Another shows nothing conclusive. A command tablet can't connect to the hazard prediction modelling software. The team waits for clarity and direction.



Crew of the USS Ronald Reagan wash down the flight deck to remove potential contamination during Operation Tomodachi. (U.S. Navy/ Nicholas A. Groesch)



CBRNe training exercise using Argon's CAMSIM

Military CBRN arrives within the hour, bringing deeper capability — but with different detection hardware, different SOPs, and different assumptions. Ground coordination is professional, but fractured. Sensor outputs are compared, challenged, re-interpreted. No one is wrong — but neither is anyone fully sure.

Eventually, a consensus is reached. The right decisions are made. But thirteen minutes were lost. And the footprint has grown.

The post-incident review notes: *"Capability present. Coordination delayed."*

***The lesson, quietly, is this:
training wasn't treated as capability.
And it should have been.***

The Cinderella Problem

The uncomfortable truth is that CBRNe training is the Cinderella of defence and emergency preparedness: overlooked, underfunded, and insufficiently prioritised. While detection hardware, UAVs, PPE, and C2 platforms attract procurement interest and capital investment, an effective training capability is too often left as an optional extra — a modular add-on rather than an integrated core requirement.

In any real-world CBRNe incident, the difference between containment and escalation lies in what people do in the first ten minutes. That behaviour is not determined by what's in the response vehicle or which badge someone wears. It's determined by effective regular training.

However good the available detection and analysis equipment may be, it can only operate effectively when paired with operator proficiency, rehearsed coordination, common operational language, and inter-agency scenario familiarity. You can't improvise interoperability on the day.

Yet surprisingly, there is evidence that many organisations continue to treat training as if it exists in isolation: one set of techniques and procedures for fire and rescue, another for military teams, a third for civilian command units. Shared spaces are rarer than they should be. Joint simulations possibly rarer still. The result? Systems that work in theory, and people who mostly operate them well — until they have to work together.

Where the Gaps Come From

It's not that CBRNe training is forgotten — it's that it gets lost in the procurement culture.

Procurement teams focus on hardware: detection instruments, drone neutralisers, atmospheric samplers, communications gear. Training is harder to specify, harder to demonstrate, and almost impossible to photograph for a glossy end-of-year report. A new piece of equipment has line-item visibility. A well-integrated training cycle does not.

Budgets are also siloed. Equipment budgets are often distinct from training or operational expenditure. Procurement officers are tasked with acquiring tools. Training units are left to figure out how to use them, often without access to the latest simulation platforms or

tools that match the new equipment or funding. This can result in years of delay between fielding of operational equipment and an effective training solution.

Inter-agency exercises — the gold standard for CBRNe preparedness — are expensive and politically difficult. Exercises get delayed or downsized. When they do happen, they often lack the realism or consequence of a true event.

The result can be a brittle system: full of excellent individual components and motivated professional operators and commanders that don't always speak to each other as well as they could — even when lives depend on it.

Benefits of Training: Individual and Collective Readiness

Modern simulation-based training delivers clear benefits at both the individual and organisational level.

For individuals, especially first responders and CBRNe operators, Argon Electronics simulation training builds intuitive familiarity with detection equipment and decision-making tools. When the simulation mirrors operational equipment precisely, cognitive familiarity and confidence develop together. The operator is not just familiar with the system — they trust it. And that trust translates into faster, better decisions when it matters most.

For teams and command structures, the value lies in coordination. Shared simulations build a common operating language across agency boundaries. They help reconcile differing operational procedures, map points of confusion, and allow commanders to build trust across jurisdictions and unit types.

This dual benefit — individual skill and collective cohesion — is what turns capability into performance.

Layered, Cost-Effective, and Sustainable

Argon Electronics simulation systems enables layered training: from classroom / local field exercise instruction and tablet-based table-top scenarios to full live field deployment using PlumeSIM or integrated into third party combined arms training systems. The simulation technology allows training to be portable, scalable, and repeatable — without requiring excessive time, risk, or expense.

