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Replacement of Halon with 3M™ Novec™ 1230 in a Crew Compartment Protection System

Objective

To evaluate the effectiveness of Novec™ 1230 as a "drop-in" replacement for halon in an existing crew compartment fire protection system.

Background

The Canadian Department of National Defence is seeking a more environmentally friendly replacement for halon to use with its crew compartment fire protection systems in armoured vehicles. The most cost-effective solution would use an agent that could be dropped into an existing system. Novec™ 1230 has been considered as such a replacement, but because its boiling point is much higher than that of other halocarbons, conventional nozzles may not fully vaporize it, reducing its effectiveness. Further work is therefore needed to find means to deliver Novec™ 1230 as a vapour and to test the effectiveness of this solution in a crew compartment fire.

Progress to Date

Conducted experiments that simulated an explosion in a Coyote light armoured vehicle crew compartment caused by fuel spray, in order to evaluate the effectiveness of various commercially available nozzles using Novec™ 1230.

Outcome to Date

A report was delivered in March 2006, which summarized these experiments and showed that available nozzles did not cause Novec™ 1230 to fully vaporize when discharged during an explosion.

Work Remaining

- Test a new explosion suppression system that uses a gas generator to discharge Novec 1230 by setting off a deflagration/explosion in a mock-up vehicle crew compartment.
- Measure discharge and explosion extinguishment times, compartment temperatures, thermal radiation levels and acid gas concentrations.

Partners

Department of National Defence Canada, Aerojet and 3M Canada.

Start/Expected Completion Dates

This project began in March 2005, and will be completed in March 2008.

Project Manager

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For more information, see http://irc.nrc-cnrc.gc.ca/fr/pfdss/crew_e.html

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