

Advanced Fire Detection in Cargo Compartments

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Recent activities in the field of fire detection have piqued interest in improving the ability to discriminate nuisance source alarms caused by environmental conditions from real fire events in aircraft cargo compartments. A selection of particulate, heat and gas sensor signals combined with the proper algorithm may provide robust detection while ignoring the typical causes of nuisance alarms experienced with currently fielded detectors. A set of experiments were performed at NIST in a detector testing tunnel, the fire emulator/detector evaluator (FE/DE) to produce fire (flaming and smoldering) and nuisance environments that could occur in cargo compartments. Signals from smoke, heat, and gas sensors were recorded during the exposure tests and analyzed to assess the ability of sensor combinations to discriminate between the fire and non-fire conditions before currently fielded cargo smoke detectors would indicate alarm. A "standardized" suite of fire and nuisance conditions reproduced in the FE/DE could be used to assess new spot-type detection technologies prior to fielding them in aircraft cargo compartments.