

## **U.S. Army Development of Environmentally Acceptable Fire Suppression Agents for use in Hand Held Extinguishers**

J. Douglas Mather

U.S. Army Program Executive Office (PEO) Aviation sought a replacement for the 2.75 pound Halon Handheld Fire Extinguisher (HHFE) currently mounted in/on legacy rotary wing weapon systems. The HHFE agent development program ran from summer of 2008 through the fall of 2012 and resulted in the development of two blended agents each based on ultra-fine sodium bicarbonate (SBC) powders blended with HFC-227ea. The agent development work included the following phases: halon 1301 agent baseline fire suppression performance testing; alternative clean agent testing, optimization and down-selection of a final clean agent for consideration; initial testing of SBC additives to enhance the fire suppression performance of the selected clean agent; extensive testing of SBC processing methods and characterization of the SBC particle sizes, suspendability in HFC-227ea and fire suppression performance; development of SBC characterization methods (field emission scanning electron microscopy, particle size distribution, surface area characterization, SBC powder water content); and development of procurement specifications for the selected process specific types of SBC.

This presentation and accompanying report describe in a chronological manner the development and testing of the new HFC-227ea/SBC replacement agents that have now been selected for replacement of the halon 1301 based HHFE used in legacy rotary wing weapon systems.