Kreckie's FleetChek Advisor

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FleetChek's Fire Checklist System

FleetChek's electronic checklists provides an electronic, secure, paperless solution, automatic record keeping for Part 139 quarterly fueler inspections, and daily and weekly emergency vehicle inspections (checkouts). This technology is available today in an app.

Lightning and Aircraft Fueling

By,
Jack Kreckie

Lightning Presents a Risk During Aircraft Fueling

The handling of aviation fuel in various locations, climates, and weather conditions requires properly maintained equipment, skilled personnel and effective bonding. NFPA 407 identifies lightning as a source of ignition that could present a hazard during aircraft fueling. Further, NFPA 407.4.2.10, "Lightning" states: "A written procedure shall be established to set the criteria for when and where fueling operations are to be suspended at each airport as approved by the fueling agent and the airport authority."

According to a 2008 report published by the Airport Cooperative Research Program (ACRP), "Lightning Warning Systems for Use by Airports", it is clear that, not only does lightning present a hazard to aircraft fuel handlers, but that the danger exists for all ramp workers.

There Is No Standard

Although a lightning detection program is indisputably necessary at all airports, there is no single standard or method used for detection of lightning, coupled with suspension of ground operations, including fueling. Airline costs are directly related to delays of scheduled departures and arrivals. An airport operator may be reluctant to issue a halt to all fueling based on their best estimate of when the lightning will be in the proximity of the airport. If this estimate is wrong, it may result in unnecessary (and costly) flight delays based on the restriction on fueling or other ramp activities.

The 2008 ACRP report surveyed eight large airports and four airlines which have airport-owned lightning detection equipment. The plans in place range from very sophisticated installed technologies and alerting procedures to "no airport-owned or operated equipment". A review of airline procedures indicates that the distance of lightning prompting the cessation of fueling operations, varies among airlines and union contracts.

NFPA 407 provides some basic guidance in Annex A.4.2.10. The paragraph to provide another explanation as to why there is not a single system in place at all airports states: "Establishing precise rules for fueling is impossible when the electrical storms are near the airport. The distance of the storm from the airport, the direction in which it is traveling, and its intensity are all factors to be weighed in making the decision to suspend fueling operations temporarily. Experience and good judgment are the best guides. Sound travels approximately 322 miles per sec. The approximate number of miles to the storm can be determined by counting the seconds between a

flash of lightning and the sound of thunder and dividing by 5."

Information On Lightning Protection Systems For Airports

There are various technologies available for weather analysis, prediction and lightening detection. These systems can be provided by a contractor or owned and operated by the airport or airlines. Examples of the technologies available for airports include:

- Handheld or portable systems based on RF transmitters
- Directional detector systems based on RF transmitters
- Electric field monitors
- Commercial lighting detection networks

ACRP Report Issue #8 provides a fairly detailed overview of each of these types of lighting detection equipment. Airports are not required to have any such equipment

DAS Technology

Dissipation Array Systems are based on a natural phenomenon known as a "point discharge" principal. The system looks like a huge umbrella on a high mast light pole. The light poles are spaced based on the protection area offered by the DAS. In layman's terms, DAS interrupts the exchange charge between earth and the cloud. The technology has an excellent record for preventing ground strikes.

DAS Pole-Mounted Hemisphere Used to Protect Aircraft Parking Ramp

Lightning at an airport creates a hazard to personnel, aircraft, structures and equipment. Delays are always detrimental to aviation transportation. In the airfreight business, a hub experiencing lightning during the big push to move freight to locations around the world for time sensitive delivery can be devastating. Portions of the FedEx

Super Hub in Memphis are equipped with the DAS to protect their employees, aircraft, buildings, equipment and assets. FedEx also uses DAS to protect aboveground fuel tanks.

DAS at the FedEx Super Hub at MEM

What's Going on at Your Airport?

If there are five airlines at your airport, there may be five procedures for shutting down aircraft fueling and ramp operations. A heavy thunder and lightning storm is typically not the time to conduct a ramp patrol, so it would not be surprising if fueler inspectors never witnessed a storm related cessation of ramp activities.

Do you know what the procedures are among the airlines and FBOs at your airports? What is the communication process in place to notify fuelers to shut down? What's next? Do they shut down the fueling and leave the bonding cables in place? Do they disconnect the nozzle? What about the fuel handler? Does he sit in his truck or run for cover?
As an inspector, this is vital information to have. Consider an effort to collect copies of the various procedures in place during anticipated lightning events. Consider forming a safety collaborative to look at these procedures. It would be great if we could develop a "best practice" based on the input of all stakeholders and standardize the procedure. If nothing else, raising awareness among the stakeholders, e.g., ARFF, Airport Operations, Airlines and FBOs, might prevent an accident or fire.

What Does All This Mean?

We know that there is amazing technology available to detect lightning and even prevent lightning strikes at airports. The bottom line is, "How does the ramp worker refueling an aircraft at your airport get notified? Is the Fire Department at the airport also notified? Are you satisfied that the system at your airport is properly notifying everybody working on the ramp, especially fuel handlers?"
Consider a survey to your Stakeholders. Start with your airport operations department and then include all airlines and FBOs.

1. Does your airline / FBO have a system in place for lightning detection?
2. At what distance from the airport does your airline / FBO begin

monitoring lightning? (miles from airport)
3. When does ramp preparation begin to prepare for a lightning event? (miles from Airport)
4. When does your airline / FBO shut down aircraft fueling based on a lightning report? (miles from airport)
5. When does your airline / FBO shut down ramp operations based on a lightning report? (miles from airport)
6. What instructions are given to fuel handlers regarding their procedures when notified to shut down in anticipation of lightning?
7. What notification methods are used to alert fuel handlers and ramp workers?
8. What signals the order to restore operations indicating lightning is no longer in the area?

If you compile your results and send me the information, I'll compile all data received and publish the findings in this forum. Please reduce your results to an excel spreadsheet and send it to Jack.Kreckie@comcast.net. Please title your email **Lightning Survey Results**. I'll close out any information received on April 6, 2017 and publish it shortly thereafter.

About the Author:

Jack Kreckie is a founding partner of FleetChek, LLC. Jack has spent 40 years in the fire service, of which 30 were in uniform. He now serves as an ARFF consultant and expert in optimized asset management of emergency vehicle fleets. Jack is a retired Deputy ARFF Fire Chief of Massport Fire Rescue. He has served as Global Chief of Aviation Fire Protection for Hostile Environment Service in Western Australia, and was the Fire Chief at Komo Airfield in the Gulf Province of Papua New Guinea. Jack is an ARFF SME, consulting internationally and domestically for airports, federal agencies and universities. Jack can be reached at Jack.Kreckie@comcast.net

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To see the Fueler Checklist Flyer *click here*.
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