CBRNE OPERATIONS GTRAINING

2024 COURSE CATALOG

NSRI.NEBRASKA.EDU/TRAINING

NATIONAL STRATEGIC RESEARCH INSTITUTE at the University of Nebraska

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TRAIN, REHEARSE & RESPOND

The National Strategic Research Institute (NSRI) at the University of Nebraska (NU) proudly offers real-world, multi-disciplinary training scenarios for responding to and preventing chemical, biological, radiological, nuclear and explosive weapons incidents.

Courses can be brought to your ideal location or offered at the NSRI National Capital Region Laboratory and Conference Center, a state-of-the-art, 12,000-square-foot facility in Annapolis Junction, Maryland.

In addition to the courses listed in this catalog, NSRI offers tailored courses to suit individual team needs. Often times, custom courses are delivered based on unique client capabilities, mission requirements or parameters.

DETAILS & TEAM BIOS



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WES CARTERResearch Director, Field
Operations & Training

21 years of DOD experience with primary focus in WMD training and response



DANIEL POLANSKI
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25 years of government service with 18+ years working WMD arena



DR. THOMAS MUELLER Research Director,

Chemical Defense

15 years supporting DOD and DOE CWMD efforts within chemical defense programs



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Director, Advanced Technologies

22 years in public health and government and military service with 12 years specifically in CBRN WMD



MARTY SIKES IIISenior Operations

Senior Operation: Manager

4 years supporting the development and execution of mass casualty and terrorist response exercises

BIOLOGICAL COURSES

BIOLOGICAL SIGNATURES

16 HOURS | MOBILE-READY | BL

Objective: Familiarize students with biological weapons characteristics, design, and production processes to provide an awareness of various growth methods and hazards associated with the agents.

This course combines lecture and demonstration starting with a general overview and history of biological weapons and their use. Students will be informed of the rationale and design of biological agents for use as weapons. Basic principles of growth and associated equipment is presented for various types of biological materials (bacteria, virus, and toxins). The course also includes hands-on demonstrations of biological processes, emphasizing potential hazards and sampling opportunities.

BIOLOGICAL AGENT PRODUCTION

32 HOURS | MOBILE-READY | IL

Objective: Introduce foundational concepts of biological agent production and expand on these by requiring students to design, build, and produce biological simulants using off-the-shelf hardware.

The course focuses on growth, concentration, drying, and milling of a spore-forming bacteria (Bacillus thuringiensis). The curriculum leverages academic instruction to convey the process requirements and general considerations when designing and building biological production operations.

Students will be required to have a fundamental knowledge of biology. Coursework will consist of PowerPoint lecture with interactive hands-on work on biological production processes. Students will gain vital knowledge about biological weapon production, how they are designed, how they are produced, and critical sampling points. The course will focus on these areas as it relates to the organization's mission and function.



Student Agar plates and Falcon tubes awaiting analysis.



Improvised glove box used for milling and packaging of biological material.

WE'RE READY

FULL-SCALE **EXERCISES**

NSRI full-scale all hazards response trainings help improve communication and increase cooperation between agencies while decreasing the number of noncredible samples collected.



Photos from successful mobility and delivery training evolution for 43rd CST and mission partners at Federal Law Enforcement Training Center, Charleston, South Carolina, August 2022.

CHEMICAL COURSES

CHEMICAL SIGNATURE AND RECOGNITION

32 HOURS | IL

Objective: Increase the safety and awareness of the WMD-CST upon entering a clandestine or makeshift laboratory.

A hardware store inspired laboratory is limited only by the creativity of the designer. As such, no two makeshift laboratories will look identical. It is critical for the Weapons of Mass Destruction – Civil Support Teams (WMD-CST) to understand the fundamentals of chemistry laboratory techniques to analyze the setup, assess the safety and determine the chemical processes occurring upon entering a makeshift laboratory.

