Pay Dirt: Turning Deadly Chemical Agents Into Harmless Soil

December 10, 2014

DARPA seeks portable system that turns stockpiles of chemical warfare agents into dirt or other safe organic compounds without generating hazardous waste

Destroying chemical warfare agents in bulk is a challenge for the military and international community. Current methods of eradication, such as incineration or hydrolysis, create toxic waste that requires further processing. And the logistics required to transport large stockpiles from storage to a disposal site can be risky and expensive. Additionally, different types of chemicals require different methods to make them safe, so each agent requires a specific neutralization procedure – one size doesn't fit all. To address these challenges, DARPA has announced the Agnostic Compact Demilitarization of Chemical Agents (ACDC) program and issued a Broad Agency Announcement solicitation today: http://go.usa.gov/Fba5.

The program aims to develop technologies for a transportable, prototype disposal system that converts any chemical warfare agent into safe organic compounds, such as harmless soil, using minimal consumables in the process and creating no hazardous waste. The system would enable safe destruction of chemical stockpiles on site without need for transportation.

"Chemical warfare agents are made of deadly combinations of chemicals that in their original, basic constituent form were at one time a harmless part of the environment," said Tyler McQuade, DARPA program manager. "ACDC aims to develop technologies that reverse the process and return the chemical compounds to their safe, natural state in the environment, without creating hazardous waste in the process."

Looking beyond current incineration methods that can create acid rain as a byproduct, and hydrolytic methods that require large amounts of water, ACDC seeks new methods that would allow indigenous materials near a chemical weapons storage site anywhere in the world to be used as scavenger material to neutralize agents. Soil is plentiful in many places around the world and is envisioned as a main consumable for a new neutralization process.

"Simply put, we want a new process that would take dirt, plant matter, or whatever is plentiful at the storage location, mix it in with any chemical agent and get safe dirt or plant matter out the back side that can be put back in the environment right at that location, significantly reducing the cost of current methods," McQuade said.

The ACDC program seeks expertise in areas such as soil science, environmental science/engineering, chemistry (analytical, inorganic, organic, physical), chemometrics, process engineering and control system engineering.

A Proposers Day Webcast is scheduled for Dec. 15, 2014. Details about the webcast are available here: http://go.usa.gov/6nNh. Registration for the webcast closes Friday, Dec.12, 2014 at 4:00 p.m. EST.

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Media with inquiries should contact DARPA Public Affairs at outreach@darpa.mil



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