

EVALUATION OF LOW-GWP ALTERNATIVE FIRE EXTINGUISHING AGENTS FOR GROUND VEHICLE AFES

PROJECT OVERVIEW

This project advanced the evaluation of low-GWP alternative fire extinguishing agents to replace halons and hydrofluorocarbons (HFC) for protection of ground vehicle crew compartments against fires and fuel explosions. International treaties and US legislation has mandated the phasedown of production of high GWP chemicals like HFCs, which could result in fleet readiness issues due to agent unavailability. Potassium bicarbonate dry chemical, an environmentally friendly alternative, was tested with novel system integration in a representative vehicle using standard qualification test procedures and was evaluated against crew safety and casualty criteria.

BENEFITS

This project advances the DOD understanding of the fire extinguishing performance and crew safety of potassium bicarbonate dry chemical in a ground vehicle crew automatic fire extinguishing system (AFES). The alternative is an environmentally friendly, commercial off the shelf solution with no anticipated production restrictions that can be integrated with minor system modifications. Implementation will enable continued fleet readiness as HFC supplies are threatened.



Alternative fire extinguishing agents under test

PATH FORWARD

Developmental testing conducted to date has advanced the use of potassium bicarbonate dry chemical in this unique application to TRL 6. The next phase will examine system integration in a production vehicle and complete qualification level testing to advance this technology to TRL 8. AFES suppliers and vehicle manufacturers can implement this technology with minimal impact to their hardware. Advancement of modeling and simulation of crew AFES performance using potassium bicarbonate dry chemical will be vital to achieving an effective agent distribution design prior to final vehicle live-fire testing.

DoD Executive Agent

Office of the Assistant Secretary of the Army for Installations, Energy, and Environment

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FOR FURTHER INFORMATION

National Defense Center for Energy and Environment
<http://www.denix.osd.mil/ndcee/>

Combat Capabilities Development Command Ground Vehicle
Systems Center (DEVCOM GVSC)
<https://www.usarmygvsc.com/>