

# Feasibility Analysis and FDS modelling of Water Mist Fire Suppression for Protection of Aircraft Hangars

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**Bio:** Karli Steranka is currently an associate at Jensen Hughes with two years of experience in fire protection engineering consulting. She has experience utilizing FDS for multiple performance based design projects. Karli received her bachelors and masters degree in Fire Protection Engineering from the University of Maryland where she completed research for the Airforce using FDS to evaluate the feasibility of water mist for the protection of aircraft hangars.

## Abstract

Concern about the possible impact of PFAS associated with aqueous film forming foam uses in the Air Force's firefighting mission motivated a two-phase feasibility analysis of water mist systems for the protection of aircraft hangars. Phase I involved a feasibility analysis of commercial off the shelf water mist technologies based on manufacturer, literature, and previous test data. Phase I identified seven manufactures who have developed systems with potential for successful protection of aircraft hangars. Phase II used NISTS Fire Dynamic Simulator to model two low pressure and one high pressure water mist system identified in Phase I. Phase II completed an analysis and validation simulations of the Lagrangian particle, extinction, and evaporation sub-models in FDS. Following validation simulations each nozzle was tested in a full-scale hangar configuration for protection of a JP-8 spill fire. The results found the high-pressure water mist system was able to extinguish the fire and earlier activation times lead to less damage to the aircraft and hangar compartment.

**KEYWORDS:** FDS modeling, aircraft hangar, high pressure water mist, low pressure water msit