This course combines practical hands-on learning training stations with classroom instruction. Participants will become familiar with basic chemistry laboratory techniques, equipment, material capabilities and commercial chemical availability. This course is designed to increase the safety and awareness of the CWMD units upon entering a clandestine or makeshift laboratory.

Participants will receive classroom and hands-on instruction of eight basic chemistry lab techniques using standard chemistry glassware setups to generate, separate, isolate, and purify mixtures of chemicals. Participants will leverage this knowledge to design and construct equipment setups from hardware store components that mimic the capabilities of standard glassware setups. The participants will then test and evaluate these hardware store setups in the generation, separation, isolation and purification of benign chemicals. Finally, a laboratory practical will test the students and their hardware store setups using commercially available chemicals to generate chemical war agent simulants and precursor chemicals.

PHARMACEUTICAL-BASED **AGENTS**

16 HOURS | MOBILE-READY | IL

Objective: Students become familiar with the hazards and threats associated with synthetic opioids.

This course is designed to improve the safety and effectiveness of anyone who responds to an incident at a PBA laboratory. Participants will be provided with risk-based response guidelines on selecting personal protective equipment and decontamination equipment, and they will be able to recognize incident indicators.

Students will receive hands-on instruction on different fentanyl synthesis pathways, production and current trends and sophistication of synthetic opioid clandestine lab operations. All participants will have the opportunity to test current detection and identification methods utilizing their equipment. The course concludes with a practical decontamination demonstration where students will examine the effectiveness of various decontamination methods using a visual stimulant.



Chemical Signature and Recognition course participant tests portable chemical lab under chemical hood.

PRINCIPALS OF CHEMICAL **WARFARE**

LENGTH TAILORED TO CUSTOMER REQUIREMENTS | MOBILE-READY | IL

Objective: Introduce chemical weapons and warfare agents.

The topic is treated from a historical, developmental, and likely-use perspective. The toxic properties, exposure symptoms, countermeasures, and basic synthetic methods for the major classes of chemical agents is reviewed.

This course also delves into the development of these weapons and both past and possible use scenarios. The course is readily customized for the first responder, support team member, or the warfighter. It provides a "what to look for" in common chemical weapons synthetic efforts. It serves as the basis for the Improvised and Clandestine Laboratory Course as well as other sampling and analysis courses offered by NSRI. The course can be offered at the Secret or Unclassified level.



OH 52nd CST analyzing an unknown White Powder using a First Defender RMX Handheld Chemical Identification detector during JHAT Operations.



53rd CST Lane Training — response to a notional PBA incident.

LABORATORY & ANALYTICAL COURSES

BIOSURVEILLANCE MANAGEMENT

24 HOURS | BL

Objective: Enhance decision-making using laboratory results and the information/resource available to assist with those decisions and their consequences.

This course is designed for those who manage biosurveillance or biological warfare identification/ detection laboratories. Participants will have some in-lab time to gain a familiarity with BW/ Biosurveillance detection identification instruments and produce data from analysis and discussion. Expect talks from members of the biosurveillance community including Public Health, Deployed Field Diagnostics Mission Partners, CWMD Agencies, and National Laboratories/Institutes.

PR2 OPERATIONS

32 HOURS | IL

Objective: Demonstrate the technology relevant in understanding the data and troubleshooting through practical analysis.

Through this laboratory-intensive course, students will utilize their own lab space, organizational protocols, and gloveboxes to work through numerous problem sets similar to those expected in real-world scenarios.

BIOFIRE FILMARRAY **OPERATIONS**

16 HOURS | MOBILE-READY | BL

Objective: Train troubleshooting, sample preparation, data analysis, and results integration.

In this laboratory-intensive course, students will be responsible for their own lab space and glovebox to work through numerous problem sample scenarios.

JBAIDS PCR OPERATIONS AND TRAINING

24 HOURS | IL

Objective: Help operators remain knowledgeable and capable in designing and analyzing PCR.

