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*“Advancements in Smart Fire Protection”*

Currently most aviation fire protection strategies involve flooding the total volume containing the fire zone. That is once a fire is detected within the space to be protected; such an engine nacelle or dry bay area a fire suppressant is discharged into that space. Unfortunately, the time required to flood these volumes with a sufficient amount of agent is relatively long and requires the availability of a large quantities of agent. This results in long fire extinguishing times, which can result in significant fire and heat damage to the structure and surrounding electronic components. Further once the agent discharge has is initiated the entire quantity of agent is typically released, leaving no agent available for a relight or second fire event. Since the impact of released fire suppressants on our environment is becoming more of a concern, a fire protection system design should if possible, look at ways to minimize the amount of agent released while maintaining maximum fire protection. To this end Engineering & Scientific Innovations, Inc. (ESI) has developed a family of Intelligent Fire Protection Systems which can be either stand alone or utilize existing fire suppressants onboard the aircraft. The current family of “Smart Fire Protection” concepts addresses these issues and has been successfully demonstrated in full scale simulators. Specifically, fire tests have been performed in a section of a wing leading edge dry bay , a rotorcraft engine nacelle fire simulator, and currently a simulated occupant compartment of a large rotorcraft. All fires were electrically ignited and used JP-8 as the fuel source. In over 250 fire tests extinction times for the dry bay and engine nacelle were less than 475 milliseconds.