Importantly, it also reduces wear and tear on expensive operational equipment. Using front-line detection systems for repeated training cycles is not only uneconomical, but risks degrading mission-critical assets. Dedicated simulation equipment, functionally identical to its operational counterpart, preserves inventory integrity while enabling meaningful practice.

The procurement of simulation training capability that accurately replicates operational equipment functionality results in increased intuitive operator confidence, deeper procedural fluency, and a faster, more decisive response under pressure.

What Modern CBRNe Training Should Look Like

A modern CBRNe training model is not a special event. It is a routine cycle embedded into operational life. It assumes complexity and rehearses around it.

Simulation platforms today — such as Argon's PlumeSIM — can model chemical plumes, radiological dispersal, among other wide scale area multi-threats. They can accurately replicate real detection equipment to test interpretation and cross-team coordination. They offer real-time decision data, student feedback for commanders, and layered learning that scales from the trainee to the strategic planner.

A joint exercise using modern simulation allows military and civilian agencies to share a threat picture. It creates a common language between sensors, between software, between people. It makes the interoperability real.

Simulation also enables just-in-time refreshers, on-call deployment at short notice, and even field-based verification of an effective CBRN response capability. Effective CBRN training is not a luxury — it's a critical enabler of day-to-day readiness.

Case in Point: Shared Understanding in Practice

The value of improved shared doctrine and training was made clear in Operation TOMODACHI, the multinational response to the 2011 Tōhoku earthquake, tsunami, and subsequent Fukushima nuclear accident.

The crisis placed enormous pressure on Japanese civil authorities and required close collaboration with U.S. military forces already stationed in the region. What could have become a chaotic scramble across agencies and borders evolved into a coordinated CBRNe response.

However, although considered successful, the operation exposed key gaps — not in courage or capability — but in integration. Differences in equipment, standards, and procedures were quickly highlighted. What prevented the situation from deteriorating further was not just equipment differences across the U.S. military units responding, but a foundation of shared training, common doctrine, and prior familiarity across key personnel.

TOMODACHI resulted in a major re-evaluation of how integrated capability should function in real-world disasters. It underlined the need to invest in training before the crisis, not alongside it.

Treat Training as Capability

Training must not be viewed as a principal support function. It is not an accessory. It is not a low-cost option to round out a procurement bid.

CBRNe capability without training is no capability at all. And that training must be realistic, immersive, and regularly repeated. Training without repetition is demonstration, not preparation. Detection without shared understanding of what the information means is just data — not a decision-making tool.

Responsible requirement planners and procurement authorities should insist on training as an indivisible element of readiness. Detection systems should be fielded only with corresponding simulation modules. Exercises should include cross-agency participants as standard, not exception.

Funding cycles need to shift. If we are serious about CBRNe readiness, then training should be funded as a first-order priority. This includes simulation hardware, course delivery, cross-training across services, and after-action analysis.

Without this, the next real-world event will look a lot like the opening vignette: good people, the right tools, and just enough delay to make it worse than it needed to be.

Because in CBRNe, you don't get a second chance.

Final Note: Train for the Moment Before It Happens

CBRNe incidents don't announce themselves with clarity. They unfold in fog, under stress, against time. Every capability fielded must already be internalised in those expected to use it.

We would never dream of handing an infantry soldier a new weapon system without a range day. We would never fly an untrained pilot into a contested zone. Yet we are possibly asking fire services, police, medical staff, and military responders to make critical decisions with detection equipment they've trained on only in limited or classroom-based settings — rather than through routine, immersive, scenario-driven practice.

It's time to change that.

Because when the drone lands, or the train leaks, your teams are deployed into an environment with known CBRNe hazard or that CBRNe weapon actually detonates, no one will be reading doctrine. They'll be reacting. And they'll either know what to do — together — or they won't.

Training at all levels is vital to ensuring an effective CBRNe response capability.

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Argon's PlumeSIM® is a wide-area instrumented training system providing management of chemical and radiological simulators that respond to a wide variety of user defined threat scenarios in real time.