This course will focus on the technology of PCR and implementation of the principles beyond the JBAIDS platform. Despite the platform's near departure, the concepts and analysis of real-time PCR will continue to be relevant. PCR will continue to be relevant and this legacy course will ensure operators remain knowledgeable and capable in designing and analyzing PCR. Students will utilize their own lab space, organizational protocols, and gloveboxes to work through numerous problem samples including sample preparation, DNA extraction, and data analysis.

MINION BIOSURVEILLANCE

24 HOURS | MOBILE-READY | IL

Objective: Enhance field application, procedural use, and data interpretation of the MinION WGS.

This course will focus on field application, procedural use, and data interpretation of the MinION WGS. Though primarily a laboratory course, exploring the utility and validity of data analysis will form the basis of discussions with the intent of identifying follow-on recommendations. Students will use individual lab space and gloveboxes to prepare samples and use MinION to identify/classify potential biothreats.



CST Science Officers work to identify unknown samples in collaboration with their local Public Health Lab.

APPLIED BIOSURVEILLANCE SAMPLING & ANALYSIS **EXPEDITION**

64 HOURS | AL

Objective: Enhance biosurveillance sampling techniques and development of biosurveillance sampling plans.

This course is designed as an advanced biosurveillance sampling and analysis course. Students will arrive at either the Field Station or the NSRI NCR Laboratory and Conference Center in Annapolis Junction, Md., to be trained in biosurveillance sampling techniques and, in teams, develop biosurveillance sampling plans that target specific regions of interest in the US with assistance of the XBRT staff.

Teams will then pack out supplies and equipment for the biosurveillance mission prior to travel to the field site. On site, students will conduct their sampling operations and prepare their samples for shipment IAW their sampling plan and instructions and quidance from staff.

Students will travel back to NSRI NCR Facility for additional instruction in sample processing and conduct analysis of the samples IAW their sample processing plans. Each team will be provided their own laboratory space, glovebox, and laboratory instruments and reagents to perform their analysis of the samples they collected. Students will receive guidance on instrument operations, sample processing, and data management to produce a biosurveillance assessment report for the area of sample operations.

ADVANCED BIOSURVEILLANCE **LEADERSHIP**

2 WEEKS | MOBILE-READY | AL

Objective: The XBRT-ABLC is an intensive analytical operations-focused course designed to ensure the next generation of analytical leaders stay relevant and continue to provide the best assistance and advice.

The course will challenge students to demonstrate expertise in biosurveillance techniques, concepts, and adaptive thinking while working to solve current and/or historical analytical operations problems faced by the CST community.

In order to remain relevant, students will:

- Learn from the stories, programs, and projects that comprise the biosurveillance community including engagement with Public Health, Deployed Field Diagnostics Mission Partners, CWMD Agencies, and National Laboratories/ Institutes.
- Demonstrate understanding of CLIP/CLIA and ISO programs, ensuring a literacy in the concept of quality and legal requirements of clinical and environmental biosurveillance.
- Develop or select models, theories, and hypotheses to test current biosurveillance operations, protocols, or procedures with the goal of creating refined, specific, and relevant solutions or documenting findings.
- ▶ Perform experiments to test hypotheses or models based on current biosurveillance TTPs.
- Be expected to learn and adapt new technologies and instruments into operational models of biosurveillance in order to guide validation and implementation of these maturing technologies.
- Be expected to present their projects and demonstrate utility and relevance for University of Nebraska graduate credit.

ANALYTICAL EXERCISE

36-72 HOURS | MOBILE-READY | AL

Objective: The XBRT Analytical Exercise is a dynamic exercise to stress and hone the operational capability of fully trained analytical laboratory operators through 36 to 72 hours of continuous analytical operation.

