EXPLOSIVES ACCESS AND DESTROY AGENT IN A FIREFIELD.

Neutralization Solutions
LITANS (Large Item Transportable Access and Neutralization System)
Reduces waste to elements (C, H, O, N).
Electrically heated detonation chamber.
Neutralizes bulk chemical warfare agents.
Neutralizes agent from large bulk containers such as non-explosively configured bombs and ton containers filled with chemical agent.
Drilling systems may not meet size/weight/logistics constraints, secondary treatment generates large volumes of waste if performed in the field.
Processes large quantities of unweaponized chemical agents and precursors only in non-hostile environments.

CAPABILITIES
Uses an air plasma torch to reduce waste.

CHALLENGES
Size/weight/logistics constraint, number of trained individuals to operate, no non-permissive capability.

EXISTING CHEMICAL AND BIOLOGICAL WEAPONS DISABLEMENT AND DESTRUCTION SOLUTIONS

TECHNOLOGY
Battlefield Solutions

DESCRIPTION
Open Detonation
Explosives access and destroy agent in a fireball.

Challenges

Closed and Drained

The munition containing the chemical or biological agent is drilled or cut into through the fill hole, or side of the munition. The agent is then poured out of the casing. In some cases, the agent has hardened and needs to be mixed/washed out, usually with water.

EDS (Explosive Destruction System)
Explosive accessing of munitions followed by chemical neutralization in a sealed chamber. Munitions packed in carrier (3-6), cutting charge added, and inserted into drum chamber. Charge detonates, neutralization chemical added, drum chamber rotated to mix chemicals, system drained, munitions fragments removed and stored as hazardous waste.

SDC (Static Detonation Chamber)
Electrically heated detonation chamber with off-gas treatment
Wide range of munitions can be destroyed, large up to 155 mm sized munitions, fit in system, high higher throughput capacity than other EDTs.
Size/weight/logistics constraint, not easily transported, number of trained individuals to set up and operate, heat management for certain size/heat requirements, large amount of water required for off-gas system, no non-permissive capability.

DAVINCH (Detonation of Ammunition in a Vacuum Integrated Chamber)
Double walled steel vacuum detonation chamber with an off-gas treatment system. Donor explosives surround agent filled munition, explosion shatters the munition, and the shockwave and heat of the explosion destroys the chemical agent and energetics.
Wide range of munitions can be destroyed.
Size/weight constraint, number of trained individuals to set up and operate, liquid waste byproduct, no non-permissive capability.

TDC (Transportable Detonation Chamber)
Explosive Imploded Container Detonation (vented); munitions packed in explosive, loaded in chamber with bags of water, system sealed, explosive detonated.

Challenges

Drilling and Drain

Drilling systems may not meet size/weight/logistics constraints; secondary treatment generates large volumes of waste if performed in the field.

CAPABILITIES
Uses a highly turbulent fluidized medium containing thousands of localized hot plasmas forming radicals that accelerate the oxidation rate by 2-4 orders of magnitude.

CHALLENGES
Size/Weight/Lightweight constraint, massive amounts of electricity required, large amounts of water required, not fully developed technology, cost efficiency concerns.

TECHNOLOGY
DIE (Detonation of Ammunition in a Vacuum Integrated Chamber)

DESCRIPTION

Challenges

Bulk agent, mortars, projectiles, bombs, rockets, highly efficient, potential for all environments including hostile, throughput of 2 tons per day.

Multiplex

Uses a highly turbulent fluidized medium containing thousands of localized hot plasmas forming radicals that accelerate the oxidation rate by 2-4 orders of magnitude.

Challenges

Size/Weight/Lightweight constraint currently, requires high voltage power supply, training for all use, technology still under development.

Plasma Energy Solutions

PEPS (Plasma Energy Pyrolysis System)
Reduces waste to elements (C, H, N).
Using high heat formed by highly ionized gas. Organic compounds are gasified into syngas. Inorganics are melted and bonded to non-leaching glass slag.
1-3 tons per day capacity, 99.99999% efficacy, bulk agent destruction (no munition).

CAPABILITIES

Challenges

Size/Weight/Lightweight Constraint, no munitions destruction, large amounts of by-product, no non-permissive capability, not cost efficient, high power and diesel energy requirements.

LITANS (Large Item Transportable Access and Neutralization System)
Neutralizes agent from large bulk containers such as non-explosively configured bombs and ton containers filled with chemical agent.
Operators are able to access and transfer agent fill to reactor without having touching the item. Operators drain waste neutralized from reactor into waste drums on reagent skid.
Neutralizes bulk chemical warfare agents and their precursors by heating and mixing with reagents, such as water, sodium hydroxide, and sodium hypochlorite to facilitate chemical degradation resulting in destruction efficiency of 99.9%.

CAPABILITIES
Neutralizes from large bulk containers.

CHALLENGES
Size/weight/logistics constraint, number of trained individuals to operate, no non-permissive capability.