In a multi-laboratory team environment, the exercise will challenge the operational awareness and objective-oriented focus of laboratory operators while they process challenging samples and integrate intelligence and information from multiple incidents. The dynamic time-sensitive scenario will require operators to leverage training, experience, and knowledge to provide the most accurate and relevant information in-time to make a difference.

Participants will:

- Triage samples by sample type, origin, and probability of most hazardous
- Prioritize how samples will be processed as a single lab or as multiple labs
- ▶ Apply scientific expertise and references to complete RFIs
- Maintain quality standards of record management
- Identify or characterize radiation and FTIR spectra received electronically
- Identify or characterize the hazard from chemical and biological samples
- Track sample progress among shifts, participants, and participating laboratories
- Exercise or establish protocols and procedures with local Public Health and agency laboratories
- Provide the most accurate answers and recommendations in a timely manner

SUBJECT MATTER EXPERTISE

CBRNE OPERATIONS & FIELD SUPPORT

NSRI experts range in disciplines from foreign securtly and nuclear physics to cyber security and biological threats. Our operational experience, education and practical knowledge allow for rapid identification and implementation of solutions, and our expansive network means — if we don't have it, we will find it.





EXPLOSIVE COURSES

IMPROVISED EXPLOSIVES DEVICE AWARENESS

8 HOURS | DESIGNATED RANGE | BL

Objective: Provide the knowledge and skills for first responders to not only identify potential explosive threats but identify the key components critical for determining response procedures.

This course provides a comprehensive overview of improvised explosive devices (IEDs) for CWMD agencies, law enforcement and fire to assist in the execution of their duties. It covers a brief history of the use of IEDs, and their evolution as a terrorist attack weapon. Participants will be provided with explosives familiarization, to include recognition of commercial, military, and homemade explosives, as well as their function and uses.

Attendees will participate in classroom lecture and practical labs to understand how IEDs function. Students will be exposed to practical exercises, focusing on the identification of an array of IEDs, their components and triggering mechanisms. The course will guide emergency personnel through the attack cycle in relation to the IED manufacturing process while identifying points of observable activity that can be communicated to emergency responders.



Explosively Formed Projectile (EFP) target demonstration.

HOMEMADE EXPLOSIVES AWARENESS

8 HOURS | DESIGNATED RANGE | BL

Objective: Fill the gap in knowledge that exists between trained EOD Operators/Bomb Technicians and first responders.

An awareness of homemade explosives (HME) IEDs is critical for first responders, as they are often the first ones to encounter the threat of such substances and devices. The course is designed to promote awareness in order to enable early recognition and an appropriate response by the discoverer of HME mixtures, precursor chemicals, IEDs or IED components. As a part of the course, participants will handle inert HME mixture samples.

Additionally, mock IEDs with a variety of switches will be demonstrated in order to enhance the hands-on learning of participants. Finally, participants will be introduced to a mock HME lab to give them an idea of what equipment might be found on site.



HME chemistry demonstration.

INTERMEDIATE HOMEMADE **EXPLOSIVES PRODUCTION**

24 HOURS | DESIGNATED RANGE | IL

Objective: Improve the safety and effectiveness of CWMD agencies, EOD technicians, DOD members, law enforcement personnel and intelligence analysts by giving them a greater awareness of improvised explosive (HME) manufacture.

This is a three-day Intermediate Improvised Explosives course. The course combines eight hours of classroom instruction with 16 hours of hands-on learning.

The course objectives include recognition of HME operations, understanding the hazards of precursor chemicals and improvised explosives, crude field identification methods, desensitization techniques, and comparison of HME sensitivity and performance to standard explosives.

ADVANCED HOMEMADE **EXPLOSIVES PRODUCTION**

40 HOURS | DESIGNATED RANGE | AL

Objective: Improve the safety and effectiveness of CST members, EOD Technicians, Special Operators and Intelligence Analysts by giving them a greater awareness of improvised explosive (HME) manufacture.

This course is an advanced, fast-paced, handson class. It combines eight hours of classroom instruction with 32 hours of hands-on learning. The course is designed to enhance recognition of HME operations and precursors. It also increases understanding of the hazards of precursor chemicals and improvised explosives, field identification methods and comparison of HME sensitivity and performance relative to standard military and commercial explosives.



Explosive test conducted on student-made HMEs.

MEDICAL COURSES

BASIC CBRN MEDICAL RESPONSE FOR FRONTLINE WORKERS

24 HOURS | MOBILE-READY | BL

Objective: Teach first responders the basic knowledge, skills, and abilities needed to manage a potential CBRN patient.

Intended for participants with little to no experience managing CBRN patients, this course includes classes on emerging threats, risk identification and mitigation, patient isolation, personal protective equipment, decontamination, packaging, and transport of CBRN patients.

Students learn to manage patients in austere environments using nonconventional methods. Includes academic blocks of instruction, hands-on activities and culminating scenarios.

BIOLOGICAL SPECIALIST

40 HOURS | MOBILE-READY | IL

Objective: Triage, treatment and evacuation of casualties from a biological warfare event.

This course will exercise requirements, development and synchronization of SOPs for USG agencies that identify, treat and globally transport, biological incident casualties.

It involves classroom instruction on threats, biological agent treatment, isolation and transport protocols, capability demonstrations of relevant support entities, international capabilities by host nations, discussion of treatment regimens and hands-on interaction with various mobility platforms.

The course culminates in a multi-hour field exercise where SOPs will be challenged and refined for future use.

EMERGENCY MEDICAL TRANSPORT OF HIGHLY INFECTIOUS DISEASE PATIENTS

24 HOURS | MOBILE-READY | IL

Objective: Prepare first responders to plan, prepare and safely transport patients with a highly infectious or high consequence disease.

The course includes planning and preparation components to ensure personnel are prepared to integrate into local, regional, or national emergency structures. The course trains emergency medical personnel to prepare an ambulance and crew for transport and rapid decontamination. Participants are also trained in when, where, and how to don and doff Powered Air-Purifying Respirators (PAPR), full-disposable coveralls, and other associated PPE. Hands-on practical experience with: preparing the ambulance, donning and doffing PPE, and the operation and movement of a portable isolation unit.



Transfer of downed operator from decon line to receiving medical personnel.

ADVANCED MEDICAL TREATMENT **FOR HAZMAT**

32 HOURS | MOBILE-READY | AL

Objective: Teaches healthcare and EMR professionals to medically manage patients exposed to HAZMAT.

The course is comprised of four separate modules combined into a single 32-hour course. It is eligible for continuing education credit by the College of Medicine, American Academy of Clinical Toxicology, CAPCE, and Center for Disease Control and Prevention.

Module 1: Advanced Hazmat Life Support Provider (16hrs)

Objective: Learn how to medically manage patients exposed to hazardous materials by recognizing the signs and symptoms.

Module 2: AHLS for Radiological Incidents & Terrorism (4hrs)

Objective: Prepare to evaluate and manage patients who are externally and internally contaminated with radioactive materials or who are exposed to ionizing radiation without contamination.

Module 3: AHLS for Chemical Burns & Toxic **Products of Combustion (4hrs)**

Objective: Teaches EMR professionals to medically manage chemical burns and toxic inhalation injuries, including carbon monoxide and cyanide poisoning.

Module 4: Explosion and Blast Injuries (8hrs)

Objective: Introduce information relevant to the initial assessment and care of casualties from explosives and blast injuries.



Extraction of downed operator from a hazardous environment.

OPERATIONAL COURSES

SITUATIONAL AWARENESS AND **MODALITY (SAM)**

40 HOURS | MOBILE-READY | BL

Objective: Provide robust understanding of CONUS/ OCONUS surveillance activities and operations, techniques to employ to safely navigate around such threats and ways to ensure mission success through limiting compromise.

Military, USG contractors and civilian personnel can easily fall prey to surveillance operations that track everyday movements of USG personnel. Whether it be host nation intelligence agencies, criminal enterprises or terrorist organizations, USG personnel face daily threats while operating incountry or in any unfamiliar AOR.

The course prepares personnel for both security and operational threats that present themselves while operational or TDY, by presenting both concepts and courses of action that will increase the operator's situational awareness and lessen their vulnerability for compromise.

Concepts include vehicle-based defensive tactics, lock vulnerability/bypass techniques and escape from unlawful confinement applications, as well as robust surveillance and counter-surveillance tactics.

Designed as a three-phase deliverable, the course combines classroom instruction and scenario-based practical exercises that ultimately culminate into a capstone field training exercise set in an urban surrounding.

THREAT RESPONSE AND FIELD SAMPLING

8 HOURS | MOBILE-READY | IL

Objective: Address crucial and specific skills and techniques associated with responding to a suspected biological threat and sample collection.

Students will become familiar with The National Strategy for CBRNe Standards, the Framework for a Biothreat Field Response Mission Capability and FBIDHS-HHS/CDC coordinated document guidance on initial responses to a suspicious letter/ container with a potential biological threat. Students will perform field screening, site characterization and public safety sampling techniques required in response to a suspected biological threat.

This course consists of lecture and skill-building by utilizing hands-on collection problems. It focuses on the role of the first responder and the process of collecting forensically valid samples through laboratory analysis; utilizing the ASTM E-2770-10 Standard Guide for Operational Guidelines for Initial Response to a Suspected Biothreat Agent and, ASTM E-2458 Bulk Sample Collection and Swab Sample Collection of Visible Powders Suspected of Being Biothreat Agents from Nonporous Surfaces Overview. This process is consistent with the FBI 12step process for managing a crime scene, including those involving a WMD.

Additionally, students will be introduced to the CDC surface sampling procedures for Bacillus anthracis spores. Students will become familiar with the hazard and threat assessment process as well as the FBI Threat Credibility and Evaluation (TCE) call that takes place on scene and the role of the FBI's Weapons of Mass Destruction Coordinator (WMDC) during the incident. At the end of the course students will be evaluated with a written test and hands-on demonstration of sample collection techniques.

TACTICAL RESPONSE TO WMD FOR LAW ENFORCEMENT

40 HOURS | MOBILE-READY | IL

Objective: Provide law enforcement or tactical response team with training on equipment and tactics needed to safely respond to and operate in an environment involving the terrorist use of weapons of mass destruction —chemical, biological, radiological or nuclear.

The course covers a general awareness of chemical, biological, and radiological and explosive hazards, as viewed by the tactical team. Additional focus is placed on the crisis resolution for improvised and clandestine laboratories and force protection options, while operating in a CBRNe environment.

One of the main objectives of this course is to utilize or develop each team's standard operating procedures (SOPs). Additional topics covered will

be self, hasty, and emergency decontamination, first aid in a hazardous environment, tactical considerations, and officer safety issues in dealing with a small- or large-scale WMD event.

This is an intense course of practical application and scenario-based training. At the conclusion of the course students will be able to recognize WMD threats, choose the protective equipment for their mission profile, and safely execute their mission objectives in a hazardous environment. They will also be able to provide emergency decontamination, mitigation and stabilization of the incident.

The culminating event for this course is a fullscale exercise designed to reinforce lessons learned throughout the week. Strong emphasis on interactive and practical exercises. Simulations are an important part of the course. We ensure a challenging but safe learning environment.



USMS loading CH-47 Chinook for Tactical Response to WMD class exercise.

DECONTAMINATION **CONSIDERATIONS AND APPLICATIONS**

40 HOURS | MOBILE-READY | AL

Objective: Improve students' current CBRN decontamination operational plans and procedures.

The course is instructed by subject matter experts who bring the most recent data and scientific knowledge to the class. Advanced decontamination technologies and skills are presented to the students and reinforced through scenario-driven practical exercises.

Training instruction includes emerging and advanced threats, decontamination principles, decontamination science and FBI decontamination case studies as well as chemical, biological, radiological decontamination techniques and best practices. Students use their own issued equipment and respond to various problem sets they will have to work through — from large scale decon operation to small tactical applications. Hot washes and afteraction reviews are conducted after each evolution to improve performance as the course progresses. The course concludes with a full-scale capstone exercise focused on a specific decontamination scenario.

Topics covered in the course include:

- Emerging threats
- Personal protective equipment
- Science of DECON
- Dermal toxicity
- ▶ Biological, radiological and chemical decon
- ▶ Pharmaceutical agents decontamination
- ► Tactical application of decontamination operations
- Current practices of decontamination for other agencies
- Case studies



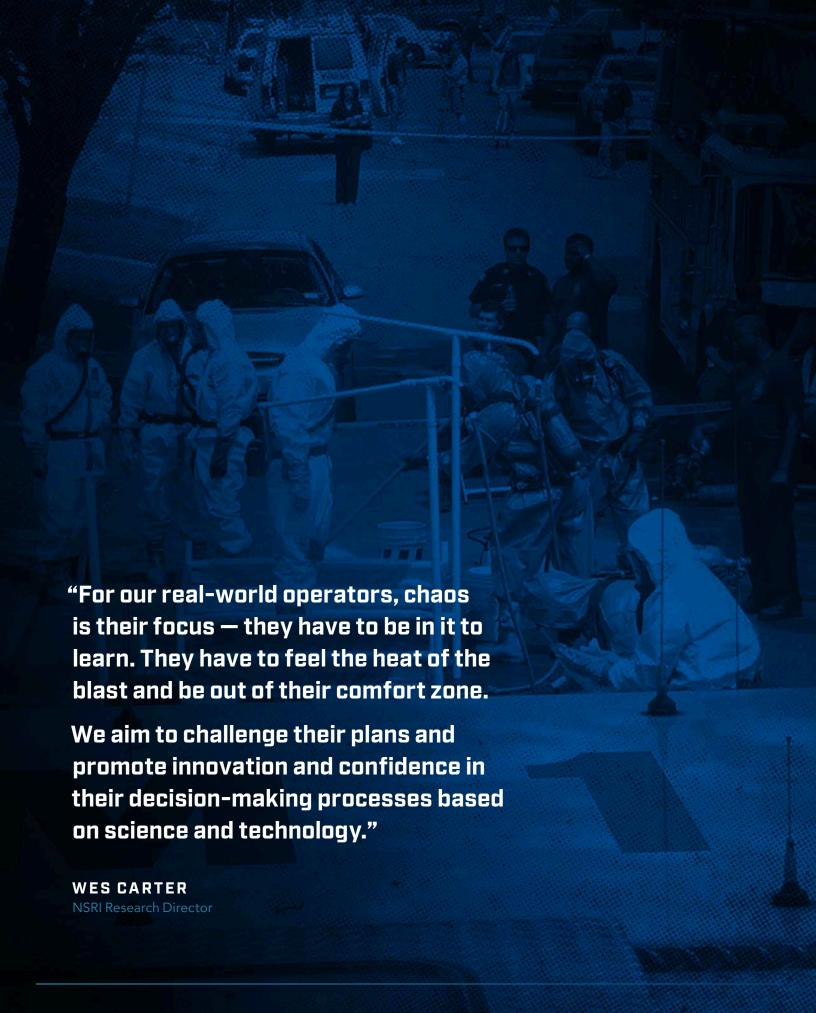
Decon Operator being cutout of PPE.



CST Operators utilizing the buddy system to assist with "peel-out" doffing of PPE.



CBRNE threats and environmental conditions are always factors when selecting the proper PPE ensemble.





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